

**THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY**  
No. 69, ANNA SALAI, GUINDY, CHENNAI – 600 032.

**M.D. & M.S.**  
**DEGREE / DIPLOMA COURSES**



**SYLLABUS AND CURRICULUM**

**2017-2018**

# **THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI**

## **PREFACE**

The Syllabus and Curriculum for the M.D. / M.S. Degree / Diploma Courses have been revamped with the experts from the concerned specialities so as to impart high quality state of art training thereby setting higher standards.

The Students passing out of this Prestigious University shall recognize the health needs of the community and carry out professional obligations ethically and keeping with the objectives of the National Health Policy.

The Post graduate education is a process by which an undergraduate medical doctor is transformed into a highly skilled and competent specialist with adequate knowledge, judgement and appropriate attitude to ensure highest level of care to the patients.

The Students have to master most of the competencies, pertaining to the speciality, that are required to be practiced at secondary and the tertiary levels of the health care delivery system. The Students should be aware of the contemporary advances and developments in the discipline concerned. The Students should acquire a spirit of scientific inquiry and to be oriented to the principles of Research Methodology and Epidemiology. They should also acquire basic skills in teaching of the Medical and Paramedical Professionals.

(Subject to changes in Amendments in MCI Regulations and SAB Resolutions)

**Prof. Dr.S.GEETHALAKSHMI, M.D., Ph.D.  
VICE-CHANCELLOR**

**Comments / Feed back are welcome if any and mail it to [registrar@tnmgrmu.ac.in](mailto:registrar@tnmgrmu.ac.in)**

## **M.D. & M.S. - DEGREE / DIPLOMA COURSE**

| <b>M.D. – COURSES</b> |                                               |                  |
|-----------------------|-----------------------------------------------|------------------|
| <b>Sl. No.</b>        | <b>Specialities</b>                           | <b>Page. No.</b> |
| 1.                    | M.D. Anesthesiology                           | 5                |
| 2.                    | M.D. Anatomy                                  | 41               |
| 3.                    | M.D. Biochemistry                             | 57               |
| 4.                    | M.D. Community Medicine                       | 81               |
| 5.                    | M.D. Dermatology, Venerology and Leprosy      | 130              |
| 6.                    | M.D. Forensic Medicine                        | 165              |
| 7.                    | M.D. General Medicine                         | 183              |
| 8.                    | M.D. Geriatrics                               | 204              |
| 9.                    | M.D. Immuno Haematology and Blood Transfusion | 239              |
| 10.                   | M.D. Microbiology                             | 269              |
| 11.                   | M.D. Nuclear Medicine                         | 291              |
| 12.                   | M.D. Emergency Medicine                       | 309              |
| 13.                   | M.D. Pathology                                | 346              |
| 14.                   | M.D. Paediatrics                              | 372              |
| 15.                   | M.D. Pharmacology                             | 410              |
| 16.                   | M.D. Physical Medicine & Rehabilitation       | 426              |
| 17.                   | M.D. Physiology                               | 467              |
| 18.                   | M.D. Psychiatry                               | 480              |
| 19.                   | M.D. Radio-diagnosis                          | 494              |
| 20.                   | M.D. Radio-therapy                            | 516              |
| 21.                   | M.D. Respiratory Medicine                     | 535              |
| 22.                   | M.D. Tropical Medicine                        | 547              |
| 23.                   | M.D. Family Medicine                          | 585              |
| <b>M.S. COURSES</b>   |                                               |                  |
| 24.                   | M.S. Otorhinolaryngology                      | 620              |
| 25.                   | M.S. General Surgery                          | 636              |
| 26.                   | M.S. Ophthalmology                            | 647              |
| 27.                   | M.S. Orthopedics                              | 676              |
| 28.                   | M.S. Obstetrics & Gynecology                  | 698              |

| <b>P.G. DIPLOMA COURSES</b> |                                                                  |                  |
|-----------------------------|------------------------------------------------------------------|------------------|
| <b>Sl. No.</b>              | <b>Specialities</b>                                              | <b>Page. No.</b> |
| 29.                         | Diploma in Anesthesiology (D.A.)                                 | 733              |
| 30.                         | Diploma in Clinical Pathology (D.C.P.)                           | 769              |
| 31.                         | Diploma in Dermatology, Venerology and Leprosy (DDVL)            | 789              |
| 32.                         | Diploma in Obstetrics & Gynecology (D.G.O.)                      | 821              |
| 33.                         | Diploma in Ophthalmology (D.O.)                                  | 853              |
| 34.                         | Diploma in Orthopedics (D.Ortho.)                                | 882              |
| 35.                         | Diploma in Oto-Rhino Laryngology(D.L.O.)                         | 902              |
| 36.                         | Diploma in Paediatrics( D.C.H.)                                  | 918              |
| 37.                         | Diploma in Physical Medicine & Rehabilitation (D.Phy. Med. & R.) | 953              |
| 38.                         | Diploma in Psychiatry (D.P.M.)                                   | 994              |
| 39.                         | Diploma in Public Health (D.P.H.)                                | 1007             |
| 40.                         | Diploma in Radio-diagnosis (D.M.R.D.)                            | 1039             |
| 41.                         | Diploma in Radio-therapy (D.M.R.T.)                              | 1060             |
| 42.                         | Diploma in Tuberculosis & Chest Diseases (D.T.C.D.)              | 1077             |
| 43.                         | Diploma in Diabetology                                           | 1089             |

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# **MD ANESTHESIOLOGY**

## **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

### **MD ANESTHESIOLOGY**

The curriculum shall train a candidate to manage anaesthesia in a competent, compassionate and caring manner.

Learning shall be self directed and essentially autonomous.

Exposure to all the sub-specialities shall be achieved

A combination of formative and summative assessments shall ensure completion of goals and training.

#### **1. GOALS:**

To produce competent and compassionate specialists who

- a) shall recognize the health needs and ethically carry out the professional obligations towards the patient.
- b) shall attain all the required competencies within all the sub-specialities in the speciality of anaesthesiology , enabling good practices at the secondary and tertiary levels of health care delivery.
- c) Shall take effort to be aware and update knowledge about the latest advances and developments in the field.
- d) Shall acquire the basic skills to teach medical and para-medical professionals.
- e) Shall orient oneself to the principles of research methodology and epidemiology

#### **2. OBJECTIVES:(Ref: Bloom's taxonomy of learning domains)**

A. Knowledge to be gained from the syllabus

B. Skills to be learned from the practical training

C. Attitudes to be developed during the training period

The curriculum shall include

- a) Anatomy, physiology and biochemistry relevant to anaesthesiology.
- b) A thorough knowledge of the pharmacokinetics and pharmacodynamics of anaesthetic drugs .
- c) Knowledge of cardiovascular, respiratory, neurological, hepatobiliary, renal and endocrine homeostasis and related drugs used in patients undergoing anaesthesia.
- d) Physics and principles involved in the construction and functioning of anaesthesia machine and equipment used to provide anaesthesia and patient vital signs monitoring.
- e) Knowledge of the commonly used techniques in General, Regional and Local anaesthesia
- f) Understanding the concept of unconsciousness and its implications in anaesthesia.
- g) Knowledge and management of acute and chronic intractable pain.
- h) Knowledge of intensive care / therapy.
- i) Knowledge of medical statistics
- j) Knowledge and gain expertise in cardiopulmonary resuscitation.
- k) Knowledge of medical ethics.

The course content should stimulate the thought processes of the candidate and encourage the candidate to acquire new information from books, journals, lectures, seminars and discussions. It should stimulate reflective thinking and problem solving by critical analysis of events during anaesthesia and interpretation of the data and logical reasoning.

### **3. COMPONENTS OF POST-GRADUATE CURRICULUM**

#### **THEORETICAL KNOWLEDGE, PRACTICAL AND CLINICAL SKILLS INCLUDING RESEARCH WORK AND THESIS**

##### **FIRST YEAR: BASIC TRAINING**

##### **Basic Sciences: Knowledge**

Post-graduates should understand the principles involved in the measurement of relevant variables and the requirements of equipment and monitoring in anaesthesia. Knowledge is expected in the areas outlined below.

Physics and Clinical Measurement Principles of Measurement .

- SI units
- Behaviour of fluids (gases and liquids)
- Flow of fluids
- Measurement of volumes, flows, and pressures
- Measurement of temperature
- Humidification
- Oximetry
- Analysis of gases
- Capnography
- Electrical safety
- Fires and explosions
- Equipment and Apparatus
- Equipment design and standards
- Gas supply in bulk and cylinders
- Anaesthesia delivery system, including pressure valves and regulators
- Vaporisers
- Breathing systems

- Devices to maintain the airway (laryngoscopes, endotracheal tubes, tracheostomy tubes, face masks, laryngeal masks, airways)
- Information systems
- Data storage and retrieval Monitoring
- Anaesthesia record – Manual and electronic record keeping
- Minimum monitoring standards
- Additional monitoring when appropriate (including central venous pressure, pulmonary artery pressure, cardiac output, cerebral function, temperature, coagulation, blood loss, blood sugar)

### **Preoperative Assessment / Pre-anaesthesia clinics**

- Appropriate history taking
- Physical examination including airway assessment, respiratory, cardiovascular and neurological examinations
- Referral to other specialists when necessary
- Establishment of a rapport with the patient to provide reassurance, disclosure of risk, information, and discussions on complementary medicine and informed consent
- Communication and consultation skills face-to-face, by phone and in writing
- Pulmonary function tests
- Measurement of cardiovascular function
- Interpretation of common radiology and imaging scans and investigations
- Other investigations as appropriate

### **Conducting Anaesthesia**

- Applied cardiac and respiratory physiology
- Applied pharmacology and variability in drug response
- Selection and planning of the anaesthesia technique
- Decision-making relating to postponement or cancellation of surgery
- Routine inhalation and intravenous inductions
- Maintenance of anaesthesia
- Correct usage of anaesthesia delivery systems
- Application and interpretation of monitored variables and neuromuscular blockade
- Use of muscle relaxants
- Application of mechanical ventilation
- Management of the airway and intraoperative complications
- Common regional anaesthesia techniques (eg, epidural and spinal anaesthesia and Regional Nerve blocks)
- Maintenance of accurate records



## **Postoperative Care**

- Safe recovery transport and handover in the post-anaesthesia recovery room
- Post-operative consultations
- Management of postoperative pain, fluid requirements, and nausea and vomiting

## **Communication skills**

- Call for help in Cardio Pulmonary Resuscitation, PACU, in Emergencies
- Establishment of rapport with patients, attenders , relatives of patients  
Especially in PACU, INTENSIVE CARE UNITS, RECOVERY UNITS to provide reassurance , disclosure of current condition & any procedural information.
- To obtain informed consent from patients or attenders /relatives
- Documentation of events correctly /properly for future verification, research activities .

## **Basic Sciences : Skills- Clinical skills**

Post-graduates should provide safe anaesthesia care and pain management for uncomplicated patients undergoing non-major surgery.

Post-graduates should be competent in the following technical skills -

- Maintenance of an adequate airway
- Rapid sequence induction
- Basic and advanced Life Support for adult and paediatrics
- Aseptic techniques
- Venous access
- Arterial blood gas collection
- Arterial cannulation
- Central venous cannulation
- ECG recording and interpretation
- Lumbar puncture
- Blood culture collection
- Emergency management of a pneumothorax

Post-graduates should be familiar with the following clinical protocols in the delivery of safe anaesthesia care, and be able to respond accordingly for crisis management.

- Checking of the anaesthesia delivery system
- Airway assessment and anticipation of Difficult airway and its management which may be acute and may be life threatening
- Inadequate airway; failed intubation, obstructed airway, oesophageal intubation, endobronchial intubation, and unplanned extubation .
- Laryngospasm .
- Bronchospasm .
- Hypertension.
- Hypotension.
- Arrhythmias.
- Myocardial Ischaemia.
- Hypoxia .
- Hypercarbia.
- Hypoventilation.
- Hyperventilation.
- Hypothermia .
- Hyperthermia .
- Malignant hyperthermia.
- Anaphylaxis .
- Residual neuromuscular blockade.
- Inadequate neuraxial blockade .
- Seizures .
- Gas embolism.
- High ventilator peak inspiratory pressures.
- Pulmonary aspiration .
- Pneumothorax.

### **Basic Sciences: Skills- Educational skills**

- Developing a study plan for the rest of the training period
- Reviewing study plans and correcting for deviations (eg, catching up on deficient knowledge or experience)
- Reflecting on previous learning experiences with the aid of the Learning Portfolio
- Linking basic science teaching with clinical practice & Studying effectively
- Participating in small-group learning and educational activities
- Being aware of decision-making processes
- Managing time effectively for study, work and home/leisure

- Giving and receiving feedback
- Developing insight into personal limitations
- Using the Internet including e-mail
- Conducting and appraising literature searches
- Appraising journal articles including the application of statistics
- Carrying out oral presentations and professional communication.

## **OBSTETRIC ANAESTHESIA AND ANALGESIA: KNOWLEDGE**

- Maternal physiology
- Process of labour and delivery
- Foetal and neonatal physiology
- Placental physiology
- Obstetric and post partum pharmacology
- Endocrine pharmacology
- Pharmacological considerations for newborn resuscitation
- Pharmacology of placental drug transfer
- Anatomy — airway, spine, pelvis, birth canal, gravid uterus, and nerve and blood supply in pregnancy
- Drugs used for fertility support and IVF
- Ecbolics and tocolytics
- Principles of in-vitro fertilisation
- Antenatal care
- Labour and delivery
- Maternal monitoring during labour
- Caesarean section; indications and levels of urgency
- Abortions and septic abortions
- Postpartum period
- High-risk Obstetrics- medical, obstetric or anaesthesia history
- Pre-existing disease in pregnancy
- Substance abuse during pregnancy
- Pre eclampsia and eclampsia, pathophysiology and management
- Obstetric complications, eg, breech, malpresentation, multiple pregnancy and abnormal placentation
- Obstetric interventions; indications and anticipation of anaesthesia and analgesia
- Amniotic fluid, air and pulmonary embolism, pathophysiology and management
- Obstetric haemorrhage- antepartum, peripartum and postpartum
- Foetal and Neonatal Considerations
- Foetal teratogenicity, carcinogenicity, and congenital abnormalities

- Foetal evaluation and monitoring
- Antepartum and intrapartum foetal compromise
- Foetal death in utero; pathophysiology and psychological issues
- Neonatal resuscitation
- Apgar score and neuro-adaptive scores, and their prognostic significance
- Neonatal surgery - Anaesthesia Management
- Pre-anaesthesia assessment of the pregnant patient and identification of high risk patients eg: Risk factors in anaesthesia such as Pre-existing diseases like cardiac disease, hypertension, respiratory disease, diabetes, thyroid disease, intracranial disease, bleeding disorders, renal disease and neuromuscular disease
- Adolescent or elderly primigravid pregnancy
- Morbid obesity
- Thromboembolic disease
- Anaesthesia for non-obstetric surgery in the pregnant patient
- Anaesthesia for elective obstetric procedures
- Anaesthesia for emergency obstetric procedures
- Anaesthesia for Caesarean section
- Pain management in obstetrics – Labour analgesia
- Complications of General Anaesthesia like Difficult airway management, Pulmonary aspiration, Awareness during general anaesthesia
- Complications of Regional Analgesia and anaesthesia, eg, high block, local anaesthetic toxicity, neurological sequelae
- Management of inadequate or failed regional anaesthesia and analgesia
- Management of severe haemorrhage; surgical, antepartum and postpartum
- Maternal morbidity and mortality; incidence and legal and ethical issues
- Organisation of an obstetric anaesthesia and analgesia service
- Safe radiation practice during pregnancy

### **Obstetric anaesthesia-Skills**

- Airway assessment in pregnancy
  - Rapid sequence induction and Acid Aspiration prevention protocol
  - Emergency airway management
  - Implementing epidural, spinal, and combined spinal/epidural anaesthesia and analgesia,
  - Management of local anaesthetic toxicity
  - Management of high regional block
  - Management of severe obstetric haemorrhage
- Post-graduates should be familiar with clinical drills for crises management especially

- for airway emergencies
- Failure to intubate algorithm in obstetrics
- Advanced Life Support in the obstetric patient
- Resuscitation of the neonate
- Management of pulmonary aspiration during general anaesthesia

## **II. SECOND YEAR- ADVANCED TRAINING:**

### **Research and Scientific Enquiry: Knowledge**

- ▢ Proposing a hypothesis
- ▢ Information search and literature review
- ▢ Research design, bias and appropriate methods of measurement
- ▢ Data collection and storage
- ▢ Good record keeping
- ▢ Common statistical tests and application of statistics
- ▢ Interpretation of results
- ▢ Responsibilities of investigator to the ethics committee
- ▢ Principles of writing a scientific paper
- ▢ Principles of oral or poster presentation of a paper
- ▢ Ethical principles
- ▢ The process of obtaining funding and writing a basic grant application

### **Research and Scientific Enquiry : Clinical-Skills**

Post-graduates should acquire skills in scientific learning as a medical specialist

- ▢ Conducting and appraising literature searches
- ▢ Appraising journal articles including the application of statistics
- ▢ Applying the principles of evidence-based medicine to clinical practice
- ▢ Carrying out oral presentations and professional communication
- ▢ Presenting quality assurance exercises or projects
- ▢ Developing facilitation skills, such as tutoring in small-group learning and conducting small-group meetings
- ▢ Preparing the thesis protocol with the help of Guide, obtaining approval from Ethics committee
- ▢ Clinical application and performance of thesis/Dissertation in the prescribed period

### **Research and Scientific Enquiry : Attitudes**

Post-graduates should develop an appreciation of and continue research and scientific enquiry

- ▢ Valuing rigorous educational and scientific processes
- ▢ Distinguishing between practice with a sound scientific basis and that which requires further objective assessment
- ▢ Committing to informed consent, confidentiality and all other ethical principles of research
- ▢ Committing to continuing professional development

## **ANAESTHESIA FOR HIGH-RISK ELECTIVE AND EMERGENCY SURGERY:**

### **KNOWLEDGE**

- Preoperative evaluation and resuscitation
- Thromboembolism prophylaxis
- Perioperative and prophylactic antibiotics
- Management of coagulopathies
- Regional anaesthesia for abdominal, vascular, and imaging procedures including anatomy, and physiological and pharmacological aspects
- Informed consent and consent for incompetent patients
- Postoperative care, Management of postoperative pain, phantom-limb pain and pain from injury

### **Anaesthesia for Trauma Surgery**

- Assessment and immediate care; primary and secondary survey, Trauma severity scores
- Emergency airway management
- Establishing intravenous access
- Priorities of resuscitation, investigations, and surgical procedures
- Physio-biochemical effects of trauma
- Managing facial, head and cervical spine injuries
- Glasgow Coma Scale and other scores of consciousness
- Pathophysiology of head injury including changes in cerebral blood flow, cerebral metabolism and intracranial pressure
- Pathophysiology and management of shock
- Pathophysiology of blood loss and massive blood transfusion
- Volume replacement
- Managing abdominal and chest injuries
- Management of burns procedures, including: – Understanding the pathophysiology of burns – Anaesthesia for debridement and skin grafting – Drills in burns resuscitation .
- Managing coagulopathies .
- Transport of ventilated or injured patients including portable ventilators and monitoring systems

## **Co-existing Medical Conditions Relevant to Anaesthesia**

- ❖ Endocrine disorders including phaeochromocytoma, hyperthyroidism, hypothyroidism, and diabetes mellitus
- ❖ Disorders of the cardiovascular system
- ❖ Disorders of the respiratory system
- ❖ Disorders of the nervous system
- ❖ Disorders of the liver, biliary tract and gastrointestinal system
- ❖ Renal disorders
- ❖ Water, electrolyte and acid-base disturbances
- ❖ Haematological disorders, including coagulopathies
- ❖ Skin and musculoskeletal disorders, including rheumatoid arthritis and ankylosing spondylitis
- ❖ Psychiatric disorders and substance abuse
- ❖ Disorders associated with ageing
- ❖ Obesity

## **ANAESTHESIA FOR HIGH-RISK ELECTIVE AND EMERGENCY SURGERY: SKILLS:**

Post-graduates should provide safe anaesthesia for

- Major abdominal surgery
- Laparoscopic surgery
- Trauma surgery –post-graduates should revise pre-assessment skills, including taking an appropriate history and performing an appropriate physical examination (including airway assessment, cardiovascular, respiratory and neurological examinations) to assess the patient's status.

## **Post-graduates should become competent in the following technical skills--**

- Securing an airway, arterial and central venous cannulation, and rapid sequence induction
- Cricothyroidotomy and percutaneous tracheostomy
- Cannulation of major vessels for volume resuscitation
- Awake fiberoptic intubation
- Thoracic and lumbar epidural and spinal anaesthesia
- Blood conservation strategies
- Regional nerve blocks for abdominal and lower limb surgery
- Chest drain insertion
- Immobilisation and care of cervical spine injuries
- Post-graduates should be familiar with clinical drills for crises management.
- Airway emergencies eg, “cannot intubate, cannot ventilate”, difficult airway, hypoxia and abnormal end-tidal CO<sub>2</sub> levels
- Managing major intraoperative events in aneurysm and abdominal surgery

- Drill for the primary and secondary survey
- Drill for raised intracranial pressure
- Drill for tension pneumothorax
- Drill for managing severe haemorrhage
- Drill for managing cardiac arrest (ACLS Algorithm)
- Drill for managing malignant hyperthermia

## **ENT, Eye, Dental, Maxillofacial, and Head and Neck Surgery: Knowledge**

- ▢ Cardiovascular, respiratory and neurological physiology
- ▢ Physiology of gases in closed body cavities
- ▢ Pharmacology of local anaesthetic agents
- ▢ Pharmacology of local vasoconstrictors
- ▢ Anatomy of the head and neck and abnormal facies
- ▢ Anatomy of the airway, nasal passages, larynx, pharynx and middle ear
- ▢ Effects of surgery and radiation on the airway
- ▢ Monitoring in anaesthesia
- ▢ Neurological monitoring
- ▢ Lasers-- types, uses in surgery, complications and precautions
- ▢ Airway devices and types of tracheal tubes, eg, Micro-laryngeal, Rae
- ▢ Equipment for difficult tracheal intubation
- ▢ Equipment for jet ventilation

## **Anaesthesia for ENT surgery**

- ▢ Pre-operative airway assessment
- ▢ Tonsillectomy and adenoidectomy, including quinsy and postoperative bleeding
- ▢ Microlaryngoscopy
- ▢ Radical head and neck surgery
- ▢ Laryngectomy and Pharyngolaryngectomy
- ▢ Laser surgery .
- ▢ Nasal and sinus operations.
- ▢ Parotid tumor surgery .
- ▢ Myringoplasty .
- ▢ Middle ear surgery.
- ▢ Microsurgery of the ear.
- ▢ Managing partial airway obstruction including: –
- ▢ Epiglottitis
- ▢ Foreign bodies
- ▢ Laryngeal tumours
- ▢ Oropharyngeal cysts and abscesses
- ▢ Elective and emergency tracheostomy
- ▢ Paediatric problems, eg, relating to disease, airway, larynx and craniofacial disorders
- ▢ Post-operative care



### **Anaesthesia for Dental surgery**

- ▢ Outpatient dental procedures- sedation and general anaesthesia
- ▢ Inpatient dental surgery
- ▢ Dental procedures on the mentally challenged
- ▢ Dental procedures on patients with bleeding disorders
- ▢ Oral surgery
- ▢ Fractured jaw
- ▢ Maxillary fractures according to the Le Fort classification
- ▢ Dental sepsis

### **Anaesthesia for Eye surgery**

- ▢ Anatomy and physiology of extremes of age
- ▢ Anatomy of orbit and contents
- ▢ Physiology of intraocular pressure
- ▢ Ocular perfusion
- ▢ Eye reflexes (oculocardiac, oculorespiratory, oculoemetic)
- ▢ Anatomy of orbit, extraocular muscles, blood vessels, lacrimal apparatus
- ▢ Local anaesthetic agents for eye surgery
- ▢ Other drugs for eye surgery, eg, topical agents, vasoconstrictors, mydriatics, miotics, and agents to reduce intraocular pressure
- ▢ General anaesthesia for eye surgery including:
- ▢ Examination under anaesthesia
- ▢ Laser eye surgery
- ▢ Intraocular surgery
- ▢ Extraocular surgery
- ▢ Retinal detachment
- ▢ Plastic and orbital surgery
- ▢ Emergency eye surgery and use of suxamethonium in penetrating eye injury
- ▢ Monitoring
- ▢ Postoperative care, management of nausea and vomiting
- ▢ Principles of regional retrobulbar and peribulbar block and choosing between general and regional anaesthesia techniques
- ▢ Sedation for eye procedures
- ▢ Principles of anaesthesia for day-case
- ▢ Paediatric considerations

### **Anaesthesia for Maxillofacial, Thyroid, and Head and Neck Surgery**

- ▢ Pre-operative airway assessment
- ▢ Management of anaesthesia for major maxillofacial surgery, which may involve prolonged anaesthesia, major blood loss, hypothermia and multiple procedures
- ▢ Management of anaesthesia for facial trauma: emergency and semi-elective, including fractured jaw and maxilla
- ▢ Management of anaesthesia for cancer, plastic and cosmetic surgery on the face, head and neck, including surgery for cleft palate
- ▢ Management of thyroid surgery, including

- ▢ Anaesthesia for thyroid and parathyroid surgery
- ▢ Stabilisation of thyroid and parathyroid disorders preoperatively
- ▢ Post thyroidectomy bleeding
- ▢ Managing a “thyroid storm”
- ▢ Sedation for head and neck procedures
- ▢ Post-operative care

### **ENT, Eye, Dental, Maxillofacial, and Head and Neck Surgery : Skills**

- ▢ Tracheal intubation
- ▢ Nasal intubation
- ▢ Use of special tubes
- ▢ Placement and removal of packs
- ▢ Applying topical local anaesthesia to the airway
- ▢ Securing the difficult airway
- ▢ Recognising the high-risk airway
- ▢ Use of stylets and bougies
- ▢ Awake intubation
- ▢ Retrograde catheter technique
- ▢ Fiberoptic intubation
- ▢ Laryngeal mask airway intubation
- ▢ Failed intubation or ventilation drill
- ▢ Cricothyroidotomy and percutaneous tracheostomy
- ▢ Transtracheal ventilation
- ▢ Managing the airway in trauma and burns
- ▢ Upper airway obstruction drill
- ▢ Post extubation drill for difficult airway
- ▢ Spontaneous gaseous induction for airway obstruction
- ▢ Regional and local anaesthesia of the head and neck
- ▢ Management of postoperative nausea and vomiting in head and neck surgery
- ▢ Management of postoperative facial and airway swelling

### **Paediatric Anaesthesia: Knowledge**

- ▢ Anatomy relevant to airway management and breathing
- ▢ The physiology of respiration, circulation, fluid balance and thermoregulation
- ▢ The pharmacology of anaesthetic agents, analgesics and common paediatric medications, especially the relationship of dose to the size/maturity of child
- ▢ The relevance of surface area of children of various ages
  - Stages of development of the normal child and their relevance to hospitalisation
  - General principles of perioperative management relevant to children, emphasising:
    - ▢ common childhood illnesses and their influence on anaesthesia and surgery
    - ▢ fasting guidelines
    - ▢ fluid and electrolyte replacement
    - ▢ temperature control
    - ▢ specialised equipment for children of different sizes
    - ▢ perioperative monitoring

- ▢ dosage and administration of emergency drugs
- ▢ postoperative apnoea detection and management
- ▢ acute and persistent pain management
- Relevant features of important childhood conditions: respiratory infections, asthma
- ▢ prematurity and its complications
- ▢ facial anomalies affecting the airway
- Neonatal emergencies
- ▢ respiratory distress,
- ▢ tracheoesophageal fistula,
- ▢ congenital diaphragmatic hernia,
- ▢ necrotising enterocolitis,
- ▢ abdominal wall defects
- other childhood emergencies- inhaled/ingested foreign bodies, fractures, head injuries and burns /Scalds
- ▢ congenital cardiac disease; especially ASD, VSD, Tetralogy of Fallot
- ▢ cerebral palsy
- ▢ chronic diseases of childhood; especially cystic fibrosis, muscular dystrophy
- ▢ congenital syndromes- Down's, Pierre-Robin, mucopolysaccharidoses
- ▢ malignancy and the treatment of malignancy
- ▢ renal failure

### **Paediatric anaesthesia Knowledge-Clinical management**

Applying principles of paediatric anaesthesia for the following surgical subspecialties:

- ▢ Neurosurgery
- ▢ Ophthalmology
- ▢ Dental surgery
- ▢ Plastics and reconstructive surgery
- ▢ Thoraco-abdominal surgery
- ▢ Cardiac surgery and procedures
- ▢ Urology surgery and procedures/investigations
- ▢ Orthopaedic Surgery Otolaryngology
- ▢ General surgery
- ▢ Trauma and Burns
- Applying principles of paediatric anaesthesia for diagnostic procedures
- ▢ Recognising and managing the sick child
- ▢ Recognising and managing reversal to transitional fetal circulation
- ▢ Managing fluid therapy in paediatric patients
- ▢ Managing specific childhood syndromes and disorders
- ▢ Applying principles of paediatric anaesthesia for procedures outside the operating theatre, including patient transport
- ▢ Caring for paediatric patients undergoing imaging investigations, which may require sedation or anaesthesia
- ▢ Recognising and managing paediatric emergencies including basic and advanced life support
- ▢ Understanding the organisation of a paediatric anaesthesia and analgesic service

### **Paediatric Anaesthesia: Skills**

Post-graduates should demonstrate decision-making and clinical skills, and perform

- ▯ Paediatric advanced life support

Manage emergencies and conditions including

- ▯ Hypoxia
- ▯ Bronchospasm
- ▯ Apnoea
- ▯ Upper airway obstruction including upper airway infection
- ▯ Bradycardia and other arrhythmias
- ▯ Cardiac arrest
- ▯ Hypovolaemia
- ▯ Neurological compromise
- ▯ Epiglottitis and croup
- ▯ Inhaled foreign body
- ▯ Infantile airway obstruction
- ▯ Laryngospasm
- ▯ Masseter spasm
- ▯ Postoperative stridor
- ▯ Aspiration of gastric contents

Technical skills, such as airway management, vascular cannulation and regional anaesthesia should be demonstrated for paediatric patients

Interpersonal skills in dealing with paediatric patients and their parents

### **Intensive Care: Knowledge**

Post-graduate should understand

#### **Acute Circulatory Failure**

- ▯ Classification, causes, pathogenesis and sequelae of shock
- ▯ Principles of management of all forms of shock
- ▯ Monitoring in the management of shock
- ▯ Causes of cardiorespiratory arrest and the effects on body systems
- ▯ Cardiopulmonary resuscitation and external defibrillators
- ▯ Cardiac dysrhythmias and their current therapies
- ▯ Valvular heart disease
- ▯ Endocarditis
- ▯ Pulmonary embolism
- ▯ Congestive cardiac failure
- ▯ Anaphylaxis
- ▯ Ischaemic Heart Disease and Myocardial Infarction
  - Factors involved in the balance of oxygen supply and demand to the heart
  - Aetiology of coronary artery disease and its effects
  - Signs and symptoms of ischaemic heart disease
  - Signs and symptoms of myocardial infarction

- ▢ Principles of the management of acute myocardial infarction including thrombolysis, angioplasty and surgery
- ▢ Indications for a transvenous pacemaker
- ▢ Right heart catheterisation, angiography and echocardiography
- ▢ Long-term effects of acute myocardial infarction and late complications

### **Respiratory Failure**

- ▢ Causes and pathogenesis of respiratory failure
- ▢ Oxygen therapy and mechanical ventilatory support (invasive and noninvasive)
- ▢ Respiratory disease processes & representative conditions
- ▢ Cardiogenic/non-cardiogenic pulmonary oedema/ARDS
- ▢ Airway obstruction
- ▢ Airway stenosis and tracheomalacia
- ▢ Bronchopleural fistula
- ▢ Pneumothorax
- ▢ Aspiration syndromes
- ▢ Fat embolism
- ▢ Pneumonia (community and nosocomial)
- ▢ Chronic airway limitation
- ▢ Asthma

### **Renal Failure**

- ▢ Definitions of acute and chronic renal failure
- ▢ Causes and pathogenesis of renal failure
- ▢ Acute renal failure
- ▢ Principles of renal replacement therapy and their indications

### **Neurological Failure**

- ▢ Definition and causes of coma
- ▢ Causes, pathogenesis and treatment of cerebral swelling and raised intracranial pressure
- ▢ Principles of cerebral function monitoring, especially intracranial pressure
- ▢ Principles of diagnosing brain stem death
- ▢ Representative conditions to be understood:
  - ▢ Acute vascular disorders of the central nervous system
  - ▢ Acute infective disorders of the central nervous system
  - ▢ Cerebral oedema
  - ▢ Brain stem death
  - ▢ Seizures
  - ▢ Hemiplegia, paraplegia, quadriplegia
  - ▢ Guillain Barre syndrome
  - ▢ Peripheral nerve and or muscle dysfunction associated with critical illness
  - ▢ Myasthenia gravis
  - ▢ Hyperthermia, hypothermia
  - ▢ Tetanus
  - ▢ Delirium

## **Severe Trauma**

- ▢ Effects of severe trauma on organs and organ systems
- ▢ Principles of EMST for the management of trauma and advantages of an organized team approach
- ▢ Technique of cricothyroidotomy/ tracheostomy/mini-tracheotomy
- ▢ Principles of the management of head injury and Glasgow Coma Scale
- ▢ Management of cervical spine injuries
- ▢ Principles of the safe transfer of injured children and adults and portable monitoring systems

## **Sepsis**

- ▢ Definition, pathogenesis and pathophysiology of sepsis and related syndromes
- ▢ Risk factors for nosocomial infection
- ▢ Infection control measures in ICU and operating suites

## **Supportive Care of Critically Ill Patients**

- ▢ Inotropic Therapy
- ▢ Recognise when to use inotropic or vasopressor therapy
- ▢ Choose an appropriate agent, dose, physiological endpoint, rate and route of administration
- ▢ Review the efficacy of inotropic therapy at regular intervals
- ▢ Provide appropriate nutritional support and General Care
- ▢ Appropriate plan for care of bowels, skin, mouth, eyes and maintenance of mobility and muscle strength

## **Intensive Care: Skills**

- ▢ Cardiovascular Related
- ▢ Choosing and using inotropic agents, vasodilators, and vasoconstrictors
- ▢ Managing dysrhythmias
- ▢ Choosing and using antimicrobial agents in heart disease
- ▢ Assisting with intra-aortic balloon pumping
- ▢ Cardioversion
- ▢ Advanced life support
- ▢ Respiratory Related
- ▢ Oxygen therapy
- ▢ CPAP & Non-invasive ventilation
- ▢ Mechanical ventilation, including modes of ventilation
- ▢ Pleural drainage
- ▢ Percutaneous tracheostomy
- ▢ Fiberoptic bronchoscopy
- ▢ Renal Failure
- ▢ General care of continuous dialysis and haemofiltration techniques
- ▢ Neurological Failure
- ▢ Maintaining cerebral perfusion pressures and intracranial pressures
- ▢ Gastro-intestinal Hemorrhage management
- ▢ Assisting with placing a Sengstaken Blakemore tube

### **Diagnostic imaging and interventional procedures (radiology and cardiology):**

#### **Knowledge**

- ▢ Preanaesthetic preparation
- ▢ Techniques appropriate for adults and children for CT scanning, MR imaging and interventional radiology, angiography and interventional cardiology
- ▢ Post-investigation care

### **Diagnostic imaging and interventional procedures (radiology and cardiology): Skills**

- ▢ Pre-anaesthetic preparation
- ▢ Sedation and general anaesthetic techniques for:
  - ▢ angiography and interventional procedures
  - ▢ CT scanning, adults and children
  - ▢ Magnetic resonance imaging
  - ▢ Problems due to magnetic field
- ▢ Post-investigation care

### **Pain Medicine: Knowledge**

- ▢ Neurobiology of Pain
- ▢ Overview of “Pain Pathways”
- ▢ Multi dimensional aspects of pain; role of physiological, psychological and environmental factors
- ▢ Pharmacology of Analgesic Agents
- ▢ Pharmacokinetic and pharmacodynamic principles, drug interactions, and side effects.

### **Knowledge of the pharmacology of:**

- ▢ Opioids
- ▢ Paracetamol
- ▢ Non-steroidal anti-inflammatory agents (NSAIDs)
- ▢ Antidepressants (TCAs and SSRIs)
- ▢ Anticonvulsants
- ▢ Membrane-stabilising agents
- ▢ Alpha-2 agonists
- ▢ NMDA-receptor antagonists
- ▢ Local anaesthetics
- ▢ Anti-emetics
- ▢ Agents used to treat hypotension associated with neuraxial blockade
- ▢ Awareness of the role of the following in pain management
- ▢ Anti-migraine agents
- ▢ Steroidal anti-inflammatory agents
- ▢ Topical agents (NSAIDs, Capsaicin)
- ▢ Neurolytic agents
- ▢ Experimental agents for analgesia
- ▢ Knowledge of different routes of analgesic drug delivery, including factors governing choice of route, side effects relevant to particular route,  
Principles of additive and synergistic effects when agents are combined

- Oral
- Intramuscular
- Subcutaneous (including continuous infusion)
- Intravenous (including continuous infusion)
- Patient-controlled analgesia (PCA) via different routes (ie intravenous, subcutaneous, intranasal, epidural, intrathecal)
- Other methods- topical, transdermal, rectal, transmucosal (intranasal, inhalational and sublingual / buccal), intra-cerebroventricular, intraarticular, infiltration under skin

### **Psychological and Sociocultural Issues**

The importance of psychological (emotional and cognitive), social, and other factors in the presentation and management of pain with emphasis on:

- Factors involved in the wide variation in individual response to tissue injury
- The relationship between depression and persistent pain
- The role of anxiety and/or depression in acute pain
- Differentiation of active and passive coping strategies
- The role of illness behaviour
- The influence of the health care provider on the response to pain treatment
- The importance of an interdisciplinary approach to pain assessment and treatment including the potential role of other members of the pain team (particularly psychiatrist, clinical psychologist, physiotherapist, nursing staff, occupational therapist, social worker)
- The placebo effect and its implications for treatment of pain

### **Pain Assessment and Measurement**

Assess pain and outcome of pain treatment using history, clinical examination and pain measurement tools.

Recognise the limitations of pain measurement techniques, particularly in some patient groups (eg, persistent pain, children, those with cognitive impairment)

Understanding of – Neuroendocrine and metabolic responses to surgery stressors and impact of analgesic techniques

- Consequences of poorly controlled pain
- Current evidence for and against pre-emptive analgesia and clinical implications
- Current evidence for the effect of analgesic technique on morbidity and mortality
- Importance of aggressive multimodal postoperative rehabilitation
- Relationship between acute and persistent pain including factors involved in progression from one to the other, and potential interventions to prevent such progression

Choose the most appropriate technique of acute pain management –

- Pharmacological techniques (opioid and non-opioid) via a variety of routes
- Regional techniques including central neuraxial, plexus and peripheral nerve blockade
- Non-pharmacological techniques

Formulate a pain management plan based upon –



- ▯ Patient preference, physical and mental status, and available expertise and technology
  - ▯ Special requirements in specific patient groups (eg, the elderly, children, pregnant and postpartum patients, Obstructive sleep apnoea, concurrent hepatic or renal disease; non-English speaking, cognitive impairment)
  - ▯ Special requirements in patients with opioid-tolerance and/or a substance abuse disorder including an understanding of guidelines and regimens for analgesic drug use (equi-analgesic ] dosing for opioids; tolerance and dependence)
  - ▯ Special requirements under specific clinical situations (eg, spinal injuries, burns, acute back pain, musculoskeletal pain, acute medical pain, acute cancer pain and patients in Intensive Care and the Emergency Department)
- Include in a pain management plan
- ▯ Appropriate evaluation of the patient's pain
  - ▯ Informed consent, including disclosure of risk and appropriate documentation
  - ▯ Patient education about the selected technique and alternatives
- Recognise common presentations of acute musculoskeletal pain (eg, rib fracture, acute back pain) and other non-surgical acute pain syndromes (migraine, renal colic) including in the Emergency Department and Intensive Care Unit
- ▯ Identify when to seek advice from, or refer to, a Pain Medicine Specialist

### **Cancer Pain**

Undertake assessment of pain in patients with cancer based on –

- ▯ Understanding of the multiple potential aetiologies of pain associated with cancer
- ▯ Differentiation between somatic, visceral, and neuropathic pain
- ▯ Evaluation of psychological, social, cultural and spiritual issues
- ▯ Undertake treatment of cancer-related pain syndromes based on therapies available (including chemotherapy, radiotherapy, surgery, invasive and non-invasive analgesic techniques, and psychological approaches)
- ▯ Understand guidelines and regimens for analgesic drug use including equianalgesic dosing for opioids; tolerance and dependence and their management in the patient with cancer
- ▯ Identify when to seek advice from, or refer to, a Palliative Medicine Specialist

### **Neuropathic Pain**

- ▯ Understand diagnostic criteria, clinical features and management of specific neuropathic pain syndromes including–
- ▯ Central pain (pain after stroke, thalamic pain, spinal cord injury pain, deafferentation pain, phantom limb pain)
- ▯ Neuralgias (trigeminal neuralgia, postherpetic neuralgia, occipital neuralgia)
- ▯ Painful peripheral neuropathy (eg, metabolic, toxic, ischaemic)
- ▯ Pain after nerve injury (eg, neuroma)
- ▯ Post-surgical pain syndromes (eg, post-thoracotomy, post-CABG pain, postmastectomy, postamputation)
- ▯ Complex regional pain syndrome types I and 2 (including the differentiation of Sympathetically maintained from sympathetically independent pain)

- ▢ Recognise and understand the ways in which acute and persistent pain in children differ from pain in adults, including–
- ▢ The effect of developmental stage on assessment and management of pain in children
- ▢ The selection of pain assessment tools for children of different developmental stages
- ▢ Principles of managing acute, procedural and persistent pain in children

### **Pain in the Elderly:**

- ▢ The epidemiology of pain syndromes in the elderly
- ▢ Physiological changes associated with ageing and effects of these on pain and pain management (including changes in pharmacokinetics, pharmacodynamics, and pain biology)
- ▢ Effects of concurrent disease, and psychological, social and cognitive changes on assessment and management of pain
- ▢ Risks associated with polypharmacy in the elderly

### **Pain Medicine: Skills-Clinical Evaluation**

- ▢ Post-graduates should demonstrate skills in the clinical evaluation of patients with acute and persistent pain by: .
- ▢ Obtaining a specific pain history – Onset, location, nature, duration, intensity, aggravating and relieving factors
- ▢ Physical, psychological and social consequences of the patient's pain
- ▢ Current and past pain treatments and outcome
- ▢ Other relevant history (past patterns of drug use or misuse, family history, medical and surgical history)
- ▢ Treatment expectations
- ▢ Interpreting relevant investigations
- ▢ Formulating a management plan and evaluating outcome

### **Pain Medicine-Technical Skills**

Post-graduates should become competent in-

- ▢ Central neuraxial blocks
- ▢ Regional techniques (including knowledge of anatomy, technique, indications, contraindications, complications and their management) including
- ▢ Peripheral and plexus blocks of the upper and lower limb
- ▢ Head and neck blocks
- ▢ Truncal blocks including intercostal and paravertebral block

### **Trainees need to understand the anatomy, technique, indications, contraindications, complications and management of**

- ▢ Stellate ganglion blockade
- ▢ Coeliac plexus blockade
- ▢ Lumbar sympathetic blockade
- ▢ Intrathecal drug delivery for cancer and persistent pain

### **III YEAR ADVANCED TRAINING**

#### **Anaesthesia and Perioperative Care (including Analgesia) for Patients with Cardiac and Vascular Disease for Non-cardiac Surgery: Knowledge**

- ▢ Pathophysiology, investigation, diagnosis, anaesthesia implications, and management of:
- ▢ Ischaemic heart disease
- ▢ Congenital heart disease
- ▢ Valvular heart disease
- ▢ Hypertension
- ▢ Cardiac arrhythmias
- ▢ Other acquired diseases, eg, myxomas, cardiomyopathies
- ▢ Understanding the principles of anaesthesia and perioperative care for patients with:
- ▢ Recent myocardial infarction
- ▢ Ischaemic heart disease
- ▢ Cardiac valvular lesions
- ▢ Congenital heart disease, corrected and uncorrected
- ▢ Hypertensive disease
- ▢ Cardiac arrhythmias
- ▢ Other acquired diseases, eg, myxomas, cardiomyopathies
- ▢ Cerebrovascular disease
- ▢ Peripheral vascular disease

#### **Anaesthesia for Cardiac Surgery-- Understanding the anaesthesia, complications and perioperative care (including analgesia) of:**

- ▢ Coronary revascularisation with/without cardiopulmonary bypass
- ▢ Valvular repair or replacement
- ▢ Emergency cardiac surgery
- ▢ Cardioversion
- ▢ Procedures in the cardiac catheterisation laboratory
- ▢ Electrophysiological procedures
- ▢ Congenital heart disease surgery (paediatric and adult)
- ▢ Procedures on the great vessels, eg, for aortic dissection
- ▢ Heart or heart/lung transplantation

#### **Anaesthesia for Vascular Surgery --Understanding the anaesthesia, complications and perioperative care (including analgesia) of:**

- ▢ Surgery on the vessels supplying the head and neck
  - ▢ Surgery on the abdominal vessels
  - ▢ Surgery on the limb vessels
  - ▢ Minimally invasive procedures on the vessels (eg, intraluminal stenting)
- Understanding the principles, role, and management of procedures, problems, or events associated with anaesthesia for cardiac and vascular surgery, including:
- ▢ Myocardial protection strategies
  - ▢ Cerebral protection

- ▢ Spinal cord protection
- ▢ Blood coagulation and anticoagulation and its monitoring
- ▢ Perioperative arrhythmias
- ▢ Poor cardiac output states
- ▢ Temperature management (including deep hypothermic circulatory arrest)
- ▢ Cardiopulmonary bypass including weaning from bypass and ECMO
- ▢ Cross-clamping of the aorta

**Organ Transplantation** -- Anaesthesia for organ transplantation including:

- ▢ Legal and ethical considerations of organ harvesting and transplantation
- ▢ Brain death and the legal definition of death
- ▢ Physiological and pharmacological considerations

**Protocols and planning Anaesthesia for Patients with Pulmonary Disease Chronic respiratory disease, pathophysiology, diagnosis**

- ▢ Preoperative evaluation of patients with respiratory diseases
- ▢ Lung function tests
  - ▢ Thoracic trauma Anaesthesia and Perioperative Care (including Analgesia) for Thoracic Surgery
- ▢ Preoperative assessment for fitness for lung surgery and one-lung ventilation
- ▢ Thoracotomy and – Lung resection, including pneumonectomy and lung reduction surgery
- ▢ Mediastinal mass resection
- ▢ Oesophageal surgery
- ▢ Surgery on the thoracic aorta
- ▢ One-lung anaesthesia, including management of hypoxia and ventilation
- ▢ Differential lung ventilation
- ▢ Tracheal and bronchial surgery (including use of lasers and stents)
- ▢ Thoracoscopic procedures
- ▢ Bronchoscopy, including removal of foreign body
- ▢ Mediastinoscopy
- ▢ Lung or heart/lung transplantation
- ▢ Management of problems or critical events : –
  - ▢ Fluid management postpneumonectomy
  - ▢ Cardiac herniation postpneumonectomy
  - ▢ Bronchopleural fistula
  - ▢ Lung bullae and cysts
  - ▢ Tension pneumothorax
  - ▢ Superior vena cava obstruction
  - ▢ Empyema
- Understanding the types and uses of endotracheal, double-lumen, and endobronchial tubes and bronchial blockers
- Understanding chest tube drainage systems and suction

## **ANAESTHESIA AND PERIOPERATIVE CARE (INCLUDING ANALGESIA) FOR PATIENTS WITH CARDIAC AND VASCULAR DISEASE FOR NON-CARDIAC SURGERY: SKILLS – CLINICAL**

### **Post-graduates should be Competent in the following**

- ▢ Fiberoptic bronchoscopy
- ▢ Placement and use of vascular monitoring lines (arterial, central venous, pulmonary artery, and femoral and neck vessels)
- ▢ Basic trans-oesophageal echo examinations (subject to local practices)
- ▢ Use of cardiac pacemakers
- ▢ Placement of endobronchial tubes and blockers
- ▢ Use of bougies and tube exchangers

### **Post graduates should be able to perform**

- ▢ Interpretation of ECGs and ECG monitoring
- ▢ Interpretation of chest x-rays and common chest CT and MRI imaging films
- ▢ Assistance with cardiopulmonary bypass
- ▢ Placement and care of chest drains and appropriate use of suction

### **Neuroanaesthesia: Knowledge**

- ▢ Neuro anatomy -- Central nervous system, Spinal cord and meninges
- ▢ Ventricular system and flow of CSF
- ▢ Blood supply to brain and spinal cord
- ▢ Cranial vault and spinal column
- ▢ Cerebral blood flow and Cerebral blood volume
- ▢ Cerebral metabolism
- ▢ Cerebrospinal fluid dynamics and physiology
- ▢ Intracranial pressure
- ▢ Blood-brain barrier
- ▢ Physiology and metabolism of normal and abnormal brain and spinal cord
- ▢ Physiological and metabolic effects of anaesthesia on brain and spinal cord
- ▢ Abnormal water and sodium homeostasis
- ▢ Temperature and CNS function
- ▢ Pharmacology relevant to neuroanaesthesia:
  - ▢ Sedatives
  - ▢ Hypnotics
  - ▢ Analgesics
  - ▢ Inhalation agents
  - ▢ Neuromuscular blocking drugs
  - ▢ Anticholinesterases
  - ▢ Neuroprotection
  - ▢ Diuretics
  - ▢ Hypotensive agents
  - ▢ Vasopressors
  - ▢ Corticosteroids

- ▢ Drug interactions with neuromuscular disorders
- ▢ Principles of clinical measurement and monitoring in neuroanaesthesia, including techniques and clinical importance.
- ▢ Haemodynamic and respiratory monitoring
- ▢ Cerebral blood flow
- ▢ Intracranial pressure (ICP) and cerebral perfusion pressure
- ▢ Cerebral metabolism
- ▢ Transcranial doppler ultrasonometry
- ▢ Electrophysiological monitoring, eg, electroencephalogram and evoked potentials
- ▢ Electrical safety standards

#### Interventions to minimise Cerebral Damage

- ▢ Principles of cerebral protection
- ▢ Haemodynamic stability
- ▢ Fluid and osmotic therapy
- ▢ Management of intracranial hypertension
- ▢ Sedation and ventilatory support

#### **Anaesthesia for Neurosurgery**

- ▢ Understanding the assessment, anaesthesia and perioperative care of patients for:
- ▢ Intra cerebral vascular surgery
- ▢ Extra cerebral vascular surgery
- ▢ Supratentorial surgery
- ▢ Posterior fossa surgery
- ▢ Pituitary surgery
- ▢ Epilepsy surgery
- ▢ 'Awake craniotomy'
- ▢ Craniofacial and craniobasal surgery
- ▢ Spinal surgery
- ▢ Emergency spinal cord decompression
- ▢ Paediatric neurosurgery

#### Principles, role and management of procedures, problems, or events associated with anaesthesia for neurosurgery: –

- ▢ Positioning for neurosurgery
- ▢ Use of inhalation or total intravenous general anaesthesia
- ▢ Induced hypotension
- ▢ Induced hypertension
- ▢ Hypothermia
- ▢ Sitting position
- ▢ Air embolism; precautions, diagnosis and management
- ▢ Injury of head, spinal column and neurological injuries
- ▢ Epilepsy and other neurological disorders
- ▢ Paediatric considerations

**Neuroanaesthesia: Skills**

- ▢ Pre-anaesthesia preparation for neuroanaesthesia
- ▢ Monitoring in neuroanaesthesia – setting up and calibration, placement of cannulae, interpretation of variables
- ▢ Post-anaesthesia care and post neurosurgical care
- ▢ Protocols and drills for
- ▢ Failed airway intubation
- ▢ Reducing raised ICP
- ▢ Suspected cervical spine injury
- ▢ Intraoperative air embolism
- ▢ Initial management of a head injury
- ▢ Positioning of patients

**ATTITUDES INCLUDING COMMUNICATION AND BEHAVIOUR FOR THE POST-GRADUATES:**

- ▢ To learn the attributes of a
- ▢ Medical expert
- ▢ Communicator
- ▢ Collaborator
- ▢ Manager
- ▢ Teacher
- ▢ Professional
- ▢ To practise good communication with colleagues, patients and others
- ▢ To work as a member of a team, but to assume responsibilities and/or delegate duties as a team leader when necessary
- ▢ To commit to, and believe in, a culture of safety and ethical, high quality care
- ▢ To accept that medical knowledge and skills are not the only requirements of specialist practice
- ▢ To be aware of medicolegal obligations relating to medical practice
- ▢ To have insight into one's own limitations, abilities and areas of expertise
- ▢ To commit to continuing professional development

**TRAINING IN RESEARCH METHODOLOGY, MEDICAL ETHICS, BIO ETHICS AND MEDICOLEGAL ASPECTS**

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, bioethics, moral and legal issues, medical audit are part and parcel of the curriculum and syllabus

## **Professionalism and Ethics**

To commit to, and believe in the ethical and professional principles –

- ▢ The best care for the patient must be the principal driving force of practice
- ▢ *Patient autonomy*: patients' ability to determine their treatment
- ▢ *Beneficence*: the principle of “doing good” to patients
- ▢ *Non-maleficence*: the principle of not doing harm to patients
- ▢ *Fidelity*: faithfulness to one's duties and obligations. This principle underlies excellence in patient care, confidentiality, telling the truth, a commitment to continuing professional development and lifelong learning, and not neglecting patient care
- ▢ *Social justice*: the right of all patients to be fairly treated
- ▢ Duty to oneself in terms of personal health care, and maintenance of competence to practise
- ▢ *Accountability*: the anaesthetist is responsible for his/her actions
- ▢ Honour and integrity in all conduct, including the generation and use of resources
- ▢ Respect for others, work as a team and practise conflict resolution
- ▢ Appropriate response to clinical error

## **Patient Considerations**

To commit to, and believe in, the rights of patients with respect to:

- ▢ Autonomy
- ▢ Confidentiality of the doctor-patient relationship
- ▢ Appropriate, excellent clinical care, including pre-operative assessment
- ▢ Informed consent
- ▢ Comprehension of the risks of anaesthesia techniques
- ▢ Appropriate care irrespective of race, culture, gender and socio-economic status
- ▢ Research Considerations
- ▢ To value rigorous educational and scientific processes
- ▢ To commit to the ethical principles of research

## **5. TEACHING AND LEARNING METHODS:**

- ▢ Introductory lectures
- ▢ Seminars, group discussions and symposia.
- ▢ Problem case discussion, before and after the conduct of the case
- ▢ Journal club presentation and discussion
- ▢ Presenting in Conferences and attendance in CME's & Workshops
- ▢ Training in the Operation Theatres (both elective and emergency),

Intensive Care Unit, Pre-anesthetic clinic, Pain Clinics, Peripheral areas like Radiology- including USG , CT MRI and interventional radiology, Endoscopy suite and Interventional cardiology lab.



## 6. **STRUCTURED TRAINING PROGRAMME**

Duration of the training 3years

### **Orientation-**

- To the hospital, wards, operation theatres and peripheral areas
- Anaesthesiology as a subject
- Assigning Thesis guides

### **Objectives for 1st year**

- Orientation- To the hospital, wards, operation theatres and peripheral areas and also to Anaesthesiology as a subject
- To observe and learn assessment and management of cases in ASA I and II in the specialities of General Surgery, Orthopaedics, Gynaecology and Recovery room. The level of supervision is slowly graded to facilitate independent management of general and spinal anaesthesia.
- They should attend the practical guidance workshop on research methodology and should have a knowledge about basic concepts of research, biostatistics etc.

### **Objectives for 2nd year**

- General and regional anaesthesia (including epidural, nerve and plexus blocks) for ASA III AND IV cases in the specialities of Paediatrics, ENT, Dental, ICU, Obstetrics, Eye, Urology, Pain, Peripheral areas and Trauma.
- Should learn BLS, ACLS, PALS and ATLS .
- The post-graduate should be able to analyse a journal article and data and able to present free papers in conferences and should attend continuous education programme & workshops.
- The post graduate should start working on the thesis/Dissertation and should complete the clinical work at the end of second year.

### **Objectives for 3<sup>rd</sup> year**

- Post-graduates should be able to anaesthetise under supervision cardiac, neuro, paediatric and all major cases.
- They should be able to anaesthetise all other elective and emergency cases independently and manage acute pain and make decisions and know how to organize mass casualty.
- Simulation based training

**First year : Basic skills and orientation to broad speciality departments**

|                               |          |
|-------------------------------|----------|
| General surgery :             | 2 months |
| Orthopaedics surgery          | 2 months |
| Pre assessment clinic         | 1 month  |
| ENT & Day care surgery        | 1month   |
| Medicine /Toxicology          | 2 month  |
| PACU/Recovery room/ casualty  | 1month   |
| Emergency Anaesthesia, Trauma | 2 months |
| Obstetric & Gynecology:       | 1 month  |

**2<sup>nd</sup> year multi speciality training**

|                                                 |          |
|-------------------------------------------------|----------|
| Neonatology/Paediatrics/ Cardiology/pulmonology | 2 weeks  |
| Paediatric surgery OT                           | 1 month  |
| Ophthalmic surgery                              | 2 weeks  |
| Urology OT                                      | 1month   |
| Plastic surgery OT                              | 1month   |
| Neuro surgery OT                                | 1 month  |
| Cardio thoracic surgery OT                      | 1month   |
| Cath lab – closed cardiac procedures            | 2 weeks  |
| Radiology- USG, CT scan,MRI, IVP Radio oncology | 2 weeks  |
| Dental/ Oro Facial Maxillary surgery            | 1 month  |
| ICU/IRCU/PACU/                                  | 1 month  |
| OBG OT (Laparoscopic surgery, Infertility &FP ) | 1 month  |
| Dissertation/Thesis department postings         | 2 months |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

### 3 rd year

Dissertation/Thesis department postings 2months

#### **Advanced training speciality postings**

Trauma/ Spine OT 1month

Urosurgery OT 1month

Plastic surgery OT 1month

Transplant surgery OT 1month

vascular OT / Endocrine/ Geriatrics 1 month

Neuro surgery OT 1 month

ENT (Endoscopic & Laser Surgery)OT 1 month

Pain Management 1 month

Critical care/ Organ transplant ICU 1 month

Advanced Orthopedics/General surgery ( Key hole surgery) 1month

Emergency Operation Theatre & Day care surgery postings on rotation

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

#### **8. COMPETENCY ASSESSMENT:**

##### **OVERALL:**

|                                                     |    |         |
|-----------------------------------------------------|----|---------|
| a) Communication / commitment / Contribution /      | () |         |
| Compassion towards patients and Innovation          | () | 5 Marks |
| b) Implementation of newly learnt techniques/skills | () |         |

a) Number of cases presented in Clinical Meetings/  
Journal clubs/seminars - 5 marks

b) Number of Posters/Papers presented in Conferences/  
Publications and Research Projects - 5 marks

c) No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings with details. - 5 marks

Total 20 Marks

PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

**ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

**9. Dissertation and University Journal of Medical Sciences:**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

## 10. THEORY EXAMINATIONS:

**Theory examination will comprise 4 papers**

Paper I - Applied Basic Sciences related to Anaesthesia including Physics in Anaesthesia, History of Anaesthesia

Paper II - Medicine Applied to Anaesthesiology

Paper III - Anaesthesiology

Paper IV - Anaesthesiology including Critical Care and Recent Advances in Anaesthesiology

**All the four question Papers will have following pattern**

I. Elaborate on            2 x 15 = 30

II. Write note on        10 x 7 = 70

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**100 Marks**

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## 11. PRACTICAL EXAMINATIONS:-

**Morning session**

| <b>Long case-1×70<br/>Marks</b>   | <b>Clinical case</b>                                                         | <b>70 marks</b> |
|-----------------------------------|------------------------------------------------------------------------------|-----------------|
|                                   | 40 minutes case examination and 20 minutes for discussion                    |                 |
| <b>Short cases-2×40<br/>Marks</b> | 10 minutes for each case examination and 20 minutes for each case discussion | <b>80 marks</b> |

**Total marks for morning session 150 marks (A)**

### Afternoon session

|                                                                                 |                              |
|---------------------------------------------------------------------------------|------------------------------|
| <b>Ward rounds / Case Scenario -5 × 5 marks<br/>5 mins each case discussion</b> | <b>25 marks (B)</b>          |
| <b>OSCE 5 stations × 5 marks</b>                                                | <b>25 marks (C)</b>          |
| <b>VIVA - 15 mins for each station 4 stations</b>                               | <b>80 marks (D)</b>          |
| 1. Anaesthesia Machine including Vaporisers,<br>Circuits, Equipments, Monitors  |                              |
| 2. CPR mannequin, Difficult airway manniquin,<br>Defibrillator, Ventilator      |                              |
| 3. Drugs, IV fluids, Instruments and Procedures tray                            |                              |
| 4. Investigation charts, ECG, Xray, ABG, GRAPHs,<br>Recent advances             |                              |
| <b>Log book</b>                                                                 | <b>20 marks (E)</b>          |
| <b>Aggregate Total (Clinical + Viva)</b>                                        | <b>300</b>                   |
| <b>Minimum required marks for pass (50%)</b>                                    | <b>(A+B+C+D+E)</b>           |
|                                                                                 | <b>150</b>                   |
| <b>Thesis</b>                                                                   | <b>Approved/Not approved</b> |

### **12. Log book**

- A detailed log book should be maintained for the entire duration of the course. It should contain the following details.
- Procedures performed
- Journal clubs/Clinical Meetings
- Seminars/CME/Conferences
- Important cases discussed/presented
- The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.
- Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

### 13. VIVA including Competency Assessment :

VIVA including Competency Assessment - 80 Marks (60 + 20)

- Anaesthesia Machine, Gas cylinders, Equipments, Monitors
- Drugs, IV fluids, Instruments, Procedure Tray
- Investigation Charts, ECG, Xray, ABG, Capnograph, Ventilator Graphics, etc..
- Resuscitation mannequin, Difficult airway mannequin, Defibrillator , Ventilator

### 14. OSCE

Five stations – Five minutes each station

5X5 =25 marks ©

1. Equipments, monitors, circuits, Vaporiser
2. Flow volume loops/ABG/ Capnographs/ Ventilator graphs /
3. Physiology, History relevant to Anaesthesiology
4. Drug Pharmacology, invasive procedure, Nerve block
5. Communication skill assessment- high risk informed consent, Cancellation/ consent for tracheostomy due to difficult intubation, Delayed recovery, Breaking bad news, etc.

### 15. REFERENCE BOOKS

| S.No. | Name of the book                     | Author                          |
|-------|--------------------------------------|---------------------------------|
| 1.    | A synopsis of Anaesthesia            | J. Alfred Lee                   |
| 2.    | Management of pain                   | J.J Bonica                      |
| 3.    | Anaesthesia for infants and children | R.M Smith                       |
| 4.    | A Practice of Anaesthesia            | Wylic and Churchill<br>Davidson |
| 5     | Anaesthesia - Vol.I and II           | Miller                          |
| 6     | Clinical Anaesthesia                 | Barash                          |
| 7.    | Critical Care                        | Joseph Civetta                  |
| 8     | Anaesthesia and neurosurgery         | Cottrell and Smith              |
| 9     | Cardiac anaesthesia                  | Kaplan                          |

|    |                                                   |                     |
|----|---------------------------------------------------|---------------------|
| 10 | Paediatric anaesthesia                            | Gregory             |
| 11 | Pharmacology & Physiology in Anaesthetic practice | Robert K. Stoleting |
| 12 | Anaesthesia for Co-existing diseases              | Robert K. Stoleting |
| 13 | Understanding Anaesthesia Equipment               | Dorsch and Dorsch   |

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **16. JOURNALS**

1. Anaesthesiology
2. Anesthesia Analgesia
3. Anaesthesia
4. Anesthesia Intensive Care
5. Canadian Journal of Anaesthesia
6. British Journal of Anaesthesia
7. Indian Journal of Anaesthesia
8. Indian Journal of Anaesthesiology Clinical Pharmacology

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# **MD Anatomy**

## **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

### **MD Anatomy**

The purpose of the curriculum including the objectives, teaching-learning methods and assessment of the MD Anatomy programme is to prepare a competent clinical anatomist.

The candidate should be aware that in medical courses particularly at higher levels of qualification, syllabus cannot be and should not be a limiting factor in the quest for knowledge and the need for acquisition of skills.

#### **General Conditions To Be Observed**

- I. Postgraduate Medical Education in broad specialities shall be of three years
- II. Postgraduate curriculum shall be competency based.
- III. Learning in postgraduate programme shall be essentially autonomous and self-directed.
- IV. A combination of both formative and summative assessment is vital for the successful completion of the PG programme.
- V. A modular approach to the course curriculum is essential for achieving a systematic exposure

The training of PG students shall involve learning experiences 'derived from' or 'targeted to' the needs of the community. It shall, therefore, be necessary to expose the students to community based activities.

#### **1. GOAL**

The purpose of this programme is to standardize Anatomy teaching at Postgraduate level so that it will benefit by achieving uniformity in undergraduate teaching as well. Accordingly the training in M.D. Anatomy should stress on Applied Anatomy and Recent advances.

The goal of postgraduate medical education shall be to produce competent specialists and/or Medical teachers who shall:

- i. recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy
- ii. have mastered most of the competencies, pertaining to the speciality, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system;
- iii. be aware of the contemporary advance and developments in the discipline concerned;

- iv. have acquired a spirit of scientific inquiry and have been oriented to the principles of research methodology and epidemiology; and
- v. who shall have acquired the basic skills in teaching of the medical and paramedical professionals;

## **2. OBJECTIVES**

### **(A) KNOWLEDGE**

A candidate upon successfully qualifying in the M.D. (Anatomy) examination should be competent to do:

#### **Teaching**

- 1) Teach the undergraduate medical students gross anatomy, radiological anatomy, embryology, histology, neuroanatomy and elementary genetics with a focus on vertical integration and training as required for the Indian Medical Graduate.
- 2) Teach relevant anatomy for paramedical courses
- 3) Assess undergraduate students' knowledge, comprehension, application, analysis, synthesis and evaluation of the anatomical basis of clinical practice

#### **Research**

- 1) Plan and implement a research project
- 2) Present their research work in a conference

### **(B) ATTITUDE**

- 1) Be relevant and responsive to the needs of the students and community
- 2) Build rapport and co-operation in a group

### **(C) SKILLS**

- 1) Plan, evaluate and modify the undergraduate curriculum.
- 2) Maintain a Gross Anatomy Lab and embalm a cadaver.
- 3) Prepare tissues for light microscopic study, use and maintain a light microscope.

## **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

### **• Theoretical Knowledge**

Be able to demonstrate a thorough knowledge of the relevant clinical anatomy and recent advances of the following:

- 1) General Anatomy: Tissues of the body, General osteology, Arthrology, Muscle & fascia, Nervous system, Principles governing arterial, Venous and lymphatic pathways, Innervation of blood vessels

2) Radiological Anatomy: Principles involved interpretation of normal plain and contrast radiographs, special investigative procedures and newer imaging techniques such as ultrasound, CT scans and MRIs

3) Embryology: a) General Embryology and b) Special embryology of all the systems of the body including variations and Congenital anomalies. Basic Molecular basis of development

4) Genetics: Structure of chromosomes, Structure of genes, Karyotype, Chromosomal aberrations, Inheritance, Common Genetic disorders

5) Histology: Histological and Museum Techniques, Microscopes – Various types, General histology, Special histology of the Systems of the body including their electron microscopic appearance

6) Neuroanatomy: Structural organization of various parts of the nervous system with particular reference to their connections and functions, localization & effects of lesions in different parts of the central nervous system and nerve injuries.

7) Sectional Anatomy

8) Surface Anatomy

- **Practical Skills**

Demonstrate competency to:

- 1) Use appropriate audio-visual aids
- 2) Conduct large group teaching using a variety of methods
- 3) Conduct small group teaching using a variety of methods
- 2) Take seminars
- 3) Embalm a cadaver and describe the medico-legal aspects
- 4) Dissect and prosect a cadaver
- 5) Use and maintain a light microscope
- 6) Prepare histological slides

- **Writing Thesis/Research Articles**

Critically analyze a journal article and make a presentation

- **Attitudes including Communication Skills**

Demonstrate: humility, perseverance, initiative, determination and team-work

- **Training in Research Methodology, Medical Ethics /Bioethics and Medicolegal aspects:**

- Should compulsorily attend the Research methodology workshop conducted by the University within first six months of M.D course.
- May attend Bio-ethics workshops/CMEs conducted by the University and other reputed Institutions.
- Will learn aspects related to Medical Ethics/Bioethics, Moral and legal issues.
- Demonstrate sensitivity to issues related to use of cadavers in relation to regional religious and cultural aspects such as awareness of the need to respect the cadaver and cover the parts of the cadaver which are not being studied.

#### **4. THEORY AND PRACTICAL SYLLABUS**

##### **Paper I – Gross Anatomy**

Osteology– Skeletal and connective tissue – cartilage and bone, Ossification of bones, appendicular & axial skeleton and skull

Arthrology– Movements and mechanisms of joints, Joints of upper and lower limbs, Vertebral and thoracic articulations, Joints of skull, Temporomandibular joint

Myology – Structure and functions of various muscles, Muscles of Head & neck, Trunk and limbs

Angiology– Vascular patterns, Heart, Vessels of Head, neck, brain, Trunk and limbs. Regional lymph nodes and vessels

Neurology– Central & peripheral nervous system, Spinal cord, Brainstem, Cerebellum and Cerebrum

Splanchnology–Respiratory, Alimentary, Urogenital and Endocrine

##### **Paper II – Embryology and Genetics**

General Embryology- Stem cell Applications, Cloning & Molecular biology. Gamatogenesis, Fertilization, Implantation, Early development of embryo and development of various organ systems,

Systemic Embryology- Congenital malformations and basics of molecular basis of congenital malformations

Basics of Medical Genetics, Clinical genetics Genomics and DNA analysis Human chromosomes –Structure, Aberrations, Cytogenetics, Gene – Structure, Function, disorders and gene therapy.

Patterns of inheritance, Mutations, Prenatal diagnosis, Genetic counseling

Practical-Identification of slides of various stages of development of embryos-human/chick/pig, Cell culture, harvesting of chromosomes, identification and interpretation

### **Paper III – Histology, Neuro anatomy and Museum Techniques**

#### **Histology**

Basic cell biology – Cell structure, Cell cycle, Cell divisions and differentiation

General histology– Tissues of the body structure and function.

Systemic histology– Histology of all organ systems, with function and histogenesis

Immune system and cell types involved in defense mechanism, Clinical significance of major histo compatibility complex, Immunohistochemical techniques

Practical-Preparation and processing of tissues for histological study

Staining– Special stains for identification of various components, Histomorphometry

Electronmicrographs-Identification of cells and cell organelles

#### **Neuroanatomy**

Structure and function of various tracts of spinal cord. Blood supply of spinal cord – arterial and venous drainage with clinical significance.

Parts of brain and its blood supply– arterial and venous drainage with clinical significance

Cross section of brain at various levels– normal structure and clinical significance

Various neurological disorders – somatic and sensory

Ventricles of brain, CSF secretion and drainage and Barriers of the brain tissue

Cranial nerves–connections, functions and distribution

Practical- Identification of neurons and nerve fibers–routine and special stains

Cross section of spinal cord at various levels

Cross section of Parts of Brainstem at various levels

Cross section of Cerebrum and cerebellum, both coronal and horizontal at different levels for the identification of various nuclei, their structure and functions and their correlation with various neurological disorders

## **Museum and Embalming techniques**

### **Paper IV – Surgical Anatomy and Applied Anatomy and Recent Advances**

Anatomy relevant to common surgical conditions and related procedures

Biostatistics - Basic principles and concepts of biostatistics applied to health sciences  
Parametric &  
Nonparametric data, Mean, Median, Mode, Standard deviation, Standard error, Analysis of variance, coefficient correlation, Chi-square test, t-test.

Exposure to the following is desirable: Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behavior studies, knowledge of pharmaco – economics and introduction to non- linear mathematics.

## **5. TEACHING LEARNING METHODS**

Lectures, videos, seminars, journal clubs, directed study of texts, preparation for teaching (micro-teaching), group tutorials, group dynamics, integrated learning, facilitating learning and setting ground rules, small group teaching-learning methods and discussion techniques, computer based teaching and learning, Information technology and browsing the internet (e.g. use of Google scholar), conducting tests and assessments for learning, appraisal of students, mentoring students, encouraging life-long learning, being prepared to learn from students, giving students opportunities to learn by doing (e.g. drawing diagrams), planning and thinking about the learning environment, preparing a lesson plan (including resources, activities and hand-outs), reflecting and thinking how the session can be improved the next time, getting participation of students by brainstorming, quizzing, buzz groups, role plays, encouraging learning, so that learning will be purposeful, involve voluntary participation of students, have specific learning objectives, give constructive feedback to students, and have opportunity for facilitated reflection

The teaching of the students shall be through Lectures, Seminars, Journal Clubs, Group Discussions, Participation in laboratory and experimental work, and involvement in Research Studies in the concerned speciality and exposure to the 'Applied aspects' of the subject relevant to clinical specialities".

## **6. STRUCTURED TRAINING PROGRAMME**

The **competency** of the student would be assessed by the guide at each stage. Feedback would need to be given, so that the student demonstrates competency at every stage and then progresses to the next stage.

### **MAIN POSTING**

Teaching UG students  
Dissection and making at least five prosections or museum specimens  
Preparation of at least five histology slides  
Research

## **PERIPHERAL POSTINGS**

- 1) Radiology
- 2) Cytogenetics
- 3) Medical and Surgical Disciplines

### **Suggested outline for the course:**

#### **FIRST YEAR**

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                            |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Teaching         | Should get involved in teaching of Gross Anatomy/applied to first year MBBS students during dissection hours on all working days                                                                                                                                                                                                                                                                                                                                                                                                            | 12 hrs/week                                |
|                  | Should get involved in small group teaching session– teaching of bones and microscopic slides of histology– demonstration classes                                                                                                                                                                                                                                                                                                                                                                                                           | Osteology 4hrs/week<br>Histology 4hrs/week |
| Learning         | Should be posted in departments of Medical and Surgical Disciplines and in Cytogenetics to acquire surgical anatomy skills and knowledge of clinically oriented problems                                                                                                                                                                                                                                                                                                                                                                    | About one month in each department         |
| Laboratory Skill | Should assist and guide first year MBBS students in the dissections of the cadaver.<br><br>Should assist and guide in identification of general & systemic histology slides of various tissues and organs for MBBS students<br><br>Should acquire knowledge and be acquainted with the knowledge of various types of microscopes their configuration and applications.<br><br>Should acquaint him/herself with and necessary training in computer operations for data retrieval and power point presentations etc. for teaching & research. | 12 hrs/week<br><br>Histology 4hrs/week     |
| Research         | Should get involved in preparation of research protocol for PG dissertation work– selection of problem, literature search, application of methods, selection of material, methods of analysis of data and hypothesis. Discussion with Supervisor/Guides&Coguides                                                                                                                                                                                                                                                                            | 2 hrs/week                                 |



## SECOND YEAR

|          |                                                                                                                                                                          |                                            |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Teaching | Should get involved in teaching of Gross Anatomy/applied to first year MBBS students during dissection hours on all working days                                         | 12 hrs/week                                |
|          | Should get involved in small group teaching sessions—teaching of bones and microscopic slides of histology—demonstration classes                                         | Osteology 4hrs/week<br>Histology 4hrs/week |
|          | Should be involved in correction work/assessment by Periodic Notified Test conducted for the first year MBBS students— both in theory and practical including viva voce. |                                            |

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Learning         | Communication skills and knowledge through seminars and journal clubs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2 hrs/week |
| Laboratory Skill | <p>In addition to the above, candidate should acquire the necessary training in</p> <ol style="list-style-type: none"> <li>1. embalming of cadavers of all types</li> <li>2. tissue processing viz. fixation, dehydration, clearing and embedding</li> <li>3. staining— routine hematoxilin and eosin staining</li> <li>4. special staining for epithelium, connective tissue, muscle, gland &amp; nervous tissue</li> <li>5. museum technique – mounting of specimens for museum both wet and dry, making of various type of models, injection corrosioncast &amp;</li> <li>6. plastination techniques.</li> </ol> <p>Cytogenetics techniques— cell culture, harvesting and processing blood samples for karyotyping.<br/>Various types of banding techniques.<br/><i>Optional (If facilities available)</i><br/>Automated karyotyping using software</p> |            |
| Research         | <p>Maintenance of work book/logbook pertaining to dissertation work undertaken and the same to be documented in electronic format.</p> <p>Discussion with Supervisor/Guides &amp; Co-guides</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2 hrs/week |

During second year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

### THIRD YEAR

|          |                                                                                                                                                                                             |                                            |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Teaching | Should get involved in teaching of Gross Anatomy/applied to first year MBBS students during dissection hours on all working days                                                            | 12 hrs/week                                |
|          | Should get involved in small group teaching session—teaching of bones and microscopic slides of histology—demonstration classes                                                             | Osteology 4hrs/week<br>Histology 4hrs/week |
|          | Should be involved in correction work / assessment of Periodic Notified Test conducted for the first year MBBS students— both in theory and practicals including viva voce.                 |                                            |
|          | Should be involved in organizing/delivering lectures for first year MBBS students on selected topics of interest in Gross Anatomy, Human Embryology & Medical Genetics Learning programmes. | 12 hrs/week                                |

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                          |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Learning         | Should obtain the necessary skills in delivering lectures through computer assisted teaching – Power point presentation                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                          |
| Laboratory Skill | Should have equipped appropriately with the guidelines required to undertake and perform embalming procedures.<br>Should be aware of—Anatomy Act Other Techniques<br>tissue processing viz. fixation, dehydration, clearing and embedding, staining— routine hematoxilin and eosin<br>special for epithelium, connective tissue, muscle, gland & nervous tissue museum technique – injection corrosion cast, resin cast of organs and plastination technique. | Minimum of two cadavers<br><br>Should submit a minimum of five H&E slides and at least one model of any one among the procedures stated. |

|          |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                         |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Research | <p>Discussion with Supervisor/Guides &amp; Co-guides to achieve the following:</p> <p>Analyze the data of dissertation work and present it comprehensively in the required format</p> <p>Should attend and present the work done on dissertation in Scientific bodies – either in the regional or at national conferences.</p> <p>Should be aware of ethical issues related to human and animal investigative procedures.</p> | <p>In the scheduled time</p> <p>Minimum one paper</p> <p>2 hrs/week</p> |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

**8. COMPETENCY ASSESSMENT:**

**1 OVERALL:**

- |                                                     |     |           |
|-----------------------------------------------------|-----|-----------|
| a) Communication / commitment / Contribution /      | ( ) |           |
| Compassion towards patients and Innovation          | ( ) | - 5 Marks |
| b) Implementation of newly learnt techniques/skills | ( ) |           |

|   |                                                                           |           |
|---|---------------------------------------------------------------------------|-----------|
| 2 | Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars | - 5 marks |
|---|---------------------------------------------------------------------------|-----------|

|   |                                                                                          |           |
|---|------------------------------------------------------------------------------------------|-----------|
| 3 | Number of Posters/Papers presented in Conferences/<br>Publications and Research Projects | - 5 marks |
|---|------------------------------------------------------------------------------------------|-----------|

|   |                                                                                                                     |           |
|---|---------------------------------------------------------------------------------------------------------------------|-----------|
| 4 | No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic meetings with details. | - 5 marks |
|---|---------------------------------------------------------------------------------------------------------------------|-----------|

|       |                            |
|-------|----------------------------|
| Total | -----<br>20 Marks<br>----- |
|-------|----------------------------|

**PG NON – CLINICAL COURSE**

|                                      |                       |
|--------------------------------------|-----------------------|
| VIVA including Competency Assessment | - 60 Marks (40 + 20 ) |
|--------------------------------------|-----------------------|

|          |            |
|----------|------------|
| Pedagogy | - 40 marks |
|----------|------------|

### **ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

### **9.DISSERTATION AND PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:**

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

### **10. THEORY EXAMINATION**

Theory examination will comprise of 4 papers

**PAPER I – GROSS ANATOMY**

**PAPER II – EMBRYOLOGY AND GENETICS**

**PAPER III – HISTOLOGY, NEUROANATOMY AND MUSEUM TECHNIQUES**

**PAPER IV – SURGICAL ANATOMY AND APPLIED ANATOMY AND RECENT ADVANCES**

Each paper will have

|                            |   |              |   |           |
|----------------------------|---|--------------|---|-----------|
| Structured Essay Questions | - | 2 x 15 Marks | = | 30 Marks  |
| Short Notes                | - | 10 x 5 Marks | = | 50 Marks  |
| Reasoning out              | - | 4 x 5 Marks  | = | 20 Marks  |
|                            |   |              |   | -----     |
| Total                      |   |              |   | 100 Marks |
|                            |   |              |   | =====     |

## 9. PRACTICAL EXAMINATION

| MD ANATOMY                                                                                  |                            |
|---------------------------------------------------------------------------------------------|----------------------------|
| PRACTICAL I                                                                                 |                            |
| GROSS ANATOMY - Dissection                                                                  | 75 marks (A)               |
| PRACTICAL II                                                                                |                            |
| HISTOLOGY (SECTION CUTTING + EMBEDDING & STAINING)<br>HISTOLOGY SLIDES DRAWING & DISCUSSION | 75 marks (B)               |
| PRACTICAL III                                                                               |                            |
| OSPE (20 Stations) - 40 marks                                                               | 50 marks (C)               |
| EMBRYOLOGY SLIDES - 5 marks                                                                 |                            |
| NEUROANATOMY SLIDES - 5 marks                                                               |                            |
| VIVA VOCE                                                                                   |                            |
| PEDAGOGY                                                                                    | 40 marks (D)               |
| VIVA                                                                                        | 60 marks (E)               |
| AGGREGATE (PRACTICAL + VIVA) TOTAL                                                          | 300 marks<br>(A+B+C+D+E)   |
| MINIMUM REQUIRED FOR PASS (50 %)                                                            | 150 marks                  |
| DISSERTATION                                                                                | APPROVED /<br>NOT APPROVED |

## 12. LOG BOOK –

The Post Graduate students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

The record (log) book shall be checked and assessed periodically by the faculty members imparting the training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

**13. VIVA INCLUDING COMPETENCY ASSESSMENT (20 marks)** 40 + 20 = 60 marks

**14. PEDAGOGY** 40 marks

( 8 minutes Presentation and 2 Minutes Q & Ans)

- Demeanour - 10
- Audio visual Aids usage, voice modulation and Attitude - 10
- Subject Content - 10
- Q & Ans /Interaction - 10

-----  
**Total** 40 Marks  
-----

**15. OSPE** - 20 Stations 40 marks

There would be at least one observed type of station, where the examiner would observe the performance of the student demonstrating a skill and would give a score using a checklist.

Examples include 1) perform a surface marking, 2) prepare Power Point slides, 3) use a light microscope and 4) use small group teaching techniques.

The other stations would be response type of stations, where the student would respond to structured questions.

**16. REFERENCE BOOKS**

**Gross Anatomy**

Cunningham's Manual of Practical Anatomy. GJ Romanes

Gray's Anatomy, The Anatomical Basis of Clinical Practice. S.Standring

Clinically Oriented Anatomy, KL Moore, AF Dalley, AMR Agur

Gray's Anatomy for Students. 1st South Asia Edition. RL Drake, AW Vogl, AWM Mitchell

**Surface Anatomy**

Surface and Radiological Anatomy 3<sup>rd</sup> Edn A Halim

Surface Anatomy: Pocket Tutor (2012) R Tunstall, N Shah

**Radiological Anatomy**

Applied Radiological Anatomy for Medical Students P Butler, A Mitchell, H Ellis

### **Embryology**

Medical Embryology by Jan Langman.

Human Embryology by Inderbir Singh.

Before we are Born: Essentials of Embryology and Birth defects 9<sup>th</sup>Edn KL Moore,  
TVN Persaud,

MG Torchia

Human Embryology and Developmental Biology 5<sup>th</sup>Edn BL Carlson

Larsen's Human Embryology 5<sup>th</sup>Edn G Schoenwolf, S Bleyl, P Brauer, P Francis-West

### **Genetics**

Genetics in Medicine – J.S.Thompson & M.W. Thompson.

Elements of Medical Genetics by Emery.

### **Embalming & Museum Techniques**

Anatomical Techniques by Tompsett.

Embalming Techniques by Dr. Jayavelu.

### **Neuroanatomy**

Clinical Neuroanatomy 7<sup>th</sup>Edn RS Snell.

Text Book of Clinical Neuroanatomy 2<sup>nd</sup>Edn. Vishram Singh.

Inderbir Singh' Textbook of Human Neuroanatomy 9<sup>th</sup>Edn. by PS Bhuiyan

### **Surgical & Applied**

Last's Anatomy: Regional & Applied Anatomy 12<sup>th</sup>Edn. by CS Sinnatamby

Lee McGregor's Synopsis of Surgical Anatomy 12<sup>th</sup>Edn. GA DEcker.

Skandalakis Surgical Anatomy: The Embryologic and Anatomic Basis of  
Modern Surgery. JE

Skandalakis

Clinical Anatomy 12<sup>th</sup>Edn H Ellis, V Mahadevan

### **Histology**

Bancroft's Theory and Practice of Histological Techniques 7<sup>th</sup>Edn

Bloom & Fawcett's: Concise Histology, 2<sup>nd</sup>Edn, DW Fawcett

Janqueira's Basic Histology 14<sup>th</sup>Edn, AL Mescher

Wheater's Functional Histology 6<sup>th</sup>Edn B Young, G O'Dowd, P Woodford

Histology: A text and Atlas, 7<sup>th</sup>Edn MH Ross and W Pawlina

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **17. JOURNALS**

- 1) Clinical Anatomy
- 2) Journal of the Anatomical Society of India
- 3) Anatomical Sciences Education
- 4) Journal of Clinical and Diagnostic Research
- 5) International Journal of Anatomical Variations
- 6) European Journal of Anatomy
- 7) Surgical and Radiologic Anatomy

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**M.D. BIOCHEMISTRY**

# **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

## **M.D. BIOCHEMISTRY**

### **1. GOAL**

The purpose of this program is to lay down clear guidelines for a postgraduate training program in Biochemistry, for doctors who have completed their undergraduate medical training, to enable them to achieve goals in teaching, training, diagnostics and research in medical biochemistry. The aim of such training is to produce professionals who are competent in each of these areas and who continue to strive to innovate and enhance the quality of undergraduate and postgraduate medical training and practice, diagnostics and research in this discipline. Hence, the training during the MD course in Biochemistry needs to be broad-based and should be distinctive from that for a Master's course (MSc) in Biochemistry (where the approach to the subject is mainly theoretical and partly experimental) and for a PhD in Biochemistry (where the approach to the subject is primarily experimental and focused on a very specific area in the discipline).

### **2. OBJECTIVES**

It is envisaged that a candidate who has obtained the qualification of an MD degree in Biochemistry should have acquired attributes in the following areas, as specified below.

#### **(A) Knowledge**

The candidate should have acquired a sound knowledge of concepts and principles of biochemistry and cell biology. She/he should be able to correlate this knowledge with cellular and molecular processes in the body and have a sound understanding of the biochemical basis of health and disease. She/he should be well-versed in basic concepts as well as recent advances in the discipline.

#### **(B) Attitude**

The candidate should have developed motivation and an enthusiasm for life-long learning to keep abreast of developments in the field and to pursue further training/specialization, as necessary and appropriate (for example, a PhD degree). She/he should constantly strive to improve skills and expertise, in order to develop as a professional who will become a teacher, mentor and guide for future trainees

### **(C) Skills**

The candidate should have

1. developed skills required to function effectively as a faculty member in a medical college in India, in order to teach and train undergraduates (UG) and postgraduates (PG) in the fields of medicine, dentistry, nursing and other allied health sciences. This should include skills to plan and implement teaching programs for students, and to innovate appropriately to make teaching as effective as possible.
2. acquired skills to supervise/manage the functioning of a modern diagnostic laboratory in Biochemistry and to trouble-shoot when problems arise; to suggest, generate, evaluate and interpret diagnostic laboratory data and interact with clinicians to provide laboratory-based expertise to contribute to more effective patient care.
3. acquired skills and expertise in various laboratory techniques applicable to metabolic and molecular aspects of medicine.
4. developed skills and expertise in research methodology and biostatistics to be able to conduct research and publish in scientific journals. Such skills will include those necessary to be a supervisor for theses for MD trainees; with passage of time, these skills should be upgraded to equip her/him to be a supervisor for PhD trainees.

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

#### **(A) Theoretical knowledge**

The various components that comprise this section are given in detail under the syllabus (see section 4 below)

#### **(B) Practical and clinical skills**

By the end of the course, the trainee should have acquired practical skills in performing the following:

- Reactions of carbohydrates, lipids, proteins and amino acids
- Chromatographic separation of sugars, amino acids and lipids
- Estimation of nitrogen in a protein
- Estimation of calcium and phosphorus in milk
- Spectroscopic identification of haemoglobin and its derivatives
- Preparation and estimation of glycogen and casein from biological samples
- Determination of enzyme activity and kinetic properties of acid phosphatase and catalase
- Agarose gel electrophoresis
- Polyacrylamide gel electrophoresis (PAGE)
- Experiments on milk
- Glucose estimation in plasma/serum
- Glucose tolerance test
- Estimation of cholesterol, triacylglycerol and lipoproteins in serum

- Estimation of calcium, electrolytes, pH and blood gases
- Estimation of urea, uric acid, creatinine and ammonia in blood
- Clearance studies
- Estimation of bilirubin, ALT, AST, GGT, cholinesterase, prothrombin time
- Estimation of copper, ceruloplasmin, lithium, iron, iron-binding capacity and magnesium in serum
- T3 and T4 assays and TSH measurement
- Urinalysis for normal and abnormal constituents
- Estimation of 17-ketosteroids and vanillyl mandelic acid (VMA) in urine
- Analysis of gastric juice
- Analysis of renal and biliary calculi
- Estimation of LDH, alkaline and acid phosphatases, amylase and creatine kinase in serum
- Separation of serum LDH isoenzymes
- Estimation of ethanol in blood and urine
- CSF analysis for biochemical parameters
- Analysis of ascitic, pleural and other fluids
- Estimation of serum proteins
- Electrophoresis of serum proteins and lipoproteins
- Estimation of glycated haemoglobin
- Estimation of urine proteins
- Detection of Bence-Jones protein in urine

### ***Quality control***

- Preparation of Levy Jennings charts; calculation of inter-assay and intra-assay variations for biochemical assays in a diagnostic laboratory.
- Implementation of Westgard rules.

### ***Optional exercise***

- Determination of reference ranges for biochemical parameters estimated in a diagnostic laboratory

### ***Optional practical work***

Hands-on performance of the following techniques is optional; however, all efforts should be made to ensure that candidates, at least, see demonstrations of these techniques.

- Separation of peripheral blood lymphocytes using Ficoll Hypaque
- Subcellular fractionation of cellular organelles and estimation of marker enzymes to determine purity
- Ultracentrifugation
- Isolation of DNA from tissues/blood

- Isolation of RNA; synthesis of cDNA by reverse transcription; polymerase chain reactions (PCR) (both conventional and real-time)
- Isolation of plasmids and agarose gel electrophoresis for proteins and nucleic acids
- Basic techniques in cell culture
- High performance liquid chromatography (HPLC)

### **(C) Writing thesis/research articles**

#### ***Thesis***

Every candidate shall carry out work on an assigned research project, under the guidance of a recognized post-graduate teacher. The results of the work done shall be written up and submitted in the form of a thesis. The aim of producing a thesis is to contribute to development of a spirit of enquiry, to familiarize the trainee with research methodology, literature searches, laboratory techniques, analysis of data, interpretation of results and skills in scientific writing.

#### ***Article for University journal of medical sciences:***

The candidate is also required to carry out a small study on any aspect of work in a department of Biochemistry. This may be in the area of teaching-learning, diagnostics or basic science research. The results of this study are to be written up and published in the University Journal of Medical Sciences.

### **(D) Attitudes including communication skills**

See section 5 below.

### **(E) Training in research methodology, medical ethics /bioethics and medicolegal aspects**

Students should compulsorily attend the Research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

All PG trainees will be required to undergo training in research methodology, biostatistics, medical ethics and medicolegal aspects and Medical audit. The aim of such training is to equip them with skills required to carry out the work required for their thesis.

## **4. THEORY SYLLABUS**

### **PAPER I**

#### **PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY, INSTRUMENTATION, BIOCHEMICAL TECHNIQUES, BIOSTATISTICS AND RESEARCH METHODOLOGY**

##### **Physical chemistry**

Properties of water

Concept of an acid, a base, pH, pK, buffer and buffering capacity

Colloidal state and Gibbs-Donnan equilibrium, Van der Waals forces, surface tension, osmosis, diffusion and viscosity, law of mass action.

Hydrogen bonding, hydrophobic interactions and ionic bridges

Determination of molecular weights

##### **Chemistry of carbohydrates**

Structure, physical and chemical properties and biological role of glucose, fructose, galactose, mannose, ribose, xylose, xylulose, lactose, maltose, sucrose

Deoxy and amino sugars

Uronic acids and sugar alcohols

Dextrin, starch, glycogen, cellulose, inulin

Glycosaminoglycans and glycoproteins

##### **Chemistry of proteins**

Structure, physical and chemical properties and biological function of proteins

Amino acids present in proteins, including selenocysteine

Amino acids not found in proteins

Modified amino acids

Dissociation constant ( $pK_a$ )

Amino acids as buffers, amino acid titration, zwitterions and isoelectric point

Cross-links, hydrogen bonds, disulphide bonds, non-covalent and ionic bonds in peptides and proteins

Primary, secondary, tertiary and quaternary structure of proteins and elucidation of these

Mass spectrometry and tandem mass spectrometers

##### **Protein structure and function:**

Relationship of function to the three dimensional structure of myoglobin, hemoglobin, collagen and elastin

Enzymes and peptide hormones

Immunoglobulins

Peptide sequencing and peptide synthesis

**Chemistry of lipids:**

Structure, physical and chemical properties of saturated and unsaturated fatty acids, polyunsaturated fatty acids, eicosanoids, triacylglycerol, sterols, phospholipids, glycolipids, sphingolipids and lipoproteins.

**Chemistry of purines and pyrimidines:**

Nucleotides and their derivatives

Polynucleotides

Synthetic nucleotides

**Principles of laboratory analyses and safety:**

Units of measurement

International system of units in laboratory medicine

Conversion from conventional units to SI units

IFCC and IUPAC system recommendations

Reference materials

Reagent grade water production

Testing for water purity

**Instrumentation and techniques:**

Centrifugation and ultracentrifugation

Radioactivity, properties of radionuclides and measurement of radioactivity

Techniques that use radioisotopes; autoradiography

Geiger counter, scintillation counting, radio-immuno assay (RIA), immunoradiometric assay (IRMA)

Stable isotopes

Spectrophotometry, reflectance photometry, flame emission photometry

Atomic absorption spectrophotometry

Flurometry

Phosphorescence, chemiluminescence and bioluminescence

Nephelometry and turbidimetry

Electrochemistry - chemical sensors, potentiometry, ion selective electrodes, optical chemical sensors, enzyme electrodes and enzyme immobilization

Osmometry

Electrophoresis (zone) – paper, agar gel, PAGE, SDS PAGE, iso-electric focusing and their applications

Chromatography – column, paper, TLC, GLC, HPLC, gel filtration, ion exchange and their applications

Principles of immunochemistry, immunoelectrophoresis

Techniques in molecular biology: blotting techniques, polymerase chain reaction, DNA and protein sequencing, microarrays and DNA chip technology, cloning techniques, genomics, proteomics and metabolomics

ELISA

Basics of nanotechnology

Automation in clinical chemistry

**Laboratory management**

Common hazards in the laboratory

Management of biological, chemistry and radioactive wastes

Computer applications in clinical chemistry

Setting up a clinical laboratory and a 24-hours emergency laboratory service

Selection and evaluation of analytical methods; evaluation of a diagnostic test

**Sample collection**

Anticoagulants and preservatives for blood

Timed urine collections and urine preservatives

**Quality assurance**

Use of reference values

Quality assurance in clinical laboratories

**Basic principles of biostatistics as applied to health sciences:**

Concepts of probability, measures of dispersion, standard deviation, coefficient of variation, correlation coefficient, tests of significance, sample size calculations

**PAPER II****CELL PHYSIOLOGY, MOLECULAR BIOLOGY AND HUMAN GENETICS****Cell physiology**

An overview of cellular structure and function

Prokaryotic and eukaryotic cells

Structure of eukaryotic cells – sub cellular organelles, cytosol, endoplasmic reticulum, nucleus, nucleolus, mitochondria, lysosomes, ribosomes, Golgi apparatus, peroxisomes, plasma membranes and their functions

Receptor-mediated endocytosis

Fluid mosaic model of biological membranes

Properties of biological membranes - motility, permeability, concept of semi-permeable membranes, electrochemical gradient and pumps, artificial membranes and liposomes

Transport across membranes – active, facilitated and passive. Transport mechanisms – ion channels including gated channels, carrier proteins, active transporters, symporters and antiporters, glucose transporters (GLUT)

Non-membrane organelles – cytoskeleton, microfilaments, microtubules and microvilli

Evolution of organic molecules, endosymbiosis hypothesis, evolution of cells

Sub-cellular fractionation – density gradient centrifugation, differential centrifugation, markers for each organelle and fraction

Cell interactions and adhesion – types of junctions: tight junctions and gap junctions

Surface glycoproteins and cell surface labeling – ABO blood groups, major histocompatibility complex (MHC).



Adhesion molecules – cadherins, selectins, integrins (beta 1 and beta 2 integrins)  
Cell cycle – concept of cell cycle, regulation of cell cycle  
Cyclins and their regulators, extracellular regulators of cell cycle  
Cell division – mitosis and meiosis  
Cells as experimental models – E.coli, yeast, Drosophila melanogaster, viruses  
Programmed cell death

### **Human genetics**

Structure of DNA and RNA  
Histones, chromatin, nucleosomes and chromosomes  
Different types of DNA  
Agents that cause DNA damage – ionizing radiation, ultraviolet light, mutagens, (chemical and viral)  
Different types of RNA – messenger, ribosomal, transfer, heterogeneous nuclear RNA, snRNPs  
Prokaryotic and eukaryotic DNA replication and transcription  
Post-transcriptional modifications  
Regulation of transcription  
Antibiotics as inhibitors of transcription  
Genetic code  
Mitochondrial and plasmid DNA  
Translation – eukaryotic and prokaryotic  
Post-translational modifications  
Factors affecting protein synthesis  
Regulation of protein synthesis and gene expression, helix-turn-helix motif, zinc-finger motif and leucine zipper motif  
Signal peptides, protein targeting and chaperones  
Disorders of post-translational modifications  
Constitutive, inducible and repressible enzymes  
Viral genetics – DNA and RNA viruses  
HIV and drugs in the treatment of HIV

### **Molecular genetics and biotechnology**

Isolation of nucleic acids  
DNA digestion with restriction enzymes  
DNA electrophoresis  
Restriction maps  
Southern analysis: hybridization and blotting.  
Polymerase chain reaction (PCR): principle, procedure, and visualization of products  
Reverse transcriptase PCR (RT-PCR)  
DNA sequence analysis  
Automated DNA sequencing

Cloning and vectors – definition, characteristics of different vectors and basic cloning techniques

Gene libraries

cDNA libraries

The human genome project – sequencing of the genome and physical mapping

Genetic maps

Restriction fragment length polymorphisms and their applications

DNA diagnostics – methods of identifying genes in human disease

Fluorescent in-situ hybridization (FISH)

Gene therapy

Repeat DNA and mobile DNA elements.

Reporter gene

Transgenic animals

The human proteome

### **Molecular basis of carcinogenesis**

Carcinogenic agents – radiation, chemicals and viruses

Oncogenes and tumor suppressor genes

Genetic cancer syndromes – familial breast cancer, familial adenomatous polyposis coli and retinoblastoma

Inherited conditions that predispose to development of cancer (e.g., ataxia telangiectasia, xeroderma pigmentosum, Fanconi syndrome)

Mechanisms of action of cytotoxic drugs

Basics of cytogenetics

### **Population genetics**

Risk assessment and genetic counseling

Medical ethics in counseling

### **Bioinformatics**

Basic of bioinformatics – proteomics, drug designing (pharmacogenomics), protein data bases and micro arrays

## **PAPER III**

### **INTERMEDIARY METABOLISM, MACRO AND MICRO NUTRIENTS AND INBORN ERRORS OF METABOLISM**

#### **Enzymes**

Biomedical importance, nomenclature, classification, general properties

Coenzymes and cofactors

Mechanism of action, action of serine proteases

Kinetics of enzyme action,  $K_m$  value and its significance

Inhibition of enzymes Regulation of enzyme activity

Enzymes in clinical medicine, isoenzymes and isoforms of enzymes

Metallo-enzymes and metal-activated enzymes

Isolation and purification of enzymes from natural sources

The use of enzymes as therapeutic agents and as laboratory tools (for diagnostic and research applications)

## **Vitamins**

Structure, sources, recommended dietary allowances (RDA), biochemical role, metabolism in the body and deficiency manifestations of water soluble and fat-soluble vitamins

Megavitamin therapy, hyper-vitaminosis

Anti-vitamins and vitamin analogues

Use of vitamins in therapy

## **Bioenergetics and biological oxidation**

The role of ATP and other high-energy phosphates

Biologic oxidation

The respiratory chain

Oxidative phosphorylation – theories, inhibitors, uncouplers

Mitochondrial diseases

## **Carbohydrates**

Carbohydrates of physiological significance

Digestion and absorption of carbohydrates

Various pathways of metabolism of glucose

Generation of ATP by substrate-level phosphorylation

Pathways of metabolism of fructose and galactose

Regulation of the major metabolic pathways of carbohydrates

Inborn errors in the metabolic pathways of carbohydrate metabolism

Regulation of blood glucose levels

Metabolism of glycosaminoglycans and glycoproteins; associated disorders

Disorders of carbohydrate metabolism – diabetes mellitus, lactose intolerance, galactosemia, disorders of fructose metabolism, glycogen storage disorders

Metabolism of alcohol

## **Lipids**

Lipids of physiological significance

Digestion and absorption of lipids, including role of bile

Assembly of chylomicrons and their metabolism

Oxidation of fatty acids

Biosynthesis of fatty acids

Metabolism of triacylglycerol

Metabolism in adipose tissue (including brown adipose tissue)

Metabolism of ketone bodies and associated disorders

Metabolism of cholesterol and associated disorders

Compounds derived from cholesterol

Metabolism of apoproteins and lipoproteins and associated disorders

Functions and metabolism of eicosanoids

Metabolism of phospholipids

Lipid storage disorders

Obesity

Metabolic adaptations in starvation and obesity

Metabolic syndrome

## **Proteins**

Digestion and absorption of proteins  
General reactions of catabolism of amino acids  
Urea cycle and associated disorders  
Hyperammonemia  
Catabolism of carbon skeleton of amino acids  
Biosynthesis of nonessential amino acids  
Degradation of individual amino acids  
Specialized products formed from amino acids  
Inborn errors of amino acid metabolism

## **Integration of metabolism**

An overview of metabolism  
The provision of metabolic fuels  
Convergent points of acetyl Co A and glucose 6-phosphate  
Methods of studying intermediary metabolism

## **Metabolism in specialized tissues**

Erythrocytes, liver, muscle, central nervous system, adipose tissue, lens, kidney

## **Nucleic acids**

Metabolism of purines  
Disorders associated with abnormalities in the metabolism of purines  
Metabolism of pyrimidines  
Disorders associated with abnormalities in the metabolism of pyrimidines  
Nucleotide analogues in chemotherapy

## **Haem**

Functions, biosynthesis  
Disorders associated with defects in biosynthesis  
Metabolism of bilirubin  
Disorders associated with abnormalities in the metabolism of bilirubin  
Laboratory diagnosis in these disorders  
Abnormal haemoglobins and haemoglobinopathies

## **Biochemical and molecular aspects of processes in the body**

Muscle contraction, nerve conduction, coagulation of blood

## **Metabolism of minerals**

Sodium, potassium, calcium, phosphorus, magnesium, copper, zinc, iron, chromium, selenium, cobalt, manganese, other trace minerals  
Inborn errors of mineral metabolism

## **Metabolism of xenobiotics and detoxification**

## **Free radicals and anti-oxidants**

## **PAPER IV**

### **CLINICAL BIOCHEMISTRY, HUMAN NUTRITION, ENDOCRINOLOGY, IMMUNOLOGY AND RECENT ADVANCES IN BIOCHEMISTRY**

The following topics are to be covered with special emphasis on the laboratory investigations relevant to the conditions concerned.

#### **Carbohydrates**

Diabetes mellitus including gestational diabetes mellitus

Laboratory diagnosis and monitoring of diabetes mellitus

Diabetic ketoacidosis

Other metabolic complications of diabetes mellitus

Monitoring of treatment

Glycated proteins

Urinary albumin excretion in diabetes mellitus

Hypoglycemia

Inborn errors of carbohydrate metabolism – disorders of galactose, fructose, lactose and pentose metabolism

Glycogen storage disorders

#### **Lipids**

Disorders of lipoprotein metabolism and laboratory diagnosis of these disorders

Association with atherosclerosis and its consequences

Biochemical derangements in metabolic syndrome

#### **Proteins**

Plasma proteins in health and disease

Proteins in other body fluids (urine, cerebrospinal fluid, amniotic fluid, saliva and faeces)

#### **Amino acids**

Disorders of amino acid metabolism and their laboratory diagnosis

Aminoacidurias

#### **Clinical enzymology**

Enzymes of liver, cardiac and skeletal muscle

Laboratory diagnosis of myocardial infarction

Pancreatic enzymes

#### **Tumour markers**

#### **Fluid and electrolyte homeostasis**

Maintenance of fluid and electrolyte balance

Associated disorders and laboratory diagnosis

#### **Hydrogen ion homeostasis**

Maintenance of pH

Associated disorders and laboratory diagnosis

**Renal function**

Disorders of renal function, including acute kidney injury (AKI) and chronic kidney disease (CKD)

Laboratory assessment of renal function

**Laboratory assessment of gastrointestinal function**

Function tests of the stomach, pancreas and intestine

Laboratory investigation of jaundice and hepatobiliary function

**Endocrinology**

Signal transduction due to neurotransmitters, hormones, growth factors, cytokines and rhodopsin

Mechanisms of hormone action by interaction with intracellular and membrane-associated receptors

Structure, functions, synthesis and regulation, metabolism, actions, associated disorders and laboratory assessment of various hormones produced by the hypothalamus, pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, gastrointestinal tract and gonads

Endocrine functions of kidney, heart, lungs and adipose tissue

Placental hormones

Biochemistry of conception, reproduction and contraception

**Mineral and bone metabolism**

Laboratory assessment of rickets, osteomalacia, osteoporosis

Markers for osteoblasts and osteoclasts

Hyper- and hypocalcaemia

Disorders of magnesium

**Disorders of porphyrin metabolism**

Laboratory assessment of porphyrias

**Cerebrospinal and other body fluids**

Analysis in health and disease

**Principles of hemo and peritoneal dialysis****Immunology**

Types of immunity

Immunoglobulins – classification, functions, generation of antibody diversity

(immunogenetics), multiple myeloma and other associated disorders, polyclonal and monoclonal antibodies and their applications.

### **Miscellaneous**

Neonatal screening for in-born errors in metabolism  
Prenatal diagnosis  
Fetal monitoring including fetal lung maturity  
Paediatric biochemistry  
Biochemistry in the elderly  
Lysosomal storage disorders  
Disorders of connective tissue

### **Human nutrition**

General nutritional and energy requirements  
Macronutrients and their roles  
Biological value of proteins  
Specific dynamic action  
Balanced diet  
Dietary fibre  
Dietary supplements  
Fortification of foods  
Food additives  
Food fads  
Vegetarianism  
Nutritional support  
Disorders of nutrition (protein malnutrition and protein energy malnutrition)  
Biochemical assessment of nutritional status  
Laboratory diagnosis of nutritional disorders  
National Nutrition Programme

### **Validation of assays/kits in a diagnostic laboratory**

## **5. TEACHING LEARNING METHODS**

Active and interactive learning should be the mainstay of the training program. The following methods are to be used to facilitate learning by and training of MD students.

### **a. Participation in interactive lectures, tutorials, problem-based learning, case discussions, seminars and attendance at guest lectures/scientific**

The above teaching learning methods should be employed for the trainees to acquire updated knowledge on various aspects of basic and clinical biochemistry, immunology and molecular biology, and their application in modern medicine and also to learn to communicate effectively.

### **b. Journal club**

Journal club sessions should be used by trainees to learn to search medical literature, to learn how scientific data is to be presented and disseminated, to develop skills in presentation of research papers, to critically analyze and evaluate data, to become familiar with research methodologies, to keep oneself updated on new developments/emerging trends in biochemistry and to learn to communicate effectively.

**c. Practical exercises**

These exercises should be used by trainees to equip themselves with knowledge, expertise and hand-on skills in various techniques used for laboratory bench-work in biochemistry and molecular biology, and in a diagnostic laboratory, and to learn to analyze and interpret data obtained.

**d. Thesis**

Under the supervision of a professor or associate professor in the Department of Biochemistry, each MD trainee is expected to generate a hypothesis/research question and design a research protocol to test/answer it. The protocol should have clearly defined objectives and a work plan. The trainee will obtain ethical clearance for the work proposed, carry out the work proposed, analyze data, interpret results and write a thesis/dissertation based on the work done and results obtained.

**e. Presentation of work done on thesis to peers**

A postgraduate trainee in Biochemistry would be required to make a poster/oral presentation of research work done at a national/state conference. All trainees should be encouraged to publish the work done.

**f. Teaching of undergraduates**

Postgraduate trainees in Biochemistry shall be required to participate in teaching and training programmes for undergraduate students. They should learn how to organize, conduct and co-ordinate lectures and practical classes for undergraduate students, to participate in clinical case-based teaching sessions and small group discussions/tutorials (as part of a team that includes faculty members, to develop skills of self-directed learning, effective communication and leadership. They should learn how to work as part of a team and to facilitate learning by students.

**g. Horizontal and vertical integration of teaching of Biochemistry with other pre-clinical, para-clinical and clinical departments**

Trainees should take part in integrated teaching of undergraduates by participation in joint teaching sessions and seminars with different departments/participation in clinical rounds for discussing cases of interest and in small group discussions of case-based problems.

**h. Development of communication skills**

Trainees should develop effective communication skills by making presentations at seminars and journal club sessions and by teaching undergraduates.



**i. Training in a diagnostic laboratory for biochemistry:**

Trainees should receive hands-on training in a diagnostic laboratory in Biochemistry; such training should be extensive and rigorous enough for each candidate to acquire adequate skills and expertise to manage and supervise such a laboratory. Trainees should be posted in all sections of the laboratory in the institution, starting from sample collection and processing. They should become proficient in working with the autoanalysers in the laboratory, in quality control methods and in specialized assays. They should learn how to set up a clinical biochemistry laboratory, and become proficient in statistical analysis of laboratory data. Wherever possible, it would also be desirable for them to acquire experience in running a 24-hours diagnostic laboratory; this may be facilitated, where possible, by posting them in the diagnostic laboratory out of regular hours as well. They should also become proficient in validation of assays/kits in a diagnostic laboratory

**j. Postings in clinical departments**

It is necessary for trainees to be posted in clinical departments. This is to be for a **minimum** of 2 months of the course. Suggested departments and durations of postings are as follows: general medicine (1 week), gastroenterology (2 weeks), nephrology (2 weeks), endocrinology (2 weeks) and intensive care units (1 week). These postings will help trainees get a better perspective on diagnostic tests in clinical practice and will enable them to contribute more effectively to patient care.

**k. Log book:**

All trainees should maintain a log book that documents all the work that they have done during their years of training. This log book should be checked and assessed periodically by the faculty members involved in the training programme.

## **6. STRUCTURED TRAINING PROGRAM**

The following activities should be components of the training program for MD trainees

Teaching activities:

These should include theory classes for nursing, dental and AHS courses, and practical classes for MBBS, dental and AHS courses

Seminars (weekly)

Journal club (weekly/monthly)

Clinical case discussions (paper-based/actual patients)

Practical exercises in General biochemistry

Posting in diagnostic biochemistry laboratories

Research methodology training

Biostatistics classes

Thesis: selection of topic, writing of research proposal, obtaining approval from ethical committee; carrying out the study, analysis of data, writing of thesis and submission to the university

Postings in clinical departments:

This should be for at least 2 months in a minimum of 4 of the following departments suggested (nephrology, gastroenterology/hepatology, endocrinology/diabetology, general medicine, ICU)

**Posting in Clinical Departments : Minimum 2 months**

|                               |   |                    |
|-------------------------------|---|--------------------|
| Nephrology                    | - | 2 weeks            |
| Endocrinology / Diabetology   | - | 2 weeks            |
| Gastroenterology / Hepatology | - | 2 weeks            |
| General Medicine              | - | 1 weeks            |
| ICU                           | - | 1 weeks            |
|                               |   | -----              |
|                               |   | 8 weeks - 2 months |
|                               |   | -----              |

In addition, postings may be recommended in the Departments of Pathology, Microbiology, Haematology, etc (depending on each institution's facility) if it is felt that trainees would benefit from such exposure.

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

Attendance and presentations at conferences/CME sessions/workshops related to the specialty

- 7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## 8. COMPETENCY ASSESSMENT:

### 1 OVERALL:

|                                                                                              |    |           |
|----------------------------------------------------------------------------------------------|----|-----------|
| a) Communication / commitment / Contribution /<br>Compassion towards patients and Innovation | () | - 5 Marks |
| b) Implementation of newly learnt techniques/skills                                          | () |           |
| c) Publications and Research Projects                                                        | () |           |

- 2 Number of cases presented in Clinical Meetings/  
Journal clubs/seminars - 5 marks
- 3 Number of Posters/Papers presented in Conferences/  
Publications and Research Projects - 5 marks
- 4 No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings with details. - 5 marks

Total 20 Marks

### PG NON – CLINICAL COURSE

|                                      |                       |
|--------------------------------------|-----------------------|
| VIVA including Competency Assessment | - 60 Marks (40 + 20 ) |
| Pedagogy                             | - 40 marks            |

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

## 9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES:

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First of the first Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

#### **10. THEORY EXAMINATION AT THE END OF THE TRAINING PROGRAMME**

|                  |                                                                                                       |
|------------------|-------------------------------------------------------------------------------------------------------|
| <b>Paper I</b>   | Physical and Organic Aspects of Biochemistry, Instrumentation Biochemical Techniques, Biostatistics.  |
| <b>Paper II</b>  | Cell Physiology, Molecular Biology and Human Genetics                                                 |
| <b>Paper III</b> | Intermediary Metabolism, Macro and Micro Nutrients and Inborn Errors of Metabolism                    |
| <b>Paper IV</b>  | Clinical Biochemistry, Human Nutrition, Endocrinology, Immunology and Recent Advances in Biochemistry |

#### **Question Paper Pattern: PAPER I, II, III & IV**

|                                   |                                  |
|-----------------------------------|----------------------------------|
| <b>Structured Essay Questions</b> | <b>- 2 x 15 Marks = 30 Marks</b> |
| <b>Short Notes</b>                | <b>- 10 x 5 Marks = 50 Marks</b> |
| <b>Reasoning out</b>              | <b>- 4 x 5 Marks = 20 Marks</b>  |
|                                   | <b>-----</b>                     |
|                                   | <b>100 Marks</b>                 |
|                                   | <b>-----</b>                     |

**11. PRACTICAL EXAMINATION AT THE END OF THE TRAINING PROGRAMME**

The practical examinations will be held over 2 days. It will have the following components:

| <b>MD BIOCHEMISTRY</b>                        |                                                 |                  |
|-----------------------------------------------|-------------------------------------------------|------------------|
| <b>PART I – 80 MARKS</b>                      |                                                 |                  |
| A                                             | Clinical case presentation and discussion       | 40 marks         |
| B                                             | Estimation of 2 analytes                        | 40 marks         |
| <b>PART II- 120 MARKS</b>                     |                                                 |                  |
| A                                             | Preparation of a standard graph for one analyte | 20 marks         |
| B                                             | Clinical cases – 4 charts - Discussion          | 20 marks         |
| C                                             | Chromatography                                  | 30 marks         |
| D                                             | Serum Protein electrophoresis                   | 30 marks         |
|                                               | OSPE – 4 stations x 5 marks                     | 20 marks         |
| <b>VIVA VOCE</b>                              |                                                 |                  |
|                                               | PEDAGOGY                                        | 40 marks         |
|                                               | VIVA                                            | 60 marks         |
| <b>AGGREGATE (Clinical +Viva)</b>             |                                                 | <b>300 MARKS</b> |
| Minimum required for pass (50%)               |                                                 | <b>150 MARKS</b> |
| <b>DISSERTATION - APPROVED / NOT APPROVED</b> |                                                 |                  |

**INSTRUCTIONS FOR EXAMINERS**

The practical examinations shall consist of the following components, which will be held over 2 days.:

| <b>MD BIOCHEMISTRY</b> |                                                      |                                                                                                                                                    |
|------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Part I                 | Clinical case presentation and discussion - 40 marks | Clinical case presentation and discussion. To plan relevant investigations                                                                         |
|                        | Estimation of 2 analytes<br>2x 20 =40 marks          | Assay of 2 biochemical analytes relevant to the case under discussion. One assay is to be an end-point assay and another is to be a kinetic assay. |

|         |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part II | A. Preparation of a standard graph for one analyte<br>– 20 marks | Preparation of a standard graph for an analyte<br>(preferably an analyte already allotted in Part I above , i.e if Glucose assay is included in part I, standard graph for the same to be done)                                                                                                                                                                                                                                                                                                                                      |
|         | B. Clinical cases – 4 charts<br>- 4 x 5 marks = 20 marks         | Discussion of findings and lab results of case scenarios provided                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|         | C. Chromatography - 30 marks                                     | Identification of the unknown carbohydrate/aminoacid                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|         | D. Serum Protein electrophoresis<br>30 marks                     | Serum Protein electrophoresis by agarose gel electrophoresis and interpretation.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|         | OSPE – 4 stations x 5 marks<br>= 20 marks                        | Two performance stations and 2 response stations<br>(Examples of performance stations: methylamine test for detecting fructose, mucic acid test for detecting galactose, Neumann's test, Watson- Schwartz test, etc)<br>(Examples of response stations: Levy Jennings chart, calculation of creatinine clearance, double reciprocal plots, precision check of internal quality control results, calculation of various indices from data obtained during validation of kits (eg, precision, accuracy, coefficient of variation, etc) |

## 12. LOG BOOK

Each PG student will maintain a log book that documents all the activities during the course.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

## 13. VIVA (including competency assessment) 40 + 20 = 60 marks

Viva-voce in Biochemistry: 40 marks

Marks for assessment of competencies during the course: 20 marks

#### 14. PEDAGOGY

40 marks

( 8 minutes Presentation and 2 Minutes Q & Ans)

|                                                          |          |
|----------------------------------------------------------|----------|
| • Demeanour                                              | - 10     |
| • Audio visual Aids usage, voice modulation and Attitude | - 10     |
| • Subject Content                                        | - 10     |
| • Q & Ans /Interaction                                   | - 10     |
| -----                                                    |          |
| Total                                                    | 40 Marks |
| -----                                                    |          |

#### 15. OSCE / OSPE

OSPE – 4 stations x 5 marks

Two performance stations and 2 response stations

(Examples of performance stations: methylamine test for detecting fructose, mucic acid test for detecting galactose, Neumann's test, Watson- Schwartz test, etc)

(Examples of response stations: Levy Jennings chart, calculation of creatinine clearance, double reciprocal plots, precision check of internal quality control results, calculation of various indices from data obtained during validation of kits (eg, precision, accuracy, coefficient of variation, etc)

#### 16. REFERENCE BOOKS

The list below is a suggested list of books to be used by MD trainees in Biochemistry. The most recent editions of these books are recommended.

1. Biochemistry (Lippincott's Illustrated Reviews)
2. Harpers Illustrated Biochemistry
3. Lehninger's Principles of Biochemistry
4. Biochemistry (Stryer)
5. Biochemistry (Voet & Voet)
6. Textbook of Biochemistry with Clinical Correlations (Thomas M. Devlin)
7. Marks' Essentials of Medical Biochemistry: A Clinical Approach
8. Clinical Chemistry: Principles, Techniques, and Correlations (Bishop et al)
9. [Tietz](#) Fundamentals of Clinical Chemistry
10. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics
11. Clinical Biochemistry: Metabolic and Clinical Aspects (Marshall et al)
12. Biochemistry: A Case-oriented Approach (Montgomery et al)
13. [Medical Biochemistry](#) (Baynes Dominiczak)
14. Medical [Biochemistry](#) (Bhagavan)
15. [Varley's Practical Clinical Biochemistry](#)
16. Wilson and Walker Principles and Techniques of Biochemistry and Molecular Biology
17. Kuby Immunology
18. Harrison's Principles of Internal Medicine
19. Davidson's Principles and Practice of Medicine

**\*\* Note :** The editions are as applicable and the latest editions shall be the part of the syllabi.

## 17. JOURNALS

Given below is a suggested list of journals that MD trainees in Biochemistry should be encouraged to read.

1. Science
2. Nature and its associated publications (Eg, Nature Medicine, Nature Genetics, etc)
3. Annual Review of Biochemistry
4. Clinical Chemistry
5. The Journal of Biological Chemistry (JBC)
6. Proceedings of National Academy of Sciences of the United States of America (PNAS)
7. Public Library of Sciences (PLOS) publications
8. Journal of Clinical Investigation (JCI)
9. Indian Journal of Clinical Biochemistry

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**MD COMMUNITY MEDICINE**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**MD COMMUNITY MEDICINE**

**1. PREAMBLE**

The purpose of this program is to standardize Community Medicine teaching at Post Graduate level throughout the country.

**Program Objectives**

A candidate upon successfully qualifying in the M.D. (Community Medicine) examinations should be competent in the following areas:-

- I. Health policy, planning, leadership and management
- II. Epidemiology, Biostatistics and Research Methodology
- III. Health Promotion and disease prevention
- IV. Behavior Change Communication
- V. Education technology
- VI. Public Health Ethics

**2. SPECIFIC LEARNING OBJECTIVES**

In the area of (I) **Public Health policy, planning, leadership and Management**, he/she should be able to:-

- 1) Identify health problems of the community in the context of the socio-economic cultural milieu
- 2) Identify threats to the environment
- 3) Identify groups which require special attention (elderly, adolescents, gender, the poor and other marginalized groups) including those facing occupational hazards
- 4) Prioritize health problems
- 5) Set objectives; prepare action plan; implement programs; and monitor, supervise and evaluate them
- 6) Plan health manpower development, logistics and materials management
- 7) Assess costs, plan, implement and supervise budget and alternative health options

- 8) Manage Health Information System and respond appropriately to the information gathered
- 9) Understand basics of hospital management
- 10) Study quality assurance and medical audit
- 11) Understand and Implement public health laws
- 12) Initiate, implement and supervise National Health Programs
- 13) Recommend policies relevant for the local community and region and propose ways to upscale it to a larger area (state/country)
- 14) Establish Surveillance System and respond to public health threats effectively and efficiently
- 15) Anticipate, prepare for and respond to disasters

In the area of (II) **Epidemiology, Biostatistics and research methodology**,  
he/she should be able to:-

- 1) Use effectively the tools of epidemiology for understanding disease distribution and determinants of diseases.
- 2) Identify sources of data and identify key aspects of measurement problems
- 3) Critically analyze available scientific information data, identify gaps in knowledge and formulate research questions
- 4) Design and conduct epidemiological studies
- 5) Design and conduct qualitative research methods
- 6) Effectively manage data, analyze, interpret and present findings
- 7) Recommend effective strategies to improve health status of the community based on the findings
- 8) Document epidemiological findings and disseminate and recommend policies
- 9) Use epidemiologic methods to investigate disease outbreaks
- 10) Use epidemiologic methods to evaluate health care delivery and conduct health systems research
- 11) Perform economic evaluation of illness and health interventions

In the area of (III) **Health Promotion and disease prevention**, he/she should be able to:-

- 1) Understand the epidemiology of communicable and non-communicable diseases and preventive measures and manage national health programs
- 2) Identify the health issues of special groups of people and plan and implement strategies to improve their health status
- 3) Identify the environmental issues affecting health of the community and plan interventions
- 4) Identify issues related to nutrition, life style and occupation and plan interventions

In the area of (IV) **Behavior Change Communication**, he/she should be able to:-

- 1) Understand the structure and behavior of communities and identify societal or individual behavior problems that can be improved
- 2) Interact, communicate, educate effectively to people from diverse backgrounds, ages and gender to promote healthy behavior through community involvement
- 3) Analyze different types of health communication initiatives and BCC tools
- 4) Plan and develop environments that enable the maintenance of positive health behaviors, and evaluate
- 5) Facilitate inter-sectoral coordination for promoting health of communities
- 6) Promote and establish partnerships - partnering with community, Panchayati Raj institutions, public private partnerships, NGOs and corporate sector

In the area of (V) **Teaching and Training**, he/she should be able to:-

- (1) Assess the learning needs of any given group
- (2) Formulate learning objectives
- (3) Plan curriculum and prepare curriculum materials
- (4) Select and implement appropriate learning methods
- (5) Evaluate learning experiences

In the area of (VI) **Ethics in Public Health**, he/she should be able to:-

- 1) Understand the Basic principles and theories of Bioethics
- 2) Be familiar with the codes and regulations pertinent to clinical and research ethics
- 3) Identify and analyze ethical issues in public health practice, biological and medical research, and health policy
- 4) Identify the beliefs and interests of stakeholders and their impact on ethical decision making in professional and research practice
- 5) Identify, anticipate and respond to public concerns in relation to public health intervention

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

- Practical and clinical skills training is provided by posting in the different clinical departments and primary care centres (rural and urban) in addition to offices of District level and state level health authorities.
- Training in Research Methodology writing/Research activities. University accredited workshops would be organised for standard training in research methodology. Hands on experience in research is ensured through preparation of dissertation thesis. Other surveys and research activities would be guided by faculty for favour of presentation at conferences and publications.
- Attitude including communication skills are inculcated by microteaching sessions (Paedagogy) for guided practice and under graduate classes and group health education sessions for independent practice in addition to clinico-social case studies for individual comprehensive management.
- Medical ethics/bioethics- Students should be oriented to the various components of ethics, ethics in research and differential equity in community services.
- Medicolegal Aspects: A detailed orientation to the public health acts/laws related to health is given through regular theory sessions and guest lectures.

### Training in Research Methodology, Medical Ethics/Bioethics and Medical Legal aspects

- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.
- 
- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
- 
- Medical ethics/Bioethics, moral and legal issues are part and parcel of the curriculum and syllabus

#### **4. THEORY SYLLABUS**

**Paper I:** History of Public Health, Concepts in Public Health, Epidemiology and Research Methodology and Nutrition

##### **History of Public Health**

1. History of different systems of Medicine
2. Public health events - Sanitary awakening, germ theory of disease, rise of Public health in various countries
3. Primary Health Care

##### **Concepts in Public Health**

1. Definition of health; appreciation of health as a relative concept; determinants of health.
2. Characteristics of agent, host and environmental factors in health and disease and the multifactorial etiology of disease.
3. Understanding of various levels of prevention with appropriate examples.
4. Indices used in measurement of health.
5. Health situation in India: demography, mortality and morbidity profile and the existing health facilities in health services.
6. Difficulties in measurement of health.
7. National Health Policy

## **Epidemiology**

1. Use of epidemiological tools to make a community diagnosis of the health situation in order to formulate appropriate intervention measures.
2. Epidemiology - definition, concept and role in health and disease.
3. Definition of the terms used in describing disease transmission and control.
4. Natural history of a disease and its application in planning intervention.
5. Modes of transmission and measures for prevention and control of communicable and non-communicable disease.
6. Principal sources of epidemiological data.
7. Definition, calculation and interpretation of the measures of frequency of diseases and mortality.
8. Common sampling techniques, simple statistical methods for the analysis, interpretation and presentation of data frequency distribution, measures of central tendency, measures of variability, statistical tests of significance and their application.
9. Need and uses of screening tests.
10. Accuracy and clinical value of diagnostic and screening tests (sensitivity, specificity, & predictive values).
11. Planning and investigation of an epidemic of communicable diseases in a community setting.
12. Institution of control measures and evaluation of the effectiveness of these measures.
13. Various types of epidemiological study designs.
14. Qualitative methods: Describe the range and purpose of different approaches to Qualitative inquiry and identify the range of qualitative data collection techniques.
15. The derivation of normal values and the criteria for intervention in case of abnormal values.
16. Planning an intervention programme with community participation based on the Community diagnosis.
17. Applications of computers in epidemiology.
18. Critical evaluation of published research.
19. Disaster Management
20. Bio ethics

## **Biostatistics**

The scope and use of Biostatistics

- a. Collection, classification and presentation of statistical data.
- b. Analysis and interpretation of data.
- c. Obtaining information, computing indices (rates and ratio) and making comparisons.
- d. Apply statistical methods in designing of studies.
- e. Choosing of appropriate sampling methods and sample size.
- f. Applying suitable test of significance
- g. Use of statistical tables.

## **Nutrition**

1. Nutritional problems of the country; Role of nutrition in Health and Disease.
2. Common sources of various nutrients and special nutritional requirement according to age, sex, activity, physiological conditions.
3. Nutritional assessment of individual, families and the community by selecting and using appropriate methods such as : anthropometry, clinical, dietary, laboratory techniques.
4. Compare recommended allowances of individual and families with actual intake.
5. Plan and recommend a suitable diet for the individuals and families bearing in mind local availability of foods, economic status etc.
6. Common nutritional disorders: protein energy malnutrition, Vitamin A deficiency, anemia, iodine deficiency disorders, fluorosis, food toxin diseases and their control and management.
7. National Nutritional Policy.
8. National programmes in nutrition and their evaluation.
9. Food adulteration: prevention and control.

## **Paper II: Epidemiology of Communicable and Non communicable diseases along with relevant National Programs and Environmental Health.**

1. Epidemiology of communicable and non-communicable diseases of public health Importance and their control.

The specific objectives of selected communicable diseases of public health importance for which National Disease Control/Eradication Programmes have been formulated are described here.e.g Infective hepatitis, ARI, T.B. Malaria, Filariasis, STDs & AIDS, Diarrhoeal diseases, Kala Azar, Mental Health, Non communicable diseases, Blindness, Hypertension, Leprosy, Accidents, JE, VPDs, Plague, Chickenpox etc.

1. ~~E~~xtent of the problem, epidemiology and natural history of the disease.
2. Relative public health importance of a particular disease in a given area.
3. Influence of social, cultural and ecological factors on the epidemiology of the disease.
4. Control of communicable and non-communicable disease by:
  - a. Diagnosing and treating a case and in doing so demonstrate skills in:
    - (i) Clinical methods
    - (ii) Use of essential laboratory techniques
    - (iii) Selection of appropriate treatment regimes.
    - (iv) Follow-up of cases.
  - b. Principles of planning, implementing and evaluating control measures for the diseases at the community level bearing in mind the relative importance of the disease.



2. Level of awareness of causation and prevention of diseases amongst individuals and communities
3. Institution of programmes for the education of individuals and communities.
4. Knowledge of the relevant National Health Programmes
5. Epidemiological basis of national health programmes.
6. Awareness of programmes for control of non-communicable diseases.
7. Emerging and Reemerging diseases
8. Hospital acquired infections / Drug resistance

### **Entomology**

1. Role of vectors in the causation of diseases.
2. Steps in management of a case of insecticide toxicity.
3. Identifying features of and mode of transmission of vector borne diseases.
4. Methods of vector control with advantages and limitations of each.
5. Mode of action, dose and application cycle of commonly used insecticides

### **Environmental Sanitation**

1. Awareness of relation of Environment to Health.
2. Awareness of the concept of safe and wholesome water.
3. Awareness of the requirements of sanitary sources of water.
4. Understanding the methods of purification of water on small scale with stress on chlorination of water
5. Various biological standards.
6. Physical, chemical standards; tests for assessing quality of water.
7. Concepts of safe disposal of human excreta.
8. Disposal of solid waste, liquid wastes both in the context of urban and rural conditions in the community.
9. Problems in the disposal of refuse, sullage and sewage.
10. Sources, health hazards and control of environmental pollution.
11. Influence of physical factors – like heat, humidity, cold, radiation and noise – on the health of the individual and community.
12. Standards of housing and the effect of poor housing on health
13. Global warming.
14. Biomedical Waste Management

**Paper III: Demography and SPECIAL GROUPS (Maternal and Child health, School health, Adolescent and geriatric health, Genetics & Mental Health, Occupational health and Urban Health)**

## **Demography and Family Planning**

1. Definition of demography and its relation to Community Health.
2. Stages of the demographic cycle and their impact on population.
3. Definition, calculation and interpretation of demographic indices like birth rate, death rate, growth rate, fertility rates.
4. Reasons for rapid population growth in the world, especially in India.
5. Need for population control measures and the National Population Policy.
6. Identify and describe the different family planning methods and their advantages and shortcomings.
7. Principles of Counselling; Client satisfaction.
8. Medical Termination of Pregnancy Act.
9. Organisational, technical and operational aspects of the National Family Welfare Programme and participation in the implementation of the Programme. Target Free Approach.
10. Give guidelines for MTP and infertility services.
11. Recent advances in contraception.
12. National Population Policies.

## **Reproductive and Child Health**

- (a) Antenatal – examination of the mother; application of the risk approach in antenatal care.
- (b) Intranatal – conducting a normal delivery; early recognition of danger signals in intranatal period; referral of cases requiring special care, essential obstetrics care, emergency obstetrics care.
- (c) Postnatal – assessment of the mother and new born, advice about appropriate family planning method; promotion of breast-feeding; advice on weaning.
- (d) Assessment of growth and development of the child – use of 'road to health' card; recording important anthropometric assessments of the child; giving immunisation to the child; identifying high-risk infant.
- (e) Management guidelines as per the 'Integrated Management of Neonatal and Childhood Illness'(IMNCI)
- (f) Objectives, Justification, Strategy, Implementation & Achievements with regard to the Reproductive Child Health Program.

## **At risk groups**

1. Adolescent Health
2. High risk group children – juvenile delinquents, orphans,
3. Geriatric Problems, Management and Policy for the elderly.
4. Person living With Disabilities (PWD).

## **Genetics and Mental Health**

1. Public health importance of mental health
2. Public health approach to mental health problems: types, diagnosis and management of mental health problems in the community
3. Genetics, diseases mediated through genetic abnormalities, Gene mapping, Genetic engineering and therapy.

### **School Health**

1. Problems of school and adolescents; Objectives of the School Health Programme.
2. Activities of the Programmes like :
  - (a) Carrying out periodic medical examination of the children and the teachers.
  - (b) Immunisation of the children in the school.
  - (c) Health Education
  - (d) Mid-day meals.
3. Obtaining participation of the teachers in the school health programme including maintenance of records; defining healthful practices; early detection of abnormalities.
4. Organization, implementation, supervision and evaluation of School Health Programme

### **Occupational Health**

1. Relate the history of symptoms with the specific occupation including agriculture.
2. Identification of the physical, chemical and biological hazards to which workers are exposed to while working in a specific occupational environment.
3. Diagnostic criteria of various occupational diseases.
4. Preventive measures against these diseases including accident prevention.
5. Various legislations in relation to occupational health.
6. Employees State Insurance Scheme.
7. Migrant Workers

### **Urban health**

1. Impact of urbanisation on health and disease.
2. Common health problems (Medical, Social, Environmental, Economic, Psychological) of urban slum dwellers.
3. Organisation of health services for slum dwellers.
4. Organisation of health services in urban areas.

### **Paper IV: Recent Advancements, Health planning, Management and Public Health Administration, Sociology and Education Technology.**

Explain the terms: public health, public health administration, regionalisation, comprehensive health care, primary health care, delivery of health care, planning, management, evaluation, National Health Policy, Development of Health Services in India and various committee reports.

### **Components of health care delivery**

- (i) Describe the salient features of the National Health Policy concerning :
  - (a) provision of medical care;
  - (b) primary health care and Health for All;
  - (c) health manpower development;
  - (d) planned development of health care facilities;
  - (e) encouragement of indigenous systems of medicine.

- (ii) Explain the process of health planning in India by demonstrating awareness of various important milestones in the history of health planning including various committees and their recommendations.
- (iii) The health systems and health infrastructure at Centre, state district and block levels. The inter-relationship between community development block and primary health centre. The organisation, function and staffing pattern of community health centre, primary health centre, rural health centre and sub-centre etc.
- (iv) The job descriptions of health supervisor (male and female); health workers; village health guide; anganwadi workers; traditional birth attendants.
- (v) The activities of the health team at the primary health centre, Community health centre, district hospital.
- (vi) Health Insurance
- (vii) National Health Mission – Rural and Urban Component.

### **Health Management**

- i. Familiarity with management techniques: define and explain principles of management; explain broad functions of management; personnel and materials management.
- ii. Finance Management: Budgeting systems
- iii. Explain general principles of health economics and various techniques of health management e.g., cost-effectiveness, cost-benefit etc.
- iv. Health Management Information System
- v. Be aware of the constitutional provisions for health in India.
- vi. Enumerate the major divisions of responsibilities and functions (concerning health) of the union, local and the state governments.
- vii. Appreciate the role of national, international voluntary agencies in health care delivery.
- viii. Appreciate the need for International Health Regulations and Disease surveillance.
- ix.
- x.
- xi.

### **Public Health Acts**

Legal provisions protecting health of the community.

- 1. MTP Act, PNDTA Act.
- 2. PFA Act
- 3. Acts regulating Organ Donation, Child adoption.
- 4. Prevention of Immoral trafficking Act.
- 5. Acts against substance abuse
- 6. Biomedical Waste Management Act and Acts protecting environment from pollution.
- 7. ESI Act, Factories Act.

## **Sociology**

1. Conduction of a clinico-social evaluation of the individual in relation to social, economic and cultural aspects; educational and residential background; attitude to health, disease and to health services; the individual's family and community.
2. Assessment of barriers in health behaviour and identification of obstacles to good health, recovery from sickness and to leading a socially and economically productive life.
3. Development of a good doctor – patient relationship, public relations and community participation for health sectors.
4. Identification of social factors related to health and disease in the context of urban and rural societies.
5. Social Stratification and the value of the different methods.

## **Education Technology**

1. General principles of teaching/learning, methods of instructions, methods of evaluation.
2. Various teaching aids (including a.v.aids) and skills to use them correctly.
3. Behavioral change communication strategy - Health education

## **Recent Advances**

1. Newer vaccines
2. New screening/diagnostic methods applicable to public health problems
3. Role of New Technology in Community Health and provision of Care at various level.
4. Recent Policies, Acts, Programs.
5. Evolving diseases, Health issues.

## **5. TEACHING AND LEARNING METHODS**

To achieve the stated objectives, various modalities and methods are commended:-The proportion of these modalities and methods will vary from Institution to Institution due to varying facilities for exposure and number of postgraduate students and recognized teachers. However, modality wise minimum exposure is suggested below:-

Field learning is facilitated through field postings during forenoons. Class room teaching to be planned in the afternoons at the department.

### **Class room learning:**

- (1)Self-directed: At least twice a week in which the student will present articles, abstracts from journals, seminars, group work, epidemiological and statistical exercises, case studies, family presentation.
- (2)Lectures: Recognized teachers should take lectures..
- (3)Participation in scientific activities, Participation in Panel discussions, Symposia, debates, workshops, Conferences

**Field posting and work**

1. Posting at Urban and Rural Health Training Centres for a period of one year distributed throughout the three years.
2. Posting in the hospital for exposure to clinical departments namely Pediatrics, Gynaecology and Obstetrics, Medicine and Surgery for one month each.
3. Wherever possible work attachment at District Health Office and Directorate of Health Services
4. The students will be encouraged to attend various camps, melas, public health emergencies, Investigation of epidemics and implementation of National Health Programmes.
5. Visits to various institutions of Public Health Importance and related development organizations.

**Teaching exposure**

They should conduct group teaching of undergraduate students. They should participate in the training programme conducted by the Department.

**Research**

1. Thesis: The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First of the first Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

2. They should be involved in departmental research projects.
3. They should be encouraged to publish papers in scientific journals
4. They should be exposed to application of computers in medical science

**ACHIEVING LEARNING OBJECTIVES: SKILL TRAINING STRATEGY****SUBJECT SPECIFIC PRACTICAL COMPETENCIES****Part I: General Skills**

The postgraduate student should be able to :

1. Elicit the clinico-social history to describe that agent, host and environmental factors that determine and influence health.
2. Recognise and assist in management of common health problems of the community.
3. Apply principles of epidemiology in carrying out epidemiological studies in the community.
4. Work a team member in rendering health care.
5. Carry out health education effectively for the community.

## Coded list of Skills:

|             | <b><u>CATEGORISED ACTIVITY - CONTENTS</u></b>          |                |
|-------------|--------------------------------------------------------|----------------|
| <b>S.No</b> | <b>DETAILS</b>                                         | <b>PAGE NO</b> |
|             | <b>HEALTH CARE</b>                                     |                |
| HC1a        | CLINICO-SOCIAL CASE STUDIES (Presented)                |                |
| HC1b        | CLINICO-SOCIAL CASE STUDIES (Attended)                 |                |
| HC2.        | ANTENATAL CLINIC / LABOUR WARD / POSTNATAL CLINIC/     |                |
|             | FAMILY PLANNING CLINIC                                 |                |
| HC3.        | PAEDIATRIC CLINIC/ ADOLESCENT CLINIC/ GERIATRIC CLINIC |                |
| HC4.        | RNTCP CENTRE/ STI CLINIC/ ART CENTRE/ DERMATOLOGY      |                |
|             | CLINIC                                                 |                |
| HC5         | NCD CLINIC/ OPHTHALMOLOGY CLINIC                       |                |
|             | <b>PUBLIC HEALTH CARE</b>                              |                |
| PH1         | COMMUNITY DIAGNOSIS                                    |                |
| PH2         | PLACES OF PUBLIC HEALTH IMPORTANCE - VISITED           |                |
| PH3         | OTHER PUBLIC HEALTH ACTIVITIES                         |                |
|             | <b>EPIDEMIOLOGY</b>                                    |                |
| EPI1a       | JOURNAL ARTICLE PRESENTED                              |                |
| EPI1b       | JOURNAL CLUBS ATTENDED                                 |                |
| EPI2        | PAPER / POSTER PRESENTATIONS                           |                |
| EPI3a       | LIST OF PUBLICATIONS                                   |                |
| EPI3b       | PROJECTS ASSISTED                                      |                |
| EPI4        | TIMELINE OF DISSERTATION/THESIS ACTIVITIES             |                |
| EPI5        | SIMULATION EXERCISES                                   |                |
|             | <b>COMMUNICATION AND EDUCATION TECHNOLOGY</b>          |                |
| C1a         | UNDER GRADUATE CLASSES ATTENDED                        |                |
| C1b         | PAEDAGOGY SESSIONS                                     |                |
| C1c         | UNDER GRADUATE CLASSES TAKEN                           |                |
| C2          | UNDER GRADUATE BLOCK POSTINGS (Community Orientation   |                |
|             | Program)                                               |                |
| C3a         | SEMINARS (PRESENTED)                                   |                |
| C3b         | DEPARTMENT SEMINARS ATTENDED                           |                |
| C4          | TRAINING / HEALTH EDUCATION/ COUNSELING SESSIONS       |                |
|             | CONDUCTED / ATTENDED                                   |                |
| C5          | CONTINUED MEDICAL EDUCATION PROGRAMS ( ATTENDED)       |                |
| C6          | GUEST LECTURE- ATTENDED                                |                |

| S.No        | DETAILS                                                                        | PAGE NO |
|-------------|--------------------------------------------------------------------------------|---------|
|             | <b>MANAGEMENT AND LEADERSHIP</b>                                               |         |
| <b>MLA1</b> | <b>HOSPITAL MANAGEMENT</b>                                                     |         |
| <b>MLA2</b> | <b>OUT REACH CLINICS-RURAL / URBAN - National Program 1,2,3</b>                |         |
| <b>MLA3</b> | <b>OUT REACH CLINICS-RURAL / URBAN – National Program 4 &amp; 5.</b>           |         |
| <b>MLA4</b> | <b>OUT REACH CLINICS-RURAL / URBAN – Materials Management.</b>                 |         |
| <b>MLA5</b> | <b>OUT REACH CLINICS-RURAL / URBAN – Health manpower development</b>           |         |
| <b>MLA6</b> | <b>OUT REACH CLINICS-RURAL / URBAN – Health Management Information System.</b> |         |
| <b>MLA7</b> | <b>OUT REACH CLINICS-RURAL / URBAN – Health centre evaluation</b>              |         |
| <b>MLA8</b> | <b>MEDICAL AUDITS/ INFANT DEATH AUDIT/ MATERNAL DEATH AUDIT (Attended)</b>     |         |
| <b>MLA9</b> | <b>REVIEW MEETINGS (CONDUCTED/ATTENDED)</b>                                    |         |

## Part II : Skills in Relation to Specific Topics

**Documentation of training in each skill to be recorded in the logbook in the relevant coded section as given.**

**1. HEALTH CARE:** Recognise and assist in management of common health problems of the community:

| Skill                                                                                                                                                                                                                                                       | Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Quality assessment                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| a. Elicit the clinico-social history to describe the agent, host and environmental factors that determine and influence health.<br>b. Adequate and appropriate treatment and follow-up                                                                      | Case studies on patients with ADD, ARI, fever with no localising sign or symptom, Chronic cough, anaesthetic patches or deformities, (covering diseases like tetanus, malaria, filariasis, rabies, cholera, typhoid, intestinal parasites, leprosy, tuberculosis, HIV, Non communicable diseases like diabetes, hypertension)<br>Cases could be obtained during their clinical postings or during their PHC & UHC posting – a minimum of 15 case studies | Documented case study reports with follow up to be reviewed by Faculty. HC1a and HC1b, HC2, HC3, HC4, HC5 |
| c. Collection of appropriate material for microbiological, pathological or biochemical tests.<br>d. Fixing, staining, and examining smears – peripheral blood smear for malaria and filariasis, sputum for AFB; Hb estimation; urine and stool examination. | Posting in laboratory where they should have performed the related simple tests.<br>Minimum tests:<br>Peripheral thick smear 1<br>Peripheral thin smear 1<br>AFB smear 1<br>Hb estimation 1<br>Stool exam for ova cyst 1                                                                                                                                                                                                                                 | Document preparation of smears and their examination findings with confirmation from guiding faculty      |



|                                                                 |                                                              |                                                                                                                                                    |
|-----------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| e.. Advice on the prevention and prophylaxis of common diseases | Health advice to individual<br>Health advice to small groups | Document context of health advice as counselling for all the 15 case studies in the GATHER (Greet, Ask, Tell, Help, Explain and Return) format. C4 |
|-----------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|

## 2. PUBLIC HEALTH - Health Promotion and Disease Prevention

| Skill                                                                                                                                                                | Activity                                                                                                                                                                                                 | Quality assessment                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. Identify health problems of the community in the context of the socio -economic - cultural milieu                                                                 | Family Study (Minimum 6)<br>Community Diagnosis of a hamlet of 100 families assigned to each Postgraduate.<br>(Research 1)                                                                               | Record of detailed Family study report. (Guidelines available in Annexure) PH1c<br>Based on survey of hamlet, details of COMMUNITY DIAGNOSIS to be provided in proper format PH1d                                 |
| b. Use of proper screening methods in early diagnosis of common diseases.                                                                                            | To complete a project using / evaluating screening methods.<br>(Research 2)                                                                                                                              | Study document should clearly justify the need for screening, the appropriateness of the test chosen for screening and the validity of the test. EPI3b5                                                           |
| c Identify groups which require special attention (elderly, adolescents, gender, the poor and other marginalized groups) including those facing occupational hazards | Based on the Community Diagnosis or a separate project, show how increased risk in groups can be identified.                                                                                             | Risk group identification should be documented either as a component of COMMUNITY DIAGNOSIS or as an independent research showing increased risk either as POR, OR, RR, Regression model or MVA. PH1e             |
| d. Identify issues related to nutrition, life style                                                                                                                  | Component activity during Community Survey<br>Quantifying and measurement of at risk lifestyles should be done either as part of community survey or as an independent qualitative research (Research 3) | Document on nutrition assessment should have indicators used for nutrition assessment of the community – both at individual level and family level. PH1f<br>Documentation of result of lifestyle assessment. PH1g |

|                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| e. Identify threats to the environment                                                                                                                                          | Component activity during Community Survey                                                                                                                                                                                                                                            | Document on environment PH1 assessment should state variables related to environment that were studied, how they were measured and the corrective action initiated.                            |
| f. Anticipate, prepare for and respond to disasters                                                                                                                             | Component activity during Community Survey.                                                                                                                                                                                                                                           | Make a statement of risks the community is prone to, the infrastructure available for disaster preparedness, contact numbers of the local authorities in charge of disaster preparedness. PH1j |
| g. Take necessary steps in disease outbreak/epidemics/natural disasters – investigation of epidemic, food poisoning; notification; Organizing medical care following disasters. | To complete a project on investigation of an epidemic/ clustering of cases/ food poisoning (Research 3)                                                                                                                                                                               | Study document should explain how the epidemic was suspected, confirmed and determinants identified. Details of management of epidemic & corrective action taken to be given PH3               |
| h. On the basis of epidemiology of communicable and non-communicable diseases, plan preventive measures and manage national health programs                                     | To prepare flow chart depicting Natural History of Diseases of Public Health Importance, giving opportunities for prevention, in the context of current status of population parameters and National program.                                                                         | Report on level of prevention directly observed or practised and its consequences for a minimum of 5 National Programs. MLA1, MLA2                                                             |
| i. Facilitate inter-sectoral coordination for promoting health of communities                                                                                                   | Make educational visits to various health related departments, updating current activities favouring health (TWAD board, TNPCB, Social Welfare Board, Aavin Milk Society, Veterinary Institute, Board for Rehabilitation of PWD, Prison Authorities, Airport and Seaport authorities) | Document report of visits along with contact number of liaison officers, especially for the field practice region assigned to the Post Graduate. PH2                                           |
| f. Anticipate, prepare for and respond to disasters                                                                                                                             | Component activity during Community Survey.                                                                                                                                                                                                                                           | Make a statement of risks the community is prone to, the infrastructure available for disaster preparedness, contact numbers of the local authorities in charge of disaster preparedness. PH1j |

**3. EPIDEMIOLOGY & BIOSTATISTICS:** Use effectively the tools of epidemiology for understanding disease distribution and determinants of diseases

| Skill                                                                       | Activity                                                                                                                                                                                                                       | Quality assessment                                                                                                                                                           |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. Design and implement Epidemiological and Health Systems research studies | Dissertation project<br>(Research 4)                                                                                                                                                                                           | Completed dissertation to be sent for external valuation. EPI4                                                                                                               |
| b. Analyze data and present findings                                        | <ul style="list-style-type: none"> <li>- Component activity of dissertation.</li> <li>- Use statistical software for analysis of data.</li> <li>- Solve simulation exercises utilising various statistical methods.</li> </ul> | Document solutions worked out for various simulation exercises. EPI5                                                                                                         |
| c. Effectively document and disseminate findings                            | <ul style="list-style-type: none"> <li>- Publish one original article.</li> <li>- Critically review journal articles.</li> </ul>                                                                                               | <ul style="list-style-type: none"> <li>- Document details of publication. EPI3a</li> <li>- Document details of journal club with articles critiqued. EPI1a, EPI1b</li> </ul> |

**4. EDUCATION TECHNOLOGY:** Behavioral Change Communication

| Skill                                                 | Activity                                                                                                                                                                                         | Quality assessment                                                                                                                                                               |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. Assess the learning needs of any given group.      | Component activity of COMMUNITY DIAGNOSIS                                                                                                                                                        | Documentation of Educational Diagnosis made in the context of societal or individual behavior problems that can be improved. PH1k                                                |
| b. Formulate learning objectives.                     | <ul style="list-style-type: none"> <li>- Plan a project on health communication to a special group. (Component part of community survey or independent study).</li> </ul>                        | Document the small group BCC by stating the steps of Set Induction, Content/ Message of Communication, Motivators and System support during trial behaviour C4                   |
| c. Select and implement appropriate learning methods. |                                                                                                                                                                                                  |                                                                                                                                                                                  |
| d. Evaluate learning experiences.                     | Evaluation of BCC/learning session either individually or as a comparative evaluation of different types of health communication initiatives and BCC tools.                                      | Document BCC evaluation report either as part of community survey/ following UG teaching session/ independent study comparing different health communication initiatives. EPI3b4 |
| e. Plan curriculum and prepare curriculum materials.  | <ul style="list-style-type: none"> <li>- Prepare lesson plan for UG sessions conducted</li> <li>- Conduct peer reviewed microteaching sessions.</li> <li>Plan &amp; Organise Seminars</li> </ul> | Document lesson plans and microteaching sessions with faculty evaluation. C1a, C1b, C1c, C2<br><br>Report on Seminars conducted C3a, 3b                                          |

## 5. Public Health policy, planning, leadership and Management

| Skill                                                                                                                            | Activity                                                                                                                                                                                                                                                                                                                                                                                                                                           | Quality assessment                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| a. Prioritize health problems, Set objectives; prepare action plan; implement programs; and monitor, supervise and evaluate them | Short term project/ training/ workshop/ Health Day Celebration/ Dept. Program to be planned and organised as a team.                                                                                                                                                                                                                                                                                                                               | Record of DEPARTMENT PROGRAM activity and its repercussions/ impact. EPI3b1         |
| b. Plan health manpower development                                                                                              | Simulation activity of comparing existing health manpower of a chosen system against the required and prepare a feasible action plan for its development including costing                                                                                                                                                                                                                                                                         | Record of Health manpower development action plan evaluated by faculty. MLA5        |
| c. logistics and materials management                                                                                            | Simulation activity of material management (of any component activity of purchase, indend, storage, logistics, maintenance, documentation and condemnation) for any material essential for health care of a community (e.g. drugs, equipments, utilities like gloves, bins, electronic gadgets for HIMS, vehicle for transport of patients, students, health workers) based on the standard guidelines of the Director General of Health Services. | Report of materials management simulation report, evaluated by faculty. MLA4        |
| d. Assess costs, plan, implement and supervise budget and alternative health options                                             | As a component activity enclose costing and budget for the Management Project.                                                                                                                                                                                                                                                                                                                                                                     | Work out simulation exercises on costing, budgeting and economic evaluation. EPI3b1 |
| e. Perform economic evaluation of illness and health interventions                                                               | As an independent exercise to prepare report of economic evaluation of individual ill health/ population economics of health interventions <b>Research 5</b>                                                                                                                                                                                                                                                                                       | Report of economic research activity, evaluated by faculty to be enclosed. EPI3b3   |
| f. Manage Health Information System and respond appropriately to the information gathered                                        | Prepare a report of Management health information system at a specific centre, interpreting the findings and recommendations to correct the limitations.                                                                                                                                                                                                                                                                                           | Report on MIS to be evaluated by faculty and recorded. MLA6                         |
| g. Establish Surveillance System and respond to public health threats effectively and efficiently                                | Prepare a critical report on the existing surveillance/ HIS system for any specific region and give recommendations/ solutions in accordance with the standard guidelines. ( One of SRS Unit, CRS, Regular Reports)                                                                                                                                                                                                                                | Report on surveillance system, evaluated by faculty to be enclosed. PH1i            |

|                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| h. Understand basics of hospital management                                                                                                            | Components of hospital administration ( Patient care OP, IP, Nursing, Pharmacy and Stores, Lab, Radiology, Operation theatres, Infection Control, Support services of Central Sterile Supply Dept., kitchen, laundry, Sanitation, Security, Hospital waste management, Records and Office Procedures, Grievance redressal) to be studied for any hospital, and report on the arrangement for monitoring and quality assurance of these components be prepared. | Report on components of hospital management with recommendations for problem solving to be documented with faculty evaluation. <b>MLA1</b> |
| i. Evaluate health care delivery                                                                                                                       | To evaluate health care delivery of a primary care centre/ sub centre based on NRHM guidelines (IPHS) for patient services offered, supervision and monitoring services, infrastructure in the form of buildings, manpower, drugs, equipment and furniture and Quality control in the form of availability of citizen's charter, standard guidelines, internal and external periodic records evaluation.                                                       | Health centre evaluation report to be documented.MLA7                                                                                      |
| j. Study quality assurance and medical audit.                                                                                                          | Attend a medical audit/ Infant, Maternal death audit.                                                                                                                                                                                                                                                                                                                                                                                                          | Report on audit as per guidelines. MLA8                                                                                                    |
| k. Initiate, implement and supervise National Health Programs                                                                                          | Formative evaluation of any one of the National programs as per the guidelines.                                                                                                                                                                                                                                                                                                                                                                                | Report of National Program evaluation to be documented after evaluation by faculty. MLA2, MLA3.                                            |
| l. Understand and Implement public health laws                                                                                                         | Trace one case study, from the list available in public domain, relating to violation of any one of the public health laws and discuss in detail the tenets of the law.                                                                                                                                                                                                                                                                                        | Report of case study on public health law.                                                                                                 |
| m. Promote and establish partnerships - partnering with community, Panchayati Raj institutions, public private partnerships, NGOs and corporate sector | One activity partnering with any of the NGOs, Corporate sector or private hospital in any aspect of national program or community project.                                                                                                                                                                                                                                                                                                                     | Report on Community, partnership project and its outcome. EPI3b2                                                                           |
| n. Recommend policies relevant for the local community                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                            |

## 6. Ethics in Public Health

| Skill                                                                                                                                                                                                      | Activity                                                          | Quality Assessment                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| a. Identify and analyze ethical issues in public health practice, biological and medical research, and health policy with reference to the codes and regulations pertinent to clinical and research ethics | As a component activity for ALL the research activity undertaken. | Report on ethical issues in research conducted. EPI4d                                                                     |
| b. Identify the beliefs and interests of stakeholders and their impact on ethical decision making in professional and research practice including those of public concerns.                                |                                                                   | Report on how interests of stake holders can influence conduct of the research planned by you and the ethics of it. EPI4e |

**MD COMMUNITY MEDICINE  
TRAINING SCHEDULE ENSURING COVERAGE OF LEARNING OBJECTIVES.  
(Suggested)  
FORENOON CLINICAL SESSIONS**

| Month | I st year Postings                               | II nd year Postings                         | III rd year Postings                            |
|-------|--------------------------------------------------|---------------------------------------------|-------------------------------------------------|
| 1     | ObG/ Family planning HC1, HC2                    | PHC – 1 MLA3                                | Mentor for UG C2                                |
| 2     | Paediatrics HC3                                  | PHC – 2 MLA3                                | Mentor for UG C2                                |
| 3     | Medicine HC5                                     | Inst. Of Phys. Rehab/ NLEPHC4               | PHC -1 MLA5                                     |
| 4     | Psychiatry/ Geriatrics HC3                       | NRHM/ Health InsuranceEPI3b3                | PHC – 2 MLA6                                    |
| 5     | Diabetology Research 3                           | Data collection for dissertation Research 1 | O/o Deputy Director of Hlth Services MLA8, MLA9 |
| 6     | ICH Nutrition HC3                                | Corporation of Chennai MLA8, MLA9           | UHC Research 5 EPI3b3                           |
| 7     | Dermatology/ Dental Hospital Administration MLA1 | Communicable Diseases Hospital (CDH) PH3    | PHC – 3 MLA7                                    |
| 8     | Ophthalmology/ENT HC5                            | UHC PH1                                     | UHC                                             |
| 9     | PHC – 1                                          | PHC – 3 MLA4                                | Department of Community Medicine.               |
| 10    | PHC – 2 MLA2                                     | ART/NIRT/RNTCP HC4                          |                                                 |
| 11    | PHC – 3 MLA2                                     | Social Welfare/ Social Rehab PH2            |                                                 |
| 12    | UHC MLA2                                         | Special Vists Port/ Occupational health PH2 |                                                 |

### AFTERNOON SESSIONS

| Day       | I year MD Community Medicine                                                                                                                                                                                         | II year MD Community Medicine                                         | III year MD Community Medicine                                                             |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Monday    | Teaching Technology – Guided Practice of UG teaching - <b>C1a</b>                                                                                                                                                    | Epidemiology - <b>EPI5</b>                                            | 8 mths: Health care delivery<br>2 mths: International health<br>2 mths: Bio Ethics         |
| Tuesday   | Case Presentation - <b>HC1a, HC1b</b>                                                                                                                                                                                | Teaching UG / Research – Guiding Data collectn & scrutiny: <b>C1b</b> | Health administration                                                                      |
| Wednesday | Seminar/ Journal club/ Family Study/ Management Case Study - <b>C1a, EPI1, PH1c.</b>                                                                                                                                 |                                                                       |                                                                                            |
| Thursday  | 3 mths: Social & behavioral science<br>3 mths: Environmental Health<br>3 mths: Medical Entomology<br>3 mths: Bio statistics                                                                                          | 9 mths: Health care of special groups<br>3 mths: Nutrition            | 4 mths: Health Financing & Health Economics<br>8 mths Teaching UG/ Legal Aspects of health |
| Friday    | Research methodology & Protocol development- <b>EPI4c</b>                                                                                                                                                            | 6 mths Occupational Health<br>6 mths Disaster Management/ Injury      | National Health Programs                                                                   |
| Saturday  | <b>1<sup>st</sup> week</b> - Log book evaluation by faculty i/c; PGs /Formative evaluation HOD in rotation. <b>3<sup>rd</sup> week</b> – Special Lectures for<br><b>4<sup>th</sup> week</b> – Log book evaluation by |                                                                       |                                                                                            |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

#### **8. Competency Assessment:**

##### **OVERALL:**

a) Communication / commitment / Contribution / Compassion towards patients and Innovation      ( )      **5 Marks**

b) Implementation of newly learnt techniques/skills      ( )

Number of cases presented in Clinical Meetings/ Journal clubs/seminars      - **5 marks**

Number of Posters/Papers presented in Conferences/ Publications and Research Projects      - **5 marks**

No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details.      - **5 marks**

Total      **20 Marks**

### PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

#### **ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

Viva Voce examination shall aim at assessing thoroughly depth of knowledge, logical reasoning, confidence and oral communication skills. It includes discussion on dissertation.

#### **9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.



**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

**Assessment:**

There are 2 major components:

**A) Formative Assessment :** Ongoing evaluation during the course –

During each posting/ Module, learning activities are evaluated as given in the activity log, by faculty in charge at the end of each month and by HOD once every 3 months.

**B) Summative Assessment:** Final assessment after 3 years.

**A. FORMATIVE ASSESSMENT/ (Ongoing Evaluation)**

Formative assessment will be conducted during each posting/module/unit. This will include the following:

1. HEALTH CARE through documented case study reports with follow up.
2. PUBLIC HEALTH PROMOTION AND DISEASE PREVENTION through survey of hamlet and details of COMMUNITY DIAGNOSIS and recommendations provided.
3. EPIDEMIOLOGY& BIOSTATISTICS through solutions worked out for various simulation exercises, and epidemiology studies completed as research for dissertation, e journal publication, oral presentation at a conference and poster presentation.
4. EDUCATION TECHNOLOGY & Behavioral Change Communication through health communication to a special group and documented lesson plans for undergraduate classes
5. PUBLIC HEALTH POLICY, PLANNING, LEADERSHIP AND MANAGEMENT through Their analytical report and recommendations of the different components of management at the public health care units they are posted.

**B. SUMMATIVE ASSESSMENT (FINAL ASSESSMENT)**  
**10) THEORY EXAMINATION**

**Final Theory papers:** 4 Papers each 100 marks

**Paper I : Tropical medicine and Public Health Basic Sciences in  
Community Medicine**

**Paper II : Community Medicine**

**Paper III : Health Care of Special Groups**

**Paper IV : Health Practice and Administration and Recent Advances.**

**Question paper pattern: PAPER I, II, III & IV**

**Structured Essay Questions - 2 x 15 Marks = 30 Marks**

**Short Notes - 10 x 5 Marks = 50 Marks**

**Reasoning out - 4 x 5 Marks = 20 Marks**

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**100 Marks**  
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\*The topics assigned to the different papers are given as general guidelines. A strict division of the subjects may not be possible. Some overlapping of topics is inevitable. Students should be prepared to answer the overlapping topics.

# 11) PRACTICAL

## MD COMMUNITY MEDICINE

|                                                                                        |                                |                         |                        |
|----------------------------------------------------------------------------------------|--------------------------------|-------------------------|------------------------|
| <b>CLINICO SOCIAL EXAMINATION :</b>                                                    |                                |                         |                        |
| <b>FAMILY STUDY :</b>                                                                  |                                |                         | <b>80 MARKS</b>        |
| <b>PUBLIC HEALTH SKILLS</b>                                                            |                                |                         |                        |
| <b>COMPUTER DATA ANALYSIS SKILLS</b>                                                   |                                |                         | <b>25 MARKS</b>        |
| <b>MANAGEMENT SKILLS(AS CASE STUDY)</b>                                                |                                |                         | <b>25 MARKS</b>        |
| <b>EPIDEMIOLOGY BIO STATISTICS EXERCISE</b>                                            |                                |                         | <b>50 MARKS</b>        |
| <b>OSPE (PUBLIC HEALTH CHEMISTRY)<br/>PH MICRO, MEDICAL ENTOMOLOGY, RCH<br/>SKILLS</b> | <b>(4 X 5)</b>                 |                         | <b>20 MARKS</b>        |
| <b>CLINICAL TOTAL</b>                                                                  |                                |                         | <b>200 MARKS (A)</b>   |
| <b>VIVA</b>                                                                            |                                |                         |                        |
| <b>VIVA VOCE</b>                                                                       |                                |                         | <b>60 MARKS</b>        |
| <b>PEDAGOGY</b>                                                                        | <b>(10X4)</b>                  |                         | <b>40 MARKS</b>        |
| <b>VIVA TOTAL</b>                                                                      |                                |                         | <b>100 MARKS (B)</b>   |
| <b>AGGREGATE (CLINICAL + VIVA)</b>                                                     |                                |                         | <b>300 MARKS (A+B)</b> |
| <b>MINIMUM REQUIRED FOR PASS (50%)</b>                                                 |                                |                         | <b>150 MARKS</b>       |
| <b>DISSERTATION</b>                                                                    |                                |                         | <b>APPROVED /NOT</b>   |
|                                                                                        |                                |                         | <b>APPROVED</b>        |
| <b>FORENOON</b>                                                                        |                                |                         | <b>AFTERNOON</b>       |
| <b>DAY 1</b>                                                                           | <b>EPIDEMIOLOGY/EXERCISES</b>  | <b>OSCE</b>             |                        |
|                                                                                        | <b>FAMILY STUDY</b>            | <b>COMPUTER SKILL</b>   |                        |
|                                                                                        |                                | <b>MANAGERIAL SKILL</b> |                        |
| <b>DAY 2</b>                                                                           | <b>PAEDAGOGY</b>               |                         |                        |
|                                                                                        | <b>LOG BOOK EVALUATION</b>     | <b>VIVA</b>             |                        |
|                                                                                        | <b>DISSERTATION DISCUSSION</b> |                         |                        |

|                                                                             |                                                                     |              |          |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------|--------------|----------|
| The practical examination should be structured and as objective as possible |                                                                     |              |          |
| <b>A. Family study</b>                                                      |                                                                     | (60 minutes) | 80 marks |
| Structured Assessment                                                       |                                                                     |              |          |
| 1.                                                                          | Oral skills/presentation with clarity of observations and decisions |              | 20 marks |
| 2.                                                                          | Comprehensiveness of Diagnosis                                      |              | 20 marks |
| 3.                                                                          | Management based on related National Programs and Policies          |              | 20 marks |
| 4.                                                                          | Completeness of Appropriate Recommendations                         |              | 20 marks |

**B. Epidemiology with applied biostatistics simulation exercises (60 minutes) 50 marks** Exercises to test competency in statistics and its application in demography, RCH indicators, study designs, screening and diagnostics, materials management, money management, environment & entomology.

**C. Computer application Exercise: (Time 30 minutes) 25 marks**

Evaluates, Information technology skills like spreadsheet and database and statistical package use, including defining data types, selecting appropriate forms of analysis and interpreting the output.

**D. Management Simulation Exercise (Time 30 minutes) 25 marks**

Simulation exercise to evaluate attainment of following competencies

F1 Manages programs within resource constraints and monitors program performance

F2 Develops strategies for determining priorities and prepares proposals.

F3 Applies basic human relations skills to the management of organizations, motivation of personnel, and resolution of conflicts

F4 Manages information systems for collection, retrieval, and use of data for decision-making

F5 Understands cost-effectiveness, cost-benefit and cost utility analysis.

## Assessment / Evaluation of PEDAGOGY

Name of the candidate

Date:

Register No.

Centre:

Topic :

| Category                                                                      | Skill                           |                                                                                                                                                                                                             | Marks                                                                                                   |
|-------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>SUBJECT CONTENT<br/>(10 marks)</b>                                         | Set induction                   | <ul style="list-style-type: none"><li>Aroused interest in the beginning by relating to previous learning, throwing a new idea, questioning etc.</li><li>Specified the objectives of presentation.</li></ul> |                                                                                                         |
|                                                                               | Planning                        | <ul style="list-style-type: none"><li>Organized material in logical sequence</li><li>Used relevant content matter</li></ul>                                                                                 |                                                                                                         |
|                                                                               | <b>DEMEANOUR<br/>(10 marks)</b> | Presentation                                                                                                                                                                                                |                                                                                                         |
| <b>Audio Visual Aids usage, Voice Modulation and Attitude<br/>(10 months)</b> |                                 | Use of AV aids                                                                                                                                                                                              | <ul style="list-style-type: none"><li>Used proper AV aids</li><li>Used the aid(s) effectively</li></ul> |
| <b>Question and Answers<br/>(10 marks)</b>                                    | Pupil Participation             | <ul style="list-style-type: none"><li>Allowed questions from students</li><li>Asked questioning</li><li>Solicited / Raised questions</li><li>Rewarded pupil effort.</li></ul>                               |                                                                                                         |
|                                                                               | Closure                         | <ul style="list-style-type: none"><li>Summarized most important points at the end of the session</li></ul>                                                                                                  |                                                                                                         |
|                                                                               |                                 | Overall marks _____ out of 40                                                                                                                                                                               |                                                                                                         |
|                                                                               | Signature of the Examiners      |                                                                                                                                                                                                             |                                                                                                         |

## **12. Log Book**

The logbook is a record of the important activities of the candidates during his training. Collectively, log books are a tool for the evaluation of the training program of the institution by external agencies. The record includes academic activities as well as the presentations and procedures carried out by the candidate.

The Postgraduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

## **13. VIVA**

**G1. VIVA-VOCE including Competency Assessment 60 marks (40 marks+20 marks)**

## **14. PEDAGOGY: (30 minutes) 40 marks**

A topic would be given to each candidate along with the practical examination question paper on the first day. Student is asked to make a presentation on the topic on the second day for 30 minutes.

## **15. OSPE: 4 stations with checklists (10 minutes for each) 20 marks**

Stations should evaluate competency relating to Public Health Entomology/ Microbiology/ Communication Skills/ Epidemiology and Research/ Environment Assessment (Public Health Chemistry)/ Clinical Diagnosis of Diseases of Public Health Importance

## **16. REFERENCE BOOKS:**

### **Recommended reading:**

#### **Books**

1. Public Health and Preventive Medicine (Maxcy-Rosenau-Last Public Health and Preventive Medicine) by Robert B. Wallace
2. Basic Epidemiology. R Bonita, R Beaglehole, T Kjellstrom. World Health Organization Geneva.
3. Epidemiology by Leon Gordis.
4. Oxford Textbook of Public Health. Holland W, Detel R, Know G.
5. Practical Epidemiology by D.J.P Barker
6. Park's Textbook of Preventive and Social Medicine by K.Park
7. Principles of Medical Statistics by A. Bradford Hill
8. Interpretation and Uses of Medical Statistics by Leslie E Daly, Geoffrey J Bourke, James MC Gilvray.
9. Epidemiology, Principles and Methods by B. MacMahon, D. Trichopoulos
10. Hunter's Diseases of Occupations by Donald Hunter, PAB Raffle, PH Adams, Peter J. Baxter, WR Lee.
11. Sathe PV and Sathe AP Epidemiology and Management for Health Care for All.
12. Vaccines by Stanley A. Plotkin.
13. All reports and documents related to all National Programmes from the Ministry of Health and Family Welfare.
14. National Health Programs of India 12<sup>th</sup> edition, by J. Kishore, Century Publication
15. Survey methods in community medicine – J.H Abramson
16. Principles of health care and management- Seth B. Goldsmith
17. A dictionary of public health – John M. Last
18. Infectious disease epidemiology 2nd edition – Kenrad E. Nelson
19. Biostatistics – The bare essentials 2nd edition – Norman streiner.

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **17.JOURNALS**

### **National**

- a) Indian Journal of Community Medicine
- b) Indian Journal of Public Health
- c) Indian Journal of Community Health
- d) Journal of Communicable Diseases
- e) Indian Journal of Maternal and Child Health
- f) Indian Journal of Preventive and Social Medicine
- g) Indian Journal of Occupational Health and Industrial Medicine
- h) Indian Journal of Medical Research
- i) Indian Paediatrics
- j) Indian Journal of Paediatrics
- k) The National Medical Journal of India
- l) Journal of Vector Borne Diseases (previously Indian Journal of Malariology)
- m) Indian Journal of Environmental Health
- n) Indian Journal of Medical Education
- o) Journal of Indian Medical Association
- p) Journals of Medicine, Paediatrics, Obstetrics and Gynecology, Dermatology and Venereology, Leprosy, Tuberculosis and Chest Diseases
- q) Indian Journal of Dental Research

### **International**

- a) WHO Publications – All
- b) Tropical Diseases Bulletin
- c) Vaccine
- d) Lancet
- e) British Medical Journal
- f) New England Journal of Medicine.
- g) BMC infectious diseases
- h) The Journal of Communicable Diseases
- i) Journal of Travel Medicine: official publication of the International Society of Travel Medicine and the Asia Pacific Travel Health Association
- j) The Lancet infectious diseases
- k) American Journal of Epidemiology
- l) International Journal of Epidemiology
- m) American Journal of Public Health
- n) Journal of Epidemiology and Community Health
- o) Population Reports
- p) The American Journal of Clinical Nutrition
- q) MMWR. Morbidity and mortality weekly report
- r) MMWR. Recommendations and reports: Morbidity and mortality weekly report Recommendations and reports / Centers for Disease Control



- s) MMWR. Surveillance summaries: Morbidity and mortality weekly report surveillance summaries / CDC
- t) Quality Management in Health Care
- u) Journal of Public Health Management & Practice.
- v) International Journal of Rehabilitation Research
- w) The Health Care Manager
- x) Health Care Management Review
- y) Current Opinion in Endocrinology, Diabetes and Obesity

### **Useful Websites**

- a) [www.icmr.nic.in](http://www.icmr.nic.in)
- b) [www.mohfw.nic.in](http://www.mohfw.nic.in)
- c) [www.nacoonline.org](http://www.nacoonline.org)
- d) [www.npsindia.org](http://www.npsindia.org)
- e) [www.tbcindia.org](http://www.tbcindia.org)
- f) [www.iapsm.org.in](http://www.iapsm.org.in)
- g) [www.iphaonline.org](http://www.iphaonline.org)
- h) [www.who.int](http://www.who.int)
- i) [www.whoindia.org](http://www.whoindia.org)
- j) [www.cdc.gov](http://www.cdc.gov)
- k) [www.unicef.org](http://www.unicef.org)
- l) [www.pitt.edu/~super1](http://www.pitt.edu/~super1) (supercourse epidemiology)
- m) <https://dish.tn.gov.in> (Directorate of Industrial Safety and Health)
- n) <https://nrhm-mis.nic.in> ( HMIS, NRHM web portal)

# LOG BOOK

BRANCH XV - M.D. (COMMUNITY MEDICINE)  
LOG BOOK PART I : DAILY ACTIVITIES

DEPARTMENT OF COMMUNITY MEDICINE  
\_\_\_\_\_ MEDICAL COLLEGE



PHOTO

NAME OF THE CANDIDATE: \_\_\_\_\_  
UNI. REGISTER NUMBER : \_\_\_\_\_

TRAINED FROM \_\_\_\_\_ TO \_\_\_\_\_

DATE: \_\_\_\_ / \_\_\_\_ / 20\_\_\_\_  
SIGNATURE OF THE HOD \_\_\_\_\_

**Introduction for Logbook**  
(To be included as 1 st page of logbook)

The log book is a record of the important activities of the candidates, during their training towards achievement of learning objective. It is a tool for the evaluation of the training program of the institution by external agencies. It is presented as two components one as a daily diary and the other as categorised activities.

The activities are categorised and coded as per specific learning objectives. The time table gives a rough guideline by highlighted 'codes' wherein the activity should be recorded.

A bound register may not give freedom of expression to the student. Maintaining each coded category in standard sheets in different folders would help manage activities performed over varying time periods.

The final presentation of log book should be in bound form all the folders maintained during the three years of study.

**LOG BOOK – PART – I**

| S.<br>No. | Date |    | Department | No. of<br>Days on<br>leave | Signature |
|-----------|------|----|------------|----------------------------|-----------|
|           | From | To |            |                            |           |
|           |      |    |            |                            |           |
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**Sig. of Professor/Associate Professor**

**Sig. of HOD**

### POSTINGS DETAILS (SECOND YEAR)

| S.<br>No. | Date |    | Department | Signature |
|-----------|------|----|------------|-----------|
|           | From | To |            |           |
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|           |      |    |            |           |

Sig. of Professor/Associate Professor

Sig. of HOD

**POSTINGS DETAILS (THIRD YEAR)**

| <b>S.<br/>No.</b> | <b>Date</b> |           | <b>Department</b> | <b>Signature</b> |
|-------------------|-------------|-----------|-------------------|------------------|
|                   | <b>From</b> | <b>To</b> |                   |                  |
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**Sig. of Professor/Associate Professor**

**Sig. of HOD**

| S. No. | Day | Session | Activity | Signature of Faculty Remarks |
|--------|-----|---------|----------|------------------------------|
|        |     | FN      |          |                              |
|        |     | AN      |          |                              |
|        |     | FN      |          |                              |
|        |     | AN      |          |                              |
|        |     | FN      |          |                              |
|        |     | AN      |          |                              |
|        |     | FN      |          |                              |
|        |     | AN      |          |                              |
|        |     | FN      |          |                              |
|        |     | AN      |          |                              |
|        |     | FN      |          |                              |
|        |     | AN      |          |                              |
|        |     | FN      |          |                              |
|        |     | AN      |          |                              |
|        |     | FN      |          |                              |
|        |     | AN      |          |                              |

Sig. of Professor/Associate Professor

Sig. of HOD

## LOG BOOK – PART - II

|             | <b><u>CATEGORISED ACTIVITY - CONTENTS</u></b>          |                |
|-------------|--------------------------------------------------------|----------------|
| <b>S.No</b> | <b>DETAILS</b>                                         | <b>PAGE NO</b> |
|             | <b>HEALTH CARE</b>                                     |                |
| HC1a        | CLINICO-SOCIAL CASE STUDIES (Presented)                |                |
| HC1b        | CLINICO-SOCIAL CASE STUDIES (Attended)                 |                |
| HC2.        | ANTENATAL CLINIC / LABOUR WARD / POSTNATAL CLINIC/     |                |
|             | FAMILY PLANNING CLINIC                                 |                |
| HC3.        | PAEDIATRIC CLINIC/ ADOLESCENT CLINIC/ GERIATRIC CLINIC |                |
| HC4.        | RNTCP CENTRE/ STI CLINIC/ ART CENTRE/ DERMATOLOGY      |                |
|             | CLINIC                                                 |                |
| HC5         | NCD CLINIC/ OPHTHALMOLOGY CLINIC                       |                |
|             | <b>PUBLIC HEALTH CARE</b>                              |                |
| PH1         | COMMUNITY DIAGNOSIS                                    |                |
| PH2         | PLACES OF PUBLIC HEALTH IMPORTANCE - VISITED           |                |
| PH3         | OTHER PUBLIC HEALTH ACTIVITIES                         |                |
|             | <b>EPIDEMIOLOGY</b>                                    |                |
| EPI1a       | JOURNAL ARTICLE PRESENTED                              |                |
| EPI1b       | JOURNAL CLUBS ATTENDED                                 |                |
| EPI2        | PAPER / POSTER PRESENTATIONS                           |                |
| EPI3a       | LIST OF PUBLICATIONS                                   |                |
| EPI3b       | PROJECTS ASSISTED                                      |                |
| EPI4        | TIMELINE OF DISSERTATION/THESIS ACTIVITIES             |                |
| EPI5        | SIMULATION EXERCISES                                   |                |
|             | <b>COMMUNICATION AND EDUCATION TECHNOLOGY</b>          |                |
| C1a         | UNDER GRADUATE CLASSES ATTENDED                        |                |
| C1b         | PAEDAGOGY SESSIONS                                     |                |
| C1c         | UNDER GRADUATE CLASSES TAKEN                           |                |
| C2          | UNDER GRADUATE BLOCK POSTINGS (Community Orientation   |                |
|             | Program)                                               |                |
| C3a         | SEMINARS (PRESENTED)                                   |                |
| C3b         | DEPARTMENT SEMINARS ATTENDED                           |                |
| C4          | TRAINING / HEALTH EDUCATION/ COUNSELING SESSIONS       |                |
|             | CONDUCTED / ATTENDED                                   |                |
| C5          | CONTINUED MEDICAL EDUCATION PROGRAMS ( ATTENDED)       |                |
| C6          | GUEST LECTURE- ATTENDED                                |                |

| S.No | DETAILS                                                                 | PAGE NO |
|------|-------------------------------------------------------------------------|---------|
|      | <b>MANAGEMENT AND LEADERSHIP</b>                                        |         |
| MLA1 | HOSPITAL MANAGEMENT                                                     |         |
| MLA2 | OUT REACH CLINICS-RURAL / URBAN - National Program 1,2,3                |         |
| MLA3 | OUT REACH CLINICS-RURAL / URBAN – National Program 4 & 5.               |         |
| MLA4 | OUT REACH CLINICS-RURAL / URBAN – Materials Management.                 |         |
| MLA5 | OUT REACH CLINICS-RURAL / URBAN – Health manpower development           |         |
| MLA6 | OUT REACH CLINICS-RURAL / URBAN – Health Management Information System. |         |
| MLA7 | OUT REACH CLINICS-RURAL / URBAN – Health centre evaluation              |         |
| MLA8 | MEDICAL AUDITS/ INFANT DEATH AUDIT/ MATERNAL DEATH AUDIT (Attended)     |         |
| MLA9 | REVIEW MEETINGS (CONDUCTED/ATTENDED)                                    |         |
|      | <b>CURRICULUM SUBJECTS</b>                                              |         |
|      | <b>POST GRADUATE CLASSES ATTENDED</b>                                   |         |
|      | <b>COURSES ATTENDED</b>                                                 |         |
|      | <b>ANNEXURE – 1</b>                                                     |         |

## HEALTH CARE

**HC1a. CLINICO-SOCIAL CASE STUDIES (Presented) (minimum 15) Page: \_\_\_\_\_**

|      |              |                           | Observation *                                  |         |          | Name and  |
|------|--------------|---------------------------|------------------------------------------------|---------|----------|-----------|
|      |              |                           |                                                |         | Grade**  | sign      |
|      |              |                           |                                                |         |          | moderator |
| S.No | Cases        | I                         | II                                             | III     | IV       |           |
| Date |              |                           |                                                |         |          |           |
|      | presented*** | ( Clarity & organisation) | presentation style,ability to answer questions | content | Handouts |           |
|      |              |                           |                                                |         |          |           |
|      |              |                           |                                                |         |          |           |
|      |              |                           |                                                |         |          |           |
|      |              |                           |                                                |         |          |           |
|      |              |                           |                                                |         |          |           |
|      |              |                           |                                                |         |          |           |

\*Scores:5-outstanding ;4-good ;3-satisfactory; 2- doubtful; 1-unsatisfactory \*\*Grade: (total score) A:18-20; B:15-17; C:10-14 ;D:<10

\*\*\* Detailed case study to be documented along with health advice for each case study in GATHER format.



**HC1b. CLINICO-SOCIAL CASE PRESENTATIONS (Attended) Page: \_\_\_\_**

| S.No. | Date | Cases presented by | Cases | Sign of Faculty |
|-------|------|--------------------|-------|-----------------|
|       |      |                    |       |                 |
|       |      |                    |       |                 |

Health care of special groups: Knowledge acquired and activities undertaken to be given as a structured essay, including details of period, place of posting and guiding faculty, for the following clinics:-

HC2. Antenatal Clinic / Labour ward / Postnatal Clinic/ Family Planning Clinic  
 HC3. Paediatric clinic/ Adolescent clinic/ Geriatric clinic  
 HC4. RNTCP Centre/ STI Clinic/ ART Centre/ Dermatology clinic  
 HC5. NCD Clinic/ Ophthalmology Clinic

**EPIDEMIOLOGY****Epi 1a.JOURNAL ARTICLE PRESENTED Page: \_\_\_\_**

|       |      |                           |              |                    | Observation                |                                                     |             |              | Grade** | Sig. Of Faculty |  |  |  |
|-------|------|---------------------------|--------------|--------------------|----------------------------|-----------------------------------------------------|-------------|--------------|---------|-----------------|--|--|--|
| S.No. | Date | Journal Article presented | Journal Name | Volume, Year, Page | I (Clarity & Organisation) | II Presentations style, ability to answer questions | III Content | IV Hand outs |         |                 |  |  |  |
|       |      |                           |              |                    |                            |                                                     |             |              |         |                 |  |  |  |
|       |      |                           |              |                    |                            |                                                     |             |              |         |                 |  |  |  |

Scores:5-outstanding ;4-good ;3-satisfactory; 2-doubtful; 1-unsatisfactory

\*\*Grade: (total score) A:18-20; B:15-17; C:10-14 ;D:<10

**Epi1b. JOURNAL CLUBS ATTENDED Page : \_\_\_\_**

| S. No | Date | Presented by | Journal Article presented | Journal Name | Volume, Year, Page | Sig. Of moderator |
|-------|------|--------------|---------------------------|--------------|--------------------|-------------------|
|       |      |              |                           |              |                    |                   |
|       |      |              |                           |              |                    |                   |

**Epi 2. PAPER / POSTER PRESENTATIONS Page: \_\_\_\_\_**

| S.No. | DATE | TYPE           | TOPIC | Name of the conference / Place | CREDITS | Awarded by                            | Sig. of Faculty |
|-------|------|----------------|-------|--------------------------------|---------|---------------------------------------|-----------------|
|       |      | PAPER / POSTER |       |                                |         | TMC<br>TN<br>Dr.<br>MGRMU<br>Others : |                 |
|       |      |                |       |                                |         |                                       |                 |

**Epi 3a. LIST OF PUBLICATIONS Page: \_\_\_\_\_**

| S.No. | Journal | Title of the Paper | Authors | Year, Volume & Page No. | Sig. of Faculty |
|-------|---------|--------------------|---------|-------------------------|-----------------|
|       |         |                    |         |                         |                 |
|       |         |                    |         |                         |                 |

**Epi 3b. PROJECTS ASSISTED Page:**

| S. No | Name of the Team members | TOPIC                                        | Outcome | Sig. Of faculty |
|-------|--------------------------|----------------------------------------------|---------|-----------------|
| 1     |                          | Department Workshop/ Health Day Celebration/ |         |                 |
| 2     |                          | Community partnership project                |         |                 |
| 3     |                          | Health economics research activity           |         |                 |
| 4     |                          | Research evaluating different health         |         |                 |
|       |                          | communication strategy                       |         |                 |
| 5     |                          | Research validating a screening test         |         |                 |

#### **Epi 4. Timeline of dissertation/thesis activities**

| <b>Date</b> | <b>Activity</b>                                                                           | <b>Status</b> | <b>Sign. of Co-guide</b> | <b>Signature of Guide</b> |
|-------------|-------------------------------------------------------------------------------------------|---------------|--------------------------|---------------------------|
|             | Research Methodology Training                                                             |               |                          |                           |
|             | Choice of Topic                                                                           |               |                          |                           |
|             | Protocol draft                                                                            |               |                          |                           |
|             | Analytical report on ethical issues in current research                                   |               |                          |                           |
|             | Anticipatory analysis of how interest of state holders can influence conduct of research. |               |                          |                           |
|             | Protocol – presentation at department                                                     |               |                          |                           |
|             | Ethics Committee approval of protocol                                                     |               |                          |                           |
|             | Preparatory activities (permissions, print of forms, identifying liaison worker)          |               |                          |                           |
|             | Data collection                                                                           |               |                          |                           |
|             | Data entry & analysis                                                                     |               |                          |                           |
|             | Final Report                                                                              |               |                          |                           |

#### **Epi 5. Simulation Exercises on epidemiology study designs/ management/ economics/ computer skills**

| <b>S.No.</b> | <b>Category</b>                                         | <b>No. of exercises worked out</b> | <b>Signature of Faculty</b> |
|--------------|---------------------------------------------------------|------------------------------------|-----------------------------|
|              | Summarising indices                                     |                                    |                             |
|              | Graphs and Tables                                       |                                    |                             |
|              | Probability                                             |                                    |                             |
|              | Cross Sectional Studies                                 |                                    |                             |
|              | Analytical and interventional studies                   |                                    |                             |
|              | Screening and diagnostic tests                          |                                    |                             |
|              | Public health environment / entomology / Nutrition      |                                    |                             |
|              | Indicators of maternal, Child health and family welfare |                                    |                             |
|              | Material and Financial Management                       |                                    |                             |
|              | Computer Technology skills for data management          |                                    |                             |

## PUBLIC HEALTH CARE

### PH1. COMMUNITY DIAGNOSIS- CD

| S.No. | Details                                       | Report enclosed | Faculty sign |
|-------|-----------------------------------------------|-----------------|--------------|
| a.    | Location                                      |                 |              |
| b.    | Total No. Of families                         |                 |              |
| c.    | Families with detailed family study           |                 |              |
| d.    | Community diagnosis based on survey           |                 |              |
| e.    | Risk groups identified with justification     |                 |              |
| f.    | Nutritional assessment indicators             |                 |              |
| g.    | Lifestyle assessment report                   |                 |              |
| h.    | Assessment of environmental factors           |                 |              |
| i.    | Existing surveillance system of the region    |                 |              |
| j     | Elements of disaster preparedness based on CD |                 |              |
| k     | Educational diagnosis based on survey         |                 |              |

### PH2. PLACES OF PUBLIC HEALTH IMPORTANCE – VISITED Page: \_\_\_\_

| S. No | Institute name , Place | Subjects learned | Sig. of faculty |
|-------|------------------------|------------------|-----------------|
|       |                        |                  |                 |
|       |                        |                  |                 |

### PH3. OTHER PUBLIC HEALTH ACTIVITIES (Epidemic management, Evaluation) Page: \_\_\_\_

| S. No. | Date | Place | Activity | Sig. of faculty |
|--------|------|-------|----------|-----------------|
|        |      |       |          |                 |
|        |      |       |          |                 |

## COMMUNICATION AND TEACHING

**C1a.UNDER GRADUATE CLASSES ATTENDED (as demonstration of communication skills) Page : \_\_\_\_\_**

| S. No. | Date | Topic | Sig. of faculty |
|--------|------|-------|-----------------|
|        |      |       |                 |
|        |      |       |                 |

**C1b. PAEDAGOGY SESSIONS (as guided practice)**

| S. No. | Date | Topic | Students / Audience | Specific Skill |
|--------|------|-------|---------------------|----------------|
|        |      |       |                     |                |
|        |      |       |                     |                |

**C1c. UNDER GRADUATE CLASSES TAKEN (independent practice)**  
**Page : \_\_\_\_\_**

| S. No. | Date | Year                                | Topic * | Sig. of faculty |
|--------|------|-------------------------------------|---------|-----------------|
|        |      | I / II / III / CRRI<br>others _____ |         |                 |
|        |      | I / II / III / CRRI<br>others _____ |         |                 |

\* Detailed lesson plan for classes taken to be given

**C2. UNDER GRADUATE BLOCK POSTINGS (Mentorship to UG) Page : \_\_\_\_\_**  
**(Community Orientation Program)**

| S. No. | Date | Activities | Sig. of faculty |
|--------|------|------------|-----------------|
|        |      |            |                 |
|        |      |            |                 |

**C3a. SEMINARS (PRESENTED) Page: \_\_\_\_\_**

|        |      |                  | Observation                   |                                                        |                |                 | Grade*<br>* | Name and sign<br>moderator |
|--------|------|------------------|-------------------------------|--------------------------------------------------------|----------------|-----------------|-------------|----------------------------|
| S. No. | Date | Topics presented | I<br>(Clarity & Organisation) | II<br>Presentations style, ability to answer questions | III<br>Content | IV<br>Hand outs |             |                            |
|        |      |                  |                               |                                                        |                |                 |             |                            |
|        |      |                  |                               |                                                        |                |                 |             |                            |

\*Scores:5-outstanding ;4-good ;3-satisfactory; 2-doubtful; 1-unsatisfactory

\*Grade: (total score) A:18-20; B:15-17; C:10-14 ;D:<10

**C3b. SEMINARS ATTENDED Page: \_\_\_\_\_**

| S.No | Date | Department<br>UG/PG | Topic | Presented by | Sig. of faculty |
|------|------|---------------------|-------|--------------|-----------------|
|      |      |                     |       |              |                 |
|      |      |                     |       |              |                 |

**C4. TRAINING / HEALTH EDUCATION/ COUNSELING SESSIONS CONDUCTED / ATTENDED Page : \_\_\_\_\_**

| S.No | Date | Place         | Partipants | Topic * | Sig. of faculty |
|------|------|---------------|------------|---------|-----------------|
|      |      | URBAN / RURAL |            |         |                 |
|      |      | URBAN / RURAL |            |         |                 |

\* Document group sessions, stating the steps of Set Induction, Content/ Message of Communication, Motivators and System support during trial behavior

| S.No | Date | Topic | Department / Place | Credits | Awarded by                              | Sig. of faculty |
|------|------|-------|--------------------|---------|-----------------------------------------|-----------------|
|      |      |       |                    |         | <b>TN Dr. MGR MU</b><br><b>Others :</b> |                 |
|      |      |       |                    |         |                                         |                 |

**C5. CONFERENCES / WORKSHOP / NATIONAL SEMINARS ATTENDED Page: \_\_\_\_**

**C6. GUEST LECTURE- ATTENDED Page: \_\_\_\_**

| S.No | Date | Place | Topic | Name of the GUEST Lecturer | Sig. of faculty |
|------|------|-------|-------|----------------------------|-----------------|
|      |      |       |       |                            |                 |
|      |      |       |       |                            |                 |

### **MANAGEMENT/ LEADERSHIP AND ADMINISTRATION**

Knowledge acquired and activities undertaken to be given as a structured essay, including details of management component analysed, with recommendations for problem solving period, place of posting and guiding faculty, for the following management perspectives:-

MLA1. Hospital Management

MLA2. OUT REACH CLINICS-RURAL / URBAN - National Program 1,2,3

MLA3. OUT REACH CLINICS-RURAL / URBAN – National Program 4 & 5.

MLA4. OUT REACH CLINICS-RURAL / URBAN – Materials Management.

MLA5. OUT REACH CLINICS-RURAL / URBAN – Health manpower development

MLA6. OUT REACH CLINICS-RURAL / URBAN – Health Management Information System.

MLA7. OUT REACH CLINICS-RURAL / URBAN – Health centre evaluation

**MLA8. MEDICAL AUDITS/ Infant Death Audit/ Maternal Death Audit  
(Attended) Page: \_\_\_\_**

| SL. NO. | DATE | AUDIT | Sig. of moderator |
|---------|------|-------|-------------------|
|         |      |       |                   |
|         |      |       |                   |
|         |      |       |                   |

**MLA9. REVIEW MEETINGS (CONDUCTED/ATTENDED) AS PART OF  
MANAGEMENT TRAINING Page : \_\_\_\_\_**

| Sl. No. | Date | Participants<br>(CRRI / PG) | Topic | Sig. of faculty |
|---------|------|-----------------------------|-------|-----------------|
|         |      |                             |       |                 |
|         |      |                             |       |                 |

**POST GRADUATE CLASSES ATTENDED Page : \_\_\_\_\_**

| Sl. No. | No. of Sessions | Topic * | Class Taken by | Sig. of faculty |
|---------|-----------------|---------|----------------|-----------------|
|         |                 |         |                |                 |
|         |                 |         |                |                 |

\* Detailed schedule with dates of sessions to be available.

**COURSES ATTENDED**

| Sl. No. | Date | Topic | Department /<br>Place | Credits | Awarded by                           | Sig. of<br>faculty |
|---------|------|-------|-----------------------|---------|--------------------------------------|--------------------|
|         |      |       |                       |         | <b>TN Dr. MGR<br/>MU</b><br>Others : |                    |
|         |      |       |                       |         | <b>TN Dr. MGR<br/>MU</b><br>Others : |                    |



## ANNEXURE – 1

### Evaluation format for seminar presentations

|                                                                                                                                                                                                                                                                    | COMMENTS | SCORE |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------|
| I.CLARITY & ORGANISATION:<br>a) Begins by stating importance of topic, objectives & previewing main points.<br>b) Presents 2 to 5 points clearly with supporting examples.<br>c) Uses instructional resources<br>d) Summarizes to achieve closure.                 |          |       |
| II. PRESENTATION STYLE:<br>a) Exhibits enthusiasm and stimulates interest in topic.<br>b) Uses well modulated, clearly articulated speaking voice<br>c) Presents without disturbing mannerisms<br>d) Able to understand the questions and give appropriate answers |          |       |
| III. CONTENT:<br>a) Organises content logically<br>b) Uses up-to-date materials and references<br>c) Presents content at appropriate level of complexity and quantity                                                                                              |          |       |
| IV. HANDOUTS:<br>Prepares appropriate supplementary resources                                                                                                                                                                                                      |          |       |
| TOTAL SCORE                                                                                                                                                                                                                                                        |          |       |

Scores: 5-Outstanding;4-Good;3-Satisfactory;2-Doubtful;1-Unsatisfactory

\*\* Grade: (Total Score) A:18-20; B-15-17; C-10-14; D-<10

\*\*\*\*\*

***M.D. DERMATOLOGY, VENEROLOGY  
AND LEPROSY***

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.D. DERMATOLOGY, VENEROLOGY AND LEPROSY**

**1. GOALS**

*The goals of postgraduate training course would be to train a MBBS doctor who will:*

- *To practice Dermatology, Venereology and Leprosy efficiently and effectively, backed by scientific knowledge, skill base, ethics and tenets of good medical practice.*
- *Recognize the economic costs of treatment and use the most effective therapy within the available economic resources.*
- *Communicate to patients and families the advantage of preventive as well as the importance of compliance to prescribed therapies.*
- *Be able to co-operate, collaborate with colleagues and contribute to the management, when the problem is a multi-system disease process.*

**2. OBJECTIVES**

1. *Knowledge (Cognitive domain)*
2. *Skills (Psycho motor domain)*
3. *Behavior: Affective domain: Human values, Ethical practice and Communication,*
4. *Partnership, Leadership and Teamwork abilities*
5. *Safety and quality*
6. *Maintaining trust*

## **Knowledge:**

- **Attain cognitive proficiency in the diagnosis and management of dermatological conditions, sexually transmitted diseases and leprosy through a patient oriented structured curriculum.**
- **Describe the etiology, pathogenesis, clinical features, prognosis, differential diagnosis and treatment of diseases relevant to DVL.**
- **Demonstrate understanding of basic sciences relevant to the specialty and its application.**
- **Attain adequate knowledge in the clinical management of Sexually Transmitted Diseases and Infections (STDs & STIs) including HIV, surveillance and reporting, prevention of morbidity and mortality due to STDs and HIV by initiating treatment, partner notification and behavioral change. To know the importance of early diagnosis, prevention and transmission, management of long term risks of STDs including HIV.**
- **Attain knowledge about various sexual dysfunctions in both male and female and their management.**
- **Attain adequate knowledge about the importance of other departments like microbiology, obstetrics and gynecology, forensic medicine, medicine, public health and psychiatry.**
- **Attain knowledge about the care and support of male, female, transgender individuals of all age groups especially sexually active people, and vulnerable groups like drug abusers, sex workers etc.,**
- **Ability to teach and train different persons from undergraduate students, health care workers and community about STDs and STIs including HIV.**
- **Attain adequate knowledge of management of patients through a “work-based, hands- on” curriculum which entails 1) supervised management of patients, 2) ward duties, 3) 24 hour “on-call duties” which requires one to attend dermatological emergencies.**
- **Attain adequate knowledge of management of complex dermatology problems by attending consultations from other specialties, and attending multidisciplinary clinics and meetings.**

- *Describe methods, indications, and interpretation of common Dermatology, Venereology and Leprosy laboratory procedures.*
- *Describe method, indications, contraindications and complications of common dermatosurgical and cosmetic procedures, phototherapy, patch tests, Lasers, and injectables.*
- *Demonstrate adequate knowledge of acquiring consent prior to performing procedures and taking clinical photographs.*
- *Identify social and economic determinants in a given case, and take them into account for planning therapeutic measures*
- *Recognize conditions that may be outside the area of his specialty/competence and to refer them to the appropriate specialist.*

### ***Skills:***

- *Record the patient's history in a structured format that benefits the patient and allows the physician to arrive at a diagnosis. This applies to both out-patient and in-patient setting with emphasis on patient confidentiality and effective time management (OPD setting).*
- *Perform a structured clinical examination of patients with Dermatology, Venereology and Leprosy related problems taking into account the specific systems that need to be examined in patients with Leprosy and Venereology related problems. Document clinical findings using acceptable terminology (relevant to DVL) in a structured manner.*
- *Document in- patient problems in a problem sheet with the management and discharge plan.*
- *Document progress, treatment, complications and the intervention strategies adopted in the care of in- patients.*
- *Provide treatment according to available best clinical evidence keeping in mind the economic impact of treatment on the patient.*
- *Perform and interpret results of common laboratory and other procedures relevant to Dermatology, Venereology and Leprosy.*

- *Interpret the histopathological features of benign and malignant diseases relevant to Dermatology, Venereology and Leprosy.*
- *Perform common dermatosurgical procedures in a safe and sterile environment.*
- *Provide basic and advanced life saving support services (BLS ) in emergency situations*

### ***Safety and Quality:***

#### ***Contribute to the safety of patients, self and community:***

1. *Regular audits of patient records, treatment administered, and guidelines followed*
2. *Report suspected adverse drug reactions*
3. *Report adverse event occurring during surgical and other procedures*
4. *Report needle stick injury and spills*
5. *External quality check of procedures done in the laboratory*
6. *Proper disposal of hospital wastes*

#### ***Affective Domain: Human values, Ethical practice and Communication, Partnership, Leadership and Teamwork abilities***

- *Adopt ethical principles in all aspects of his/her practice.*
- *Be aware of personal prejudices and judgmental attitude when confronted with diseases such as HIV, STDs, and leprosy. One should be able to deal with these positively through self-reflection or counselling.*
- *Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.*
- *Develop partnership, leadership and teamwork abilities with colleagues, subordinates and others in the departments and in the community.*

- *Apply ethical standards while carrying out human or animal research.*
- *Recognize limitations in his knowledge and skill and refer to more competent colleagues, when needed.*
- *Observe professional decorum regarding comments on diagnostic or management practices of professional colleagues.*
- *Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.*

### ***Maintaining trust***

***Maintaining trust with patients.***

***Maintaining confidentiality and concern about the community in managing the various diseases of his/her speciality.***

***Application of the best of his/her knowledge for the well- being of the patient/community.***

### **3. COMPONENTS OF THE POST GRADUATE CURRICULUM**

- ***Theoretical Knowledge***
- ***Practical and Clinical Skills***
- ***Writing Thesis/Research Articles***
- ***Attitudes including Communication Skills***
- ***Training in Research Methodology, Medical Ethics /Bioethics and Medicolegal aspects***

***Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.***

***Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.***

***Medical ethics, bioethics, moral and legal issues and medical audit are part and parcel of the curriculum and syllabus.***

#### **4. THEORY SYLLABUS**

**(Source: ROOK'S TEXT BOOK OF DERMATOLOGY  
Volume 1-4, Ninth Edition, 2016**

**Edited by – Christopher Griffiths, Jonathan Barker, Tanya Bleiker, Robert Chalmers, Daniel Creamer)**

- 1.History of Dermatology**
- 2.Structure and Function of the Skin**
- 3.Histopathology of the Skin: General Principles**
- 4.Diagnosis of Skin Disease**
- 5.Epidemiology of Skin Disease**
- 6.Health Economics and Skin Disease**
- 7.Genetics and the Skin**
- 8.Inflammation, Immunology and Allergy**
- 9.Photobiology**
- 10.Cutaneous Response to Injury and Wound Healing**
- 11.Psychological and Social Impact of Long-term Dermatological**
- 12.Adverse Immunological Reactions to Drugs**
- 13.Topical Drug Delivery**
- 14.ClinicalPharmacology**
- 15.Principles of Holistic Management of Skin Disease**
- 16.Principles of Measurement and Assessment in  
Dermatology**
- 17.Principles of Evidence-based Dermatology**
- 18.Principles of Topical Therapy**
- 19.Principles of Systemic Therapy**
- 20.Principles of Skin Surgery**
- 21.Principles of Phototherapy**
- 22.Principles of Photodynamic Therapy**
- 23.Principles of Cutaneous Laser Therapy**



- 24.Principles of Radiotherapy**
- 25.Viral Infections**
- 26.Bacterial Infections**
- 27.Mycobacterial Infections**
- 28.HIV and the Skin**
- 29.Fungal Infections**
- 30.Parasitic Diseases**
- 31.Arthropods**
- 32.Psoriasis and Related Disorders**
- 33.Pityriasis Rubra Pilaris**
- 34.Lichen Planus and Lichenoid Disorders**
- 35.Graft-versus-host Disease**
- 36.Eczematous Disorders**
- 37.Seborrhoeic Dermatitis**
- 38.Atopic Eczema**
- 39.Urticaria**
- 40.Recurrent Angio-oedema without Weals**
- 41.Urticarial Vasculitis**
- 42.Autoinflammatory Diseases Presenting in the Skin**
- 43.Mastocytosis**
- 44.Reactive Inflammatory Erythemas**
- 45.Adamantiades–BehcetDisease**
- 46.NeutrophilicDermatoses**
- 47.Immunobullous Diseases**
- 48.Lupus Erythematosus**
- 49.Antiphospholipid Syndrome**
- 50.Dermatomyositis**
- 51.Mixed Connective Tissue Disease**
- 52.Dermatological Manifestations of Rheumatoid Disease**
- 53.Systemic Sclerosis**
- 54.Morphoea and Allied Scarring and Sclerosing InflammatoryDermatoses**

**55Cutaneous Amyloidoses**

**56Cutaneous Mucinoses**

**57Cutaneous Porphyrrias**

**58Calcificationof the Skin and Subcutaneous Tissue**

**59Xanthomas and Abnormalities of Lipid Metabolism and Storage**

**60Nutritional Disorders Affecting the Skin**

**61Skin Disorders in Diabetes Mellitus**

**62.Inherited Disorders of Cornification**

**63.Inherited Acantholytic Disorders**

**64.Ectodermal Dysplasias**

**65.Inherited Hair Disorders**

**66.Genetic Defects of Nails and Nail Growth**

**67.Genetic Disorders of Pigmentation**

**68.Genetic Blistering Diseases**

**69.Genetic Disorders of Collagen, Elastin and Dermal Matrix**

**70.Disorders Affecting Cutaneous Vasculature**

**71.Genetic Disorders of Adipose Tissue**

**72.Congenital Naevi and Other Developmental Abnormalities Affecting the Skin**

**73.Chromosomal Disorders**

**74.Poikiloderma Syndromes**

**75.DNA Repair Disorders with Cutaneous Features**

**76.Syndromes with Premature Ageing**

**77Hamartoneoplastic Syndromes**

**78.Inherited Metabolic Diseases**

**79.Inherited Immunodeficiency**

**80.Pruritus, Prurigo and Lichen Simplex**

**81.Mucocutaneous Pain Syndromes**

**82.Neurological Conditions Affecting the Skin**

**83.PsychodermatologyandPsychocutaneous Disease**

**84.Acquired Disorders of Epidermal Keratinization**

**85.Acquired Pigmentary Disorders**

- 86.Acquired Disorders of Hair**
- 87.Acne**
- 88.Rosacea**
- 89.HidradenitisSuppurativa**
- 90.Other Acquired Disorders of the Pilosebaceous Unit**
- 91.Disorders of the Sweat Glands**
- 92.Acquired Disorders of the Nails and Nail Unit**
- 93.Acquired Disorders of Dermal Connective Tissue**
- 94.Granulomatous Disorders of the Skin**
- 95.Sarcoidosis**
- 96.Panniculitis**
- 97.Other Acquired Disorders of Subcutaneous Fat**
- 98.Vascular Disorders Involving the Skin**
- 99.Purpura**
- 100.Cutaneous Vasculitis**
- 101.Dermatoses Resulting from Disorders of the Veins and Arteries**
- 102.Ulceration Resulting from Disorders of the Veins and Arteries**
- 103.Disorders of the Lymphatic Vessels**
- 104.Flushing and Blushing**
- 105.Dermatoses of the Scalp**
- 106.Dermatoses of the External Ear**
- 107.Dermatoses of the Eye, Eyelids and Eyebrows**
- 108.Dermatoses of the Oral Cavity and Lips**
- 109.Dermatoses of the Male Genitalia**
- 110.Dermatoses of the Female Genitalia**
- 111.Dermatoses of Perineal and Perianal Skin**
- 112.Cutaneous Complications of Stomas and Fistulae**
- 113.Dermatoses of Pregnancy**
- 114.Dermatoses of the Neonate**
- 115.Dermatoses and Haemangiomas of Infancy**

- 116. Benign Cutaneous Adverse Reactions to Drugs**
- 117. Severe Cutaneous Adverse Reactions to Drugs**
- 118. Cutaneous Side Effects of Chemotherapy and Radiotherapy**
- 119. Dermatoses Induced by Illicit Drugs**
- 120. Dermatological Manifestations of Metal Poisoning**
- 121. Mechanical Injury to the Skin**
- 122. Pressure Injury and Pressure Ulcers**
- 123. Cutaneous Reactions to Cold and Heat**
- 124. Burns and Heat Injury**
- 125. Cutaneous Photosensitivity Diseases**
- 126. Allergic Contact Dermatitis**
- 127. Irritant Contact Dermatitis**
- 128. Occupational Dermatology**
- 129. Stings and Bites**
- 130. Benign Melanocytic Proliferations and Melanocytic Naevi**
- 131. Benign Keratinocytic Acanthomas and Proliferations**
- 132. Cutaneous Cysts**
- 133. Lymphocytic Infiltrates**
- 134. Cutaneous Histiocytoses**
- 135. Soft-tissue Tumours and Tumour-like Conditions**
- 136. Tumours of Skin Appendages**
- 137. Kaposi Sarcoma**
- 138. Cutaneous Lymphomas**
- 139. Basal Cell Carcinoma**
- 140. Squamous Cell Carcinoma and its Precursors**
- 141. Melanoma**
  - Melanoma Clinicopathology**
  - Systemic Treatment of Melanoma**
- 142. Dermoscopy of Melanoma and Naevi**
- 143. Merkel Cell Carcinoma**
- 144. Skin Cancer in the Immunocompromised Patient**

- 145. Cutaneous Markers of Internal Malignancy**
- 146. The Skin and Disorders of the Haematopoietic and Immune Systems**
- 147. The Skin and Endocrine Disorders**
- 148. The Skin and Disorders of the Heart**
- 149. The Skin and Disorders of the Respiratory System**
- 150. The Skin and Disorders of the Digestive System**
- 151. The Skin and Disorders of the Kidney and Urinary Tract**
- 152. The Skin and Disorders of the Musculoskeletal System**
- 153. Skin Ageing**
- 154. Cosmeceuticals**
- 155. Soft Tissue Augmentation (Fillers)**
- 156. Aesthetic Uses of Botulinum Toxins**
- 157. Chemical Peels**
- 158. Lasers and Energy-based Devices**

### ***Sexually Transmitted Infections***

***(Source: SEXUALLY TRANSMITTED INFECTIONS 2<sup>nd</sup> edition***

***Editors: Dr. Somesh Gupta & Bhushan Kumar)***

- 1. Historical aspects of Sexually Transmitted Infections**
- 2. Global Epidemiology of Sexually Transmitted infections**
- 3. Global Epidemiology of HIV infection**
- 4. Sexual Behaviour and Sexually Transmitted infections**
- 5. Prevention strategies for the control of sexually transmitted infections**
- 6. Behavioral and counseling aspects of sexually transmitted infections (Including HIV)**
- 7. Condoms and other Barrier methods of STI and HIV prevention**
- 8. Prevention of HIV and other Sexually Transmitted Infections: Male circumcision**
- 9. Microbicides for prevention of Sexually Transmitted Infections**
- 10. Vaccines for Sexually Transmissible infections**
- 11. Vaccines for HIV**
- 12. Partner Notification for Sexually Transmitted Diseases**
- 13. Implementation of STI programs**
- 14. Monitoring and Evaluating Sexually Transmitted Infection Control Programs**
- 15. Anatomy of the Male Genital Tract**
- 16. Anatomy of the Female Genital Tract**
- 17. Normal Genital Flora**

18. **History and Physical examination**
19. **Genital Mucosal Immunity Against Sexually Transmitted Infections**
20. **Laboratory Diagnosis of Sexually Transmitted Infections**
21. **Rapid tests for the Detection of Sexually Transmitted infections**
22. **Genital herpes simplex infections**
23. **Anogenital Human Papillomavirus infection: Natural History: Epidemiology, and vaccination**
24. **Anogenital Warts, Intraepithelial Neoplasia and their clinical management**
25. **Molluscum Contagiosum**
26. **Hepatitis Viruses**
27. **Human Cytomegalovirus infection**
28. **Epstein-Barr Virus Infections**
29. **Kaposi Sarcoma Herpesvirus**
30. **Infectious Syphilis**
31. **Late Syphilis**
32. **Endemic Treponematoses**
33. **Gonococcal Infections**
34. **Chlamydia Trachomatis Infections**
35. **Lymphogranuloma Venereum**
36. **Chancroid**
37. **Donovanosis**
38. **Bacterial Vaginosis**
39. **Pelvic Inflammatory disease**
40. **Genital Mycoplasmas**
41. **Sexually Transmitted Anorectal Infections and Enteric Bacterial Infections**
42. **Genital Candidal Infections**
43. **Trichomonas vaginalis Infections**
44. **Intestinal Protozoa**
45. **The syndromic approach for the management of STIs: An overview**
46. **Genital Ulcer-Adenopathy syndrome**
47. **Urethral Discharge**
48. **Epididymitis and Epididymo-orchitis**
49. **Abnormal Vaginal Discharge: Syndromic management**
50. **Syndromic Management of Lower Abdominal pain in women**
51. **Inguinal and Femoral Bubo**
52. **Vulvar Vestibulitis Syndrome**
53. **Male Genital pain syndromes**
54. **Ocular Manifestations of Sexually transmitted infections**
55. **Arthritis associated with sexually transmitted infections**
56. **Human Immunodeficiency Virus: Biology and Natural history of infections**
57. **HIV Diagnosis**
58. **Pharmacology of Antiretroviral Drugs**
59. **Surrogate Markers of Antiretroviral Efficacy**
60. **Antiretroviral Drugs for HIV Prevention**
61. **Acute HIV infection**
62. **Opportunistic Infections**

63. **Mucocutaneous Manifestations of HIV**
64. **Pulmonary Manifestations of HIV Disease**
65. **Neurological Manifestations of HIV**
66. **Gastrointestinal Manifestations of HIV Infections and AIDS**
67. **Renal Manifestations of HIV Infection and AIDS**
68. **HIV and Endocrine Manifestations**
69. **AIDS Associated Malignancies and their treatment**
70. **Rheumatic Manifestations of HIV and AIDS**
71. **Cardiac Involvement in HIV Infection/AIDS**
72. **Ocular Manifestations of HIV Infection and AIDS**
73. **Sexually Transmitted Infections in HIV-Infected Patients**
74. **Human Immunodeficiency Virus infection in women**
75. **HIV in children**
76. **HIV infection in Homosexual Men**
77. **HIV in blood and blood product recipients**
78. **HIV in Injection and other drugs users**
79. **Sexually transmitted infections and pregnancy**
80. **Sexually Transmitted infections in Neonates and Infants**
81. **Congenital Syphilis**
82. **Sexually Transmitted Infections and Infertility**
83. **Aging. Sexual Behavior, and HIV/STI Risk**
84. **Sexually Transmitted infections in the Female Sex Worker Community**
85. **Sexually Transmitted Infections Associated with Sexual Assault**
86. **Sexual Health of Migrant Populations**
87. **Human Sexuality**
88. **Homosexuality, Bisexuality and Sexual Orientation**
89. **Sexually Transmitted Infections among women who have Sex with Women**
90. **Sexually Transmitted Infections in Transgender**
91. **Sexual Abuse in Children**
92. **Male Sexual Dysfunction**
93. **Women's Sexual Dysfunction**
94. **Sexuality Education for Young People**
95. **Dhat Syndrome: A Culture Bound Sex Related disorder in Indian Subcontinent**
96. **Clinical Services for Sexually Transmitted Infections and HIV**
97. **Medicolegal Aspects of Sexually Transmitted Infections and Sexual Assault**
98. **Sexually Transmitted Infections: Screening and Diagnostic Practices**
99. **Sexually Transmitted Infections Related Genital Neoplasias**
100. **HIV, Sexually Transmitted Infections, and Human Right**
101. **Animal Models of Sexually Transmitted Infections**  
**Guidelines for the Treatment of HIV and AIDS in Resource Limited Countries**
102. **Guidelines for Prevention of Perinatal HIV Infection**
103. **Guidelines for the Management of HIV-Associated opportunistic Infections**

## **Leprosy**

**(Source: IAL TEXT BOOK OF LEPROSY**

**Editors: Dr. Bhushan Kumar & Hemanta Kumar 2<sup>nd</sup> edition, 2016)**

- 1. History of Leprosy in India: A Historical overview from Antiquity to the introduction of MDT**
- 2. Epidemiology of Leprosy**
- 3. Global Leprosy situation: Historical perspective, Achievements, Challenges and future steps**
- 4. Changing National Scenario, National Leprosy Control programmes, National Leprosy Eradication Programme, and New Paradigms of Leprosy Control**
- 5. Immunogenetics of Leprosy**
- 6. Bacteriology of Leprosy**
- 7. Immunological Aspects**
- 8. Biochemical Aspects of Leprosy**
- 9. Pathological Aspects of Leprosy**
- 10. Structure Electrophysiological and Ultrasonographics studies of Peripheral Nerve**
- 11. Pathomechanisms of Nerve Damage**
- 12. Naturally occurring Leprosy: Mycobacterium leprae and other environmental mycobacteria in Nature**
- 13. Experimental Leprosy: Contributions of Animal Models to Leprosy Research**
- 14. History taking and clinical examination**
- 15. Case definition and clinical types of Leprosy**
- 16. Classification**
- 17. Methods of Nerve examination**
- 18. Histoid Leprosy**
- 19. Laboratory diagnosis**
- 20. Serological and molecular diagnosis of leprosy**
- 21. Differential diagnosis of Dermatological Disorders in relation to Leprosy**
- 22. Differential diagnosis of Neurological disorders in relation to Leprosy**
- 23. Systemic involvement in Leprosy**
- 24. Leprosy and Human immunodeficiency virus coinfection**
- 25. Leprosy and pregnancy**
- 26. Childhood Leprosy**
- 27. Ocular Leprosy**



28. *Neuritis: Definition, Clinicopathological manifestations and Proforma to record nerve impairment in Leprosy*
29. *Leprosy Reactions: Pathogenesis and clinical features*
30. *Chemotherapy of Leprosy*
31. *Chemotherapy: Development and evolution of WHO-MDT and Newer treatment regimens*
32. *Management of Leprosy reactions*
33. *Management of neuritis and neuropathic pain*
34. *Chemoprophylaxis in Leprosy*
35. *Leprosy vaccine: Immunoprophylaxis and Immunotherapy*
36. *Nursing care in Leprosy patients*
37. *Deformities of Face, Hands, Feet and Ulcers and their management*
38. *Deformity and Disability prevention*
39. *Relapse in Leprosy*
40. *Drug resistance in Leprosy*
41. *Morbidity and Mortality in Leprosy Rehabilitation*
42. *Community-based initiatives in Comprehensive Leprosy Work*
43. *Psychosocial Aspects in Leprosy*
44. *Human Rights and Stigma in Leprosy*
45. *Health Promotion, Education and Counseling*
46. *Role of NGOs in National Leprosy Eradication Programme*

## **5. Teaching and Learning Methods**

*The emphasis should be on patient oriented learning*

1. *Acquire skills in clerking patients and communication through structured bedside clinics.*
2. *“On the job teaching” by faculty in the OPD and during ward rounds.*
3. *“One-One” or small group teaching of dermatosurgery and other procedures*
4. *Grand rounds*
5. *Structured “class-room” based clinics to prepare the candidate for the final summative exam (University)*
6. *Monthly Seminars*
7. *Monthly Symposia*
8. *Weekly Journal clubs*
9. *Group discussions*
10. *Multidisciplinary team meetings- Skin malignancies, Leprosy, Tuberculosis, HIV, Genodermatoses, and for management of leprosy reactions.*
11. *Tutorials- dermatopathology, clinical microbiology and virology, instruments*
12. *Didactic lectures (optional)*

13. *Students should attend the following training modules to attain basic competence in: Biostatistics, Research Methodology, Medical Ethics, Good medical practice, Communication skills, Medical education*
14. *Students should update their knowledge through attendance of subject related CMEs, workshops and conferences.*

## 6. STRUCTURED TRAINING PROGRAM FOR DEGREE COURSE-DVL(3 years)

| S. No. | First Year                                                                                                                                                                                                                                                       | Second Year                                                                                                                                                                                                                                                                                                                                | Final Year                                                                                                                                                                                                                                                                                                                                   |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | <b>Knowledge : General Dermatology, Leprosy and Venereology including basic sciences, pathology, clinical microbiology and virology</b>                                                                                                                          | <b>General Dermatology, Leprosy and Venereology including basic sciences therapeutics, pathology, clinical microbiology and virology</b>                                                                                                                                                                                                   | <b>General Dermatology, Leprosy and Venereology including basic sciences, therapeutics, pathology, clinical microbiology, virology and recent advances</b>                                                                                                                                                                                   |
| 2      | <b>General DVL OPD clinics (minimum of 3/week) and ward postings-minimum of 6 months/year</b><br><br><b>Special clinics: Vitiligo, Pigmentary, immunobullous, contact dermatitis, connective tissue diseases, psoriasis, Pediatric Dermatology, Leprosy, STI</b> | <b>General DVL OPD clinics (minimum of 3/week) and ward postings-minimum of 6 months/year</b><br><br><b>Special clinics: Vitiligo, Pigmentary, immunobullous, contact dermatitis, connective tissue diseases, psoriasis, Pediatric Dermatology, Leprosy, STI</b>                                                                           | <b>General DVL OPD clinics (minimum of 3/week and ward postings -minimum of 6 months/year</b><br><br><b>Special clinics: Vitiligo, Pigmentary, immunobullous, contact dermatitis, connective tissue diseases, psoriasis, Pediatric Dermatology, Leprosy, STI</b>                                                                             |
| 3      | <b>1.Elicit history and perform a clinical examination, arrive at a diagnosis, list differential diagnosis, select appropriate investigations and device a treatment plan.</b>                                                                                   | <b>1.Elicit history and perform a clinical examination, arrive at a diagnosis, list differential diagnosis, select appropriate investigations and device a treatment plan. Provide information about the disease in terms of prognosis, complications and treatment outcome. Counselling and follow up of patients should be advocated</b> | <b>1..Elicit history and perform a clinical examination, arrive at a diagnosis, list differential diagnosis, select appropriate investigations and device a treatment plan. Provide information about the disease in terms of prognosis, complications and treatment outcome. Counselling and follow up of patients should be advocated.</b> |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                        |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 | <p><b>Procedural skills for trainees:</b></p> <ol style="list-style-type: none"> <li>1. Hand washing and sterile technique for procedures.</li> <li>2. Take an informed consent for procedures</li> <li>3. Methods of administration of local anesthesia for biopsies and other procedures</li> <li>4. Biopsies: Skin (punch, shave, elliptical, wedge) biopsies under sterile conditions, under supervision</li> <li>5. Describe histological features of common diseases including leprosy</li> <li>6. Intralesional injections</li> <li>7. Cryotherapy</li> <li>8. Paring</li> <li>9. Nail Avulsion</li> <li>10. Electrosurgery</li> <li>11. Radiofrequency surgery</li> <li>12. Molluscum needling</li> <li>13. Chemical cautery</li> </ol> | <p><b>Procedural skills for trainees:(in addition procedural skills attained in year 1)</b></p> <ol style="list-style-type: none"> <li>1. Biopsies: nail, oral, nerve biopsies (under supervision)</li> <li>2. Phototherapy- Administer Narrow UVB, PUVA, targeted phototherapy, hand and foot phototherapy, bath PUVA, soak PUVA</li> <li>3. Perform Patch tests- standard and photopatch, interpret results and counsel</li> <li>4. Perform Contact immunotherapy for alopecia areata</li> <li>5. Perform a drug challenge (under supervision)</li> <li>6. Administer all Dermatology, Leprosy and Venereology related drugs and biologics in appropriate doses under supervision, after counseling patients on the side effects, expected benefits, interactions and teratogenic potential</li> <li>7. Describe histologic features of common benign and malignant lesions and leprosy, interpret special stains and immunohistochemistry</li> <li>8. Observe preparation (grossing, staining) of dermatopathology specimens.</li> </ol> | <p><b>Procedural skills for trainees:</b></p> <p>The postgraduate trainee should be able to perform the procedures learnt in year 1 and 2 safely and effectively, under supervision when required.</p> |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p><b>14.Auto Inoculation of Wart</b></p> <p><b>15. Vitiligo grafting</b></p> <p><b>16.Acne Scar Surgeries</b></p> <p><b>17.Dermaroller</b></p> <p><b>18.PRP</b></p> <p><b>19.Aesthetic Procedures(Botox / Fillers- Demo)</b></p> <p><b>20. Lasers (demo)</b></p> <p><b>21. Wood's lamp- indications and interpretation of results</b></p> <p><b>22. Students must be familiar in administering</b></p> <p><b>i)Saline soak compresses, bleach baths, medicated tub bath, wet wraps</b></p> <p><b>ii) Fluid and temperature management in patients with skin failure</b></p> <p><b>23.Aware of principles of barrier nursing in patients with skin failure</b></p> | <p><b>9. Observe direct and indirect immunofluorescence procedures of immunobullous and connective tissue diseases(Optional)</b></p> <p><b>10. Microbiology and Virology:</b><br/> <b>i)Learn techniques of plating and culture of bacteria associated with skin and soft tissue infections, fungus, M.Tb and atypical mycobacteria and STIs</b></p> <p><b>ii) Observe and learn methods of performing and interpretation of serological tests relevant to STIs</b><br/> <b>iii)Observe lab techniques in diagnosis HIV</b></p> <p><b>11. Dermatoscope- Learn the features of dermascopic images of relevant common skin conditions and help to arrive at a diagnosis and differentiate benign and malignant pigmented lesions.</b></p> <p><b>12. Trichoscopy- should be able to recognize common hair shaft abnormalities</b></p> <p><b>13.Radiodermatology – Describe and interpret the features of relevant CXR, CT, MRI and fluoroscopic images eg. Esophagus in scleroderma</b></p> <p><b>14 .Peripheral Nerve High Resonance USG in Leprosy</b></p> |  |
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|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p><b>15. Teledermatology:</b><br/>Students should be introduced to teledermatology</p> <p><b>16.Trainees can observe and learn basics of compounding of common topical preparations used in Dermatology (optional)</b></p>                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 5 | <p><b>Safety and Quality– Trainees should:</b></p> <p><b>1.Report adverse events during procedures to the supervisor</b></p> <p><b>2. Report needle stick injuries</b></p> <p><b>3. Be able to dispose medical waste correctly</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p><b>Safety and Quality</b></p> <p><b>1.Report adverse drug reactions</b><br/>In addition to those already mentioned (1<sup>st</sup> year)</p>                                                                                                                                                                                                                                                                                                                                                             | <p><b>Safety and Quality</b></p> <p><b>1.Trainees should perform a clinical audit</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 6 | <p><b>Dermatology Laboratory:</b></p> <p><b>1.Learn methods for appropriate specimen collection- pus culture, throat culture, nasal swab,Tzanck smear, herpes culture, fungal culture, Mycobacterium Tb and atypical Mycobacteria, Leishmaniasis, and STIs</b></p> <p><b>2.Trainees should be trained to perform KOH, Gram stain, Leishman's stain/ Giemsa stain, Tzanck, , ZN stain, demonstrate sclerotic bodies</b></p> <p><b>Leprosy- Perform slit skin smears, stain and interpret slides</b></p> <p><b>STI-Students should be able to identify STI pathogens- trichomonas, gonococci, H.ducreyi, clue cells and Donovan bodies</b></p> <p><b>Perform Dark field examination for treponema pallidum</b></p> | <p><b>Dermatology Laboratory:</b><br/>Trainees should be able to perform KOH, Gram stain, Leishman's stain/ Giemsa stain, Tzanck smear , ZN stain, demonstrate sclerotic bodies</p> <p><b>Leprosy- Perform slit skin smears, stain and interpret slides</b></p> <p><b>Calculate BI and MI</b></p> <p><b>STI-Students should be able to identify STI pathogens- trichomonas, gonococci, H.ducreyi, clue cells and Donovan bodies</b></p> <p><b>Perform Dark field examination for treponema pallidum</b></p> | <p><b>Dermatology Laboratory:</b><br/>Trainees should be able to perform and interpret independently the following:</p> <p><b>KOH, Gram stain, Leishman's stain/ Giemsa stain, Tzanck, ZN stain, demonstrate sclerotic bodies</b></p> <p><b>Leprosy- Perform slit skin smears, stain and interpret slides</b></p> <p><b>Calculate BI and MI</b></p> <p><b>STI-Students should be able to identify STI pathogens- trichomonas, gonococci, H.ducreyi, clue cells, and Donovan bodies. Identify MNGs.</b></p> <p><b>Perform Dark field examination for treponema pallidum</b></p> |

|   |                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                      |                                                                                                                                                                                 |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | <p><i>gonococci, H.ducreyi, clue cells and Donovan bodies. Should be able to identify MNGs in herpetic infections</i></p> <p><i>Dark field examination for treponema pallidum</i></p>                                                                                                                                                                                                      |                                                                                                                                                                                                                      |                                                                                                                                                                                 |
| 7 | <p><b>Dermatology emergencies- Trainees should attend to dermatology emergencies during their 24 hour “on call” duties under supervision</b></p>                                                                                                                                                                                                                                           | <p><b>Dermatology emergencies- Trainees should attend to dermatology emergencies during their 24 hour “on call” duties under supervision</b></p>                                                                     | <p><b>Dermatology emergencies- Trainees should be able to independently diagnose and treat common emergencies and seek help from the attending consultant when required</b></p> |
| 8 | <p><b>Internal rotation:</b></p> <p><b>Venereology posting – 3months / year – This is for Institutions where Venereology is present as a separate department.</b></p> <p><b>External rotation (MD trainees)</b></p> <p><b>Microbiology Department - 3 weeks</b></p> <p><b>Pathology (Dermatopathology)- 3 weeks</b></p> <p><b>Infectious Disease Unit/ Internal Medicine - 4 weeks</b></p> | <p><b>External rotation(MD trainees)-optional</b></p> <p><b>Community Dermatology - should participate in school surveys,/camps or work in a secondary care dermatology departments in rural areas (2 weeks)</b></p> |                                                                                                                                                                                 |
| 9 | <p><b>Academic Activities</b></p> <p><b>Attend CME-1 (optional)</b></p>                                                                                                                                                                                                                                                                                                                    | <p><b>Academic activities</b></p> <p><b>1. Attend State level conference,CME</b></p> <p><b>2. Participate in Undergraduate teaching</b></p>                                                                          | <p><b>Academic activities</b></p> <p><b>1. Attend National conference,CME</b></p> <p><b>2. Participate in Undergraduate teaching</b></p>                                        |

## Leprosy

|  | <b>First Year</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Second Year</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Final year</b>                                                                                                                                                                                                                                                                                                                                         |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>1. Trainees should be able to take a history, examine skin lesions, peripheral nerves, perform a sensory-motor examination and record findings, list deformities and signs of reaction and classify the disease</b></p> <p><b>2. Trainees should learn to counsel patients and attenders about early signs and symptoms of leprosy, ameliorating the taboo against leprosy .</b></p> <p><b>3. Trainees should develop skills in interacting with the patients, persuading them to bring the family members for examination</b></p> <p><b>4. Stress should be given to acquire knowledge on medical ,occupational and social rehabilitation of patients</b></p> | <p><b>1. Trainees should be encouraged to attend various camps organized at periphery level by district authorities.</b></p> <p><b>2. Trainees should take part in health education regarding prevention of damage to eyes, deformities of limbs.</b></p> <p><b>3. Trainees should be posted to leprosy homes rehabilitation centres, district leprosy hospitals for Institutions where leprosy patient load is inadequate for satisfactory training of postgraduates</b></p> | <p><b>1. Trainees should be able to take a focused history, perform a relevant clinical examination, do slit skin smears for AFB, interpret results, treat and counsel patients with leprosy.</b></p> <p><b>2. Trainees should attain a sound knowledge of the principles of rehabilitative surgery, use of prostheses and disability prevention.</b></p> |

## Venereology

| <b>Knowledge Skills</b>                                                 | <b>Attitude Skills</b>                                     | <b>Psychomotor Skills</b>                                    |
|-------------------------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------------------|
| <b>First Year</b>                                                       |                                                            |                                                              |
| <b>Classification of STDS</b>                                           | <b>Communication skills and Case holding</b>               | <b>Blood sample collection, labeling</b>                     |
| <b>Impact of STDs on the World – past, present and future</b>           | <b>Non Judgmental and Non Moralistic history taking</b>    | <b>Smear preparation, Staining and microscopy</b>            |
| <b>Incubation period and Window period and their importance in STDS</b> | <b>Psychological impact of STDS</b>                        | <b>Examination of a patient and describing the findings.</b> |
| <b>Difference between STDs and STIs</b>                                 |                                                            | <b>Disposal of Waste</b>                                     |
| <b>Hospital Waste Management</b>                                        |                                                            |                                                              |
| <b>SECOND &amp; THIRD YEAR</b>                                          |                                                            |                                                              |
| <b>Syndromic Management and other Managements of STDS</b>               | <b>Attitude towards HRB persons like FSW, MSM, TGs etc</b> | <b>RPR Test, HIV Test, Smear preparation from lesions</b>    |
| <b>PEP for HIV</b>                                                      | <b>Pre test and Post test Counseling for HIV</b>           | <b>Vaginal examination      Speculum examination</b>         |
| <b>Complications of STDs</b>                                            | <b>Sexual Orientation</b>                                  | <b>ViAViLi Testing</b>                                       |
| <b>Gender Identity, Gender Role</b>                                     | <b>Initiation of HAART</b>                                 | <b>Colposcopy (Optional)</b>                                 |
| <b>Human Sexual Behavior and Sexual Response cycle, Sex problems</b>    | <b>Premarital and Pre employment testing</b>               | <b>Podophylline application</b>                              |
| <b>ART drugs</b>                                                        | <b>Partner revelations, Partner Participation,</b>         | <b>Prostatic massage</b>                                     |
| <b>Govt. Program(NACP)</b>                                              | <b>Follow Up Skills</b>                                    | <b>Paraphimosis reduction (Optional)</b>                     |



|                                                                                                      |                                    |                                                          |
|------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------|
| <b><i>Legal aspects of STDs, Sex and Sexuality</i></b>                                               | <b><i>Case reporting</i></b>       | <b><i>Semen analysis, and Circumcision(Optional)</i></b> |
| <b><i>Use of newer investigations tools in the management of STDs</i></b>                            | <b><i>Partner notification</i></b> | <b><i>Lumbar Puncture (Optional)</i></b>                 |
| <b><i>Vaccines in STDS</i></b>                                                                       |                                    | <b><i>Proctoscopy</i></b>                                |
| <b><i>Sex Reconstruction Surgery</i></b>                                                             |                                    |                                                          |
| <b><i>Pre marital and Pre employment tests</i></b>                                                   |                                    |                                                          |
| <b><i>Interpretation of tests</i></b>                                                                |                                    |                                                          |
| <b><i>Marriage and STDs, Infertility</i></b>                                                         |                                    |                                                          |
| <b><i>ART Failure and 2<sup>nd</sup> line ART, Resistance and Reinfection, Partner treatment</i></b> |                                    |                                                          |
| <b><i>Emergency contraception</i></b>                                                                |                                    |                                                          |

***STDs- Sexually Transmitted Diseases, STIs - Sexually Transmitted Infections, PEP- Post Exposure Prophylaxis, HIV- Human Immunodeficiency Virus, ART – Anti Retrovirus Therapy, NACP – National AIDS Control Program, FSW – Female Sex Worker, MSM – Men having Sex with Men, TG – Transgender, HAART – Highly Active Anti Retroviral Therapy, RPR – rapid Plasma Reagin Test, ViAViLi Test – Visual Inspection of Cervix with Acetic Acid and Lugols Iodine.***

***During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.***

***7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.***

## 8. COMPETENCY ASSESSMENT :

- OVERALL:

|                                                                                                                       |    |           |
|-----------------------------------------------------------------------------------------------------------------------|----|-----------|
| a) Communication / commitment / Contribution /                                                                        | () |           |
| Compassion towards patients and Innovation                                                                            | () | - 5 Marks |
| b) Implementation of newly learnt techniques/skills                                                                   | () |           |
| • Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars                                           |    | - 5 marks |
| • Number of Posters/Papers presented in Conferences/<br>Publications and Research Projects                            |    | - 5 marks |
| • No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic meetings with details. |    | - 5 marks |
|                                                                                                                       |    | -----     |
| Total                                                                                                                 |    | 20 Marks  |
|                                                                                                                       |    | -----     |

### PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 marks              |

## 9. Dissertation and University Journal of Medical Sciences:

*As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation*

*The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.*

*As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.*

*A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.*

***The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.***

***Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper***

#### **10. THEORY EXAMINATION: MDDVL**

**PAPER I - Applied Basic Sciences**

**PAPER II - General Dermatology, Leprosy and Venereology**

**PAPER III - Skin Manifestations of Systemic Diseases and Therapeutics**

**PAPER IV - Recent Advances**

#### ***Question paper Pattern***

##### **Paper I**

#### **SECTION – A DERMATOLOGY AND LEPROSY**

|                                    |              |             |
|------------------------------------|--------------|-------------|
| <b>Write notes on: I. ANATOMY:</b> | <b>2 x 5</b> | <b>= 10</b> |
| II. PHYSIOLOGY:                    | 2 x 5        | = 10        |
| III. BIO-CHEMISTRY:                | 2 x 5        | = 10        |
| IV. PHARMACOLOGY:                  | 2 x 5        | = 10        |
| V. MICROBIOLOGY:                   | 2 x 5        | = 10        |
| VI. PATHOLOGY:                     | 2 x 5        | = 10        |

#### **SECTION B – VENEREOLOGY**

|                     |       |      |
|---------------------|-------|------|
| I. ANATOMY:         | 2 x 5 | = 10 |
| II. PHYSIOLOGY:     | 2 x 5 | = 10 |
| III. BIO-CHEMISTRY: | 1 x 5 | = 5  |
| IV. PHARMACOLOGY:   | 1 x 5 | = 5  |
| V. MICROBIOLOGY:    | 1 x 5 | = 5  |
| VI. PATHOLOGY:      | 1 x 5 | = 5  |

**Total 100 marks**

## **Paper II**

### **SECTION – A (DERMATOLOGY & LEPROSY)**

- I. Elaborate on:  $1 \times 15 = 15$
- II. Write notes on:  $7 \times 7 = 49$

### **SECTION – B (VENEREOLOGY)**

- I. Elaborate on:  $1 \times 15 = 15$
- II. . Write notes on:  $3 \times 7 = 21$

**Total 100 marks**

## **Paper III**

- I. Elaborate on:  $2 \times 15 = 30$
- II. Write notes on:  $10 \times 7 = 70$

**Total 100 marks**

## **Paper IV**

### **SECTION – A (DERMATOLOGY & LEPROSY)**

- III. Elaborate on:  $1 \times 15 = 15$
- IV. Write notes on:  $7 \times 7 = 49$

### **SECTION – B (VENEREOLOGY)**

- III. Elaborate on:  $1 \times 15 = 15$
- IV. . Write notes on:  $3 \times 7 = 21$

**Total 100 marks**

**11. PRACTICAL EXAMINATION:**

|                                                                       |             |                                                     |                         |
|-----------------------------------------------------------------------|-------------|-----------------------------------------------------|-------------------------|
| 1 LONG CASE X 50 MARKS                                                |             |                                                     | 50 MARKS                |
| 2 SHORT CASES X 25 MARKS<br>(LEPROSY 1, STD 1)                        |             |                                                     | 50 MARKS                |
| CASE DISCUSSION<br>Ward Rounds – 4 x 5 = 20<br>Spotters - 10 x 3 = 30 |             |                                                     | 50 MARKS                |
| OSCE 10 stations x 5 marks                                            |             |                                                     | 50 MARKS                |
| CLINICAL TOTAL                                                        |             |                                                     | 200 MARKS (A)           |
|                                                                       |             | VIVA                                                |                         |
| VIVA                                                                  | DERMATOLOGY | DISCUSSION<br>INSTRUMENTS<br>DRUGS<br>SLIDES        | 80 MARKS                |
|                                                                       | STD         | DISCUSSION<br>INSTRUMENTS<br>CHARTS<br>KIT & CONDOM |                         |
| LOG BOOK                                                              |             |                                                     | 20 MARKS                |
| VIVA TOTAL                                                            |             |                                                     | 100 MARKS (B)           |
| AGGREGATE (CLINICAL + VIVA)                                           |             |                                                     | 300 MARKS (A+B)         |
| MINIMUM REQUIRED FOR PASS (50%)                                       |             |                                                     | 150 MARKS               |
| DISSERTATION                                                          |             |                                                     | APPROVED / NOT APPROVED |

**MD DVL**

|                                                                           |                                                                    |                                |
|---------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------|
| <b>CLINICALS</b>                                                          |                                                                    |                                |
| <b>One Long case x 50 marks</b>                                           |                                                                    | <b>50 Marks</b>                |
| <b>Two short cases x 25 Marks<br/>(Leprosy 1 + STD 1)</b>                 |                                                                    | <b>50 Marks</b>                |
| <b>Case Discussion - Ward rounds<br/>(20 Marks) + Spotters (30 Marks)</b> |                                                                    | <b>50 Marks</b>                |
| <b>OSCE</b>                                                               |                                                                    | <b>50 Marks</b>                |
| <b>Clinical Total</b>                                                     |                                                                    | <b>200Marks(A)</b>             |
| <b>VIVA (including Competency Assessment - (CA)) 60 + 20 marks</b>        |                                                                    |                                |
| <b>Dermatology<br/>(Including<br/>Leprosy)<br/>40 + 10 marks</b>          | <b>Discussion<br/>Instruments<br/>Drugs</b>                        | <b>80 Marks</b>                |
| <b>STD<br/>(10 marks)</b>                                                 | <b>Discussion<br/>Instruments<br/>Charts<br/>Kits &amp; Condom</b> |                                |
| <b>LOG BOOK</b>                                                           |                                                                    | <b>20 Marks</b>                |
| <b>Viva Total (Viva+CA+Log Book</b>                                       |                                                                    | <b>100 Marks (B)</b>           |
| <b>Aggregate (Clinical + Viva Total)</b>                                  |                                                                    | <b>300 Marks (A+B)</b>         |
| <b>Minimum required Pass Marks</b>                                        |                                                                    | <b>150 Marks</b>               |
| <b>Dissertation</b>                                                       |                                                                    | <b>Approved / Not Approved</b> |
|                                                                           |                                                                    |                                |

**Clinical Examination in MD DVL -Detailed**

|                  |                                                            |                      |
|------------------|------------------------------------------------------------|----------------------|
| <b>CLINICALS</b> |                                                            |                      |
| <b>1.</b>        | <b>Long Case – 1 X 50 = 50</b>                             | <b>50 marks</b>      |
| <b>2.</b>        | <b>Short Case – 2 X 25 = 50<br/>(Leprosy -1 , STD – 1)</b> | <b>50 marks</b>      |
| <b>3.</b>        | <b>Spotters – 10 X 3 =30</b>                               | <b>50 Marks</b>      |
| <b>4.</b>        | <b>Ward Rounds – 4 X 5 =20</b>                             |                      |
| <b>5.</b>        | <b>OSCE / OSPE -10X5=50</b>                                | <b>50 marks</b>      |
| <b>Total</b>     |                                                            | <b>200 Marks (A)</b> |

**MD DVL****Clinical Exams**

| I. LONG CASE                                                                           |                                                  |                                                             |          |
|----------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------|----------|
| Duration : 40 mins<br>for Examination;<br>15 mins for<br>Assessment<br>Total – 55 mins | A)History                                        |                                                             | 10 marks |
|                                                                                        | B) Physical findings & Clinical<br>Bedside tests |                                                             | 15 marks |
|                                                                                        | C) Diagnosis and differential Diagnoses          |                                                             | 5 marks  |
|                                                                                        | D) Management (5+5+5)                            |                                                             | 15marks  |
|                                                                                        | 1. Investigation                                 | 5 marks                                                     |          |
|                                                                                        | 2. General Measures                              | 5 marks                                                     |          |
|                                                                                        | 3. Specific Treatment<br>(Topical &Systemic      | 5 marks                                                     |          |
|                                                                                        | E)Communication & Counseling                     |                                                             | 5 marks  |
| Total                                                                                  |                                                  |                                                             | 50 marks |
| II. SHORT CASE                                                                         |                                                  |                                                             |          |
| STD CASE<br>Examination 15<br>mins<br>Assessment 10<br>mins<br>Total – 25 mins         | Focused History                                  |                                                             | 5 marks  |
|                                                                                        | Physical Findings                                |                                                             | 5 marks  |
|                                                                                        | Investigations                                   |                                                             | 3 marks  |
|                                                                                        | Diagnosis and differential<br>Diagnoses          |                                                             | 3 marks  |
|                                                                                        | Treatment                                        |                                                             | 3 marks  |
|                                                                                        | Counseling                                       |                                                             | 3 marks  |
|                                                                                        | Follow up / Partner Management                   |                                                             | 3 marks  |
| Leprosy<br>Examination 15<br>mins<br>Assessment 10<br>mins<br>Total – 25 mins          | Focused History                                  |                                                             | 5 marks  |
|                                                                                        | Physical Findings                                |                                                             | 10 marks |
|                                                                                        | Diagnosis                                        |                                                             | 3 marks  |
|                                                                                        | Management                                       |                                                             | 7 marks  |
|                                                                                        | Investigation                                    | Treatment<br>Medical Surgical,<br>Counseling &<br>Education |          |
| Total (STD Case + Leprosy)                                                             |                                                  |                                                             | 50 marks |

**Spotters:**

**10 Spotters including at least 1 case/ case scenario of STD and 1 case/ case scenario of Leprosy**

**Total – 30 marks**

**Time – 30 mins**

**Each spotter- 3 mins**

**1 min for Examination**

**2 mins – Assessment**

**Ward Rounds (Management based discussion)**

**Four stations including 1 case/case scenario of STD and 1 case/case scenario of Leprosy**

**5 mins (3 + 2 mins) each station x 4    Total-20 mins**

**Marks: 5 marks each station x 4   - 20 marks**

**12.LOG BOOK:**

**The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.**

**The record or log book shall be checked and assessed periodically by the faculty members imparting the training**

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

**13.VIVA**

|                                                                      |                                          |                 |
|----------------------------------------------------------------------|------------------------------------------|-----------------|
| <b>DERMATOLOGY and LEPROSY</b><br><b>8 – mins</b><br><b>50 marks</b> | <b>General dermatology &amp; Leprosy</b> | <b>10 marks</b> |
|                                                                      | <b>Instruments</b>                       | <b>10 marks</b> |
|                                                                      | <b>Drugs</b>                             | <b>10 marks</b> |
|                                                                      | <b>Recent Advances</b>                   | <b>10 marks</b> |
|                                                                      | <b>Aesthetic / Dermato-surgery</b>       | <b>10 marks</b> |
| <b>STD</b><br><b>2-mins</b><br><b>10 marks</b>                       | <b>Applied Basics</b>                    | <b>10 Marks</b> |
|                                                                      | <b>Instruments</b>                       |                 |
|                                                                      | <b>Charts</b>                            |                 |
|                                                                      | <b>Kit &amp; Condom</b>                  |                 |
| <b>Total</b>                                                         |                                          | <b>60 marks</b> |



|                                                   |                                |
|---------------------------------------------------|--------------------------------|
|                                                   |                                |
| <b>Log book</b>                                   | <b>20 marks</b>                |
| <b>Viva total including CA</b>                    | <b>80 marks</b>                |
| <b>Log Book (20 Marks )+ Viva Total (80 Marks</b> | <b>100 marks (B)</b>           |
| <b>Aggregate (Clinical + Viva + Log book )</b>    | <b>300 marks (A + B )</b>      |
| <b>Minimum required for Pass (50%)</b>            | <b>150 marks</b>               |
| <b>Dissertation</b>                               | <b>Approved / Not Approved</b> |

#### **14. OSCE /OSPE**

**10 Stations, Each -2 mins**

**Marks: 5 X 10 = 50 marks**

- 1. Histopathology – Tumors -Benign/malignancy**
- 2. Histopathology – Non - Tumors**
- 3. Wet Mount / KOH / Tzanck / SSS / Grams Stain / Any culture**
- 4. STD Station I**
- 5. STD Station II**
- 6. Leprosy – Splint / Prosthesis**
- 7. Occupational Dermatology**
- 8. Dermato-surgery**
- 9. Aesthetic Dermatology**
- 10. X-rays / CT scans / MRI/Any image**

**15. Recommended books (The latest Edition of the text books listed is recommended)**

- 1. Rook's Text book of Dermatology. Edited by Christopher Griffiths, Jonathan Barker, Tanya Bleiker, Robert Chalmers & Daniel Creamer. 9<sup>th</sup> edition.**
- 2. Fitzpatrick's Dermatology in General Medicine. Lowell A. Goldsmith, Stephen I. Katz, Barbara A. Gilchrest, Amy S. Paller, David J. Leffell, Klaus Wolff. 8<sup>th</sup> Edition**
- 3. Dermatology (Bologna, Dermatology). Jean L. Bologna MD, Joseph L. Jorizzo MD, Julie V. Schaffer MD, Jean L. Bologna, Joseph L. Jorizzo, Julie V. 3<sup>rd</sup> Edition**
- 4. IADVL Text Book of Dermatology. Editor S. Sacchidanand, Co-editors Chetan Oberai, Arun C. Inamadar. 4<sup>th</sup> edition**

5. *Andrew's Diseases of the Skin – Clinical Dermatology.* James DJ, Berger TG, ElstonDM, Neuhaus 12<sup>th</sup> edition
6. *Sexually Transmitted Diseases.* King K. Holmes, P. Frederick Sparling, Walter E. Stamm, Peter Piot, Judith N. Wasserheit, Lawrence Corey, Myron S. Cohen and D. Heather Watts. 4th edition.
7. *Sexually Transmitted Infections,* Bhushan Kumar, Somesh Gupta. 2nd Edition.
8. *Sexually Transmitted Diseases and HIV/AIDS.* Vinod K. Sharma. Second edition
9. *Oxford Handbook of Genito Urinary Medicine, HIV and Sexual Health* Edited by Richard Pattman and K Nathan Sankar
10. *Sexually Transmitted Infections The Facts –* David Barlow
11. *Sexually Transmitted Infections and Sexually Transmitted Diseases* Edited by Gerd Gross and Stephen K Tying
12. *ABC of Sexually Transmitted Infections, Sixth Edition* by Karen E Rogstad
13. *Color atlas and synopsis of Sexually Transmitted Diseases, Third Edition* by Hunter Handsfield
14. *Sexually Transmitted Infections and HIV- An illustrated guide to management* by Veerakathy Harindra, Verapol Chandeying, and N. Usman
15. *Websites of WHO, CDC and NACO for current updates*
16. *Hand book of Sexual dysfunction* Edited by Richard Balon and R. Taylor Graves
17. *Textbook of Clinical Sexual Medicine* by IsHak and Waguhih
18. *Leprosy, 2nd edition.* Robert C. Hastings. Churchill. Livingstone: 1994
19. *IAL text book of Leprosy.* Editors Bhushan Kumar, Hemanta Kumar Kar. 2<sup>nd</sup> edition
20. *Handbook of Leprosy.* by W.H. Jopling
21. *Dharmendra, Leprosy 2 Volumes – 1<sup>st</sup> Edition 1985, Samant and Company.*

22. ***Histopathology of the Skin. Walter – F. Lever Gundula Schaumburg Lever, 11<sup>th</sup> edition.***
23. ***Weedon's Skin Pathology. 4<sup>th</sup> edition***
24. ***Comprehensive dermatologic drug therapy. Stephen E. Wolverton. 3<sup>rd</sup> edition.***
25. ***Fisher's Contact Dermatitis. Robert L. Rietschel, Joseph F. Fowler, Alexander A. Fisher. 6<sup>th</sup> edition***
26. ***Diseases of the nails and their management. Baran R, Dawber RPR, De Berker. 4<sup>th</sup> edition***
27. ***A Textbook of Skin Disorders of Childhood and Adolescence. Hurwitz Clinical Pediatric Dermatology. Amy S Paller, Anthony J. Mancini MD. 5<sup>th</sup> Edition.***
28. ***Dermatological Signs of Systemic Disease. Jeffrey Callen Joseph Jorizzo John Zone Warren Piette Misha Rosenbach Ruth Ann Vleugel. 5<sup>th</sup> Edition.***
29. ***Surgical Management of Vitiligo. Somesh Gupta, Mats J. Olsson, Amrinder J. Kanwar, Jean-Paul Ortonne***
30. ***ACS(I) Textbook on Cutaneous and Aesthetic Surgery Hardcover – 2012 by Venkataram .***
31. ***Text Book & Atlas of Dermato Surgery & Cosmeutology. Satish S. Savant, Radha Atal Shah, Deepak Gore***

**\*\* Note :** The editions are as applicable and the latest editions shall be the part of the syllabi.

## **15. RECOMMENDED JOURNALS**

- 1.     *Archives or Dermatology***
- 2.     *British Journal of Dermatology***
- 3.     *Indian Journal of Dermatology***
- 4.     *Indian Journal of Dermatology, Venereology & Leprosy***
- 5.     *Journal of American Academy of Dermatology***
- 6.     *Journal of European Academy of Dermatology & Venereology***
- 7.     *International Journal of Dermatology***
- 8.     *Seminars in Cutaneous Medicine & Surgery***
- 9.     *Clinical and Experimental Dermatology***
- 10.    *Journal of Investigative Dermatology***
- 11.    *Dermatology online***
- 12.    *Indian dermatology online journal***
- 13.    *Indian Journal of Leprosy***
- 14.    *Leprosy Review***
- 15.    *International Journal of STD & AIDS***
- 16.    *Indian journal of Sexually transmitted diseases***
- 17.    *Genitourinary Medicine***
- 18.    *Pediatric Dermatology***

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# **MD FORENSIC MEDICINE**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**MD FORENSIC MEDICINE**

**GOAL:**

This program aims at educating & training a medical professional towards becoming a competent expert in Forensic Medicine & Toxicology.

**OBJECTIVES:**

**A.KNOWLEDGE**

*At the end of the course the professional shall be:*

1. Able to identify and deal with all Medicolegal cases
2. Able to know the procedure of examination of a Medicolegal case and be aware about the procedure of collection of the requisite evidential materials.
3. Aware about the prevalent law and legal procedures and be able to appear in a court of law as an Expert and give evidence in cases of Suicide, Homicide, Accident, Assault, Sexual offences, Alcoholic intoxication, Drug dependence and all other cases requiring medical opinion
4. Aware about the procedure of preparation of Medico legal reports.
5. Having fundamental knowledge of all branches of Medical disciplines related to their medico legal applications. The professional will also be able to refer & understand relevant application of few other branches of Science like Botany, Zoology, Physics, Chemistry etc.....
6. Able to plan, implement, evaluate & modulate Medicolegal services.

**B. ATTITUDE**

*At the end of the course the professional shall:*

1. Keep oneself abreast with all recent developments & emerging trends in the field of Medical ethics & Law.
2. Remain knowledgeable with emerging trends in the field of Forensic Medicine
3. Evaluate his professional knowledge & skills, select appropriate learning resources for updating his / her knowledge

## **C. SKILLS**

*At the end of the course the professional shall be:*

1. Able to conduct a proper Medicolegal examination, document and report in all Medicolegal cases.
2. Able to prepare Medical record and reports
3. Able to conduct the Medicolegal Autopsy
4. Able to examine, document, preserve evidential material, dispatch specimens and relevant materials to the concerned centers in all medicolegal cases.
5. Able to interpret HPE, Microbiological, Radiological, FSL & other investigative reports.
6. Able to properly depose evidence in a court of law.
7. Competent to issue all Medical and Medicolegal certificates.
8. Able to impart education in Forensic Medicine & Toxicology to Undergraduate students, Medical officers & other professionals using modern teaching aids.

## **COMPONENTS OF POSTGRADUATE CURRICULUM**

### **THEORETICAL KNOWLEDGE**

1. Knowledge about Medical, Legal and Medicolegal responsibilities of a physician.
2. Laws in relation to Medical Practice.
3. Medical Ethics and Etiquette to be followed during Medical Practice.
4. Relevant aspects of basic medical sciences useful in Medicolegal practice
5. Examination of a case and furnish medicolegal opinion
6. Procedure of issuance of certificates in medicolegal practice

### **PRACTICAL KNOWLEDGE**

1. Perform Medico legal Autopsy independently.
2. Conduct Medico legal examination of Skeletal remains
3. Conduct examination of evidential materials such as Weapons, Clothing, Wet specimens etc..... & furnish medico legal opinion.
4. Examine Photographs Xrays etc.... & furnish medico legal opinion.
5. Collect, preserve & dispatch materials for investigation
6. Prepare reports in Medico legal cases such as Age Estimation.
7. Prepare independently Medico legal Injury report
8. Conduct examination, collect evidential material in cases of Alcohol intoxication.
9. Conduct examination, collect evidential material in cases of substance abuse.
10. Conduct examination, collect evidential material in cases of Sexual offences.

11. Conduct psychiatric assessment & furnish medico legal opinion in such cases
12. Conduct examination & collect evidential material in cases of poisoning.
13. Conduct basic tests for detection of poisons in Toxicological laboratory
14. Conduct laboratory examination of all biological & Trace evidential materials
15. Interpret Investigative reports for Medicolegal purposes
16. Give evidence in a court of law as an expert
17. Awareness of various intensive care & OT setups & related medico legal aspects

## **WRITING THESIS / RESEARCH ARTICLES**

The student shall plan & conduct systematic scientific enquiry, analyze the data and arrive at a conclusion, which shall be utilized as scientific information for health planning & research. Further this shall be the topic on which the student bring out their dissertation

Student will publish at least one scientific research article in University Journal of Medical Sciences.

## **ATTITUDE INCLUDING COMMUNICATION SKILLS**

The student shall undergo training in attitude, communication skills during his / her course.

## **TRAINING IN RESEARCH METHODOLOGY / MEDICAL ETHICS / BIOETHICS & MEDICOLEGAL ASPECTS**

The student shall undergo training in research methodology before submitting / registering his Dissertation topic to the university. Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions, since Medical ethics, moral and legal issues are part and parcel of the curriculum and syllabus.

The student shall undergo training in Medical audit, Health economics, Health information system, Basics of statistics during his / her course.

The student will have exposure to human behavior studies during his / her course.

The student will have knowledge of Pharmaco economics & will have introduction to nonlinear mathematics during his / her course.



## **THEORY SYLLABUS:**

### **I Basic sciences:**

|                         |                                                                                                                                                                                                                                                                                                                                   |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Anatomy                 | Parts of the body relevant from the Medicolegal aspects<br>(Structure & Functions)                                                                                                                                                                                                                                                |
| Biochemistry            | Basic lab values needed in Clinical Forensic Medicine<br>Chromatography                                                                                                                                                                                                                                                           |
| Physiology<br>Pathology | Homeostasis, Fluid & Electrolytes & regulation & Imbalance,<br>Thermoregulation, Pathophysiology of Disease process,<br>Neoplasm,<br>Tissue reaction to Injury, Repair process<br>Infection, Inflammation, Degenerative process<br>Histopathological & Histochemical aspect of diseases that can<br>cause sudden / natural deaths |
| Immunology              | Immune system – Cellular bases, Complement System, Cell<br>mediated Immunity, Antigen-Antibody reactions, Immune<br>response, Immune deficiency diseases, Immunological aspects<br>related to Organ Transplantation,<br>Precipitation Tests, Gel diffusion tests, ELISA, RIA                                                      |
| Microbiology            | Infections caused by Microorganisms which are relevant in medico<br>legal practice, HIV & AIDS                                                                                                                                                                                                                                    |
| Pharmacology            | Pharmacological actions of common Drugs<br>Idiosyncrasy, Drug reaction, Management of Anaphylaxis                                                                                                                                                                                                                                 |
| Community<br>Medicine   | National Health Policies, Nutritional Disorders, Starvation, WMA<br>guidelines on hunger strikers<br>Hazards of Pollution, Occupational hazards,<br>Waste disposal                                                                                                                                                                |

## II Clinical Subjects:

|                         |                                                                                                                                                                                                                                                                                                             |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General Medicine        | CVS : Clinical features, Management & autopsy findings in respect of diseases of Pericardium, Heart<br>Congenital Heart Diseases                                                                                                                                                                            |
|                         | RESP SYS: Clinical features, Management & autopsy findings in respect of diseases of Larynx, Bronchial Tree, Pleura, Lungs,                                                                                                                                                                                 |
|                         | GIT : Clinical features, Management & autopsy findings in respect of diseases of Pharynx, Stomach & GI Tract.<br>Diseases of Liver, Kidneys Pancreas.<br>Infections of GI Tract                                                                                                                             |
|                         | CNS : Normal anatomy, Physiological aspects of brain, Spinal cord & adnexas, Clinical Presentation of Neurological cases<br>Clinical features, Management & autopsy findings in respect of infectious diseases involving CNS                                                                                |
| Surgery<br>Traumatology | Clinical features, Management & autopsy findings in cases of Shock, Head injuries, Thoracic & abdominal injuries<br>Clinical features, Management & autopsy findings in respect of Surgical emergencies<br>Medicolegal aspects of Intra operative, Post operative Deaths                                    |
| Anesthesia              | Pharmacological aspects of Anesthetic drugs<br>Medicolegal aspects of Deaths during Anesthetic procedures                                                                                                                                                                                                   |
| OBG                     | Diagnosis, Therapeutic procedures & Medicolegal aspects of Impotence, Infertility, Sterility, Pregnancy, Delivery, Abortion, MTP Act, Assisted Reproductive technology, Surrogacy,                                                                                                                          |
| Paediatrics             | Clinical & Medicolegal aspects of Child Neglect, SIDS, Infanticide, Genocide                                                                                                                                                                                                                                |
| Orthopedics             | Functional aspects of Skeletal system & Joints<br>Medicolegal aspects of the Diseases of Bones & Joints,<br>Disability certification                                                                                                                                                                        |
| Psychiatry              | Behavioral Science,<br>Common terminologies of Forensic importance in Psychiatry<br>Medicolegal aspects of Psychiatry & Mental Health<br>Role of Psychiatry in Crime investigation, Trial & Punishment<br>Civil & Criminal responsibilities of an Insane person<br>Mental Health act, Personality disorders |

### **III Forensic Medicine:**

|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Legal Procedures                             | Relevant sections of Constitution of India, Indian Penal Code, Code of Criminal Procedure, Indian Evidence act,<br>Hospital Administration act<br>Court procedures, Deposition of Evidence<br>Land mark judgments of Supreme court & high court                                                                                                                                                                                                |
| Ethics & Law                                 | Medical Ethics, Etiquette, Medical Council<br>Laws governing Medical profession<br>Negligence, Infamous conduct<br>Euthanasia, Advance directives,<br>COPRA, TOHA, ESI ACT, WORKMANS COMPENSATION ACT<br>Clinical research                                                                                                                                                                                                                     |
| Clinical research                            | Human experimentation, Clinical Trials<br>Ethical committees : Constitution, roles & functions<br>Ethical guidelines for biomedical research                                                                                                                                                                                                                                                                                                   |
| Torture Medicine                             | Define & explain issues relating to torture<br>Identify injuries caused by torture<br>NHRC guidelines & protocols                                                                                                                                                                                                                                                                                                                              |
| Identification<br>Anthropology<br>Odontology | Establishment of Identity in living & Dead<br>Estimation of Age in living & Dead<br>Medico legal importance of Age<br>Exploitation of Children, Child labor, POCSO ACT<br>Determination of Sex. Intersex, Certification of Third gender<br>Dactylography, Poroscopy, Superimposition, DNA finger printing,<br>Forensic Anthropology<br>Forensic Odontology<br>Comparative Anthropology<br>Estimation of skeletal age<br>Carbon dating of bones |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Thanatology              | <p>Death &amp; its causes</p> <p>Mode, Manner of death, Sudden death</p> <p>Medical Certification of Cause of Death (M C C D)</p> <p>Postmortem Changes &amp; estimation of Time since death</p> <p>Autopsy techniques &amp; procedures [Regular &amp; Special cases]</p> <p>Psychological Autopsy</p> <p>Collection of materials for further Histopathological, Microbiological, Serological studies &amp; for Chemical analysis</p> <p>Crime scene Investigation</p>                                   |
| Traumatology             | <p>Injuries in living &amp; Dead</p> <p>Differentiate between Ante mortem &amp; Postmortem injuries</p> <p>Biophysical &amp; Biodynamic aspects of Injuries</p> <p>Enzyme histochemistry</p> <p>Injuries caused by Fire arms &amp; Explosion</p> <p>Terminal ballistics</p> <p>Injuries caused by Physical agents</p> <p>Regional Injuries, Thermal Injuries, Transportation Injuries, Medicolegal aspects of Injuries</p> <p>Clinical, Social. Ethical &amp; Medicolegal aspects of Mass disasters.</p> |
| Violent Asphyxial Deaths | <p>Autopsy findings in cases of asphyxial deaths.</p> <p>Differentiate between Suicidal accidental &amp; Homicidal asphyxial deaths.</p> <p>Study of structural &amp; traumatological aspects of Hyoid bone &amp; thyroid cartilage</p>                                                                                                                                                                                                                                                                  |

#### **IV Sexual Jurisprudence:**

|                      |                                                                                                                                                                                               |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sexual jurisprudence | <p>Impotence, Sterility,</p> <p>Virginity, Pregnancy, Delivery,</p> <p>Abortion, MTP act</p> <p>Legitimacy, Disputed paternity</p> <p>Sexual offences</p> <p>Foetal Examination, Placenta</p> |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## V TOXICOLOGY:

|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General    | Law relating to Poisons<br>Drugs & Cosmetic act<br>Narcotic drugs & Psychotropic substances act                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Clinical   | Examine, Diagnose & manage cases of poisoning in casualty<br>Collect, Preserve & dispatch materials for chemical / Toxicological / Drug analysis                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|            | Signs, Symptoms, Management ,Autopsy findings & Medicolegal aspects in cases of:<br>Corrosive Poisons<br>Irritant Poisons : Metallic, Non metallic, Organic<br>Insecticides, Pesticides, Rodenticides & Weed killers<br>Inebriants, Somniferous compounds, Deleriants<br>Alcohol,[Including certification of Drunkenness]<br>Food poisoning, Food Adulterants,<br>Substances causing cardiac toxicity<br>Poisons acting on spinal cord<br>Poisons causing Asphyxia<br>Toxic Envenomation<br>House hold poisons<br>Industrial poisons causing occupational toxicity<br>Biological & Chemical Warfare<br>Drug overdose |
|            | Signs, Symptoms, Management ,Autopsy findings & Medicolegal aspects in cases of:<br>Substance abuse<br>Drug dependence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Analytical | Develop methods for identification & analysis of common poisons<br>TLC, GLC, HPLC, ASS & Spectrophotometer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## **TEACHING LEARNING METHODS:**

### **➤ Regular**

- AUTOPSY POSTINGS & TRAINING
- CASUALTY POSTING FOR TRAINING IN CLINICAL FORENSIC MEDICINE
- ATTEND / PARTICIPATE IN UG THEORY CLASSES & PRACTICAL SESSIONS

### **➤ Posting Given Once During The Course**

- POSTING AT TOXICOLOGY UNITS TO LEARN ANALYTICAL TOXICOLOGY
- FORENSIC SCIENCE LABORATORY (FSL) POSTING FOR TRAINING IN DNA FINGER PRINTING, BALLISTICS etc – 3 weeks
- PATHOLOGY POSTINGS TO LEARN ABOUT HPE – 2 weeks
- DENTISTRY POSTING FOR TRAINING IN FORENSIC ODONTOLOGY- 1 week
- PSYCHIATRY POSTING FOR TRAINING IN FORENSIC PSYCHIATRY – 2 weeks

### **➤ Once In A Week**

- SEMINARS
- MORTALITY MEETING
- AUTOPSY CASE DISCUSSION
- JOURNAL REVIEW MEETING
- CLINICAL FORENSIC MEDICINE CASE DISCUSSION
- STATISTICS OF MLC CASES

### **➤ Once In A Month**

- THESIS REVIEW

### **➤ Once In Six Months**

- WRITTEN TESTS
- VIVA
- GUEST LECTURES BY LEGAL LUMINARIES / SUBJECT EXPERTS

## **STRUCTURED TRAINING PROGRAM:**

|                                                        |                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DAY 1                                                  | DOCUMENTATION & JOINING FORMALITIES                                                                                                                                                                                                                                                                                                                         |
| 0 -15 DAYS                                             | ORIENTATION PROGRAM                                                                                                                                                                                                                                                                                                                                         |
| 16 - 30 DAY                                            | BASIC AUTOPSY SKILLS TRAINING<br>INTRODUCTION TO CLINICAL TOXICOLOGY                                                                                                                                                                                                                                                                                        |
| BY THE END OF<br>6 MONTHS                              | RESEARCH METHODOLOGY TRAINING<br>PREPARATION OF THESIS PROTOCOL<br>POSTING WITH BASIC MEDICAL SCIENCES DEPARTMENTS <ul style="list-style-type: none"> <li>• ANATOMY [2 Wks]</li> <li>• PHYSIOLOGY [1 Wk]</li> <li>• BIOCHEMISTRY [1 Wk]</li> <li>• PATHOLOGY [2 Wks]</li> <li>• MICROBIOLOGY [2 Wk]</li> </ul> <p>THESIS TOPIC SUBMISSION TO UNIVERSITY</p> |
| UPTO 12<br>MONTHS                                      | AUTOPSY WORK<br>CLINICAL FORENSIC MEDICINE WORK @ CASUALTY<br>ATTEND UG CLASSES                                                                                                                                                                                                                                                                             |
| BEFORE 24<br>MONTHS                                    | FSL POSTING [3 Wks]<br>RADIOLOGY DEPARTMENT POSTING [1 Wk]<br>POSTING TO DENTISTRY [1 Wk]<br>PSYCHIATRY DEPARTMENT POSTING [2 Wks]<br>THESIS WORK<br>EXPOSURE TO COURT PROCEDURES<br>DEPOSITION OF EVIDENCE                                                                                                                                                 |
| THROUGHOUT<br>THE COURSE<br>THE STUDENT<br>WILL ATTEND | AUTOPSY WORK<br>CLINICAL FORENSIC MEDICINE WORK<br>PARTICIPATION IN ACADEMIC SESSIONS OF UGS<br>MORTALITY MEETING<br>AUTOPSY CASE DISCUSSION<br>JOURNAL REVIEW MEETING<br>SEMINARS, GUEST LECTURES<br>ALL OTHER ACADEMIC ACTIVITIES CONDUCTED IN THE DEPARTMENT                                                                                             |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

**COMPETENCY ASSESSMENT:**

**1. OVERALL:**

|                                                                                          |           |
|------------------------------------------------------------------------------------------|-----------|
| a) Communication / commitment / Contribution / Compassion towards patient and Innovation | - 5 marks |
| b) Implementation of newly learnt techniques/Skills                                      |           |

2. Number of cases presented in Clinical Meetings/  
Journal Clubs/Seminars – 5 marks
3. Number of papers presented in conferences/Publications /  
Research Projects. - 5 marks
4. No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings with details. - 5 marks

|              |                |
|--------------|----------------|
| <b>Total</b> | <b>20marks</b> |
|--------------|----------------|

**PG NON – CLINICAL COURSE**

- |                                      |                       |
|--------------------------------------|-----------------------|
| VIVA including Competency Assessment | - 60 Marks (40 + 20 ) |
| Pedagogy                             | - 40 marks            |

**ASSESSMENT SCHEDULE IS AS FOLLOWS**



| Year of study | Period   |          |           |          | Total Max.20 marks |
|---------------|----------|----------|-----------|----------|--------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks           |
|               | AVERAGE  |          |           |          | 20 Marks           |

## **DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper.**

## **THEORY EXAMINATION**

Theory examination will comprise of four papers of 100 marks each

- PAPER I Forensic Medicine in relation to Medicine and Surgery, Obstetrics and Gynaecology and Paediatrics
- PAPER II Forensic Pathology, Forensic Immunology and Forensic Biochemistry
- PAPER III Forensic Medicine including Physical Anthropology and Forensic Odontology
- PAPER IV Forensic Toxicology, Forensic Psychiatry and Medical Jurisprudence and Recent Advances.

## **THEORY PAPERS PATTERN**

**Question Paper Pattern: PAPER I, II, III & IV**

- Structured Essay Questions - 2 x 15 Marks = 30 Marks**
- Short Notes - 10 x 5 Marks = 50 Marks**
- Reasoning out - 4 x 5 Marks = 20 Marks**

-----  
**100 Marks**  
-----

## **PRACTICAL EXAMINATION**

**DAY 1 : FORENOON [9.00AM - 1.00 PM]**

|   | <b>EXERCISE</b> | <b>DURATION</b> | <b>MARKS</b> |
|---|-----------------|-----------------|--------------|
| 1 | ADULT AUTOPSY   | 02 Hrs 30 Min   | 60           |
| 2 | FOETAL AUTOPSY  | 01 Hrs 30 Min   | 40           |

**The time slots allotted include the time required for preparation & submission of reports on the Autopsy conducted. Distribution of marks are as under:**

- PROCEDURE 25% Marks**
- OBSERVATION 25% Marks**
- INTERPRETATION 25% Marks**
- REPORTING 25% Marks**

**DAY 1 : AFTERNOON [2.00PM - 5.00PM]**

|                                                                                      | <b>EXERCISE</b>                                                                        | <b>DURATION</b> | <b>MARKS</b> |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------|--------------|
| 1                                                                                    | O S P E [4 STATIONS - 5 MARKS EACH]                                                    | 00 Hrs 40 Min   | 20           |
|                                                                                      | A) EXAMINATION OF BODY FLUID                                                           |                 |              |
|                                                                                      | B) COLLECTION, PRESERVATION & FORWARDING OF A VISCERA TO FSL FOR CHEMICAL ANALYSIS     |                 |              |
|                                                                                      | C) EXAMINATION OF A WEAPON                                                             |                 |              |
|                                                                                      | D) TOXICOLOGY SPOT TEST                                                                |                 |              |
| 2                                                                                    | MICROSCOPIC EXAMINATION OF SLIDES & REPORTING - 4 Nos                                  | 00 Hrs 20 Min   | 20           |
|                                                                                      | A) SEX CHROMATIN (4 X5 marks)                                                          |                 |              |
|                                                                                      | B) HAIR / FIBRE / CLUE MATERIAL                                                        |                 |              |
|                                                                                      | C) BLOOD PICTURE IN A CASE OF POISONING                                                |                 |              |
|                                                                                      | D) FORENSIC PATHOLOGY                                                                  |                 |              |
| 3                                                                                    | ESTIMATION OF AGE BY PHYSICAL & DENTAL EXAMINATION                                     | 00 Hrs 20 Min   | 10           |
| 4                                                                                    | EXAMINATION OF A CLUSTER OF BONES                                                      | 00 Hrs 20 Min   | 10           |
| 5                                                                                    | EXAMINATION OF A SET OF XRAYs                                                          | 00 Hrs 20 Min   | 10           |
| 6                                                                                    | EXPERT OPINION BY STUDY OF DOCUMENTS [HPE / FSL REPORT] PROVIDED IN A MEDICOLEGAL CASE | 00 Hrs 15 Min   | 10           |
| 7                                                                                    | INTERPRETATION OF PHOTOGRAPHS & CORRELATION OF INJURIES SEEN WITH THE WEAPON PROVIDED  | 00 Hrs 15 Min   | 10           |
| 8                                                                                    | MOCK COURT                                                                             | 00 Hrs 30 Min   | 10           |
| <b>FOR EXERCISE No 3 WHEREVER POSSIBLE SUBJECTS MUST BE PROVIDED FOR EXAMINATION</b> |                                                                                        |                 |              |

**DAY 2 : FORENOON [9.00AM - 1.00 PM]**

|   |                                                         |               |    |
|---|---------------------------------------------------------|---------------|----|
| 1 | SPOTTERS [10 Nos]                                       | 00 Hrs 20 Min | 10 |
|   | A) FORENSIC SPECIMEN / PHOTOGRAPHS - 2 Nos              |               |    |
|   | B) PATHOLOGY SPECIMEN - 2 Nos                           |               |    |
|   | C) ANIMAL IRRITANT / CHEMICAL IRRITANT - 2 Nos          |               |    |
|   | D) POISONOUS PLANT / SEEDS - 2 Nos                      |               |    |
|   | E) WEAPONS OF OFFENCE - 2 Nos                           |               |    |
| 2 | CLINICAL EXAMINATION OF A CASE OF DRUNKENNESS           | 00 Hrs 20 Min | 20 |
| 3 | CLINICAL EXAMINATION OF A CASE OF INJURY                | 00 Hrs 20 Min | 20 |
| 4 | CLINICAL EXAMINATION OF A SEXUAL OFFENCES CASE - VICTIM | 00 Hrs 20 Min | 15 |
| 5 | CLINICAL EXAMINATION OF A MALE FOR POTENCY              | 00 Hrs 20 Min | 15 |
| 6 | PSYCHIATRIC CASE INTERPRETATION                         | 00 Hrs 20 Min | 20 |

|  |                                                                                            |
|--|--------------------------------------------------------------------------------------------|
|  | <b>FOR EXERCISE Nos 2 TO 6 WHEREVER POSSIBLE SUBJECTS MUST BE PROVIDED FOR EXAMINATION</b> |
|--|--------------------------------------------------------------------------------------------|

**DAY 2 : AFTERNOON [2.00PM - 4.30PM]**

|          |               |    |
|----------|---------------|----|
| PEDAGOGY | 01 Hrs 00 Min | 40 |
| VIVA     | 01 Hrs 30 Min | 60 |

## **LOG BOOK**

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

## **VIVA**

**VIVA (including Competency Assessment) – 60 Marks (40 + 20)**

**An unstructured viva will be carried out by the examiners. VIVA including Competency Assessment for PG Non – Clinical courses**

## **PEDAGOGY**

The examiners must evaluate the postgraduate student in respect of his / her methodology of teaching – Pedagogy, during final examination. Pedagogy topic will be given to the Postgraduate student on the previous day & the examiners will evaluate the student's performance under the following aspects:

**( 8 minutes Presentation and 2 Minutes Q & Ans)**

- |                                                          |      |
|----------------------------------------------------------|------|
| • Demeanour                                              | - 10 |
| • Audio visual Aids usage, voice modulation and Attitude | - 10 |
| • Subject Content                                        | - 10 |
| • Q & Ans /Interaction                                   | - 10 |

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**Total**

**40 Marks**

## **OSPE / OSCE**

The students will have OSPE as part of their practicals during their final examinations. There shall be four OSPE exercises & will comprise of both manned & unmanned stations. The exercises are:

- EXAMINATION OF BODY FLUID
- PACKING LABELLING & FORWARDING VISCERA
- WEAPON EXAMINATION
- TOXICOLOGY SPOT TEST

## **REFERENCE BOOKS**

1. FORENSIC PATHOLOGY BY B KNIGHT
2. COLOR ATLAS OF FORENSIC PATHOLOGY BY J DIX
3. FORENSIC PATHOLOGY BY DIMAIO V J
4. ESSENTIALS OF FORENSIC MEDICINE BY C J POLSON
5. SIMPSON'S FORENSIC MEDICINE BY SHEPHERD R
6. KEITH MANT, TAYLOR'S PRINCIPLES & PRACTICE OF MEDICAL JURISPRUDENCE
7. FORENSIC MEDICINE : CLINICAL & PATHOLOGICAL ASPECTS BY PAYNE , JAMES
8. CLINICAL FORENSIC MEDICINE BY STARK M M
9. FORENSIC PATHOLOGY : PRINCIPLES & PRACTICE BY DAVID DOLINAK ET AL
10. SUDDEN DEATH IN CUSTODY BY DARELL ROSS ET AL
11. DNA : FORENSIC & LEGAL APPLICATIONS BY LAWRENCE KOBILINSKY ET AL
12. FORENSIC ANTHROPOLOGY BY MICHAEL W WARREN ET AL
13. CURRENT METHODS OF AUTOPSY PRACTICE BY JURGEN LUDWIG
14. THE ESSENTIALS OF FORENSIC MEDICINE AND TOXICOLOGY - DR. K.S. NARAYAN REDDY
15. PRINCIPLES OF FORENSIC MEDICINE AND TOXICOLOGY - DR. APURBA NANDY
16. TEXT BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY - DR. C.K. PARIK
17. MODI'S MEDICAL JURISPRUDENCE AND TOXICOLOGY - DR. C.A. FRANKLIN
18. MEDICO LEGAL POST MORTEM IN INDIA PUBLISHED DR. C.K. PARIK
19. TEXT BOOK OF FORENSIC MEDICINE - DR. V.V. PILLAY
20. LYONS MEDICAL JURISPRUDENCE AND TOXICOLOGY - DR. DOGRA
21. TEXT BOOK OF FORENSIC MEDICINE & TOXICOLOGY-DR. R.N. KARMAKAR
22. PRINCIPLES OF FORENSIC MEDICINE AND TOXICOLOGY - DR. RAJESH BARDALE
23. TEXT BOOK OF FORENSIC MEDICINE & TOXICOLOGY - DR. ANIL AGGARWAL

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **JOURNALS**

1. JOURNAL OF INDIAN ACADEMY OF FORENSIC MEDICINE
2. JOURNAL OF SOUTH INDIA MEDICOLEGAL ASSOCIATION
3. JOURNAL OF INDIAN SOCIETY OF TOXICOLOGY
4. JOURNAL OF PUNJAB ACADEMY OF FORENSIC MEDICINE & TOXICOLOGY
5. JOURNAL OF KARNATAKA MEDICOLEGAL SOCIETY
6. INDIAN JOURNAL OF FORENSIC MEDICINE & TOXICOLOGY
7. MEDICOLEGAL UPDATE
8. SCIENCE & JUSTICE : JOURNAL OF FORENSIC SCIENCE SOCIETY UK
9. INTERNATIONAL JOURNAL OF MEDICINE & LAW
10. JOURNAL OF FORENSIC & LEGAL MEDICINE
11. INTERNATIONAL JOURNAL OF LEGAL MEDICINE

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**M.D. GENERAL MEDICINE**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.D. General Medicine  
Branch I**

**1. GOAL**

**The goal of MD General Medicine Programme shall be to produce competent specialists and/or Medical teachers.**

- i. who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy**
- ii. who shall have mastered most of the competencies, pertaining to General Medicine, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system;**
- iii. who shall be aware of the contemporary advance and developments in General Medicine**
- iv. who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology; and**
- v. who shall have acquired the basic skills in teaching of the medical and paramedical professionals.**

**2. OBJECTIVES:**

**At the end of the postgraduate training in General Medicine in the student shall be able to**

**A) Knowledge**

- i. Recognize the importance to General Medicine in the context of the health needs of the community and the national priorities in the health section.**
- ii. Practice General Medicine ethically and in step with the principles of primary health care.**
- iii. Demonstrate sufficient understanding of the basic sciences relevant to General Medicine**
- iv. Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.**



## **B) Attitude**

- i. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.**

## **C) Skills**

- ii. Diagnose and manage majority of the conditions in General the basis of clinical assessment, and appropriately selected and conducted investigations.**
- iii. Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to General Medicine**
- iv. Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.**
- v. Play the assigned role in the implementation of national health programme, effectively and responsibly.**
- vi. Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.**
- vii. Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.**
- viii. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing / Allied Health Sciences students, general physicians and paramedical health workers.**
- ix. Function as an effective leader of a health team engaged in health care, research or training.**

### 3. COMPONENTS OF THE POSTGRADUATE CURRICULUM

- **THEORETICAL KNOWLEDGE**

As per attached theory syllabus

- **PRACTICAL AND CLINICAL SKILLS**

| No. | Technical Procedures                                                                        |  |
|-----|---------------------------------------------------------------------------------------------|--|
|     |                                                                                             |  |
|     |                                                                                             |  |
|     |                                                                                             |  |
|     |                                                                                             |  |
| I.  | <b>HEMATOLOGY</b> Peripheral smear – [preparation,                                          |  |
|     | staining & interpretation]                                                                  |  |
|     |                                                                                             |  |
|     | • Bone marrow aspiration preparation, collection, transport, processing and interpretation] |  |
|     | • Bone marrow biopsy                                                                        |  |
|     |                                                                                             |  |
| II. | <b>RESPIRATORY SYSTEM</b>                                                                   |  |
|     | • Pulmonary function test                                                                   |  |
|     |                                                                                             |  |
|     | • Peakflow meter                                                                            |  |
|     | • Endotracheal Intubation                                                                   |  |
|     |                                                                                             |  |
|     | • Ventilator Management                                                                     |  |
|     |                                                                                             |  |
|     | • Pulse oximetry                                                                            |  |
|     |                                                                                             |  |
|     | • Pleural aspiration                                                                        |  |
|     |                                                                                             |  |
|     | • Insertion of intercostal tube [ICT]                                                       |  |
|     |                                                                                             |  |
|     | • Pleural biopsy                                                                            |  |
|     |                                                                                             |  |
|     | • Pleurodesis                                                                               |  |
|     |                                                                                             |  |
|     | • Fiberoptic bronchoscopy                                                                   |  |
|     |                                                                                             |  |
|     | • Bronchial Artery Embolization                                                             |  |
|     |                                                                                             |  |

|      |  |                                          |  |  |
|------|--|------------------------------------------|--|--|
|      |  | • ABG, VBG, Procedure and interpretation |  |  |
|      |  |                                          |  |  |
|      |  | • Polysomnography                        |  |  |
|      |  |                                          |  |  |
| III. |  | <b>CARDIO VASCULAR</b>                   |  |  |
|      |  | • Pericardiocentesis                     |  |  |
|      |  |                                          |  |  |
|      |  | Temporary pacing                         |  |  |
|      |  |                                          |  |  |
|      |  | Defibrillation                           |  |  |
|      |  |                                          |  |  |
|      |  |                                          |  |  |
|      |  | ECHO cardiogram -                        |  |  |
|      |  | training and use in                      |  |  |
|      |  | regular and emergency                    |  |  |
|      |  | cases and for procedures                 |  |  |
|      |  |                                          |  |  |
|      |  | TMT testing                              |  |  |
|      |  |                                          |  |  |
|      |  | Holter monitoring                        |  |  |
|      |  |                                          |  |  |
| IV.  |  | <b>ABDOMEN</b>                           |  |  |
| A    |  | <b>Insertion of catheter for-</b>        |  |  |
|      |  | <b>1.Peritoneal dialysis</b>             |  |  |
|      |  |                                          |  |  |
|      |  | <b>2.Hemodialysis</b>                    |  |  |
|      |  |                                          |  |  |
|      |  | <b>3.Care of catheter</b>                |  |  |
|      |  |                                          |  |  |
|      |  | <b>4.Catheterization of Bladder</b>      |  |  |
| B    |  | <b>Vascular procedures</b>               |  |  |
|      |  | <b>1.Preparing cases for AV Fistula</b>  |  |  |
|      |  | <b>2,Care of AV fistula</b>              |  |  |
|      |  |                                          |  |  |
|      |  |                                          |  |  |
| VI   |  | <b>CNS</b>                               |  |  |
|      |  |                                          |  |  |
|      |  | <b>Fundus Examination</b>                |  |  |
|      |  |                                          |  |  |
|      |  | <b>Lumbar puncture, EEG,</b>             |  |  |

|            |                                                      |  |
|------------|------------------------------------------------------|--|
|            | <b>EMG, Muscle Biopsy,</b>                           |  |
|            |                                                      |  |
|            | <b>Nerve Biopsy</b>                                  |  |
|            |                                                      |  |
| <b>VII</b> | <b>Endocrine investigations</b>                      |  |
|            |                                                      |  |
| <b>VII</b> |                                                      |  |
| <b>I.</b>  | <b>OTHERS</b>                                        |  |
|            | <b>Arterial puncture for</b>                         |  |
|            | <b>ABG</b>                                           |  |
|            | <b>Central venous catheter</b>                       |  |
|            | <b>[insertion &amp; care]</b>                        |  |
|            | <b>FNAC</b>                                          |  |
| <b>IX.</b> | <b>SPECIMEN</b>                                      |  |
|            | <b>COLLECTION FOR</b>                                |  |
|            | <b>A] Microbiology</b>                               |  |
|            | <b>Urine</b>                                         |  |
|            |                                                      |  |
|            | <b>Stool</b>                                         |  |
|            | <b>sputum</b>                                        |  |
|            | <b>Blood</b>                                         |  |
|            | <b>Body fluids</b>                                   |  |
|            | <b>Swabs – Throat, nasal, etc.,</b>                  |  |
|            |                                                      |  |
|            | <b>B] Pathology</b>                                  |  |
|            | <b>Body fluids</b>                                   |  |
|            | <b>Smear analysis</b>                                |  |
|            | <b>Specimen</b>                                      |  |
|            | <b>C]Biochemistry</b>                                |  |
|            | <b>[special investigation]</b>                       |  |
|            | <b>Collection</b>                                    |  |
|            | <b>Transportation</b>                                |  |
|            | <b>PATIENTS-</b>                                     |  |
|            | <b>A]. Radiology &amp; Imaging</b>                   |  |
|            | <b>X-rays—</b>                                       |  |
|            | <b>Contrast studies</b>                              |  |
|            | <b>CT scan</b>                                       |  |
|            | <b>MRI</b>                                           |  |
|            | <b>B]. Radio-isotope studies</b>                     |  |
|            | <b>C]. Radiotherapy</b>                              |  |
|            | <b>D]. Invasive / Non invasive Procedures</b>        |  |
|            |                                                      |  |
| <b>XI</b>  | <b>Ultrasonogram –</b>                               |  |
|            | <b>training and use in</b>                           |  |
|            | <b>regular and emergency</b>                         |  |
|            | <b>USG guided aspiration procedures &amp; Biopsy</b> |  |

|     |                                 |  |  |
|-----|---------------------------------|--|--|
|     |                                 |  |  |
| XI  | <b>Echocardiogram</b>           |  |  |
| XII | Advanced high support technique |  |  |
| XII | <b>Newer aspects</b> as felt    |  |  |
|     | by the department/              |  |  |
|     | speciality or recommend         |  |  |
|     | by Authorities                  |  |  |
|     | (Audiogram, Evoked              |  |  |
|     | potential, Joint                |  |  |
|     | aspiration, MRCP/ERCP )         |  |  |
|     |                                 |  |  |

- **WRITING THESIS / RESEARCH ARTICLES**

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year.

Thesis shall be submitted at-least 6 Months before the Theory and Clinical/Practical Examination.

- **ATTITUDES INCLUDING COMMUNICATION SKILLS**

Student should develop the art of eliciting the maximum information from patients in a given time considering the sensory deficits of the patient and caregivers. Communication skills can be learnt through observation and from formal communication skills training and workshops. Students have to develop patience and empathy in dealing with elderly patients. They have to learn to show sensitivity to their special needs.

- **TRAINING IN RESEARCH METHODOLOGY MEDICAL ETHICS BIO ETHICS AND MEDICOLEGAL ASPECTS**

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, moral and legal issues, medical audit are part and parcel of the curriculum and syllabus.

#### **4. THEORY SYLLABUS**

##### **M.D. Br. I - GENERAL MEDICINE APPLIED BASIC SCIENCES**

##### **ANATOMY INCLUDING HISTOLOGY :**

- Embryology - Development of Heart and Great Vessels
- Development of Brain and Spinal Cord.
- Anatomy of Brain and Spinal Cord with their Blood Supply and Venous Drainage.
- Cranial Nerves and Autonomic Nervous System.
- Nervous Control of Bladder and Rectum.
- Anatomy including Histopathology of Endocrine Glands.
- Anatomy of Liver, Pancreas and Portal Circulation.
- Anatomy including Histopathology of Kidneys.
- Anatomy including Histopathology of Spleen.
- Anatomy of Bronchopulmonary Segments, Pleura and Mediastinum.
- Surface Anatomy of Head and Neck, Thorax and Abdomen.

##### **PHYSIOLOGY INCLUDING BIOCHEMISTRY:**

- Liver: Laboratory tests of liver Function.
- Kidney: Laboratory Tests of Kidney Function.
- Exocrine and Endocrine function of pancreas.
- Hormones: Pituitary, Adrenal, Thyroid, Parathyroid, and Chemistry of Steroids - Various tests to study function of Endocrine Glands.
- Pulmonary Function Tests.
- The mechanism of Deglutition.
- Digestion: Gastric and Intestinal secretion and their Hormones- Mechanism of absorption of Fat, Proteins and Carbohydrates.
- Heart: Basic principles of condition system and electro-cardiogram - Circulation - Measurement of cardiac output - Factors controlling arterial blood pressure – Mechanism of production of cardiac failure and syndrome of shock.

- Blood, Plasma, proteins - Coagulation of blood RBC and WBC development - Platelets - Erythropoiesis and its regulation - Blood groups - Iron Metabolism.
- Physiology of Micturition and Defaecation.
- Fluid and electrolyte balance.
- Calcium and Phosphorous Metabolism.
- Carbohydrate metabolism.
- Fat metabolism
- Protein metabolism and electrophoresis.
- Inborn Errors of metabolism.
- Porphyrins and porphyrias.
- Jaundice - Types and Diagnosis.
- Metabolism of Haemoglobin and circulation of Bile pigments.
- Immunoglobulin and the Mechanism of Immunity.
- Physiology of consciousness.
- Physiology of sleep and disorders of sleep.
- Temperature regulation.
- Physiology of hunger and its disorders.

#### **PATHOLOGY INCLUDING MICROBIOLOGY:-**

Central nervous system: Brain and spinal cord Meningitis and Encephalitis, Abscess Tumors, Syphilis .of nervous system, Nutritional and metabolic disorders, epilepsy, vascular diseases.

- Heart: Rheumatic fever and carditis, Coronary artery diseases Hypertension, Atherosclerosis, Cardiomyopathy, Pericarditis,
- Specific and non specific arteritis, Congenital Heart diseases.
- Kidneys: Nephritis, Nephrosis, Kidney, changes in metabolic and collagen vascular diseases, Acute and chronic renal failure.
- Lungs: Pulmonary tuberculosis, atypical mycobacteria, Tumours of lung.
- Liver: Portal hypertension, Cirrhosis of liver, Tumors of liver.
- Bone: Disorders of Mineral and Bone matrix.
- Endocrine Glands: Myxoedema and Thyrotoxicosis, Hyper and hypoparathyroidism, disease of Pituitary, Adrenal Cortex and Medulla.
- Diabetes Mellitus and its complications – Pathological changes in Viscera.
- Gastro intestinal disorders: Peptic ulcer, Malabsorption syndrome, Ulcerative colitis, Amoebiasis (Intestinal and extraintestinal).
- Lymphomas. Leukemias and other blood dyscrasias.

## PHARMACOLOGY:

- Chemotherapy, Antibiotics and antimicrobials
- Antimalarial drugs.
- Antiamoebic drugs.
- Anthelmintics.
- Analgesics.
- Sedatives.
- Tranquilizers.
- Antiviral agents.
- Antimitotics.
- Drugs acting on Autonomic nervous system.
- Hormones.
- Drugs for Epilepsy.
- Diuretics.
- Cardiac glycosides.
- Antiarrhythmic drugs.
- Coagulants and anticoagulants.
- Histamine and antihistamine drugs.
- Alcohol.
- Vaccines and Immune Sera.
- Drug abuse, drug tolerance, drug addiction

## SYLLABUS FOR PART II

### (A) TROPICAL MEDICINE:

- Diseases caused by Protozoa: Malaria, African and American Trypanosomiasis, Leishmaniasis, Toxoplasmosis, Coccidiosis and
- Pneumocystis infection, Ameobiasis, Giardiasis
- Diseases caused by Helminths: Filariasis, Other Nematode infestation, Trematode and Cestode infestation.
- Diseases caused by Viruses: Arbovirus diseases Pox diseases, other viruses' diseases: Measles, Infective Hepatitis, poliomyelitis, Rabies.
- Diseases caused by Bacteria: Leprosy, Tuberculosis, Plague, Meliodosis, Brucellosis, Tularaemia, *Cholera*, Shigellosis and Diarrhoea, Salmonellosis, Tetanus, Anthrax, Tropical Pyomyositis, Rhinoscleroma, Meningitis.
- Diseases caused by Spirochetes: Relapsing fevers, Rat bite fever, Leptospirosis.
- Diseases caused by Rickettsiae and Bartonella
- Tropical Veneral Diseases: Lymphogranuloma Venereum, Granuloma Inguinale.



- Diseases caused by Fungi: Superficial Mycoses – Systemic Mycoses.
- Neurological Diseases, Neurasthenia in Tropics, Kuru
- Heart Disorders: Heat stroke and heat hyperpyrexia.
- Nutritional Diseases: Nutritional deficiency syndromes, Malabsorption in the Tropics, Vitamin deficiencies, Nutritional.
- Poisons: Chiggers, Mites and Animal poisons – plant poisons, leeches and Leech Infestation.
- Ophthalmology in the Tropics:

## **B. INTERNAL MEDICINE**

### **1. Introduction to Clinical Medicine:**

Headache – Pain in the chest, Abdominal pain, Pain in the back and neck, Pain in the extremities, Disturbances of heat regulation, Chills and fever, Nervousness, Anxiety and Depression, Lassitude and Asthenia, Faintness, Syncope and Episodic weakness, Motor paralysis, Tremor, Chorea, Athetosis, Ataxia and other abnormalities of Movement and Posture, Dizziness – Vertigo and Disorders of Gait, Common disturbances of Vision, Ocular movement and hearing, Disorders of sensation, Coma and related disturbances of consciousness – Sleep and its abnormalities, The Convulsive state, Affections of Speech, Delirium and other acute confusions states, Derangement of intellect and behaviour due to diffuse and focal cerebral disease, Dyspnoea, Cyanosis, Hypoxia and Polycythemia, Oedema, Palpitation, Hypotension and the Shock Syndrome, Elevation of Arterial Pressure – Sudden Cardiovascular Collapse and Death, Cough and Hemoptysis, Oral manifestations of disease, Dysphagia – indigestion, Anorexia, Nausea and vomiting, Constipation, Diarrhoea and disturbances of Anorectal function, Hemetemesis and Melena, Jaundice and Hepatomegaly, Abdominal swelling and Ascites, Loss of weight, Obesity, Dysuria, Incontinence and

Enuresis, Oliguria, Polyuria and Nocturia, Hematuria, Disturbances of Menstruation – Disturbances of sexual function, Infertility, Pallor and Anemia, Bleeding, Enlargement of Lymph Nodes and Spleen, Alteration in Leukocytes.

### **2. Genetic Factors in Disease: Cell division and reproduction**

The nature of genetic material, The pattern of familial disorders, Visible abnormalities of Chromosomes – Genetic advice.

### **3. Immunological factors in disease:**

Components of the Immune System, Mechanism of the Immune Response, Immune deficiency and Lymphoproliferative disorders, Types of Immune reaction and their relation to human disease, Suppression of immune reactions and their effects.

### **4. Infections diseases and Tropical Medicine & Hygiene**

#### **5. Infectious Diseases**

#### **6. Chemotherapy of infections**

#### **7. Antibiotic Audit**

#### **8. Infection control Strategies**

- **Immunisations:** Active and passive.
- **Nutritional disorders:**  
Protein - Calorie Malnutrition, Kwashiorkor, Marasmus, Nutritional dwarfing, Mineral deficiencies, Vitamin deficiencies, Obesity, Anorexia Nervosa, Bulimia.

#### **9. Disturbances in water and electrolyte balance**

#### **10. DISEASES OF CARDIOVASCULAR SYSTEM:**

Principles of clinical electrocardiogram, Cardiac dysarrhythmias, Cardiac failure, Rheumatic fever, Valvular diseases, Congenital heart diseases, Ischaemic heart disease, Pericardial diseases, Cardiomyopathies and Myocarditis, Cardiac tumours, Atherosclerosis, Hypertension, Diseases of Aorta, Peripheral vascular diseases, Cardiovascular syphilis.

#### **11. DISEASES OF THE RESPIRATORY SYSTEM:**

Disturbances of respiratory functions, diseases of upper respiratory tract, Obstructive Airway Diseases, Bronchiectasis – Lung Abscess, Broncholithiasis, Diffuse, infiltrative diseases of Lung, Pulmonary thromboembolism, Hypersensitivity reactions of Lung, Environmental Lung Diseases – Primary Pulmonary Hypertension, Neoplasms of Lung, Diseases of Pleura, Mediastinum and Diaphragm, Cor pulmonale, Acute Respiratory Failure.

## **12. DISEASES OF THE DIGESTIVE SYSTEM:**

Diseases of Oesophagus, Peptic Ulcer, Gastritis and other diseases of Stomach including Carcinoma, Diseases of small intestine, Diseases of Colon and Rectum

– Diseases of Peritoneum and Mesentery.

## **13. DISEASES OF LIVER AND BILIARY TRACT:**

Diagnostic Procedures in Liver Diseases, Derangement of Hepatic Metabolism, Disturbance of Biliary Metabolism, Acute Hepatitis, Chronic Active Hepatitis, Cirrhosis of Liver, Tumours of Liver, Suppurative Diseases of Liver, Infiltrative and Metabolic Diseases affecting the Liver, Diseases of Gall bladder and Bile ducts.

## **14. DISEASES OF PANCREAS:**

## **15. DISEASES OF KIDNEY AND URINARY SYSTEM:**

Acute and Chronic Renal Failure, Glomerulonephritis, Nephrotic Syndrome: Vascular Diseases of Kidney, Toxaemia of Pregnancy, Infections of the Urinary Tract, Obstructive Uropathy – Nephrolithiasis, Cystic Diseases of the Kidneys, Other Congenital and Hereditary Disorders of the Kidney and Urinary Tract, Tumours of the Urinary Tract.

## **16. DISEASES OF THE ENDOCRINE SYSTEM:**

The Hypothalamus and Pituitary Gland, Diseases of Anterior Lobe of Pituitary, Diseases of Adrenal Cortex and Medulla, Diseases of Testis and Ovaries, Pineal Gland, Diabetes Mellitus, Hyperinsulinism, Hypoglycemia, Glucagon Secretion. Diseases of Neurohypophysis, Diseases of Thyroid.

### **• DISEASES OF THE BLOOD AND BLOOD FORMING ORGANS**

ORGANS: Blood Formation Blood Destruction, Anemia, Bone Marrow failure, Blood Groups and Transfusions Polycythemia Rubra Vera, Abnormal Haemoglobin, Disorders of platelets, Haemorrhagic Disorder, Leukemia, Lymphomas, Diseases of spleen and Reticulo Endothelial system.

### **• DISEASES OF CONNECTIVE TISSUES, JOINT AND BONES:**

Rheumatoid Arthritis, Ankylosing Spondylitis, Systemic Lupus Erythematosus, Scleroderma, Polymyalgia Rheumatica, Gout, Pseudo Gout, Osteoarthritis, Diseases of Bone, Metabolic and Endocrine Diseases, Tumors of Bone, Metabolic and Endocrine Diseases of Bone, Paget's Disease.

- **DISEASES OF THE NERVOUS SYSTEM:**

Diagnostic Methods in Neurology, Coma, Headache, Epilepsy, Diseases of Peripheral Nervous System, Diseases of Cranial Nerves, Diseases of Spinal Cord, Cerebro vascular Diseases, Traumatic Diseases of brain, Neoplasms, Pyogenic Infection of Central Nervous System –Tuberculosis and Viral Infections, Multiple Sclerosis, Demyelinating diseases, Metabolic and Nutritional Diseases of Brain, Degenerative Diseases of Nervous system, Developmental and other Congenital Anomalies of Nervous Systems, Narcolepsy, Migraine, Disease of Extraparamidal System, Muscle Disorders, Disorders of Myoneural Junction.

**20. PSYCHIATRY:**

Neuroses, Antisocial Personality, Grief, Reactive Depression, Manic depressive Psychosis, Involutional Melancholia and Hypochondriasis, Schizophrenic Syndromes and related Psychoses.

**21. ERRORS OF METABOLISM:**

Genetic Disorders of Amino acid Metabolism, Cystinuria, Renal Glycosuria Renal Tubular Acidosis, Carcinoid, Syndrome, Gout, Haemochromatosis, Disorders of Porphyrin Metabolism, Hepatolenticular Degeneration, Disorders of Glycogen Synthesis and Mobilization, Galactosemia, Disorders of Lipid Metabolism, Amyloidosis.

- **DISORDERS DUE TO CHEMICAL AND PHYSICAL AGENTS INCLUDING NUCLEAR MEDICINE:**

Common Poisons, Heavy Metals, Alcohol, Opiates and other Synthetic Analgesic Drugs, Barbiturates, Depressants, Stimulants and Psychogenic Drugs, Disorders Caused by Venoms, Bites and Stings, Disorders due to Environment, temperature. Electric Shock, Lightning, Hanging, Disorders due to Alternations in Barometric Pressure Problems of Air and Space Travel –Radioactive Isotopes and Radiation injury Electrical Injuries, Immersion Injury and Drowning.

- **GERIATRIC MEDICINE:**

Problem of old age and disease, condition peculiar to the aged.

**24. COMMUNITY MEDICINE:**

Problem of over population, Family Planning Programme, National health programmes

**25. IATROGENIC DISORDERS:**

Induced by Drug and Other forms of Therapy.

## **DISEASES OF THE SKIN:**

Interpretation of alterations in the Skin, Lesions of General Medical significance, Generalized Pruritus, Pigmentation of the Skin and Disorders of Melanin Metabolism, Photo sensitivity and other Reactions to Light, Hirsutism and Alopecia, Cutaneous Manifestations of Internal Malignancy, Psoriasis, Pemphigus, Scabies and fungal infections of the Skin.

## **DISEASES OF CHILDREN:**

Chromosomal Abnormalities, Social paediatrics, Preventive Paediatrics, Child Health in Developing Countries – Neonatal care – Nutritional Requirements and Nutritional Disturbances – Parenteral Fluid Therapy, Vomiting and Diarrhoeal Disorders – Cardiovascular Respiratory Diseases peculiar to children, Tuberculosis in children – Convulsive disorders, Developmental disorders – Psychiatric Disorders in Childhood – Immunodeficiency – Metabolic Disorders – Endocrine Disorders.

History of Medicine

Occupational hazards

Space medicine including high altitude

Problems in industrial medicine

Organ transplantation

Imaging technique including CT scan and MRD

- 1. Medical disorders in Pregnancy**
- 2. Stem cell therapy**
- 3. Critical care including ABG analysis / Toxicology**
- 4. Disaster Management**
- 5. Bioterrorism**
- 6. Environmental Medicine**
- 7. International Travel Regulations**
- 8. Medical Fitness**
- 9. International Health Regulations**
- 10. Pharmacovigilance**
- 11. Health Economics**
- 12. HMIS**

## **5. TEACHING LEARNING METHODS**

*The teaching and training of the students shall include graded responsibility in the management and treatment of patients entrusted to their care; participation in Seminars, Journal Clubs, Group Discussions, Clinical Meetings, Grand Rounds, and Clinico-Pathological Conferences; practical training in Diagnosis and Medical treatment; training in the Basic Medical Sciences, as well as in allied clinical specialties.*

The following teaching learning methods are recommended.

- Lectures
- Case based discussion
- Bed side clinics
- Teaching on ward rounds
- Symposia
- Seminars
- Journal clubs
- Problem based learning
- Telemedicine

### **STRUCTURED TRAINING PROGRAM**

**1<sup>st</sup> Year:**

|                                                           |                  |
|-----------------------------------------------------------|------------------|
| Haematology                                               | 15 days          |
| Endocrinology                                             | 15 days          |
| Paediatrics                                               | 15 days          |
| Psychiatry                                                | 15 days          |
| Dermatology                                               | 15 days          |
| Coronary care unit                                        | 15 days          |
| Intensive Medical care unit                               | 15 days          |
| Thoracic Medicine                                         | 15 days          |
| Radiology including imaging techniques & Nuclear Medicine | 15 days          |
| Diabetology                                               | 15 days          |
| Rheumatology                                              | 15 days          |
| Cancer Chemotherapy                                       | 15 days          |
| Geriatrics                                                | 15 days          |
| General Medical Wards                                     | 5 1/2 months     |
| <b>TOTAL</b>                                              | <b>12 months</b> |

**2<sup>nd</sup> Year:**

|                          |                  |
|--------------------------|------------------|
| Cardiology               | 1 Month          |
| Nephrology               | 1 Month          |
| Neurology                | 1 Month          |
| Medical Gastroenterology | 1 Month          |
| General Medical Ward     | 8 Months         |
| <b>TOTAL</b>             | <b>12 Months</b> |

### 3<sup>rd</sup> Year:

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## 1 OVERALL:

- ## PG CLINICAL COURSES

Log Book - 20 marks

| Year of study | Period   |          |           |          |  | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|--|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks |  | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks |  | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks |  | 20 Marks              |
|               | AVERAGE  |          |           |          |  | 20 Marks              |

## **9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

**As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation**

**The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.**

**As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.**

**A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.**

**The periodical evaluation of dissertation work should be done by the guide / HOD once in every six months. All the Heads of Department will be held responsible for submission of dissertation in time.**

**The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.**

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

## **10. THEORY EXAMINATION**

**Theory examination will comprise 4 papers.**

**Paper I : Applied Basics Sciences in General Medicine**

**Paper II : Medicine including Psychiatry**

**Paper III : Tropical Medicine**

**Paper IV : Medicine including Children's Diseases and Recent advances**



**Question paper Pattern:**

|              |                |                    |
|--------------|----------------|--------------------|
| Paper I :    | Write notes on |                    |
| i.           | Anatomy        | 4 x 5 = 20         |
| ii.          | Physiology     | 4 x 5 = 20         |
| iii.         | Biochemistry   | 3 x 5 = 15         |
| iv.          | Pharmacology   | 3 x 5 = 15         |
| v.           | Pathology      | 3 x 5 = 15         |
| vi.          | Microbiology   | 3 x 5 = 15         |
| <b>Total</b> |                | <b>= 100 marks</b> |

|                      |                |                    |
|----------------------|----------------|--------------------|
| Paper II, III & IV : |                |                    |
| i.                   | Elaborate on : | 2 x 15 = 30        |
| ii.                  | Write notes on | 10 x 7 = 70        |
| <b>Total</b>         |                | <b>= 100 marks</b> |

**11. PRACTICAL EXAMINATION**

|                                                              | EXAMINATION<br>TIME     | DISCUSSION<br>TIME | MARKS     |
|--------------------------------------------------------------|-------------------------|--------------------|-----------|
| LONG CASE - 1X 80 MARKS                                      | 60 MIN                  | 30 MIN             | 80        |
| SHORT CASES – 3 x 20 MARKS                                   | 45 MIN                  | 30 MIN             | 60        |
| WARD ROUNDS<br>4 CASES X 10 marks<br>(one case per examiner) | 50 MIN                  | 30 MIN             | 40        |
| OSCE<br>4 STATIONS X 5 MARKS                                 |                         |                    | 20        |
| TOTAL                                                        | 155 MIN                 | 90 MIN             | 200 (A)   |
| VIVA                                                         |                         |                    | 80        |
| LOGBOOK                                                      |                         |                    | 20        |
| VIVA TOTAL                                                   |                         |                    | 100 (B)   |
| TOTAL AGGREGATE                                              |                         |                    | 300 (A+B) |
| MINIMUM REQUIRED FOR PASS<br>(50 %)                          |                         |                    | 150       |
| DISSERTATION                                                 | APPROVED / NOT APPROVED |                    |           |

## **12. LOG BOOK**

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

The record or log book shall be checked and assessed periodically by the faculty members imparting the training

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

**A detailed log book should be maintained for the entire duration of the course. It should contain the following details.**

- 1. Procedures performed**
- 2. Journal clubs**
- 3. Seminars**
- 4. Important cases discussed/ presented**

## **13. VIVA including competency Assessment - 80 marks**

VIVA including Competency Assessment - 80 Marks (60 + 20)

**An unstructured viva will be carried out by the examiners.**

## **14.OSCE (Objective Structural Clinical Examination)**

**The following are suggested stations for the OSCE. Any 4 can be chosen at the discretion of the examiners.**

| -----        |                                          |              |
|--------------|------------------------------------------|--------------|
| <b>S.No.</b> | <b>Stations</b>                          | <b>Marks</b> |
| -----        |                                          |              |
| 1.           | Images (X-ray/CT/MRI)                    | 05           |
| 2.           | Lab Data                                 | 05           |
| 3.           | Procedures                               | 05           |
| 4.           | Emergency                                | 05           |
| 5.           | Communication Skills                     | 05           |
| 6.           | Drugs                                    | 05           |
| 7.           | Nutrition                                | 05           |
| 8.           | ECG                                      | 05           |
| 9.           | Simulation Lab – Techniques & Procedures | 05           |

## **15. REFERENCE BOOKS**

1. Harrison's Principles and practice of medicine
2. Davidson Principles and practice of medicine
3. Oxford Textbook of Medicine
4. API Textbook of Medicine
5. Braunwald's
6. Hurst Cardiology
7. Manson's tropical Disease
8. Williams Endocrinology
9. Murray and Nadel
10. Fishman Respiratory Medicine
11. Crofton Respiratory Medicine
12. Brain Neurology
13. Adams Neurology
14. Shella Sherlock
15. Shamroth ECG Book
16. Mandell and Douglas infectious disease

**\*\* Note :** The editions are as applicable and the latest editions shall be the part of the syllabi.

## **16. JOURNALS**

1. New England Journal of Medicine
2. British Medical journal
3. Lancet
4. JAPI
5. National Medical Journal of India

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**M.D.GERIATRICS**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.D.GERIATRICS**

**BRANCH XVI**

Ever Increasing elderly population with large burden of disease and disability, pose a tremendous challenge for the health sector as well as for the social and economic infrastructure. The need for specialized training in the field of gerontology and geriatric medicine has been realized in recent years. There is an initiative in developing PG training program across the country in various medical institutions.

**1. GOAL**

The aim of this curriculum is to create a cadre of medical professionals in care of the older people who would have knowledge about the age related biological changes

- i) Provide comprehensive health care, preventive geriatrics and Rehabilitation of the elderly in both hospital and home settings.
- ii) provide undergraduate and postgraduate training
- iii) carry out research in geriatrics and gerontology
- iv) to organize and implement different health care programs for the oldest persons

**2. OBJECTIVES:**

**A) Knowledge**

The post graduate students have to acquire the knowledge of physiological changes in aging, identify the manifestations due to diseases and plan the management and care of the elderly.

**B) Attitude**

Through the training program the student should develop a positive attitude and empathy towards the elderly patient.

### **C) Skills**

The student should develop skills of communication with the elderly patient especially considering their deficits in hearing and eyesight. History taking and clinical skills with respect to the elderly patient have to be developed. The student also needs to acquire skills in carrying out various diagnostic and therapeutic procedures and use of geriatric assessment tools.

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

- **THEORETICAL KNOWLEDGE**

- a) **Basic sciences: biology of human ageing, epidemiology of human ageing, immunology of human ageing, effect of ageing on different organs.**

- b) **Clinical geriatric medicine: Knowledge of geriatric and frailty syndromes**

- c) **Knowledge of problems related to sub systems in the elderly relating to cardiology, pulmonary medicine, gastroenterology, endocrinology, nephrology, neurology, hematology, rheumatology and oncology.**

- d) **Knowledge of problems of elderly pertaining to allied specialties: urology/ andrology/ gynecology, orthopaedics, ophthalmology/ENT/ dentistry, psychiatry, pre anesthetic evaluation and peri operative management**

- e) **Preventive geriatrics, rehabilitation, palliative care, end of life, long term institutional care, legal, ethical and economic aspects.**

- **PRACTICAL AND CLINICAL SKILLS**

- ❖ **PRACTICAL SKILLS DIAGNOSTIC PROCEDURES**

1. Lumbar puncture
2. Bone marrow Aspiration, Biopsy
3. Ascitic and pleural tap
4. FNAC

- ❖ **THERAPEUTIC PROCEDURES**

1. Ascitic and pleural aspiration
2. Central line insertion
3. Intubation and ventilation
4. Urethral catheterization
5. Ryle's tube insertion

- ❖ **CLINICAL SKILLS**

1. History taking and physical Examination
2. Functional assessment
3. Cognitive assessment
4. Other geriatric assessment tools for
5. environment nutrition, depression, frailty,  
environment socio-economic

- **WRITING THESIS/ RESEARCH ARTICLES**

All students will have to carry out a research program and bring out a dissertation (thesis)

Students are encouraged to attend CME's, publish research papers and present posters, or platform presentations at State, National and International conferences.

- **ATTITUDES INCLUDING COMMUNICATION SKILLS**

Student should develop the art of eliciting the maximum information from patients in a given time considering the sensory deficits of the patient and caregivers. Communication skills can be learnt through observation and from formal communication skills training and workshops. Students have to develop patience and empathy in dealing with elderly patients. They have to learn to show sensitivity to their special needs.

- **TRAINING IN RESEARCH METHODOLOGY, MEDICAL ETHICS, BIO ETHICS AND MEDICOLEGAL ASPECTS**

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, bioethics, moral and legal issues are part and parcel of the curriculum and syllabus in geriatric medicine.

#### **4. THEORY SYLLABUS**

##### **Paper I -APPLIED BASIC SCIENCES**

##### **ANATOMY INCLUDING HISTOLOGY:**

- **Anatomy of Brain and Spinal Cord with their Blood Supply and Venous Drainage.**
- ⌘ **Cranial Nerves and Autonomic Nervous System.**
- ⌘ **Nervous Control of Bladder and Rectum.**
- ⌘ **Anatomy including Histopathology of Endocrine Glands.**
- ⌘ **Anatomy of Liver, Pancreas and Portal Circulation.**
- ⌘ **Anatomy including Histopathology of Kidneys.**
- **Anatomy including Histopathology of Spleen.**
- ⌘ **Anatomy of cardiac circulation**



- Anatomy of Bronchopulmonary Segments, Pleura and Mediastinum.
- Surface Anatomy of Head and Neck, Thorax and Abdomen.
- Aging changes in brain, Nerves, heart & blood vessels, lungs, GI Tract, Kidneys, Liver.

#### **PHYSIOLOGY INCLUDING BIOCHEMISTRY:**

- Liver: Laboratory tests of liver Function.
- Kidney: Laboratory Tests of Kidney Function.
- Exocrine and Endocrine function of pancreas.
- Hormones: Pituitary, Adrenal, Thyroid, Parathyroid, and Chemistry of Steroids - Various tests to study function of Endocrine Glands.
- Pulmonary Function Tests.
- The mechanism of Deglutition.
- Digestion: Gastric and Intestinal secretion and their Hormones- Mechanism of absorption of Fat, Proteins and Carbohydrates.
- Heart: Basic principles of conduction system and electrocardiogram - Circulation - Measurement of cardiac output - Factors controlling arterial blood pressure - Mechanism of production of cardiac failure and syndrome of shock.
- Blood, Plasma, proteins - Coagulation of blood RBC and WBC development - Platelets - Erythropoiesis and its regulation - Blood groups - Iron Metabolism.
- Physiology of Micturition and Defaecation.
- Fluid and electrolyte balance.
- Calcium and Phosphorous Metabolism.
- Carbohydrate metabolism.
- Fat metabolism
- Protein metabolism and electrophoresis.
- Inborn Errors of metabolism.
- Porphyrins and porphyrias.
- Jaundice - Types and Diagnosis.
- Metabolism of Haemoglobin and circulation of Bile pigments.
- Immunoglobulin and the Mechanism of Immunity.
- Physiology of consciousness.
- Physiology of sleep and disorders of sleep.

- Temperature regulation.
- Physiology of hunger and its disorders.

#### **PATHOLOGY INCLUDING MICROBIOLOGY:-**

- Central nervous system: Brain and spinal cord Meningitis and Encephalitis, Abscess Tumors, Syphilis .of nervous system,
- Nutritional and metabolic disorders, epilepsy, vascular diseases.
- Heart: Rheumatic fever and carditis, Coronary artery diseases Hypertension, Atherosclerosis, Cardiomyopathy, Pericarditis,
- Specific and non specific arteritis, Congenital Heart diseases.
- Kidneys: Nephritis, Nephrosis, Kidney, changes in metabolic and collagen vascular diseases, Acute and chronic renal failure.
- Lungs: Pulmonary tuberculosis, atypical mycobacteria, Tumours of lung.
- Liver: Portal hypertension, Cirrhosis of liver, Tumors of liver.
- Bone: Disorders of Mineral and Bone matrix.
- Endocrine Glands: Myxoedema and Thyrotoxicosis, Hyper and hypoparathyroidism, disease of Pituitary, Adrenal Cortex and Medulla.
- Diabetes Mellitus and its complications – Pathological changes in Viscera.
- Gastro intestinal disorders: Peptic ulcer, Malabsorption syndrome, Ulcerative colitis, Amoebiasis (Intestinal and extraintestinal).
- Lymphomas. Leukemias, Myeloma and other blood dyscrasias.

#### **PHARMACOLOGY:**

- Pharmacokinetics & Pharmacodynamics
- Chemotherapy, Antibiotics and antimicrobials
- Antimalarial drugs.
- Antiamoebic drugs.
- Anthelmintics.
- Analgesics.
- Sedatives.
- Tranquilizers.
- Antiviral agents.

- Antimitotics.
- Drugs acting on Autonomic nervous system.
- Hormones.
- Drugs for Epilepsy
- 
- Diuretics.
- Cardiac glycosides.
- Antiarrhythmic drugs.
- Coagulants and anticoagulants.
- Histamine and antihistamine drugs.
- Alcohol.
- Vaccines and Immune Sera.
- Drug abuse, drug tolerance, drug addiction, drug interactions, side effects and ADR (Adverse Drug Reactions)

## **PAPER II - GENERAL MEDICINE INCLUDING PSYCHO GERIATRICS**

### **INTRODUCTION TO CLINICAL MEDICINE:**

#### **SYMPTOMS**

- Headache
- Chest pain
- Chills and Fever
- Lassitude and Asthenia
- Cough
- Dyspnoea and palpitation
- Nausea and Vomiting
- Dysphagia
- Ascites
- Weakness, Tremor, Chorea, Athetosis
- Dizziness, Disorders of Sensation, Convulsions

#### **IMMUNOLOGICAL FACTORS IN DISEASE:**

- Components of immune system

- Mechanism of the immune response
- Immune deficiency and Lymphoproliferative disorders
- Types of immune reaction and their relation to disease
- Suppression of immune reactions and its effects
- Immunosenescence

#### **INFECTIONS AND DISEASE**

- Nature of Micro-organisms
- Epidemiology and Spread of Infections
- Defence of Human host
- Diagnosis of Infections
- Pyrexia of Unknown origin

Streptococcal infections, Staphylococcal infections, Diphtheria, Typhoid, Tetanus, Brucellosis, Sexually transmitted infections, Hospital acquired infections, Gram negative bacterial infections, Anaerobic infections

#### **CHEMOTHERAPY OF INFECTIONS**

- Antibiotics and Other Antibacterial agents
- Antivirals
- Antifungals
- Anti-retroviral therapy

#### **DISTURBANCES IN ELECTROLYTE, WATER AND H<sup>+</sup> ION**

##### **METABOLISM**

- Hyper and Hyponatremia
- Hyper and Hypokalemia
- Calcium and Magnesium metabolism

- Disturbances in  $H^+$  ion concentration

#### **DISEASES OF THE CARDIOVASCULAR SYSTEM**

- Cardiac Arrhythmia
- Cardiac Failure
- Valvular Heart Disease
- Ischemic Heart Disease
- Pericardial Diseases
- Cardiomyopathies
- Myocarditis
- Cor Pulmonale
- Atherosclerosis
- Hypertension
- Diseases of the Aorta
- Peripheral Vascular Disease

#### **DISEASES OF THE RESPIRATORY SYSTEM**

- ➔ Disease of the Upper Respiratory Tract
- ➔ Bronchial Asthma
- ➔ COPD
- ➔ Neoplasms of Lung
- ➔ Diseases of Pleura, Mediastinum and Diaphragm
- ➔ Respiratory failure

## **DISEASES OF THE GASTROINTESTINAL SYSTEM**

- **Diseases of the Oesophagus**
- **GERD**
- **Peptic Ulcer, Gastritis and Other diseases of the Stomach**
- **Malignancy of Stomach, Colon**
- **Diseases of the peritoneum**
- **Malnutrition**
- **Under nutrition**
- **Mal absorption**

## **DISEASES OF THE LIVER AND BILIARY TRACT**

- **Diagnostic procedures in Liver Disorders**
- **Derangement of Hepatic / Biliary metabolism**
- **Acute Hepatitis**
- **Chronic Active hepatitis**
- **Cirrhosis of Liver**
- **Tumors of Liver**
- **Suppurative Diseases of Liver**
- **Infiltrative and Metabolic Diseases of Liver**
- **Disorders of Gall Bladder and Bile Duct**
- **Ascites**

## **DISEASES OF THE PANCREAS**

- **Acute pancreatitis, chronic pancreatitis and pancreatic malignancy**

## **DISEASES OF THE KIDNEY AND URINARY SYSTEM**

- **Acute Renal Failure**
- **Chronic Kidney Disease**
- **Glomerulonephritis**
- **Nephrotic syndrome**
- **Vascular diseases of the Kidney**
- **Infections of the Urinary Tract**
- **Obstructive Uropathy**
- **Urinary Incontinence**
- **Nephrolithiasis**
- **Bladder outlet obstruction**
- **Prostatic Hypertrophy**
- **Benign**
- **Cancer**

## **DISEASES OF THE ENDOCRINE SYSTEM**

- **Thalamus and Pituitary Gland**
- **Diseases of the Anterior Pituitary**
- **Disorders of the Neurohypophysis**
- **Hyper and Hypothyroidism**
- **Hyper and Hypoparathyroidism**
- **Diabetes Mellitus / Insipidus**
- **Hyperinsulinism / Glucagon and its effects**
- **Diseases of the Adrenal Cortex and Medulla**
- **Diseases of the testes and Ovaries**

## **DISEASES OF BLOOD AND BLOOD FORMING ORGANS**

- **Blood formation and destruction**
- **Anaemia**
- **Bone Marrow Failure**
- **Blood Groups and Blood Transfusion**
- **Myeloproliferative disorders**
- **Abnormal Haemoglobins**
- **Disorders of platelets**
- **Haemorrhagic disorders**
- **Leukaemia**
- **Lymphomas**
- **Diseases of Spleen and Reticulo-endothelial system**



## **DISEASES OF CONNECTIVE TISSUE, JOINTS AND BONES**

- **Rheum**
- **atoid Arthritis, including LORA**
- **Ankylosing spondylitis**
- **Systemic Lupus Erythematosus**
- **Scleroderma**
- **Polymyalgia Rheumatica**
- **Gout**
- **Pseudogout**
- **Osteoarthritis , Osteopenia , Osteomalacia, Osteoporosis**
- **Diseases of bone – Metabolic and Endocrine**
- **Tumours of Bone**

## **DISEASES OF THE NERVOUS SYSTEM**

- **Diagnostic methods in Neurology**
- **Coma**
- **Headache**
- **Epilepsy**
- **Sleep Disorders**
- **Diseases of Cranial Nerves**
- **Cerebrovascular Diseases**
- **Diseases of the Spinal Cord**
- **Diseases of the Peripheral Nervous System**
- **Pyogenic infections of the CNS**

- **Viral Infections**
- **Multiple Sclerosis and other demyelinating diseases**
- **Metabolic and Nutritional diseases of CNS**
- **Degenerative diseases**

#### **DISEASES OF THE SKIN**

- **Cutaneous manifestation of systemic illness**
- **Generalised Pruritus**
- **Pigmentation of the Skin**
- **Disorders of Melanin Metabolism**
- **Photosensitivity and other reactions to light**
- **Hirsutism and Alopecia**
- **Cutaneous manifestations of internal malignancy**
- **Psoriasis**
- **Scabies**
- **Fungal infections of skin**

#### **SYLLABUS FOR PSYCHO GERIATRICS**

- **Epidemiology of Mental Disorders in the elderly**
- **Definition and Classification of Psychiatric Disorders**
- **Delirium / Acute Confusional State**
- **Dementia**
- **Depression in Old Age**
- **Bipolar disorder**
- **Functional psychiatric disorders in old age**
- **Personality and Behavioural disorders**
- **Psychogeriatric service – Principles of treatment**
- **Management of Psychiatric Illness**
- **Alcoholism and the elderly patient**
- **Care-giver problems**

### **PAPER III**

### **GERIATRIC MEDICINE**

#### **GENERAL:**

- **Demography, World Trends**
- **Trends in India and Developing countries**
- **The Aged and Society – Past and Present**
- **The evolution of Geriatric Medicine**

#### **GERONTOLOGY:**

- **Normal and Abnormal Aging**

- **Theories of Aging**
- **Metabolic and Structural Aspects of Aging**
- **Biochemical changes in the Normal Aging Brain**
- **Aging in tissues and cells**
- **Atherosclerosis and Aging**
- **Ecology of Human Senses**
- **The interior milieu and Aging**

#### **GERIATRIC MEDICINE:**

- **How are elderly patients different?**
- **Common patterns of disease in old age**
- **Alteration in pain and temperature responses**
- **Atypical presentation**
- **Complications of Illness**
- **Non specific presentations**
- **Masking by known disease**
- **History taking in the elderly**
- **Physical Examination of the old patient**

#### **INVESTIGATIONS IN THE ELDERLY**

- **Policy**
- **Interpretation**

- Radiological, Hematological & Biochemical investigations
- ECG
- Urinalysis
- Radio isotope tests
- Bone Scan
- Imaging – Ultrasound, CT Scan, MRI
- How much to investigate?
- Concept of Normal Range

## **IMMUNOLOGY**

- Genetic aspects of Immunity and Immunological Diseases
- Mutation
- Alternative theories of Aging
- Cancer
- Immunological Surveillance

## **NUTRITION**

- Nutritional requirement
- Changes in total body mass and body composition
- Nutritional Assessment
- Nutritional deficiency in old age
- Osteoporosis
- Osteomalacia and Vitamin D
- Iron and Vitamins
- Recommended intake of nutrients

- **Prevention of Nutritional Deficiency**

## **CARDIOVASCULAR SYSTEM**

- **Physiology and Pathology of Cardiovascular system in old age**
- **Investigation of Heart Diseases in Old age**
- **Cardiac Arrhythmias**
- **Coronary Artery Disease and Acute Myocardial Infarction**
- **Hypertension and Hypertensive Heart Disease**
- **Postural Hypotension**
- **Valvular Heart Disease**
- **Cor Pulmonale**
- **Chronic Congestive Heart Failure**
- **Aortic aneurysm**
- **Bacterial Endocarditis**
- **Peripheral Vascular Disease**
- **Deep Venous Thrombosis and Pulmonary Embolism**

## **ENDOCRINE AND METABOLIC DISORDERS**

- **Changes with Aging**
- **Diabetes Mellitus**
- **Diseases of the Pituitary, Parathyroid and Thyroid**
- **Obesity**

- **Sexual dysfunction**
- **Disorders of Sodium, Potassium, Calcium, Magnesium and Zinc**
- **Disturbances of Fluid Metabolism**
- **Hyperpyrexia / Heat Stroke**

#### **CENTRAL NERVOUS SYSTEM**

- **The Aging Brain**
- **Vascular lesions of the Central Nervous System**
- **Dementia**
- **Degenerative disorders including Parkinsonism**
- **Head Trauma**
- **Infections of the Nervous System**
- **Epilepsy**
- **Peripheral Neuropathy**
- **Disorders of Spinal cord & Nerve Roots**
- **Neoplasia**

#### **GENITOURINARY SYSTEM**

- **Structural changes with aging**
- **Acute and Chronic Renal Failure**
- **Infections of the Genito Urinary Tract**
- **Diseases of the Bladder and Prostate**
- **Urinary Incontinence**

- **Aging changes in the Genital Tract**
- **Post Menopausal Bleeding**
- **Gynaecological disorders in the Elderly**

#### **DISORDERS OF THE SPECIAL SENSES**

- **Disorders of the Eye**
- **Hearing Disturbances**
- **Disturbance of Taste and Smell**
- **Dental Problems**

#### **INFECTIONS IN THE ELDERLY:**

- **Host Defences – Natural Barriers**
- **White Cell response, Immune mechanism**
- **Diagnosis of Fevers**
- **Urinary Infection – Diagnosis and Treatment**
- **Pneumonias – Cause, Diagnosis and Treatment**
- **Septicemia**
- **Bacterial Endocarditis**
- **Antibiotic Treatment**
- **Rational Use of Antibiotics**

#### **GASTRO INTESTINAL SYSTEM**

- **Changes with Age**
- **Investigations of the Gastro intestinal Tract**
- **Disorders of the Mouth**
- **GERD / Hiatus Hernia**
- **Acid Peptic Disease**
- **Disease of the Pancreas**



- Diseases of the small Intestine
- Diseases of the Large Intestine
- Fecal Incontinence
- GI Malignancy
- Disease of the liver and Biliary System
- Constipation – Prevention and Management

#### **RESPIRATORY SYSTEM**

- Changes with Age
- Infections of the Respiratory System
- Chronic Obstructive Airway Disease
- Bronchial Asthma
- Bronchogenic carcinoma
- Respiratory Abnormalities in Extra-pulmonary conditions
- Respiratory Failure

#### **MUSCULOSKELETAL SYSTEM**

- The aging joints
- Degenerative Joint Disease
- Gout, Pseudogout
- Rheumatoid Arthritis
- Infective Arthritis
- Myopathy, Myositis, Polymyalgia Rheumatica
- Temporal artiritis

- Osteoporosis
- Osteomalacia
- Osteopenia

#### **HEMATOPOIETIC SYSTEM**

- Changes with Aging
- Anaemia in the elderly
- The Leukaemias and Lymphomas
- Paraproteinaemia
- Myelodysplastic syndromes
- Disorders of Haemostasis

#### **DERMATOLOGY**

- The Aging Skin
- Pruritus
- Cancers / Benign Lesions
- Pemphigus & Pemphigoid
- Senile Purpura
- Herpes Zoster
- Intertrigo
- Leg Ulcer
- Hansen's Disease

#### **MALIGNANCY IN THE ELDERLY**

- Incidence, Clinical Significance
- Presentation
- Investigation and Management
- Counselling

## **PHARMACOLOGICAL ASPECTS OF AGING**

- **Pharmacokinetics in the elderly**
- **Pharmacodynamics**
- **Drug Selection and Dosage**
- **Drug Interactions**
- **Adverse Drug Reactions / side effects**
- **Drug Compliance**
- **Drug Misuse**

## **SURGERY IN THE ELDERLY**

- **Pre-operative Assessment**
- **Priorities for surgery**
- **Surgical Emergencies**
- **Fractures**
- **Pathological fractures**
- **Benign lesions**
- **Gangrene – Amputation**
- **Elective Surgery**
- **Peri operative problems and Management**
- **Anaesthesia in old age**

## **SPECIAL PROBLEMS**

- **Pressure Sore**
- **Care of the Chronically ill**
- **Care of patients with terminal illness**
- **Religion and Illness**

- Falls
- Nursing home placement
- Syncope
- Frailty
- Palliative care

#### **PAPER IV**

#### **SOCIAL AND PREVENTIVE GERIATRICS**

#### **INCLUDING REHABILITATION & RECENT ADVANCES**

#### **SOCIAL GERIATRICS**

- Types of Family – Joint family system- promotion of Joint Family System – Role of Elders and the younger generation
- Isolation, loneliness and dependency – Dependency ratio – Generational equality
- Social changes due to urbanisation and industrialisation with respect to Elders
- Elder mistreatment (neglect and abuse)
- Problems of elderly women
- Ethno geriatrics
- Financial aspects – sources of Income, Old age pension
- Role of Govt and NGOs in Socio-Economic status of the Elderly
- Geriatric Service for the Elderly in Western Countries and in India – Structure of geriatric Service – Family as basic Unit – Models of Geriatric Service
- Day Hospital, Day Care Centre, Long Stay Care Institution, Home for the Aged, Functions of the Day Hospital – Staff and patients of day Hospital
- Nursing Home in Western Countries – Goals of Geriatric Care – Need for similar services in India

- **Psychogeriatric services – structure and facility– Domiciliary Assessment and community Care**
- **Palliative and Terminal Care Services – social and Spiritual problems in Terminally ill**
- **Ethical Issues in Geriatric Medicine – Self determination and decision making in treatment options – Advance directives - Informed Consent – Quality of life – Age limits on health careLife sustaining measures**
- **Euthanasia – Acts of Omission and Commission**

#### **PREVENTIVE GERIATRICS**

- **Preventing Diseases and promoting health in old age – Types of preventive activities – Risk factor management in elderly – screening**
- **Health belief model – General Health practices in elderly**
- **Exercise in the elderly – Physical and Mental domain – Benefits of Exercise**
- **Development of Anticipatory Care and its Rationale – methods of Anticipatory Care**
- **Health promotion and Health Education in the Elderly**
- **Anti-Aging interventions**

#### **REHABILITATION**

- **The concepts and History of Rehabilitation**
- **The goals of Rehabilitation**
- **Principles of Rehabilitation – Assessment, Goals, Priorities and Monitoring Progress**
- **Rehabilitation in Old age – Special features in relating to aging, multiple pathology, Policies, Expectation, Carers, Acute Illness, Social and Financial Support**

- **Clinical Evaluation of Rehabilitation – Impairment, Disability and Handicap**
- **Prevalence of Disability, Types of disability**
- **Rehabilitation as Team work – Team leadership, Therapist, Physiotherapy, Occupational Therapy, Social Worker, Physician and Nursing personnel.**
- **Self care evaluation and management of Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) – Self Care Assessment Tools**
- **Aids and application – tools for living**
- **Role of Physiotherapy in the elderly**
- **Contractures and other deleterious effects of immobility**
- **Pressure Ulcer – Factors, Prevention and management**
- **Rehabilitation of Stroke in the Elderly**
- **Rehabilitation of specific Diseases – Parkinsonism, Paraplegia, Fracture Neck of Femur, Acute and chronic Arthritis, Lower limb amputation, low back pain**
- **Organisation and Effectiveness of Rehabilitation services – Community Services**
- **Geriatric Unit, Day hospital, Day Care Centre, Long Stay Care Institution – role of rehabilitation in the above services**

#### **ADVANCES IN GERIATRIC MEDICINE:**

- **Alzheimers Disease**
- **Parkinsonism**
- **Osteoporosis**
- **Urinary Incontinence**
- **Falls / Prevention of Fractures**
- **Parenteral Nutrition**
- **Stroke Clinic**
- **Memory Clinic**
- **Anti Aging research**
- **Frailty**
- **Inflammatory markers**

- Assistive devices and gerotechnology

### 1. TEACHING LEARNING METHODS

The following teaching learning methods are recommended.

- Lectures
- Case based discussion
- Bed side clinics
- Teaching on ward rounds
- Symposia
- Seminars
- Journal clubs
- Problem based learning
- Telemedicine
- Attending Medical Audit Meetings.

### 6. STRUCTURED TRAINING PROGRAM

Duration of Course – Three years

→ I Year : Candidates will be posted in Geriatric medicine and General Medicine for a period of 12 months as follows:

- |                        |          |
|------------------------|----------|
| o Geriatric Medicine : | 6 months |
| o General Medicine :   | 6 months |

- II Year:

Geriatric Medicine : 3 months

*Specialty postings*

Cardiology, Neurology, Psychiatry, : 1 month in each

Department

|                             |                            |
|-----------------------------|----------------------------|
| Rehabilitation, Nephrology  |                            |
| Gastroenterology            |                            |
| Haematology                 |                            |
| Dermatology                 | 15 days in each department |
| Intensive Medical Care Unit |                            |
| Thoracic Medicine           |                            |
| Rheumatology                |                            |
| Medical Oncology            |                            |
| Diabetology                 |                            |

**\*\*** The students shall be posted in the first month of third year at the Department of Community Medicine to undergo field practice by selecting 30 geriatric patients at rural and urban areas of 15 cases each and the same shall be documented in the record (log) book.

This will be implemented from 2017-18 admission onwards

**\*\* Resolved in 55<sup>th</sup> Standing Academic Board held on 18.07.2018.**

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**III Year: Geriatric Medicine : 12 months**



7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

#### 8. COMPETENCY ASSESSMENT:

- **OVERALL:**

a) Communication / commitment / Contribution / Compassion towards patients and Innovation ( ) - 5 Marks

b) Implementation of newly learnt techniques/skills ( )

- Number of cases presented in Clinical Meetings/ Journal clubs/seminars - 5 marks

- Number of Posters/Papers presented in Conferences/ Publications and Research Projects - 5 marks

- No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks

Total 20 Marks

#### PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)  
Log Book - 20 marks

#### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total Max.20 marks |
|---------------|----------|----------|-----------|----------|--------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks           |
|               | AVERAGE  |          |           |          | 20 Marks           |

#### 9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

#### **10.THEORY EXAMINATION**

Theory examination will comprise 4 papers.

**Paper I : Applied Basics Sciences in Geriatric Medicine**

**Paper II : General Medicine including Psycho Geriatrics**

**Paper III : Geriatrics**

**Paper IV : Social and Preventive Geriatrics including Rehabilitation and Recent Advances**

**Question Paper pattern:**

**Paper I : Write notes on**

Anatomy  $4 \times 5 = 20$

Physiology  $4 \times 5 = 20$

Biochemistry  $3 \times 5 = 15$

Pharmacology  $3 \times 5 = 15$

Pathology  $3 \times 5 = 15$

Microbiology  $3 \times 5 = 15$

**Total = 100 marks**

**Paper II, III & IV :**

Elaborate on :  $2 \times 15 = 30$

Write notes on  $10 \times 7 = 70$

**Total = 100marks**

**11.PRACTICAL EXAMINATION**

**SCHEME OF EXAMINATION**

|                                         |                                |
|-----------------------------------------|--------------------------------|
| <b>Clinicals</b>                        |                                |
| <b>LONG CASE (1 CASE x 80 MARKS)</b>    | <b>80 MARKS</b>                |
| <b>SHORT CASES (2 CASES X 35 MARKS)</b> | <b>70 MARKS</b>                |
| <b>WARD ROUNDS (3 CASES X 10 MARKS)</b> | <b>30 MARKS</b>                |
| <b>OSCE (4 STATIONS X 5 MARKS)</b>      | <b>20 MARKS</b>                |
| <b>TOTAL</b>                            | <b>200 MARKS (A)</b>           |
| <b>VIVA</b>                             |                                |
| <b>VIVA</b>                             | <b>80 MARKS</b>                |
| <b>LOG BOOK</b>                         | <b>20 MARKS</b>                |
| <b>TOTAL</b>                            | <b>100 MARKS (B)</b>           |
| <b>AGGREGATE (CLINICAL + VIVA)</b>      | <b>300 MARKS (A + B)</b>       |
| <b>MINIMUM PASS (50%)</b>               | <b>150 MARKS</b>               |
| <b>DISSERTATION</b>                     | <b>APPROVED / NOT APPROVED</b> |

## **12. LOG BOOK**

### **LOG BOOK:**

The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

## **13. VIVA (including Competency Assessment) – 80 Marks (60 + 20)**

An unstructured viva will be carried out by the examiners.

## **14.OSCE (Objective Structural Clinical Examination)**

The following are suggested stations for the OSCE.

1. Images (X-ray/CT) / MRI / PET
2. Lab Data
3. Procedures
4. Emergency
5. Communication Skills
6. Drugs
7. Disability
8. Nutrition
9. Rehabilitation
10. Geriatric Assessment Tools

## **15. REFERENCE BOOKS**

1. Lecture notes on elderly care medicine
2. Brocklehurst Textbook of Geriatric Medicine and Gerontology
3. Oxford Textbook of Geriatric Medicine

4. Essentials of Clinical Geriatrics
5. Current Geriatric Diagnosis and Treatment
6. Geriatrics Secrets
7. Geriatrics at your finger tips
8. Comprehensive geriatric assessment
9. Little black book of geriatrics
10. Geriatric dosage hand book
11. Healthy ageing the role of Nutrition & Life style
12. Hazzard's Geriatric Medicine and Gerontology

**\*\* Note :** The editions are as applicable and the latest editions shall be the part of the syllabi.

#### **16. JOURNALS**

1. JOURNAL OF THE AMERICAN GERIATRICS SOCIETY
2. AGE AND AGEING
3. NEW ENGLAND JOURNAL OF MEDICINE
4. GERIATRICS
5. CLINICS IN GERIATRIC MEDICINE
6. CANADIAN GERIATRICS JOURNAL
7. THE GERONTOLOGIST
8. INTERNATIONAL JOURNAL OF GERIATRICS PSYCHIATRY
9. DRUGS AND AGING
10. BMC GERIATRICS
11. ANNUAL REVIEW OF GERONTOLOGY AND GERIATRICS
12. NEUROBIOLOGY OF AGING

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**M.D IMMUNO HAEMATOLOGY  
AND BLOOD TRANSFUSION**

**THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI**

**M.D IMMUNO HAEMATOLOGY AND BLOOD TRANSFUSION**

Transfusion medicine has emerged as a distinct speciality not confined to blood bank alone but has reached the patient's bed side. It is a diverse and multifaceted discipline concerned with the proper use of blood and blood components in the treatment of human diseases. Last few decades have witnessed rapid technological advances which have changed the scope and scenario of transfusion medicine services. It becomes important that MD students are trained in this specialty so that they are properly equipped to render special consultative service. The purpose of the course is to provide didactic education and practical training in all aspects of blood transfusion technology including pheresis donation and therapeutic apheresis, to develop the knowledge required to analyze Immunohematology problems, to provide expertise in blood centre administrative policies such as donor recruitment, collection, storage, preservation, administration of blood and components.

The rapid technological advances in transfusion practices, such as apheresis, stem cell transplantation, plasma exchange, molecular testing protocols, fractionation, have created a gap between users of the blood and BTS. Didactic training programs will help to resolve these problems. A well conceived training program will improve quality, efficiency and effectiveness of BTS. IT will also help promote applied research in the field pertaining to the needs of the country.

The National Blood Policy of India has reiterated the importance of creation of trained manpower in this field in the country. It is, therefore, extremely essential to train medical specialists in the discipline of Transfusion Medicine who can actively and constantly interact with clinical colleagues for evolving a relevant and rational approach for provision of efficient and effective blood transfusion services.

A postgraduate appearing for the MD degree in this specialty is supposed to have acquired not only professional competence expected of a well-trained specialist but also academic maturity, a capacity to reason and critically analyze a set of scientific data. He is supposed to keep himself abreast with the latest developments in the field of the blood transfusion & Immunohematology and related sciences. A brief outline of what is expected to have learnt during each of the postings in the different sections/laboratories during the MD Course is given under each head.

**I.GOAL**

To impart training to develop transfusion medicine specialists with comprehensive knowledge and skills in clinical and laboratory domains of the speciality.



## **II. PROGRAM OBJECTIVES**

- To impart composite training in fundamental and applied aspects of Transfusion Medicine at postgraduate level leading to degree of MD in Transfusion Medicine [Blood transfusion and immunohematology].
- To provide consultants and teachers in Transfusion Medicine in various medical colleges and institutions for operating a well organized & efficient transfusion services.
- To impart training and stimulate interest in research in the field of Transfusion Medicine.

## **III. SPECIFIC OBJECTIVES**

1. To provide comprehensive training in all aspects of blood banking, recruitment, donation, screening, processing, storage, component preparation, immunohaematological procedures, apheresis techniques and transfusion management so that trainees are equipped for:

- a. Managing a major academic department or hospital blood centre.
- b. Acting as a guide, teacher, and consultant;
- c. Beginning a career as a research investigator in the field of Transfusion Medicine.

2. It is expected that blood transfusion specialists will be specifically equipped for the following tasks:

- a. Programme and organisation of the collection, preparation, storage, distribution and use of blood and blood products in the lights of a periodical evaluation of the needs of the sector in their charge.
- b. Organisation of a quality control programmes.
- c. Promotion of optimal use of blood and blood products and development of system for the clinical control of their use.
- d. Organisation of Training Programme for manpower development.
- e. Participation in research on Blood Transfusion, Immunohaematology, Immunogenetics, and Haemotherapy.

#### **IV.COMPONENTS OF POSTGRADUATE CURRICULUM:**

##### **a. THEORETICAL KNOWLEDGE**

- i. Basic Sciences: Immunology, Medical Genetics, Haemostasis & Physiology of Formed Elements of blood.
- ii. Blood Collection/Blood Center/Component Processing: Demonstrate understanding of the processes associated with Blood in donor motivation, counselling, recruitment, selection and proper donor care. Knowledge of organisation and management, regulations, legal and ethical aspect of blood transfusion services. Knowledge of blood collection (whole blood/apheresis), processing, compatibility testing and issue of blood components as per clinical indications.
- iii. Transfusion transmitted infection: Demonstrate understanding of various strategies for improving blood safety in general and TTI testing in particular pertaining to Indian conditions. Knowledge of newer technologies that are being introduced in the field of TTI testing.
- iv. Immunohematology / Blood Group Serology / Compatibility testing: knowledge of various major and minor blood group systems, Immunohaematological laboratory tests, pretransfusion testing, potentiators and their applications in solving immunohaematological problems such as polyagglutination, subgroups of ABO system, red cell antibody detection. Knowledge of various advances in this field including automation and computerization. Knowledge of pathophysiology, clinical features, lab diagnosis & management of various clinical conditions requiring immunohaematological and transfusion support. Knowledge of “rare blood group donor” including identification, cryo-preservation of rare blood and making their registry.
- v. Clinical Transfusion Service: Knowledge of patient/ unit identification and its importance in blood safety, blood inventory management, rational use of blood and components. Recognition of symptoms and signs of hemolytic and nonhemolytic transfusion reactions, pathophysiology, treatment, and prevention of these complications. Knowledge of the major non-infectious complications of blood

transfusions, their risk, prevention and management strategies. Knowledge of bleeding disorders such as Hemophilia, von Willebrand's disease. Knowledge of various methods of blood conservation and approaches to "bloodless" surgery, various point-of-care tests (TEG, ROTEM) for hemostasis & recommend component therapy depending on the results, transfusion support in general surgery and special procedures such as cardiac surgery or oncological surgery. Knowledge of hematopoietic stem cell transplantation, including collection, processing, storage and the indications for use.

- vi. Knowledge of Therapeutic Apheresis, Therapeutic Plasma Exchange and Cytapheresis.
- vii. Knowledge of various regulatory and accreditation agencies, quality assurance and quality control in blood transfusion service.
- viii. Demonstrate additional competencies & recent advances specific to transfusion medicine.
- ix. Demonstrate the knowledge of various research methodologies and their applications of bio statistics in analyzing the research data.

**b. PRACTICAL / CLINICAL SKILLS**

❖ Practical skills in basic sciences

1. Hemoglobin estimation.
2. Laboratory tests in coagulation and thrombosis such as prothrombin time, activated partial thromboplastin time (APTT), thrombin time, platelet function testing, mixing tests, factor assays, investigations in DIC.
3. HLA typing techniques, including serological methods, micro cytotoxicity assays, nucleic acid assays and lymphocyte culture.
4. Polymerase Chain Reaction (PCR) and Western Blot and Hybridization procedures

❖ Blood Collection/Blood Centre/Component Processing

1. Selection of whole blood donors and apheresis donors.
2. Collection of whole blood (phlebotomy site preparation, proper volume and sample collection etc...).
3. Evaluation and management donor of adverse reactions (whole blood / apheresis donations).
4. Organization of outdoor blood donation camps and demonstrates skills to motivate blood donors / organizers.
5. Preparation of various blood components as per departmental SOP.
6. Understand the significance of storage of blood components at appropriate temperature and demonstrate proficiency in compatibility, labelling requirements of various components.
7. Donor notification and counselling (Pre and Post donation) and the donor look-back process.
8. Modifications of blood components ( irradiation/ cell washing/ volume depletion/ leuko depletion)
9. Perform quality control tests on each blood components such as PRBC, FFP, Platelets, and Cryoprecipitate.

❖ Transfusion transmitted infection

1. Compare & contrast various methodologies such as ELISA, rapid & chemiluminescence used in screening of transfusion transmitted infections
2. Demonstrate proficiency in performing, interpretation, documentation of blood donor screening tests for TTIs as per departmental SOP.
3. Preparation and interpretation of LJ Chart and root cause analysis (RCA) and Corrective and Preventive action (CAPA) as and when required.
4. Perform and be able to interpret nontreponemal and treponemal antibody tests used to diagnose syphilis.
5. Proper handling and disposal of biohazardous material as per regulatory requirements
6. Gram staining.

❖ Immunohematology / Blood Group Serology / Compatibility testing

1. preparation of cell suspensions of appropriate concentration following cell washing techniques correctly & grade and interpret antibody-antigen reactions according to the established criteria
2. Perform ABO/Rh grouping as per departmental SOP.
3. Perform, interpret and resolve discrepant results in pretransfusion testing, ABO/Rh grouping, red cell antibody screen, and antibody identification.

4. Perform and interpret various immunohematological tests such as Direct Antiglobulin test, Indirect Antiglobulin test , Red cell antibody detection and identification, Titration of Anti D and Anti A and Anti B ,Elution, Adsorption, minor blood group typing, Saliva Inhibition Test, Resolution of ABO discrepancy
5. Selection of blood unit for a patient with auto immune haemolytic anemia

❖ Clinical Transfusion Service

1. Identification of irregular antibodies in pregnant patients that are clinically significant and make appropriate recommendations for blood products. Demonstrate proficiency in preparation and transfusion of blood for intra uterine transfusion / exchange transfusion.
2. Choose appropriate blood components and derivatives based on a thorough knowledge of the indications for transfusion.
3. Evaluation and appropriate transfusion therapy of thrombocytopenic patients (both adult and pediatric) including neonatal alloimmune thrombocytopenia.
4. Transfusion support in special patient populations (e.g., hematology/ oncology, pediatrics, thalassemia, hemophilia, transplantation, cardiac surgery and burn/trauma).
5. Appropriate use of blood components in clinical conditions such as hemoglobinopathies, hemophilia, autoimmune hemolytic anemia, massive transfusion, obstetric conditions etc
6. Management of blood inventory and the ability to communicate effectively the hospital's needs to the blood donor recruiters. Triage and screen requests for blood components appropriately during inventory shortages.
7. Evaluation of effectiveness of platelet transfusion including patient's with refractoriness to platelet transfusions
8. Demonstrate competency in providing transfusion and immunohaematological support to patients with bone marrow / stem cell transplantation.

❖ Therapeutic Apheresis, Therapeutic Plasma Exchange and Cytapheresis

1. Demonstrate proficiency in evaluating and preparing patients for therapeutic apheresis, including discussion with the patient of the risks and benefits associated with apheresis procedures and obtaining informed consent.
2. Perform plasma exchange and monitoring the patient for complications and efficacy of the procedure.
3. Demonstrate proficiency in evaluating and treating adverse reactions associated with therapeutic apheresis.

❖ Regulatory issues / Quality Assurance/ Quality Control in blood transfusion

1. Demonstrate proficiency in preparing SOPs for the department.
2. Be able to understand proper use of instrumentation and computerization in a transfusion laboratory.
3. Compare and contrast the various means of performing blood utilization reviews.
4. Explain the logistics required in determining appropriate blood inventory for a geographic region and the process of meeting daily, weekly and monthly collection goals.
5. Recognize sources of pre-analytical variation and the role of biological variability in laboratory assessment.
6. Be able to calculate means, standard deviation and standard error from the given experimental data
7. Ability to generate various reports required for the various regulatory authorities.
8. Be able to perform root cause analysis.

❖ Practice-Based Learning and Improvement

Demonstrate the ability to develop new policies and procedures or change existing policies and procedures based on a review of the literature or issuance of new guidelines by regulatory agencies.

b. **WRITING DISSERTATION AND RESEARCH PAPER**

All students will have carry out a research program and bring out a dissertation (thesis).

Students are encouraged to attend CMEs, publish research papers and present posters, or platform presentations at state, national and international conferences.

c. **ATTITUDE INCLUDING COMMUNICATION SKILLS**

❖ Basic Sciences

- Demonstrate honesty and integrity in all interactions.
- Demonstrate responsibility and trustworthiness in the execution of all duties.
- Demonstrate the ability to accept criticism and to understand the limitations of one's own knowledge and skills.
- Demonstrate a commitment to excellence and ongoing professional development

❖ Blood Collection/Blood Center/Component Processing

- The student should demonstrate professionalism in taking a bleeding history from a patient.
- The student should be able to function as a part of a team that is essential for the selection and management of a blood donor. He/she should therefore develop an attitude of cooperation with his/her colleagues so necessary for this purpose. It is implied that he/she will whenever necessary interact with the blood donor, patient, clinician

and other colleagues to provide the best possible blood transfusion support, diagnosis or opinion.

- Demonstrate compassion and sensitivity in the care of patients and respect for their privacy and dignity.
- Respect for donor / patient autonomy.
- The student should demonstrate professionalism during blood donor selection, counseling and notification. Always adopt ethical principles and maintain proper etiquette with blood donors, outdoor camp organizers and other health personnel.
- Be able to obtain informed consent from donor.
- Respect the rights of the blood donor including the right to information and maintaining confidentiality.
- Develop communication skills not only to word reports and professional opinions but also to interact with blood donors, outdoor camp organizers, peers and paramedical staff.
- Always adopt principles of laboratory / personnel safety and respect documentation required as per law.

#### ❖ Transfusion transmitted infection

- Respect the rights of the sero-positive blood donor including their confidentiality, right to information.
- Adopt ethical principles and maintain proper documentation while interacting with other inter related labs such as ICTCs, counselor, state AIDS Control Societies etc.
- Student should follow all safety policies and adhere to the department's laboratory safety plan and personal hygiene plan.

#### ❖ Immunohematology / Blood Group Serology / Compatibility testing

- Should be able to interact with clinical colleagues in professional manner to provide best possible transfusion support and opinion in immunohaematological problems.
- Demonstrate improvement in the affective traits of organizational skills, work habits, attitude, interpersonal skills, and problem-solving ability.
- The student should maintain a clean and orderly work area.

#### ❖ Clinical Transfusion Service

- Should be able to function as a part of a team that is essential for the diagnosis and management of a patient. He/she should therefore develop an attitude of cooperation with his/her colleagues so necessary for this purpose.
- Should be able to interact with clinical colleagues in professional manner to provide best possible transfusion support and opinion.
- The student should accept constructive criticism as a learning process. Utilize constructive criticism to correct deficiencies and improve performance.

- The student should demonstrate inquisitiveness by asking necessary questions concerning practical performance or theoretical application of laboratory procedures.
  - ❖ Therapeutic Apheresis, Therapeutic Plasma Exchange and Cytapheresis
    - Communicate effectively with clinicians and patients regarding emergent or scheduled therapeutic apheresis procedures through conversations and writing of consult notes
    - Demonstrate the ability to discuss the process of therapeutic apheresis with patients, and/or family members where appropriate; answer their questions; and obtain informed consent.
  - ❖ Regulatory issues / Quality Assurance/ Quality Control in blood transfusion
  - Provide leadership and inspire members of the team with whom he/she is involved with in the fields of management of transfusion services, teaching and research
- d. **TRAINING IN RESEARCH METHODOLOGY, MEDICAL ETHICS, BIOETHICS AND MEDICOLEGAL ASPECTS**
- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.
  - Students are encouraged to attend workshops/CME on Bioethics conducted by the University and other reputed Institutions.
  - Medical ethics, Bioethics, moral and legal issues are part and parcel of the curriculum and syllabus.
  - Students should be given the opportunity to participate in applied or basic science projects related to transfusion in addition to their MD dissertation.

## **II.THEORY SYLLABUS**

### **1. History of Transfusion Medicine: (Only Theoretical Knowledge required)**

#### **1.1. Landmarks in the evolution of Transfusion Medicine.**



1.2. Changing trends in the practice of Transfusion Medicine.

1.3. Development of Transfusion Medicine during wars.

2. **Physiology and Biochemistry of blood:**

**Theoretical Knowledge**

II.1 Basic physiology and biochemistry of red cells, platelets and leukocytes in terms of their kinetics, function and life span.

II.2 Hemoglobin structure, synthesis, function and degradation.

II.3 Membrane structure and function of red cells, platelets and leukocytes and their implication in transfusion medicine.

II.4 Principles of hemoglobin screening.

II.5 Iron and bilirubin metabolism.

II.6 Physiology of hemostasis with regard role of platelets, coagulation pathway and fibrinolysis & concepts of basic coagulation disorders.

II.7 Pathophysiology of thrombocytopenia and thrombocytosis.

II.8 Pathophysiology and laboratory features of intravascular and extravascular hemolysis.

II.9 Homeostasis of blood donation.

II.10 Haemostatic and thrombotic disorders:

a. Coagulopathy of liver disease.

b. Pathophysiology of vitamin K deficiency and antagonism.

- c. Laboratory evaluation of disseminated intravascular coagulation

II.11 Haemodynamics of circulation.

II.12 Pathophysiology of haemorrhagic shock.

II.13 Biochemical and haematological alterations during storage.

### **Practical Skills**

II.14 Competence in various haemoglobin estimation techniques.

II.15 Complete Blood Count – Methods & Interpretation.

II.16 Competence in clinical assessment of patients with bleeding and thrombotic disorders.

II.17 Blood/Plasma Volume estimation and applications.

II.18 Performing basic tests to assess storage lesions of various blood components

## **3. Immunology, Immunohaematology and Immunogenetics relevant to Transfusion Medicine and Transplantation (including Blood Group systems)**

### **Theoretical Knowledge**

3.1 Basic concepts of antigen, antibody complements and immunoglobulins.

3.2 Complement activation pathways and their role in transfusion medicine

3.3 Antibody development after immunization and infection.

3.4 Antigen antibody reactions and factors affecting these reactions.

3.5 Antigen systems of formed elements of blood such as red cells, platelets and leukocytes and their implications in transfusion medicine.

- 3.6 Structure and function of B cells, T cells, NK cells.
- 3.7 Classification of primary immune deficiency diseases, including defects in humoral immunity, cellular immunity
- 3.8 Detailed study of Blood Group and serological platforms & reagents for testing.
- 3.9 Basic genetics with regard to Mendelian law of inheritance, phenotype / genotype and population genetics.
- 3.10 Nomenclature, organization and polymorphism of the human major histocompatibility complex, including HLA class I, II, and III genes and other systems relevant to transfusion medicine and transplantation.
- 3.11 Basics of Hybridoma technology

### **Practical Skills**

- 3.12 Basics of tests involving antigen-antibody reactions, blood grouping, antihuman globulin (coombs serum) and crossmatching.
- 3.13 Antibody screening and identification
- 3.14 Extended phenotyping of red cells.
- 3.15 Methods for antigen – antibody testing.
- 3.16 Transfusion reaction work-up.
- 3.17 Genotyping including different molecular techniques (if facilities are available)

3.18 Applied serology ( e.g., use of enzymes, adsorption elution techniques, identification of Donath-Landsteiner antibody etc., )

#### **4      Organisation and Management of Transfusion Services**

##### **Theoretical Knowledge**

- 4.1 Planning and development of Transfusion Services.
- 4.2 Organisation and functions of blood centre.
- 4.3 Donor motivation and voluntary blood donation programme.
- 4.4 Awareness of basics of a rare donor program
- 4.5 Operation of mobile blood camps.
- 4.6 Donor recruitment and care.
- 4.7 Donor Counselling
- 4.8 Statutory Records and Statistics
- 4.9 Computerization in blood bank services.
- 4.10 Bio statistics and Health Economics.
- 4.11 Inventory management.
- 4.12 Massive/emergency Transfusion protocol
- 4.13 Medical audits - Blood audits.

4.14 Accreditation of blood banks.

4.15 Haemovigilance.

4.16 Disaster Management

### **Practical Skills**

4.17 Should be capable of defining requirements for setting up a blood transfusion service.

4.18 Should be capable of developing good donor program.

4.19 Demonstrate the proficiency in organization of outdoor blood donation camp and be able to understand importance of cold chain maintenance

4.20 Should have an understanding of data generated in the blood bank.

4.21 Should be able to evaluate the reported Haemovigilance data.

## **5 Blood Collections and Processing**

### **Theoretical Knowledge**

5.1 Management of blood donation, criteria for selection, screening procedures, risks and management of donor complications.

5.2 Different types of Blood bags, pooling techniques, storage additive solutions, etc.,

5.3 Blood collection procedures.

5.4 Screening of collected blood for infections, including pathogen inactivation.

5.5 Directed and autologous donations.

5.6 Preservations and storage of blood and components.

5.7 Preparation and standardisation of blood components.

5.8 Irradiation, Leukofiltration.

5.9 Plasma fractionation.

5.10 Cryopreservation.

5.11 Plasmapheresis.

5.12 Cytapheresis.

5.13 Therapeutic aphaeresis.

5.14 Plasma exchange.

### **Practical Skills**

5.15 Demonstrate proficiency in collection of whole blood with regard to preparation of phlebotomy site, proper volume and sample collection.

5.16 Demonstrate proficiency in evaluating and treating adverse reactions associated with blood donation/phlebotomy (whole blood and apheresis donations).

5.17 Understand the factors influencing quality of blood bag for whole blood collection.

5.18 Demonstrate knowledge of the indications for therapeutic phlebotomy.

5.19 Understand the process of Plateletpheresis

5.20 Summarize the steps in blood component preparation by different methods

5.21 Know various factors affecting the quality of blood components

5.22 Understand the significance of storage of blood components at appropriate temperature and demonstrate proficiency in compatibility, labelling requirements of various components

5.23 Demonstrate knowledge in haematopoietic stem cell collection, processing and storage of these stem cell products and indications for use.

## **6      Clinical Transfusion Services**

### **Theoretical Knowledge**

6.1      Clinical considerations, in transfusion practice.

6.2      Indications for whole blood, red cells, platelets, cryoprecipitate and other components.

6.3      Rational use of blood and blood components.

6.4      Emergency indications of massive transfusion shock and Traumatology.

6.5      General Surgical and medical support.

6.6      Coagulopathies, thrombocytopenia, various haematological disorders, haemophilia and disseminated Intra Vascular Coagulation.

6.7      Neonatology, Paediatrics and Obstetrical Services

6.8      Thoracic Surgery.

6.9      Haemodialysis.

6.10     Intrauterine Transfusion

6.11     Exchange transfusion.

6.12     Burns.

- 6.13 Autoimmune and other causes of Haemolytic anaemias.
- 6.14 Thrombocytopaenia
- 6.15 Etiopathogenesis, Investigations and management of Haemolytic Disease of the Foetus and Newborn (HDFN).
- 6.16 Antenatal serology and Rh immunization.
- 6.17 Role of immunoglobulin in prevention of HDFN.
- 6.18 Immunological and non immunological reactions of blood transfusion.
- 6.19 Etiopathogenesis, investigation and management of transfusion reactions.
- 6.20 Transfusion Transmitted Infections (Hepatitis, HIV, Syphilis, Malaria etc.).  
Detection and outline of management.
- 6.21 Pre-donation, haemodilution and intraoperative conservation of blood.
- 6.22 Intraoperative Blood salvage
- 6.23 Administration of blood and blood components/blood products
- 6.24 Synthetic oxygen carrying compounds perfluorocarbons, Hb solutions, blood substitutes, haematopoietic agents, cultured RBCs, etc.,
- 6.25 Volume expanders, crystalloids, natural and synthetic colloids

### **Practical skills**

- 6.26 To critically evaluate the appropriateness of transfusion requests in different groups of patients.



- 6.27 To be able to perform relevant tests and recommend the most appropriate products in different settings.
- 6.28 To be aware of adverse transfusion reactions, their management and follow up workups.
- 6.29 To evaluate mother & child for suspected HDFN
  
- 6.30 To be competent in the workup of patients with haemolytic anaemias (both AIHA and non-immunological)
- 6.31 To be able to evaluate platelet refractoriness.
- 6.32 To be able to do therapeutic aphaeresis with adequate emergency clinical support.
- 6.33 To be able to liaison between laboratories and clinicians for appropriate usage of blood components/products.

## **7 Quality Management Systems**

- 7.1 Total quality management
- 7.2 Concepts of quality assurance, quality control and quality management
- 7.3 QC in individual areas
- 7.4 Quality Indicators in transfusion medicine
- 7.5 Validation of automation/electronics/software applications in blood transfusion service
  
- 7.6 Calibration of instruments
- 7.7 QC of blood components
- 7.8 EQAS assessment

## **Practical Skills**

7.9 QC of blood group reagents/AHG etc.,

7.10 Internal QC of TTI testing/Immunohaematology/Blood components etc.,

## **8 Regulatory Issues in Blood Banking**

## **9 Bio safety/Biomedical Waste/Sterilisation**

## **10 Human allografts and Hospital Transfusion Service**

10.1 Cord Blood Banking

10.2 Tissue Banking

## **11 Organisation of teaching, research and co ordination with national and International agencies.**

## **12 Recent advances in Transfusion Medicine**

## **III.TEACHING AND LEARNING METHODS**

### **Theoretical Training**

(Seminars/Lectures/Journal Clubs/ Clinical Case Discussions /Telemedicine /Webinars/PBL etc.,)

Hospital Transfusion Committee Meeting

### **Practical Training**

Hands on training in all different domains of blood transfusion services

Rotation through various clinical specialities to gain more comprehensive

Knowledge about clinical aspects of transfusion.

#### **IV.STRUCTURED TRAINING PROGRAMME (for 36 months)**

**TRANSFUSION MEDICINE - 24 MONTHS**

**CLINICAL POSTINGS - 6 MONTHS**

|                            |     |         |
|----------------------------|-----|---------|
| Burns                      | ... | 2 weeks |
| Neonatology and pediatrics | ... | 4 weeks |
| Hematology                 | ... | 4 weeks |
| Oncology                   | ... | 2 weeks |
| Surgical Gastroenterology  | ... | 2 weeks |
| Intensive Medical Care     | ... | 4 weeks |
| Obstetrics and Gynecology  | ... | 2 weeks |
| Surgery                    | ... | 2 weeks |
| Orthopedics                | ... | 2 weeks |

#### **ALLIED LABS - 3 MONTHS**

|                       |     |         |
|-----------------------|-----|---------|
| Clinical pathology    | ... | 6 weeks |
| Microbiology          | ... | 4 weeks |
| Forensic Medicine Lab | ... | 2 weeks |

#### **SPECIAL POSTINGS**

IUT/Exchange Transfusion/

BMT/SCT/HLA/molecular labs ... 3 months

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**VII Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## VIII COMPETENCY ASSESSMENT:

### 1. OVERALL:

|                                                                                          |           |
|------------------------------------------------------------------------------------------|-----------|
| a) Communication / commitment / Contribution / Compassion towards patient and Innovation | - 5 marks |
| b) Implementation of newly learnt techniques/ Skills                                     |           |

2. Number of cases presented in Clinical Meetings/  
Journal Clubs/Seminars - 5 marks

3. Number of papers presented in conferences/Publications /  
Research Projects. - 5 marks

4. No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings with details. - 5 marks

### PG NON – CLINICAL COURSE

VIVA including Competency Assessment - 60 Marks (40 + 20 )

Pedagogy - 40 marks

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

## 9.DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper.**

## **10.THEORY EXAMINATION**

|           |                                                                                              |
|-----------|----------------------------------------------------------------------------------------------|
| Paper I   | Basic Applied aspects Related to Immuno-Haematology and Blood Transfusion                    |
| Paper II  | Immuno-Haematology, Immunogenetics and Applied Serology                                      |
| Paper III | Blood Donor Organisation and Management, Technology of Components and Clinical Haemotherapy. |
| Paper IV  | Recent Advances in Immuno-Haematology and Blood Transfusion                                  |

**Question Paper: –**

**Structured Essay Questions - 2 x 15 Marks = 30 Marks**

**Short Notes** - 10 x 5 Marks = 50 Marks

**Reasoning out** - 4 x 5 Marks = 20 Marks

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**100 Marks**  
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#### **11. PRACTICAL EXAMINATION**

|                             |              |                       |
|-----------------------------|--------------|-----------------------|
| LONG CASE                   | 1X 100 MARKS | 100                   |
| SHORT CASE                  | 2 X 25 MARKS | 50                    |
| CLINICAL CASE DISCUSSION    | 5 X 6 MARKS  | 30                    |
| SPOTTERS                    | 10 X 1 MARKS | 10                    |
| OSCE                        | 2 X 5 MARKS  | 10                    |
| TOTAL                       |              | 200 MARKS (A)         |
| VIVA                        |              |                       |
| VIVA                        |              | 60 MARKS              |
| PEDAGOGY                    |              | 40 MARKS              |
| VIVA TOTAL                  |              | 100 MARKS (B)         |
| AGGREGATE (CLINICAL + VIVA) |              | 300 MARKS (A+B)       |
| MINIMUM PASS (50%)          |              | 150 MARKS             |
| DISSERTATION                |              | APPROVED/NOT APPROVED |

**\*\*** The following pattern of examination shall be implemented from the Academic Year 2017-2018 admission onwards:

#### **THEORY**

| QUESTIONS              | MARKS |
|------------------------|-------|
| 2 ESSAY QUESTIONS X 15 | 30    |
| 10 SHORT NOTES X 7     | 70    |
| TOTAL                  | 100   |

|           |                                                                        |
|-----------|------------------------------------------------------------------------|
| Paper I   | Basic applied aspects related to Transfusion Medicine                  |
| Paper II  | Immunohaematology, Immunogenetics Applied Serology                     |
| Paper III | Blood Donor Organisation Technology of Components Clinical Haematology |
| Paper IV  | Recent advances in Technology                                          |

PRACTICAL (ONE DAY EXAMINATION)

| CLINICALS                |         |               |
|--------------------------|---------|---------------|
| Long Case                | 1 x 100 | 100           |
| Short Case               | 2 x 30  | 60            |
| Clinical case discussion | 2 x 10  | 20            |
| OSCE                     | 4 x 5   | 20            |
| TOTAL                    |         | 200 MARKS (A) |

VIVA

|                            |                        |
|----------------------------|------------------------|
| VIVA                       | 80 Marks               |
| Log Book                   | 20 Marks               |
| VIVA TOTAL                 | 100 Marks (B)          |
| Aggregate (CLINICAL +VIVA) | 300 Marks (A + B)      |
| Minimum pass (50%)         | 150 MARKS              |
| DISSERTATION               | APPROVED/ NOT APPROVED |

**\*\* Resolved in 55<sup>th</sup> Standing Academic Board held on 18.07.2018.**

**12. LOG BOOK:**

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

**13. Viva including competency Assessment: 60 marks**

40 marks for viva, and 20 marks for competency assessment

**14. Pedagogy: - 40 marks**

**( 8 minutes Presentation and 2 Minutes Q & Ans)**

- |                                                           |      |
|-----------------------------------------------------------|------|
| 1. Demeanour                                              | - 10 |
| 2. Audio visual Aids usage, voice modulation and Attitude | - 10 |
| 3. Subject Content                                        | - 10 |
| 4. Q & Ans /Interaction                                   | - 10 |

**Total**

-----  
**40 Marks**  
-----

**15. OSCE**

**2x5 =10 Marks**

**(Model Stations)**

**Station 1: (Procedure Station: Donor's screening of Haemoglobin by CuSO<sub>4</sub> Method)**

**Instruction to candidate:**

Screen the voluntary blood donor for Haemoglobin by CuSO<sub>4</sub> Method.

**Materials Required**

2 Chairs for donor & Candidate, 1 table to keep the reagents & do the test, Cotton, Spirit, Lancet, Pipette, tips, kidney tray with 1% Hypochlorite Solution, Beaker with CuSO<sub>4</sub> working Solution with S.G 1.053, Check list for the examiner.



**Checklist with marks assigned**

| Subtasks                                                                                                        | Marks    |
|-----------------------------------------------------------------------------------------------------------------|----------|
| Greet the donor and take consent                                                                                | 0.25     |
| Explain the procedure to the donor                                                                              | 0.5      |
| Cleaning of the fingertip                                                                                       | 0.5      |
| Puncture of the finger tip with the sterile lancet                                                              | 0.5      |
| Wiping the first drop of blood                                                                                  | 0.5      |
| Drawing of blood without air bubbles                                                                            | 0.5      |
| Whether the blood drop is allowed to drop from the height of 1 cm above the surface of $\text{CuSO}_4$ solution | 0.5      |
| Observation of the blood drop for 15 seconds                                                                    | 0.5      |
| Whether lancet and tips are disposed off in a container with 1% sodium hypochlorite solution                    | 0.5      |
| Whether results are interpreted and documented correctly                                                        | 0.5      |
| Take leave                                                                                                      | 0.25     |
| <b>Total</b>                                                                                                    | <b>5</b> |

**Station 2: (Phlebotomy procedure for blood collection from the donor)****Instruction to candidate:**

Do phlebotomy procedure on a voluntary blood donor with adequate aseptic precaution.

**Materials Required**

Donor Couch, Voluntary blood donor, Table, Blood Collection Monitor, Labeled blood bag, Cotton, Artery forceps, 10% Povidone- iodine, Spirit, B.P. apparatus, Handroller, Adhesive strips, First-aid tray,  $\text{O}_2$  cylinder with accessories, checklist for the assessor.

**Checklist with marks assigned**

| Subtasks                                                                                                          | Marks    |
|-------------------------------------------------------------------------------------------------------------------|----------|
| Greet the donor and take consent                                                                                  | 0.25     |
| Explain the procedure to the donor                                                                                | 0.5      |
| Cleaning of the fingertip                                                                                         | 0.5      |
| Puncture of the finger tip with the sterile lancet                                                                | 0.5      |
| Wiping the first drop of blood                                                                                    | 0.5      |
| Drawing of blood without air bubbles                                                                              | 0.5      |
| Whether the blood drop is allowed to drop from the height of 1 cm above the surface of CuSO <sub>4</sub> solution | 0.5      |
| Observation of the blood drop for 15 seconds                                                                      | 0.5      |
| Whether lancet and tips are disposed off in a container with 1% sodium hypochlorite solution                      | 0.5      |
| Whether results are interpreted and documented correctly                                                          | 0.5      |
| Take leave                                                                                                        | 0.25     |
| <b>Total</b>                                                                                                      | <b>5</b> |

**16. REFERENCE BOOKS**

1. Rossi's Principles of Transfusion Medicine, 5th Edition.  
Ed. [Toby L. Simon](#) , [Jeffrey McCullough](#) , [Edward L. Snyder](#) , [Bjarte G. Solheim](#) , [Ronald G. Strauss](#), Wiley-Blackwell, May 2016.
2. Mollison's Blood transfusion in clinical medicine, 12<sup>th</sup> edition.  
Ed. Harvey G. Klein, David J. Anstee , Blackwell Sci. Pub. Oxford, 2014.
3. Blood banking and transfusion medicine - Basic principles and practice, 2<sup>nd</sup> edition Ed. Hillyer, Silberstein, Ness, Anderson, Pub. Saunders, 2003

4. Practical Transfusion Medicine, 4th Edition.  
Ed. [Michael F. Murphy](#), [Derwood H. Pamphilon](#), [Nancy M. Heddle](#),  
Pub. Wiley-Blackwell, April 2013.
5. Technical Manual: American Association of Blood Banks, 18<sup>th</sup> edition.  
Ed. Mark K. Fung, Brenda J. Grossman, Christopher Hillyer, Connie M. Westhoff, Pub. AABB, 2014.
6. Modern Blood Banking & Transfusion Practices, 6<sup>th</sup> edition.  
Ed. Denise M. Harmening, Pub. Jaypee Brothers, 2013.
7. Haematology basic principles and practice, 6<sup>th</sup> edition.  
Ed. Hoffman, Benz, Silberstein, Heslop, Weitz, Anastasi, Pub. Elsevier, 2013.
8. Basic & Applied Concepts of Immunohematology, 2<sup>nd</sup> edition.  
Ed. [Kathy D. Blaney](#), [Paula R. Howard](#), Pub. Mosby, Elsevier, 2009.
9. Laboratory biosafety manual, 3<sup>rd</sup> edition, WHO, 2004.
10. Manual of basic techniques for a health laboratory, 2<sup>nd</sup> edition, WHO, 2003.
11. Rodak's Hematology, 5<sup>th</sup> edition.  
Ed. Elaine Keohane, Larry Smith, Jeanine Walenga,  
Pub. Elsevier, 2015.
12. Clinical Practice of Transfusion Medicine, 3<sup>rd</sup>, edition.  
Ed. [Lawrence D. Petz](#), [Scott N. Swisher](#), [Steven N. Kleinman](#), [Richard P. Spencer](#), [Ronald G. Strauss](#), Pub. Churchill Livingstone, 1995.
13. Kuby's Immunology, 7<sup>th</sup> edition. Ed. Owen, Punt, Stranford. Pub. W.H. Freeman, 2013.
14. Pediatric Transfusion: A Physicians Handbook, 4th edition. Ed. Edward C.C. Wong, MD, Susan D. Roseff,  
Pub. AABB, 2014.
15. Dacie And Lewis Practical Haematology, 12<sup>th</sup> edition.  
Ed. Barbara j. Bain, Imelda Bates, Michael a. Laffan. Mitchell Lewis,  
Pub. Elsevier, 2017

16. Neonatal Transfusion Practices, 1<sup>st</sup> edition  
Ed. Sesok-Pizzini, Deborah A.  
Springer International Publishing, Switzerland, 2017

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **17. JOURNALS – TRANSFUSION MEDICINE**

1. Transfusion - AABB
2. Transfusion Medicine  
British Blood Transfusion Society
3. Asian Journal of Transfusion Science  
Elsevier ISBTI, ISTM
4. Transfusion Medicine Reviews  
Elsevier – Peer Reviewed
5. Indian Journal of Transfusion Medicine
6. Indian Journal of Haematology and Blood Transfusion - ISHBT
7. Vox Sanguinis - ISBT
8. Blood Transfusion  
Italian Society of Transfusion Medicine and Immunohaematology
9. Journal of clinical Aphaeresis  
American Society for Apheresis (ASFA)
10. Seminars in thrombosis and haemostasis  
National Centre for Biotechnology Information,  
U.S. National Library of Medicine
11. Transfusion and Apheresis Science  
World Apheresis Association and European Society of Haemopheresis

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**M.D.MICROBIOLOGY**

## **M.D.MICROBIOLOGY**

### **1. GOAL**

The aim of this curriculum is to train and equip clinical microbiologist for identification, diagnosis, containment of infectious diseases, autoimmune and immunodeficiency diseases in hospital and community settings and training on planning and execution of applied and fundamental research in the field of microbiology. They will be proficient to apply the wholesome knowledge both for laboratory diagnosis and fundamental / applied research.

### **2. OBJECTIVES:**

- To train clinical microbiologist in identification, diagnosis of infectious diseases, auto immune disorders and immunodeficiency diseases.
- Use skills for prevention and control of infectious diseases especially to contain hospital acquired infections.
- To steer and control appropriate use and prevent misuse of anti microbials in clinical treatment settings.
- Be well versed in vertical programmes / WHO, UN

To attain the above objectives the following are the essential requirements

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

#### **(i) KNOWLEDGE**

Good knowledge of various disciplines of micro-biology includes General Bacteriology, Systematic Bacteriology, Virology, Parasitology, Immunology, Mycology and Molecular diagnosis.

Clinical Microbiologist should establish good clinical microbiological services in the hospital and community in the fields of bacteriology, virology, parasitology, immunology, serology ,mycology and also get updated with new diagnostic technology.

Interact with allied departments, acquire knowledge of infections in humans, immunoprophylaxis, transplantation immunology, Health care associated infections, Antibiotic stewardship and outbreak investigations, Awareness of National policies like RNTCP, NACO guidelines, NVBDCP, IDSP & Reference Lab network etc.,

Acquire skills in planning, executing and evaluating teaching assignments in medical microbiology and conducting collaborative research both clinical and experimental in the field of microbiology and allied sciences.

Knowledge of laboratory animals and applications in diagnosis, quality assurance, quality control and management for laboratory standardization and accreditation is essential **prerequisite** of the curriculum.

**(ii) SKILLS**

- Washing and sterilization of glass wares, Plugging and packing
- Preparation and pouring of basal media, Enriched media, Selective media and Transport media
- Disinfection, sterilization techniques and checking and adjustment of PH of media
- Sterility check (Dry / Moist methods) and disinfectant testing
- Preparation of in house reagents
- Decontamination of cultures
- QC and QA of media, reagents, antibiotic discs
- Safe laboratory practices including bio safety
- Care and maintenance of laboratory equipments (Conventional / Automated)
- Collection and transport of various clinical specimens
- Performance of antibiotic sensitivity test – Kirby Bauer, Stokes method
- Determination of MIC by agar dilution, Broth dilution
- Test for drug resistance including MRSA, VRE, ESBL, AmpC, Metallobetalactamases.
- Environmental sampling including operating Room (OR)
- Identification of Bacteria of Medical importance upto species level by routine and special tests.
- Identification of Anaerobic Bacteria with various techniques of Anaerobiasis .
- Preparation and performance of different stains including Grams, Albert, Capsule, Shaufer Fulton Spore Staining Method, Fontana, Ziehl-Neelsen, Modified Ziehl-Neelsen etc.
- Care and operation of various microscopes viz. light, dark ground, phase contrast, Inverted and fluorescence microscopes.
- Quantitative and semi-quantitative analysis of urine sample / BAL
- Inoculation of clinical specimen on media for isolation, identification of bacteria
- Test for motility, in-vitro toxicity tests
- Bacteriological tests for air, water and milk
- Maintenance and preservation of bacterial cultures.
- Serological grouping of streptococcus
- Antibiotic susceptibility test for mycobacteria
- Molecular methods of detection of drug resistance in bacteria
- Molecular diagnostic methods for bacteria / virus / fungi

## **IMMUNOLOGY**

- Collection / separation / preservation of blood samples
- Antigen preparation for Widal / Weil-Felix, VDRL
- Serological test including rapid / conventional (LAT, IC, tube agglutination, slide flocculation)
- Raising of bacterial anti sera in laboratory animals
- Enzyme linked immunosorbent assay / Immunoblotting
- Co- agglutination test

## **VIROLOGY**

- Preparation of Glasswares for tissue culture(washing,sterilization)
- Preparation of media like Hanks, MEM, VTM
- Preparation of clinical specimens for isolation of viruses
- Maintenance of continuous cell lines by subcultures
- Preservation in -70°C & Liquid Nitrogen
- Recognition of CPE & Cytopathogenic viruses
- Serological test- ELISA, Rapid tests for Hepatitis A,B,C,D& E, HIV, Arboviruses & Westernblot for HIV

## **MYCOLOGY**

- i Collection and transport of specimens
- ii Direct examination of specimens by KOH, Gram's, Giemsa, Lactophenol Cotton blue stains and tissue stains.
- iii Calcofluor staining and examination under fluorescent microscope.
- iv Examination of histopathology slides for fungal infections
- v Isolation and identification of common laboratory contaminants, dermatophytes and other fungi of medical importance (yeast, dematiaceous fungi)
- vi Special techniques like Wood's lamp examination, hair baiting, hair perforation, paraffin baiting and slide culture
- vii Maintenance of stock cultures

## **PARASITOLOGY**

- i Examination of faeces for parasitic ova and cysts etc. by direct and concentration methods (salt floatation and formal-ether methods)
- ii Egg counting techniques for helminths
- iii Examination of blood for protozoa and helminths by wet mount and thin and thick stained smears
- iv Examination of other specimens e.g. urine, CSF, bone marrow etc. for parasites.
- v Histopathology sections-examination and identification of parasites
- vi Performance of stains-JSB, Field's Leishman, Giemsa



- vii In-vitro culture of parasites like *Entamoeba*, *Leishmania*, etc.
- viii Preparation of media- NNN, etc.
- ix Copro-culture of larva of hookworms
- x Antigen preparation-viz. *Entamoeba*, filarial, hydatid for serological tests like IHA and skin tests like Casoni's test
- xi Identification of common arthropods and other vectors viz., mosquito, sandfly, tick, mite, cyclops
- xii Collection of specimens
- xiii Preservation of parasites- mounting, fixing, staining, etc.
- xiv Peripheral blood smear, QBC for malaria

## **MOLECULAR BIOLOGY**

- Extraction of DNA & RNA, Routine PCR Protocols, Gel Documentation

### **(iii) CLINICAL APPLICATION**

At the end of the course, the student should be able to

- Diagnose infectious diseases, correlating the clinical details with laboratory tests as evidence.
- Identify, aid in prevention, control and treatment of common Health care associated infections (HCAI) which includes Catheter associated urinary tract infections(CAUTI), Ventilator associated pneumonia(VAP), Central line associated blood stream infections(CLABSI), Surgical site infections(SSI).
- Alert the treating physician on existing and emerging antimicrobial resistance and follow up.
- Interpret the surveillance indicators of HCAI
- Practice and participate in antimicrobial stewardship program(ASP) with regard to selection of appropriate antimicrobials – dose, duration, dosing interval, & de-escalation, etc.

### **• WRITING THESIS/ RESEARCH ARTICLES**

All students will have to carry out a research program and bring out a dissertation (thesis).

Students are encouraged to attend CME's, publish research papers and present posters, or platform presentations at State, National and International Conferences.

- **ATTITUDES INCLUDING COMMUNICATION SKILLS**

Students should develop the art of eliciting clinical history from patients to correlate laboratory reports. Communication skills to be acquired to inform critical parameters to clinicians without undue delay.

- **TRAINING IN RESEARCH METHODOLOGY MEDICAL ETHICS, BIOETHICS AND MEDICOLEGAL ASPECTS**

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, Bioethics, moral and legal issues and Medical Audit are part and parcel of our curriculum and syllabus in Medical Microbiology like Lab reports confidentiality, Notification and reports disclosure, Pre and post test counseling. And biomedical ethics related to quarantine and its impact, patient Vector, carrier, Specimen transport, Bio-terrorism, outbreak and their control, HCAI , BMWM, NABL including quality assurance are very much essential for the Health care setup and teaching institutions.

#### 4. **THEORY SYLLABUS**

##### **General Microbiology**

- **Microbiology- The Historical introduction**
- **Microscopy**
- **Biosafety and standard precautions**
- **Taxonomy and Nomenclature of microorganisms**
- **Sterilization and disinfection.**
- **Microbial susceptibility & resistance to chemical and physical agents**
- **Morphology of bacteria and other microorganisms**
- **Human microbiota**
  - **Bacterial growth and metabolism.**
- **Bacterial toxins &, Bacteriocins & Bacteriophages**
- **Microbiology of hospital environment.**
- **Microbiology of air**
  - **Microbiology of milk and dairy products**
- **Microbiology of Food**
- **Microbiology of water.**
- **General epidemiology, Transmission, and Therapy**
  - ❖ **Epidemiology of infectious diseases,**
  - ❖ **Theory of infectious diseases transmission and control,**
  - ❖ **emergence and resurgence of infectious diseases,**
  - ❖ **Healthcare associated infections,**
- **Host-parasite relationship**

- **Antibacterial therapy and drug resistance**
- **Bacterial genetics & Bacterial Typing**
- **Molecular genetics relevant for Medical Microbiology.**
- **Molecular techniques in diagnosis of microbial infections**
- **Automation in Microbiology**
- **Quality assurance & quality control in Microbiology.**
- **Accreditation of laboratories**

## **IMMUNOLOGY**

- History
- Innate Immunity and Inflammation:
  - ✓ Phagocytes: Macrophages, Neutrophils
  - ✓ Basophils and eosinophils
  - ✓ Natural killer cells
  - ✓ Apoptosis
  - ✓ Complement
  - ✓ Antimicrobial peptides
  - ✓ Mediators of Inflammation
  - ✓ Acute phase response
- Acquired Immunity
  - ✓ Antibodies and B lymphocytes
  - ✓ The B-cell antigen receptor
  - ✓ Monoclonal antibody therapy
  - ✓ Processing and presentation of antigen – Class II MHC
  - ✓ CD4 lymphocytes and their role in infectious disease
  - ✓ Processing of antigen – Class I MHC
  - ✓ CD8 lymphocytes and their role in infectious diseases, malignancy
  - ✓ TCR
  - ✓ Unconventional T cell
  - ✓ Lymphocyte mediated cytotoxicity
  - ✓ Immunological memory
  - ✓ Lymphocyte homing
  - ✓ Mucosal immune response
  - ✓ Superantigens
  - ✓ Immunogenetics
  - ✓ **Transplantation immunity**
  - ✓ **Tumour Immunology**
  - ✓ **Vaccines and immunotherapy**
  - ✓ **Measurement of immunological parameters**
  - ✓ **Immunological techniques**
  - ✓ **Immunopotential & immunomodulation**
  - ✓ **ImmunoHaematology**

- Infection and Immunity
  - ✓ Virus & Interference with Host immune response
  - ✓ Bacteria & Evasion of immune response
  - ✓ Parasite evasion
- Immunopathology & Immunodeficiency
  - ✓ Sepsis/ Shock
  - ✓ DTH associated pathology
  - ✓ Airway hypersensitivity
  - ✓ Autoimmunity
  - ✓ Immunocompromised host
  - ✓ Acquired immunodeficiencies
- Vaccines
  - ✓ New approaches to vaccine delivery
  - ✓ New vaccine delivery
  - ✓ Peptide vaccines
  - ✓ Live vaccine carriers
  - ✓ Naked DNA vaccines
  - ✓ Adjuvants and subunit vaccines
  - ✓ Mathematical models of vaccination

### Systematic Bacteriology:

- Isolation & identification of bacteria.
- Gram positive cocci of medical importance including Staphylococcus, Micrococcus, Streptococcus species, Streptococcus pneumoniae, Enterococcus, Anaerobic cocci, etc.
- Gram negative cocci of medical importance including Neisseria, Branhamella, Moraxella, etc.
- Corynebacterium and other Coryneform organisms, Bacillus & other Aerobic bacilli, Actinomyces, Nocardia, and other Actinomycetales, Erysipelothrix, Listeria, Clostridia and other spore bearing Anaerobic bacilli, Lactobacillus, etc.
- Gram negative bacilli of medical importance including Vibrios, Aeromonas, Plesiomonas, Haemophilus, HACEK Group, Bordetella, Brucella, Gardnerella, Pseudomonas, Burkholderia, Acinetobacter & other Non-fermenters, Pasteurella, Francisella, Capnocytophaga, Bacteriodes, Fusobacterium, Leptotrichia and other anaerobic gram negative bacilli, etc.
- Helicobacter, Campylobacter & Spirillum, Gardnerella, Legionella

- Enterobacteriaceae- Escherichia, Edwardsiella, Citrobacter, Salmonella, Shigella, Klebsiella, Enterobacter, Hafnia, Serratia, Proteus, Morganella, Providencia, Yersinia & Erwinia
- Mycobacteria
  - Mycobacterium tuberculosis complex, Non-Tuberculous Mycobacteria, Mycobacterium leprae
  - Microbiology, pathogenesis, transmission, clinical spectrum, laboratory diagnosis – conventional and recently developed point of care, rapid and automated techniques, molecular diagnostic methods, national and WHO guidelines on diagnosis and treatment of Pulmonary and extrapulmonary Tuberculosis in adults and children , drug resistant TB and diagnosis of drug resistance, and treatment of drug resistant TB, prophylaxis – immunoprophylaxis and control and prevention of TB in community and hospitals , national programs on control of tuberculosis.
- Spirochaetes including Treponema, Leptospira, Borrelia etc
- Chlamydiae
- Mycoplasmatales; Mycoplasma, Ureaplasma, Acholeplasma and other Mycoplasma
- Rickettsiae, Coxiella, Bartonella, & Orientia etc.
- Ehrlichia, Anaplasma, etc.
- Spirillum minus, Streptobacillus moniliformis
- Antibiotic panels / Guidelines

## MYCOLOGY

- Historical introduction to fungi
- General characteristics & classification of fungi. Phylogeny and systematic
- Morphology & reproduction of fungi.
- Laboratory diagnosis -Isolation and identification of fungi, Mycology, molecular diagnosis of fungal diseases.
- Tissue reactions to fungi and histopathological diagnosis of fungal infections
- Yeasts and yeast like fungi of medical importance including Candida, Cryptococcus, Malassezia. Trichosporon, Geotrichum, Saccharomyces, etc.
- Mycelial fungi of medical importance including Aspergillus, Zygomycetes, Pseudoallescheria, Fusarium, Piedra, other dematiaceous hyphomycetes and other hyalohyphomycetes, etc.

- Dimorphic fungi including Histoplasma, Blastomyces, Coccidioides, Paracoccidioides, Sporothrix, Penicillium manneffeii, etc.
- Dermatophytes
- Fungi causing mycetoma, keratomycosis & otomycosis
- Phythium insidiosum
- Prototheca
- Pneumocystis carinii infection; Pneumocystis jirovecii.
- Rhinosporidium seeberi & Loboa loboi
- Superficial and ocular fungal infections
- Subcutaneous mycoses
- Systemic mycoses due to Dimorphic fungi
- Systemic mycoses due to Opportunistic fungi
- Common laboratory contaminant fungi.
- Mycetism & mycotoxicosis.
- Therapeutic agents and vaccines
  - ❖ Antifungal agents & inVitro antifungal susceptibility tests
  - ❖ Principles of antifungal therapy
  - ❖ Resistance to antifungal agents

## VIROLOGY:-

- History of research in virology
- General properties of viruses.
- Classification of viruses.
- Morphology : Viral structure, Bacteriophages.
- Viral replication
- Isolation & identification of viruses.
- Cultivation of viruses.
- Epidemiology and Pathogenesis & Control of viral diseases.
- Genetics of vertebrate viruses.
  - Virus host interaction
- DNA viruses of medical importance including Poxviridae, Herpesviridae, Adenoviridae, Hepadna virus, Papova and Parvo viruses, etc.
- RNA viruses of medical importance including Enteroviruses, Picorna virus, Togaviridae, Flaviviruses, Orthomyxoviruses, Paramyxoviruses, Reoviridae, Rhabdoviridae, Arenaviridae, Bunyaviridae, Retroviridae, Filoviruses, Coronaviridae, Calciviruses, etc.

- Human immunodeficiency virus

- ❖ Morphology, transmission and prevention, epidemiology, pathogenesis, clinical syndromes, Opportunistic Infections, laboratory diagnostic procedures, National and WHO guidelines on diagnosis and treatment in adults and children, Post exposure prophylaxis, developments in vaccine research

- Lentiviruses, Slow viruses including Prions

- Arthropod borne & Rodent borne viruses
- Oncogenic & Teratogenic Viruses
- Hepatitis viruses

- ❖ Morphology, transmission and prevention, epidemiology, pathogenesis, clinical syndromes, laboratory diagnostic procedures, diagnosis and treatment guidelines in adults and children and in high risk patients, and Prophylaxis for diseases caused by hepatitis viruses

- Slow viruses including prions

- Oncogenic & Teratogenic Viruses
- Virioids
- Unclassified viruses
- Syndromes caused by a range of viruses

- ❖ Infections of central nervous system,
- ❖ viral infections of the fetus and neonates( congenital)
- ❖ viral infections of the immunocompromised patients

- Principles of diagnosis and control of viral infections

- ❖ Safety in virology laboratory
- ❖ The laboratory diagnosis of viral infections
- ❖ Immunoprophylaxis of viral diseases( Viral Vaccines)
- ❖ Viral vectors for gene therapy
- ❖ Antiviral chemotherapy including emerging resistance to antiviral drugs
- ❖ The emergence and re emergence of viral diseases

- Vaccines, anti-viral drugs & anti-viral agents

## **PARASITOLOGY:-**

- General Parasitology
  - ✓ History
  - ✓ World- wide importance of parasites
  - ✓ Epidemiology
  - ✓ Immunology and Immunopathology of parasitic infections
  - ✓ Control of parasitic diseases
  - ✓ Diagnosis of parasitic infections
  - ✓ Antiparasitic agents
- Protozoa
  - ✓ Cellular organization of parasitic protozoa
  - ✓ Classification
  - ✓ Introduction to parasitic protozoa
  - ✓ Protozoan parasites of medical importance including Entamoeba, Free living amoebae, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium, Toxoplasma, Cryptosporidium Sarcocystis, , Cyclospora, Isospora, Babesiosis, Blastocystis Microsporidium, Balantidium, etc.
- Helminths
  - ✓ Helminths of medical importance including those belonging to
    - o Cestodes(Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Dipylidium, Multiceps, etc.),
    - o Trematodes (Schistosomes, Fasciola, Fasciolopsis, Gastrodiscoides, Paragonimus, Clonorchis, Opisthorchis, etc.) and
    - o Gastrointestinal Nematodes Trichiuris, Ancylostoma, Necator, Ascaris, Enterobius,
    - o Trichinella
    - o Strongyloides
    - o Toxocara,
    - o Lymphatic Filarial worms,
    - o Oncocerciasis
    - o Dracunculus
    - o Angiostrongylus
- Entomology: common arthropods & other vectors viz, mosquito, sandfly, ticks, mite, Cyclops, louse, myiasis.



## **APPLIED MICROBIOLOGY :-**

- General Ecosystem:
    - ✓ Human microbiota
    - ✓ Airborne bacteria
    - ✓ Bacteriology of water
    - ✓ Bacteriology of food
    - ✓ Bacteriology of Milk and milk products
  - Infectious Diseases:
    - ✓ Epidemiology
    - ✓ Theory of infectious diseases transmission and control
    - ✓ Emergence and resurgence of bacterial infectious diseases
  - Health care associated infections
  - Management of hospital waste.
  - Investigation of an infectious outbreak
  - Organ and system infections
    - ✓ Blood stream infections and Endocarditis
    - ✓ Meningitis
    - ✓ Other CNS infections
    - ✓ Infections of the eye
    - ✓ Infections of the Upper respiratory tract
    - ✓ Infections of the lower respiratory tract
    - ✓ Infections of the genital tract
    - ✓ Infections of the Urinary tract
    - ✓ Infections of the bones and joints
    - ✓ Opportunistic infections
- Recent advances in Microbiology & Immunology( diagnosis & management)

- Quality assurance & quality control in microbiology
- Accreditation of laboratories
- Information technology (Computers) in microbiology
- Automation in Microbiology
- Statistical analysis of microbiological data and research methodology
- Animal and human ethics involved in microbiological work.

## **5. TEACHING LEARNING METHODS**

The following teaching learning methods are recommended.

- Lectures
- Case based discussion
- Bed side clinics
- Teaching on ward rounds

- Symposia
- Seminars
- Journal clubs
- Problem based learning
- Telemedicine ( where available)

## **6.STRUCTURED TRAINING PROGRAM**

**Duration of Course – Three years**

|            | <b><u>Details of Training M.D. (MICROBIOLOGY)</u></b>                                                                                                                                                                                                                                                                                                                                                                                                              |          |                  |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------|
| <b>1.</b>  | <b>Collection of Clinical samples in the Central Laboratory</b>                                                                                                                                                                                                                                                                                                                                                                                                    | <b>:</b> | <b>2 weeks</b>   |
| <b>2.</b>  | <b>Sterilisation &amp; disinfection, Central sterile supplies department (CSSD)</b>                                                                                                                                                                                                                                                                                                                                                                                | <b>:</b> | <b>2 weeks</b>   |
| <b>3.</b>  | <b>Media preparation and sterilization of lab materials</b>                                                                                                                                                                                                                                                                                                                                                                                                        | <b>:</b> | <b>1 month.</b>  |
| <b>4.</b>  | <b>Bacteriology</b> <ul style="list-style-type: none"> <li>• Bacteriological techniques – 1 month</li> <li>• Bacterial culture Antibigram and reporting <ul style="list-style-type: none"> <li>▪ Blood Culture – 2 Months</li> <li>▪ Urine &amp; genitor urinary specimens culture – 6 weeks</li> <li>▪ Exudate – – 6 weeks</li> <li>▪ Respiratory specimens – 2 months</li> <li>▪ Sterile Body fluids – 2 month</li> <li>▪ Stool – 1 Month</li> </ul> </li> </ul> | <b>:</b> | <b>11months</b>  |
| <b>5.</b>  | <b>Serology – Diagnostic Techniques and Reporting</b>                                                                                                                                                                                                                                                                                                                                                                                                              | <b>:</b> | <b>2 months.</b> |
| <b>6.</b>  | <b>Special Microscopy and Staining</b>                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>:</b> | <b>1 month.</b>  |
| <b>7</b>   | <b>Preparation for Dissertation Protocol submission</b>                                                                                                                                                                                                                                                                                                                                                                                                            | <b>:</b> | <b>1 month.</b>  |
| <b>8.</b>  | <b>Mycobacteriology</b> <ul style="list-style-type: none"> <li>• RNTCP &amp; DOTS clinic – 2 Weeks</li> <li>• Mycobacteriology conventional culture and microscopy - 4 Weeks</li> <li>• MGIT, LPA, Genexpert – 2 weeks</li> </ul>                                                                                                                                                                                                                                  | <b>:</b> | <b>2 months.</b> |
| <b>9.</b>  | <b>Anaerobic culture</b>                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>:</b> | <b>1 month</b>   |
| <b>10.</b> | <b>Mycology</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>:</b> | <b>2 months</b>  |
| <b>11.</b> | <b>Parasitology</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>:</b> | <b>2 months.</b> |

|     |                                                                                                                                                                                                                                                                 |   |                  |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------|
| 12. | <b>Virology (Should include tissue culture, molecular diagnosis, viral serology and other viral diagnostic techniques) - 6 weeks</b><br><b>Posting at ART centre- 2 weeks</b>                                                                                   | : | 2 months.        |
| 13. | <b>Immunology (Should include diagnostic techniques in auto immune diseases, transplantation and cancer immunology)</b>                                                                                                                                         | : | 2 months.        |
| 14. | <b>Preparation of antigens and antisera</b>                                                                                                                                                                                                                     |   | 1 week           |
| 15. | <b>Vaccinology</b><br><ul style="list-style-type: none"> <li>• Vaccine preparation &amp; Biological control- 2 weeks</li> <li>• Immunisation Clinic – 2 week</li> </ul>                                                                                         | : | 1 month          |
| 16. | <b>Molecular Biology &amp; Biotechnology &amp; Microbial Genetics</b>                                                                                                                                                                                           | : | 1 month          |
| 17. | <b>Medical Statistics (Research Methodology) &amp; Epidemiology –</b>                                                                                                                                                                                           | : | 1 week.          |
| 18. | <b>Dermato-Venereology including Leprology</b>                                                                                                                                                                                                                  | : | 1 week           |
| 19  | <b>Pathology</b>                                                                                                                                                                                                                                                | : | 1 week.          |
| 20. | <b>Clinical diagnosis of infectious diseases, HAI Surveillance , Antibiotic Stewardship</b><br><ul style="list-style-type: none"> <li>• posting to medical and pediatric wards-3 months</li> <li>• posting to ICU's- IMCU, ISCU, PICU / NICU-1 Month</li> </ul> | : | 4 Months         |
| 21. | <b>Within the gamut of the course the dissertation must be completed by the students as an ongoing process, within the stipulated time as deemed fit by the guides.</b>                                                                                         |   |                  |
|     | <b>TOTAL</b>                                                                                                                                                                                                                                                    |   | <b>35 Months</b> |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

- 7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## **8. COMPETENCY ASSESSMENT:**

|                                                                                                                            |           |                  |
|----------------------------------------------------------------------------------------------------------------------------|-----------|------------------|
| <b>1. OVERALL:</b>                                                                                                         |           |                  |
| <b>a) Communication / commitment / Contribution / Compassion towards patients and Innovation</b>                           | <b>()</b> | <b>- 5 Marks</b> |
| <b>b) Implementation of newly learnt techniques/skills</b>                                                                 | <b>()</b> |                  |
| <b>2. Number of cases presented in Clinical Meetings/ Journal clubs/seminars</b>                                           |           | <b>- 5 marks</b> |
| <b>3. Number of Posters/Papers presented in Conferences/ Publications and Research Projects</b>                            |           | <b>- 5 marks</b> |
| <b>4. No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details.</b> |           | <b>- 5 marks</b> |
| <b>Total</b>                                                                                                               |           | <b>20 Marks</b>  |

### **PG NON – CLINICAL COURSE**

|                                             |                              |
|---------------------------------------------|------------------------------|
| <b>VIVA including Competency Assessment</b> | <b>- 60 Marks (40 + 20 )</b> |
| <b>Pedagogy</b>                             | <b>- 40 marks</b>            |

### **ASSESSMENT SCHEDULE IS AS FOLLOWS**

| <b>Year of study</b> | <b>Period</b>   |                 |                  |                 | <b>Total Max.20 marks</b> |
|----------------------|-----------------|-----------------|------------------|-----------------|---------------------------|
| <b>I year</b>        | <b>Upto Dec</b> | <b>10 marks</b> | <b>Upto June</b> | <b>10 marks</b> | <b>20 Marks</b>           |
| <b>II year</b>       | <b>Upto Dec</b> | <b>10 marks</b> | <b>Upto June</b> | <b>10 marks</b> | <b>20 Marks</b>           |
| <b>III year</b>      | <b>Upto Oct</b> | <b>10 marks</b> | <b>Upto Feb</b>  | <b>10 marks</b> | <b>20 Marks</b>           |
|                      | <b>AVERAGE</b>  |                 |                  |                 | <b>20 Marks</b>           |

## **9.DISSERTATION AND PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:**

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper.**

#### **10. THEORY EXAMINATION**

|                  |                                                           |
|------------------|-----------------------------------------------------------|
| <b>Paper –I</b>  | <b>General Microbiology and Immunology</b>                |
| <b>Paper-II</b>  | <b>Systematic Bacteriology</b>                            |
| <b>Paper-III</b> | <b>Virology &amp; Parasitology</b>                        |
| <b>Paper-IV</b>  | <b>Mycology, Applied Microbiology and Recent Advances</b> |

#### **Distribution of Marks - PAPER I, II, III & IV**

|                         |                                  |
|-------------------------|----------------------------------|
| <b>Structured Essay</b> | <b>- 2 x 15 Marks = 30 Marks</b> |
| <b>Short Notes</b>      | <b>- 10 x 5 Marks = 50 Marks</b> |
| <b>Reasoning out</b>    | <b>- 4 x 5 Marks = 20 Marks</b>  |
|                         | <b>-----</b>                     |
|                         | <b>100 Marks</b>                 |
|                         | <b>-----</b>                     |

## **11. PRACTICAL EXAMINATION:**

Reframed practical scheme for 2 days duration

|       | Division                                                   | Exercises                                                                                                                                                                                                                                          | Marks |
|-------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 1     | Bacteriology                                               | A) Preliminary sample processing & report – 15 marks<br>B) Clinical Sample processing ( Simulated Sample with Case scenario) – 35 marks<br>C) Bacterial Techniques – Pure Culture Identification & Antimicrobial Susceptibility testing – 30 Marks | 80    |
| 2     | Mycology                                                   | One slant / slide culture<br>(Contaminant , Pathogenic fungi)                                                                                                                                                                                      | 20    |
| 3     | Virology                                                   | PCR / CPE / Western Blot / ELISA                                                                                                                                                                                                                   | 20    |
| 4     | Immunoserology                                             | Bacteriology (Widal / VDRL / Weil-felix / SAT for Brucellosis / ASO / CRP / RA. etc) rapid test for Viral infections - Point of care tests                                                                                                         | 20    |
| 5     | Parasitology                                               | laboratory diagnosis of parasitic infections in stool/ blood / sputum- Concentration Techniques                                                                                                                                                    | 20    |
| 6     | OSPE Exercises-Including Case scenario – discussion (2X10) |                                                                                                                                                                                                                                                    | 20    |
| 7     | Microscopy Including histopathology Slides - Discussion    |                                                                                                                                                                                                                                                    | 20    |
| 8     | Pedagogy                                                   |                                                                                                                                                                                                                                                    | 40    |
| 9     | Viva voce including Competency Assessment                  |                                                                                                                                                                                                                                                    | 60    |
| TOTAL |                                                            |                                                                                                                                                                                                                                                    | 300   |

| DAYWISE DISTRIBUTION OF EXERCISES |                       |
|-----------------------------------|-----------------------|
| DAY 1                             | DAY 2                 |
| 1. Bacteriology- A,B,C            | 1.Bacteriology- B & C |
| 2. Mycology                       | 5. Parasitology       |
| 3. Virology                       | 7. Microscopy         |
| 4. Immunoserology                 | 8. Pedagogy           |
| 6. OSPE including Case Scenario   |                       |
| 9. Viva voce                      |                       |

## **12. LOG BOOK:**

The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

A detailed log book should be maintained for the entire duration of the course. It should contain the following details.

1. Procedures performed
2. Journal clubs
3. Seminars
4. Important cases discussed/ presented

## **13. VIVA including Competency Assessment**

VIVA including Competency Assessment - 60 Marks (40 + 20)

## **14. PEDAGOGY**

Pedagogy Assessment (8 minutes Presentation and 2 Minutes Q & Ans.)

|                                                        |   |       |
|--------------------------------------------------------|---|-------|
| Demeanour                                              | - | 10    |
| Audio Visual Aids usage, Voice modulation and Attitude | - | 10    |
| Subject Content                                        | - | 10    |
| Q & Ans.                                               | - | 10    |
|                                                        |   | ----- |
| Total                                                  |   | 40    |
|                                                        |   | ----- |

## **15.OSPE (Objective Structural Practical Examination)**

The following are suggested stations for the OSCE. Any 4 can be chosen at the discretion of the examiners. All the 4 stations should be common to all candidates appearing on that day.

1. Special Staining - Spore staining  
Negative staining  
RNTCP grading  
Fontana staining
2. Media preparation & Checking of PH wherever applicable
  - \* Alkaline peptone water
  - \* Bbod Agar Plate
  - \* Chocolate Agar Plate
  - \* Triple sugar Iron Agar/ Simmons Citrate Agar
  - \* Sabouraud's dextrose Agar

3. Sputum concentration /stool / concentration techniques
4. E-Test
5. Modified Hodge test
6. Dalmau Plate culture for candida
7. Rapid tests (serology)
8. Bio Medical waste management & infection control

## **16. REFERENCE BOOKS**

### **List of Books:**

#### **MICROBIOLOGY**

1. Jawetz Melnick & Adelbergs Medical Microbiology
2. Topley & Wilson's Microbiology
3. Murray Rosenthal pfaller Medical Microbiology
4. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases
5. Greenwood Medical Microbiology- David **Greenwood**, Mike Barer, Richard Slack, and Will Irving
6. Bailey & Scott's Diagnostic Microbiology
7. Collee J.G.Mackie and MC cartney practical Medical Microbiology
8. Koneman's Colour Atlas & Textbook of Diagnostic Microbiology
9. Prescott's Microbiology
10. Harrison's Principles and Practice of Medicine
11. Manson's Tropical Diseases

#### **VIROLOGY**

1. Fields Virology (5<sup>th</sup> edition)

#### **MYCOLOGY**

1. Text book of Medical Mycology – Jagdish Chander
2. Essentials of Clinical Mycology –Carol A Kauffmann, Peter G Pppas
3. Clinical Mycology –Elias J Anaistic ,Michal R Mc Ginnis
4. Medical Mycology –Current Trents & Future Prospects- Mehdi Razzaghi
5. Textbook of mycology –Gopinath Hait
6. Fundamentals of Diagnostic Mycology-Fisher & Cook

#### **PARASITOLOGY**

1. Diagnostic Medical Parasitology - Garcia
2. Parasitology- An Integrated Approach
3. K.D.Chatterjee - Parasitology
4. Human Parasitology – Fatik Baran Mandal
5. Textbook of Medical Parasitology - Subhash Chandra Parija
6. Microbiology & Parasitology K Rajeshniar Reddy
7. Human Parasitology Fatik Baran Mandal

#### **Infection Control**

1. Infection Control in Clinical Practice –Jennie Wilson
2. Clinical Infectious Disease –David Schlossderg
3. Manual of Infection prevention and Control- Damani



## **IMMUNOLOGY**

1. Kuby Immunology
2. Medical Immunology – Daniel Stites
3. Roitts Immunology
4. Sander's Immunology
5. Basic And Clinical Immunology- Peakman
6. Lipincott's Immunology

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi**

## **17. JOURNALS**

1. Journal of Clinical Microbiology
2. Journal of Infectious Diseases
3. European Journal of Clinical Microbiology & Infectious Diseases
4. American Journal Of Bacteriology
5. PLOS Pathogen
6. Indian Journal of Medical Microbiology
7. Indian Journal of Pathology & Microbiology
8. Indian journal of Medical Microbiology
9. International journal of Medical Microbiology
10. International Journal of Antimicrobial Agents

## **VIROLOGY**

1. Viruses
2. Annual Review of Virology
3. Journal Virology
4. Journal of Clinical Virology
5. Journal of General Virology
6. Virology and Antivirus research
7. Virus Disease( Indian journal of Virology)
8. Journal of Antivirus and Antiretrovirals

## **IMMUNOLOGY**

1. Journal of Clinical; & Cellular Immunology
2. Journal of Immunological Technique & Infectious Diseases
3. Indian Journal of Allergy Asthma & Immunity
4. Journal of Rheumatology Current Research
5. Journal of Clinical Immunology

## **MYCOLOGY**

1. Journal on Studies in Mycology
2. Journal of Medical Mycology
3. Journal of Fungal Diversity
4. Journal of Mycological Research
5. Journal of fungal genetic and Biology
6. An International Journal on Fungal Biology
7. Journal of Infection Disease and therapy
8. American Journal of Infection Control
9. International Journal of Infection Control

## **PARASITOLOGY**

1. Journal of Vector Borne Disease
2. Journal of Bacteriology I & Parasitology
3. International Journal for Parasitology
4. Parasitology International
5. Comparitive Parasitology
6. Tropical Parasitology

\*\*\*\*\*

**M.D. NUCLEAR MEDICINE**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.D. NUCLEAR MEDICINE**

Nuclear Medicine involves use of small quantities of open, unsealed, short lived and medical grade radioactive substances (radiopharmaceuticals) in diagnosis, treatment and research in medical sciences. This postgraduate medical course provides a comprehensive study of basic principles, practices and protocols associated with nuclear and molecular medicine.

**1.GOALS:**

This 3-year post graduate course is aimed at providing comprehensive and quality education for the medical professionals in the field of Nuclear and Molecular Medicine.

This enables the student to become fully competent to practice, organize, conduct research and involve in teaching activities as well as become well versed with radiation safety, quality, medical ethics and legal aspects of imaging and treatment with radioisotopes.

At the end of this training, the student shall be able to:

1. Provide the health care to the patients needing Nuclear medicine service.□
2. Teach and train future undergraduate and postgraduate medical students, junior doctors and technologists in Nuclear medicine in Medical Colleges, Institutions and other Hospitals.
3. Acquire a spirit of scientific enquiry, carry out and guide research to improve the art clinical medicine and science of Nuclear medicine.□
4. Have management capabilities to make cost-effective and quality healthcare.□
5. Recognize the health needs of the community and carry out professional obligations ethically, while keeping with the objectives of the national health policy.
6. Be aware of the contemporary advances and developments in the field of Nuclear and molecular medicine.

**2.OBJECTIVES**

The postgraduate students have to acquire adequate knowledge in all the basic concepts, knowledge in instrumentation and radiochemistry and acquire optimum clinical skills relevant to the practice of Nuclear Medicine, in compliance with moral and ethical values of the country and humane approach to the patient.

### **Primary Objectives:**

The student should be able to

- 1 Suggest and conduct all routine diagnostic in-vitro and in-vivo nuclear medicine procedures.
- 2 Interpret the results of in-vitro and in-vivo non-imaging and imaging procedures and also provide a differential/provisional diagnosis, based on the results obtained.
- ☐ 3 Provide radioisotope therapy for endocrine, bone and joint diseases, with special emphasis on the management of thyrotoxicosis, thyroid cancer, neuro-endocrine tumours, rheumatoid arthritis and disseminated skeletal metastasis with intractable bone pain. ☐
- 4 Independently conduct emergency diagnostic nuclear medicine procedures and manage disorders accordingly. ☐
- 5 Independently organise and conduct seminars, teaching programmes and research projects in medicine including use of radioisotopes.

### **Secondary Objectives:**

The student should be able to

1. Conduct routine quality control tests on all nuclear medicine related instruments and correlate the functional status of an isotope generator, dose calibrator, uptake probe, gamma camera, gamma camera and radiation monitor.
2. Perform all routine quality control tests on radio-immunoassay procedures and maintain an acceptable degree of sensitivity, specificity and reproducibility of the test results.
- ☐ 3. Conduct quality control tests to assess the radiochemical purity and sterility of the radio-pharmaceuticals used in the department, including commercially available kit preparations.
4. Advise routine radiation safety measures during handling and administration of radioactive isotopes, and also calculate (wherever necessary) the radiation dose absorbed by the patients and their relatives during the course the investigations and therapy following ALARA principles.
- ☐ 5. Interpret the radiographic images and specialized investigations of an allied nature

(e.g. angiography, endoscopy, histopathological specimens, etc.)

□

### **Tertiary Objectives:**

The nuclear medicine physician should be able to

1. Setup nuclear medicine department either as an independent unit, or in hospitals and medical colleges.

□

2. Carry out and help in the conduct of research in nuclear medicine, communicate the results of such research at medical meetings and report in medical journals.

□

3. Guide research projects of students and critically evaluate the results of other □

**Apart from above, the postgraduate student has to develop human values, ethical practice and communication abilities:**

1. Adopt ethical principles in all aspects of his medical practice.

□

2. Develop communication skills, in particular, various □options available for management and to obtain a true informed consent from □the patient or the attendant.

□

3. Provide leadership and get the best out of his team in a congenial working □atmosphere.

□

4. Apply high moral and ethical standards while carrying out human or animal □research.

□

5. Be humble and accept the limitation in his knowledge and skills to ask for help □from colleagues when needed.

□

6. Respect patient's rights and privileges right to information and right to seek a second opinion.

### **3.Components of the Postgraduate curriculum**

•

**knowledge:**

#### **Theoretical**

**Basic sciences:** Basic principles, mathematics, counting statistics and statistical methods relevant to nuclear medicine.

Introduction to computers, basic of computer applications related to nuclear medicine, digital image acquisition, processing, archiving and retrieval of data.

**Radiation physics:** Introduction to nuclear physics, Radioactivity, Decay, Interaction of radiation with matter, units of measuring radioactivity, dosimetry.

**Radiochemistry and radiopharmaceuticals:** Production and properties of radio isotopes, mechanism and biological behavior radiopharmaceuticals and quality control.

**Radiobiology and safety:** Biological effects of radiation, diagnosis and therapeutic procedures, radiation protection, ICRP recommendations, managements of radiation accident, radioactive waste disposal and misadministration.

**Instrumentations:** Basics of electronic instruments, radiation measuring and detecting instruments, imaging and counting systems, Cross sectional Anatomy, SPECT – CT, PET – CT, PET – MRI, other contemporary imaging technologies and other in-vitro diagnostic instruments in Nuclear medicine.

- **Clinical skills** **Practical and**

**Diagnostics procedure:** Standard operating guidelines to be followed depending on the type of investigations

**Therapeutic procedure:** Full clinical work up is necessary with consultant opinion on co morbidities

**Quality Control Procedures:** Quality control procedures for diagnostic nuclear medicine equipment, radiopharmaceuticals and imaging and therapeutic protocols.

- **Writing**  
**thesis/research articles**

Each candidate should carry out a research program and has to submit a thesis, as per the Medical Council of India Guidelines and Regulations of this University before appearing in the final examination. Students are encouraged to attend CME's publish research papers and present posters or platform presentations at the state, national and international conferences.

- **Attitudes**  
**including communication skills**

Students should develop the art of eliciting the maximum information from the patient in a given time considering the sensory deficits of the patients and caregivers.

Communication skills can be learnt through observation and from formal communication skills training and workshops. Students have to develop patience and empathy in dealing with pediatric and geriatric- therapy and imaging patients. They have to learn and develop humane approach to patients.

- **Training in**  
**research methodology, medical ethics/bioethics and medico legal aspects**

**Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.**

**Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.**

**Medical ethics, bioethics, moral and legal issues, medical audit are part and parcel of the curriculum and syllabus in geriatric medicine.**

**1.**

**SYLLABUS**

**THEORY**

**I. Physics in Nuclear Medicine**

- a) Modes of Radioactive decay, with special emphasis to radionuclides commonly used in nuclear medicine
- b) Emissions accompanying radioactive decay, and their biological implications.
- c) Interactions of radiation with matter.□
- d) Basic physics of other imaging procedures including X-ray computed tomography, Nuclear magnetic resonance and ultrasonography.□
- e) Probability distribution and parametric and non-parametric statistics.
- f) Compartmental analysis and mathematical models of physiological systems.
- g) Computer applications with emphasis on digital image acquisition, analysis, processing and enhancement, tomographic reconstruction, display and recordings of findings.

**2. Instrumentation**

- a) Principles of radiation detection and detectors.□
- b) Nuclear Medicine instrumentation including Gamma scintillation cameras, scanners, dose calibrators, tomographic imaging devices, positron imaging instruments, whole body counters, Gamma well counters, liquid scintillation counters, monitoring devices and Cyclotron.□
- c) Quality control of Nuclear Medicine instruments.□
- d) Collimation of radiation detectors, the characteristics of parallel hole and other types of collimators, their response to point, line and plane sources.□
- e) Electronic instruments, such as pulse amplifiers, pulse height analyzers, count rate



meters and computer interfaces including gating systems. □

- f) Image production and display technology including photographic principles, with special emphasis on sensitivity, resolution, contrast latitude and film processing.

### **3. Radiation Biology & Protection**

- a) The biological effects of radiation exposure, with emphasis on the effects of low level exposure. □
- b) Administrative and technical means of preventing unnecessary radiation exposure to patients, personnel and environment.
- c) Calculation of the radiation dose from internally administered radionuclides.
- d) The diagnosis, evaluation and treatment of radiation overexposure in any □ form. □
- e) International recommendations and governmental regulations regarding limits □ of radiation exposure, handling of radioactive patients, transport of radioactive □ material and disposal of radioactive wastes. □
- f) Management of radiation accidents, including monitoring, decontamination □ and subsequent control. □

### **4. Radiopharmaceuticals**

- a) The safe handling of radioactive material. □
- b) Production of radio-nuclides by reactors, cyclotrons, other particles □ accelerators and the use of radionuclide generators and labeled compounds. □
- c) Formulation of radiopharmaceuticals considering chemical properties and □ quality control with special emphasis on Tc-99m Chemistry. □
- d) Biochemistry, physiology and pharmacokinetics of radio-pharmaceuticals.

### **5. In vivo diagnostic use of radio-nuclides**

- a) General clinical indications and limitations in the appropriate usage of radionuclide procedures; normal and altered anatomy, biochemistry and metabolism of the

various organs or processes to be examined; technical performance of the procedure, including proper patient preparation and patient management before, during and after the procedure. □

- b) The use of imaging devices, external detectors and computers for body organ imaging, and for time dependent and differential function studies. □
- c) The use of physiologic gating techniques for functional studies. □
- d) Patient monitoring during interventional tests such as exercise and pharmacological administrations and necessary management of any □emergency situation. □
- e) Cellular kinetics, absorption and excretion analysis, nuclear hematology and □metabolic balance studies using radiotracers. □
- f) Body composition tests, including compartmental analysis. □
- g) Whole body counting and total body scanning.
- h) Relationship between Nuclear Medicine imaging modalities including available, established (gamma camera, SPECT.CT, PET.CT and PET.MRI) and newer emerging nuclear medicine functional imaging methods with other pertinent imaging modalities. □
- i) Quantification analysis methods using SPECT and PET imaging in in neurology, cardiology, oncology, hepatobiliary and genitourinary systems

□

- j) In vivo imaging and/or function studies in following organ systems

## **1. Clinical Applications of Cardiovascular Nuclear Medicine.**

- a) Radio-Pharmaceutical agents for cardiac imaging, □
- b) Computer aspects of myocardial imaging, □
- c) Functional Cardiac imaging, □
- d) Clinical application of myocardial perfusion imaging, □
- e) Radiopharmaceuticals for myocardial infarct imaging, □
- f) MIBG imaging, □
- g) Positron emission Tomography of the Cardio-vascular system, □
- h) Peripheral Vascular Disease: Arterial & Venous.

□

## **2. Clinical applications of endocrine nuclear medicine,**

- a) The thyroid gland, □

- b) Scintigraphic Imaging of the Adrenals & neuro-ectodermal tumors, □
- c) Parathyroid scintigraphy, □
- d) Correlative endocrine Imaging.

### **3. Clinical Application of Gastrointestinal Nuclear Medicine. □**

- a) Radio pharmacy aspects of gastrointestinal imaging salivary gland, □
- b) Oesophageal transit and reflux, □
- c) Gastric emptying scintigraphy, □
- d) Radio pharmacy for Liver & Spleen imaging, □
- e) Liver & Spleen Imaging, □
- f) Radiopharmaceuticals for hepatobiliary imaging, □
- g) Evaluation of Gastrointestinal bleeding by nuclear medicine □ techniques, □
- h) Scintigraphic assessment of Peritoneovenous shunt function □

### **4. Clinical Application of Genitourinary Nuclear Medicine**

- a) Radiopharmaceuticals for renal imaging, □
- b) Glomerular Filtration, □
- c) The role of ACE inhibitor, □
- d) Renography in the diagnosis of renal vascular hypertension, □
- e) Evaluation of renal transplants, □
- f) Paediatric Urology.

### **5. Clinical Application of Musculoskeletal Nuclear Medicine**

- a) Bone imaging – Radiopharmaceutical,
- b) Skeletal scintigraphy in non-neoplastic osseous disorders.
- c) Malignant bone disease,

- d) Bone marrow scintigraphy,
- e) Bone mineral analysis ☐

#### 6. **Clinical Application of neurosurgical and neurologic Nuclear Medicine,**

1. Radiopharmaceuticals for cerebral imaging cerebral perfusion ☐imaging, Cerebralspinal fluid imaging, ☐
2. The role of positron emission, Tomography in the investigation of ☐neurologic disorders, ☐
3. The role of positron emission, Tomography in the investigation of ☐psychiaritic disorders, ☐
4. Correlative imaging in neurology and neurosurgery. ☐

#### 7. **Clinical Application of Pulmonary Nuclear Medicine**

- a. Radiopharmaceuticals for pulmonary Imaging ventilation- perfusion ☐scintigraphy
- b. Pulmonary imaging for non thromboembolic disease.
- c. Clinical application of Oncologic Nuclear Medicine,
- d. Non-FDG Tumor imaging lymphoscintigraphy in Oncology,
- e. Positron Emission Tomography: Application in Oncology.

#### 8. **Immunologic and Oncologic Aspects of Nuclear Medicine.**

- a. New approaches to radio labelling monoclonal antibodies, ☐

- b. Tumour necrosis therapy for Cancer: New methods of Antibody ☐Targeting, ☐
- c. Radiation Dosimetry of Radio Labeled monoclonal Antibodies: ☐Practical considerations, ☐
- d. Over view of Imaging Procedures with Radio labeled monoclonal antibodies in cancer patients.

## 9. In vitro Studies

- a) Principles of radio-isotopic micro analytical techniques, including quality control and data analysis. ☐
- b) Radioimmunoassay (RIA) and immunoradiometric assay (IRMA) - specific assays of thyroid hormones (T3, T4, TSH)- - principles, procedures, data analysis and quality control methods ☐
- c) Binding capacity studies such as receptor assays and T-3 Resin uptake etc.
- d) Principles of activation analysis and autoradiography. ☐
- e) Chromium-51 RBC studies - estimation of RBC mass and splenic ☐sequestration ☐
- f) Calculation of Glomerular Filtration Rate (GFR) by Tc-99m DTPA - one ☐sample, two sample and multiple sample techniques, data analysis and ☐quality control ☐
- g) Carbon-14 urea breath test for diagnosis of Helicobacter pylori infection and ☐prognosis after treatment ☐
- h) Miscellaneous studies – RAIU, Denatured RBC studies for accessory spleen ☐

## 10. Therapeutic Uses of Radionuclide

- (a) Patient selection, including the diagnostic procedures necessary to establish the need for radionuclide therapy, indications and contraindications for the use of radionuclide therapeutic procedures and their efficiency in relation to other therapeutic approaches. ☐
- (b) Dose administration in patient management including dose to the target areas, to the surroundings tissues and/or other organ systems, and total body exposures;

the range of doses in each specific application, the special problems of patient care caused by radionuclide therapeutic procedure, potential early and late adverse reactions, the timing and parameters of anticipated clinical response, and the follow up care and evaluation as needed. □

(c) Specific applications: radio-iodine in hyperthyroidism and thyroid carcinoma; radiophosphorus (soluble) in polycythemia vera and other myeloproliferative disorders, colloidal radiophosphorus and radio-colloids for intra cavitory therapy of malignant effusions and treatment of chronic inflammatory joints (radiosynovectomy); radiolabelled antibodies, radioisotope bone pain palliation, radionuclide therapy for neuroendocrine tumors.

(d) Radionuclide therapy using both established and newer radioisotopes in various conditions, their advantages and limitations in comparison to other available conventional modes of therapy.

11. Recent Advances in SPECT-CT, PET-CT & PET-MRI and their clinical applications

12. Recent Therapeutic Radiopharmaceuticals and Procedures.

### **13. Organizational Considerations**

(a) Design of laboratories. □

(b) Economic aspects of Nuclear Medicine and cost-effectiveness of Nuclear Medicine procedure. □

(c) Public relations. □

(d) Role of national and International Organizations.

### **5. Teaching Learning methods**

1. Didactic Lectures in Physics related in Nuclear Medicine, Radiopharmacy, Radioisotope, Techniques, instrumentation data processing and quality control.
2. Participation in the daily routine work of the department including work rounds of patient admitted for radionuclide therapy.
3. Presentation of cases in the reporting sessions of the department.

4. Active participation in the combined clinical meeting with other departments for case discussions.

## 6. Special Posting in Clinical Nuclear Medicine

Students will be in Parent department during first year and third year

### Second Year :

|                         |          |
|-------------------------|----------|
| a. Radio diagnosis      | 2 months |
| b. Cardiology           | 1 months |
| c. Neuro-Science        | 2 months |
| d. Nephrology & Urology | 1 months |
| e. Endocrine Surgery    | 1months  |

- |                        |          |            |
|------------------------|----------|------------|
| f. Medical & Radiation | Oncology | - 2 months |
| h. General Medicine    |          | - 2 months |
| i. Paediatric Surgery  |          | - 1 month  |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## 8. COMPETENCY ASSESSMENT:

### • OVERALL:

- |                                                     |     |           |
|-----------------------------------------------------|-----|-----------|
| a) Communication / commitment / Contribution /      | ( ) |           |
| Compassion towards patients and Innovation          | ( ) | - 5 Marks |
| b) Implementation of newly learnt techniques/Skills | ( ) |           |

- Number of cases presented in Clinical Meetings/  
Journal clubs/seminars - 5 marks

- Number of Posters/Papers presented in Conferences/

**Publications and Research Projects**

**- 5 marks**

- **No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details.**

**- 5 marks**

**Total**

**20 Marks**

**PG CLINICAL COURSES**

**VIVA including Competency Assessment**

**- 80 Marks (60 + 20)**

**Log Book**

**- 20 marks**

**ASSESSMENT SCHEDULE IS AS FOLLOWS**

| <b>Year of study</b> | <b>Period</b>   |                 |                  |                 |  | <b>Total Max.20 marks</b> |
|----------------------|-----------------|-----------------|------------------|-----------------|--|---------------------------|
| <b>I year</b>        | <b>Upto Dec</b> | <b>10 marks</b> | <b>Upto June</b> | <b>10 marks</b> |  | <b>20 Marks</b>           |
| <b>II year</b>       | <b>Upto Dec</b> | <b>10 marks</b> | <b>Upto June</b> | <b>10 marks</b> |  | <b>20 Marks</b>           |
| <b>III year</b>      | <b>Upto Oct</b> | <b>10 marks</b> | <b>Upto Feb</b>  | <b>10 marks</b> |  | <b>20 Marks</b>           |
|                      | <b>AVERAGE</b>  |                 |                  |                 |  | <b>20 Marks</b>           |

**9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to



**submit at-least one research paper. Case Reports are not considered as Research Paper**

## **10 THEORY EXAMINATION**

PAPER-I Basics Radiation Physics & Instrumentations of Nuclear Medicine  
Computers and Mathematics in Nuclear Medicine, Compartmental  
Analysis & Statistics.

PAPER-II Radiopharmacy, Radiobiology, Quality Assurance in Medical Imaging,  
Radiation Protection Radiation Safety – including national and  
international regulatory norms.

PAPER –III Clinical Nuclear Medicine including (in vivo & in vitro studies),  
Cardiovascular, Neurology, Endocrinology, Gastroenterology,  
Oncology, Infection and Inflammation, Genitourinary, Musculoskeletal  
and Radionuclide Therapy

PAPER –IV Recent Advances in Nuclear Medicine Imaging and Radionuclide Therapy.

**\*\*** The university for having modified the pattern of question in respect of Paper –  
I Basic Sciences & Instrumentation in Nuclear Medicine, Computers and Mathematics  
in Nuclear Medicine and Compartmental Analysis – MD (Nuclear Medicine) Post  
Graduate Degree Course.

**\*\* Resolved in 55<sup>th</sup> Standing Academic Board held on 18.07.2018.**

### **Question Paper Pattern:**

|           |                 |                    |
|-----------|-----------------|--------------------|
| Paper I : | Write notes on  |                    |
|           | 1. Anatomy      | 4 x 5 = 20         |
|           | 2. Physiology   | 4 x 5 = 20         |
|           | 3. Biochemistry | 3 x 5 = 15         |
|           | 4. Pharmacology | 3 x 5 = 15         |
|           | 5. Pathology    | 3 x 5 = 15         |
|           | 6. Microbiology | 3 x 5 = 15         |
|           |                 | -----              |
|           | <b>Total</b>    | <b>= 100 marks</b> |
|           |                 | -----              |

Paper II, III & IV

|                   |             |
|-------------------|-------------|
| 1. Elaborate on:  | 2 x 15 = 30 |
| 2. Write Notes on | 10 x 7 = 70 |

**Total = 100 marks**

## 11. PRACTICAL EXAMINATION :

|                                                            |                         |
|------------------------------------------------------------|-------------------------|
| CLINICALS                                                  |                         |
| Long Case -1 (1 X 80 MARKS)                                | 80 MARKS                |
| Short Cases -2 (2 X 35 MARKS EACH)                         | 70 MARKS                |
| PRACTICAL (Physics / Radiopharmaceuticals Quality Control) | 30 Marks                |
| OSCE / SPOTTERS (10 x 2 marks)                             | 20 Marks                |
| Total                                                      | 200 marks (A)           |
| VIVA including Competency Assessment                       | 80 marks (B)            |
| LOG Book                                                   | 20 marks (C)            |
| Total (Clinical + Viva)                                    | 300 MARKS (A+B+C)       |
| Minimum marks required for Pass (50%)                      | 150 marks               |
| Dissertation                                               | Approved / Not Approved |

## 12.LOG BOOK

Each candidate should be required to maintain a log book in which following details will be entered.

1. Investigations Performed
2. Cases Presented in
  - a. Clinical meetings with other departments.
  - b. Departmental seminars.
  - c. Journal clubs along with Title & Journal Issue with title.
  - d. Cases worked up for radionuclide therapy.
  - e. Schedule of interdepartmental rotations.
  - f. Details of hands – on trainings.

3. Conferences attended – National / International.

Papers presented of conference with title name of the conference, date of presentation.

4. Paper published with title, name & issue of the journal.

**The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.**

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

### **13. VIVA (including Competency Assessment) – 80 Marks (60 + 20)**

**An unstructured viva will be carried out by the examiners. VIVA including Competency Assessment for Clinical courses**

### **14. OSCE Stations**

OSCE /SPOTTERS stations include topics on radiopharmaceuticals, radiation safety aspects, nuclear medicine physics and the clinical/practical relevance of these aspects in nuclear medicine.

1. TLD badge: Questions: a) Identify b) the content of the material c) Principle of its function
2. Lead pot: Questions: a) Identify b) Its usage in Nuclear Medicine c) HVT of lead for I-131
3. Transport index Symbol: Questions: a) Identify b) What is transport index c) Essential Details on tremcard (Transport Emergency Card)
4. MIBI cold kit: Questions: a) Its imaging uses b) Indications for myocardial perfusion imaging c) Other imaging uses of MIBI
5. Millipore filter: Questions: a) Identify b) its uses in Nuclear medicine c) Principle of its function
6. Survey meter: Questions: a) Identify b) its uses in Nuclear medicine c) Principle of its function
7. Interesting clinical image 1: Identify and interpretation
8. Lead Apron: a) Identify b) its uses in Nuclear medicine c) Principle of its function
9. Interesting clinical image 2: Identify and interpretation
10. Interesting clinical image 3: Identify and interpretation

### **15. REFERENCE BOOKS**

1. Physics in Nuclear Medicine – Simon Cherry, James Sorenson & Michael Phelps.
2. Basic Medical Radiation Physics: Stanton.
3. Medical Radiation Physics – William R. Hendee.
4. Basics of Computers and Image hard copy production in Nuclear Medicine.
5. Computers in Nuclear Medicine- A Practical Approach -Kai. H.LEE.
6. Computer Fundamentals- concepts, systems & Applications – D.P.Nagpal.
7. Effective use of computers in Nuclear Medicine: Medical J.Gelf and Stephen R. Thomas.
8. Book for basic in Statistics by Sundar Rao and Richard
9. Practical Mathematics in Nuclear Medicine technology by Patricia Wells.
10. Text Book of Nuclear Medicine by [John C. Harbert](#), [Antonio Fernando Gonçalves Rocha](#), Vol. 1 & 2
11. Instrumentation in Nuclear Medicine – Gerald J. Hine.
12. Hand book of Nuclear Medicine – Frederick L. Datz.

13. Essentials of Nuclear Medicine Imaging – Fred A Mettler, Milton J Guiberteau.
14. Fundamentals of Nuclear Pharmacy – Gopal. B. Saha.
15. Modern Nuclear Chemistry – Waltor D Loveland, Davi Morrissey and Glenn.
16. Diagnostic Nuclear Medicine Martin P Sandler, Edward Colmann.
17. Recent advances in Nuclear Medicine John. H. Lawrence.
18. Radiation Biology and Physics Paul F Wilson and Joel S Bedford
19. Radiation safety in Nuclear Medicine – Max. H.Lombardi.
20. An introduction to Radiobiology – A.H.W.Nias
21. Biological assessment of Radiation Damage – Thomas. L, Walden.Jr and Nushin K
22. Radiobiology for the Radiologist –Eric J Hall, and Amato J Giaccia. PET:  
Physics, Instrumentation, and Scanners – Michael Phelps.
23. PET and PET-CT A clinical Guide –Eugence Lin and Abbas Alavi
24. Text Book of Nuclear Medicine – Henkins
25. Nuclear Medicine and PET/CT Technology and Techniques –Paul Christian and  
Kristin Waterstram.

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

#### **16.Journals:**

1. Clinical Nuclear Medicine.
2. Seminars in Nuclear Medicine.
3. Journal of Nuclear Medicine.
4. Annals of Nuclear Medicine.
5. European journal of Nuclear Medicine and Molecular Imaging
6. Nuclear Medicine Communication.
7. Indian Journal of Nuclear Medicine.
8. International Journal of Nuclear Medicine and Biology
9. World Journal of Nuclear Medicine
10. PET Clinics
11. Nuclear Medicine
12. International Journal of Radiation Biology
13. Journal of Labeled Compounds and radiopharmaceuticals

\*\*\*\*\*

**M.D. EMERGENCY MEDICINE**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.D. EMERGENCY MEDICINE**

|     | <b>Table of contents</b>                                                                                                                                                                                                                                                                                                                               | <b>Page No.</b> |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 1.  | Introduction                                                                                                                                                                                                                                                                                                                                           | 2               |
| 2.  | Goal                                                                                                                                                                                                                                                                                                                                                   | 2               |
| 3.  | Objectives                                                                                                                                                                                                                                                                                                                                             | 3               |
| 4.  | Components of the postgraduate curriculum <ul style="list-style-type: none"><li>• Theoretical Knowledge</li><li>• Practical and Clinical Skills</li><li>• Writing Thesis/Research Articles</li><li>• Attitudes including Communication Skills</li><li>• Training in Research Methodology, Medical Ethics /Bioethics and Medico legal aspects</li></ul> | 4               |
| 5.  | Theory syllabus                                                                                                                                                                                                                                                                                                                                        | 11              |
| 6.  | Teaching learning methods (including Clinical Study)                                                                                                                                                                                                                                                                                                   | 34              |
| 7.  | Structured training program                                                                                                                                                                                                                                                                                                                            | 35              |
| 8.  | Dissertation and e-journal                                                                                                                                                                                                                                                                                                                             | 36              |
| 9.  | Theory examination                                                                                                                                                                                                                                                                                                                                     | 37              |
| 10. | Practical examination                                                                                                                                                                                                                                                                                                                                  | 38              |
| 11. | Log book                                                                                                                                                                                                                                                                                                                                               | 39              |
| 12. | Viva                                                                                                                                                                                                                                                                                                                                                   | 40              |
| 13. | Pedagogy                                                                                                                                                                                                                                                                                                                                               | 40              |
| 14. | OSCE / OSPE                                                                                                                                                                                                                                                                                                                                            | 41              |
| 15. | Reference books                                                                                                                                                                                                                                                                                                                                        | 42              |
| 16. | Journals                                                                                                                                                                                                                                                                                                                                               | 43              |

## **Introduction**

Emergency Medicine (EM) is a specialty that is concerned with the initial diagnosis and management of a wide spectrum of acute illnesses and injuries in all age groups. It is a specialty in which time is critical. There is an initiative in developing PG training program in Emergency medicine across the country in various medical institutions. The specialist Emergency Medicine physician is an academic and community resource, providing leadership in the administration of emergency departments, emergency medical systems and programs, and the conduct of relevant research and education.

## **GOAL**

The aim of this curriculum is to create a specialist Emergency Medicine physician who at the completion of the 3 year training period is

- ❖ A competent specialist in Emergency Medicine, capable of assuming a consultant's role in the specialty.
- ❖ Capable of employing pertinent methods of prioritization, assessment, intervention, resuscitation, and further management of patients to the point of transfer.
- ❖ Skilled in emergency department management and disaster management, and has the ability to interface with and play a leadership role in the development and organization of emergency medical services and pre-hospital care in India
- ❖ Able to carry out research and guide trainees in the field of emergency medicine
- ❖ Competent to pass on his/her knowledge, skills and attitudes for effective patient care to undergraduates and post-graduate trainees

## OBJECTIVES

At the end of the post-graduation training, the Emergency Medicine physician should have acquired the required clinical knowledge, skills, and attitudes necessary to rapidly assess and manage a full spectrum of patients, often concomitantly, with acute or undifferentiated illness and injury.

|   |           |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A | Knowledge | The post-graduate student should acquire knowledge of the principles of resuscitation and critical care management, trauma, acute medical and surgical disorders, neurological, cardio-pulmonary, abdominal, genito-urinary, skin and soft tissue and musculoskeletal emergencies, psychiatric and behavioral disorders, toxicology, environmental emergencies, pre-hospital care, emergency preparedness and disaster medicine. |
| B | Attitude  | Through the training program the post-graduate student should develop empathy towards patients, recognize and respond to the ethical dimensions in medical decision-making and be able to prioritize professional duties effectively when faced with multiple patients and emergencies.                                                                                                                                          |
| C | Skills    | The post-graduate student should be able to apply the knowledge of the clinical, basic sciences and socio-behavioral sciences relevant to Emergency Medicine to rapidly assess and manage patients with acute and/or undifferentiated illness or injury, ranging from life-threatening events to common minor presentations                                                                                                      |



## COMPONENTS OF THE POSTGRADUATE CURRICULUM

### THEORITICAL KNOWLWDGE

The post-graduate student should acquire basic science and clinical knowledge of all emergencies ranging from life-threatening events to common minor presentations, including but not limited to the following.

|   |                                                                                                         |                                                                                                                                                                                                                                                                            |
|---|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Principles of resuscitation and critical care management                                                | Basic life support, Advanced cardiac life support, Pediatric life support                                                                                                                                                                                                  |
| 2 | Trauma                                                                                                  | General concepts in the management of the traumatized patient, Advanced trauma life support, Injuries to the following areas/body systems: Head, face, neck, thorax, abdomen, genitor-urinary, musculoskeletal, nervous system, soft tissue/cutaneous, spine and vascular. |
| 3 | Acute medical and surgical disorders including but not limited to the following cardinal presentations: |                                                                                                                                                                                                                                                                            |
|   | a. Head and neck                                                                                        | Diplopia, eye pain/ ,loss of vision, ear pain, loss of hearing, tinnitus, rhinorrhea, dysphagia, sore throat, stridor                                                                                                                                                      |
|   | b. Neurological                                                                                         | Coma, confusion, decreased level of consciousness, delirium, ataxia, dizziness headache, neurologic deficit, paralysis, paresthesia/dysesthesia, seizure, tremor, Vertigo                                                                                                  |
|   | c. Cardio-pulmonary                                                                                     | Chest pain. Cough, cyanosis, dyspnea, edema, hemoptysis, palpitations, syncope, wheezing                                                                                                                                                                                   |

|   |                                              |                                                                                                                                                                                                 |
|---|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | d. Abdominal                                 | Abdominal pain, ascites, diarrhea, Gastrointestinal bleeding, jaundice, nausea and/or vomiting                                                                                                  |
|   | e. Genito-urinary                            | Abnormal vaginal bleeding, dysmenorrhea, dysuria, genital ulcers, hematuria, pelvic pain, testicular pain, urethral discharge, urinary incontinence, urinary retention, vaginal discharge       |
|   | f. Skin and soft tissue                      | Abscesses, bites, cellulitis, necrotizing infections, rash                                                                                                                                      |
|   | g. Musculoskeletal                           | Back pain, limb or joint pain/swelling, neck pain                                                                                                                                               |
|   | h. Systemic                                  | Fever, hypotension, shock, weakness                                                                                                                                                             |
| 4 | Psychiatric and behavioral disorders         |                                                                                                                                                                                                 |
| 5 | Disorders of special populations, including  | Pediatric patients, The pregnant patient and her fetus, Geriatric patients, Immunocompromised patients                                                                                          |
| 6 | Toxicology                                   | General measures in the management of poisoning, insecticide and pesticide poisoning, drug overdose, plant poisons and other poisons, snake bites, insect envenomation, Animal bite management. |
| 7 | Environmental emergencies                    | Burns, chemical accidents, occupational injuries, inhalation injuries, Bioterrorism.                                                                                                            |
| 8 | Pre-hospital care                            |                                                                                                                                                                                                 |
| 9 | Emergency preparedness and disaster medicine |                                                                                                                                                                                                 |

## PRACTICAL AND CLINICAL SKILLS

The post-graduate student should have the knowledge of the indications, contraindications, methods, and potential complications of the therapeutic and investigative procedures employed in Emergency Medicine. At the end of the training period, he/she should be able to perform these procedures in an appropriate, safe, and skillful manner, with appropriate attention to minimizing patient risk and discomfort

| Diagnostic procedures  |                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                      | Minor diagnostic procedures                                  | Abdominal paracentesis , Arterial puncture, arthrocentesis, Thoracocentesis, Venipuncture, Vaginal examination using speculum, Assessment of the sexual assault victim, Slit lamp use                                                                                                                                                                                                                                                                 |
| 2                      | Diagnostic procedures relevant to the critically ill patient | Carotid sinus massage, Lumbar puncture and measurement of cerebrospinal fluid (CSF) pressure                                                                                                                                                                                                                                                                                                                                                          |
| 3                      | Emergency ultrasonography                                    | Focused Assessment of Sonography in Trauma (FAST), Emergency Ultrasound (to identify intrauterine gestation, intra-peritoneal free fluid , pleural fluid), Echocardiology (determination of the absence of cardiac motion, determine regional wall motion abnormalities, identify RA, RV dilatation, pericardial fluid ) and facilitation of vascular access                                                                                          |
| Therapeutic procedures |                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 1                      | Basic and advanced airway management                         | End-tidal carbon dioxide (CO <sub>2</sub> ) detection and monitoring, Laryngoscopy, Laryngoscopy and removal of foreign body, Mask ventilation, Orotracheal intubation, Percutaneous transtracheal ventilation, Rapid sequence intubation , Selection of appropriate mode and parameters for mechanical ventilation, Sellick's manoeuvre, Surgical/needle cricothyrotomy, Difficult airway management, Non-invasive ventilation, Invasive ventilation |

|   |                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                           |
|---|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | Therapeutic procedures relevant to the critically ill patient                     | Interpretation of an ECG, Defibrillation , Needle thoracentesis, Needle thoracostomy, Thoracostomy tube insertion and management ,Pericardiocentesis , Synchronized cardioversion, Transcutaneous pacing                                                                                                                                                                                  |
| 3 | Peripheral and central vascular access and line insertion/monitoring              | central venous catheter insertion (femoral, brachial, sub clavian, internal jugular), Central venous pressure (CVP) measurement, Cannulation of the external jugular vein and peripheral veins, Intraosseous needle insertion, Administration of fluids including blood and substitutes                                                                                                   |
| 4 | Minor therapeutic procedures relevant to the daily practice of emergency medicine | Anterior intranasal packing, insertion of indwelling urethral catheter, Bladder irrigation, Gastric lavage, Bursae aspiration/injection, Debridement of burn blisters, External auditory canal wick insertion, Ocular irrigation, Posterior intranasal packing, Subungual hematoma drainage, Incision and drainage of abscess, Needle aspiration of abscess, Testicular torsion reduction |
| 5 | Local/regional anesthesia and procedural sedation                                 | Assessment of the level of pain and sedation, Peripheral nerve blocks, local anaesthesia administration, Pediatric and adult procedural sedation with monitoring                                                                                                                                                                                                                          |
| 6 | Wound management                                                                  | Application of bandages/dressings, Basic wound debridement, Closure with tissue adhesive glue, Management of fingertip amputation, Nail bed laceration repair, Suturing, single and multiple layer closure, Wound hematoma evacuation                                                                                                                                                     |
| 7 | Extraction of                                                                     | Corneal or conjunctival foreign body, ear wax, Nasal foreign body, Otic foreign body, Rectal foreign body, Skin/subcutaneous tissues foreign body, Vaginal foreign body                                                                                                                                                                                                                   |

|   |                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8 | Management of fractures and dislocations                                    | <ul style="list-style-type: none"> <li>❖ Application and removal of cervical collar/spinal immobilization ,</li> <li>❖ Application and removal of femoral traction device,</li> <li>❖ Application of upper extremity slings,</li> <li>❖ Circumferential cast immobilization of extremity fractures,</li> <li>❖ Definitive reduction and immobilization of the following displaced fractures, when appropriate (Distal radius, Fifth metacarpal neck, Phalanx),</li> <li>❖ Immobilization of unstable pelvic fractures ,</li> <li>❖ Reduction of subluxations and dislocations, including but not limited to: Ankle, Elbow, Glenohumeral, Hip, Interphalangeal, Metacarpal phalangeal, Patella, Radial head subluxation</li> <li>❖ Rigid splint immobilization of extremity fractures and injuries</li> <li>❖ Splinting of tendon and ligament injuries of the hand, including but not limited to: Mallet finger injury, Volar plate injury</li> <li>❖ Stabilization and immobilization of uncomplicated upper and lower extremity fractures,</li> <li>❖ Temporary reduction and immobilization of any displaced fracture for the relief of pain and/or neurovascular compromise</li> </ul> |
| 9 | Management of normal and complicated delivery, including but not limited to | Normal vaginal delivery, Newborn and premature resuscitation, Postpartum hemorrhage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## **WRITING THESIS/ RESEARCH ARTICLES**

Research should be an integral part of the education program of all the trainees in emergency medicine. All students must complete a thesis/dissertation by the end of their training period under the guidance of an expert faculty. The Basic aim of requiring the candidates to write a thesis/dissertation is to familiarize him/her with research methodology.

The students are also encouraged to attend CME's, publish research papers and present posters, or platform presentations at state, national and international conferences.

## **ATTITUDES INCLUDING COMMUNICATION SKILLS**

At the end of the training period, the post-graduate resident should be an effective communicator who can effectively facilitate the dynamic exchanges that happen during the doctor-patient-relatives interaction during and after the medical encounter.

Key competencies: The emergency physician should be able to

- ❖ Develop rapport, trust, and positive, ethical therapeutic relationships with patients and their relatives
- ❖ Accurately elicit and synthesize relevant information from the patients and act professionally and be sensitive to the patients' perspective while screening for sensitive information.
- ❖ Convey sensitively the relevant information and health care plan that includes a clear explanation of the diagnosis, investigations, treatment and expected outcome to the patient and their relatives
- ❖ Explain clearly the details of therapeutic and diagnostic procedures performed on patients and obtain oral and written consent when required.
- ❖ Act professionally and respectfully of his/her colleagues during times of stress of a medical encounter.

## TRAINING IN RESEARCH METHODOLOGY, MEDICAL ETHICS /BIOETHICS AND MEDICOLEGAL ASPECTS

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics,Bioethics, moral and legal issues, medical audit are part and parcel of the curriculum and syllabus.

### Medicolegal aspects:

At the end of the training period, the student should be able to

- ❖ Possess adequate knowledge of the various medicolegal conditions and the process of informing the police during a medical encounter.
- ❖ Distinguish a grievous injury from a non-grievous injury (Section 320 IPC) and perform their role as a law abiding citizen of India.
- ❖ Provide appropriate medical documentation (including forensic and clinical photography, collection of biological samples, ballistics)
- ❖ Report and refer certain conditions appropriately (eg. child sexual abuse or neglect, elderly abuse, sexual assault allegations)

### THEORY SYLLABUS

This is the recommended core theory syllabus for MD in Emergency Medicine. The following are the topics that a post-graduate resident should have in depth knowledge of by the end of their training program. This list is not exhaustive

The theory syllabus is divided as follows:

|   |                                             |                                                                                                                                                                                                                                               |
|---|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A | Core resuscitation knowledge and techniques | <ul style="list-style-type: none"><li>• Basic life support</li><li>• Sudden cardiac death</li><li>• Cardiopulmonary resuscitation</li><li>• Airway and breathing</li><li>• Circulation</li><li>• Fluid and electrolyte disturbances</li></ul> |
|---|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|   |                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B | Applied basic sciences                 | <ul style="list-style-type: none"> <li>• Applied anatomy</li> <li>• Pathophysiology</li> <li>• Pathology</li> <li>• Pharmacology</li> <li>• Microbiology</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| C | System based core knowledge            | <ul style="list-style-type: none"> <li>• Cardio-vascular emergencies</li> <li>• Pulmonary emergencies</li> <li>• Neurological emergencies</li> <li>• Gastro-intestinal and hepatic emergencies</li> <li>• Dermatological emergencies</li> <li>• Renal and urological emergencies</li> <li>• Endocrine and metabolic emergencies</li> <li>• ENT and dental emergencies</li> <li>• Ophthalmological emergencies</li> <li>• Obstetric and gynaecological emergencies</li> <li>• Hematology and oncological emergencies</li> <li>• Musculoskeletal emergencies</li> <li>• Immunological emergencies emergencies</li> <li>• Infectious diseases</li> <li>• Psychiatric and behavior disorders</li> <li>• Trauma</li> <li>• Wound management</li> <li>• Pediatrics</li> </ul> |
| D | Specific aspects of emergency medicine | <ul style="list-style-type: none"> <li>• Toxicology and envenomation</li> <li>• Disaster medicine</li> <li>• Abuse and assault</li> <li>• Analgesia and procedural sedation</li> <li>• Environmental accidents</li> <li>• Medico-legal issues</li> <li>• Pre-hospital care</li> <li>• Problems in the elderly</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## CORE RESUSCITATION KNOWLEDGE AND TECHNIQUES

1. Basic life support
2. Sudden cardiac death
3. Cardiopulmonary resuscitation (CPR)
  - CPR in adults
  - CPR in children
  - Neonatal resuscitation
  - Resuscitation issues in pregnancy
  - Disturbances of cardiac rhythm and conduction



#### 4. Airway and breathing

- Difficult airway in adults
- Pediatric airway management
- Non-invasive airway management
- Tracheal intubation and mechanical ventilation
- Surgical airway management

#### 5. Circulation

- Vascular access
- Management of shock: Septic, cardiogenic, hemorrhagic and neurogenic

#### 6. Fluid and electrolyte disturbances

- Acid-Base disorders
- Electrolyte disorders
- Volume status and fluid balance

### APPLIED BASIC SCIENCES

#### 1. Applied anatomy

- Upper limb
  - Pectoral region: Muscles (Surface markings, actions and nerve supply)
  - Axilla: Muscles: Surface markings, actions and nerve
  - Breast: Lymph drainage pattern to nodes based upon quadrants of the breast
  - Muscles: Origin, insertion, neuro vascular innervations and action
  - Nerves: Brachial plexus (origin, course, branches), musculocutaneous, axillary, radial, median, ulnar nerves and their branches. Cutaneous supply of the upper limb.
  - Bones: Long and short bones of the arm, forearm and hand
  - Joints: (coraco-acromial, acromio-clavicular, elbow, wrist and carpal joints) Joint type, bony articulations of the joint, ligaments of the joint, range of motion
  - Vascular supply: Subclavian, Axillary, brachial, radial, ulnar and their branches.  
Vascular supply, surface anatomy, course and relationship to other structures
- Lower limb
  - Muscles: Origin, insertion, neuro vascular innervations and action
  - Nerves: Lumbosacral plexus (origin, course, branches), Femoral, sciatic, obturator, superficial peroneal, deep peroneal, posterior tibial and their branches. Cutaneous supply of the lower limb.
  - Bones: Long and short bones of the thigh, leg and foot
  - Joints: (Hip, knee, ankle, tarsal joint) Joint type, bony articulations of the joint, ligaments of the joint, range of motion
  - Vascular supply: Femoral, popliteal, anterior tibial, posterior tibial and their branches.  
Vascular supply, surface anatomy, course and relationship to other structures.

- Thorax
  - Thoracic wall
  - Diaphragm
  - Thoracic inlet
  - Trachea
  - Heart and pericardium
  - Esophagus
  - Pleura and lungs
- Abdomen and groin
  - Abdominal wall
  - Inguinal region
  - Testis, epididymis and spermatic cord
  - Peritoneum
  - Gastrointestinal tract
  - Intra-abdominal viscera
  - Posterior Abdominal wall: muscles, vessels, nerves
  - Pelvic cavity
  - Rectum and anus
  - Male urogenital region
  - Female urogenital region
- Head and neck
  - General topography: muscles, spaces & fascia
  - Triangles of the neck: anterior and posterior triangles
  - Thyroid
  - Trachea
  - Oesophagus
  - Carotid sheath
  - Face
  - Scalp
  - Parotid region
  - Infratemporal fossa
  - Nerves supply of the head and neck
  - Blood supply of the head and neck
  - Pterygopalatine fossa
  - Nose and paranasal region
  - Mouth and palate
  - Nasopharynx, Oropharynx and laryngopharynx
  - Larynx
  - Orbit and eye
  - Functional anatomy of eye movement
  - Ear: External, middle and internal
  - Temporomandibular joint

- Central nervous system
  - Cerebral hemispheres and lobes
  - Cortical areas
  - Thalamus, subthalamus and Limbic system
  - Ventricles
  - Brain stem – midbrain, pons and medulla
  - Cranial nerves – origin, course, motor, sensor and autonomic innervations
  - Cerebral blood supply – Circle of willis
  - Spinal cord – cross sections cervical, thoracic, lumbar and sacral, blood supply
  -

## 2. Pathophysiology

- Basic cellular physiology
  - Homeostasis: osmolality and osmolarity
  - Cell structure and function (membrane structure and function)
  - Blood and blood flow
  - Neurological action potential
  - Function of the sympathetic and parasympathetic nervous system
  - Muscle physiology: skeletal muscle, cardiac muscle
- Cardiovascular physiology
  - Control BP and HR (afferent, central, efferent)
  - Factors affecting cardiac output, pre and afterload
  - Measurement of cardiac output
  - Frank Starling curves
  - Control of peripheral blood flow, renal blood flow, Cerebral blood flow, Coronary blood flow, Pulmonary blood flow
  - Electrical & mechanical changes during cardiac cycle
  - ECG
  - Pharmacological manipulation of heart & peripheral circulation
  - Acute & delayed responses to intravascular fluid loss
- Respiratory physiology
  - Lung volumes and pressures: Definition of lung volumes, epithelial function in health, lung compliance, alveolar interfaces, airway resistance, gas transport, alveolar diffusion
  - Gas transport during circulation: Carriage of O<sub>2</sub> and CO<sub>2</sub> in blood, carriage of CO, oxy-Hb dissociation curve (& myoglobin)
  - Control of respiration: Respiratory centre mechanism, chemoreceptors, stress receptors, J receptors
  - Ventilation perfusion mismatch

- Central nervous physiology
  - Intra cranial pressure: Regulation, Measurement, Relationship with cerebral perfusion pressure
  - Sensory & motor pathways
  - Nerve conduction
  - Pain (mechanism & control)
  - Control of sight & hearing
  - Brain stem reflexes & death
  - Temperature: Thermoregulation (central & peripheral), Fever, Measurement of core temperature, Hypothermia, Hyperthermia
- Renal physiology
  - Mechanism of filtration in health: Glomerular filtration, creatinine clearance, tubular transport, proximal tubular function, loop of henle, distal collecting system, regulation of plasma osmolarity, effect of renal hormones
  - Renal function and its measurement
  - Control of electrolytes (Na, K, Cl, Ca) & water homoeostasis
  - Thirst
  - Control of micturition
  - Acid base balance
- Hematology
  - Erythropoiesis
  - Compensatory mechanisms in anemia
  - Blood groups
  - Coagulation pathway
- Endocrine physiology
  - Pitutary function
  - Adrenal function
  - Endocrine pancreas
  - Thyroid physiology
  - Calcium and bone physiology
- Gastro-intestinal physiology
  - Physiology of swallowing
  - Stomach: Acid production, mucosal barrier, secretion patterns, gastric emptying
  - Small and large intestine: Functional anatomy and digestion, peristalsis, defecation reflex

- Pancreas: Function of exocrine pancreas
- Liver and gall bladder: Entero-hepatic circulation, bile formation, storage and release

### 3. Pathology

- Inflammatory response: Normal versus abnormal, inflammatory markers
- Immune response: normal response, hypersensitivity and anaphylaxis
- Wound healing: General principles, healing by repair, scar formation and fibrosis, cutaneous wound healing, factors influencing wound healing
- Hematology:
  - Anaemia: classification, causes, investigation
  - Leukaemia: classification; acute and chronic lymphoblastic leukaemia; acute and chronic myeloid leukaemia
  - Lymphoma and myeloma
  - Coagulation: platelet disorders, inherited and acquired coagulation disorder, thrombophilia

### 4. Pharmacology

- CVS
  - Cardiac glycosides
  - Anti hypertensives: Beta blockers, alpha blockers, ACE inhibitors, ARB s, calcium channel blockers
  - anti-arrhythmics
  - inotropes
- Respiratory:
  - Bronchodilators (Beta agonists, anti-cholinergic agents)
  - Theophyllines
  - Inhaled corticosteroids
  - Anti histamines
  - Expectorants
  - Oxygen
- CNS:
  - Local anaesthesia: Lignocaine, bupivacaine
  - Procedural sedation: Benzodiazepines, ketamine, Etomidate, Propofol, Fentanyl
  - Anti-epileptics
  - Muscle relaxants
  - Hypnotics and anxiolytics
  - Antipsychotics

- Antidepressants
- Opioid analgesics
- Drugs used in nausea and vertigo
- Renal
  - Diuretics
- Gastro-intestinal:
  - Antacids,
  - Proton pump inhibitors,
  - Anti spasmodic,
  - Laxatives,
  - Anti diarrhoeal
- Musculo skeletal system
  - Anti-inflammatory drugs (NSAIDs)
  - Drugs used in gout & hyperuricaemia
- Infections:
  - Antibacterial
  - Antiviral drugs
  - Anti malarial drugs
  - Anti fungal drugs: Systemic and topical
  - Anti helminthes
  - Anti tuberculous therapy
- Endocrine system
  - Oral hypoglycaemic agents
  - Glucagon
  - Insulin
  - Corticosteroids
  - Thyroid hormones and antithyroid drugs
- Coagulation: anti platelets, anti coagulants (parenteral and oral), fibrinolytics, anti-fibrinolytics

## 5. Microbiology

- Principles of microbiology
  - Natural and innate immunity: Barriers of infection, normal bacterial flora, phagocytes and complements
  - Mechanism of disease: Mechanism of attachment, invasion and persistence

- Controlling infection: Endogenous and exogenous infection sources, hospital acquired infection and prevention
- Principles of investigation: Specimen types, specimen culture, specimen examination, serology, molecular techniques (PCR)
- Principles of immunization: Childhood immunization schedule, Additional immunization schedules
  
- Specific pathogens
  - Bacteria: Streptococci, staphylococci, Clostridial infections, Neisseria, Pertusis, Enterobacteriaceae (Klebsiella, E. coli, Salmonella, Shigella), Legionella, Pseudomonas
  - Viruses: Herpes simplex and zoster, HIV, Hepatitis, Measles, Mumps, Rubella, Respiratory viruses (Influenza, parainfluenza, Rhinoviruses, RSV), gastro-intestinal viruses( Rota virus, Novo virus, Adeno virus)
  - Mycobacterium tuberculosis
  - Chlamydia
  - Fungii: Candida, Cryptococcus, dermatophytes, mucormycosis
  - Worms: nematodes, trematodes and cestodes
  - Parasites: malaria, amoebiasis
  - Spirochetes and rickettsial infections (scrub typhus)

## **SYSTEM BASED CORE KNOWLEDGE**

### **7. Cardio-vascular emergencies**

- Congenital heart disorders
- Chest pain: etiology
- Acute coronary syndromes:
  - Acute myocardial infarction (STEMI)
  - NSTEMI
  - Unstable angina
- Syncope
- Congestive heart failure and acute pulmonary edema
- Valvular emergencies
- Cardiomyopathies, myocarditis and pericardial diseases
- Pulmonary embolism
- Hypertensive emergencies
- Aortic dissection and aneurysm
- Hypertensive emergencies

- Occlusive arterial disease, thrombophlebitis

## 8. Pulmonary emergencies

- Congenital: cystic fibrosis
- Pulmonary infections:
  - Bronchitis, bronchiolitis
  - Pneumonia
  - Empyema
  - Aspiration pneumonia and lung abscess
  - Tuberculosis
- Acute asthma in adults and children
- Chronic obstructive pulmonary disease
- Pneumothorax: Spontaneous and iatrogenic
- Hemoptysis
- Tumours: acute complications of pulmonary and metastatic tumours
- Lung transplant: complications
- Others: Acute lung injury, Atelectasis, Acute respiratory distress syndrome

## 9. Neurological emergencies

- Headache and facial pain
- Vascular disorders
  - Cerebrovascular accidents and transient ischemic attacks
  - Cerebral venous sinus thrombosis
  - Subarachnoid hemorrhage
  - Subdural and extradural hematoma
- CNS infections: Meningitis and encephalitis, brain abscess
- Altered mental status and coma
- Vertigo and dizziness
- Ataxia and gait disturbances
- Seizures and status epilepticus
- Acute peripheral neurologic lesions
- Neuroimaging in the emergency department
- Others: Guillain-Barré syndrome, temporal arteritis, myasthenic crisis, multiple sclerosis

## 10. Gastro-intestinal and hepatic emergencies

- Acute abdominal pain
- Gastro-intestinal bleeding
- Esophageal emergencies



- Dysphagia, GERD, Esophagitis, Esophageal perforation, Swallowed foreign bodies
- Peptic ulcer disease and gastritis
- Acute appendicitis
- Acute cholecystitis and biliary colic
- Ileitis, colitis and diverticulitis
  - Crohn disease, ulcerative colitis, pseudomembranous enterocolitis, diverticulitis
- Intestinal obstruction
  - Small bowel obstruction, large bowel obstruction, pseudo-obstruction
- Hernia
- Ano-rectal disorders
  - Hemorrhoids, fissure-in-ano, ano rectal abscess, fistula in ano, proctitis, rectal prolapsed, pruritis ani, rectal foreign bodies, pilonidal sinus, proctalgia fugax
- Vomiting, diarrhea and constipation
- Jaundice
- Chronic liver disease and acute liver failure
- Acute and chronic pancreatitis
- The liver transplant patient

## 11. Dermatological emergencies

- Serious generalized skin disorders:
  - Erythema multiforme
  - Toxic epidermal necrolysis
  - Exfoliative dermatitis
  - Toxic infective erythemas (Toxic shock syndrome, streptococcal toxic shock syndrome, staphylococcal scalded skin syndrome)
  - Disseminated viral infections (Infectious exanthems, herpes zoster, herpes simplex)
  - Disseminated gonococcal infections
  - Purpura fulminans
  - Bullous diseases (pemphigus vulgaris and bullous pemphigoid)
- Disorders of face and scalp
  - Acneform eruptions
  - Seborrheic dermatitis
  - Erysipelas and facial cellulitis
  - Photosensitivity
  - Contact dermatitis of the face

➤ Disorders of hands, feet and extremities

- Psoriasis
- Lichen simplex chronicus
- Venous stasis dermatitis
- Erythema nodosum

➤ Skin infections and infestations

- Scabies
- Tinea
- Candidiasis
- Hansen's disease

## 12. Renal and urological emergencies

- Acute renal failure
- Emergencies in renal failure and patients on dialysis
- Urinary tract infections: Cystitis and acute pyelonephritis
- Nephrolithiasis
- Complications of urological procedures
- Complications of renal transplant
- Male genital problems
  - Scrotum: scrotal abscess, Fournier gangrene
  - Penis: Balanoposthitis, phimosis, paraphimosis, entrapment injuries, fracture of the penis, priapism
  - Testes and epididymitis: Testicular torsion, epididymo-orchitis
  - Acute prostatitis
  - Urethral stricture
  - Urinary retention

## 13. Endocrine and metabolic emergencies

- Acute presentation of inborn errors of metabolism
- Adrenal insufficiency and crisis
- Disorders of glucose metabolism
  - Diabetic ketoacidosis
  - Hyperosmolar hyperglycaemic state
  - Hypoglycaemia
- Thyroid emergencies:
  - Hyperthyroidism and thyroid storm
  - Hypothyroidism and myxoedema coma
- Pheochromocytoma

## 14. ENT and dental emergencies

- Emergencies of the external, middle and inner ear
  - Otolgia
  - Tinnitus

- Infections: Otitis externa, otitis media, bullous myringitis
- Foreign bodies, cerumen impaction
- Tympanic membrane perforation
- Face and jaw emergencies
  - Salivary glands infection
  - Masticator space infection
  - Temporomandibular joint dislocation
  - Bells palsy
- Nasal emergencies
  - Epistaxis
  - Nasal fracture
  - Nasal foreign body
  - Sinusitis
- Oral and dental emergencies:
  - Oro-facial pain: Tooth eruption, dental caries, post-extraction alveolar osteitis
  - Soft tissue lesions: Oral candidiasis, aphthous stomatitis, herpangina, hand foot and mouth disease, herpes simplex
  - Oro-facial trauma
  - Oral manifestations of systemic diseases
- Infections and disorders of the neck and upper airway
  - Pharyngitis/ tonsillitis
  - Peri-tonsilar abscess
  - Epiglottitis
  - Retropharyngeal abscess
  - Dental abscess, Ludwigs angina, deep neck abscesses
- Foreign bodies
- Stridor
- Complications of airway devices

## 15. Ophthalmic emergencies

- Inflammatory and Infectious disorders: conjunctivitis, dacrocystitis, endophthalmitis, iritis, keratitis, orbital and periorbital cellulitis, uveitis, herpes zoster ophthalmicus
- Occular trauma: foreign body in the eye, ocular injuries
- Acute visual reduction / loss

- Painful visual reduction/ loss: Acute angle closure glaucoma, optic neuritis
- Painless visual reduction/ loss : Central retinal artery and vein occlusions, giant cell arteritis, vitreous hemorrhage, retinal detachment

## 16. Obstetric and gynaecological emergencies

- Vaginal bleeding in the non-pregnant patient
- Abdominal pain and pelvic pain in the non-pregnant patient
  - Functional ovarian cysts, adnexal torsion, endometriosis, adenomyosis, leiomyoma
- Pelvic inflammatory disease
- Normal pregnancy: Physiological changes during pregnancy
- Co-morbid diseases in pregnancy: Diabetes, hypertension, hyperthyroidism, thromboembolism, asthma, HIV infection
- Ectopic pregnancy
- Maternal resuscitation
- Emergencies during pregnancy and post-partum period
  - Emergencies during the first half of pregnancy: vaginal bleeding, abortion, gestational trophoblastic disease, hyperemesis gravidarum
  - Emergencies during the second half of pregnancy: Pre-eclampsia, eclampsia, HELLP syndrome, abruption placentae, placenta previa, premature labour and premature rupture of membranes
  - Emergencies during the post-partum period: Post-partum hemorrhage, post-partum infections, thrombo-embolic diseases, peri-partum cardiomyopathy
- Emergency delivery:
  - caesarian delivery, fetal distress
  - Complications of delivery: Cord prolapse, shoulder dystocia, breech presentation, preterm delivery
- Breast disorders
  - Acute mastitis and breast abscess
  - Mastalgia, nipple discharge
- Urogynaecologic disorders and gynaecologic oncology
  - Incontinence
  - Prolapse

- Complications of gynaecological malignancies

## 17. Hematology and oncological emergencies

- Anemia
- Acquired bleeding disorders
  - Acquired platelet defects:
    - Thrombocytopenia: Immune thrombocytopenic purpura, other causes of thrombocytopenia
    - Qualitative platelet abnormalities
  - Anticoagulants and fibrinolytics
  - Liver disease and renal disease
  - Disseminated intravascular coagulation
  - Circulating anticoagulants: Factor VIII inhibitors, anti-phospholipid antibody syndrome
- Hemophilias and von Willebrand disease
- Hereditary hemolytic anemias
  - Sickle cell anemia
  - Thalassemias
  - Glucose 6 phosphate dehydrogenase deficiency
  - Hereditary spherocytosis
- Acquired hemolytic anemias
  - Immune mediated hemolytic anemia: autoimmune, alloimmune and drug related
  - Microangiopathic hemolytic anemia: Thrombotic thrombocytopenic purpura, hemolytic uremic syndrome
  - Macrovascular hemolytic anemia: prosthetic heart valve, extra-corporeal circulation
- Transfusion therapy
  - Blood products
  - Complications of blood transfusion
- Complications of lymphomas and leukemias
- Febrile neutropenia
- Anticoagulants, antiplatelet agents and fibrinolytics
- Emergency complications of malignancies

- Related to local tumour effects: pathological fractures, acute spinal cord compression, upper airway obstruction, malignant pleural effusion, superior vena cava syndrome
- Related to biochemical derangements: Hypercalcemia, SIADH, tumour lysis syndrome
- Related to hematologic derangement: granulocytopenia, infections, hyperviscosity syndrome, thromboembolism

### 18. Musculoskeletal emergencies

- Congenital disorders: dislocated hip, osteogenesis imperfecta
- Neck pain
- Thoracic and lumbar pain syndromes
- Acute disorders of the joints and bursae
- Inflammatory and Infectious disorders: arthritis, bursitis,
- Complications of systemic rheumatic diseases
- Metabolic disorders complications of osteoporosis and other systemic diseases
- Non-traumatic disorders of the hands and feet
  - Hand:
    - Infections: Flexor tenosynovitis, deep space infections, paronychia, felon
    - Non-infectious conditions: Tendinitis, tenosynovitis, trigger finger, De Quervain tenosynovitis, carpal tunnel syndrome, ganglion cysts
  - Feet: Corns and calluses, plantar warts, onychocryptosis, plantar fasciitis, tarsal tunnel syndrome, foot ulcers

### 19. Immunological emergencies

- Allergies and anaphylactic reactions
- Acute complications of vasculitis

### 20. Infectious diseases

- Common viral infections: Influenza virus, Herpes viruses, Epstein Barr virus, cytomegalo virus, Measles, Mumps, Rubella, Dengue
- Common bacterial infections: Streptococcal and staphylococcal infections, Diphtheria, Botulism, Gas gangrene, Tetanus, Salmonellosis
- Leptospirosis
- Scrub typhus
- HIV and opportunistic infections

- Rabies
- Protozoal infections: Malaria, Toxoplasmosis
- Helminthiasis: Nematodes, trematodes and cystodes
- Food borne and water borne diseases
- Zoonotic infections:
- Sexually transmitted diseases:
  - STD's presenting as urethritis, cervicitis or discharge: Chlamydia, Gonococci, Trichomonas
  - STD's with genital ulcers: Syphilis, HSV, Chancroid, Lymphogranuloma venereum, Donavanosis, genital warts
- Skin and soft tissue infections: Cellulitis, necrotizing fasciitis

## 21. Psychiatric and behavior disorders

- Common psychiatric emergencies
  - Acute psychosis
  - Anorexia nervosa and bulimia nervosa
  - Anxiety and panic attacks
  - Conversion disorders
  - Deliberate self harm
  - Depressive illness
- Substance and alcohol abuse
- Behavioral disorders

## 22. Trauma

- Early management of trauma
  - Primary survey: Airway with cervical spine stabilization, Breathing, Circulation with hemorrhage control, Disability, Exposure
  - Secondary survey
- Head injuries
- Maxillo-facial trauma
- Neck trauma: Blunt and penetrating injuries
- Thoracic trauma: Blunt and penetrating injuries
- Abdominal trauma: Blunt and penetrating injuries
- Genito-urinary trauma
- Extremity injuries
- Spinal cord injuries
- Trauma in pregnancy: Maternal and fetal injuries, pre hospital care, ED management, disposition
- Pediatric trauma
- Wound ballistics
- Injury prevention

### 23. Wound management:

- Evaluation of wounds
- Wounds preparation
- Methods for wound closure: Sutures, staples, adhesive tapes, cyanoacrylate tissue adhesives
- Face and scalp lacerations

### 24. Pediatrics

- The normal child Bacteremia, sepsis and meningitis in children
- Common neonatal problems
- Sudden infant death syndrome (SIDS)
- Otitis and pharyngitis in children
- Skin and soft tissue infections
- Viral and bacterial pneumonia in children
- Pediatric asthma and bronchiolitis
- Seizures and status epilepticus
- Vomiting and diarrhea
- Pediatric abdominal emergencies
- Diabetic ketoacidosis
- Altered mental status and headache in children
- Syncope and sudden death
- Fluid and electrolyte therapy
- Acute pain management and procedural sedation in children
- Pediatric exanthems
- Sickle cell disease
- Evaluating the child with special care needs
- Urologic and gynaecologic problems in children
- Pediatric urinary tract infections

## SPECIFIC ASPECTS OF EMERGENCY MEDICINE

### 1. Toxicology and envenomation

- General principles of toxicology and management of poisoned patients
- Insecticides, herbicides and rodenticides
- Drug overdose
  - Paracetamol, benzodiazepines, barbiturates, beta blockers, calcium channel blockers, lithium, phenytoin, antidepressants, theophylline,
- Metals and metalloids: Lead, arsenic, mercury, copper, chromium and others
- Plant poisons: Datura, oleander, oduvanthalai, mushroom
- Corrosive poisoning
- Methemoglobinemia



- Methanol poisoning
- Cyanide poisoning
- Substance abuse: Cannabis, Cocaine, Amphetamine, LSD, opioids
- Snake bite
- Arthropod bites and stings

## 2. Disaster medicine

- Disaster medical services
- Disaster preparedness and response
- NBCR (nuclear, biological, chemical and radiological: decontamination, specific aspects)

## 3. Abuse and assault

- Child abuse and neglect
- Female and male sexual assault
- Abuse in the elderly and impaired
- Violence in the emergency department

## 4. Analgesia and procedural sedation

- Acute pain management
- Local and regional anaesthesia
- Procedural sedation and analgesia

## 5. Environmental accidents

- Electricity (electrical and lightning injuries)
- High-altitude medical problems
- Temperature (heat and cold related emergencies)
- Travel medicine
- Water (near-drowning, dysbarism and complications of diving, marine fauna)
- Inhalation injuries (carbon monoxide poisoning)

## 6. Medico-legal issues

- Medico-legal cases and reporting
- Grievous injuries

## 7. Pre-hospital care

- Emergency Medical Services organization (administration, structure, staffing, resources)
- Medical transport (including neonates and children, air transport)
- Paramedic training and function
- Safety at the scene
- Collaboration with other emergency services (e.g. police, fire department)

## 8. Problems in the elderly

- Atypical presentations (e.g. abdominal pain, infections, myocardial infarction)
- Delirium
- Dementia
- Falls (causes & investigations)
- Incontinence
- Immobility
- Multiple pathology and multiple therapies

### TEACHING LEARNING METHODS (Including clinical study)

The following teaching learning methods are recommended.

- Lectures
- Case based discussion
- Bed side clinics
- Teaching on ward rounds
- Symposia
- Seminars
- Journal clubs
- Problem based learning
- Telemedicine ( where available)

### STRUCTURED TRAINING PROGRAMME

Duration of the course: 3 years

- \* **The postgraduate will be attached to Department of Medicine and they will monitor, conduct examinations in institutions where there is no Department for Emergency Medicine.**

|                   | Posting            | Duration |
|-------------------|--------------------|----------|
| <b>First year</b> |                    |          |
| 1.                | Emergency Medicine | 7 months |
| 2.                | Pediatrics         | 1 month  |
| 3.                | Obstetrics         | 2 weeks  |
| 4.                | Orthopedics        | 2 weeks  |

|                    |                    |          |
|--------------------|--------------------|----------|
| 5.                 | ENT                | 2 weeks  |
| 6.                 | Ophthalmology      | 2 weeks  |
| 7.                 | Anaesthesiology    | 1 month  |
| 8.                 | Medical ICU        | 1 month  |
| <b>Second year</b> |                    |          |
| 1.                 | Emergency medicine | 7 months |
| 2.                 | Surgical ICU       | 1 month  |
| 3.                 | Cardiac ICU        | 1 month  |
| 4.                 | Neurology          | 2 weeks  |
| 5.                 | Neurosurgery       | 2 weeks  |
| 6.                 | Pulmonology        | 2 weeks  |
| 7.                 | Radiology          | 2 weeks  |
| 8.                 | General surgery    | 1 month  |
| <b>Third year</b>  |                    |          |
| 1.                 | Emergency Medicine | 8 months |
| 2.                 | Pediatrics         | 2 month  |
| 3.                 | General Medicine   | 1 month  |
| 4.                 | Orthopedics        | 2 weeks  |
| 5.                 | Psychiatry         | 2 weeks  |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

#### **COMPETENCY ASSESSMENT:**

##### **1. OVERALL:**

|                                                                                                                           |              |                 |
|---------------------------------------------------------------------------------------------------------------------------|--------------|-----------------|
| a) Communication / commitment / Contribution /<br>Compassion towards patients and Innovation                              | ()<br>()     | - 5 Marks       |
| b) Implementation of newly learnt techniques/Skills                                                                       | ()           |                 |
| 2. Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars                                              |              | - 5 marks       |
| 3. Number of Posters/Papers presented in Conferences/<br>Publications and Research Projects                               |              | - 5 marks       |
| 4. No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic meetings<br>with details. |              | - 5 marks       |
|                                                                                                                           |              | -----           |
|                                                                                                                           | <b>Total</b> | <b>20 Marks</b> |
|                                                                                                                           |              | -----           |

#### PG CLINICAL COURSES

|                                      |                      |
|--------------------------------------|----------------------|
| VIVA including Competency Assessment | - 80 Marks (60 + 20) |
| Log Book                             | - 20 marks           |

#### **ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period         |          |           |          | Total<br>Max.20 marks |
|---------------|----------------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec       | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec       | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct       | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | <b>AVERAGE</b> |          |           |          | <b>20 Marks</b>       |

## **DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

### **THEORY EXAMINATION**

|           |                                                                                               |
|-----------|-----------------------------------------------------------------------------------------------|
| Paper I   | Applied Basic Sciences related to Emergency Medicine                                          |
| Paper II  | Medical Emergencies including toxicology                                                      |
| Paper III | Surgery emergencies and trauma                                                                |
| Paper IV  | Pediatrics , disaster management, pre hospital care and Recent advances in Emergency Medicine |

Question paper pattern:

|                |                |                 |
|----------------|----------------|-----------------|
| Paper I :      | Write notes on |                 |
| i.             | Anatomy        | 4 x 5 = 20      |
| ii.            | Physiology     | 4 x 5 = 20      |
| iii.           | Biochemistry   | 3 x 5 = 15      |
| iv.            | Pharmacology   | 3 x 5 = 15      |
| v.             | Pathology      | 3 x 5 = 15      |
| vi.            | Microbiology   | 3 x 5 = 15      |
| <b>Total =</b> |                | <b>100marks</b> |

|                      |                |             |
|----------------------|----------------|-------------|
| Paper II, III & IV : |                |             |
| i.                   | Elaborate on : | 2 x 15 = 30 |
| ii.                  | Write notes on | 10 x 7 = 70 |

**Total = 100marks**

**PRACTICAL EXAMINATION**

| ASSESSMENT METHOD                  | EXAMINATION TIME    | DISCUSSION TIME         | MARKS                          |
|------------------------------------|---------------------|-------------------------|--------------------------------|
| Long Case (1)                      | 45 min              | 30 min                  | 1 x 50 = 50                    |
| Short cases (5)                    | (10 min x 5)=50 min | (6 minx5 cases) =30 min | 5 x 20 = 100                   |
| Ward Rounds (3)                    | 30 min              | 30 min                  | (3 cases x 10 marks) = 30      |
| OSCE (4)                           | 20 min              | 20 min                  | 4 stations x 5 marks = 20      |
| <b>VIVA</b>                        |                     |                         |                                |
| <b>VIVA</b>                        |                     |                         | <b>80 MARKS</b>                |
| <b>LOG BOOK</b>                    |                     |                         | <b>20 MARKS</b>                |
| <b>TOTAL</b>                       |                     |                         | <b>100 MARKS (B)</b>           |
| <b>AGGREGATE (CLINICAL + VIVA)</b> |                     |                         | <b>300 MARKS (A + B)</b>       |
| <b>MINIMUM PASS (50%)</b>          |                     |                         | <b>150 MARKS</b>               |
| <b>DISSERTATION</b>                |                     |                         | <b>APPROVED / NOT APPROVED</b> |
| <b>Total</b>                       |                     |                         | <b>300</b>                     |

**EXAMINERS:**

**Internal Examiners - Professor of Medicine / Professor of Surgery**

**External Examiners - Professor of Orthopedics / Professor of Paediatrics**

**LOG BOOK**

Logbook serves as a document of the trainees work. A detailed log book should be maintained for the entire duration of the course and its authenticity shall be assessed monthly by the concerned post graduate teacher/ head of the department. This shall be made available for the board of examiners for their perusal at the time of his/ her appearing for the final examination. The log book shall be evaluated during the PG examination.

It should contain the following details.

1. Procedures performed
2. Journal clubs presented
3. Seminars presented
4. Important cases discussed/ presented

The log book should also bear record of the training that the student has undergone in the following courses :

- Basic life support (BLS) and Advanced cardiac life support(ACLS): 3 day course
- Advanced Trauma Life Support (ATLS) – 3 day course
- Advanced Pediatric Life Support (APLS)- 3 day course
- Neonatal advanced life support (NALS)- 3 day course

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

**VIVA including Competency Assessment**

VIVA including Competency Assessment - 80 Marks (60 + 20)

The viva shall have 4 stations.

- Emergency radiology
- ECG interpretation
- Instruments
- ABG interpretation

## OSCE

The following are suggested stations for the OSCE. Any 4 can be chosen at the discretion of the examiners. All the 4 stations should be common to all candidates appearing on that day

|    | Station                                                    |
|----|------------------------------------------------------------|
| 1. | Basic life support                                         |
| 2. | Advanced cardiac life support                              |
| 3. | Advanced trauma life support                               |
| 4. | Pediatric life support                                     |
| 5. | Neonatal resuscitation                                     |
| 6. | Airway and breathing skills                                |
| 7. | Splinting                                                  |
| 8. | Communication skills (breaking bad news / angry relatives) |

## REFERENCE BOOKS

- Emergency Medicine: a comprehensive study guide. Tintinalli, J et al, New York: McGraw-Hill
- Emergency Medicine (latest edition) Anthony FT Brown, Michael D Cadgan, London, Hodder Arnold
- Medicine Textbook of Adult Emergency (Latest Edition) Peter Cameron, George Jelinek, Anne- Maree Kelly, Lindsay Murray, Anthony FT Brown, Jhon Heyworth eds. Edinburgh, Churchill Livingstone
- Oxford Hand Book of Accident and Emergency Medicine (Latest edition) JP Wyatt, RN Illingworth, CE Robertson, MJ Clancy, PT Munro eds. Oxford, oxford University Press
- Text book of pediatric Emergency Medicine (Latest edition) Peter Cameron, George Jelinek, Ian Everitt, Gary Browne, Jeremy Raftos. London, Churchill Livingstone.
- Textbook of Adult Emergency Medicine, Edinburgh: Churchill Livingstone.
- Rosen's textbook of emergency Medicine
- Accident & Emergency Radiology, A survival guide- Nigel Raby
- Harwood-Nuss' Clinical Practice of Emergency Medicine, Wolfson A (Editor), New York: Lippincott, Williams & Wilkins.
- Textbook of Emergency Medicine, David, S (Editor), New York: Lippincott, Williams & Wilkins.
- Goldfrank's Toxicologic Emergencies, Nelson, L et al., New York: McGraw-Hill.
- Modern Medical Toxicology, Pillay V.V.



- Textbook of Critical Care, Fink, M (Editor): Philadelphia, Elsevier Saunders.
- ECG For Emergency Physician, Mattu and Brady (Editors), London: BMJ Publishing.
- An Introduction to Clinical Emergency Medicine, Mahadevan, S.V. (Editor), New York: Cambridge University Press.
- American Heart Association Basic Life Support, Advanced Cardiovascular Life Support and Pediatric Life Support manuals
- Advanced Trauma Life Support manual published by the American College of Surgeons

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

### JOURNALS

- The journal of Emergency Medicine- Elsevier (the official journal of the American Academy of Emergency Medicine)
- American Journal of Emergency Medicine
- European Journal of Emergency Medicine (the official journal of the European Society for Emergency Medicine)
- Annals of Emergency Medicine (the official journal of the American College of Emergency Medicine)
- Emergency Medicine Australasia
- Academy Emergency Medicine
- Emergency Medicine Journal
- Journal of emergencies, trauma and shock
- National Journal of Emergency Medicine published by SEMI
- American Heart Association journal, Circulation

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## **M.D. PATHOLOGY**

# **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

## **M.D. PATHOLOGY**

### **1. GOAL**

The purpose of this program is to standardize Pathology teaching at Post Graduate level through out the country so that it will benefit in achieving uniformity in undergraduate teaching as well and resultantly creating suitable manpower with appropriate expertise.

### **2. OBJECTIVES**

#### **(A) KNOWLEDGE**

A candidate upon successfully qualifying in the M.D. (Pathology) examination should be -

1. Capable of offering a high quality diagnostic opinion in a given clinical situation with an appropriate and relevant sample of tissue, blood, body fluid, etc., for the purpose of diagnosis and overall wellbeing of the ill.
2. Able to teach and share his knowledge and competence with others. He / She should be imparted Training in teaching methods in the subject which may enable them to take up teaching assignments in Medical Colleges /Institutes.
3. Capable of pursuing clinical and laboratory based research. He /She should be introduced to basic research methodology so that they can conduct fundamental and applied research.

#### **(B) ATTITUDE**

##### **Cognitive Domain-**

1. Diagnose routine and complex clinical problems on the basis of Histopathology (Surgical Pathology) and Cytopathology specimens, Blood and Bone Marrow examination and various tests of Laboratory Medicine (Clinical Pathology, Clinical Biochemistry) and basics of Blood Banking (Transfusion Medicine).
2. Interpret and correlate clinical and laboratory data so that clinical manifestations of disease can be explained.
3. Advice on the appropriate specimens and tests necessary to arrive at a diagnosis in a problematic case.
4. Correlate clinical and laboratory findings with pathologic findings of autopsy specimens submitted for study.

5. Should be able to teach Pathology to undergraduates, nursing and paramedical students at the appropriate level.
6. Plan, execute, analyse and present research work.
7. Make and record observations systematically and maintain accurate records of tests and their results for reasonable periods of time as per standard guidelines. Identify problems in the laboratory, offer solutions thereof & maintain a high order of quality control.
8. Capable to organize safe & effective disposal of laboratory waste.
9. Able to supervise and work with subordinates and colleagues in a laboratory.

### **(C) SKILLS**

#### **Psychomotor Domain -**

- 1) Able to perform most of the routine tests in a Pathology Laboratory including grossing of specimens, processing, cutting of paraffin and frozen sections, making smears, and staining.
- 2) Able to collect specimens by routinely performed non-invasive out-patient procedures such as vene-puncture, finger-prick, fine needle aspiration of superficial lumps and bone-marrow aspirates, and provide appropriate help to colleagues performing an invasive procedure such as a biopsy or an imaging guided biopsy.
- 3) Be able to interpret gross and microscopic findings of specimens submitted to the pathology department, by the Forensic Medicine department.
- 4) Should be familiar with the function, handling and routine care of equipments in the laboratory.

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM:**

#### **A) Theoretical Knowledge**

##### **Post Graduate Training**

Based on the available facilities, Department can prepare a list of postgraduate **activities** pertaining to basic and applied Pathology. Active learning should form the mainstay of postgraduate training. There should be lectures **by postgraduates** (at least 20 per year) along with seminars, symposia, group-discussions, Journal clubs. The postgraduate students should **regularly interact with** various clinical departments and learn cases of interest for discussion with the surgical, medical, super-speciality faculties. **The postgraduate should actively involve in generating teaching resource material for U.G. and evolving of problem solving modules.**

## **B) Practical and Clinical Skills**

The following is a rough guideline to various teaching / learning activities that may be employed : -

- Collection of specimens including Fine needle aspiration of superficial lumps
- Grossing of specimens.
- Discussions during routine activities such as during signing out of cases.
- Presentation and work-up of cases including the identification of special stains and ancillary procedures needed.
- Clinico-pathological conferences.
- Intradepartmental and interdepartmental conferences related to case discussions.
- Conferences, Seminars, Continuing Medical Education (CME) Programmes.
- Journal Club.
- Research Presentation and review of research work.
- Guest and in-house lectures.
- Participation in workshops, conferences and presentation of papers, etc.
- Laboratory-work (Knowledge on technical aspect, Interpretation, Quality Control, Biomedical waste management and requirements of reagents and consumables).
- Use and maintenance of equipment – SOPs.
- Maintenance of records.
- Teaching undergraduates and paramedical staff.

## **C) Writing Thesis/Research Articles:**

Thesis shall be submitted by each candidate at least 6 months before the date of commencement of the Theory examination.

#### **D) Attitudes including Communication Skills**

- 1) Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- 2) Develop communication skills to word reports and professional opinions with clarity as well as to interact with patients, relatives, peers and paramedical staff, & for effective teaching.

#### **E) Training in Research Methodology, Medical Ethics /Bioethics and Medicolegal aspects**

- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel & respect the rights of the patient including the right to information and second opinion.
- Should compulsorily attend the Research methodology workshop conducted by the University within first six months of M.D course.
- Are encouraged to attend Bio-ethics workshops/CMEs conducted by the University and other reputed Institutions.

### **4. THEORY SYLLABUS**

#### **Course Content :-**

The study of Pathologic Anatomy includes all aspects of Pathology as encompassed in the branches of General and Systemic Pathology. Only the broad outlines are provided.

#### **1) A)General Pathology:**

Normal cell and tissue structure and function. The changes in cellular structure and function in disease. Causes of disease and its pathogenesis. Reaction of cells, tissues, organ systems and the body as a whole to various sublethal and lethal injuries.

#### **B) Systemic Pathology:**

The study of normal structure and function of various organ systems and the aetiopathogenesis, gross and microscopic alterations of structure of these organ systems in disease & functional correlation with clinical features.

#### **2) Haematology:**

The study of Haematology includes all aspects of the diseases of the blood and bone marrow. This would involve the study of the normal, and the causes of diseases and the changes thereof.

3) Laboratory Medicine (Clinical Biochemistry /Clinical Pathology including Parasitology).

- 4) Basics of Transfusion Medicine (Blood-Banking).
- 5) The student is expected to acquire a general acquaintance of techniques and principles and to interpret data :
- a) Immunopathology.
  - b) Electron microscopy.
  - c) Enzyme Histochemistry.
  - d) Immunohistochemistry.
  - e) Cytogenetics.
  - f) Molecular Biology.
  - g) Maintenance of records.
  - h) Information retrieval, Computer, Internet in Medicine and Microphotography.

A postgraduate is supposed to acquire not only professional competence of a well-trained specialist but also academic maturity, a capacity to reason and critically analyse the scientific data as well as to keep himself/herself abreast of the latest developments in the field of the pathology and related sciences. A brief outline of what is expected to be learnt during the M.D. Course is given under each head.

### **Surgical Pathology:-**

#### **Knowledge-**

- The student should be able to demonstrate an understanding of the histogenetic and patho-physiologic processes associated with various lesions.
- Should be able to identify problems in the laboratory and offer viable solutions.

### **Autopsy Pathology :-**

#### **Knowledge –**

- Should have sufficient understanding of various disease processes so that a meaningful clinico-pathological correlation can be made.
- Correctly identify all morphological (gross and Microscopic) changes of the specimens submitted.
- Write correctly and systematically Provisional and Final Anatomic Diagnosis reports.

## **Cytopathology:-**

### **Knowledge -**

- Should possess the background necessary for the evaluation and reporting of Cytopathology specimens.
- Should possess knowledge of the following, keeping in mind the indication for the test:
  1. Choice of site from which smears may be taken(as in the case of vaginal smears).
  2. Type of samples.
  3. Method of obtaining various specimens (urine sample, gastric smear, colonic lavage, sputum, Squash cytology, FOB wash and brush etc.)
  4. Be conversant with the principles and preparation of stains.

## **Haematology :-**

### **Knowledge-**

- Should demonstrate the capability of utilizing the principles of the practice of Haematology for the planning of tests, interpretation and diagnosis of diseases of the blood and bone marrow.

Should be conversant with various equipments used in the Haematology laboratory.

Should have knowledge of automation and quality assurance in Haematology.

Correctly plan a strategy of investigating at least 90% of the cases referred for special investigations in the Haematology Clinic and give ample justification for each step in consideration of the relevant clinical data provided.

## **Laboratory Medicine :-**

### **Knowledge –**

Possess knowledge of the normal range of values of the chemical content of body fluids, significance of the altered values and its interpretation.

Possess knowledge of the principles of the relative utility and limitations and significance of the altered values:

- i. In Relevant Biochemical tests
  - Know the principles, advantages and disadvantages scope and limitation of Automation in laboratory.
  - Know the principles and methodology of quality control in laboratory.



## **Transfusion Medicine (Blood Banking) :-**

### **Knowledge -**

Students should possess knowledge of the following aspects of Transfusion Medicine:

- Basic immunology.
- ABO and Rh groups.
- Clinical significance of other blood groups.
- Transfusion therapy including the use of whole blood and RBC concentrates.
- Blood component therapy.
- Rationale of pre-transfusion testing.
- Infections transmitted in blood

#### **a) Immunopathology:**

### **Knowledge –**

- i. Demonstrate familiarity with the current concepts of structure and function of the immune system, its aberrations and mechanisms thereof.
  - ii. Demonstrate familiarity with the scope, principles, limitations and interpretations of the results of the following procedures employed in clinical and experimental studies relating to immunology :
    - (a) ELISA techniques.
    - (b) Radioimmuno assay.
    - (c) HLA typing.
- (bi) Interpret simple immunological tests used in diagnosis of diseases and in research procedures.
- a) Immunofluorescence techniques especially on kidney and skin biopsies.

#### **b) Electron Microscopy :**

### **Knowledge –**

- (i) Demonstrate familiarity with Principles and Techniques of electron microscopy and the working of an electron microscope (including Transmission and Scanning Electron Microscope: TEM and SEM).
- (ii) Recognise the appearance of the normal subcellular organelles and their common abnormalities (when provided with appropriate photographs).

### **C) Enzyme Histochemistry :**

#### **Knowledge –**

Should be familiar with the principles, use and interpretation of common enzyme histochemical procedures (Alkaline Phosphatase, Acid Phosphatase, Glucose-6-Phosphate Dehydrogenase, Chloroacetate Esterase).

#### **d) Immunohistochemistry : Knowledge –**

Demonstrate familiarity with the principles and exact procedures of various immunohistochemical stains using both PAP (Peroxidase-Antiperoxidase) and AP-AAP (Alk. Phosphatase-anti Alk. Phosphatase) ABC (Avidin-Biotin Conjugate) Systems;

Employing monoclonal and polyclonal antibodies. Be aware of the limitations of immunohistochemistry.

### **e) Molecular Biology:**

#### **Knowledge –**

Should understand the principles of Molecular Biology especially related to the understanding of disease processes and its use in various diagnostic tests.

Should be conversant with the principle & steps and interpretations of a Polymerase Chain Reaction (PCR Western Blot, Southern Blot, Northern Blot and Hybridisation procedures).

### **f) Cytogenetics :**

#### **Knowledge –**

Demonstrate familiarity with methods of Karyotyping and Fluorescent in-situ

Hybridisation(FISH).

### **g) Tissue Culture:**

#### **Knowledge –**

Demonstrate familiarity with methods of tissue culture.

## 5. TEACHING LEARNING METHODS (including Clinical Study)

### Surgical Pathology:-

#### Skills-

- Given the clinical and operative data, the student should be able to identify, and
- systematically and accurately describe the chief gross anatomic alterations in the surgically removed specimens and be able to correctly identify the lesions received from the surgical service of an average teaching hospital.
- A student should be able to demonstrate ability to perform a systematic gross
- examination of the tissues including the taking of appropriate tissue sections and in special cases as in intestinal mucosal biopsies, muscle biopsies, nerve biopsies and skin biopsies to demonstrate the orientation of tissues in paraffin blocks.
- The student should be able to identify and systematically and accurately describe the chief histomorphological alterations in the tissue received in the surgical pathology service. He /She should also correctly interpret & correlate with the clinical data to help in the diagnosis of the routine surgical material received.

Be conversant with all the equipment in the Histopathology and the Clinico pathology lab and the principles of its running.

Process a tissue, make a paraffin block and cut sections of good quality on a rotary microtome.

Stain paraffin sections with at least the following:

- (i) Haematoxylin and eosin.
- (ii) Stains for collagen, elastic fibers and reticulin, congo red
- (iii) Iron stain.
- (v) PASstain.
- (vi) Acid fast stains.
- (vii) GMS stains
- (viii) Any other stains needed for diagnosis – fungal stains.

Demonstrate understanding of the principles of:

- (i) Fixation of tissues.
- (ii) Processing of tissues for section cutting.
- (iii) Section cutting and maintenance of related equipment.
- (iv) Differential (Special) stains and their utility.

Cut a frozen section using freezing microtome /cryostat, stain and interpret the slide in correlation with the clinical data provided, and correctly diagnose at least 75 percent of the lesions within 15 minutes. Perform fat stain on frozen section.

- Perform and interpret the utility of various immunohistochemical stains especially in the diagnosis of tumour subtypes.

## **Cytopathology:-**

### **Skills-**

- Independently prepare and stain good quality smears for cytopathologic examination.
- Be conversant with the techniques for concentration of specimens: i.e., various filters, centrifuge and cytocentrifuge.
- Independently be able to perform fine needle aspiration of palpable superficial lumps in patients; make good quality smears and be able to decide on the type of staining in a given case. Desirable to have a knowledge in image guided FNACs. Knowledge of preparation of Cell blocks, LBCs.

Given the relevant clinical data, he / she should be able to independently and correctly :

- i. Evaluate hormonal status in all cases as may be required.
- ii. Diagnose the status of malignancy or otherwise in at least 75% of the cases received in a routine laboratory and categorise them into negative, inconclusive and positive.
- iii. Demonstrate ability in the technique of screening and dotting the slides for suspicious cells.
- iv. Indicate correctly the type of tumour, if present, in at least 75% cases.
- v. Identify with reasonable accuracy the presence of organisms, fungi and parasites in at least 75% of cases.

## **Haematology :-**

### **Skills-**

- Observe and/or perform/interpret correctly and independently the following special tests, in addition to doing the routine blood counts:
  - i. Haemogram including Reticulocyte and Platelet counts, ESR, PCV, Osmotic fragility test
  - ii. Bone marrow staining including stain for iron.
  - iii. Blood smear staining ( thick and thin smear)
  - iv. Cytochemical characterization of leukemia with special stains like Peroxidase, Leukocyte Alkaline Phosphatase (LAP), PAS, Sudan Black, etc.
  - v. Hemolytic anaemia profile including HbF, Hb electrophoresis, etc.
  - vi. Coagulation profile including PT, APTT, FDP, Factors assay.
  - vii. BM aspiration and BM biopsy.
- Demonstrate familiarity with the principle and interpretation of results and utility in diagnosis of the following :
  - i. Cytogenetics – Karyotypes of Leukemia – CML, promyelocytic leukemia, common trisomy and monosomies like Downs, Turner's and Klinefelter syndromes.
- Describe accurately the morphologic findings in the peripheral and bone marrow smears, identifying and quantitating the morphologic abnormalities in non-neoplastic and neoplastic diseases and arriving at a correct diagnosis in at least 90% of the cases referred to the Haematology clinic, given the relevant clinical data.

## **Laboratory Medicine :-**

### **Skills –**

- Plan a strategy of laboratory investigation of a given case, given the relevant clinical history and physical findings in a logical sequence, with a rational explanation of each step; Be able to correctly interpret the laboratory data of such studies, and discuss their significance with a view to arrive at a diagnosis.
- Demonstrate familiarity with and successfully perform.
  - i. Routine Urinalysis including Physical, Chemical and Microscopic, examination
  - ii. A complete examination; physical, chemical and cell content of Cerebrospinal fluid (C.S.F.), Pleural, synovial, pericardial and Peritoneal fluid.
  - iii. Semen analysis.
  - iv. Absolute Eosinophil Count
  - v. Examination of Peripheral Blood for the commonly occurring parasites along with QBC.
  - vi. Be familiar with the preparation of standard solution and chemicals relevant to Histopathology and clinical pathology

- Explain the principle of Instrumentation, use and application of the instruments commonly used in the laboratories, eg., Photoelectric colorimeter, Electrophoresis, Centrifuge, Flow cytometer.

#### **d) Immunohistochemistry :**

##### **Skills –**

Be able to interpret panel of IHC markers appropriate for the condition and perform immunohistochemical staining using paraffin section with at least one of the commonly used antibodies (Cytokeratin or LCA) using PAP method.

### **6. STRUCTURED TRAINING PROGRAMME**

The three-year training programme for the M.D. degree may be arranged in the form of postings to different assignments / laboratories for specified periods as outlined below. The period of such assignments / postings is recommended for 35 months. Postings schedules may be modified depending on needs, feasibility and exigencies. For facilities not available in the parent institution as well as for additional knowledge & skill, extramural postings may be undertaken.

|       | <b><u>Section / Subject</u></b>                                                                                                                            | <b><u>Duration in Month</u></b> |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| (i)   | Surgical Pathology                                                                                                                                         | 14                              |
| (ii)  | Surgical Pathology Techniques                                                                                                                              | 1                               |
| (iii) | Haematology                                                                                                                                                | 8                               |
| (iv)  | Cytopathology                                                                                                                                              | 6                               |
| (v)   | Laboratory Medicine including Clinical Biochemistry and clinical Immunology                                                                                | 2                               |
| (vi)  | Transfusion Medicine /Blood Bank                                                                                                                           | 1                               |
| (vii) | Ancillary Techniques including Immunopathology – Transplant immunology, HLA typing, Molecular Biology basics, Research Methodologies and Electrophoresis . | 1                               |
|       | Elective / Reorientation including research methodologies                                                                                                  | 2                               |
|       | <b>Total</b>                                                                                                                                               | <b>35 months</b>                |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

The training programme should be designed to enable the student to acquire a capacity to learn and investigate for himself / herself, to synthesize and integrate a set of facts and develop a faculty to reason. The curricular programmes and scheduling of postings must provide the student with opportunities to achieve the above broad objectives. Most of the learning is to be accomplished by the student himself. Interactive discussions are to be preferred over didactic sessions. The student must blend as an integral part of the activities of an academic Department that usually revolves around three equally important basic functions of teaching, research and service. As mentioned earlier the emphasis is recommended under a residency programme or learning while serving / working.

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

**8. COMPETENCY ASSESSMENT:**

**1. OVERALL:**

- |                                                                                                     |                  |
|-----------------------------------------------------------------------------------------------------|------------------|
| <b>a) Communication / commitment / Contribution /<br/>Compassion towards patient and Innovation</b> | <b>- 5 marks</b> |
| <b>b) Implementation of newly learnt techniques/Skills</b>                                          |                  |

|                                                                                      |                  |
|--------------------------------------------------------------------------------------|------------------|
| <b>2. Number of cases presented in Clinical Meetings/<br/>Journal Clubs/Seminars</b> | <b>– 5 marks</b> |
|--------------------------------------------------------------------------------------|------------------|

|                                                                                           |                  |
|-------------------------------------------------------------------------------------------|------------------|
| <b>3. Number of papers presented in conferences/Publications /<br/>Research Projects.</b> | <b>- 5 marks</b> |
|-------------------------------------------------------------------------------------------|------------------|

|                                                                                                                                |                  |
|--------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>4. No. of Medals / Certificates won in the conference /<br/>Quiz competitions and other academic meetings with details.</b> | <b>- 5 marks</b> |
|--------------------------------------------------------------------------------------------------------------------------------|------------------|

-----  
**20 Marks**  
-----

### **PG NON – CLINICAL COURSE**

|                                      |                       |
|--------------------------------------|-----------------------|
| VIVA including Competency Assessment | - 60 Marks (40 + 20 ) |
| Pedagogy                             | - 40 marks            |

### **ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period         |          |           |          | Total<br>Max.20 marks |
|---------------|----------------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec       | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec       | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct       | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | <b>AVERAGE</b> |          |           |          | <b>20 Marks</b>       |

## **9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**



## 10. THEORY EXAMINATION

Theory : There shall be four theory papers

### PATTERN OF EXAMINATION :-

FOUR PAPERS - 100 Marks each 3 Hours duration each

**Paper – I**      General Medical and Surgical Pathology including applied aspects in Pathology.

**Paper – II**      General Pathology

**Paper – III**      Systemic Pathology

**Paper–IV**      Immunopathology, Haematology, Principles and Application to Technological Advances in Laboratory Services.

### Question Paper Pattern:

**Structured Essay Questions - 2 x 15 Marks = 30 Marks**

**Short Notes - 10 x 5 Marks = 50 Marks**

**Reasoning out - 4 x 5 Marks = 20 Marks**

-----  
**100 Marks**  
-----

## 11. PRACTICAL EXAMINATION

### PRACTICALS DAY 1 FORENOON SESSION

|                                                                                                                            |                           |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------|
| HAEMATOLOGY / CLINICAL PATHOLOGY / BLOOD BANKING<br>( 2 HRS) (10 + 10 + 5 = 25 Marks)                                      | 25 MARKS                  |
| GROSSING /AUTOPSY /GROSS SPECIMEN FOR Dx& DISCUSSION<br>(1.5 H) 5+ 10+10 MARKS                                             | 25 MARKS                  |
| AFTERNOON SESSION                                                                                                          |                           |
| HAEMATOLOGY + CYTOLOGY SLIDES & DISCUSSION<br>(5 Slides x 5 Marks) + (5 Slides x 5 Marks)<br>(2 HRS) (10 SLIDES X 5 MARKS) | 50 MARKS                  |
| DAY2                                                                                                                       |                           |
| FORENOON SESSION                                                                                                           |                           |
| HISTOPATHOLOGY SLIDES & DISCUSSION<br>(2.5 HOURS) (16 SLIDES X 5 MARKS)                                                    | 80 MARKS                  |
| OSPE (5X4 marks)                                                                                                           | 20 MARKS                  |
| AFTERNOON SESSION – 2 Hours                                                                                                |                           |
| PEDOGOGY                                                                                                                   | 40 MARKS                  |
| VIVA                                                                                                                       | 60 MARKS                  |
| LOG BOOK                                                                                                                   |                           |
| AGGREGATE (CLINICAL + VIVA) TOTAL                                                                                          | 300 MARKS                 |
| MINIMUM REQUIRED FOR PASS (50%)                                                                                            | 150 MARKS                 |
| DISSERTATION                                                                                                               | APPROVED /NOT<br>APPROVED |

The practical examination shall consist of the following and should be spread over two days.

|                                                                    |                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Clinical Case discussion (10 marks):</b>                        | : Discussion of a clinical case / history. Plan and interpret relevant investigations of a given case Hematological, Biochemical, Immunological, Immunophenotype, Immunofluorescence, Electron Microscopy and other relevant investigations pertaining to the case).                                                         |
| <b>Haematology &amp; Blood Banking (10+5 =15marks)</b>             | : Discuss haematology cases or given the relevant history. Plan and interpret relevant investigations of a given case Perform blood grouping. Perform the necessary exercise given a relevant history.                                                                                                                       |
| <b>A. Histopathology (80 Marks) &amp; Cytopathology (25 marks)</b> | : Examine report and discuss sixteen histopathology and Five Cytopathology cases given in the relevant history and slides. To be familiar with MGG, PAP and other special stains, H&E on cytology smear, IHC on cell block.                                                                                                  |
| <b>B. Hematology slides (25 marks):</b>                            | : Examine, report and discuss around five cases given the history and Relevant blood smears and / or bone marrow aspirate smears.                                                                                                                                                                                            |
| <b>Structured Autopsy (10 Marks)</b>                               | : Given a case history and relevant organs. Give a list of anatomical diagnosis in an autopsy case.                                                                                                                                                                                                                          |
| <b>Gross Pathology (10+5=15 marks)</b>                             | : Perform grossing of one gross specimen. Describe findings of another gross specimen, give diagnosis and identify the sections to be processed.                                                                                                                                                                             |
| <b>Basic Sciences (OSPE – 5x4 = 20 marks)</b>                      | : Identify Electronmicrographs, osmotic fragility tests, Electrophoretic strips, Flow cytometry pictures, Sequencing, Karyotyping and FISH pictures Identify gels, results of PCR, immunological tests including staining for direct / indirect immuno fluorescence. Identify histochemical and immunohistochemistry stains. |

All practical exercises are to be evaluated jointly by all the examiners. An oral question-answer section should be conducted at the end of each exercise.

## **12. LOG BOOK**

- (a) Every Post-graduate candidate shall maintain a record of skills he/she has acquired during the training period certified by the various Heads of Departments where he / she has undergone training including outside the institution.
- (b) The candidate should also be required to participate in the teaching and training programme of post-graduate and intern-students.
- (c) In addition, the Head of the Department shall involve their postgraduate candidates in Seminars, Journal Clubs, Group Discussions and participation in clinical, clinico-pathological conferences.
- (d) Every Post-graduate candidate should be encouraged to present short title papers in conferences and improve on it and submit them for publication in reputed medical journals. Motivation by the Heads of Departments is essential in this area to sharpen the research skills of the post-graduate candidates.
- (e) Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.
- (f) At the end of the course, the candidate should summarise the contents and get the Log Book certified by the Head of the Department.
- (g) The Log Book should be submitted at the time of practical examination for the scrutiny of the Board of Examiners.

## **13. VIVA (including Competency Assessment) – (60 Marks (40 + 20))**

**An unstructured viva will be carried out by the examiners. VIVA including Competency Assessment for PG Non – Clinical courses**

## **14. PEDAGOGY:**

**( 8 minutes Presentation and 2 Minutes Q & Ans)**

- |                                                          |      |
|----------------------------------------------------------|------|
| • Demeanour                                              | - 10 |
| • Audio visual Aids usage, voice modulation and Attitude | - 10 |
| • Subject Content                                        | - 10 |
| • Q & Ans /Interaction                                   | - 10 |

**Total**

-----  
**40 Marks**  
-----

**15. OSCE / OSPE:**

OSPE containing five charts each carrying 4 marks (**5x4 = 20 marks**)

**Charts may have these topics**

- Electronmicrographs
- Osmotic fragility tests
- Electrophoretic strips
- Flow cytometry pictures
- Gene Sequencing
- Karyotyping
- FISH pictures
- Identify gels, results of PCR
- Immunological tests including staining for direct / indirect immuno fluorescence.
- Identify and interpret histochemical and immunohistochemistry stains

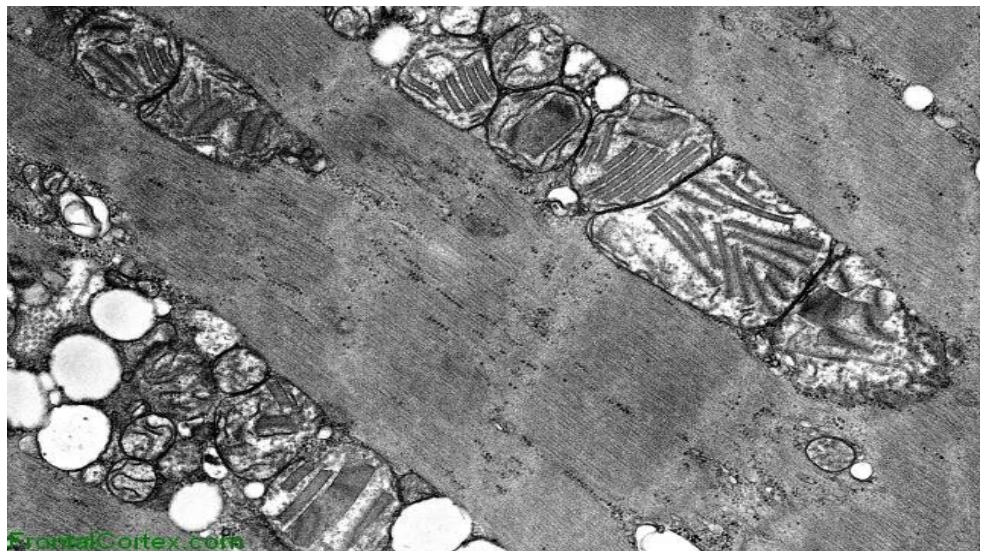
**Electron Microscopy**

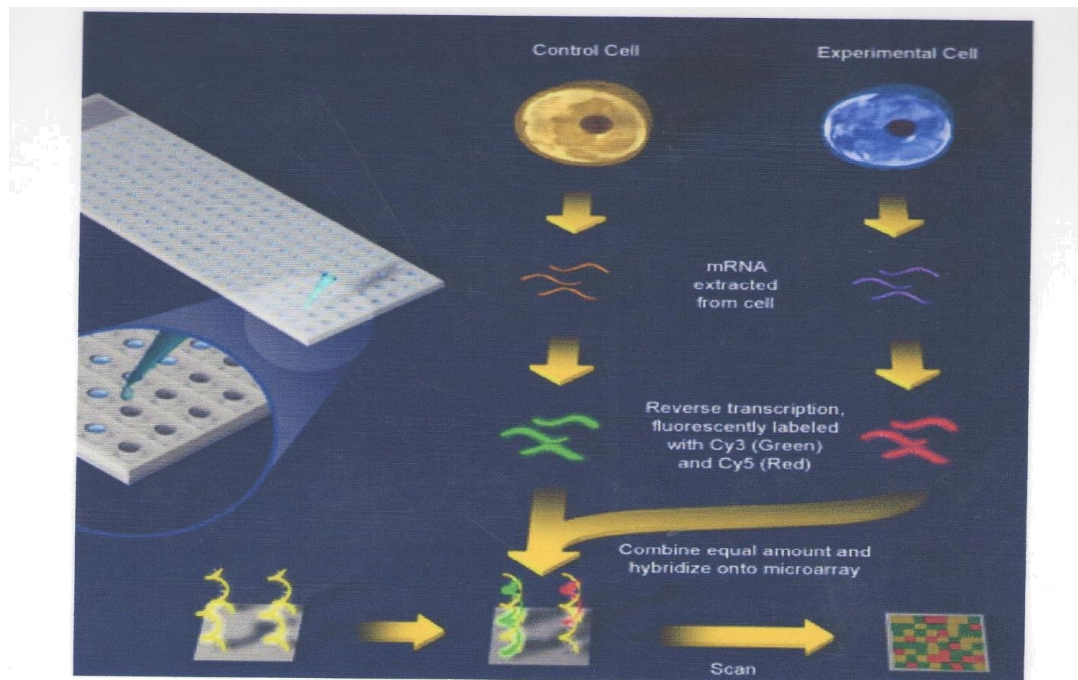
11 years male presented with proximal muscle weakness, hypotonia and delayed motor developments.

Muscle biopsy was done and sent for HPE and Electron Microscopy

**Questions :**

1. Write your diagnosis
2. Write the Electron Microscopy findings





1. WHAT IS THE DIAGNOSTIC TOOL ILLUSTRATED HERE ?
2. WHAT ARE THE OTHER NAMES FOR THIS DIAGNOSTIC TOOL ?
3. WHAT ARE THE STEPS INVOLVED IN THIS PROCEDURE ?
4. WHAT ARE ITS APPLICATIONS ?
5. WHAT IS PROTEOMICS ?

### **IMMUNOHISTOCHEMISTRY - V**

5) 46 years old male patient presented with a huge mass lesion in the left thigh. Biopsy was taken. HPE diagnosis was epithelioid sarcoma.

IHC markers were used for diagnosis.

CK

EMA

CD 31

CD 34

UEA 1

Vimentin

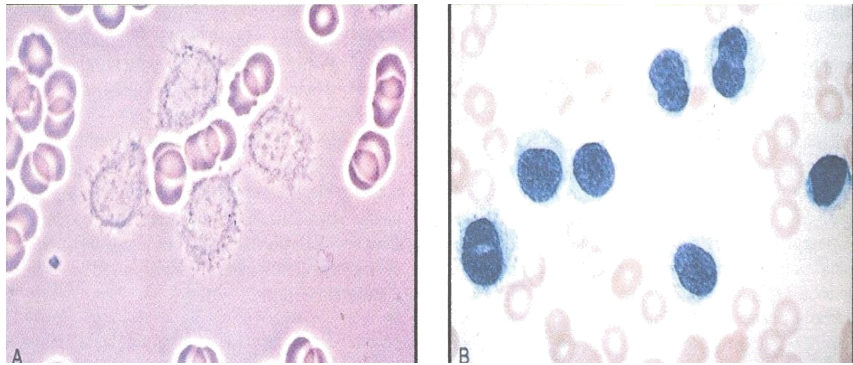
S 100

QUESTIONS :-

1. What is your diagnosis ?
2. What are your differential diagnosis ?
3. How did you rule them out with this panel of antibodies ?
4. What are the other investigations which can be done to confirm your diagnosis ?

## **HAEMATOLOGY**

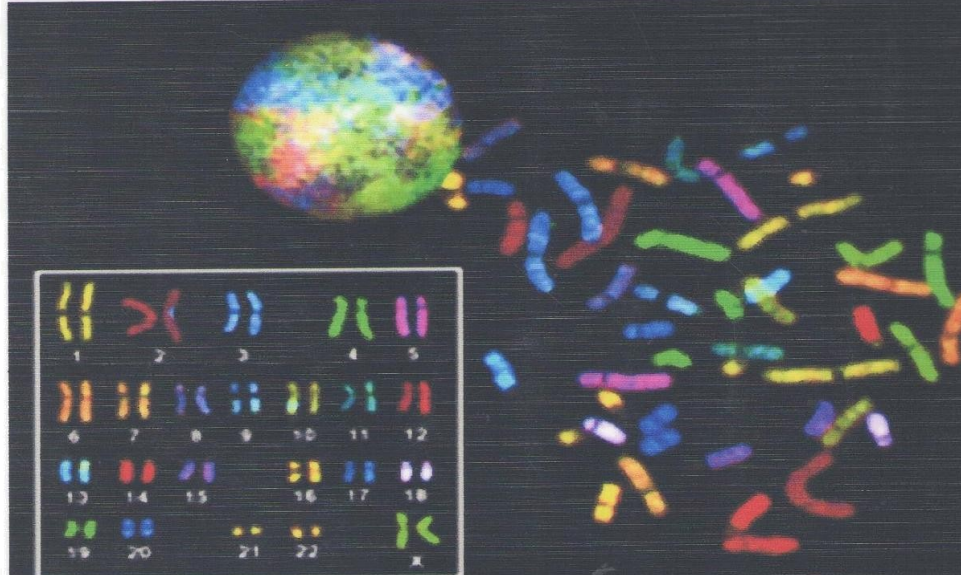
7) 35 years old male presented with massive splenomegaly and pancytopenia. Identify the following pictures and given your diagnosis.



### **QUESTIONS :-**

1. What is your diagnosis ?
2. What are the other tests to confirm your diagnosis ?
3. What are the immunohistochemical markers expressed by these cells ?
4. What is the enzyme histochemical marker available for confirmation ?





- 1) WHAT IS THE MOLECULAR DIAGNOSTIC PROCEDURE SHOWN HERE ?
- 2) WHAT ARE THE STEPS INVOLVED IN THIS PROCEDURE ?
- 3) WHAT ARE THE APPLICATIONS OF THIS MOLECULAR DIAGNOSTIC TOOL ?
- 4) WHAT IS THE ADVANTAGE OF THIS DIAGNOSTIC TOOL ?
- 5) WHAT ARE MARKER CHROMOSOMES ?

## REFERENCE BOOKS

### I. ESSENTIAL READING :-

- 1) Robbins Pathologic basic of disease – 7th edn Elsevier
- 2) Diagnostic Surgical Pathology – Sternberg.
- 3) Ackerman's Surgical Pathology – Juan Rosai – 9th edn Mosby
- 4) Diagnostic Histopathology of Tumours – Fletcher – 2nd edn Churchill Livingstone.
- 5) Soft Tissue Tumours – Enzinger & Weiss
- 6) Manual and Atlas of fine needle aspiration cytology – Orell 2nd edn 2005 elsevier.
- 7) Diagnostic exfoliative Cytology – Koss 5th edn 2006 Lippincott.
- 8) AFIP fascicles on various tumours.

- 9) WHO fascicles.
- 10) Wintrobe's Haematology, 2004
- 11) Practical Haematology, Dacie ELBS edn.
- 12) Theory & Practice of Histological techniques - & staining – Bancroft & Stevens.
- 13) Recent Advances in Pathology Churchill Livingstone
- 14) Handbook of autopsy practice Ludwig Humana press

## **II. EXTENDED READING :-**

- 1) Pathology of Liver – Macsween
- 2) Breast pathology by Rosen Lippincott 2001
- 3) Gastrointestinal pathology – Morson & Dawson Blackwell 2003.
- 4) Practical pulmonary pathology Leslie & Wick Churchill Livingstone 2005
- 5) Iochim's Lymph node pathology Iochim & Ratech Lippincott William Wilkins
- 6) Blaustein's Pathology of female genital tract Springer 2002
- 7) Atlas of orthopedic pathology – Wold, Adleer, Sim, Unni 2003
- 8) Histopathology of Skin – Lever.
- 9) Pathology of Skin – McKee, Calonje Elsevier Mosby 2005
- 10) Bone Marrow pathology – Bain Claud Lampert Wilkins 2001
- 11) Ophthalmic pathology – Spencer WB Saunders latest edn.
- 12) Biopsy interpretation series
- 13) Paediatric Pathology – Stocker & Dehner William & Wilkins 2001
- 14) Surgical pathology of nervous system and its coverings – Burger, Scheithaur, Vogel  
Churchill Livingstone 2002.

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **17. JOURNALS**

1. ACTA CYTOLOGICA
2. ADVANCES IN ANATOMIC PATHOLOGY
3. AMERICAN JOURNAL OF CLINICAL PATHOLOGY
4. AMERICAN JOURNAL OF PATHOLOGY
5. AMERICAN JOURNAL OF SURGICAL PATHOLOGY
6. ARCHIVES OF PATHOLOGY & LABORATORY MEDICINE
7. BRAIN TUMOR PATHOLOGY
8. DIAGNOSTIC CYTOPATHOLOGY
9. INDIAN JOURNAL OF PATHOLOGY AND MICROBIOLOGY
10. INTERNATIONAL JOURNAL OF GYNECOLOGICAL PATHOLOGY
11. INTERNATIONAL JOURNAL OF SURGICAL PATHOLOGY
12. JOURNAL OF CLINICAL PATHOLOGY
13. MODERN PATHOLOGY
14. JOURNAL OF ORAL PATHOLOGY & MEDICINE
15. ENDOCRINE PATHOLOGY

\*\*\*\*\*

**M. D. PAEDIATRICS**

# **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

## **M. D. PAEDIATRICS**

### **1. GOALS**

The goals of postgraduate training in Paediatrics would be to train a basic medical graduate (MBBS)

- To practice as a Child Health specialist equipped with appropriate knowledge and skills necessary to care for the normal and sick child.
- To practice Child Health in the community (urban or rural) and to perform professionally at all levels of the existing health care system.
- To practice with empathy and the highest ethical standards of the profession.
- To continue to strive for excellence by continuing medical education throughout his or her professional career.
- To teach by sharing knowledge and skills with colleagues
- To research and find solutions to challenges in health care.

### **2. OBJECTIVES**

The objectives to be fulfilled at the completion of the course are as follows:

At the end of the program, the student should be able to:

- **Knowledge:**
  - Describe, identify and monitor normal patterns of growth and development of children.
  - Describe etio-pathogenesis, principles of clinical diagnosis, investigations and treatment of diseases of childhood.
  - Demonstrate an understanding of Basic (Pre and Para-clinical) Sciences and its application to the normal and abnormal processes.
  - Analyze clinical and investigation data approach and manage a health-related problem.
  - Identify and understand socio-economic-environmental-cultural factors in health care.

- Recognize problems outside his or her abilities and appropriately refer.
  - Update one's knowledge and skills by self directed learning and by participating in continued medical education programs utilizing media – spoken, written, Print and electronic.
  - Teach and share knowledge and skills with colleagues.
  - Audit and analyze work, assist in research and publish scientific articles in peer reviewed journals.
- **Skills:**
    - Elicit an appropriate clinical history.
    - Demonstrate appropriate clinical physical examination skills on children.
    - Plan, decide upon and interpret appropriate cost effective investigations.
    - Perform essential procedures both diagnostic and therapeutic.
    - Manage, resuscitate and stabilize children in Pediatric or Neonatal emergencies.
- **Communication and attitudes:**
    - Communicate appropriately with guardians and children, assisting in their health care decision making.
    - Practice child health care at the highest ethical level, protecting the child at all costs.
    - Respect Patient's (and their guardian's) rights and professional relationships (Doctor-Doctor, Doctor-Nurse, Doctor-Patient, Doctor-Society).
    - Apply the highest level of ethics in Research, Publication, References and Practice of Paediatrics.

### **3. COMPONENTS OF THE PG CURRICULUM**

The major components of the PG curriculum shall be:

- Theoretical knowledge
- 
- Practical/clinical Skills
- 
- Training in Thesis.:

All students will have to carry out a research program and bring out a dissertation (thesis) Students are encouraged to attend CME's, publish research papers and present posters, or platform presentations at State, National and International conferences.

- Attitudes, including communication.
- Training in research methodology, medical ethics/bioethics and medico legal aspects
- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.
- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
- Medical ethics, bioethics, moral and legal issues are part and parcel of the curriculum and syllabus.

#### **4. THEORY SYLLABUS**

##### Course Contents

##### 1. The Field of Paediatrics

1. Evaluating Medical Literature

##### Critical appraisal of Journal articles

2. History of Paediatrics
3. Overview of Child Health
4. Traditions and Cultural Issues pertaining to Child Care
5. The Normal Child
6. Preventive and Social Paediatrics
7. Epidemiology, Statistics and Research Methodology including Dissertation
8. Ethical Issues in Paediatric

##### 1. Growth and Development

1. Biopsychological Models of Development
2. IQ assessment
3. Fetal growth and development
4. The newborn G/D
5. Infant, Preschool, Early school, Adolescence G/D
6. Assessment of Growth
7. Development Assessment
8. Standards/Normograms (including Indian)
9. Approach to short stature
10. Approach to Obesity
11. Approach to Undernutrition

## **2. Psychological Disorders**

1. Assessment and Interviewing
2. Psychiatric considerations of CNS injury
3. Vegetative Disorders-Rumination, Pica, Enuresis, Encopresis, Sleep disorders
4. Habit Disorders
5. Mood Disorders
6. Anxiety Disorders
7. Disruptive Behavioral disorders
8. Suicide
9. Sexual behavior variations
10. ADHD
11. Psychosis
12. Autism
13. Psychological treatment
14. Poor Scholastic performance
15. Neurodevelopment dysfunction in school age child
16. Psychosomatic Illness
17. Learning Disorders

## **3. Social Issues**

1. Adoption
2. Effects of a mobile society
3. Street Child
4. Impact of Violence
5. Child Care
6. Single parent child
7. Separation, death
8. Foster care
9. Abuse and Neglect
10. Child Labor
11. Media (TV, Movies) and its effect on the child

## **4. Children with Special Needs**

1. Failure To Thrive – Problems, Approach and Evaluation  
Children in Poverty
2. Developmental disabilities, Chronic Illness
3. Homeless children
4. Mental Retardation – Problems, Approach and Evaluation  
Foster Children
5. Care of Child with fatal illness
6. Runaway Children



## **5.Nutrition**

1. Nutritional Requirements- Water, energy, proteins, CHO, Fats, Minerals, Vitamins,
2. Diet/Nutrition Evaluation
3. Athletic Diet
4. Diet for later childhood and Adolescent
5. Infant and Child Feeding
6. Breast Milk Feeding, Human Lactation Management, BFHI
7. Nutrition Values of Indian Foods, Recipes
8. Weaning foods
9. Feeding through 1 and 2nd years
10. Nutritional Disorders Including Obesity
11. Protein Energy Malnutrition
12. Vitamin Deficiencies and Excess
13. Micro-nutrient Malnutrition
14. Nutrition in Special situations – LBW, Premature, IEM, Chronic illness, Surgery, Critically ill child
15. TPN

## **Patho-physiology of Body Fluids and Fluid therapy (Approach and Management)**

1. Physiology of Fluids, Electrolytes and Acid Bases
2. Dehydration and fluid management
3. Dyselectrolytemia
4. Acid Base Disorders
5. Special Situations - Pyloric stenosis, CNS disorders, Burns, Peri-operative, Endocrine disorders, Renal Failure.

## **6. Acutely Ill child**

1. Evaluation in Emergency
2. Pediatric Anesthesia
3. Injury Control
4. Emergency Medical Services
5. Organization of a PICU/NICU
6. Pediatric Critical Care
7. Equipment for Intensive care  
Respiratory Failure, Ventilation  
Circulatory Failure and Shock(all types)  
Acute Neurological Dysfunction- approach to a child with altered sensorium  
Resuscitation – Basic and Advanced, NALS/PALS  
Post Resuscitation stabilization  
Cold/Heat Injury
8. Transportation of Sick Child/neonate
9. Post-operative supportive care

## **7. Emergencies/ Critical Care Paediatrics**

1. Fluid abnormalities
2. Electrolyte abnormalities
3. Thermoregulation problems
4. Acute Renal failure
5. Hypertensive crisis
6. Congestive Cardiac failure
7. Cardiogenic shock
8. Pericardial tamponade
9. Cyanotic spells
10. Unstable and stable Arrhythmias
11. Vomiting and Diarrhea
12. Recognition of critical illness
13. Stridor
14. Pulmonary edema-cardiogenic and non cardiogenic
15. Traumatic brain injury
16. Polytrauma
17. Diabetic ketoacidosis
18. GI Bleeds - Hematemesis, Melena, Hematochezia Rapid Sequence incubation
19. Adrenal Crisis
20. Metabolic problems – hyperammonemia, lactic acidosis, acid base abnormalities, Hypoglycemia
21. Septicemic shock, Viral infections and shock
22. Pneumothorax, empyema, pleural effusion, ascites
23. Severe Anemia, Bleeding child, Neutropenia
24. Pain management, Drug therapy
25. ARD
26. Respiratory Failure
27. Burns/ electrocution
28. Animal Bites
29. Preanesthetic check up PAC
30. Sickle cell crisis, severe complicated malaria
31. Acute severe asthma, Bronchiolitis
32. Status epilepticus
33. Febrile seizure
34. Coma, Increased intra-cranial pressure
35. Cardiopulmonary resuscitation
36. Shock
37. Upper airway obstruction
38. Near drowning
39. Poisoning
40. Snake bite
41. Scorpion sting
42. Physical abuse
43. Sexual abuse

## **8.Human Genetics**

1. Molecular Basis of Disorders
2. Molecular Diagnosis
3. Human Genome Project
4. Inheritance Patterns
5. Chromosomal/genetic clinical Abnormalities
6. Genetic Counseling
7. Dysmorphism
8. Gene therapy

## **9.Metabolic Disorders**

1. Approach to IEM
2. Purine and pyrimidine metabolism defects
3. Amino acid Metabolic defects - Common
4. Porphyria
5. Amino acid Metabolic Defects – Rare
6. Lipid Metabolism - Common
7. Lipid Metabolism - Rare
8. CHO Metabolism – Common
9. CHO Metabolism – Rare
10. Mucopolysaccharidosis
11. Mucopolipidosis
12. Hypoglycemia

## **10.Fetus and Newborn**

1. Mortality and morbidity
2. Newborn – history, examination, routine delivery care, nursery care, bonding
3. High risk pregnancies
4. Dysmorphology
5. Fetus
  - Growth/Development
  - Fetal distress
  - Maternal diseases
  - Maternal medications
  - Detection, treatment, prevention of fetal disease
    - Antenatal diagnosis
    - Fetal therapy
    - Antenatal therapy
    - Counseling
    - Teratogens, radiation
6. High risk infant
  - Multiple pregnancies
  - Prematurity
  - Postdated
  - IUGR/LBW
  - LFD

7. Congenital anomalies/ malformations
8. Birth injuries
9. Hypoxia - ischemia, asphyxia
10. Organization and levels of newborn care
11. Normal Newborn
12. Common problems in a normal newborn
13. Delivery room emergencies
14. Respiratory disorders
15. Oxygen therapy, toxicity
16. Ventilation
16. GI disturbances including NEC
17. Hyperbilirubinemia
18. Cardiac problems
19. PPHN
20. Blood disorders
  - Polycythemia
  - Anemia
  - Hemorrhagic disease of newborn
  - Hemolytic disease of newborn
  - Thrombocytopenia
21. Genitourinary disturbances
22. Metabolic disorders
22. Endocrine disorders- IDM, CAH
23. Ambiguous genitalia
24. Fluid and electrolytes in Newborn care
25. Nutrition and feeding the newborn – term/preterm, LBW, IUGR
26. Neonatal transport
27. Surgical problems
  - TEF
  - Anorectal malformations
  - Diaphragmatic Hernia/Eventration
  - Hirschsprung
  - Urogenital anomalies
  - NEC
  - Congenital Lobar Emphysema
  - Volvulus
28. Thermoregulation
29. Neonatal follow-up

## **11. Neonatal Infections**

1. Epidemiology
2. Intrauterine infections
3. Viral Infections
4. Neonatal sepsis/meningitis
5. Pneumonia

6. UTI
7. Hepatitis
8. Nosocomial
9. Universal precautions
10. Prevention of infections
11. Therapy- antimicrobials, adjuvants

## **12. Adolescent Health**

1. Epidemiology
2. Depression
3. Sexual development and SMR stages
4. Suicide
5. Deliveries of health care
6. Pregnancy
7. Contraception
8. STD
9. Menstrual problems
10. Substance abuse
11. Anorexia nervosa, bulimia
12. Sleep disorders
13. Skin/Orthopedics

## **13. Immunological system**

1. Basics of Immunology
2. Approach to immunodeficiency
3. HIV
4. Bone marrow transplantation
5. Primary B cell diseases
6. Primary T cell diseases
7. Complement and phagocytic diseases
8. Chronic granulomatous disease
9. Chediak Higashi Disease
10. Neutrophil abnormalities
11. Adhesion disorders

## **14. Allergic disorders**

1. Allergy and Immunological basis
2. Insect allergy
3. Diagnosis
4. Ocular allergy
5. Therapy – principles
6. Adverse food reaction
7. Allergic Rhinitis
8. Asthma
9. Atopic dermatitis
10. Urticaria, Angioedema
11. Anaphylaxis
12. Serum sickness
13. Adverse drug reactions

## **15.Rheumatology**

1. Autoimmunity
2. Ankylosis spondylosis
3. Laboratory evaluation
4. Neonatal Lupus
5. JRA
6. Scleroderma
7. SLE
8. Mixed connective Tissue Disease
9. Vasculitis
10. Dermatomyositis
11. Erythema Nodosum
12. Behcet syndrome
13. Sjogren syndrome
14. Nonrheumatic conditions
15. Painsyndromes, panniculitis,
16. polychondritis, amyloidosis

## **16.Infectious diseases**

1. Fever
2. Clinical use of Micro Lab
3. Fever without a focus
4. Sepsis and Shock
5. CNS Infections
6. Pneumonia
7. Gastroenteritis
8. Osteomyelitis, Septic arthritis
9. Compromised host infections
10. Bacterial Infections
11. Anaerobic infections
12. Viral Infections
13. Mycotic infections
  - Candidiasis
  - Aspergillosis
14. Parasitic infections
  - Helminthiasis
15. Protozoal
  - Malaria
  - Kalazar
  - Leishmania
  - Giardia
  - Amoeba
16. Antiparasitic drugs
17. Antimicrobials
18. Antivirals drugs, interferon
19. Preventive measures
  - Health advice for travelling
  - Infection control

## 20. Immunization

- Principles
- Schedules
- Controversies
- Standard and Optional Vaccines
- Recent advances in Vaccines

## **17.Digestive system**

1. Normal tract – Physiology, Anatomy, Development
2. Clinical features of Disorders
3. Disorders of Esophagus
4. Disorders of Stomach
5. Disorders of Intestines except Food allergy
6. Disorders of Pancreas
7. Disorders of Liver and biliary system  
Acute Hepatitis, Chronic Hepatitis, Cirrhosis,  
Metabolic Liver Diseases, Cholestatic liver disease,  
Neonatal Obstructive Cholangiopathy, Complications  
of Liver Disease – Portal Hypertension, Encephalopathy,  
Coagulopathy,
8. Disorders of Peritoneum
9. GI function tests
10. Approach to Malabsorption

## **18.Respiratory system**

1. Development and function
2. Congenital disorders of nose
3. Disorders of Upper Respiratory tract
4. Disorders of Lower respiratory tract
5. Hypoventilation
6. Pleural disorders
7. Chronic Respiratory Disease  
Interstitial fibrosis, ILD, empyema,  
lung abscess, bronchiectasis
8. Hypostatic pneumonia
9. Kyphoscoliosis
10. Recurrent Respiratory Disease
11. Ventilation
12. Central hyperventilation
13. Pulmonary Function tests
14. Obesity
15. Cystic Fibrosis
16. Obstructive sleep apnea
17. Pulmonary Hemosiderosis
18. Neuromuscular skeletal disorders
19. Cough Syncope
20. Bronchial Asthma

## **19. Cardiovascular System**

1. Investigations –Lab, ECG, CXR, ECHO, Cath
2. Physiology and Pathophysiology of Transitional Circulation Embryology
3. Sick Sinus
4. Congenital Heart Disease
  - Epidemiology
  - Approach
    - Cyanotic
    - Acyanotic
5. Tumors of Heart
6. Heart Lung, Heart
7. Transplants
8. Aneurysms and fistulae
9. Cardiac Arrhythmia
10. Acquired heart disease
  - Infective Endocarditis
  - Rheumatic Heart Disease
11. Diseases of the Myocardium – Myocarditis, Cardiomyopathy
12. Cardiac Therapeutics

## **20. Blood**

1. Development of Hematopoietic system
2. Elliptocytosis
3. Anemias
  - Inadequate production
    - Nutrition – Iron, Folate, B12
    - Bone Marrow failure
  - Hemolytic
    - Congenital and Acquired
4. Stomatocytosis
5. Other membrane defects
6. Constitutional pancytopenia
4. Polycythemia
7. Granulocyte transfusions
8. Pancytopenia
9. Blood and component transfusions
10. Thrombotic disorders
9. Hemorrhagic disorders – acquired and congenital
  - Physiology
  - Bleeding disorders
  - Coagulation disorders
10. Hypersplenism, trauma, splenectomy
11. Physiology and Disorders of the Spleen
12. Lymphatic vessel disorders
13. Lymphatics



## **21. Neoplasms**

1. Principles of diagnosis
2. Epidemiology
3. Principles of treatment
4. Molecular pathogenesis
5. Leukemia
6. Soft tissue sarcomas
7. Lymphomas
8. Gonadal, germ cell tumours
9. Neuroblastoma
10. Liver neoplasm
11. Kidney tumors
12. GI neoplasm
13. Bone Neoplasms
14. Carcinomas
15. Retinoblastoma
16. Skin Cancer
17. Benign tumours

## **22. Nephrology**

1. Structure and function of kidney
2. Hematuria and conditions
3. Membranous GN
4. HUS
5. Lupus nephritis- Evaluation
6. Membrano Prolif GN
7. Proteinuria
8. Chronic infectious GN
9. Nephrotic syndrome
10. Goodpasture
11. Acute Glomerulonephritis
12. Tubular disorders
  - Function
  - RTA
  - DI
13. Renal Failure
14. RPGN
15. Renal Replacement therapy
16. Bartter syndrome- Investigations
17. Interstitial nephritis
18. Toxic nephropathy
19. Cortical necrosis

### **23.Urological disorders**

1. UTI
2. Congenital anomalies, dysgenesis kidney
3. Vesico-ureteral reflux
4. Bladder anomalies
5. Obstructions
6. Penis, urethra anomalies
7. Voiding dysfunction
8. Scrotal anomalies
9. Genitourinary trauma
10. Urolithiasis
11. Investigations – imaging, renal function tests
12. Neurogenic bladder

### **24.Gynecological problems**

1. Menstrual Problems
2. Neoplasms
3. Vulvovaginitis
4. Breast Disorders
5. Developmental anomalies
6. Hirsutism, polycystic ovaries
7. A child with special Gynec needs
8. Gynec imaging
9. Athletic problems

### **25.Endocrine**

1. Hypothalamus and pituitary
  - Hyperpituitarism
  - Hypopituitarism, Growth hormone
  - DI
  - ADH
  - Physiology of Puberty
  - Disorders of puberty
    - Precocious Puberty
    - Delayed puberty
2. Thyroid
  - Thyroid studies
  - Hypothyroidism
  - Thyroiditis
  - Goitre
  - Hyperthyroidism
3. Parathyroid and disorders
4. Carcinoma of thyroid
5. Tumours of testis/ovary
6. Multiple Endocrine Disorders
- 4 Diabetes mellitus

## 10. Adrenal Disorders

- CAH
- Cushing
- Addisons
- Excess mineralocorticoids
- Feminizing adrenal tumours
- Pheochromocytoma

## 26. CNS

1. Examination, Localization of lesions
2. Movement disorders
3. Congenital anomalies
4. Seizures
5. Headaches
6. Neurocutaneous disorders
7. Coma
8. Brain death
9. Head Injury
10. Neurodegenerative disorders- Approach, Grey/white matter disorders
11. Acute Stroke
12. Brain abscess
13. Tumors
14. Spinal cord disorders
15. Investigations
16. Antiepileptic drugs
17. SSPE
18. Rabies Vaccine Encephalomyelitis,
19. Acute Demyelinating Encephalomyelitis
20. Approach, Investigations of UMN, LMN, Extrapyramidal, Cerebellar lesions
21. Cerebral Palsy
22. Neuroinfections
23. Encephalopathies

## 27. Neuromuscular

1. Evaluation, investigations
2. Development disorders of muscle
3. Muscular Dystrophies, Congenital Myopathy, Myositis
4. Endocrine Disorders
5. Neuromuscular transmission and motor neuron Abnormalities
6. Metabolic Disorders
7. GB syndrome
8. Motor sensory neuropathy
9. Bell's Palsy
10. Autonomic Disorders
11. Floppy Infant
12. Myasthenia Gravis

## **28.Eye**

1. Examination of eye
2. Refraction, accommodation
3. Diseases of Eye movement and alignment disorders
4. Vision
5. Diseases of Conjunctiva - Conjunctivitis
6. Pupils and iris
7. Diseases of Lens - Cataracts
8. Lids
9. Diseases of Optic nerve – Papillitis, Neuritis,
10. Papilledema
11. Diseases of Cornea - Clouding
12. Uveal tract
13. Vitamin A deficiency
14. Retina and vitreous
15. Lacrimal problems - Dacrocystitis
16. Glaucoma
17. Retinopathy of Prematurity
18. Orbital abnormalities
19. VER
20. Injuries to eye

## **29.Ear**

1. Clinical manifestations
2. Congenital malformations
3. Hearing loss
4. Inner ear discharge
5. External Otitis
6. Trauma
7. Otitis media
8. Tumors
9. BAER

## **30.Skin**

1. Morphology
2. Cutaneous defects
3. Evaluation
4. Hypersensitivity
5. Principles of therapy
6. Epidermis dis
7. Diseases of the neonate
8. Keratinization dis
9. Ectodermal dysplasias
10. Dermis dis
11. Vascular disorders
12. Subcutn dis
13. Cutaneous nevi
14. Sweat glands
15. Pigment Disorders

16. Hyperpigmentation
17. Hair
18. Hypopigmentation
19. Nails
20. Vesiculobullous disease
21. Mucous membranes
22. Eczema
23. Tumors
24. Cutaneous Infections – Bacterial, Viral, Fungal
25. Arthropod bites, infestations
26. Acne
27. Nutritional diseases
28. Drug Reactions

### **31. Bone/Joint**

1. Evaluation
2. Sports medicine
3. Diseases of Foot, toes
4. Pseudoachondroplasia
5. Torsional, angular deformities
6. Diagnosis, assessment of genetic skeletal disorders
7. Leg length discrepancy      diastrophic,
8. Dysplasias- Thantophoric, camptomelic
9. Diseases of Knee
10. Ellis van Creveld
11. Diseases of Hip
12. Osteochondrodysplasia
13. Diseases of Spine
14. Inherited osteoporosis
15. Diseases of Neck
16. Upper limb
17. Hypophosphatasia
18. Arthrogryposis
19. Primary Chondrodystrophy
20. Common Fractures
21. Idiopathic hypercalcemia
22. Arthritis – approach, investigations, Management
23. Hyperphosphatasia
24. Congenital Dislocation of Hip
25. Osteomyelitis
26. Septic Arthritis
27. Rickets – Nutritional and non nutritional

### **Genetic skeletal disorders**

1. Lethal and nonlethal bone dysplasias
2. Achondroplasia
3. Osteopetrosis
4. Marfans

### **32. Metabolic Bone disease**

1. Bone and vitamin D
2. Familial Hypophosphatemia
3. Rickets – Nutritional and non nutritional

### **33. Unclassified disease**

1. SIDS
2. Sarcoidosis
3. Histiocytosis
4. Progeria
5. Cystic fibrosis
6. Chronic fatigue syndrome

### **Environmental**

1. Radiation
2. Lead poisoning
3. Chemical pollutants
4. Envenomation
5. Mercury
6. Mammalian bites
7. Nonbacterial poisoning
8. Common Poisonings – OP, Kerosene, Phenobarbitone, Iron, etc

## **HEALTH STATISTICS, NATIONAL PROGRAMS**

### **ORGANIZATION OF OFFICE PRACTICE**

Equipment, Documentation, Records, Space and functioning

## **34. RECENT ADVANCES IN PAEDIATRICS - ALLIED SUBJECTS**

### **35. Anatomy**

Applied Embryology, Development of major organ systems

### **36. Physiology**

Applied Physiology with regard to major organ systems

### **37. Biochemistry**

Biochemical basis of diseases in children – Nutritional and metabolic

### **38. Pathology**

Pathophysiology of diseases in children, Pathogenesis, Basic Histopathology

### **39. Microbiology**

Clinical Microbiology applied to investigations for diseases in childhood, serology, staining, cultures

#### **40. Pharmacology**

Clinical Pharmacology, Therapeutics of childhood diseases, drug interactions, Rational drug therapy, Adverse Drug Reactions

#### **41. Community Medicine**

Health Care Delivery Systems – structure and function, Health Statistics, National Programs

#### **42. Pediatric Surgery**

Recognition and referral of surgical conditions in Paediatrics

#### **43. Radiology**

Clinical Indications and interpretations of Xray, Ultrasound, CT, MRI

#### **44. Legal and Ethical Medicine**

Rights and protection of children, Consumer Protection Act, Basic Principles of Ethics

### **MEDICAL ETHICS**

Doctors and health professionals are confronted with many ethical problems. It is, therefore necessary to be prepared to deal with these problems. To accomplish this **ethical sensitisation** should be achieved by lectures or discussion on ethical issues, clinical case discussion of cases with an important ethical component and by including ethical aspects in discussion in all case presentation, bedside rounds and academic postgraduate programmes.

Course content should include *definition of Medical Ethics*, difference between medical ethics and bio-ethics, major Principles of Medical Ethics, the Hippocratic oath, the Declaration of Helsinki, the WHO Declaration of Geneva, International code of Medical Ethics (1993), Medical Council of India Code of Ethics, *Profession Ethics* (Code of conduct, Contract and confidentiality, Malpractice and Negligence) prolongation of life and euthanasia

### **Postgraduate skills**

Please note code:

PI: Perform Independently

PA: Perform with assistance

#### **45.List of PI Skills**

Clinical History and Physical examination  
Human Lactation management (counseling and practical skills)  
Neonatal resuscitation  
Pediatric resuscitation  
Teaching encounters  
Intravenous injections  
Intravenous cannulation  
Lumbar puncture  
Test dose  
Infusions  
Blood transfusions  
Neonatal Exchange transfusions

ABG  
Central line, CVP  
Intraosseous  
Bone marrow aspiration, trephine biopsy  
Pleural tap  
Paracentesis – diagnostic and therapeutic  
Mantoux test  
DPT, OPV, Measles vaccination  
Sampling for Fluid cultures  
Liver biopsy  
Neonatal, Pediatric Partial exchange

#### ***Respiratory management (All PI)***

Nebulization  
Inhaler therapy  
Oxygen delivery

#### ***Critically Ill child (All PI)***

Monitoring a sick child  
Pulse oximetry  
Infant feeding tube/ Ryles tube, stomach wash  
Urinary catheterization  
Restraining a child for a procedure  
ORS and ORT  
Prognostication

#### ***Laboratory- Diagnostic (All PI)***

Urine Protein, sugar, microscopy  
Peripheral bloods smear  
Malarial smear  
Ziehl Nielson smear – sputum, gastric aspirate  
Grams smear – CSF, pus  
Stool pH, reducing substances, microscopy  
KOH smear



**Neonatal tests (All PI)**

Apt test  
Shake test

**Clinical Assessment skills (All PI)**

Clinical History and Physical examination  
Anthropometry  
Dietary recall, calorie and protein estimation  
Nutritional advice  
Gestational assessment  
Neurological examination of newborn  
Primitive reflexes  
Fundoscopy  
Otoscopy  
Examination of external genitalia – male and female  
Tanner's SMR scales  
DST or Baroda scales, TDS  
Amiel Telson's angles  
Per rectal examination

**Interpretation (All PI)**

Clinical History and Physical examination  
Blood, Urine, CSF and Fluid investigations – hematology, biochemistry

Chest Xray  
ECG  
ABG interpretation  
Abdominal Xray  
Bone and joint Xray  
CT scan Brain  
Barium studies  
IVP, VUR studies  
Ultrasound abdomen  
Neurosonogram

## **Communication skills**

### ***All PI:***

- Clinical History and Physical examination
- Communicating health, disease
- Communicating about a seriously ill or mentally abnormal child
- Communicating death
- Informed consent
- Empathy with a family
- Referral letters, Replies
- Discharge summaries
- Death Certificates
- Pre-counseling for HIV
- Post counseling for HIV
- Basic Pedagogy sessions – teaching students, adults  
Lectures, bedside clinics, discussions
- Medline search, internet, Computer usage

### ***List of Observations:***

Genetic counseling

Classification of diseases

### ***List of PA skills:***

Sedation

Analgesia

Brain death

Intercostal tube placement with underwater seal

### ***List of PA skills:***

Peritoneal dialysis

Subdural, Ventricular tap

## **Paper – I Basic Sciences (As furnished under M.D Branch-1 General Medicine)**

### **Paper – II Clinical Paediatrics**

1. Nutrition and Nutritional Disorders.
2. General considerations in the case of sick children.
3. Inborn errors of Metabolism.
4. Immunity, Allergy and Related Diseases.
5. Infectious Diseases.
6. The Digestive System.
7. The Respiratory System.
8. Metabolic Disorders.
9. Paediatric Gynaecology and Adolescent Issues.
10. Convulsive Disorders.

11. The Bones and Joints.
12. The Skin
13. Paediatric Ophthalmology
14. Unclassified Diseases.
15. Radiation Therapy.
16. Poisoning from Food, Drugs and Chemical Pollutants, Venoms, Bites, Mammalian Bites.

#### **Paper – III Neonatology Development Paediatrics Preventive and**

##### **Social Paediatrics.**

1. Developmental Paediatrics
2. Preventive Paediatrics and Epidemiology.
3. Prenatal Disturbances.
4. The Fetus and the Neonatal Infant (Neonatology).
5. Medical Ethics / Bio-ethics

#### **Paper – IV Specialities**

1. The Cardiovascular System.
2. Diseases of the Blood
3. Neoplasms and Neoplasm Like Lesions.
4. The Urinary System.
5. The Endocrine System.
6. The Nervous System.
7. Pediatric emergency and critical care

### **5.TEACHING LEARNING ACTIVITIES**

#### **Methods suggested for Pediatric Postgraduate Training Programs:**

- **Didactic Lectures:** (Faculty lectures)

*Objective:* To introduce a broad-based concept in an important area of learning to orient the postgraduate student.

*Examples:* Potential introductory topics to Paediatrics like Fluid and Electrolytes, Early recognition of Shock and Respiratory Failure, DTTU management, Recent advances, Basic Science/ Concepts and ARI program.

*Frequency:* Three times a week during the introductory orientation phase of the first one-two months of the new postgraduates joining the course.

- **Seminars:**

*Objective:* To enable a student to study in depth an important area of learning important to the training of the student.

*Examples:* Examples of potential seminar topics would be Protein Energy Malnutrition, Pediatric Tuberculosis, Pediatric HIV, Bronchial Asthma, Chronic Liver Disease and its complications.

*Frequency:* Once a week. Topic to be shared among students and to be equally distributed depending upon the number of postgraduate students in the department.

- **Journal Club:**

*Objective:* To appreciate and enable the critical analysis of scientific literature published in peer reviewed journals – studies, reviews.

*Examples:* Articles like the study on prophylactic Zidovudine to HIV positive pregnant women in prevention of vertical transmission to the fetus, Digoxin versus Captopril in VSD in CCF, etc.

*Frequency:* Ideally, once in 1-2 times per month.

- **Undergraduate Teaching Clinics**

*Objective:* To teach effectively undergraduate and colleagues utilizing simple educational methods.

*Methodology:* During the third year of MD course, postgraduate students should be given opportunities to teach undergraduates.

*Examples:* Bedside Clinic, Didactic lecture, skill workshop (e.g. NALS, PALS)

*Frequency:* During undergraduate postings in the department each postgraduate should have a minimum of 2 opportunities per year after the first year of the postgraduate course is completed.

- **Bedside Clinics**

*Objective:* To learn bedside techniques - interview, physical examination, analysis, diagnostic decision making, investigation decisions, treatment and communication.

*Examples:* Child with hemiplegia, hepatosplenomegaly, anemia, jaundice, etc.

*Frequency:* Once in a week is the minimum as it forms the basis of good clinical training activities.

- **Mortality Review Meeting**

*Objective:* To analyze, discuss and learn from mortalities.

*Frequency:* Once in a month preferably in the first week to allow the previous months mortality to be presented for discussion.

- **Grand Rounds**

*Objective:* To improve on bedside techniques – interview, physical examination, analysis, diagnostic decision making, investigation decisions, treatment, communication.

*Examples:* The child with pyrexia of unknown origin, undiagnosed hepato-splenomegaly, multi-systemic disease.

*Frequency:* Once in a week

**Inter-departmental Meetings**

*Objective:* To experience inter-departmental cooperation and develop a healthy professional respect for each others opinions in addition to the subject learning experience.

*Methodology:* Case discussions or students present investigations to members of all faculty. The discussion is a learning experience and improves communications between departments.

*Examples:* Chest X-rays of a complicated bronchopneumonia progressing to an empyema, CT scans of intra-cranial pathology, Tracheo-esophageal fistulae and supportive care.

*Frequency:* Once or twice in a month and rotated between departments – Radiology, Pediatric Surgery, Cardiology, Nephrology, Neurology, Clinical Hematology, etc.

- **Clinical Pathological Conference CPC**

*Objective:* To analyze clinical material to reach a differential diagnosis and correlate with the pathological biopsy findings.

*Frequency:* Once in two months. All are encouraged to participate.

- **Records Round**

*Objective:* To appreciate the importance of documentation of facts and record keeping.

*Methodology:* Faculty in the presence of the team scrutinizes random case records. History sheets, doctor order sheets, progress sheets and discharge summaries are discussed.

*Frequency:* Once a week with the entire team present at the session.

## **6.STRUCTURED TRAINING PROGRAM**

### **I Year Postings**

|                                 |                  |
|---------------------------------|------------------|
| Paediatric Medical ward         | - 8 Months       |
| New born posting                | - 1 Month        |
| Emergency Department            | 1 Month          |
| Intensive care Unit             | - 1 Month        |
| <b>PHC / PPC/ School Health</b> | <b>- 15 Days</b> |

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|                      |         |
|----------------------|---------|
| Pediatric Psychiatry | 15 Days |
|----------------------|---------|

### **II Year Postings**

|                             |                  |
|-----------------------------|------------------|
| Newborn                     | - 2 Months       |
| Paediatric Ward             | - 3 Months       |
| Intensive care unit         | - <b>1 month</b> |
| <b>Dermatology</b>          | <b>- 15 days</b> |
| <b>Emergency department</b> | <b>-1 month</b>  |

### **Recommended Special postings**

|                               |           |
|-------------------------------|-----------|
| Hemato-oncology               | - 1 Month |
| Cardiology                    | - 1 Month |
| Gastroenterology / ORT Centre | - 15 days |
| Nephrology                    | - 1 Month |
| Pulmonology                   | -15 days  |
| Pediatric surgery             | -15 days  |

### **III Year Postings**

|                          |                  |
|--------------------------|------------------|
| Medical Newborn postings | - 2 Months       |
| <b>Endocrine</b>         | <b>- 15 Days</b> |

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|                               |          |
|-------------------------------|----------|
| Pediatric Intensive Care Unit | 1month   |
| Paediatric Medical Ward       | 6 months |
| Pediatric Neurology           | 1 Month  |
| Emergency medicine            | 1 month  |

|                 |                  |
|-----------------|------------------|
| <b>Genetics</b> | <b>- 15 Days</b> |
|-----------------|------------------|

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## **MD Paediatrics 2 Years Course (Post DCH) 2017-18**

### **I Year Postings**

|                               |            |
|-------------------------------|------------|
| Paediatric Medical Ward       | - 6 Months |
| Emergency Medicine Department | - 1 Month  |
| Intensive Care Unit           | - 1 Month  |
| Medical Newborn               | - 2 Months |
| Pulmonology                   | - 15 Days  |
| PHC /PPC / School Health      | - 15 Days  |
| Dermatology/                  | -15 days   |

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|                         |                |
|-------------------------|----------------|
| <u>Child Psychiatry</u> | <u>15 days</u> |
|-------------------------|----------------|

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### **II Year Postings**

|                               |          |
|-------------------------------|----------|
| Medical Newborn               | 2 Month  |
| Emergency Medicine            | 1 month  |
| Pediatric Intensive Care Unit | 1 month  |
| HIV Clinic (ART) Centre       | 15 Days  |
| Paediatrics surgery           | 15 Days  |
| General Paediatrics           | 3 Months |

**If any speciality is not available in the parent institution the postgraduate may be posted in the general pediatric ward during that period.**

### **Recommended Special postings**

|                               |           |
|-------------------------------|-----------|
| Neurology                     | - 1 Month |
| Cardiology                    | - 15 Days |
| Haematoncology                | - 1 month |
| Gastroenterology / ORT Centre | - 15 days |
| Nephrology                    | - 15days  |
| Medical genetics              | - 15 days |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**7 Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

Theory Exams and Practical exams will have to be conducted once in 6 months

**8 COMPETENCY ASSESSMENT:**

**1 OVERALL:**

- |                                                      |    |           |
|------------------------------------------------------|----|-----------|
| a) Communication / commitment / Contribution /       | () |           |
| Compassion towards patients and Innovation           | () | - 5 Marks |
| b) Implementation of newly learnt techniques /Skills | () |           |

|          |                                                                       |           |
|----------|-----------------------------------------------------------------------|-----------|
| <b>2</b> | Number of cases presented in Clinical Meetings/Journal clubs/seminars | - 5 marks |
|----------|-----------------------------------------------------------------------|-----------|

|          |                                                                                       |           |
|----------|---------------------------------------------------------------------------------------|-----------|
| <b>3</b> | Number of Posters/Papers presented in Conferences/ Publications and Research Projects | - 5 marks |
|----------|---------------------------------------------------------------------------------------|-----------|

|          |                                                                                                                  |           |
|----------|------------------------------------------------------------------------------------------------------------------|-----------|
| <b>4</b> | No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. | - 5 marks |
|----------|------------------------------------------------------------------------------------------------------------------|-----------|

|              |                 |
|--------------|-----------------|
| <b>Total</b> | <b>20 Marks</b> |
|--------------|-----------------|

**PG CLINICAL COURSES**

|                                      |                      |
|--------------------------------------|----------------------|
| VIVA including Competency Assessment | - 80 Marks (60 + 20) |
|--------------------------------------|----------------------|

|          |            |
|----------|------------|
| Log Book | - 20 marks |
|----------|------------|

**ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period   |          |           |          | Total Max.20 marks |
|---------------|----------|----------|-----------|----------|--------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks           |
|               | AVERAGE  |          |           |          | 20 Marks           |



## **9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES:**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation.

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

## **10.Theory Examination:**

|                  |   |                                                                              |
|------------------|---|------------------------------------------------------------------------------|
| <b>Paper I</b>   | : | Applied Basic Sciences in Paediatrics                                        |
| <b>Paper II</b>  | : | Clinical Paediatrics                                                         |
| <b>Paper III</b> | : | Neonatology, Developmental Paediatrics,<br>Preventive and Social Paediatrics |
| <b>Paper IV</b>  | : | Specialties of Pediatric Medicine and Recent advances                        |

### Question paper Pattern:

Paper I : Write notes on

Anatomy  $4 \times 5 = 20$

Physiology  $4 \times 5 = 20$

Biochemistry  $3 \times 5 = 15$

Pharmacology  $3 \times 5 = 15$

Pathology  $3 \times 5 = 15$

Microbiology  $3 \times 5 = 15$

**Total = 100 marks**

Paper II, III & IV :

Elaborate on :  $2 \times 15 = 30$

Write notes on  $10 \times 7 = 70$

**Total = 100 marks**

**11.Clinical Examination:**

| th<br>REFERENCE- 46 SAB dt 17.07.2013                                                                                                |                                |
|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| MD Paediatrics                                                                                                                       |                                |
| CLINICALS                                                                                                                            |                                |
| LONG CASE - (1 X 45 MIN) - (1 X 80 MARKS)                                                                                            | 80 MARKS                       |
| SHORT CASE - (2 X 15 MIN) - (2 X 35 MARKS)                                                                                           | 70 MARKS                       |
| WARD ROUNDS ( 20 MIN) (3 cases X 10 MARKS)                                                                                           | 30 MARKS                       |
| OSCE ( DRUGS, LAB DATA, EMERGENCY, IMNCI<br>4 STATIONS X 5 MARKS                                                                     | 20 MARKS                       |
| TOTAL                                                                                                                                | 200 MARKS (A)                  |
| VIVA VOCE (4 X 5 MIN) (4 X 15MARKS)<br>(NUTRITION, IMAGING, COUNSELLING,<br>PROCEDURES, INSTRUMENTS, RECENT<br>ADVANCES, ADOLESCENCE | 80 MARKS (B)                   |
| LOG BOOK                                                                                                                             | 20 MARKS (C)                   |
| AGGREGATE (CLINICAL + VIVA) TOTAL                                                                                                    | 300 MARKS (A+B+C)              |
| MINIMUM REQUIRED FOR PASS (50%)                                                                                                      | 150 MARKS                      |
| DISSERTATION                                                                                                                         | APPROVED /<br><br>NOT APPROVED |

**12.Log book:**

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

### **13.Viva including competency assessment**

VIVA including Competency Assessment

- 80 Marks (60 + 20)

Case reports, charts, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, for interpretation. It includes discussion on dissertation also.

### **14.OSCE/OSPE:**

- DRUGS,
- LAB DATA,
- EMERGENCY,
- IMNCI
- CLINICAL SIGN DEMONSTRATION (MANNED STATION) / COUNSELING

### **15.Recommended Books and Journals**

#### **Texts:**

##### **Essential**

1. Nelson's Textbook of Paediatrics, Harcourt Asia Saunders
2. Cloherty's Manual of Neonatal Care
3. Meharban Singh's Care of the Newborn
4. Harriat Lane
5. Manual of Pediatric Therapeutics, Little Brown's Children's Hospital, Boston.
6. O.P. Ghai's Textbook of Paediatrics

##### **Reference**

1. Rudolf's Paediatrics, Appelton and Lange
2. Forfar and Arneil's Textbook of Paediatrics, ELBS
3. Frank Oski's Principles and Practice of Paediatrics
4. Avery's Disease of the Newborn
5. Robertson's Textbook of Neonatology
6. Illingworth's The normal child
7. Guha's Textbook of Neonatology
8. IAP Textbook of Paediatrics
9. Nadas' Pediatric Cardiology
10. Perloff's Approach to Congenital Heart Disease
11. Moss and Adam's Heart Disease in Infants, children and Adolescent
12. Miller's Blood Diseases of Infancy and Childhood
13. DeGruchy's Clinical Hematology in Medical Practice
14. Barret and Holiday's Pediatric Nephrology
15. Caffey's Pediatric X-Ray diagnosis
16. Alleyne's Protein Energy Malnutrition
17. Miller, Tuberculosis
18. Vimlesh Seth, Tuberculosis
19. Swanson's Pediatric Surgery

20. Cherry and Feigen's Pediatric Infectious Diseases
21. Fenichel's Pediatric Neurology
22. Kendig's Respiratory Diseases in Paediatrics
23. Alex Mowat's Liver Disease in Children
24. Roger's Pediatric Critical Care
25. H.P.S. Sachdev's Principles of Pediatric and Neonatology Emergencies
26. Smith's Recognition patterns of Human Malformations

### **16.Indexed Journals**

1. Indian Paediatrics
2. Indian Journal of Paediatrics
3. Pediatric Clinics of North America
4. New England Journal of Medicine
5. Lancet
6. British Medical Journal
7. Journal of Paediatrics
8. Archives Disease of Childhood and Adolescence
9. Paediatrics
10. Perinatal Clinics of North America
11. Indian Journal of Practical Paediatrics

### **Reference Series**

1. Suraj Gupta's Recent Advances in Paediatrics
2. David's Recent Advances in Paediatrics
3. Advances in Paediatrics
4. Year Book of Paediatrics

### **ADDITIONAL READING**

1. Indian Council of Medical Research, "Ethical Guidelines for Biomedical Research on Human Subjects", I.C.M.R, New Delhi, 2000.
2. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.
3. Francis C M, Medical Ethics, J P Publications, Bangalore, 1993.
4. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.
5. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424-8
6. Kirkwood B R, Essentials of Medical Statistics , 1<sup>st</sup> Ed., Oxford: Blackwell Scientific Publications 1988.

7. Mahajan B K, Methods in Bio statistics for medical students, 5<sup>th</sup> Ed. New Delhi, Jaypee Brothers Medical Publishers, 1989.
8. Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, min. of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi. P - 335.
9. National Health Policy, Min. of Health & Family Welfare, Nirman Bhawan, New Delhi, 1983
10. Srinivasa D K etal, Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

# LOG BOOK

**Table 1 : Academic activities attended**

Name:

Admission Year:

College:

[illegible]

# LOG BOOK

### Table 2 : Academic presentations made by the student

Name:

Admission Year:

College:

[illegible]



## LOG BOOK

**Table 3 : Diagnostic and Therapeutic Procedures Performed**

Name:

Admission Year:

College:

| Date | Name | ID No. | Diagnostic and Therapeutic Procedure | Category<br>O, A, PA, PI* |
|------|------|--------|--------------------------------------|---------------------------|
|      |      |        |                                      |                           |
|      |      |        |                                      |                           |
|      |      |        |                                      |                           |
|      |      |        |                                      |                           |

- \* Key:**
- O - Washed up and observed
  - A - Assisted a more senior faculty
  - PA - Performed procedure under the direct supervision of a senior faculty
  - PI - performed independently

\*\*\*\*\*

**M.D.PHARMACOLOGY**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.D.PHARMACOLOGY  
BRANCH IV**

**1. GOAL**

The aims of MD course in Pharmacology are:

To train a medical graduate to be a Pharmacologist who is well versed with the basic principles of Pharmacology and is up to date with the recent advances.

Acquisition of skills related to teaching, research methodology and corporate world.

Knowledge of elementary statistics and its applications.

Overall development of skills and personality of the PG resident.

Broaden the scope of Pharmacology from bench to bed side.

**2. OBJECTIVES:**

**A) Knowledge:**

At the end of the MD course in Pharmacology, the student should be able to:

Recognize the importance of Pharmacology as a key branch in health sciences.

**B) Attitude:**

Develop skills as a self-directed learner, recognize continuing educational needs; use appropriate learning resources and be able to critically analyze relevant published literature.

Function as a productive member of a team engaged in research, education and industry.

Play the assigned role in the implementation of national health programs effectively, including planning of drug procurement and distribution.

### **C) Skills:**

Utilize the acquired knowledge in teaching, research and industry ; Plan and organize projects using managerial and leadership skills.

Understand and apply ethical principles involved in animals and human experiments.

Handle animals to conduct experiments e.g. screening of various drugs.

Perform qualitative and quantitative identification and estimation of drugs in different samples of body fluids. Design protocol for clinical trials. Incorporate Knowledge of information technology in medical sciences. Monitor adverse drug reactions and provide drug information service to the needy

## **3.COMPONENTS OF THE POSTGRADUATE CURRICULUM**

### Theoretical Knowledge:

#### Course Content :-

#### General Pharmacology :

History of Pharmacology, Pharmacokinetics, Pharmacodynamics, Adverse Drug Reactions, Drug Interactions, Pediatric Pharmacology, Geriatric Pharmacology, Drugs in Pregnancy and Lactation. Dosage calculation in special situations, Factors modifying drug action, Pharmacokinetics, Drug delivery systems and Fixed dose combinations, Gene therapy, Sources of drugs. Principles of Toxicology, Principles of prescription writing.

Basic concepts of immunology needed to understand the immuno- modulatory action of drugs

#### Systemic Pharmacology, Chemotherapy and Therapeutics:

Pharmacology of drugs acting on autonomic, peripheral and central nervous systems; cardiovascular, endocrine, respiratory, renal, gastrointestinal and haemopoietic systems and treatment of diseases affecting these systems; Pharmacology of anti-microbial and anti-parasitic drugs and treatment of infective diseases; cancer chemotherapy, immuno-pharmacology and ocular Pharmacology. Dermatological pharmacology, Vitamins, Heavy metals and antagonists, Miscellaneous.

### Experimental Pharmacology, Bioassay:

Experimental methodologies involved in the discovery of drugs (in vivo, in vitro ex vivo). Animal handling and animal care. Methods of anaesthetizing animals and methods of euthanasia. Restraining and blood collection methods. Drug screening methods involved in the evaluation of anti-ulcer, antidepressant, anti-anginal, anti-hypertensive, anti-arrhythmic, anti-cataract, anti-platelet, anticancer, anti-inflammatory, anti-diarrheal, anti-epileptic, analgesic, anti-thyroid, antipyretic, anti-glaucoma, anti-hyperlipidemic, anti-asthmatic drugs and cough suppressants. Drug screening methods used in screening anti-fungal, antihelmintic, antibacterial and antiviral agents. Drug screening methods for heart failure, posterior pituitary, adrenal, steroid (gluco & mineralo), testicular, parathyroid, ovarian, thyroid hormones, Methods involved in testing teratogenicity, carcinogenicity and organ toxicities in animals. Bio-assay and dose response relationship.

### Clinical Pharmacology and Biostatistics:

Principles of therapeutics, Individualisation of drug therapy, Drug regulatory systems, Placebo, Drug development, Pharmacoeconomics, Pharmacoepidemiology, Therapeutic drug monitoring, Ethics of clinical trial, Ethical committee, Drug utilization studies, Essential drug concept and rational drug use. Patient compliance. GCP (Good Clinical Practice) Guidelines, Pharmacovigilance, Bioavailability studies (Writing protocol, Preparing consent forms, Checklist for bioavailability studies, Collection, Separation of samples, Zero order Kinetics and Regulatory aspects), Pharmacoeconomics.

### Bioethics :

1. Respect human life and the dignity of every individual.
2. Refrain from supporting or committing crimes against humanity and condemn all such acts.
3. Treat the sick and injured with competence and compassion and without prejudice and apply the knowledge and skills when needed.
4. Protect the privacy and confidentiality of those for whom we care and breach that confidence only when keeping it would seriously threaten their health and safety or that of others.
5. Work freely with colleagues to discover, develop, and promote advances in medicine and public health that ameliorate sufferings and contribute to human well being.
6. Educate the public about present and future threats to the health of humanity.
7. Advocate for social, economic, educational and political changes that ameliorate suffering and contribute to human well being.
8. Teach and mentor those who follow us, for they are the future of our caring profession.

- PRACTICAL AND CLINICAL SKILLS

Practical Training:-

Experimental Method Discussion:

**1.** Screening and Evaluation of Drug Activities including Animal Models for Study of following Actions:

- |                                  |                                             |
|----------------------------------|---------------------------------------------|
| 1) Analgesic.                    | 15) Antihistaminics, Antiallergic.          |
| 2) Antiinflammatory.             | 16) Antisecretory & drugs for peptic ulcer. |
| 3) Antipyretic; pyrogen testing. | 17) Antiemetic.                             |
| 4) Anticonvulsant.               | 18) Hypoglycaemic.                          |
| 5) Antianxiety.                  | 19) Antifertility.                          |
| 6) Antipsychotic.                | 20) Anticancer.                             |
| 7) Antidepressant.               | 21) Diuretic.                               |
| 8) Antiparkinsonian.             | 22) Animalarial.                            |
| 9) Sedative, hyponotics.         | 23) Antitubercular.                         |
| 10) Antihypertensive.            | 24) Antidiabetic.                           |
| 11) Antianginal.                 | 25) Antiatherosclerotic.                    |
| 12) Antiarrhythmic.              | 26) Bronchodilator & anti-asthmatic drugs.  |
| 13) Skeletal muscle relaxant.    |                                             |
| 14) Local anaesthetic.           |                                             |

B. Bioassay of :

- |                                |                    |
|--------------------------------|--------------------|
| 1) Acetylcholine.              | 5) Insulin.        |
| 2) Adrenaline / noradrenaline. | 6) Antibiotics.    |
| 3) Histamine.                  | 7) Digoxin.        |
| 4) 5- Hydroxytryptamine.       | 8) Glucocorticoids |

- Quantitative study of agonists and antagonists on isolated tissues.
- Measurement of blood pressure in conscious and anaesthetized animals.

#### EXPERIMENTAL PHARMACOLOGY EXERCISES:-

- Frog's rectus abdominis muscle : dose response curve (DRC) and cumulative DRC of acetylcholine; potentiation of ACh by physostigmine and antagonism by tubocurarine / pancuronium.
- Study of drug action on perfused frog's heart.
- Dose-response curve of histamine on isolated guineapig ileum, Cumulative dose response curve of histamine in isolated guinea pig tracheal chain.
- Bioassay of histamine on guineapig ileum by matching assay, 3 point assay and 4 point (Latin square design) assay.
- Bioassay of ACh on frog's rectus abdominis muscle.
- Determination of EC<sub>50</sub> and pD<sub>2</sub> values of histamine and ACh on guineapig ileum and frog rectus abdominis muscles.
- Bio-assay on estrogen primed rat uterus.
- Demonstration of muscarinic and nicotinic actions of ACh and carbachol on the B.P. and respiration.
- Study of local anaesthetics by rabbit cornea guineapig intradermal wheal, frog lumbar plexus.
- Study of analgesic activity of drugs using rat tail-hotwire method, hot plate method, acetic acid induced writhing.
- Study of analgesic activity of drugs against carrageenin induced rat paw oedema.
- Antagonism of histamine aerosol induced bronchospasm by anti-histaminics.
- Effect of psychopharmacological drugs on conditioned avoidance response (Cook's pole climbing).

- Effect of psychopharmacological agents on foot shock induced aggression in rats.
- Effect of psychopharmacological agents on elevated plus maze.
- Effect of drugs on spontaneous motor activity of mice, photoactometer.
- Study of anorectic activity of amphetamine in mice.
- Potentiation of barbiturate sleeping time.
- Study of miotics and mydriatics on rabbit's eye.

#### Minor Procedures:

- Rat tail vein injection.
- Administration of drugs to rats by gastric cannula.
- Collection of blood from rat tail.
- Collection of blood by Cardiac puncture in rat.
- Injection of drugs through marginal ear vein of rabbits.
- Intraperitoneal and subcutaneous injection to rats and mice.

#### Chemical Pharmacology Exercises :

- Identification of unknown compounds by using chemical tests.
- Estimation of drug levels using colorimetry, spectrophotometry, fluorimetry, flame photometry, high performance liquid chromatography (HPLC), enzyme linked immunoassay.

#### Clinical Pharmacology Exercises:

- Molarity calculations and preparations of reagents.



#### 4. WRITING THESIS/ RESEARCH ARTICLES

Registration of title of thesis to be done within six months of joining the course.

Topic Change will be permitted only once with proper justification before the end of first year.

Attendance in research methodology workshop is mandatory before initiation of dissertation work. The candidate may be required to present the dissertation work during the final year examination.

#### 5. TRAINING IN RESEARCH METHODOLOGY, MEDICAL ETHICS, BIO ETHICS AND MEDICOLEGAL ASPECTS:

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, moral and legal issues are part and parcel of our curriculum and syllabus

#### 6. SCHEME OF TRAINING :-

##### I Year:

| <u>Duration</u> | <u>Department</u>            | <u>Department</u>               |
|-----------------|------------------------------|---------------------------------|
|                 | <u>(Forenoon: 10-1 p.m.)</u> | <u>(Afternoon: 2-4.30 p.m.)</u> |
|                 | Pharmacology.                | Pharmacology.                   |

Getting acquainted with the Department.

Attending all the classes.

Introduction to Dissertation including statistical classes.

Visits to Pharmaceutical Industries and Toxicology centres.

**12<sup>th</sup> month**      Selection & Planning of Dissertation.  
Submitting the topic to the University.

## **II & III Year**

II & III yr. In the Department of Pharmacology

wherein:

- ← The Practical Training as specified by the M.C.I. will be given, depending upon the availability of animals & other facilities.
- ← The student will acquire skills-
  - ← To conduct practical classes for the U.Gs.
  - ← To take lectures for the U.Gs.
  - ← To plan an undergraduate teaching programme & to set questions including MCQs.
- ← The student will participate & contribute to other academic activities of the Department like Journal clubs, Seminars and CME programmes. Students will be, in addition, encouraged to attend conferences, workshops and present papers in scientific sessions.

\* During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

## **7. TEACHING LEARNING METHODS**

The following teaching learning methods are recommended.

Lectures

Symposia

Seminars

Journal clubs

Problem based learning

Telemedicine ( where available)

Computer assisted learning (CAL)

8. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

#### 9. COMPETENCY ASSESSMENT:

##### 1. OVERALL:

|                                                                                          |           |
|------------------------------------------------------------------------------------------|-----------|
| a) Communication / commitment / Contribution / Compassion towards patient and Innovation | - 5 marks |
| b) Implementation of newly learnt techniques/Skills                                      |           |

2. Number of cases presented in Clinical Meetings/  
Journal Clubs/Seminars - 5 marks

3. Number of papers presented in conferences/Publications /  
Research Projects. - 5 marks

4. No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings with details. - 5 marks

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20 Marks

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#### PG NON – CLINICAL COURSE

VIVA including Competency Assessment - 60 Marks (40 + 20 )  
Pedagogy - 40 marks

#### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          |  | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|--|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks |  | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks |  | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks |  | 20 Marks              |
|               | AVERAGE  |          |           |          |  | 20 Marks              |

## **10.DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

## 11. THEORY EXAMINATIONS

Theory examination will comprise 4 papers.

### **PATTERN OF EXAMINATION:**

FOUR PAPERS – 100 Marks each

3 Hours duration each

| <b><u>Theory</u></b> | <b><u>Title</u></b>                                                             | <b><u>Duration</u></b> | <b><u>Marks</u></b> |
|----------------------|---------------------------------------------------------------------------------|------------------------|---------------------|
| Paper -I             | General Pharmacology<br>Experimental Pharmacology and<br>Bioassay               | 3 hrs.                 | 100                 |
| Paper - II           | Systematic Pharmacology<br>Including Recent Advances.                           | 3 hrs.                 | 100                 |
| Paper - III          | Clinical Pharmacology and<br>Pharmacotherapeutics<br>Including Recent Advances. | 3 hrs.                 | 100                 |
| Paper -IV            | Applied Pharmacology and<br>Laws governing drug regulations                     | 3 hrs.                 | 100                 |
|                      |                                                                                 |                        | -----               |
|                      |                                                                                 |                        | Total 400           |

### **Distribution of Marks:\*\***

**Structured Essay Questions - 2 x 15 Marks = 30 Marks**

**Short Notes - 10 x 5 Marks = 50 Marks**

**Reasoning out - 4 x 5 Marks = 20 Marks**

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**100 Marks**

-----

**12. SCHEME OF PRACTICAL EXAMINATION:**

| <b>MD PHARMACOLOGY</b>                                |                      |
|-------------------------------------------------------|----------------------|
| <b>PRACTICALS DAY 1</b>                               |                      |
| <b>CLINICAL PHARMACOLOGY CASE DISCUSSION (2 X 50)</b> | <b>100 MARKS</b>     |
| <b>TOXICOLOGY</b>                                     | <b>30 MARKS</b>      |
| <b>PROTOCOL WRITING</b>                               | <b>25 MARKS</b>      |
| <b>JOURNAL CRITICISM</b>                              | <b>25 MARKS</b>      |
| <b>OSPE ( 4 STATIONS X 5 MARKS)</b>                   | <b>20 MARKS</b>      |
| <b>DAY 1 TOTAL</b>                                    | <b>200 MARKS (A)</b> |
| <b>VIVA DAY 2</b>                                     |                      |
| <b>PEDAGOGY</b>                                       | <b>40 MARKS</b>      |
| <b>VIVA</b>                                           | <b>60 MARKS</b>      |
| <b>LOG BOOK</b>                                       |                      |
| <b>VIVA TOTAL</b>                                     | <b>100 MARKS (B)</b> |
| <b>AGGREGATE (CLINICAL + VIVA) TOTAL (A+B)</b>        | <b>300 MARKS</b>     |
| <b>MINIMUM REQUIRED FOR PASS (50%)</b>                | <b>150 MARKS</b>     |
| <b>DISSERTATION</b>                                   | <b>APPROVED /</b>    |
|                                                       | <b>NOT APPROVED</b>  |

### 13. LOG BOOK

A detailed log book should be maintained for the entire duration of the course. It should contain the following details.

1. Experiments performed
2. Journal clubs
3. Seminars
4. Important cases discussed / presented

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

### 14. VIVA (including Competency Assessment) – 60 Marks (40 + 20)

An unstructured viva will be carried out by the examiners. VIVA including Competency Assessment for PG Non – Clinical courses

### 15. PEDAGOGY - 40 marks

( 8 minutes Presentation and 2 Minutes Q & Ans)

- |                                                          |      |
|----------------------------------------------------------|------|
| • Demeanour                                              | - 10 |
| • Audio visual Aids usage, voice modulation and Attitude | - 10 |
| • Subject Content                                        | - 10 |
| • Q & Ans /Interaction                                   | - 10 |

-----

|              |                 |
|--------------|-----------------|
| <b>Total</b> | <b>40 Marks</b> |
|--------------|-----------------|

### 16.OSPE

- Interpretation of clinical pharmacology charts
- Interpretation of pharmacokinetic charts
- Interpretation of pharmacodynamic charts
- Prescription audit
- Causality analysis
- Calculation of bio availability , Therapeutic Drug Monitoring, Steady State Concentration
- Ethics-exercise based on ethical decision making

- Exercise based on evidence based medicine (meta analysis)
- Dosage calculation in paediatrics and geriatrics
- Dosage calculation in compromised renal and liver function
- Computer assisted learning
- Instrument demonstration ex. Rotarod , photoactometer, etc.

## **17. Books recommended**

- Goodman & Gilman's The Pharmacological basis of therapeutics. Ed. Hardman JG, Limbird LE (11<sup>th</sup> edn/ latest edition) McGraw Hill press New York (2005 / latest).
- Essentials of Medical Pharmacology – Tripathi KD 7<sup>th</sup> Editions Jaypee Brothers.
- Pharmacology & Pharmacotherapeutics – Satoskar.RS., BhandarkarSD, Popular Prakashan.
- Basic & Clinical Pharmacology – Bertram G Katzung, Tata McGraw Hill education Pvt. Ltd.
- Fundamentals of experimental pharmacology. Ed. Ghosh MN. (3<sup>rd</sup> edition/latest) Scientific book agency, Calcutta (2005 / latest).
- Drug discovery and evaluation – Pharmacological assays. Ed. Vogel HG & Vogel WH. Springer – New York (2002 / latest).
- Harrison's Principles of Internal Medicine. (16<sup>th</sup> edition/latest) McGraw Hill press New York volume I & II (2005 / latest).
- Principles of Clinical Pharmacology.Ed.Arthur J.Atkinson,JR.Academic Press(2001).
- Oxford Textbook of Clinical Pharmacology and Drug Therapy. (3rd edition/latest). Smith G & Aronson JK. (2002 / latest)
- Pharmacotherapy – A pathophysiological approach. (6th edition / latest) DiPiro JT. McGraw Hill press New York (2005 / latest).
- Applied therapeutics - The Clinical Use of Drugs. (8th edition / latest) Kimble MA. Lippincott Williams & Wilkins.
- Clinical Pharmacokinetics Concepts & Applications. (3rd edition / latest) Rowland M & Tozer TN(1996 / latest).



- Avery's Drug Treatment. (4<sup>th</sup> edition / latest) Eds. Speight TM & Holford NHG. Adis International Ltd (1997 / latest)
- Design and analysis of clinical trials – concepts & methodologies. Chow SC & Liu JP. (2<sup>nd</sup> edition / latest) Wiley.
- Methods in Biostatistics – B.K.Mahajan, Jaypee brothers
- Hand Book of Experimental Pharmacology – Kulkarni S.K., Vallabh Publication Prakasham.
- Rang and Dale's Pharmacology – Rang HP, Dale M, Ritter JM, Churchill Livingstone, Elsevier.
- Clinical Pharmacology-Laurence DR, Bennet PN, Brown MJ, Elsevier.

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi**

### **18.Journals to be referred**

1. Indian Journal of Pharmacology
2. Indian Journal of Physiology & Pharmacology
3. Trends in Pharmacological Sciences
4. Annual Review of Pharmacology and Toxicology
5. Pharmacological Reviews
6. Drugs
7. Indian Drugs
8. Clinical Pharmacology and Therapeutics
9. British Journal of Pharmacology
10. British Journal of Clinical Pharmacology
11. Journal of Pharmacology and Experimental Therapeutics
12. European Journal of Clinical Pharmacology
13. New England Journal of Medicine
14. Lancet

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**M.D. PHYSICAL MEDICINE  
& REHABILITATION**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.D. PHYSICAL MEDICINE & REHABILITATION**

**GOAL:**

The **goal** of this programme is to standardize Physical Medicine and Rehabilitation (PM&R) teaching at the Post Graduate level throughout the country so that it will benefit in achieving uniformity in postgraduate as well as undergraduate medical teaching.

World Health Organization estimated that 10 percent of the population is differently abled. According to UN Development Program (UNDP) 80 percent of the differently abled people live in developing countries. Population growth, increasing number of older people, increase in vehicular traffic, expansion of industry, mechanization of agriculture along with social-economic backwardness will magnify the problem in future.

Physical Medicine and Rehabilitation, also called physiatry, is an important branch of medical sciences emphasizing the prevention, diagnosis and treatment of disorders, particularly those of the neuro-musculo-skeletal, cardiovascular, and pulmonary systems, that may produce temporary or permanent activity limitation, disability, or participation restriction. Physical Medicine and Rehabilitation is an independent clinical discipline. It has a vast scope as it provides integrated comprehensive care in the diagnosis, treatment and rehabilitation management of neurological, musculo-skeletal, cardio-pulmonary disabilities from acquired or congenital conditions presenting at any stage in life from pediatric to geriatric phases. This specialty focuses on the restoration of function of people to the highest possible level, through a multi-disciplinary team approach, making use of diagnostic and therapeutic armamentarium including education and counseling, prescription of medicines, therapeutic exercises, equipments (mobility aids, orthotic-prosthetic appliances, assistive technology, physical agents and modalities, etc.), injections, surgical interventions for correction of deformities etc. in an institution-based (out-door and in-door/wards/ICUs/Nursing Homes/Old-Age Homes etc.), out-reach (Camps, Mobile Units), or community-based settings (CBR), based on the evaluation of the individual under consideration. It is also involved in disability prevention, evaluation and certification, besides development, monitoring and supervision of a rehabilitation plan and conducting research and development.

## **OBJECTIVES:**

The objective of post graduate training is to enable the candidate to acquire sufficient **theoretical knowledge, develop clinical skills and competence, and provide medical care with an attitude of compassion and sensitivity.**

The overall objective is to impart a thorough and comprehensive training to a medical graduate so that at the end of this training he/she becomes a knowledgeable, skilled, and competent Physical Medicine and Rehabilitation specialist, capable of discharging his/her duties as expected under different settings, in an ethical manner.

He/she should be able to investigate, diagnose, treat, and rehabilitate a person is suffering from a limitation in function, disability, or restriction in participation. He should also be able to prescribe, monitor and lead the execution of rehabilitation plan through an integrated, multi-disciplinary team involving various medical, nursing, paramedical or allied health professionals. He/she should be able to interpret reports and plan research, teach medical and paramedical personnel, educate the person with disability, family, rehab team members and community, and be well versed with recent advances, administrative, financial, ethical and legal aspects related to the specialty.

## **COMPONENTS OF POST GRADUATE CURRICULUM**

Upon completion of the training and successfully qualifying in the MD (Physical Medicine and Rehabilitation) examinations he/she should be able to demonstrate:

- 1. Theoretical knowledge:** He/she should have adequate knowledge of
  1. The basic medical sciences such as Anatomy, Physiology, Biochemistry, Pathology, Microbiology Pharmacology and other disciplines related to Physical Medicine and Rehabilitation
  2. Factors which may disturb structure or function and result in disability
  3. Diagnosis, pathogenesis, prevention, treatment and rehabilitation of neuromusculoskeletal and other system disorders
  4. Orthotics and prosthetics including fitting and manufacturing
  5. Indications and complications of drugs used in Physical Medicine and Rehabilitation

## **2. Practical and clinical skills:**

(1) Understand and develop competence in executing common diagnostic, therapeutic and surgical procedures employed in diagnosis, investigations and management of conditions encountered in Physical Medicine and Rehabilitation.

(2) He/she should be able to practice and handle independently most of the day to day problems as encountered in Physical Medicine and Rehabilitation in a safe, effective and ethical manner.

(3) He/she should be able to plan a comprehensive rehabilitation service independently. (4) He/she should be able to demonstrate understanding of the design and fabrication and have competence in prescription and check out of orthoses and prostheses, the principles, prescription and supervision of physiotherapy, occupational therapy and psycho-socio-vocational counselling. He should be familiar with the common problems occurring in the urban, semi-urban, and rural areas and deal with them effectively, should be able to organize, conduct, and supervise surveys in rural, urban and industrial communities and in specified groups of population; organise and conduct camps for disability prevention and rehabilitation of disabled persons, and guide rehabilitation workers at the community level for rehabilitation of persons with disabilities.

- 3. Attitudes and Communication skills:** The post graduate trainee must be able to communicate effectively with patients, families as well as with members of the treating team and other specialists involved in the care of the patients. The candidate should conduct professional responsibilities with integrity, adhering to the ethical principles, respecting the autonomy and privacy of the patient. The candidate should recognize one's professional limitation, seek advice when necessary and accept advice graciously. Thus he should be able to provide compassionate, appropriate and effective patient care.

- 4. Writing Thesis and Training in Research and Teaching Methodology:** The post graduate candidate should be able to recognise a research topic, state the objectives and plan a rational approach. The methodology should be statistically valid, ethically sound and technically accurate. The data should be collected diligently, without bias and analysed scientifically. He should be able to interpret the interpret in the light of existing knowledge. He should be able to write a thesis in accordance with the prescribed instructions, and be familiar with the ethical aspects of research .

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

- 5. Medical ethics/ Bioethics and Medicolegal aspects:** The postgraduate trainee must demonstrate knowledge of biomedical, epidemiological, socio behavioral issues relevant to the patient care. He should have skills in preparing medicolegal reports. Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, Bioethics, moral and legal issues are part and parcel of the curriculum and syllabus.

- 6.** He/she should be able to plan educational programs in Physical Medicine and Rehabilitation in association with his senior colleagues and be familiar with the modern methods of teaching and evaluation. He should be able to teach medical students, residents, other health professionals and persons with disabilities and their family members and hold clinical demonstrations for them; discuss a seminar or a symposium and critically discuss it and methodically summarise published articles.

## SYLLABUS

### Section A

#### Basic Sciences as applied to Physical Medicine and Rehabilitation

|                                                                                                                                    | Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Attitude | Skills/Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| 1. Basic Anatomy and Physiology of the Musculoskeletal, Urogenital, Cardio-pulmonary and Nervous Systems, Biomechanics, Biophysics | <p>1. Describe the anatomy of muscles that govern the joints of the body.</p> <p>2. Discuss the biomechanics and kinesiology of various joints of the body.</p> <p>3. Review the basic cell physiology, biophysics, action potential, muscle contraction, neuromuscular transmission</p> <p>4. Principles of exercise physiology and energy expenditure.</p> <p>5. Outline autonomic nervous system functions. Explain the structure and function of bladder, bowel and its control and mechanism of deglutition.</p> <p>6. Describe the blood supply of heart. Discuss the cardiac cycle, basic principles of conduction systems, ECG, maintenance of blood pressure.</p> <p>7. Review physiology of blood, plasma, coagulation, blood groups, erythropoiesis, iron metabolism.</p> <p>8. Review the fluid compartments of the body and mechanisms of dyselektrolytaemia.</p> <p>9. Discuss anatomy of the lung and bronchopulmonary segments. Understand mechanics of respiration including pulmonary function tests.</p> <p>10. Discuss structure and function of brain and spinal cord, the major pathways and blood supply. Recall physiology of consciousness, temperature regulation, maintenance of muscle tone, posture.</p> <p>Anatomy and functions of the vestibular system. Understand CSF and its flow and mechanism of coning.</p> <p>11. Anatomy and functions of kidneys</p> <p>12. Anatomy and functions of skin</p> <p>13. Biophysics of physical agent modalities used in PMR- Heat, Light, Electromagnetic Spectrum, Electricity and Sound, LASER</p> |          | <p>1. Manual muscle charting</p> <p>2. Goniometry</p> <p>3. Musculoskeletal examination</p> <p>4. Assessment of muscle tone</p> <p>5. Understanding of dermatomes and myotomes</p> <p>6. Interpret nerve conduction studies</p> <p>7. Bedside evaluation of respiratory system, and interpret pulmonary function tests</p> <p>8. Bedside evaluation of the cardiovascular system and interpret ECG, stress ECG and ECHO findings and results of cardiac enzyme evaluation</p> <p>9. Interpret coagulation profile</p> <p>10. Assessment of swallowing, bladder and bowel at bed side.</p> <p>11. Perform indwelling urethral and suprapubic catheterization, Ryles tube insertion and change of tracheostomy</p> <p>12. CNS Examination- Higher mental functions, cranial nerves, sensory motor testing, cerebellar functions, evaluation of autonomic function.</p> |

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| 2.Basics of biochemical aspects of Metabolism, Hormones, Vitamins and Minerals | <p>1. Explain the metabolism of calcium, Vitamin D, PTH, Calcitonin, physiology of bone remodelling</p> <p>2. Review glucose metabolism and its regulations, actions of insulin.</p> <p>3. Causes of obesity, metabolic syndrome, inborn errors of metabolism</p> <p>4. Review structure and functions of endocrine system including pituitary, adrenal, thyroid and endocrine pancreas. Chemistry of steroids</p> <p>5. Immunity and Immunoglobulins</p>                                                                                                                                                                                                                                                                                                                                                                                                 |  | <p>1. Interpret results with respect to calcium, glucose and fat metabolism, evaluation of bone mineral density.</p> <p>2. Interpret liver function test, kidney function test, serum electrolytes, endocrine function tests, metabolic profile and biomarkers.</p> |
| 3.Basic Pathology and Microbiology of diseases and disabilities                | <p>1.CNS: Meningitis, encephalitis, pyogenic abscess, tuberculosis, poliomyelitis, stroke, vasculitis, epilepsies, neurodegenerative disorders, ataxias, multiple sclerosis, demyelinating illness, transverse myelitis, tumours, nutritional and metabolic disorders, craniovertebral junction anomalies, neural tube defects, hydrocephalus</p> <p>2.Disorders of muscle and nerve: Peripheral nerve injuries, neuropathies, hereditary sensory neuropathy, GuillenBarre syndrome, myopathy</p> <p>3. CVS: Ischemic heart disease, Rheumatic heart disease, hypertension, atherosclerosis, cardiomyopathy, congenital heart disease, cardiac failure and shock</p> <p>4. Kidneys- acute and chronic glomerulonephritis, nephrolithiasis, hydronephrosis, acute and chronic renal failure, nephrotic syndrome, metabolic and vasculitic nephropathy.</p> |  | <p>1.Clinical skills to diagnose all these diseases mentioned</p> <p>2.Skills to interpret pathological reports, culture reports, and imaging findings related to these conditions</p>                                                                              |



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|  | <p>5. Pulmonary: Restrictive and obstructive lung diseases, ARDS, Tuberculosis, Pleural diseases, Pneumonia, Lung abscess, Occupational lung diseases, Pulmonary embolism, Tumors</p> <p>6. Bone and joints: Congenital disorders including CDH&amp;CTEV, Infections, Degenerative disorders, Avascular necrosis, Epiphyseal dysplasias, Bone tumours, Metabolic bone disease, Fractures-Types, complications, stages of healing, common principles of management.</p> <p>7. Review Rheumatological diseases, Categorise different types of joint diseases and principles of treatment</p> <p>8. Immunological diseases including HIV</p> <p>9. Endocrine system: dysfunction of pituitary, adrenals, thyroid, pancreas</p> <p>10. Gastrointestinal system: Peptic ulcers, malabsorption syndrome, ulcerative colitis</p> <p>11. Hematological: Dyscrasias, leukaemias, multiple myeloma, deep vein thrombosis, Hemophilia and other coagulation disorders</p> |  |  |
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| 4. Basic principles of Pharmacology as applied to the conditions encountered in Physical Medicine and Rehabilitation. | Review the pharmacology of<br>i. Antibiotics<br>ii. Antituberculous drugs<br>iii. Analgesics<br>iv. Steroids<br>v. Anti rheumatic medications and biological agents<br>vi. Oral hypoglycemic agents and Insulin<br>vii. Medications for Osteoporosis<br>viii. Statins<br>ix. Bronchodilators<br>x. Anticoagulants and antiplatelet agents<br>xi. Anti Parkinsonian agents<br>xii. Antispasticity drugs and Botulinum toxin<br>xiii. Cognitive stimulants<br>xiv. Anticonvulsants<br>xv. Drugs for bladder and bowel dysfunction<br>xvi. Drugs acting on neuromuscular junction<br>xvii. Drugs for erectile dysfunction<br>xviii. Antidepressants, sedatives, anti-psychotics<br>xix. Vitamins, mineral supplements and Antioxidants<br>xx. Hormones<br>Vaccines and Immunoglobins |  | Be familiar with drug dosages, indications and contraindications, interactions and routes of administration                                               |
| 5. Biostatistics and Genetics                                                                                         | Sampling and sample size<br>Randomization<br>Tests of significance<br>Patterns of inheritance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | Be familiar with sample size calculation<br>Should be able to interpret scientific data statistically<br>Be familiar with different tests to analyse data |

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| <b>SECTION B</b><br><b>Principles and Practice of Physical Medicine and Rehabilitation, Diagnostic modalities in PMR, Physiotherapy, Occupational therapy, Orthopedics &amp; Sports Injuries and Musculoskeletal Rehabilitation</b> |                                                                                                                        |  |  |
| 1. Philosophy, history, scope and need of Physical Medicine and Rehabilitation.                                                                                                                                                     | Understanding the principles of rehabilitation, recall history and evolution of this specialty after major world wars. |  |  |

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| 2. Basic concepts in Physical Medicine and Rehabilitation                         | <p>Incorporating the clinical situation within social, psychological, vocational and cultural contexts. Describe the spectrum of disease, diagnosis and disability with respect to attitudinal and architectural barriers.</p> <p>Define Rehabilitation team.</p> <p>Recognize and incorporate the role and responsibilities of allied health professionals, including physiotherapy, occupational therapy, speech therapy, prosthetics &amp; orthotics, psychology, social work.</p> |  | <p>Get a physiatric evaluation</p> <p>Plan rehabilitation in the context of the real environment.</p> <p>To be able to organize, lead and function in a multi-disciplinary team.</p>                                                                                                                                                                                                                                                              |
| 3. Principles of evaluation and rehabilitation management of social problems.     | <p>Describe the impact of disability beyond the affected individual and dynamics of disability on the family, colleagues and community and society.</p> <p>Recognize the concepts of restoration of independence, interdependency, respect and dignity</p>                                                                                                                                                                                                                            |  | <p>To analyze the various socio-economic factors influencing a person with disability.</p> <p>To plan clinical management with due regard to dependency, interdependency, economic status and medical co-morbidities.</p> <p>To form an inter-disciplinary team for evaluation and planning community based rehabilitation.</p> <p>To be able to guide persons with disability regarding access to disability benefits and government schemes</p> |
| 4. Principles of evaluation and rehabilitation management of vocational problems. | <p>Outline the purpose of vocation and the principles of restoration of identity and dignity by integrating into the society productively.</p> <p>Understand the economic impact of the disability for the individual and beyond.</p>                                                                                                                                                                                                                                                 |  | <p>Assessment of the multiple factors influencing functional independence and return to education or work.</p> <p>Be able to advise regarding sheltered workshops, self-help groups, home based programs, transitional employment .</p>                                                                                                                                                                                                           |

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| 5.Organisation and administration of Physical Medicine and Rehabilitation Services.             | Describe infrastructure, clinical services and personnel required with suitable links to primary, secondary and tertiary centers in order to provide seamless service for patients who need rehabilitation.                                                                                                                                                                                                                    |  | To create an organogram for a department of Physical Medicine and Rehabilitation along with optimal proportional utilization of funds and personnel.                                                                                                                               |
| 6.Disability process Impairment, disability, International Classification of function.          | Define and discuss with suitable examples, the concepts of impairment, disability, handicap and integrate with ICF and various levels of prevention<br><br>Explain the concept of ICF. Calculate the spectrum of physical capabilities.                                                                                                                                                                                        |  | To apply ICF classification to an individual, thereby estimating the restriction to activity and participation.                                                                                                                                                                    |
| 7.Disability Prevention                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                |  | Institute effective ways to prevent disabilities and minimize complications following a disabling event or injury.                                                                                                                                                                 |
| 8.Epidemiology of Disability                                                                    | Categorize the spectrum of disability in India and compare with developed nations. State the proportion of physical, mental, visual, auditory and communication disabilities. Determine the changes in trend of causes of disability from infections to lifestyle related, geriatric disabilities due to advances in life expectancy. Recognize the problems related to perinatal health and disabilities from cerebral palsy. |  | To apply the relevant knowledge of epidemiology of various conditions causing disability in India and worldwide so as to determine suitable strategies to limit the extent of physical, mental, visual, auditory and communication disabilities.                                   |
| 9.Basic principles of diagnostic modalities as applied to Physical Medicine and Rehabilitation. | Diagnostic imaging- Xrays, CT Scan, MRI, Musculoskeletal ultrasound<br>Electrodiagnostic testing<br>Cystometrogram<br>Endoscopic procedures including cystoscopy and laryngoscopy<br>Gait analysis of common movement disorders<br>Pulmonary function tests<br>Laboratory tests                                                                                                                                                |  | Apply skills in using diagnostic modalities to evaluate conditions and complications of degenerative, overuse and inflammatory joint diseases, musculo-skeletal trauma, lung diseases, acquired brain injury, stroke, cerebral palsy, spinal cord injury, demyelinating disorders. |

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| 10.Gait Analysis                                             | Understand the biomechanics and temporal parameters of normal human locomotion, different phases of gait cycle, determinants of normal gait, components of gait analysis, energy expenditure to identify common pathological gaits.                                                                                                                                                                                                |  | <p>Clinically identify and describe various phases of normal gait cycle.</p> <p>Describe common gait deviations in stroke, neuropathies, myopathies, spinal cord injury, amputation, cerebral palsy</p> <p>Be able to plan appropriate interventions.</p>                                                                                                                                                                                                           |
| 11.Electrodiagnostic Medicine                                | <p>Review action potential generation and mechanisms of normal and abnormal wave forms from nerve and muscle. Recognize abnormal patterns of nerve and muscle potentials in common conditions including anterior horn cell diseases, radiculopathies and plexopathies, neuropathies, nerve injuries, myopathies and neuromuscular junction disorders. Categorize different types of nerve injuries and prognosticate recovery.</p> |  | <p>To perform sensory and motor nerve conduction tests, elicit F-wave and H-reflex as part of electrodiagnostic evaluation.</p> <p>To plan and perform electromyographic (EMG) evaluation based on clinical findings and arrive at a diagnosis</p> <p>To interpret findings of tests like somato-sensory evoked potentials, auditory and visual evoked potentials, to prognosticate recovery</p> <p>To demonstrate proper care of electro-diagnostic equipment.</p> |
| 12.Outcome Measures in Physical Medicine and Rehabilitation. | Identify and implement common outcome measures in rehabilitation medicine. Summarize essential principles of quality improvement                                                                                                                                                                                                                                                                                                   |  | <p>To use various outcome measures relevant to underlying condition thereby aiding both subjective and objective assessment.</p> <p>Assessment of ADL, IADL</p> <p>Disease and injury specific scales used in Acquired brain injury, Stroke, Arthritis, Parkinson's disease, Spinal cord injury, Amputations, Hemophilia, and Pediatric disabilities etc.</p> <p>Scales to assess hand function, pain and affective disorders</p>                                   |

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| 13. Therapeutic Exercises           | <p>Describe effect of exercises on muscle physiology- strength, endurance, flexibility, and coordination.</p> <p>Evaluate different energy systems in the body</p> <p>Cardiovascular responses to physical exercise and effect of training.</p> <p>Pelvic floor and Antenatal exercises</p> <p>.</p> |                                                                       | <p>Assess range of motion, muscle strength, and tone.</p> <p>To plan and prescribe specific therapeutic exercises in due consideration of multiple factors.</p> <p>Determine contra-indications to specific exercises and to communicate the same with a multi-disciplinary team and the care givers</p> <p>Design exercise programme for cardio respiratory endurance</p> |
| 14. Physical Agents/Modalities      | <p>Review the physiological benefits of different types of physical modalities of heating and cryotherapy.</p> <p>Distinguish various modalities, principles, methods of application, indications and define precautions and contraindications.</p>                                                  | <p>Patient education on the scope and limitations of modalities.</p>  | <p>To prescribe physical modalities - heat and cold appropriately</p>                                                                                                                                                                                                                                                                                                      |
| 15. Manipulation, Traction, Massage | <p>Recall the principles and biomechanics of different types of manipulation, traction, muscle energy techniques.</p> <p>State indications, precautions and contraindications to these measures</p>                                                                                                  | <p>Patient education on the scope and limitations of manipulation</p> | <p>To prescribe manipulative therapies, stating the precautions to be taken.</p>                                                                                                                                                                                                                                                                                           |

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| 16. Electrical Stimulation                                         | <p>Describe the types of current used in electrical stimulation</p> <p>Outline the principles behind the use of neuromuscular electrical stimulation.</p> <p>Describe the types and methods of electrical stimulation.</p> <p>To recall the precautions, indications and contra-indications for the use of electrical stimulation.</p> <p>Explain the various theories of pain control and modulation by transcutaneous electrical nerve stimulation (TENS)</p> <p>Discuss the principles and practice of Functional Electrical stimulation.</p> | <p>Patient education regarding the scope and limitations of these measures.</p>                     | <p>Evaluate clinically to determine likely candidates to benefit from electrical stimulation.</p> <p>Prescription of neuromuscular electrical stimulation in appropriate clinical setting</p> <p>Application of FES in appropriate clinical contexts</p>                                                                                                                                                                    |
| 17. Principles of Occupational Therapy                             | <p>Evaluation of occupational and functional performance, access to home, community and workplace.</p> <p>Understand the principles of interventions for physical retraining, cognitive training and sensory re education</p>                                                                                                                                                                                                                                                                                                                    | <p>Understand these issues in the social and cultural contexts with sensitivity and compassion.</p> | <p>Understand the principles of common therapeutic approaches like Rood approach, Bobath neuro developmental approach, Brunnstrom technique, proprioceptive neuromuscular facilitation and use of biofeedback to enhance performance in neuromuscular rehabilitation.</p> <p>Apply common scales to assess function in disability</p> <p>Prescription of orthoses and self help devices to improve functional outcomes.</p> |
| 18. Integrative Medicine and Physical Medicine and Rehabilitation. | <p>List common complementary and alternative medicine systems, outline the categories of alternate medical systems including chiropractic, osteopathic medicine, meditation, art therapy, music therapy, dance therapy and movement therapies like Tai Chi, yoga, energy therapy, acupuncture, acupressure, reflexology. common biological supplements.</p>                                                                                                                                                                                      | <p>Patient education and counseling regarding limitations and scope of these systems</p>            | <p>Appraise and discuss the scope and limitation of these complementary second line therapies with the patient.</p>                                                                                                                                                                                                                                                                                                         |

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| 19.Assistive Technology related to Physical Medicine and Rehabilitation. | Discuss the devices to augment functional abilities and meet felt need of patients with disability.<br>Enumerate the different assistive technology for communication disorders, mobility impairment of upper and lower limbs, visual and hearing impairment<br>Outline the principles of selecting appropriate assistive technology.:-                                                                                                                                                                                                                                      | Patient education on use of technology in social, cultural and economic contexts, addressing apprehension                            | Prescription of various assistive devices to improve communication, vision, hearing, functional status and mobility with due consideration of medical, psychological, environmental and socio-economic factors.                                                                                                                                                                                                                                                                                                   |
| 20. Low back pain and Neck pain.                                         | Review the anatomy and biomechanics of the Lumbosacral spine and cervical spine.<br>Causes & source of lower lumbar pain and neck pain with differential diagnosis.<br>Outline the investigations for neck and backpain.<br>Role of therapeutic exercises and physical modalities in management of low back pain and neck pain.<br>Evaluation and management of back pain in pregnancy<br>Describe the technique of interventional procedures available in management of low back pain and neck pain.<br>Indications for surgical management of low back pain and neck pain. | Patient education.<br>Provide reassurance, counseling and follow up.                                                                 | Clinically assess trunk balance, strength, mobility, spinal deformity and neurological deficits.<br>Recognise underlying pathological processes causing back/neck pain including infections and neoplasms<br>Determine the appropriate radiological imaging for these conditions.<br>Prescribe therapeutic exercises and physical modalities, and orthosis for low back and neck pain.<br>Pharmacological management<br>Interventional spinal management –Epidural and caudal injections, Radiofrequency ablation |
| 21.Musculoskeletal injuries                                              | Discuss the common fractures and its complications and sequelae<br>Management of common traumatic conditions to the upper and lower limbs.                                                                                                                                                                                                                                                                                                                                                                                                                                   | Addressing apprehensions. Explain simple biomechanics ,overuse, ergonomics of the problems contextually and the solutions available. | To diagnose common musculoskeletal injuries by clinical history, examination and investigation.<br>Prescription of orthosis to facilitate tissue repair and prevent deformity in common musculoskeletal conditions.<br>Prescription of therapeutic exercise and physical modalities in common musculoskeletal injuries.                                                                                                                                                                                           |



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|                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                              | Application of splints and casts to immobilize the extremity in acute musculoskeletal trauma. Pharmacological management of pain and spasm in musculoskeletal trauma: acute and chronic.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 22.Sports Medicine                                                                                   | Understand the principles of conditioning, training, over-training syndrome and altitude training.<br>Outline the biomechanics of common sports.<br>Role of pre-participant examination for sports events.<br>Performance enhancing drugs and its demerits.<br>Benefits of exercise and common sports injuries.                                                                                                                                                                                                                                                                                                 | Explain biomechanics of problems and suitable solutions and options of treatment.                            | Clinically examine and investigate for common sports related injuries in the acute, sub acute and chronic settings.<br>Interpret imaging findings as well as manage these conditions appropriately.                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 23.Holistic Rehabilitation of persons suffering from:<br>i.Rheumatic and Degenerative joint diseases | Description of etio-pathogenesis of inflammatory and non-inflammatory arthritis<br>Role of radiological investigation, metabolic profile, serum biomarkers and immunological investigations<br>Medical and surgical management of inflammatory and non-inflammatory arthritis.<br>To enumerate the mechanism of action, indications and contra indications for biologicals in inflammatory arthritis.<br>Discuss the physical modalities - mode, timing, duration, technique of application in non inflammatory and inflammatory arthritis.<br>Review the different orthoses and exercise program in arthritis. | Patient education and family counseling in the long term management respecting patients emotions, anxieties. | Clinically assess the small and large joints for range of motion, synovitis and deformity. Identify the findings on diagnostic imaging.<br>To aspirate synovial fluid from the joints (with USG guidance wherever required) and interpret analysis<br>To be familiar with use of classification criteria to diagnose rheumatological diseases<br>Plan pharmacological management in inflammatory and non inflammatory arthritis.<br>To be able to do Therapeutic injections<br>To assess functional status by the use of appropriate outcome measures.<br>Prescribe an exercise program and orthosis in case of arthritis. |
| ii.Spinal deformity                                                                                  | Biomechanics of spine and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Counseling                                                                                                   | Perform clinical tests to                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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|                                         | <p>causes of spinal deformities.<br/>Medical and surgical management.<br/>Role of orthotics.<br/>Role of therapeutic exercises<br/>Congenital vertebral anomalies and management.</p>                                                                           | <p>related to diagnosis, complications and long term treatment plan and follow up.</p>                              | <p>assess type and degree of curve in spinal deformities, respiratory function, limb length discrepancy.<br/>Serial assessment (clinical and radiological) to determine the degree of curve progression and plan the management.<br/>Identify radiological features in spinal deformities and vertebral anomalies<br/>Application of spinal brace. and plan management.</p>                                                  |
| iii.Upper and Lower limb pain syndromes | <p>Discuss common causes of upper and lower limb pain.<br/>Evaluate to identify source of pain and assess severity of pain<br/>Pharmacological management of neuropathic pain.<br/>To elaborate role of conservative and surgical management to manage pain</p> | <p>Patient education and counseling ergonomics benefits and limitations of interventions.</p>                       | <p>Previously outlined in musculoskeletal conditions.<br/>To use musculoskeletal ultrasound for diagnosis<br/>Performing therapeutic injections of joints and soft tissues- intraarticular, periarticular and trigger point injections<br/>Use of ultrasonographic guidance to aid in the above joint injections.</p>                                                                                                        |
| iv.Osteoporosis                         | <p>Recall vitamin D, calcium and PTH metabolism Explain causes and types of osteoporosis<br/>Evaluation of osteoporosis<br/>Pharmacological and non pharmacological management.</p>                                                                             | <p>Patient education and counseling on nutrition, posture ergonomics benefits and limitations of interventions.</p> | <p>To investigate so as to establish etiology in osteoporosis including plain radiography, DEXA and markers of bone turnover.<br/>Identify features suggestive of osteoporosis on a plain radiograph.<br/>Interpret DEXA scan with due reference to age and sex.<br/>Pharmacological management and follow up of osteoporosis<br/>Prescription of orthosis with appropriate modifications<br/>Planning spinal exercises.</p> |
| v.Burns                                 | <p>Classification of burns<br/>To discuss the acute complications and sequelae of superficial partial thickness and full thickness burns<br/>Assess the concomitant injuries like inhalational, electrical, nutritional</p>                                     | <p>Sensitivity and attitude of caring.<br/>Providing pain relief and emotional support,</p>                         | <p>Plan prevention and management of complications following different degrees of burns, assess concomitant injuries<br/>Prescribe appropriate splints and supports to prevent deformities</p>                                                                                                                                                                                                                               |

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|                                                                       | <p>components of the trauma. Discuss the strategies for preventing scars, contractures and its management.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>respecting privacy and dignity.</p>                                                          | <p>Prescribe pressure garments to manage hypertrophic scars<br/>To be able to work as part of a burn rehabilitation team.<br/>Plan and perform simple soft tissue release, skin graft for deformity correction.</p>                                                                                  |
| <p>24.Rehabilitation of persons after fractures, and arthroplasty</p> | <p>Describe biomechanics of various joints and the relevant anatomy. To discuss indications, types and technique of arthroplasty. To recall the indications and technique of plaster cast application.<br/>To discuss the classification of fractures and management of complications.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                 | <p>To interpret imaging findings post arthroplasty and prescribe a therapeutic exercise program considering the type and site of arthroplasty, duration following arthroplasty and associated co-morbidities.<br/>To apply plaster cast following proper precautions in conditions with fracture</p> |
| <p>25.Rehabilitative surgeries</p>                                    | <p>Discuss the etiopathogenesis of deformity / contracture in poliomyelitis, CTEV, muscular dystrophy and cerebral palsy and outline principles of management<br/>Description of pre-operative preparation, steps involved in surgical correction and post-operative care.<br/>Describe the surgical options for management of spasticity. Indication, side effects, adverse effects, surgical technique for intra thecal baclofen pump.<br/>Recall the principles of surgery in amputation at various levels. Describe how to choose residual limb length and technique of surgery.<br/>Indications and technique for revision of residual limb.<br/>Technique of fractional lengthening or tendon transfers in upper and lower extremity.<br/>To recall techniques of excision and closure for pressure ulcers</p> | <p>Patient education<br/>family counseling on scope and limitations of these interventions.</p> | <p>Planning pre-operative investigations.<br/>To perform surgeries and plan appropriate post operative care for the conditions mentioned.</p>                                                                                                                                                        |

## Section C

### Rehabilitation of Neurological, Pediatric, Geriatric and Cardiopulmonary Disorders

|                                   | KNOWLEDGE                                                                                                                                                                                                                                                                                                                                                                                                   | ATTITUDE                                                                                              | SKILLS                                                                                                                                                                                                                                                                                                                                         |
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| 1.Spasticity                      | <p>Understand the mechanism involved in pathogenesis of spasticity.</p> <p>To outline the non pharmacological management of spasticity.</p> <p>Discuss the pharmacodynamics of common anti-spastic drugs, nerve blocks, motor point blocks, Baclofen pump, role of surgical intervention in spasticity management.</p> <p>Role of intra-vesicalbotulinum toxin in management of detrusor over activity.</p> | <p>Patient education and family counseling about treatment options in the socio-economic context.</p> | <p>Assess the extent and grade of spasticity. Administer Botulinum toxin injection using appropriate technique with due consideration of its indications, route, site of injection, side-effects and dosing interval.</p> <p>To perform neurolysis with phenol, tone inhibiting cast and soft tissue surgery for management of spasticity.</p> |
| 2.Speech and Language Dysfunction | <p>Understand different types of aphasia.</p> <p>Outline the evaluation and management of aphasia including speech therapy and alternate augmentative communication methods.</p>                                                                                                                                                                                                                            | <p>Patient education and family discussions regarding available treatment options.</p>                | <p>Assess extent and type of language dysfunction; suggest appropriate interventions.</p>                                                                                                                                                                                                                                                      |
| 3.Swallowing disorders            | <p>Pathophysiology of common swallowing disorders</p> <p>Evaluation of swallowing dysfunction</p> <p>Common methods in treatment of dysphagia Strategies to prevent aspiration pneumonia.</p> <p>Indications for PEG and PEJ and its merits and demerits</p>                                                                                                                                                | <p>Patient counseling and family discussions in the cultural and socio economic context.</p>          | <p>To perform bed-side test for assessment of swallowing.</p> <p>To interpret findings on barium swallow assessment.</p> <p>To prescribe investigations to establish an etiology including video or endoscopic assessment.</p> <p>To suggest appropriate measures for reduction of dysphagia and aspiration.</p>                               |

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| 4. Bladder dysfunction                | Describe evaluation and classification of neurogenic bladder dysfunction.<br>Describe the management of neuropathic bladder.<br>Outline the acute and chronic complications of neuropathic bladder.                                                                   | Counseling patient and family regarding the long term care needs.        | Evaluation of neurogenic bladder.<br>To perform ultrasonography of kidneys and bladder, cystometrogram and cystoscopy.<br>Classify neurogenic bladder based on above findings and plan management - conservative and surgical (suprapubic cystostomy and cystolitholapaxy).                                                                                                              |
| 5. Bowel dysfunction                  | Describe the common symptoms and complications of neurogenic bowel.<br>Discuss the evaluation and management options for bowel dysfunction.                                                                                                                           | Counseling patient and family regarding the long term care needs.        | Evaluation of neurogenic bowel and its causes. To perform proctoscopy to evaluate the bowel and prescribe appropriate solutions.                                                                                                                                                                                                                                                         |
| 6. Sexuality and disability           | Understand the types of sexual dysfunction, its evaluation and treatment.                                                                                                                                                                                             | Counseling and discuss management options, ensuring privacy and dignity. | Be familiar with ALLOW, PLLISSIT and BETTER models for facilitating discussion on sexuality as well as fertility.<br>Prescription of medications to enhance sexual function.<br>Use of common assistive devices to facilitate erection or ejaculation and intra-cavernosal injections<br>To familiarize with assisted fertilization, pregnancy and delivery following spinal cord injury |
| 7. Pressure ulcers and chronic wounds | Etiopathogenesis of chronic wounds and pressure ulcers<br>Systemic and local evaluation of a patient with neuropathic joints and chronic ulcers<br>Staging of pressure ulcers<br>Conservative and surgical management of pressure sore<br>Management of diabetic foot |                                                                          | Evaluate the cause for chronic ulcers and neuropathic foot<br>Conservative management of ulcers<br>Plan and perform common surgical procedures like STSG, direct closure and local rotation flap for chronic ulcers                                                                                                                                                                      |

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| <p>8.Spinal Cord Injury</p> | <p>Describe etiology and pathogenesis in spinal cord injury.<br/>Classification of spinal cord injury and the various spinal cord injury syndromes<br/>Biomechanics of the spine and the relation of mode of trauma to type of injury.<br/>Assess instability of the spine following injury.</p> <p>Principles of acute management-surgical and conservative<br/>Describe acute and chronic complications following spinal cord injury.<br/>Mechanism of autonomic dysreflexia and outline algorithm to manage the same<br/>To recall etiopathogenesis and staging of pressure ulcers.<br/>To describe features of neurogenic bladder and its types and management<br/>Recall the pathophysiology of neurogenic bowel, types and management<br/>To outline the neuronal pathway involved in sexual function and management of sexual dysfunction following spinal cord injury.<br/>Discuss rehabilitation management of a patient with spinal cord injury<br/>To discuss the recent advances including role of stem cells in its repair</p> | <p>Communication with patient and family with sensitivity and compassion.<br/>Be aware of the anxieties and apprehension<br/>Develop communication skills on breaking bad news.<br/>Organize long term treatment plans with active involvement of the team members.</p> | <p>Clinical examination and determining neurological level of injury using AIS<br/>To identify clinical syndromes following spinal cord injury.<br/>To recognize clinical signs of autonomic dysreflexia, evaluate for its cause, plan appropriate treatment and prevention<br/>Evaluation of neurogenic bladder: To perform ultrasonography of kidneys and bladder, cystometrogram and cystoscopy<br/>Classify neurogenic bladder based on above findings and plan management - conservative and surgical<br/>Evaluation of neurogenic bowel and its management.<br/>Management of pressure ulcers, including surgical debridement, skin grafts, direct excision and closure of pressure ulcer, flap closure of pressure ulcer and pressure relief techniques.<br/>Prescribe and check out appropriate orthosis, wheelchair with suitable modifications, special seating.<br/>Evaluation of cause of spasticity and management using drugs, nerve blocks and common surgical procedures for spasticity and contractures.<br/>Recognise late complications like syringomyelia and osteoporosis<br/>Management of neuropathic pain<br/>Psychosocial and vocational rehabilitation</p> |
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| 9.Traumatic Brain Injury | <p>Recall the pathophysiology associated with traumatic brain injury and scope of neuro-plasticity in recovery of function.</p> <p>Outline the evaluation and treatment following acute TBI, management of moderate and severe TBI, vegetative state and coma.</p> <p>Describe the post TBI complications.</p> <p>Pharmacotherapy and interventions for acute and chronic TBI sequelae</p> <p>Biomarkers and imaging for prognostication following TBI.</p> <p>Discuss the outcome measures for traumatic brain injury</p> | To counsel care-givers in long term care and prognosis respecting their emotions in the cultural and social context. | <p>Assess patients with brain injury and investigate to plan suitable goals relevant to the TBI sequelae.</p> <p>Recognise and manage complications arising as a result of the TBI.</p> <p>Assessment of cognition and cognitive rehabilitation strategies</p> <p>Evaluation and management of neurobehavioural symptoms following TBI</p>                                                                                                                                                                                                                                                                             |
| 10.Stroke                | <p>Recall risk factors of stroke and pathology of different types of stroke.</p> <p>Review the vascular segments and anatomical basis of different stroke syndromes</p> <p>Discuss investigations and early interventions following stroke.</p> <p>Rehabilitation and management of complications.</p> <p>Evaluation of young stroke</p>                                                                                                                                                                                   | To counsel care-givers in long term care and prognosis respecting their emotions in the cultural and social context. | <p>Determine the risk factors and drug therapy to modify the risk.</p> <p>Therapeutic approach for stroke in upper and lower limbs</p> <p>Orthotic support</p> <p>Spasticity management with botulinum toxin or phenol injection or tone inhibiting cast</p> <p>Constraint induced movement therapy</p> <p>Alternate augmentative communication methods</p> <p>Treatment of co-morbidities.</p> <p>Scope and limitation of FES to aid function</p> <p>Be able to set suitable goals contextually and organize treatment plan with the team.</p> <p>Be familiar with outcome tools of use in stroke rehabilitation.</p> |

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| 11. Parkinson's disease, Multiple sclerosis, Ataxia, Neurodegenerative disorders | <p>Understand the pathophysiology of common neuro degenerative disorders including Parkinson's disease, motor neuron disease, multiple sclerosis, hereditary ataxia, dementias.</p> <p>Recall diagnostic criteria of conditions like Parkinson's disease, multiple sclerosis etc.</p> <p>Discuss pharmacodynamics of medications used in these conditions and basis of deep brain stimulation.</p> <p>Outline rehabilitation management of these conditions</p> | Counseling and discussions on course of disease and limitations of treatment                                 | <p>Clinical evaluation and interpretation of investigations including imaging and electro diagnosis to establish the diagnosis</p> <p>Management and planning long term care. Prescribe, monitor and titrate medications for these disorders.</p>                                                                                                                                                                                                                               |
| 12. Plexopathies and Neuropathies                                                | <p>Classify nerve injuries. Outline its etiology and investigations to establish the diagnosis</p> <p>Recall the management following nerve / plexus injury – conservative and surgical.</p> <p>Indications for use of various orthosis following nerve injury.</p> <p>To outline findings in neuropathic conditions on electrodiagnosis.</p> <p>Describe foot complications following peripheral neuropathy.</p>                                               | Patient education, counseling regarding cause, management and prognosis.                                     | <p>Clinical evaluation, electrodiagnostic testing, and diagnostic imaging.</p> <p>Prescribe orthoses following nerve injury – both static and dynamic.</p> <p>Therapeutic exercise prescription following nerve injury, planning activity modification and methods to improve functional status.</p> <p>Prevent and treat foot complications (including ulcers and Charcot joint).</p> <p>Be familiar in techniques to offload the joints in case of peripheral neuropathy.</p> |
| 13. Poliomyelitis and its sequelae                                               | <p>To discuss the etio-pathogenesis and epidemiology of poliomyelitis.</p> <p>To recall methods of prevention employed in India.</p> <p>Outline the pathogenesis of deformities in poliomyelitis and its management.</p> <p>To describe the diagnostic criteria of post-polio syndrome.</p>                                                                                                                                                                     | Counsel regarding post-polio syndrome addressing apprehensions and discuss scope and limit of interventions. | <p>Evaluation to establish diagnosis of poliomyelitis.</p> <p>Conservative or surgical management for correction of deformity including casting, skeletal traction, surgical release and common tendon transfers.</p> <p>Prescription of orthosis in a patient with post polio residual paralysis</p>                                                                                                                                                                           |



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| 14.Diseases of Muscles                                    | <p>Recall the various clinical features differentiating various myopathies and dystrophies.</p> <p>To outline the co-morbidities associated with myopathies or dystrophies.</p> <p>To discuss findings of various investigations including metabolic studies, electro diagnostic studies, muscle biopsy, genetic analysis and histopathology.</p> <p>Outline principles of management</p>                                                                                                                                                                                                                             | Counsel about etiology, limitations in management and prognosis with sensitivity and compassion.                    | <p>To obtain clinical history followed by a detailed clinical examination thereby framing a clinical diagnosis.</p> <p>To investigate appropriately so as to establish the etiology.</p> <p>Prescription of pharmacological agents, therapeutic exercise and orthoses after due consideration of the diagnosis and clinical co-morbidities.</p>                                                                                                                                                                                                                                                                                                           |
| 15.Cerebral Palsy                                         | <p>Recall the etiology and risk factors associated with cerebral palsy.</p> <p>Outline the classification of CP.</p> <p>Discuss the clinical features, diagnosis, pattern of involvement, investigations and management in CP.</p> <p>Enumerate the non neurological complications.</p> <p>Discuss the scope and benefits of early intervention and different therapy approaches for CP</p> <p>Common antispastic medications, Botulinum toxin and phenol injections, intra-theatal baclofen.</p> <p>Soft tissue surgery in upper and lower limbs to improve function.</p> <p>Principles of orthopedic management</p> | Family counseling and discuss the spectrum of management options with its merits and limitations.                   | <p>Assess the type of cerebral palsy, extent of involvement, motor control, cognition, soft tissue contractures and deformity at each joint.</p> <p>Interpret gait analysis for children with cerebral palsy.</p> <p>Management of spasticity</p> <p>Perform soft tissue release for contractures</p> <p>Prescribe appropriate orthotic devices and mobility aids, assistive devices, augmentative communication aids, wheelchair and special seating system to enhance function and community integration.</p> <p>Evaluate and manage behavioural problems in cerebral palsy</p> <p>Assessment for special education and sociovocational integration</p> |
| 16.Neural tube defects like meningocele and hydrocephalus | <p>Outline the clinical classification of spinal dysraphism</p> <p>Discuss the management of meningocele and its long term complications.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Counseling patient and family regarding the long term care needs within the cultural, social and economic contexts. | <p>Clinical assessment and management of meningocele, addressing the mobility, bladder, bowel, sexual problems.</p> <p>Recognize complications including hydrocephalus, trophic ulcers and tethered cord syndrome.</p> <p>Prescribe appropriate appliances for mobility, independence and vocational rehabilitation.</p>                                                                                                                                                                                                                                                                                                                                  |

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| 17.Rehabilitation of children with Autism Spectrum Disorders, learning disabilities, multiple disabilities, mental retardation | Understand normal development and learning. General principles and scales of normal development. Contemporary theories of normal learning and appropriate interventions to enhance attention, memory, cognition and learning.                                                                                                                                      | Family counseling, spectrum of management options with its merits and limitations. Acknowledge the role of team work in enhancing outcome. | Plan rehabilitation strategies in a child with multiple disabilities. To consider environmental modifications to address barrier to community integration<br>Provide mobility devices and address seating issues<br>Address language dysfunction and use of communication aids as appropriate<br>Evaluate psychological status and organise social and family support.<br>Explore special school facilities.                       |
| 18.Geriatric Rehabilitation                                                                                                    | Recall the biology of ageing<br>Outline the common problems encountered by the elderly-evaluation and management.<br>Recognize features of dementia, depression, normal pressure hydrocephalus in the elderly.<br>Evaluate the risk of falls and its prevention and management of falls in the elderly.                                                            | Counsel family and care givers on outcome, benefits and limitations of interventions, respecting autonomy and ensuring dignity.            | Systematic and methodical approach to problems encountered by geriatric population.<br>Evaluate metabolic, neurological, musculo-skeletal problems, cardio-pulmonary problems and suggest remedial measures.<br>Describe suitable assistive devices available for elderly<br>Evaluate dementia, pseudo-dementia, Alzheimer's.<br>Prevention and management of complications like falls, fractures, memory and visual disturbances. |
| 19.Visual Rehabilitation<br><br>20.Auditory Rehabilitation                                                                     | Outline common ocular disorders causing visual impairment and recognize features of cortical blindness, hemianopsia, hemi-inattention<br>Management of visual problems- Mention the common low vision aids and assistive technology for visual impairment.<br>Mention the common causes of hearing impairment and the role of assistive devices in its management. | Patient education and family discussions regarding available treatment options.                                                            | Detect common visual and auditory disabilities and suggest relevant interventions including low vision aids.                                                                                                                                                                                                                                                                                                                       |

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| 21.Vestibular Rehabilitation                | Recall the anatomy of the vestibular system and outline etiology and the types of vestibular dysfunction.<br>To discuss management in vestibular dysfunction.                                                                                                                                                                                                                                                                                              | Discussions of long term plans with attitude of care and compassion.                                                                                              | To clinically assess the vestibular system and localize the pathology.<br>To suggest rehabilitation for the vestibular dysfunction.                                                                                                                                                                                                                                                                                                                                                                            |
| 22.Psychological problems or mental illness |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                   | Determine the extent of psychological issues and social support system available.<br>Be able to address depression and anxieties associated with disability.                                                                                                                                                                                                                                                                                                                                                   |
| 23.Cardiovascular Disease                   | Discuss the risk factors for the coronary artery disease and cardiac evaluation before exercise prescription.<br>Understand the concept of MET<br>Outline methods of cardiac stress testing and mention the factors associated with poor stress tolerance. Discuss the changes in physiology following exercise and aerobic training.<br>To recall the pharmacodynamics of drugs like anti-arrhythmics, anti-hypertensives, anti-anginals and vasodilators | Patient and care givers education regarding risk factors for cardiovascular disease and role of diet, exercise and drugs with the care givers. Explain prognosis. | Clinical assessment to predict maximum heart rate and exercise tolerance.<br>Interpret electrocardiogram.<br>To investigate for risk factors of cardiovascular disease.<br>Risk assessment prior to exercise prescription in cardiovascular disease.<br>Prescription of aerobic training to enhance cardiac endurance.<br>To consider various co-morbidities and plan rehabilitation following coronary artery disease, myocardial infarction, post coronary artery by-pass grafting, cardiac transplantation. |
| 24.Obesity and life style diseases          | Describe methods to measure obesity and categorization based on body mass index. Diagnostic criteria of metabolic syndrome.                                                                                                                                                                                                                                                                                                                                | Patient counseling, education on treatment options and monitoring.<br>Advice on benefits of life-style modification.                                              | To investigate the metabolic status and interpret the results.<br>To prescribe appropriate pharmacological and non pharmacological methods in metabolic syndrome.                                                                                                                                                                                                                                                                                                                                              |

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| <p>25. Pulmonary Disease</p> | <p>Mention the mechanism of ventilation and perfusion and role of arterial blood gas analysis.<br/> Mention common lung capacities and lung volumes and its characteristics in different pulmonary disorders.<br/> Recall the pulmonary physiology and role of <math>\dot{V}O_2</math> max.<br/> Role of exercises for chronic obstructive pulmonary disease, bronchial asthma, myopathies, spinal cord injury<br/> Understand the principles of postural drainage and different methods of chest physiotherapy<br/> Types of respiratory failure<br/> Benefits of continuous positive airway pressure and mechanical ventilation<br/> Indications, complications and postoperative management following thoracotomy<br/> .</p> | <p>Counsel the family and patients regarding benefit of respiratory exercises and precautions to improve the pulmonary endurance.</p> | <p>To investigate and interpret arterial blood gas analysis, pulmonary function tests, ventilation-perfusion ratio<br/> To be familiar with findings of pulmonary disease on contrast or non-contrast tomography.<br/> To prescribe drugs and therapeutic exercises in COPD and asthma.<br/> To diagnose various types of pneumonia by clinical examination and interpret the findings on radiological imaging followed by initiation of timely management.<br/> <br/> Prescription of exercises to facilitate airway clearance and improve pulmonary endurance in patients with neurological disabilities</p> |
| <p>26. Chronic Pain</p>      | <p>Discuss the principles of pain management.<br/> To discuss the etiology of chronic pain eg. Neuropathic pain and phantom pain<br/> Proposed theories to describe the mechanism.<br/> Outline the biopsychosocial management of chronic pain- pharmacological and non pharmacological Recall emerging methods for control of chronic pain.</p>                                                                                                                                                                                                                                                                                                                                                                                | <p>To discuss the mechanism and management options for chronic pain</p>                                                               | <p>To manage chronic pain comprehensively.<br/> To plan appropriate investigations so as to establish etiology of chronic pain.<br/> To consider dose, duration, route, side effects and contraindications prior to pharmacological prescription for chronic pain.<br/> Prescribe therapeutic exercises, physical modalities, electrical stimulation with due consideration of indications.<br/> To consider interventions for management of intractable chronic pain when required.</p>                                                                                                                       |

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| 27. Cancer                                             | Describe the common impairments caused by tumour and by the treatment of tumours, complications of radiotherapy and chemotherapy,<br>Principles of lymphedema management<br>Management of secondary deposits in spine Precautions during cancer rehabilitation.<br>Identification and management of Paraneoplastic syndromes<br>Management of cancer pain and palliative care                                | To discuss the care, pain management options, with sensitivity respecting their autonomy. | To be familiar with cancer pain and its treatment including the WHO ladder for pain management.<br>To be conversant with the basic pillars of bio-medical ethics like autonomy, beneficence, non-maleficence and justice.<br>To maintain professionalism with compassion during management.                                                                        |
| 28.HIV/AIDS                                            |                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                           |                                                                                                                                                                                                                                                                                                                                                                    |
| 29.Organ Transplantation                               | To recall diagnostic criteria of acquired immunodeficiency syndrome and pharmacodynamics of anti-retrovirals.<br><br>Recognize the common neuromuscular complications following organ transplantation and metabolic effects of immuno-suppressive agents.                                                                                                                                                    |                                                                                           | Plan rehabilitation goals, interdisciplinary team and suggest suitable strategies in the context of co-morbidities and structural and functional limitations.                                                                                                                                                                                                      |
| 30.Emergencies in Physical Medicine and Rehabilitation | Recognize and take appropriate steps for the medical emergencies like falls and fractures, deep venous thrombosis, acute pulmonary embolism, anaphylaxis or drug allergy, postural hypotension, autonomic dysreflexia, myocardial infarction, status epilepticus, dyselectrolytemia, cerebrovascular accident, status asthmaticus, septic shock syndrome, aspiration atelectasis, hydrocephalus and hypoxia. | Counseling the family regarding the magnitude and gravity of the condition.               | Respond swiftly and assess situation and prioritize the possible interventions.<br>Algorithm for management of Cardio respiratory arrest and anaphylactic shock.<br>Clinical assessment and investigation aimed at finding causes of autonomic dysreflexia along with appropriate clinical management.<br>To institute early management for the listed conditions. |
| 31.ICU                                                 | Early recognition and management of critical illness neuropathy                                                                                                                                                                                                                                                                                                                                              |                                                                                           | Plan rehabilitation goals with interdisciplinary team and suggest strategies in the context of comorbidities                                                                                                                                                                                                                                                       |

## Section D

### Recent Advances in Physical Medicine and Rehabilitation, Prosthetics and Orthotics, Community Based Rehabilitation, Disability Evaluation

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| 1.Recent Advances in Physical Medicine and Rehabilitation | Keep abreast with the latest advances in the field of Physical Medicine and Rehabilitation                                                                                                                                                                                                                                                                                              |                                                                                                                                                    | Be familiar with the recent literature , scientific journals and attend conferences and workshops.                                                                                                                                                                                                                                                                                                            |
| 2.Evidence-based Medicine                                 | Apply evidence-based guidelines and high quality published literature to advance clinical practice.<br>Understand the levels of evidence and basic statistical methods to analyze / evaluate a scientific publication.                                                                                                                                                                  | Demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application and translation of medical knowledge | Able to search the medical literature and use critical analytical skills on publications.<br>Interpret the information and apply relevant knowledge to clinical practice.<br>Able to plan, organize, write, perform a scientifically sound, statistically robust study with ethical and legal standing.<br>To interpret and analyze scientific publications relevant to Physical Medicine and Rehabilitation. |
| 3.Upper limb Orthosis                                     | Describe the materials used in the fabrication of upper limb orthosis<br>Classify upper limb orthosis<br>Recall the principles of static and dynamic orthosis used in upper limb<br>Describe the biomechanical principles involved in upper extremity deformity correction with orthoses with specific reference to conditions like arthritis, contractures and paralysis and fractures | Respecting emotions, anxieties and ensuring autonomy and dignity during evaluation and prescription of orthosis                                    | Clinical evaluation to determine the need for orthotic intervention.<br>Prescribe orthosis selecting appropriate components and materials<br>Check out orthosis                                                                                                                                                                                                                                               |
| 4.Lower limb orthotics                                    | Describe the materials used in the fabrication of orthosis<br>Biomechanical principles in prescription<br>Classify lower limb orthoses<br>Indications of different types of orthoses<br>Parts of shoes and modifications                                                                                                                                                                | Respecting autonomy and privacy during prescription of orthosis                                                                                    | Clinical evaluation to determine the need for orthotic intervention.<br>Prescribe and check out appropriate orthotic appliances.                                                                                                                                                                                                                                                                              |

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| 5.Spinal orthoses                                    | Describe materials used in fabrication of spinal orthosis<br>Biomechanical principles in prescription of spinal orthosis<br>Classify common spinal orthosis<br>Indications, precautions and contra indications for spinal orthosis                                                                                                                                                                                                                                                                                                                                                                     | Education regarding role, limitations and application of orthosis             | Prescribe appropriate spinal orthosis to prevent further instability in the spine and facilitate healing. reduce progression of an existing spinal deformity.<br>Check out spine orthosis                                                                                                                                                                                                                                                               |
| 6.Upper limb prosthetics and amputee rehabilitation. | Describe etiology, incidence and prevalence, morbidity of upper limb amputations<br>Recall levels of upper limb amputation<br>Summarize the surgical principles of amputation at various levels.<br>Explain pre-prosthetic management and post-operative care.<br>Categorize components of upper limb prosthesis<br>Principles governing prescription of upper limb prosthesis<br>Goal setting for prosthetic training.                                                                                                                                                                                | Respecting emotions, anxieties and ensuring autonomy, privacy and dignity     | Wound care and prescription of temporary prosthesis following amputation.<br>To prescribe prosthesis for individuals with upper limb amputation at various levels in due consideration of medical co-morbidities, age, expected functional outcome.<br>Prescription of prosthesis in a child with acquired amputation or congenital limb deficiency.                                                                                                    |
| 7.Lower limb prosthetics and amputee rehabilitation. | Different levels of amputation of lower limb, advantages of different levels.<br>Post-operative management following amputation surgery.<br>Preprosthetic training, role of immediate post operative prosthetic fitting and advantage of temporary prosthesis<br>Categorize the components of lower limb prosthesis.<br>Principles governing prescription of lower limb prosthesis<br>Outline the recreational activities possible and be familiar with the energy expenditure involved.<br>Classify and describe common congenital limb deficiencies and the measures involved in its rehabilitation. | Patient education.<br>Suggest different options and cost effective solutions. | To assist performing lower limb amputation at various levels.<br>To prescribe appropriate prosthesis<br>Organise and lead an amputee clinic<br>To perform prosthetic check-out and analyze residual limb along with gait deviations.<br>To interpret causes and management of residual limb pain and phantom limb pain.<br>Management of complications<br>Prescription of prosthesis in a child with congenital limb deficiency or acquired amputation. |

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| 8.Mobility aids, wheelchairs and seating systems.     | Describe the components of a manual and powered wheelchair and its basic dimensions.<br>Outline the body measurements taken for wheelchair prescription and factors to be considered for proper seating, pressure relief and positioning.<br>Outline the different aids for mobility and its advantages. | Respecting the privacy and autonomy of the patient. | Prescription of a manual / motorized wheelchair after a proper clinical assessment:<br>Prescription of devices like cane, crutches or walker after assessment.                                                                                                                                                                                                                                   |
| 9.Community Based Rehabilitation                      | Concept of CBR<br>Advantages over Institution based Rehabilitation<br>Organisation and implementation of CBR<br>Linking CBR with primary, secondary and tertiary centres                                                                                                                                 |                                                     | Identify local resources<br>Train volunteers to identify, intervene appropriately and refer when required                                                                                                                                                                                                                                                                                        |
| 10.Legislation in relation to disability              | Know the legal rights of the disabled and discuss the salient features of Rights of Persons with Disability Act and Persons With Disability Act (PWD)                                                                                                                                                    |                                                     | Discuss the legal provisions and benefit schemes applicable to a person with a disability.                                                                                                                                                                                                                                                                                                       |
| 11.Schemes and Benefits for persons with disabilities | Understand the schemes and benefits for the person with disabilities offered by the Govt. of India.                                                                                                                                                                                                      |                                                     | Home visits to fully understand community integration issues.                                                                                                                                                                                                                                                                                                                                    |
| 12.Barrier-free Environment                           | Outline the architectural barriers encountered by the disabled and simple measures to address this                                                                                                                                                                                                       |                                                     |                                                                                                                                                                                                                                                                                                                                                                                                  |
| 13.Impairment Rating and Disability Evaluation.       | Principles of disability evaluation                                                                                                                                                                                                                                                                      |                                                     | Elicit clinical history and perform a detailed clinical examination, followed by review of investigations to evaluate the degree of impairment, disability and handicap in an individual with regards to various factors.<br>To determine extent of locomotor disability in accordance with the national guidelines<br>To determine vocational ability following a detailed clinical assessment. |



## LEARNING METHODS

### A. Theoretical training:

The students pursuing post-graduation in Physical Medicine and Rehabilitation would be expected to engage in self-study. Theoretical knowledge would be imparted to the candidates through the following:

1. **Symposia/Seminars:** The post-graduate student would be required to present topics to the group of teachers and students. A free discussion would be encouraged during these sessions. The candidate should be able to deliver lectures to undergraduates and hold clinical demonstrations for them.
2. **Lectures:** Formal teaching lectures by the faculty.
3. **Journal Club:** This should be a regular activity. The candidate would be assigned /allowed to choose an article from amongst the recent publications from the list of recommended journals, present, summarise, and discuss the published article critically. The contributions made by the article in further enhancing the scientific knowledge and limitations should be highlighted.

### B. Practical and Clinical Training:

1. **Case discussions:** The student would be attached to a Faculty member to be able to pick up methods of history taking and examination in rehabilitation practice. During this period the student would also be oriented to the common problems that present in the OPD or Wards/ICUs or are encountered in the community. The student would be supervised by Senior Residents and Faculty members.
2. **Bedside teaching:** The student would work up cases; learn management of cases by discussion with the senior residents and faculty of the department. He/she would be trained in management of in-patients including performing certain procedures such as debridement, Plaster cast application, traction, catheterization, intubation etc.

3. **Rehabilitative Surgery:** The student would be provided with an opportunity, as far as possible, to observe, learn, assist and once proficient, perform rehabilitative surgical operations such as for correction of deformities in polio, cerebral palsy, amputation, clubfoot, pressure sore etc. including post-operative care with the assistance of the Senior Residents and/or under the direct supervision of a Faculty member.
4. The student would also be oriented to the various sections in a comprehensive rehabilitation set up (such as occupational therapy, orthotics-prosthetics, physiotherapy, social works, clinical psychology, vocational guidance/counseling, educational institution and Non-Governmental Organization in the disability sector etc.) and be well informed about the various equipments and methods used there, and the scope, role and responsibilities of different members of a rehabilitation team.

### **C. Training in Research Methodology**

The student would carry out the research project and write a thesis. Thesis topic would be finalized by the student in consultation with the Guide and Co-Guides, as per the norms duly approved by the Ethics Committee of the Institution. He would also be given exposure to partake in the research projects going on to learn their planning, methodology and execution to learn various aspects of research.

### **STRUCTURED TRAINING PROGRAM**

***Post graduate education is a process by which an undergraduate medical doctor is transformed into a highly skilled and competent specialist with adequate knowledge, judgement and appropriate attitude to ensure highest level of care to the patients. The post graduates are expected to engage in self-study. It is physically, emotionally, and intellectually demanding and requires consistent and concentrated effort by the candidate. The skills, knowledge and attitude are imparted to the trainee through interaction with faculty and patients and they gain expertise to perform with greater independence. By the end of the training program, the trainee will be able to perform all medical, diagnostic and surgical procedures essential for the condition and context. The faculty provide the guidance, support and environment and serves as a role model for the trainee as he / she acquires the ability to enter into independent practice of medicine and professional growth. A faculty must ensure availability of adequate resources and actively participate in organized clinical discussions, journal clubs, ward rounds, seminars to foster scholarship for the postgraduate trainee.***

The course will be conducted at the Department of Physical Medicine & Rehabilitation of the Medical College. During their tenure the Post-Graduate would be posted in the Department of PMR and he/she may also be posted in various other departments related to Rehabilitation for their clinical training for the duration.

The teaching sessions in the department shall include the following:

|                                                                       |             |
|-----------------------------------------------------------------------|-------------|
| Formal lecture                                                        | Once a week |
| Journal club                                                          | Once a week |
| Seminar/ Symposium                                                    | Once a week |
| Case discussions                                                      | Once a week |
| Bed side teaching                                                     | Daily       |
| Disabilities evaluation & prosthetic<br>and orthotic check out clinic | Once a week |

The students are encouraged to attend accredited scientific meetings (CME, symposia, and conferences)

List of peripheral departments - Postings

|                                           |         |
|-------------------------------------------|---------|
| 1. Rheumatology                           | 3weeks  |
| 2. Cardiology                             | 1 week  |
| 3. Neurology/ Neuro Surgery               | 8 weeks |
| 4. Orthopaedics including Sports injuries | 4 weeks |
| 5. Hand surgery and Rehabilitation        | 2 weeks |
| 6. Leprosy & Dermatology                  | 2 weeks |
| 7. Diabetology and foot care              | 2 weeks |
| 8. Pulmonary Medicine                     | 1 weeks |
| 9. Community Medicine                     | 2 weeks |
| 10. Urology                               | 2 weeks |
| 11. Geriatrics                            | 2 weeks |
| 12. ICU                                   | 2 weeks |
| 13. Psychiatry                            | 3 weeks |
| 14. Plastic surgery                       | 3 weeks |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## COMPETENCY ASSESSMENT:

### OVERALL:

|                                                                                                                           |          |                            |
|---------------------------------------------------------------------------------------------------------------------------|----------|----------------------------|
| 1. a) Communication / commitment / Contribution /<br>Compassion towards patients and Innovation                           | ()<br>() | - 5 Marks                  |
| b) Implementation of newly learnt techniques/ Skills                                                                      | ()       |                            |
| 2. Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars                                              |          | - 5 marks                  |
| 3. Number of Posters/Papers presented in Conferences<br>/Publications and Research Projects                               |          | - 5 marks                  |
| 4. No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic<br>meetings with details. |          | - 5 marks                  |
| Total                                                                                                                     |          | -----<br>20 Marks<br>----- |

### PG CLINICAL COURSES

|                                      |   |                    |
|--------------------------------------|---|--------------------|
| VIVA including Competency Assessment | - | 80 Marks (60 + 20) |
| Log Book                             | - | 20 marks           |

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

## **DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

### **THEORY EXAMINATION**

|         |                                                                                                                                                                                                                                       |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Paper 1 | Applied Basic Sciences relating to Physical Medicine and Rehabilitation                                                                                                                                                               |
| Paper 2 | Physical Medicine and Rehabilitation I (including Physiotherapy, Occupational Therapy, Paediatrics, Radiology, Genetics, Industrial injuries, Sports injuries, Electro Diagnosis, Musculoskeletal Disorders, Neuromuscular Disorders) |
| Paper 3 | Physical Medicine & Rehabilitation –II (Cardiac and Pulmonary Rehabilitation Geriatric, O&G)                                                                                                                                          |
| Paper 4 | Physical Medicine & Rehabilitation –III (Recent advances in Rehabilitation and Community Based Rehabilitation)                                                                                                                        |

## **PAPER I**

Write Notes on :

- |                  |            |
|------------------|------------|
| 1. Anatomy       | 4 x 5 = 20 |
| 2. Physiology    | 4 x 5 = 20 |
| 3. Bio Chemistry | 3 x 5 = 15 |
| 4. Pharmacology  | 3 x 5 = 15 |
| 5. Pathology     | 3 x 5 = 15 |
| 6. Microbiology  | 3 x 5 = 15 |

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**100 marks**  
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## **PAPER II, III & IV**

Elaborate on 2 x 15 = 30

Write Notes on 10 x 7 = 70

-----  
**100 marks**  
-----

## **CLINICAL/ PRACTICAL EXAMINATION:**

|                                               |                             |  |  |                            |
|-----------------------------------------------|-----------------------------|--|--|----------------------------|
| LONG CASE (1 X100 MARKS)                      |                             |  |  | 100 MARKS                  |
| SHORT CASE (2 X 25 MARKS)                     |                             |  |  | 50 MARKS                   |
| WARD ROUNDS ( 5 CASES X 5 MARKS)              |                             |  |  | 25 MARKS                   |
| OSCE ( 5 SPOTTERS / SPECIMENS X 5 MARKS EACH) |                             |  |  | 25 MARKS                   |
| TOTAL                                         |                             |  |  | 200 MARKS (A)              |
|                                               | DISABILITY EVALUATION/ ACT/ |  |  |                            |
| VIVA                                          | RECENT ADVANCES/ MRI/XRAY)  |  |  | 80 MARKS (B)               |
| VOCE                                          | PHYSICAL MODALITY           |  |  |                            |
|                                               | ORTHOTICS/PROSTHETICS       |  |  |                            |
| LOG BOOK                                      |                             |  |  | 20 MARKS (C)               |
| AGGREGATE (CLINICAL + VIVA) TOTAL             |                             |  |  | 300 MARKS (A+B+C)          |
| MINIMUM REQUIRED FOR PASS (50%)               |                             |  |  | 150 MARKS                  |
| DISSERTATION                                  |                             |  |  | APPROVED / NOT<br>APPROVED |

System of marking/evaluation and weightage given to each area shall be as follows: -

**I. One Long Case, 100 marks**

|      | <b>Item</b>                                                                          | <b>Marks</b> |
|------|--------------------------------------------------------------------------------------|--------------|
| i)   | Written Work<br>(including history, examination,<br>summary & provisional diagnosis) | 10           |
| ii)  | Presentation Style                                                                   | 20           |
| iii) | Elicitation of signs or maneuvers                                                    | 20           |
| iv)  | Discussion                                                                           |              |
|      | Differential Diagnosis                                                               | 10           |
|      | Investigations                                                                       | 10           |
|      | Management                                                                           | 20           |
| v)   | Attitudes                                                                            | 10           |

**II. Short Cases, Two Cases, 25 marks each case. 25X2=50**

|      | <b>Item</b>                              | <b>Marks</b> |
|------|------------------------------------------|--------------|
| i)   | Written Work                             | 5            |
| ii)  | Diagnosis                                | 5            |
| iii) | Elicitation of signs (two signs)         | 5            |
| iv)  | Differential diagnosis and<br>management | 5            |
| v)   | Attitudes                                | 5            |

**III. Ward Rounds 5 Cases X 5 Marks = 25 Marks**

**OSCE 5 Spotters X 5 marks each= 25 Marks**

|      | <b>Item</b>                                 | <b>Marks</b> |
|------|---------------------------------------------|--------------|
| i.   | Xrays/ MRI                                  | 5            |
| ii.  | Prosthetics and Orthotics                   | 5            |
| iii. | CMG/EMG/Gait Analysis /Other lab<br>reports | 5            |
| iv.  | Surgical Instruments                        | 5            |
| v.   | Rehab Appliance/ Equipment                  | 5            |

## LOG BOOK:

The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

## VIVA including Competency Assessment: (60+20=80marks)

**60 marks Viva, 20 marks competency assessment**

### VIVA VOCE

|      | Item                                                | Marks     |
|------|-----------------------------------------------------|-----------|
| i.   | Physical Medicine Equipments                        | 15        |
| ii.  | X-rays, US Scan, CT Scan, MRI                       | 15        |
| iii. | Surgical Instruments                                | 15        |
| iv.  | Prosthetics and Orthotics and Disability Evaluation | 15        |
|      | <b>Total</b>                                        | <b>60</b> |

## Reference Books:

1. Braddom RL *Physical Medicine & Rehabilitation*, Saunders (latest edition)
2. DeLisa JA. *Rehabilitation Medicine: Principles and Practice*. Lippincott (latest edition)
3. Rusk HA. *Rehabilitation Medicine*. CV Mosby (latest edition)
4. Solomon L. *Apley's System of Orthopaedics and Fractures*. Arnold London (latest edition)
5. Vernon W Lin. *Spinal Cord Medicine- Principles and Practice*. Demos
6. *Introduction to Psychology*, Clifford T. Morgan, Richard A. King, Tata McGraw Hill Edition



7. *Behavioral Medicine- A guide for clinical Practice* , Mitchell D.Feldman, John F. Christensen
8. *Physiological Basis of Rehabilitation Medicine*,(Downey and Darling's) Erwin G. Gonzalez
9. *Clinical evaluation and diagnostic tests for Neuromuscular disorders*, Tulio E. Bertorini
10. *Electrodiagnosis in diseases of nerve and muscle: Principles and practice*, Jun Kimura
11. *Essentials of Exercise Physiology*, William D. Mc Ardle
12. *Fundamentals of Pain Medicine*, J.D. Hoppenfeld
13. *Kinesiology: The mechanics and pathomechanics of human movement*, Carol A. Oatis
14. *Movement disorders: A Clinical and therapeutic approach*, Shyamal K Das
15. *Muscles testing and function with posture and pain*, Florence Peterson Kendall, Elizabeth Kendall McCreary
16. *Rheumatology Principles and practice*, Ashit Syngle, SD Deodhar
17. *Hutchison's Paediatrics*, Krishna M Goel, Devendra K Gupta
18. *Atlas of Musculoskeletal Ultrasound*, PK Srivastava
19. *Atlas of nerve conduction studies and electromyography*, A. Arturo Leis, Michael P. Schenk
20. *Neurological rehabilitation*, Richard Greenwood, Michael P. Barnes
21. *Occupational therapy for physical dysfunction*, Catherine A. Trombly
22. *Clayton's Electrotherapy*, Shiela Kitchen
23. *ISCOS, The textbook on comprehensive management of Spinal Cord Injuries*, Dr H S Chhabra
24. *Joint structure and function: A Comprehensive analysis*, Cynthia C. Norkin
25. *Tidy's Physiotherapy*, Stuart Porter
26. *Brain's diseases of nervous system*, Michael Donaghy
27. *Dejong's : The neurological examination*, William W. Campbell
28. *Disabled Village Children*, David Werner

29. *Nothing about us without us: Developing innovative technologies For, By, and with disabled persons*, David Werner
30. Helander E, Mendis P, Nelson G, Goerdts A, *Training in the Community for People with Disabilities* WHO, Geneva, 1989.
31. *Atlas of Orthoses and Assistive Devices*, John D. Hsu
32. *Atlas of Amputations and Limb deficiencies*, Douglas G. Smith

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

### **Journals:**

1. Archives of Physical Medicine & Rehabilitation
2. American Journal of Physical Medicine & Rehabilitation
3. Journal of Rehabilitation Research and Development
4. PM & R journal
5. Disability and Rehabilitation
6. Clinical Rehabilitation
7. Neuro Rehabilitation
8. Physical Medicine & Rehabilitation Clinics of North America
9. Orthopaedics Clinics of North America
10. Stroke
11. Spinal Cord
12. Arthritis and Rheumatism
13. Journal of Prosthetics Orthotics International
14. Physical Therapy
15. American Journal of Occupational Therapy
16. Neurology India
17. Indian Journal of Orthopaedics (IJO)
18. Indian Journal of Physical Medicine & Rehabilitation (IJPMPR)
19. National Medical Journal of India (NMJI)

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# **MD PHYSIOLOGY**

# **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

## **MD PHYSIOLOGY**

### **1. Goal:**

The purpose of this program is to train post graduate students in such a manner that the teaching of physiology and physiological research in the country are maintained at the highest standards. They must be trained in such a manner that they compete for positions not only in teaching institutions but also in science and research institutions in the country and anywhere in the world.

### **2. Objectives:**

Knowledge: The students should have adequate knowledge in the basics, history, recent advances and clinical aspects of human physiology.

Attitude: The students should develop the attitude of direct implementation of the knowledge and skills that they acquire towards enhancement of health care in the country. This involves generation of knowledge that addresses lacunae in knowledge and practices of health care and dissemination of knowledge in the most efficient manner to medical students.

Skills: must be acquired towards:

- a) Teaching at various levels ie, UG (medical, paramedical) and post-graduates of all disciplines, with the latest advancements in teaching methodology.
- b) Content development and content delivery of teaching material using traditional and modern methods, and assessment of student performance.

Research – General research skills:

Generation of scientifically, clinically and socially relevant research questions, standardization of methodology to answer the question, grant-writing skills to develop project proposals, submission of project to institutional research committees, human and animal ethics committees as required, grant application to funding agencies, manuscript writing skills, identification of reputed journals to publish the research, manuscript submission, and publication.

Specific technical skills: Clinical and animal research in the areas of expertise within a given institution.

### **3. Components of the post-graduate curriculum**

Theoretical knowledge: The student should possess thorough knowledge in basic principles of physiology and a comprehensive understanding of recent advances

Practical and Clinical skills: Students should be able to perform animal experiments, human experiments, hematology experiments and clinical examination and should be able to demonstrate all experiments to UG students as per the I year MBBS curriculum.

Writing thesis/Research articles: Students should be able to write their thesis/research articles under the supervision of the guide.

Attitudes including communication skills: Students should develop the attitude of presentation of knowledge in a simple and effective manner.

Training in research methodology, medical ethics, bioethics and medicolegal aspects:

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, bioethics, moral and legal issues are part and parcel of the curriculum and syllabus in M.D Physiology.

#### **4. Theory syllabus:**

##### **I. GENERAL PHYSIOLOGY:**

- 1) Body fluids.
- 2) Membrane potential & Action Potentials.
- 3) Functional Morphology of Cell.
- 4) Homeostasis
- 5) Aging

##### **II PHYSIOLOGY OF EXCITABLE TISSUE:**

- 1) Nerve.
- 2) Skeletal Muscle.
- 3) Cardiac Muscle.
- 4) Smooth Muscle.

##### **III NEURO PHYSIOLOGY:**

- 1) Synaptic transmission.
- 2) Cutaneous & Deep Visceral sensation - initiation of impulses in sense organs, transmission and cognition of sensations
- 3) Motor control
- 4) Reflexes
- 5) Control of Posture & Equilibrium.

- 6) Sleep, Arousal Mechanisms, the Electrical Activity of the Brain.
- 7) Central Regulation of Visceral Function.
- 8) The Autonomic Nervous System.
- 9) Neural Basis of Instinctive Behavior & Emotions.
- 10) Higher Functions of the Nervous system, Conditioned Reflexes, Learning & Related Phenomena

#### **IV SPECIAL SENSES:**

- 1) Vision.
- 2) Hearing.
- 3) Smell & Taste.

#### **V. BLOOD:**

- 1) Composition and functions.
- 2) Structure, functions and origin of blood cells.
- 3) Immunity.
- 4) Blood groups.
- 5) Hemostasis.
- 6) Reticuloendothelial System.

#### **VI. ENDOCRINOLOGY & METABOLISM:**

- 1) Energy Balance, Metabolism & Nutrition.
- 2) The Thyroid Gland.
- 3) Endocrine Functions of the Pancreas & Regulation of Carbohydrate Metabolism.
- 4) The Adrenal Medulla & Adrenal Cortex.
- 5) Hormonal Control of Calcium Metabolism & Physiology of Bone.
- 6) The Pituitary Gland
- 7) The Gonads: Development & Function of the Reproductive System.
- 8) Other Endocrine glands.

#### **VII. GASTROINTESTINAL FUNCTION:**

- 1) Secretions of the digestive system
- 2) Motility of GI tract

- 3) Digestion & Absorption of nutrients
- 4) Applied aspects in GIT

#### **VIII. CIRCULATION:**

- 1) Circulating Body Fluids.
- 2) Origin of the Heartbeat & the Electrical Activity of the Heart.
- 3) The Heart as a pump.
- 4) Dynamics of Blood & Lymph Flow.
- 5) Cardiovascular Regulatory Mechanisms.
- 6) Circulation Through Special Regions.
- 7) Cardiovascular Homeostasis in Health & Diseases.

#### **IX. RESPIRATION:**

- 1) Ventilation
- 2) Pulmonary circulation
- 3) Diffusion of gases
- 4) Gas Transport between the Lungs & the Tissue.
- 5) Regulation of Respiration.
- 6) Respiratory Adjustments in Health & Diseases.
- 7) Environmental Physiology.

#### **X. FORMATION & EXCRETION OF URINE:**

- 1) Glomerular filtration
- 2) Tubular reabsorption
- 3) Tubular secretion
- 4) Micturition
- 5) Renal function tests
- 6) Regulation of Extracellular Fluid Composition & Volume.
- 7) Role of kidney in acid base balance

**5. Teaching learning methods:** Lectures, seminars, journal club, group discussions, guest lectures, laboratory and experimental work.

## 6. Structured training program:

### Training Period

#### First year:

Learns the basics in physiology in the Department of Physiology,

Take Practical classes for U.Gs

Training in teaching methods (attends a workshop),

Computer training in word processing, power point presentation, statistical packages, internet browsing

Selection of topic for dissertation and submission to University, training in research methodology

#### Second year:

##### 1st 6 months:

Posting in the clinical and other basic science departments

Details of the training in the Clinical & other Basic Science Departments.

|                                                                                                          |          |
|----------------------------------------------------------------------------------------------------------|----------|
| Medicine                                                                                                 | 30 days  |
| Anatomy                                                                                                  | 15 days  |
| Biochemistry                                                                                             | 15 days  |
| Clinical pathology                                                                                       | 15 days  |
| Blood Bank                                                                                               | 15 days  |
| Endocrinology                                                                                            | 15 days  |
| Cardiology                                                                                               | 15 days  |
| Neurology                                                                                                | 15 days  |
| Chest Medicine                                                                                           | 15 days  |
| Medical Gastroenterology                                                                                 | 15 days  |
| Elective posting with regard to research<br>(either within the institute or in any other reputed centre) | 15 days  |
| Physiology                                                                                               | 6 Months |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.



II<sup>nd</sup> 6 months:

Works on dissertation

III year: Actively involves in U.G. teaching, Prepares for the University examination.

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## **8. COMPETENCY ASSESSMENT:**

### **1. OVERALL:**

|                                                                                                     |                  |
|-----------------------------------------------------------------------------------------------------|------------------|
| <b>a) Communication / commitment / Contribution /<br/>Compassion towards patient and Innovation</b> | <b>- 5 marks</b> |
| <b>b) Implementation of newly learnt techniques / Skills</b>                                        |                  |

**2. Number of cases presented in Clinical Meetings/  
Journal Clubs/Seminars** **– 5 marks**

**3. Number of papers presented in conferences/Publications /  
Research Projects.** **- 5 marks**

**4. No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings with details.** **- 5 marks**

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**20 Marks**

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### **PG NON – CLINICAL COURSE**

**VIVA including Competency Assessment** **- 60 Marks (40 + 20 )**

**Pedagogy** **- 40 marks**

### **ASSESSMENT SCHEDULE IS AS FOLLOWS**

| <b>Year of study</b> | <b>Period</b>   |                 |                  |                 | <b>Total Max.20 marks</b> |
|----------------------|-----------------|-----------------|------------------|-----------------|---------------------------|
| <b>I year</b>        | <b>Upto Dec</b> | <b>10 marks</b> | <b>Upto June</b> | <b>10 marks</b> | <b>20 Marks</b>           |
| <b>II year</b>       | <b>Upto Dec</b> | <b>10 marks</b> | <b>Upto June</b> | <b>10 marks</b> | <b>20 Marks</b>           |
| <b>III year</b>      | <b>Upto Oct</b> | <b>10 marks</b> | <b>Upto Feb</b>  | <b>10 marks</b> | <b>20 Marks</b>           |
|                      | <b>AVERAGE</b>  |                 |                  |                 | <b>20 Marks</b>           |

### **9.DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the first Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper.**

**10. Theory examination:**

|            |                                                                                                      |
|------------|------------------------------------------------------------------------------------------------------|
| Paper -I   | General Physiology, Blood, Digestion and Tissues of the Body.                                        |
|            |                                                                                                      |
| Paper -II  | Circulation, Respiration, Environmental Physiology Comparative Physiology and Excretion              |
|            |                                                                                                      |
| Paper -III | Nervous System and Special Senses.                                                                   |
|            |                                                                                                      |
| Paper -IV  | History of Medicine, Recent Advances in Clinical Physiology, Endocrinology and Reproductive Systems. |

**Distribution of marks:**

|                   |                   |
|-------------------|-------------------|
| Structured essays | 2 x 15 = 30 marks |
| Short notes       | 10 x 5 = 50 marks |
| Reasoning out     | 4 x 5 = 20 marks  |
|                   | -----             |
| Total             | 100 marks         |
|                   | -----             |

## PRACTICALS

|                                    |                   |
|------------------------------------|-------------------|
| LONG EXERCISE – ANIMAL LAB         | 80 MARKS          |
| SHORT EXERCISE 1 – HUMAN LAB       | 70 MARKS          |
| SHORT EXERCISE 2 –HAEMATOLOGY LAB  | 30 MARKS          |
| OSPE            5 stations X4marks | 20 MARKS          |
| TOTAL                              | 200 MARKS (A)     |
| VIVA VOCE                          | 60 MARKS (B)      |
| PEDAGOGY                           | 40 MARKS (C)      |
| AGGREGATE (CLINICAL + VIVA) TOTAL  | 300 MARKS (A+B+C) |
| MINIMUM REQUIRED FOR PASS (50%)    | 150 MARKS         |
| DISSERTATION                       | APPROVED /        |
|                                    | NOT APPROVED      |

## 11. Practical examination:

## DAY1

**LONG EXERCISE – ANIMAL LAB - 80 MARKS**

MAMMALIAN GRAPHS - 20 MARKS

MAMMALIAN ISOLATED ORGAN - 40 MARKS

AMPHIBIAN CHARTS - 20 MARKS

**SHORT EXERCISE 2 – HAEMATOLOGY LAB - 30 MARKS**

HEMATOLOGY - 30 MARKS

## **DAY2**

**SHORT EXERCISE 1- HUMAN LAB** - **70 MARKS**

CLINICAL EXAMINATION - 20 MARKS

HUMAN EXPERIMENTS - 30 MARKS

PROBLEM SOLVING EXERCISES - 20 MARKS

**OSPE** - **20 MARKS**

**TOTAL** = **200 MARKS**

PEDAGOGY - 40 MARKS

VIVA - 60 MARKS

**TOTAL** = **100 MARKS**

**12. Log book:** A detailed log book should be maintained for the entire duration of the course. It should contain the following details.

Journal clubs

Seminars

Classes taken

Demonstrations performed

Clinical postings and elective postings attended

Training programs attended

Conferences, CMEs, work shops attended

Details of paper presentations – Oral/poster

Publication details

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

## **13. Viva including competency Assessment: 60 marks**

40 marks for viva, and 20 marks for competency assessment

#### 14. Pedagogy:

The teaching skills of the candidate will be assessed. The candidate will be given a topic by the 4 Examiners at the end of the first day of the practical examination for a Lecture presentation on the next day. The Examiners shall evaluate the candidate's ability (Trial class room lecture for under graduate students) to teach with chalk and board.

( 8 minutes Presentation and 2 Minutes Q & Ans)

|                                                          |          |
|----------------------------------------------------------|----------|
| • Demeanour                                              | - 10     |
| • Audio visual Aids usage, voice modulation and Attitude | - 10     |
| • Subject Content                                        | - 10     |
| • Q & Ans /Interaction                                   | - 10     |
|                                                          | -----    |
| Total                                                    | 40 Marks |
|                                                          | -----    |

#### 15. OSPE : 5 stations x 4 marks

Solution preparation

Statistics

Histology slides - 2

Instruments - 2

Interpretation of investigations

#### 16. Reference books:

International and National authors

1,GUYTON & HALL

2.GANONG

3.BERNE&LEVY

4.SARADA SUBRAMANIAN

5.BORON

6.BEST&TAYLOR

7.INDU KHURANA

**\*\* Note :** The editions are as applicable and the latest editions shall be the part of the syllabi

**17. Journals :**

Annual review of Physiology

Physiological reviews

Journal of Physiology

American journal of physiology

Indian journal of physiology and pharmacology

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**M.D. PSYCHIATRY**



**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.D. PSYCHIATRY**

**1. GOAL**

A person who has obtained the qualification of a Doctor of Medicine (MD) degree in Psychiatry should be well-versed in / should have skills and expertise in

1. Basic concepts and recent advances in the subject
2. Recognizing mental health, distress, illness and disease
3. Training should empower her/him to lead a multidisciplinary team to manage mental disorders
4. Training during the course should equip her/him with skills to become an effective teacher with skills to plan and implement teaching programmes for students in medical and allied health science courses
5. Understand basic research methodology, study design and statistics to be able to assess new information and research
6. Understand the principles of ethical medical and professional clinical practice and employ it in their work

**Rationale**

The purpose of this curriculum is to outline the competencies the trainee must demonstrate and the learning and assessment processes that must be undertaken. The curriculum is outcome- based allowing the trainee to explore the field while being encouraged and supported by clinical supervisors.

**2. SPECIFIC LEARNING OBJECTIVES**

At the end of the MD training program in Psychiatry, the trainee should have acquired /achieved the following objectives. These are linked to the competencies listed above.

- 1. Knowledge and understanding of the psychosocial and biological basis of mental health and illness**  
The trainee should understand basics of genetics, biology, psychology, sociology and anthropology in order to be able to comprehend mental health, distress, illness and disease and provide holistic care.
- 2. Elicit details of psychiatric history and perform mental state and physical examinations to assess psychiatric disorders**  
The trainee should have the theoretical knowledge related to symptoms and signs of mental illness and possess the skills to elicit psychiatric history and perform comprehensive mental state and physical examinations.
- 3. Able to master detailed psychiatric presentations, summary, diagnostic formulation and differential diagnosis for patients with different mental disorders**

The trainee should possess knowledge, skill and confidence in reaching appropriate conclusions about different clinical presentations of mental disorders.

**4. Able to recommend appropriate investigations including psychological assessment, laboratory tests and radiological investigations and suggest a management plan**

The trainee should be able to document a detailed investigation and management plan for treating mental disorders.

**5. Able to communicate effectively with patients, their families, colleagues, members of the multidisciplinary team and with other health care staff**

The trainee should have the necessary communication skills to establish rapport, provide education about mental disorders and their treatment and communicate effectively.

**6. Able to assess and manage psychiatric emergencies, and evaluate and manage the risk of harm to self and to others in patients with mental disorders**

The trainee should have the necessary knowledge and skill in evaluating risk and managing people who present with psychiatric emergencies.

**7. Able to assess the need for psychotropic medication and employ it appropriately in managing mental disorders**

The trainee should have the necessary knowledge about the mechanisms of action, pharmacodynamic and pharmacokinetic properties, adverse effects, drug interaction, dosing schedules and cost of psychotropic medication.

**8. Able to assess the need for and deliver psychotherapeutic and psychosocial interventions for mental disorders.**

The trainee should be able to employ basic psychotherapy techniques, employ psychosocial intervention in individual, family, and group settings.

**9. Able to teach students in medicine and allied health sciences about mental disorders, their recognition and management**

The trainee should be competent in teaching methods like lectures, case discussions, case conferences and seminars to teach students about mental illness and their management.

**10. Able to understand research methodology and critical appraisal of psychiatric literature**

The trainee should be familiar with common study designs, methodology, analysis and interpretation. S/he should be able to also do audits of clinical practice.

**11. Able to understand the principles of ethical medical practice and employ it in day- to- day health care.**

The trainee should be well versed in the principles of bioethics and know the common situations and the applications of these principles.

**12. Able to understand the importance of documentation in medical practice**

The trainee should be able to document clinical details, diagnostic evaluations, treatment and interventions, maintain progress notes, write discharge summaries and maintain legal documents.

### **13. Able to develop leadership skills**

The trainee should learn leadership skills in order to be able to work effectively with other colleagues in the multidisciplinary team and in general hospital settings

## **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

The components include

- (i) Theoretical knowledge,
- (ii) Practical and clinical skills,
- (iii) Thesis and research,
- (iv) Professional attitudes including communication skills
- (v) Training in research methodology, bioethics and medicolegal aspects of care

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics/Bioethics, moral and legal issues, medical audit are part and parcel of the curriculum and syllabus.

### **Competencies to be achieved**

At the end of the 3 years of training, the trainee should achieve the competencies listed below. S/he should

1. Acquire knowledge and understanding of the biopsychosocial models and approach to mental health, distress, illness and disease
2. Be able to use such knowledge and understanding to effectively manage people with mental distress, illness and disease
3. Be able to manage a clinical unit/service in psychiatry, ensuring good quality psychiatric care and to interact with clinicians from other disciplines to contribute to holistic management of patients
4. Be able to teach students in medical and allied health science courses about the importance of mental health and illness and their impact on mental disorders and physical disease
5. Have adequate knowledge of and competence in basic research methodology and biostatistics to carry out simple research projects and clinical audits and be able to publish the results in regional, national and international journals
6. Have a good knowledge of principles of bioethics and their application in day-to-day clinical practice.
7. Develop the potential and enthusiasm to pursue life-long learning to keep up with developments in the field, and to constantly work to improve skills and expertise, in order to develop as a professional who will become a clinician, teacher, mentor and guide for future trainees.

#### **4. THEORY SYLLABUS**

The syllabus should be comprehensive covering important aspects of the etiology, psychopathology, diagnosis, differential diagnosis, psychological assessments, laboratory and radiological investigations, treatment and management plans, and rehabilitation of mental and behavioral disorders in children and adults.

The syllabus consists of:

##### **Paper –I : Basic sciences as related to psychiatry:**

Basic aspects of biological sciences and their relation/application/ association with mental health, illness and disease:

1. Structural and functional neuroanatomy
2. Neurodevelopment and neurogenesis
3. Neurophysiology
4. Receptors, neurotransmitter, neuropeptides and neurotrophic factors
5. Basic and applied electrophysiology
6. Basic science of sleep
7. Psycho neuro endocrinology
8. Chronobiology
9. Genetics
10. Brain imaging in psychiatry

##### Behavioral Sciences as applied to Psychiatry:

Basic aspects of psychological and social sciences and their relation/application/association with mental health, illness and disease:

1. Growth and developmental process in childhood and adolescence
2. Sensation, perception and cognition
3. Consciousness
4. Intelligence and aptitude
5. Motivation
6. Feelings and emotions
7. Learning and memory
8. Information processing
9. Personality
10. Communication
11. Abnormal psychology and psychopathology
12. Sociology and psychosocial work
13. Anthropology and culture
14. Public opinion, consumer- survivor movement, antipsychiatry movement
15. Research methodology, epidemiology and statistics
16. Evidence based medicine and psychiatry
17. Principles of Bioethics

## **Paper- II : Clinical Psychiatry**

Etiology, pathology, clinical features, diagnosis, differential diagnosis, treatment and management of psychiatric disorders including:

1. Historical of psychiatry
2. Signs and symptoms of psychiatric illnesses: psychiatric interview, history and mental status examination
3. Diagnosis in psychiatry, classificatory systems, psychiatric rating scales, medical assessment and laboratory testing in psychiatry, clinical neuropsychology, psychiatry report
4. Delirium, dementia and neurocognitive disorders
5. Psychiatric disorders secondary to medical disease
6. Substance related disorders
7. Schizophrenia and other psychotic disorders
8. Mood disorders
9. Anxiety disorders
10. Somatoform disorders
11. Chronic fatigue syndrome
12. Factitious disorder
13. Dissociative disorders
14. Eating disorders
15. Sleep and sleep disorder
16. Impulse control disorders
17. Sexual disorders
18. Adjustment disorders
19. Personality disorders
20. Psychiatry and reproductive medicine
21. Relational problems
22. Problems related to abuse and neglect
23. Emergency psychiatric medicine
24. Aggression and violence
25. Suicide and deliberate self -harm
26. Death, dying, grief and bereavement
27. Culture bound syndromes
28. Psychotherapies: Psychoanalytical/dynamic, cognitive behavioral, interpersonal, family, group therapy, etc
29. Biological therapies: psychotropic medication, ECT and other brain stimulation techniques, psychosurgery, etc
30. Complementary and alternative medicine in psychiatry
31. Ethics in psychiatry

### **Paper- III : Psychiatric specialties, general medicine and neurology related to psychiatry**

Etiology, pathology, clinical features, diagnosis, differential diagnosis, treatment and management of psychiatric disorders including:

1. Child and adolescent psychiatry including intellectual disability, learning disorders, developmental and communication disorders, attention deficit disorders, disruptive behavior, eating, feeding and elimination disorders, movement and tic disorders, attachment disorders, anxiety and mood disorder, suicide, psychosis and substance abuse, legal aspects
2. Consultation-Liaison Psychiatry
3. Psychiatric aspects of neurological diseases
4. Psychiatric aspects of medical disease
5. Psychosocial rehabilitation
6. Prevention of mental distress, illness and disease

### **Paper IV : Recent advances in psychiatry including forensic psychiatry and community mental health**

1. Recent advances related to psychiatric disorders and their management
2. Forensic psychiatry and legal aspects
3. Community mental health, district, state and national programs

### **5. TEACHING LEARNING METHODS (including clinical study)**

The learning/teaching methods will include:

- i. Bedside clinics
- ii. Case demonstration
- iii. Didactic lectures
- iv. Seminars
- v. Case conference
- vi. Journal Club
- vii. Research Forum
- viii. Case presentations
- ix. Ward and Grand rounds
- x. Attendance in special clinics/units
- xi. Training in ECT administration
- xii. Research methodology course
- xiii. Library and resources on the internet

## 6. STRUCTURED TRAINING PROGRAM

The three-year course should provide the trainee adequate opportunity to be exposed to the different aspects of psychiatric practice; general and adult psychiatry, child and adolescent psychiatry, psychiatry of old age, forensic psychiatry, substance misuse, neuropsychiatry, consultation-liaison psychiatry, community and rehabilitation psychiatry and medical psychotherapy.

The course should provide adequate exposure and learning opportunities for supervised out-patient and in-patient work, and in managing emergencies and “on-call” duties. Training placements should be in psychiatric facilities, general medical settings and in the community.

The curriculum should be delivered through workplace learning with appropriate clinical supervision. The learning methods and components will also include:

1. Clinical supervision
2. Interview skills
3. Diagnostic and psychological assessment experience and supervision
4. Management experience and supervision
5. Psychotherapy experience and supervision
6. Emergency psychiatry experience and supervision
7. Training in Electroconvulsive Therapy (ECT)
8. Basic research methodology teaching and supervision

The training should be rotated through the different departments to include the following schedule:

| Component                                                                                                                                                    | Duration                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
|                                                                                                                                                              | Total 52 x 3 =156 weeks |
| General psychiatry including adult, old age, consultation liaison, substance misuse through posting in out-patient, inpatient, and general hospital postings | 122 weeks               |
| Child and Adolescent Psychiatry                                                                                                                              | 16 weeks                |
| Community psychiatry                                                                                                                                         | 4 weeks                 |
| Forensic psychiatry                                                                                                                                          | 2 weeks                 |
| General Medicine                                                                                                                                             | 4 weeks                 |
| Neurology                                                                                                                                                    | 8 weeks                 |

The trainees will have weekly lectures/seminars in general, abnormal and social psychology and psychodiagnostics during the first year of training. Lectures and seminars will also be arranged in neuroanatomy and neurophysiology.

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

#### 8.COMPETENCY ASSESSMENT:

- **OVERALL:**
    - a) Communication / commitment / Contribution /  
Compassion towards patients and Innovation      ()      - 5 Marks
    - b) Implementation of newly learnt techniques/skills      ()
  
  - **Number of cases presented in Clinical Meetings/  
Journal clubs/seminars**      - 5 marks
  
  - **Number of Posters/Papers presented in Conferences/  
Publications and Research Projects**      - 5 marks
  
  - **No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings  
with details.**      - 5 marks
- 
- Total**      **20 Marks**
- 

#### PG CLINICAL COURSES

- VIVA including Competency Assessment**      - 80 Marks (60 + 20)
- Log Book**      - 20 marks

#### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period         |          |           |          | Total<br>Max.20 marks |
|---------------|----------------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec       | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec       | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct       | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | <b>AVERAGE</b> |          |           |          | <b>20 Marks</b>       |



## **9. DISSERTATIONS AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES:**

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

## **10. THEORY EXAMINATION**

Paper I - Basic Sciences as related to psychiatry (including Neuroanatomy, Neurophysiology, Neurochemistry, Biostatistics, General Psychology, Abnormal Psychology, Social Psychology, Psychometry and Genetics as related to Psychiatry).

Paper II – Clinical Psychiatry

Paper III – Psychiatric Specialties and General Medicine and Neurology related to Psychiatry

Paper IV - Recent Advances in Psychiatry including Forensic Psychiatry and Community Mental Health

## Question Paper pattern: PAPER I, II, III & IV

Elaborate on            2   x   15 = 30

Write Notes on        10   x   7 = 70

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**Total**                                **100 marks**  
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### 11. PRACTICAL EXAMINATION:

The clinical examination will be at the end of the 3 year training period and will consist of the following:

|                               |        |            |                  |
|-------------------------------|--------|------------|------------------|
| 1. Clinical cases             |        |            |                  |
| a) One Long case(Psychiatry)  | 1 x 80 | 45minutes  | 80 marks         |
| b) Two Short cases            | 2 x 35 | 20 minutes | 70 marks         |
| i. Neurology/general medicine |        |            |                  |
| ii. Psychiatry                |        |            |                  |
| 2. Spotters    (5x5)          |        |            | 25 marks         |
| 3. OSCE        (5x5)          |        |            | 25 marks         |
| 4. Viva voce                  |        |            | 80 marks         |
| 5. Logbook                    |        |            | 20 marks         |
| <b>Total</b>                  |        |            | <b>300 marks</b> |
| <b>Minimum for pass</b>       |        |            | <b>150 marks</b> |

### 12.LOG BOOK

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training. The clinical postings including OPD, ward rounds, academic sessions (case seminars, journal clubs, symposia) are written in the logbook on a day- to- day basis for the entire 36 months of training. The Assistant Professor of Psychiatry who supervises the resident and the Consultant under whom he/she is posted will sign the logbook. The record or log book shall be checked and assessed periodically by the faculty members imparting the training

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

### 13. VIVA

**VIVA including Competency Assessment**

**-    80 Marks (60 + 20)**

#### 14. OSCE/OSPE

There are five stations and the following topics have to be elicited by the trainee:

- i. Mental Status examination
- ii. Eliciting symptoms like delusion, hallucination, obsessions etc
- iii. Bedside lobe function tests
- iv. Assessing motivation for abstinence in people with substance use
- v. Assessment of suicide risk
- vi. Assessment of mood
- vii. Assessment of cognitive function like memory, orientation, attention and concentration
- viii. Psychoeducation for different mental disorders
- ix. Psychoeducation for different drug therapies like lithium, clozapine etc
- x. Side effects of medication

#### 15. RECOMMENDED REFERENCE BOOKS:

| <b>Authors</b>                                                                    | <b>Name of Book</b>                                                                          | <b>Year</b> | <b>Publisher</b>                                |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------|-------------------------------------------------|
| Femi Oyeboode                                                                     | Sims' Symptoms in the Mind: Textbook of Descriptive Psychopathology, 5 <sup>th</sup> edition | 2015        | Elsevier Ltd, Edinburgh                         |
| Brendan Kelly and Patricia R. Casey                                               | Fish's Clinical Psychopathology: Signs and Symptoms in Psychiatry, 3 <sup>rd</sup> edition   | 2007        | Royal College of Psychiatrists, London          |
| American Psychiatric Association                                                  | Diagnostic and Statistical Manual of Mental Disorders 5th edition                            | 2013        | American Psychiatric Association: Arlington, VA |
| Benjamin J Sadock and Virginia A Sadock                                           | Kaplan And Sadock's Comprehensive Textbook of Psychiatry 9th Edition                         | 2009        | Lippincott, William Wilkins, Philadelphia       |
| Benjamin J Sadock and Virginia A Sadock                                           | Kaplan And Sadock's Synopsis of Psychiatry 10th Edition                                      | 2007        | Lippincott, William Wilkins, Philadelphia       |
| Michael Gelder, Nancy Andreasen, Juan Lopez-Ibor, John Geddes                     | New Oxford Textbook of Psychiatry 2nd Edition                                                | 2009        | Oxford University Press, Oxford                 |
| Anthony S David, Simon Fleminger, Michael Kopelman, Simon Lovestone, John Mellors | Lishman's Organic Psychiatry: A Textbook of Neuropsychiatry, 4th Edition                     | 2009        | Wiley-Blackwell, Chichester                     |

| <b>Authors</b>                                                                                                | <b>Name of Book</b>                                                                                                                | <b>Year</b> | <b>Publisher</b>                            |
|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------|
| David Taylor, Carol Paton, Shitij Kapur                                                                       | The Maudsley Prescribing Guidelines in Psychiatry, 12th Edition                                                                    | 2015        | Wiley-Blackwell, Chichester                 |
| World Health Organization                                                                                     | The International Classification of Diseases 10: mental and behavioral disorders, clinical descriptions and diagnostic guidelines. | 1992        | World Health organization, Geneva           |
| Stephen M Stahl                                                                                               | Stahl's Essential Psychopharmacology: Neuroscientific Basis and Practical Applications 4 <sup>th</sup> edition                     | 2013        | Cambridge University Press, Cambridge       |
| J.N. Vyas , Niraj Ahuja                                                                                       | Textbook of Postgraduate Psychiatry 2 <sup>nd</sup> edition                                                                        | 2003        | Jaypee Publishers, New Delhi                |
| Michael J. Rutter, Dorothy Bishop, Daniel Pine, Stephen Scott, Jim S. Stevenson, Eric A. Taylor, Anita Thapar | Rutter's Child and Adolescent Psychiatry, 6th Edition                                                                              | 2015        | John Wiley, Chichester                      |
| Andrés Martin, Fred R. Volkmar, Melvin Lewis                                                                  | Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook 4 <sup>th</sup> edition                                          | 2007        | Lippincott, Williams, Wilkins, Philadelphia |
| Wen-Shing Tseng                                                                                               | Handbook of Cultural Psychiatry                                                                                                    | 2001        | Academic Press, San Diego                   |
| Allan Ropper, Martin Samuels, Joshua Klein                                                                    | Adams and Victor's Principles of Neurology 10th Edition                                                                            | 2014        | McGraw Hill, Toronto                        |
| Dennis L. Kasper, Anthony S. Fauci, Stephen Hauser, Dan Longo, J. Larry Jameson, Joseph Loscalzo              | Harrison's Principles of Internal Medicine 19 <sup>th</sup> Edition                                                                | 2015        | McGraw Hill, Toronto                        |

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## 16.RECOMMENDED JOURNALS:

- i. Indian Journal of Psychiatry
- ii. Indian Journal of Psychological Medicine
- iii. Indian Journal of Clinical Psychology
- iv. Annals of Indian Academy of Neurology
- v. British Journal of Psychiatry
- vi. Advances in Psychiatric Treatment
- vii. American Journal of Psychiatry
- viii. Archives of General Psychiatry
- ix. Journal of Clinical Psychiatry
- x. Psychiatric Clinics of North America
- xi. Acta Psychiatrica Scandinavia
- xii. Psychosomatic Medicine
- xiii. Schizophrenia Bulletin
- xiv. Lancet Psychiatry
- xv. Child and Adolescent Psychiatric Clinics of North America
- xvi. [Journal of the American Academy of Child and Adolescent Psychiatry](#)
- xvii. [Journal of the American Academy of Child Psychiatry](#)
- xviii. [Journal of autism and developmental disorders](#)

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## **M.D. RADIO DIAGNOSIS**

# **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

## **M.D. RADIO DIAGNOSIS**

### **1. GOAL**

To optimally train a student in all aspects of medical imaging and image guided procedures to obtain ability to be a safe and efficient radiologist.

The candidate is fully competent to practice, teach and do research in the broad discipline of radiology. A resident on completing his/her MD (Radio-diagnosis) should be well versed with legal and regulatory aspects of imaging / intervention including medical ethics.

### **2. OBJECTIVES**

In order to achieve the goal of this course, following objectives are to be accomplished by the time the candidate completes the 3 years course.

**Three broad domains of the objectives are:**

#### **2 (A) Knowledge**

Principles of the various imaging equipment

Imaging anatomy, anatomical variations

Relevant etiology, pathology

Knowing the approach to a clinical problem

Patient positioning

Imaging protocols

Imaging appearances of various abnormalities

Contrast agents, medicines used in Radiology

Safety in the work area including self, colleagues, patients and the equipment – in terms of radiation, biohazard etc.

Familiarity of the existing governing rules from the concerned government ministries (like PCPNDT act) and AERB.

Audit of reports and image guided procedures

An enthusiasm for knowledge and understanding to support lifelong learning.

A reflective attitude allowing accurate self-assessment and learning from practice.

maintenance of equipments, documents

## **2 (B) Attitude**

Follow the commitment and ethical principles of medical practice

Respect patient's rights

Empathetic attitude towards patients' needs

Understanding human values and commitment to the society

Clinical Radiology relies on a multi professional team and so radiologists should work with other healthcare professionals to put the needs of the patient above their own.

scientific attitude

commitment to clinical excellence

## **2 (C) Skills**

Ability to interact with the patients with communication skills

Ability to examine the patients

Communication skills with patients and colleagues

Critical reporting in case of acute findings, potentially requiring an immediate intervention

Sound judgment through intelligent application of knowledge.

Basic life support; ability to manage anaphylactic reactions.

Image guided interventions – including vascular and non-vascular procedures

Teaching skills – role in teaching undergraduates, juniors, technician students etc..

Interdepartmental conferences- clinico radiologic meetings

life long learning : Update oneself by self-study and by attending courses, seminars, conferences and workshop which are relevant to the field of radio-Diagnosis.

Carry out research with the aim of publishing his/her work and presenting work at various scientific fora.

Leadership and mentorship: The student must take on a leadership role where needed in order to ensure clinical productivity and patient satisfaction.

Organize CME in the speciality utilizing modern methods of teaching and evaluation.



### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

#### **Theoretical Knowledge**

Clinical imaging has significantly grown expanded over a period of time, especially in the last few decades. This knowledge to be acquired in a comprehensive manner during the postgraduate period. A detailed plan is mentioned in the subsequent section.

#### **Practical and Clinical Skills**

The practical and clinical skills are important as the subject is a clinical specialty. Interaction with the patients and the accompanying persons is very important in deciding the right choice of imaging. As some of the imaging involve ionizing radiation, one should be careful in using such imaging technology.

Image guided interventions help in the diagnosis and management. The postgraduate student should learn under supervision these skills. Consenting and counseling are essential.

#### **Writing Thesis/Research Articles**

A formal training with respect to writing thesis and research articles is important. This can be from a centralized system within the institution along with the postgraduates of other broad specialties. Time to time appraisal by the guide and the head of the department is strongly recommended.

#### **Attitudes including Communication Skills**

Knowing the patients' requirement helps in deciding which imaging is needed in problem solving. At the same time, unnecessary imaging, especially the ones with ionizing radiation should be implemented only when required. Role of radiology during medical emergencies is even higher, as the decision making needs to be quick. Learning and practising empathetic approach while interacting with the patients is essential component of the training.

#### **Training in Research Methodology, Medical Ethics /Bioethics and Medico-legal aspects**

The subject specific medico-legal aspects to be studied in the department like PCPNDT act, AERB rules etc.

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, bioethics, moral and legal issues and medical audit are part and parcel of the curriculum and syllabus.

#### **4. THEORY SYLLABUS**

##### **4 (A) Physics of Medical imaging**

##### **X-ray Production**

Discovery – Production – Properties of X-rays – Characteristics and continuous spectra – Design of hot cathode X-ray tube – Basic requirements of Medical diagnostic and therapeutic radiographic tubes – Rotating anode tubes – Hooded anode tubes – Rating of tubes – safety devices in X-ray tubes – Ray proof and shock proof tubes – Insulation and cooling of X-ray tubes – Mobile and dental units – faults in X-ray tubes – Limitations on loading. Modern xray tubes

##### **Generators**

Electric Accessories for X-ray tubes – Filament and high voltage transformers – High voltage circuits – Half-wave and full-wave rectifiers – Condenser discharge apparatus – Three phase apparatus – voltage doubling circuits – Current and Voltage stabilizers – Automatic exposure control – Automatic Brightness control – Measuring instruments – measurement of kV and mA - timers – control panels – Complete X-ray circuit

**Radioactivity:** Natural and artificial radioactivity-alpha decay-beta decay and spectra – gamma emission-positron decay electron capture and internal conversion-Exponential decay- Half life-Unit of activity-specific activity. Nuclear Fission-Nuclear reactor. Radiation sources- Natural and artificial-production of radio isotopes-reactor produced isotopes-Fission products- Gamma ray source for Medical uses.

**Interaction of X-and Gamma rays:** Attenuation of X-ray or Gamma rays-absorption and scattering-half value layer-coherent scattering-Photo electric absorption-compton scattering pair production and photoelectric disintegration. X-Ray transmission through medium-linear and mass attenuation coefficients. HVT - TVT and interaction of charged particle and neutrons with matter. Interaction of X-and Gamma rays in body-fat-soft-tissue-bone-cont rast medium-Total attenuation coefficient. Relative important of different types of interactions.

### **Radiation detection and Measurements:**

Ionization of gases- Fluorescence and Phosphorescence -Effects on photographic emulsion. Ionization Chambers – proportional counters- G.M counters- scintillation detectors – liquid semiconductor detectors – DAP meter. Measuring systems – free air ionization chamber – thimble ion chamber – condenser chamber –electrometer – secondary standard dosimeters – film dosimeter – chemical dosimeter-thermoluminescent Dosimeter. -Pocket dosimeter-Radiation survey meter- wide range survey meter -zone monitor-contamination monitor -their principle function and uses.

Advantages & disadvantages of various detectors & its appropriateness of different detectors for different type of radiation measurement.

**Biological Effects of radiation:** Ionization, excitation and free radical formation, hydrolysis of water, action of radiation on cell -Chromosomal aberration and its application for the biological dosimetry- Effects of whole body and acute irradiation, dose fractionation, effects of ionizing radiation on each of major organ system including fetus -Somatic effects and hereditary effects- stochastic and deterministic effects-Acute exposure and chronic exposure-LD50 - factors affecting radiosensitivity. .

### **Principles of X-ray Diagnosis & Conventional Imaging**

#### **Physical Principle of diagnostic radiology:**

Interactions of X-rays with human body, differential transmission of x-ray beam, spatial image formation, visualization of spatial image, limitations of projection imaging technique viz. superimposition of overlying structures and scatter, application of contrast media and projections at different angles to overcome superimposition of overlying structures.

#### **Radiography techniques:**

Prime factors (kVp, mAs and SID/SFD), influence of prime factors on image quality, selection criteria of prime factors for different types of imaging, different type of projection and slices selected for imaging, objectives of radio-diagnosis, patient dose Vs Image quality.

#### **Scatter reduction:**

Factors influencing scatter radiation, objectives of scatter reduction, contrast reduction factor, scatter reduction methods; **beam restrictors** (diaphragms, cones/cylinders & collimators). **Grids** (grid function, different types of stationary grids, grid performance evaluation parameters, moving grids, artifacts caused by grids, grid selection criteria), air gap technique. **Filtration:** Inherent and added filters, purpose of added filters, beryllium filters, filters used for shaping X-ray spectrum (K-edge filters: holmium, gadolinium, molybdenum)

## **Radiography:**

**Radiographic Film:** Components of Radiographic Film, physical principle of image formation on film, double and single emulsion film, sensitometric parameters of film (density, speed, latitude etc.) **Intensifying screens:** Function of intensifying screens, screen function evaluation parameters, emission spectra and screen film matching, conventional screens Vs rare earth screens. Quality assurance in film, developer etc

**Digital radiography:** Computed Radiography (C.R) –equipment parts –advances- principle of imaging –applications- advantages & disadvantages. Photostimulable phosphors-image acquisition- Direct and indirect DR systems. Laser imager and multiformatter- recent trends

## **Mammography**

Imaging requirements- Mammography system - construction/types accessories - tube, compression, grids, AEC etc.- nature of X-Ray beam suitable – accessories for immobilization - film processing - image quality - image recording devices - interventional procedures – accessories-biopsy equipment attachments - radiation dose- & digital mammo

**Dental Radiography** – Equipment Basics –types of equipments- Intra oral radiography, orthopantomography, cone beam CT, image reconstruction techniques

**Fluoroscopy and angiography:** Fluoroscopic equipment- Conventional fluoroscopy – factors affecting the Fluoroscopic image. Image intensifier tubes – principle construction and function regarding intensified image- cine fluorography-mode of operation – Image intensifiers - optical coupling - cameras - Automatic brightness control- over and under couch tubes safety features. Flat panel fluoroscopy systems, digital subtraction techniques. Quality assurance tests for fluoroscopic equipment. Angiography, DSA, road mapping, pixel shift, reconstruction techniques.

**Dexa Scan & Bone Mineral Densitometry** : Physics ,Principles, Applications

## **Tomography and Computed tomography**

Conventional tomography (Principle only), orthopan tomography (OPG), Basic physics – Tomography principle - detectors technology - Basic data acquisition concepts - Image reconstruction- artifacts- Equipment for computed tomography – Table, scanning gantry X-Ray generator – CT control console. Scanner types -technologic considerations of sequential /spiral volume zoom - image processing system- QA of CT equipment. CT dosimetry

## **Magnetic Resonance Imaging (MRI)**

Magnetic Resonance image – proton density, relaxation time T1 & T2 images – Image characteristics – MRI system components – Magnets, Magnetic fields, Gradients, Magnetic field shielding, Radio Frequency systems, Computer functions – Imaging process – Pulse sequences, Advanced sequences – spectroscopy, fMRI, BOLD, DTI, SWI etc, Image artifacts – MRI safety.

## **Ultrasound Imaging**

Basic acoustics principle- Basic physics of sound propagation in different media, production of Ultrasound (piezoelectric effect), ultrasound terminologies – interaction of ultrasound with matter – ultrasound properties propagation in tissue, absorption, scattering, reflection and refraction- acoustic impedance – piezoelectric effect – transducer – Pulsar – receiver – beam/sensitivity and gain - generators- A, B and M scanning & echo modes- transducers techniques of sonography - equipment selection- display methods – ultrasound image formation - data storage and display – image and artifacts – Doppler instrumentation – Doppler equation – transducer – quality assurance and performance tests – bio effects and safety considerations. Types of machines – portable systems- acoustic coupling agents ingredients/ preparation.

## **Image quality and PACS:**

Image quality parameters: sources of un-sharpness, reduction of un-sharpness factors influencing radiographic contrast, resolution, factors influencing resolution, evaluation of resolution (point spread function (PSF), line spread function (LSF), edge spread function (ESF), modulation transfer function (MTF), focal spot size evaluation. PACS, archival systems, DICOM,

**Nuclear Medicine Equipments:** Nuclear Physics - basics in Nuclear Medicine- Nuclear medicine equipments – Gamma Cameras- rectilinear scanners- radioisotope generators-Handling of isotopes- SPECT-CT & PET-CT- introduction basic physics and principle involved- equipments basic structure—differences- fusion techniques- image formation-storage devices— advantages- limitations.

## **Radiation protection:**

Radiation protection of self and patient- Principles of radiation protection, time - distance and shielding, shielding - calculation and radiation survey –ALARA- personnel dosimeters (TLD and film batches)- occupational exposure. Radiation safety accessories in Radiology modalities.

## **Regulatory Bodies & regulatory Requirements:**

Calculation of Work load, weekly calculated dose to radiation worker & General public Good work practice in Diagnostic Radiology. Planning consideration for radiology, including Use factor, occupancy factors, and different shielding material. Evaluation of workload versus radiation factors – Occupational exposure and protection Tools/devices.

National Regularity body (AERB - Atomic Energy Regulatory Board) - Responsibilities, organization, Safety Standard, Codes and Guides, Responsibilities of licenses, registrants & employers and Enforcement of Regulatory requirements. e LORA ,Registration/ license of X-Ray /other equipment installation- Certification.

PCPNDT, clinical establishment act, NABH

International bodies: ICRP, NRPB, NCRP and WHO guidelines for radiation protection, pregnancy and radiation protection.

### **Quality Assurance (QA) in Diagnostic Radiology**

Meaning of the terms used and aspects of a QA programme, equipment and staff requirements, benefits of QA procedures in an imaging department –NABH guidelines. QA in X-ray unit, CT scanner, Mammography, DEXA, OPG, Dental, Lithotripsy, Angiography/Fluoroscopy

Picture archiving and communication system (PACS) and Radiology information system (RIS)

Basic sciences related to radiology as applied physics

### **4 (B) Radiology (diagnostic and interventional)**

The entire human body systems and vulnerable patient groups in the following category to be considered in the following systems but not limited to -

**Central nervous**

**Head and neck**

**Pulmonary**

**Cardiovascular**

**Gastrointestinal tract and hepato-biliary**

**Genitourinary**

**Musculoskeletal**

**Endocrine**

**Paediatric**

**Women's imaging – including obstetrics and breast**

The body systems to be covered with **relevant anatomy, etiology, patho-physiology, essential clinical features, biochemical findings, confirmative tests, complications** etc

In respective systems, knowledge regarding the **patient positioning, imaging protocols** etc should be emphasized.

The relevant imaging like **plain radiography, ultrasound, Doppler, CT, MRI, Angiogram , Nuclear medicine** including **contrast studies**

Role of **image guided interventions** like FNA, FNAB, drainage procedures, angiogram, vascular interventional procedures, foetal interventions, radiofrequency ablations etc. in all the systems.

Special emphasis on **emergency radiology** findings in all the systems.

Understanding of **multi-system involvement of diseases**.

Ability to give **differential diagnosis** and to suggest **further relevant management**

To have some idea regarding the medical and surgical management.

**Recent advances** are to be learnt from the journals.

## **5. TEACHING LEARNING METHODS (including Clinical Study)**

Students are trained by

### **I. Rotational postings**

### **II. Various teaching methods. Some recommendations are below**

1. Theory classes / lectures by Faculties -2/week.
2. Clinical symposium organized every month with 3 senior residents & faculty
3. clinical seminars - Every day floor presentation of short topic by residents
4. practical classes by faculty- like ultrasound demonstration-1/week.
5. Once in a week journal club –presented by the student and critical review by faculty
6. Case presentations -3 days a week of all modalities to be covered (with due importance to X ray, contrast, methodology, description of procedures and reading the films)- discussion for a period of 45 min to 60 min. Competitive/interesting case presentation by PG s -once in a week (case of the week)
7. Clinico radiological Inter-departmental meets -every week
8. Guest lectures – once in a month
9. Group discussions-2 days a week Special practical classes with images - clinicoradiologic approach and possible differential diagnosis - discussion by faculty & residents
10. Special focus on recent advances once in 3 months- paper discussion/ implementation in dept / AJC staging / implementation of newer classifications e.g. – Thyreds, Pirads, Atlanta etc.

11. Audits: Mortality, Reporting, Image guided procedures etc. – once in every month
12. Every day lobby quiz/ electronic quiz –open to all.
13. Thesis/dissertation review/competency assessment - once in every month
14. logbook ,journal publication and research review -- once in every month
15. Spotters /Quiz & film reading session By faculty-every week

**Weekly Post Graduate Academic Timetable (Model)**

|                               | <b>Number<br/>per<br/>week</b> | <b>Day in which<br/>held</b> | <b>Time</b>             | <b>Number<br/>per month</b> | <b>Number / year</b> |
|-------------------------------|--------------------------------|------------------------------|-------------------------|-----------------------------|----------------------|
| <b>Theory Classes</b>         | 2                              | Tuesday /<br>Thursday        | 1.30 pm<br>to<br>2.30pm | 8                           | <b>96</b>            |
| <b>Clinical<br/>Seminars</b>  | 1                              | Friday                       | 8 to 9<br>am            | 4                           | <b>48</b>            |
| <b>Journal Clubs</b>          | 1                              | Wednesday                    | 12 noon<br>to 1 pm      | 4                           | <b>48</b>            |
| <b>Case<br/>presentations</b> | 3                              | Mon / Wed /<br>Friday        | 12:30 to<br>1:30 pm     | 12                          | <b>144</b>           |
| <b>Group<br/>Discussions</b>  | 2                              | Tuesday /<br>Thursday        | 12:30 to<br>1:30 pm     | 8                           | <b>96</b>            |
| <b>Guest lectures</b>         | -                              | Fourth Saturday              | 11 am<br>to 12<br>noon  | 1                           | <b>12</b>            |

Note: All sessions will be co-ordinated by the faculty members. Time table may be modified depending on the feasibility and exigencies.

### **III. ACADEMIC REQUIREMENTS:**

Student are encouraged to attend conference and CME

Basic life support(BTLS /ATLS) certificate

Bioethics and spastics training certificate



#### IV. Various assessment methods.

Formative Assessment :

The formative assessment is continuous as well as end-of-term. The former is based on the feedback from the senior residents and the consultants concerned. End-of-term assessment is held at the end of each semester (upto the 5th semester). Formative assessment will not count towards pass/fail at the end of the program, but will provide feedback to the candidate.

#### 6. STRUCTURED TRAINING PROGRAMME

Students are trained by the following methods.

##### I. Rotational postings

| S.NO | TRAINING TOPICS                                                          | 1 ST YEAR | 2 ND YEAR   | FINAL YEAR |
|------|--------------------------------------------------------------------------|-----------|-------------|------------|
| 1    | CONVENTIONAL: DIGITAL XRAY/<br>DENTAL XRAY, OPG/ DEXA                    | 2months   | 15<br>days  | 15 days    |
| 2    | CONTRAST & SPECIAL PROCEDURES:<br>BARIUM/ IVU                            | 1 month   | 15<br>days  | 15 days    |
| 3    | ULTRASONOGRAM/ ABDOMEN/ SMALL<br>PARTS/ MSK/ BREAST                      | 2 months  | 2<br>months | 2 months   |
| 4    | DOPPLER STUDIES                                                          | 1 month   | 1 month     | 1 month    |
| 5    | CT SCAN                                                                  | 2 months  | 2 months    | 2 months   |
| 6    | MRI SCAN                                                                 | 1 month   | 2 months    | 2 months   |
| 7    | NUCLEAR MEDICINE / SPECT, PET                                            | -         | 1 month     | 15 days    |
| 8    | VASCULAR INTERVENTIONAL<br>RADIOLOGY, DSA                                | -         | 15 days     | 1 month    |
| 9    | ECHO - CARDIOLOGY                                                        | 15 days   | 15 days     | 15 days    |
| 10   | ENDOSCOPIC<br>ULTRASONOGRAMS,INTRAOPERATIVE<br>USG AND INTRAVASCULAR USG | 15 days   | 15 days     | -          |

|    |                                                                                                               |                                               |                                               |                                               |
|----|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| 11 | OBSTETRICS AND GYNAEC<br>ULTRASOUND & DOPPLER                                                                 | 1 month                                       | 15 days                                       | 1 month                                       |
| 12 | EMERGENCY RADIOLOGY-<br>FASTULTRASOUND,WHOLE BODY<br>ULTRASOUND, EMERGENCY IMAGE<br>GUIDED INTERVENTIONS,.... | Minimum 1<br>month<br>(concurrent<br>posting) | Minimum 1<br>month<br>(concurrent<br>posting) | Minimum 1<br>month<br>(concurrent<br>posting) |
| 13 | PAEDIATRIC RADIOLOGY                                                                                          | -                                             | 15 days                                       | 15 days                                       |
| 14 | NON VASCULAR IMAGE GUIDED<br>INTERVENTIONS WITH SPECIMEN<br>(SLIDE) PREPARATION AND<br>PRESERVATION           | 15 days                                       | 15 days                                       |                                               |
| 15 | MAMMOGRAM                                                                                                     | 15 days                                       | -                                             | 15 days                                       |

## II .Practical skill assessment with scores using structured skill modules

E.g. Structured skill module to demonstrate segments of the liver in the ultra sonography for radiology residence

| S.<br>NO | DEMONSTRATION                                                                  | SCORE<br>(MAX) | SCORE |
|----------|--------------------------------------------------------------------------------|----------------|-------|
| 1.       | Clinical History                                                               | 1              |       |
| 2.       | Position and proper exposure for USG                                           | 1              |       |
| 3.       | plane of scanning - inter costal and sub costal                                | 2              |       |
| 4.       | Position – supine / right anterior oblique, depends on the patient built       | 2              |       |
| 5.       | To show all the 3 hepatic veins from confluence into IVC up to margin of liver | 3              |       |
| 6.       | To show horizontal segment of right and left portal vein                       | 2              |       |
| 7.       | Gall bladder fossa, falciform ligament and IVC                                 | 3              |       |
| 8.       | To show hepatic artery and CBD at porta hepatis                                | 2              |       |
| 9.       | To identify caudate lobe                                                       | 1              |       |
| 10.      | Show divisions of right and left lobe                                          | 1              |       |
| 11.      | To identify the segment 5, 6,7 and 8                                           | 4              |       |
| 12.      | To identify the segment 2,3 and 4                                              | 3              |       |
|          | Total                                                                          | 25             |       |

Total score of 25 given and each radiology post graduate student was evaluated.

This will help both the student and training faculty to identify the mistake to specific areas and correct at ease. This will improve the confidence of the students a lot. The bias in assessment is also removed.

To device this kind of modules for each and every system / organs / modality in radiology in a feasible way to individual training institute.

Specific scores to be fixed by the institutes to allow the students to do the cases under a faculty and to allow them to handle the patients individually.

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

#### **8. COMPETENCY ASSESSMENT:**

- **OVERALL:**

|                                                                                              |    |           |
|----------------------------------------------------------------------------------------------|----|-----------|
| a) Communication / commitment / Contribution /<br>Compassion towards patients and Innovation | () |           |
| b) Implementation of newly learnt techniques / Skills                                        | () | - 5 Marks |

- Number of cases presented in Clinical Meetings/  
Journal clubs/seminars - 5 marks
- Number of Posters/Papers presented in Conferences/  
Publications and Research Projects - 5 marks
- No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings with details. - 5 marks

|              |                                   |
|--------------|-----------------------------------|
| <b>Total</b> | -----<br><b>20 Marks</b><br>----- |
|--------------|-----------------------------------|

#### PG CLINICAL COURSES

|                                             |                             |
|---------------------------------------------|-----------------------------|
| <b>VIVA including Competency Assessment</b> | <b>- 80 Marks (60 + 20)</b> |
| <b>Log Book</b>                             | <b>- 20 marks</b>           |

**ASSESSMENT SCHEDULE IS AS FOLLOWS**

| <b>Year of study</b> | <b>Period</b>   |                 |                  |                 | <b>Total<br/>Max.20 marks</b> |
|----------------------|-----------------|-----------------|------------------|-----------------|-------------------------------|
| <b>I year</b>        | <b>Upto Dec</b> | <b>10 marks</b> | <b>Upto June</b> | <b>10 marks</b> | <b>20 Marks</b>               |
| <b>II year</b>       | <b>Upto Dec</b> | <b>10 marks</b> | <b>Upto June</b> | <b>10 marks</b> | <b>20 Marks</b>               |
| <b>III year</b>      | <b>Upto Oct</b> | <b>10 marks</b> | <b>Upto Feb</b>  | <b>10 marks</b> | <b>20 Marks</b>               |
|                      | <b>AVERAGE</b>  |                 |                  |                 | <b>20 Marks</b>               |

**9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. the results of such a work shall be submitted in the form of a dissertation

The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results ,drawing conclusions and write a research paper.

Every candidate shall submit thesis plan to the university within the time frame mentioned by the university.

The dissertation shall be certified by the guide, head of the department and head of the Institution.

**As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation**

**The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.**

**A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.**

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

## 10. THEORY EXAMINATION

|           |                                                                         |
|-----------|-------------------------------------------------------------------------|
| Paper I   | Medical Radiation Physics as applied to Radio Diagnosis                 |
| Paper II  | Radio Diagnosis including Nuclear Medicine                              |
| Paper III | Radio Diagnosis Including Instrumentation and Contrast Studies          |
| Paper IV  | Radio Diagnosis including interventional Procedures and Recent Advances |

### Question Paper pattern

**Elaborate on** **2 x 15 = 30**

**Write Notes on** **10 x 7 = 70**

**Total** **-----**  
**100 marks**  
**-----**

## 11. PRACTICAL EXAMINATION

|                                                                                    |                       |
|------------------------------------------------------------------------------------|-----------------------|
| LONG CASE : (1X60 MARKS)                                                           | 60 MARKS              |
| SHORT CASE : (3 X 30 MARKS EACH)<br>Including one ULTRASOUND CASE<br>DEMONSTRATION | 90 MARKS              |
| SPOTTERS / OSCE (40 x 1.25 mark)                                                   | 50 MARKS              |
| TOTAL                                                                              | 200 MARKS (A)         |
| VIVA VOCE                                                                          | 80 MARKS (B)          |
| LOG BOOK                                                                           | 20 MARKS(C)           |
| AGGREGATE (CLINICAL+VIVA)TOTAL                                                     | 300 MARKS(A+B+C)      |
| MINIMUM REQUIRED FOR PASS (50%)                                                    | 150 MARKS             |
| DISSERTATION                                                                       | APPROVED/NOT APPROVED |

## 12. LOG BOOK

Log book should be regularly maintained, signed by the faculty supervising the area. This should represent the academic and clinical work done by the candidate. The presentations and procedures carried out by the candidate.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

**Table 1: Academic activities attended**

| Date | Type of Activity<br>CME , conferences by national societies | Particulars |
|------|-------------------------------------------------------------|-------------|
|      |                                                             |             |

**Table 2: Academic papers/posters presentation**

| Date | CME , conferences by national societies | Particulars |
|------|-----------------------------------------|-------------|
|      |                                         |             |

**Table 3: Academic presentations made by the student in the department**

| <b>Date</b> | <b>Topic</b> | <b>Type of Presentation</b><br><b>Specify Seminar, Journal Club, Presentation, UG teaching etc.</b> |
|-------------|--------------|-----------------------------------------------------------------------------------------------------|
|             |              |                                                                                                     |

**Table 4: Diagnostic and interventional procedures performed**

| <b>Date</b> | <b>Patient particulars</b> | <b>Procedure</b> | <b>Diagnosis/DD</b> | <b>Remarks/<br/>followup</b> |
|-------------|----------------------------|------------------|---------------------|------------------------------|
|             |                            |                  |                     |                              |

**Table 5: Abstract of Diagnostic and interventional procedures performed**

| <b>period</b> | <b>Procedure</b> | <b>Number seen</b> | <b>Number done</b> |
|---------------|------------------|--------------------|--------------------|
|               |                  |                    |                    |

**Table 6: Publications in Indexed Journals**

| <b>Date</b> | <b>Journal</b> | <b>Title</b> | <b>Authours</b> |
|-------------|----------------|--------------|-----------------|
|             |                |              |                 |

### **13. VIVA-MD Radiodiagnosis**

**VIVA including Competency Assessment: (60 + 20 = 80 marks)**

**60 marks Viva, 20 marks competency assessment**

**VIVA (4 X15=60 marks)**

1. RAPID FILM READING
2. INSTRUMENTS/ RADIOLOGIC PHYSICS
3. COPETENCY ASSEEMENT /CONTRAST AGENTS
4. CATHETERS/NEEDLES QUALITY CONTROL AND REGULATIONS

#### **14. SPOTTER / OSCE -Objective Structured Clinical Examination (OSCE)**

The following items in different combinations can be used as OSCE.

Medical images with a clinical scenario, asking for a diagnosis and suitable management. Digital images of medical grade high resolution are acceptable.

Contrast agents, Emergency drugs relevant to treating anaphylaxis

Interventional Radiology material

Radiology physics items ,regulatory bodies and quality assurance

#### **15. REFERENCE BOOKS**

##### **Text books of Physics:**

1. Curry,T.S. Dowdey,J.E. Murry,R.C,(1990), Christensen's introduction to the Physics of diagnostic radiology, 4th edition, Philadelphia,Lea & Febiger
2. Bushberg,S.T; Seibert,J.A; Leidholt,E.M & Boone,J.M.(1994), The essential Physics of Medical imaging, Baltimore, Williams & Wilkins
3. David J. Dowsett; Patrick A. Kenny; Eugene Johnston R. The Physics of
4. Diagnostic imaging
5. Johns,H.E.& Cunningham,J.R, The Physics of radiology, 4th edition
6. Hendee,W.R. & Ritenour,R.(1993) Medical Imaging Physics, 3rd edition
7. Dendy,P.P. & Heaton,B. Physics for diagnostic radiology, 2nd edition
8. E.Seeram, X-ray imaging equipment, An introduction
9. Hashemi,R.H. Bradley, W.G;& Lisanti C.J. MRI the basics
10. RF Farr and PJ Allisy-Roberts Physics for Medical Imaging
11. Sprawls,P; Magnetic resonance imaging principles, methods and techniques
12. Chesney,D.N. & Chesney,M.O. X-ray equipment for student radiographers
13. Chesney,D.N. & Chesney,M.O. Radiographic imaging



## **Radiology text books**

1. Diagnostic Radiology-An Anglo American Text Book of Imaging – Grainger & Allison
2. Text Book of Radiology & Imaging – Sutton
3. CT & MRI Imaging of the Whole Body –Haaga
4. Diagnostic ultrasound by- Rumack
5. Essential of skeletal Radiology – Yochum and Rowe's
6. Thoracic Imaging – W. Richard Webb & Charles B. Higgins
7. Chapman's Radiological Differential Diagnosis
8. Chapman's Radiological Procedures
9. Radiology review manual – Wolfgang Dahnert
10. Radionuclide section scanning. An atlas of clinical practice-khan
11. Alimentary tract Radiology – Abdominal Imaging – Margulies
12. Diagnostic Imaging of Neuro Radiology – Osborn
13. Christensen's physics of Diagnostic Radiology
14. Clark's Positioning Radiology – A. Stewart Whitley Charles Sloane, Craig Anderson, Graham Hoadley, Gail Jefferson, & Ken Holmes
15. Bushberg,S.T; Seibert,J.A; Leidholt,E.M & Boone,J.M.(1994), The essential Physics of Medical imaging, Baltimore, Williams & Wilkins
16. Hashemi,R.H. Bradley, W.G;& Lisanti C.J. MRI the basics
17. Sprawls,P; Magnetic resonance imaging principles, methods and techniques

REFERENCE BOOK: (Latest Editions)

1. Text Book of GastroIntestinal Radiology – Richard M.Gore
2. Head & Neck Imaging - Som & Curtin
3. Clinical Urography – Pollack
4. Diagnostic Imaging – Brain & Spine Anatomy
5. Diagnostic Imaging - Brain
6. Diagnostic Imaging - spine
7. Diagnostic Imaging - ultrasound
8. Diagnostic Imaging - abdomen
9. Diagnostic Imaging - Head & Neck
10. Diagnostic Imaging - Interventional Radiology
11. Diagnostic Imaging - Caffey's Pediatric
12. Applied Radiological Anatomy – Paul Butler, Adam W.M. Mitchell & Jeremiah C. Healy
13. Orthopedic Imaging – A Practical Approach – Adam Greenspan & Javier Beltran
14. Caffey's Paediatric X-Ray Diagnosis – Frederic Silverman
15. Abrams Angiography – Interventional Radiology – Jean-Francois H. Geschwind & Michael D. Dake
16. Callen's Ultrasonography in Obstetrics and Gynecology – Mary E. Norton, Leslie M. Scoutt, Vickie A. Feldstein
17. Breast Imaging – Daniel B. Kopans
18. Introduction to Vascular Ultrasonography – Zwiebel & Pellerito
19. A Practical Guide to Fetal Echocardiography - Normal and Abnormal. Hearts – Alfred Abuhamad & Rabih Chaoul
20. MRI of the Musculoskeletal System – Thomas H. Berquist
21. Nuclear Medicine in Clinical Diagnosis & Treatment – I.P.C Murray & P.J. Ell
22. Essentials of Nuclear Medicine Imaging

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **16. JOURNALS**

1. Radiographics
2. Radiology
3. British Journal of Radiology
4. Clinical Radiology
5. American Journal of Roentgenology
6. Radiology Clinics of North America
7. Recent Advances in Radiology and Medical Imaging
8. American Journal of Neuroradiology
9. Indian Journal of Radiology & Imaging
10. Seminars in Roentgenology
11. Journal of Ultrasound
12. JCIR (Journal of Clinical Interventional Radiology)

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## **MD RADIO-THERAPY**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**MD RADIO-THERAPY**

**1. GOAL**

The main goal of the radiation oncology residency program is to produce radiation oncologists with the necessary knowledge, skill and attitude to prevent, diagnose, manage and follow up various cancers.

**2. OBJECTIVES**

As a result of training in radiation oncology, the resident should become competent in the use of the various diagnostic methods, radiation equipments, techniques, treatment planning, radiation dose prescription, treatment verification, treatment delivery; chemotherapy administration and management of related complications.

In order to be considered a competent radiation oncologist, a resident must possess humanistic qualities, attitude and behavior necessary for the development of appropriate patient-doctor relationship.

**(A) KNOWLEDGE**

1. Proper history taking and clinical examination
2. Understand anatomy pathology and natural history of common neoplasms.
3. Learn the algorithmic approach to image these patients based on the suspected disease, its biological behavior and potential and limitations of various imaging modalities.
4. Perform appropriate investigation (both conventional and advanced methods), interpret the results and reach at a reasonable diagnosis/differential diagnosis based on the clinical and biochemical results.
5. Interpretation of results and to come up with the treatment plan for the individual.

**(B) ATTITUDE**

1. To be aware of the department protocol in the management of patient
2. To be competent enough to break the bad news
3. To be able to differentiate the radical vs palliative intent of treatment and effectively communicate with the patient and relatives
4. To communicate a balanced view of the advantages, disadvantages, risks and benefits of various forms of treatment appropriate to individual patients
5. To communicate effectively with relatives
6. To help deal with disappointment
7. To be involved in the initial management of complaints
8. To obtain consent appropriately
9. To keep good records
10. To identify priorities
11. To attempt by conscientious care to recognize problems early
12. To allocate resources and call for assistance appropriately
13. To be aware of local audits and self audit
14. Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste or religion of the patient.

**(C) SKILLS**

1. Competence in history taking, physical examination, formulating diagnosis, identifying etiology, ordering further investigation, planning comprehensive management including pharmacological treatment and radiotherapy.
2. Be familiar with literature search and computer skills.
3. Constant update of knowledge including advanced diagnostic methods and radiotherapeutic management
4. Critically review and comment on research papers and make oral presentations.
5. Prepare research protocols, conduct experimental studies analyze and solve clinical and experimental problems.

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

#### **Theoretical Knowledge**

1. A student should have good knowledge of basic sciences as applied to Clinical Oncology and Radiotherapy and medical physics.
2. Should acquire in-depth knowledge of Cancer diagnosis, staging, management and follow up including recent advances.
3. Should have basic knowledge to identify co-existing physical, social, economical and psychiatric problems.
4. Should be knowledgeable about cancer registry, National health care plans for NCDs, national cancer control program at various levels of health sectors, preventive oncology, various cancer screening methods and their implications.
5. Should be knowledgeable about epidemiology of cancers and preventive oncology including various cancer screening methods and their implications.

#### **Practical and Clinical Skills**

1. Competence in history taking, physical examination, formulating diagnosis, identifying etiology, ordering further investigation, planning comprehensive management including pharmacological treatment and radiotherapy.
2. Competency in various radiotherapy planning process including simulation, imaging contouring, treatment calculation, verification and delivery with or without supervision
2. Develop effective communication skills including breaking bad news and counselling during end of life care
3. Acquire skills to lead a multi disciplinary team of nurses, Medical Physicists and Technologists and social workers

Teaching: He / she should learn the basic methodology of teaching and develop competence in teaching medical and paramedical students.

#### **Writing Thesis/Research Articles**

Research: He / she should know the basic concepts of the research methodology, and plan a research project. Basic knowledge of statistics is also required.

## **Attitudes including Communication Skills**

### **HUMAN VALUES, ETHICAL PRACTICE AND COMMUNICATION ABILITIES:**

1. Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste or religion of the patient.
2. Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
3. Provide leadership and get best out of his team in a congenial working atmosphere.
4. Apply high moral and ethical standards while carrying out human or animal research.
5. Be humble and accept limitations in his knowledge and skill and to ask for help from colleagues when needed.
6. Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.
7. Be able to work in a multidisciplinary team, communicate and guide management with the team.

## **Training in Research Methodology, Medical Ethics /Bioethics and Medicolegal aspects**

### **Research in Oncology**

- 1.1 How to conduct a research
- 1.2 Guidelines for biomedical research: Animal studies, drug studies, human trial
- 1.3 Cancer clinical trials. Phase I/II, III
- 1.4 Ethics of clinical research
- 1.5 Evidence based medicine

**BIOSTATISTICS:** Basic principles and concepts of biostatistics as applied to health sciences - basic concepts of probability, mean, standard deviation, binomial expression, Analysis of variance, Co-efficient of correlation, Chi square test, Parametric data, Non parametric data, Regression Analysis, ROC curve, evaluation of a new diagnostic procedure etc.,.

**Medical Ethics –** Autonomy & Consent, Equality, Justice & Equity, Privacy & Confidentiality, Benefit & Harm, Human dignity & Human rights, Vulnerable population, Gender disparity and protection, Ethics & Professionalism



- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.
- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
- Medical ethics/bioethics, moral and legal issues and Medical audit are part and parcel of the curriculum and syllabus.

#### **4. THEORY SYLLABUS**

##### **1. BASIC SCIENCES**

##### **1.1 Anatomy**

- 1.1.1 Knowledge of surface anatomy pertaining to Oncology
- 1.1.2 Knowledge of the anatomy of all organs
- 1.1.3 Knowledge of the lymphatic system of all regions
- 1.1.4 Practical familiarity with the radiographic appearance
- 1.1.5 Cross sectional anatomy

##### **1.2. Pathology**

1.2.1 Definitions of & distinction between different types of growth disorders (i.e. Distinction between hyperplasia, hypertrophy, regeneration, malformation & neoplasia)

##### **1.2.2 Malignant transformation**

- a) Initiation & promotion stages of carcinogenesis
- b) Mode of origin - monoclonal, polyclonal, unifocal, multifocal
- c) Structural & functional changes in the cellular components

##### **1.2.3 Apoptosis and cell signaling pathways**

##### **1.2.4 Mechanisms of spread**

##### **1.2.5 Local effects of tumors**

##### **1.2.6 Local & systemic reactions to tumors**

##### **1.2.7 Effects of therapy on tumors & normal tissues**

##### **1.2.8 Criteria for tumor diagnosis - macroscopic, histological & cytological uses & value of biopsy material**

##### **1.2.9 Nomenclature - solid tumors, lymphomas, leukemias**

##### **1.2.10 Classification of tumors**

##### **1.2.11 Structure & organization of tumors - vascular supply, stroma etc.**

##### **1.2.12 Systems of grading**

##### **1.2.13 Tumor Markers**

##### **1.2.14 Tumor Immunology**

##### **1.2.15 Cytogenetics, Molecular Pathology and Immunohistochemistry**

### 1.3. Radiation Oncology Physics

The aim of this subject is to provide the future Clinical Oncologist with the knowledge of physics required in clinical practice. An understanding of the principles of planning & carrying out treatment is a necessary prerequisite & will be enhanced by the study of this subject.

A familiarity with the physics of atomic structure & electromagnetic radiation will also be required in order to understand parts of the syllabus. As they are studied they should be analyzed critically with respect to their implications for accurate dose delivery in clinical radiation therapy.

Applicability limitations, advantages, & disadvantages of the various devices & techniques should receive particular attention. Candidates should be encouraged to observe & gain practical experience with the equipment & techniques used in radiotherapy in clinical oncology departments.

- 1.3.1 Structure of Matter
- 1.3.2 Nuclear Transformations
- 1.3.3 Production of X-rays
- 1.3.4 Radioactivity
- 1.3.5 Interaction of Radiation with Matter
- 1.3.6 Interaction of particle beam
- 1.3.7 Measurement of Radiation – Radiation quantities and units
- 1.3.8 Radiation detection and measurements
- 1.3.9 Radioisotopes and Radiotherapy Equipments
- 1.3.10 Principles of Radiologic physics, Dosimetry and Treatment Planning
- 1.3.11 Photon External Beam Dosimetry and Treatment Planning
- 1.3.12 Physics, Biology and Dosimetry of Brachytherapy
- 1.3.13 Clinical Applications of Brachytherapy –LDR, HDR and PDR
- 1.3.14 Electron Beam Therapy- Dosimetry, Planning and Techniques
- 1.3.15 Particle Beam Therapy- Dosimetry and Techniques
- 1.3.16 Three Dimensional Conformal Radiation Therapy- Physics, Treatment Planning and Clinical Aspects
- 1.3.17 Intensity Modulated Radiation Treatment, Planning and Clinical Application
- 1.3.18 Particle Beam Radiotherapy: Clinical Perspectives
- 1.3.19 Magna Field Irradiation
- 1.3.20 Intraoperative Radiation Therapy
- 1.3.21 Stereotactic Irradiation
- 1.3.22 Nonsealed Radionuclide Therapy
- 1.3.23 Radioimmunoglobulins in Cancer Therapy
- 1.3.24 Quality Assurance in radiotherapy (QART)
- 1.3.25 Radiation Protection and Regulatory Aspects
- 1.3.26 Errors and correction in radiotherapy delivery
- 1.3.27 Image Guided Radiotherapy (IGRT) and Clinical Aspects
- 1.3.28 Recent Advancements in Radiation Oncology

#### 1.4. Radiobiology

- 1.4.1 The Physics and Chemistry of Radiation Absorption
- 1.4.2 DNA Strand Breaks and Chromosomal Aberrations
- 1.4.3 Cell Survival Curves
- 1.4.4 Radiosensitivity and Cell Age in the Mitotic Cycle
- 1.4.5 Repair of Radiation Damage and the Dose Rate Effect
- 1.4.6 The Oxygen Effect and Reoxygenation
- 1.4.7 Linear Energy Transfer and Relative Biological Effectiveness
- 1.4.8 Acute Effects of Total Body Irradiation
- 1.4.9 Cell Tissue and Tumor Kinetics
- 1.4.10 Predictive Assay
- 1.4.11 Radiation Carcinogenesis
- 1.4.12 Hereditary Effects of Radiation
- 1.4.13 Effects of Radiation on the Embryo and Fetus
- 1.4.14 Molecular Techniques In Radiobiology
  - 1.4.15 Dose Response Relationship for Model Normal Tissues
  - 1.4.16 Effect of Radiation on Normal Tissues
  - 1.4.17 Time, Dose and Fractionation in Radiotherapy
  - 1.4.18 Alternative Radiation Modalities
  - 1.4.19 Radioprotectors
  - 1.4.20 Radiosensitizers and Bio-reductive Drugs
  - 1.4.21 Hyperthermia
  - 1.4.22 Immunomodulation of Radiotherapy

#### 1.5 Clinical trials - Statistical basis for planning & interpretation

##### 1.5.1 Clinical Trials

- a) Advantages & disadvantages
- b) Retrospective & Prospective studies
- c) Controlled & uncontrolled trials
- d) Single-blind & double-blind studies
- e) Phase I, II & III trials and metaanalysis
- f) Ethics

##### 1.5.2 Planning a trial

- a) Establishing objectives- short term and long term
- b) Determining the appropriate criteria.
- c) Establishing grounds for inclusion and exclusion of patients
- d) Calculation on sample size
- e) Determining the treatment schedules and any appropriate modifications
- f) Determining the method of allocation of treatments; the allocation ratio and the method and timing of randomization
- g) Determining what measures are to be taken, how they will be taken, who will take them, at what time(s) and where they will be recorded
- h) Designing the appropriate forms of documentation
- i) Determining the proposed duration of the trial, either in terms of a fixed closing date, or the entry of a pre-determined number of patients.

- j) Establishing conditions under which the trial may be terminated earlier than planned & procedures for detecting these conditions.
- k) Re-assessing the proposed trial in terms of ethics, appropriateness to the short & long term objectives, feasibility & the availability of resources.
- l) Writing the protocol
- m) Running a pilot study

### 1.5.3 Reporting and Publishing a clinical trial

- a) Types of publications
- b) Collating data
- c) Drafting a manuscript
- d) Responding to review
- e) Ethics of publication and plagiarism

## 2. PRINCIPLE OF ONCOLOGY

### 2.1 Etiology of Cancer

- a) Genetic predisposition, congenital syndromes
- b) Chromosomal abnormalities, hereditary tumours
- c) Protooncogenes, oncogenes, tumor suppressor genes,
- d) Multifactorial causation
- e) Nutritional aspects in cancer causation and prevention.
- f) Environmental causes of cancer
- g) Biological - protozoal, bacterial, viral
- h) Chemical - Classes of carcinogenic chemicals, smoking
- i) Physical - trauma, irradiation (UV rays, other electromagnetic radiation including X rays and Gamma rays and particulate radiations)
- j) Occupational cancers.

### 2.2 Epidemiology of Cancer

### 2.3 Cancer Screening and Prevention

### 2.4 Cancer Registries & National Cancer Control Programme

### 2.5 Cancer Chemotherapy

- a) Classification and mode of action of cytotoxic drugs
- b) Pharmacokinetics and Pharmacodynamics
- c) Principles of combinations of therapy, dose response curves, sequential and concomitant chemotherapy, sanctuary sites, high dose chemotherapy, and regional chemotherapy
- d) Standard chemotherapy schedules
- e) Drug administration and Precautions in the safe handling of cytotoxic drugs
- f) Drug Toxicity
- g) Supportive care for chemotherapy
- h) Resistance to Chemotherapy
- i) Basic concepts of Chemotherapy and Irradiation Interaction
- j) Specialised chemotherapy administration techniques

## 2.6 Cancer Biotherapeutics

- a) Hormonal Therapy
- b) Differentiation Agents
- c) Monoclonal Antibodies
- d) Interferons
- e) Interleukins
- f) Antiangiogenesis Agents
- g) Molecular Targeted Therapy
- h) Vaccines
- i) Gene Therapy
- j) Metronomic therapy

## 2.7 Imaging in Oncology

- a) Clinical utility of Ultrasound imagers
- b) X ray based imaging modalities in Oncology
- c) MRI and functional imaging in oncology
- d) Biological imaging modalities

## 2.8 Pharmacogenomics

# 3. CLINICAL RADIOTHERAPY, CHEMOTHERAPY AND TARGETED THERAPY IN MANAGEMENT OF MALIGNANCIES

## 3.1 Skin Cancer

## 3.2 Central Nervous System Tumor/ orbital tumors/Spinal tumors

## 3.3 Head and Neck Tumors

## 3.4 Thoracic Tumors

## 3.5 Breast Tumors

## 3.6 Gastrointestinal Tumors

## 3.7 Liver, Gall bladder , bile duct and pancreatic tumors

## 3.8 Pediatric Tumors

## 3.9 Gynecologic Tumors

## 3.10 Male Genitourinary Tumors

## 3.11 Urinary Tract Tumors

## 3.12 Endocrine Tumors

## 3.13 Hematological Malignancies –Leukemias, lymphomas and Plasma cell neoplasm

## 3.14 Sarcomas of Bone and Soft tissues

## 3.15 Metastasis of Unknown Origin

## 3.16 AIDS related Malignancies

## 3.17 Oncologic Emergencies

## 3.18 Endocrine aspects of malignancy:- production of hormones by tumors, effect of hormones on tumors, paracrine effects of tumors

## 3.19 Paraneoplastic syndromes

## 3.20 Benign Diseases

## 3.21 Hereditary cancer syndromes

#### 4. OTHER DISCIPLINES ALLIED TO RADIOTHERAPY AND ONCOLOGY

##### 4.1 Surgical Oncology

4.1.1 Basic principles of surgical oncology, biopsy, conservation surgery, radical surgery, palliative surgery

4.1.2 Basics of surgical techniques - head & neck, breast, thorax, abdomen, gynecological, genitourinary, musculoskeletal, CNS

4.1.3 Combined treatments: with radiotherapy, chemotherapy, and hormone therapy

##### 4.2 Rehabilitation

##### 4.3 Complementary alternative medicine

#### 5. PALLIATIVE CARE

##### 5.1 Guidelines for palliative care

##### 5.2 Symptoms of advanced cancer

##### 5.3 Different pharmacologic & non-pharmacologic methods

##### 5.4 Pain control, WHO guidelines for adults & children

##### 5.5 Palliative radiotherapy

##### 5.6 Palliative chemotherapy

##### 5.7 Home care

##### 5.8 Hospice care

##### 5.9 Physical, social, spiritual & other aspects

#### 6. RESEARCH, TRAINING & ADMINISTRATION

##### 6.1 Research in Oncology

###### 6.1.1 How to conduct a research

###### 6.1.2 Guidelines for biomedical research: Animal studies, drug studies, human trial

###### 6.1.3 Cancer clinical trials. Phase I/II, III

###### 6.1.4 Ethics of clinical research

###### 6.1.5 Evidence based medicine

##### 6.2 Training Programme in Radiotherapy and Oncology

6.2.1 Participation in the daily routine work of the department including work rounds of patients admitted for radiotherapy, symptomatic treatment for acute and late radiation reactions, administration of cytotoxic drugs, management of chemotherapy induced side effects and complications, cancer pain management and palliative care.

6.2.2 Presentation of cases in the reporting sessions of the department

6.2.3 Participation in various procedures and techniques (e.g. Simulation and Treatment Planning; Mould Room Procedures etc.) External Beam Radiotherapy- 2-D & 3- DCRT, IMRT; Brachytherapy- Interstitial, Intracavitary, Intraluminal, Surface;

6.2.4 Active participation in the Tumor Board meetings with other departments for case discussions.

6.2.5 Junior Residents in Radiotherapy must undergo 3 months peripheral postings in other specialities during their 3 years course towards M.D.

6.2.6 Participation in CME-conference, symposium, workshop, seminar

6.2.7 Active participation in teaching and training programme of undergraduate students, allied health students and oncology nurses.

6.3 Administration in Radiotherapy and Oncology

6.3.1 Clinical Oncologist's role as an administrator.

6.3.2 How to set up a Radiotherapy and Oncology department, planning of infrastructure, & equipments

6.3.3 Role in cancer control programme.

6.3.4 Responsibilities towards radiation safety & quality assurance.

6.3.5 Administration aspects of training, academic, patient care & research.

6.3.6 Cancer screening programmes

6.3.7 Cancer Registries

## **5. TEACHING LEARNING METHODS (including Clinical Study)**

Didactic lectures are of least importance; Seminars, Journal clubs, Symposia, Reviews and Guest lectures should get priority for theoretical knowledge.

a) Didactic lectures:

Didactic lectures in Radiation Physics, Radiation Protection and Quality Control

b) Seminars:

There should be a weekly seminar attended by the residents as well as the faculty in which the junior residents present material on assigned topic in rotation. It should be followed by discussion in which all trainees are supposed to participate.

c) Case conference:

A case conference should be held every week where a junior resident prepares and presents a case of academic interest by rotation and it is attended by all the members of the department.

d) Journal club:

Journal club is held every week in which a junior resident presents a critical evaluation of a research paper from a journal.

e) Research Forum:

There should be a monthly meeting of one hour each in which the residents present their plan of research as well as the report of the completed work of their projects to the faculty, resident and non-medical professionals who make critical comments and suggestions.

f) Case presentations:

New inpatient and outpatient cases should be routinely worked up in detail by the residents and discussed with the consultant. They are also encouraged to bring their follow up patients to the consultant for presentation and discussion. In addition, the residents are required to present case material at ward rounds.

g) Attendance at Multi-Disciplinary tumor board Team Meetings as applicable

h) Clinical audits including radiation chart audits

## 6. STRUCTURED TRAINING PROGRAMME

Posting Schedule Total Duration: 3 years

| First Year<br>(In Rotation) | Second Year<br>(In Rotation)                                        | Third Year<br>(In Rotation) |
|-----------------------------|---------------------------------------------------------------------|-----------------------------|
| Ward Posting –Monthly       | OPD Posting – Monthly                                               | OPD Posting – Monthly       |
| OPD Posting- Monthly        | Ward Posting – Monthly                                              | Ward Posting – Monthly      |
|                             | Simulator Planning –<br>Monthly                                     | Simulator Planning- Monthly |
| Conventional RT planning    | Conventional and<br>conformal RT planning<br>Brachytherapy- Monthly | Brachytherapy- Monthly      |
|                             | Special RT procedures-<br>TBI/SRT/SRS observation                   |                             |
| Tumor Board Meetings        | Tumor Board Meetings                                                | Tumor Board Meetings        |

### Peripheral Postings

- |                       |            |
|-----------------------|------------|
| 1.Surgical Oncology   | - 1 month  |
| 2.Medical Oncology    | - 1 month  |
| 3.E.N.T.              | - 15 days. |
| 4.Radiology           | - 15 days  |
| 5.IMRT/3DCRT Training | - 1 month. |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**



## 8. COMPETENCY ASSESSMENT:

- **OVERALL:**

- a) Communication / commitment / Contribution / Compassion towards patients and Innovation ( ) - 5 Marks
- b) Implementation of newly learnt techniques/skills ( )

- Number of cases presented in Clinical Meetings/ Journal clubs/seminars - 5 marks

- Number of Posters/Papers presented in Conferences/ Publications and Research Projects - 5 marks

- No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks

Total 20 Marks

### PG CLINICAL COURSES

- VIVA including Competency Assessment - 80 Marks (60 + 20)
- Log Book - 20 marks

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total Max.20 marks |
|---------------|----------|----------|-----------|----------|--------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks           |
|               | AVERAGE  |          |           |          | 20 Marks           |

## 9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES:

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

#### **10. THEORY EXAMINATION:**

**Paper I- Medical Radiation Physics as applied to Radiotherapy and Radiation Biology**

**Paper II- General Principles of Radiotherapy including Radiobiology and Oncology**

**Paper III- Clinical Practice and Technique of Radiotherapy**

**Paper IV- Cancer Chemotherapy & Recent developments in Clinical Oncology & Radiotherapy**

**Question Paper pattern: PAPER I, II, III & IV**

|                     |                    |
|---------------------|--------------------|
| <b>Elaborate on</b> | <b>2 x 15 = 30</b> |
|---------------------|--------------------|

|                       |                    |
|-----------------------|--------------------|
| <b>Write Notes on</b> | <b>10 x 7 = 70</b> |
|-----------------------|--------------------|

|              |                  |
|--------------|------------------|
| <b>Total</b> | <b>100 marks</b> |
|--------------|------------------|

## 11. PRACTICAL EXAMINATION

REFERENCE- 218<sup>th</sup> GC dt 28.03.2013

### MD RADIOTHERAPY

#### CLINICALS

|                                    |                   |
|------------------------------------|-------------------|
| LONG CASE - (1 X 100 MARKS)        | 100 MARKS         |
|                                    |                   |
| SHORT CASE - (2 X 25 MARKS EACH)   | 50 MARKS          |
|                                    |                   |
| PRACTICALS – RADIOTHERAPY PLANNING | 25 MARKS          |
|                                    |                   |
| OSCE (5 marks x 5 stations)        | 25 MARKS          |
|                                    |                   |
| TOTAL                              | 200 MARKS (A)     |
|                                    |                   |
| VIVA VOCE                          | 80 MARKS (B)      |
|                                    |                   |
| LOG BOOK                           | 20 MARKS (C)      |
|                                    |                   |
|                                    |                   |
| AGGREGATE (CLINICAL + VIVA) TOTAL  | 300 MARKS (A+B+C) |
|                                    |                   |
|                                    |                   |
| MINIMUM REQUIRED FOR PASS (50%)    | 150 MARKS         |
|                                    |                   |
| DISSERTATION                       | APPROVED / NOT    |
|                                    | APPROVED          |
|                                    |                   |

## 12. LOG BOOK

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

Following details will be entered:

1. Treatment planning and procedures performed
2. Presentation in departmental seminars
3. Cases presented in clinical meetings
4. Presentations in journal clubs along with Title, Journal & Issue.
5. Schedule of intradepartmental rotation
6. Details of peripheral postings
7. Conferences attended – National/International
8. Posters presented in the conference
9. Papers presented at conferences with title name of the conference, date of presentation
10. Paper published with title, name & issue of the journal

#### **11. Physics Practical**

- a. Output measurement
- b. Determination of optical and radiation field congruence
- c. Determination of % depth dose for cobalt beam
- d. Verification of inverse square law
- e. Quality Assurance in Radiotherapy

#### **13. VIVA including Competency Assessment**

VIVA including Competency Assessment

- 80 Marks (60 + 20)

Prevention, Screening, Clinical trials, Radiation protection, Cancer Registry, National Cancer Control Programme, Oncological emergencies, Benign disease and RT, Paediatric malignancies, Recent advances.

#### **14. OSCE**

1. Pathological specimens /Histopathology slides
  2. X-ray films, CT and MR Images
  3. Isodose charts
  4. Cases
  5. Medical Physics Instruments and Brachytherapy Applicators
  6. Chemotherapeutic agents
  7. Dosimetry and QA reports
  8. Plan evaluation reports / Colour wash / DVH
- Spotters- Identification and Description

## 15. REFERENCE BOOKS

### SUGGESTED BOOKS AND AUTHORS

1. Principle & Practice of Radiation Oncology Carlos Perez 6<sup>th</sup> Edn, 2013 Halperin
2. Cancer (2 Volumes) Devita 10<sup>th</sup> Edn, 2012 LWW
3. ACS Textbook of Clinical Oncology Murphy 2<sup>nd</sup> Edn
4. The Physics of Radiation Therapy Faiz M Khan
5. Radiobiology For The Radiologist Eric J. Hall 6<sup>th</sup> Edn LWW
6. AJCC Cancer Staging Handbook, American Cancer Society, 7<sup>th</sup> Edn, 2010 Springer Verlag
7. The Physics of Radiology H.E.Johns 4th Charle.C.Thomas
8. The Physics of Modern Brachytherapy in Oncology Baltas 1<sup>st</sup> Edn, 2007 Taylor & Fracis
9. Clinical Oncology Abeloff 3<sup>rd</sup> Edn, 2004 Elsevier
10. Practical Essentials of Intensity Modulated Radiation Therapy Chao 2<sup>nd</sup> Edn, 2005 LWW
11. Textbook of Radiation Oncology Principles and Practice G. K. Rath 2<sup>nd</sup> Edn Elsevier
12. Radiation Therapy Planning Bentel Gunilla C McGraw-Hil
13. Clinical Radiation Oncology Gunderson 2<sup>nd</sup> Edn, 2007 Elsevier
14. Principles and Practice of Radiation Therapy: Introduction to Radiation Therapy C. Washington 2<sup>nd</sup> Edn Elsevier
15. Intensity modulated radiation therapy: a clinical perspective Arno J. Mundt PMPH-USA
16. Handbook of Evidence-based Radiation Oncology Eric K. Hansen
17. Fundamental Physics of Radiology Meredith & Massey
18. The Manual of Clinical Oncology Casciato 5<sup>th</sup> Edn.2004 LWW
19. Clinical Target Volumes in Conformal and Intensity Modulated Radiation Therapy V. Gregorie
20. Textbook of Radiation Oncology L. Phillips Elsevier
21. Bethdsa Hand Book of Clinical Oncology Abraham 2<sup>nd</sup> Edn, 2005 LWW
22. Treatment Planning in Radiation Oncology Faiz M Khan 2<sup>nd</sup> Edn, 2007 LWW
23. Diagnostic and Surgical Imaging Anatomy H.RicHarnsberger 1<sup>st</sup> Edn, 2006 LWW
24. Cancer- Diagnosis and Management Ackermann
25. Text Book of Radiotherapy G. Fletcher
26. Surface and Radiological Anatomy A. Halim
27. Essentials of Surface and Radiological Anatomy V. Kapur
28. Handbook of Radiation Oncology: Basic Principles and Clinical Protocols Bruce Haffty

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## 16. JOURNALS

### SUGGESTED JOURNALS

1. Annals of Oncology
2. British Journal of Cancer
3. Cancer Wiley
4. Cancer Genetics and Cytogenetics Elsevier
5. Clinical Oncology (R Coll Radiol) Elsevier
6. European Journal of Cancer Elsevier
7. Gynecologic Oncology
8. Journal of cancer research and therapeutics Medknow
9. Journal of medical physics Medknow
10. Indian Journal of Cancer Indian J Cancer
11. International Journal of Cancer Int J Cancer Wiley
12. International Journal of Clinical Oncology Springer-Verlag
13. International Journal of Gynecological Cancer Blackwell
14. International Journal of Oncology
15. International Journal of Radiation Oncology, Biology, and Physics Elsevier
16. Journal of Cancer Research and Clinical Oncology Springer-Verlag
17. Journal of the National Cancer Institute OUP
18. Lancet
19. The Lancet Oncology
20. New England Journal of Medicine
21. Radiation Oncology Investigations Wiley
22. Radiation Research
23. Radiotherapy and Oncology Elsevier
24. Recent Results in Cancer Research Springer-Verlag
25. Seminars in Oncology Saunders
26. Seminars in Radiation Oncology Saunders
27. Radiation Oncology

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**M.D RESPIRATORY MEDICINE**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.D RESPIRATORY MEDICINE  
BRANCH XVII**

**1. GOAL**

To train post graduate medical students in the specialty of respiratory medicine in different medical institutions with the common broad based curriculum.

To train post graduate in respiratory medicine to undergo training in research methodology so as to make them understand ways and means to take their dissertation and clinical research in a more scientific manner.

To enable them to become efficient teachers to undergraduates, para-medical, Nursing Post graduate students in the speciality of respiratory medicine.

To sensitize them to take part in National programme and community intervention including respiratory medicine, so that they are sensitive to the needs of the society.

To Train them to conduct interactive meeting with public

To instill confidence in them in problem solving approach while managing various clinical scenario

To train them in holistic approach in preventive, curative and re-habilitative aspects of respiratory medicine.

**2. OBJECTIVES:**

**A) Knowledge**

The students are expected to get trained in basics of anatomy, Embryology, physiology, Bio-Chemistry, Bio-Ethics, Micro-Biology, Pathology related to respiratory medicine.

To make them understand the patho physiology of various respiratory ailments.

They should be adequately trained to recognize and diagnose various respiratory ailments and epidemics involving respiratory pathogens.

To train them to handle various respiratory emergencies independently with available recourses.

To train them in research work publication, and presentation of scientific papers.

To train them in bio-statistics.



## **B) Attitude**

To train them in communicative skills to interact with patients and their relatives with their colleagues so as to make them responsible physicians.

To instill inter-disciplinary approach among them so as to make them capable to interaction with other speciality departments, Nursing and para-medical personnel

To instill them the concept of team work in their day to day activities to deliver better patient care.

## **C) Skills**

Able to perform and interpret procedures like Thororacostomy, Polysomnography, Spirometry, Bronchoscopy , USG chest, DLCO, Medcal Thoracoscopy etc.,

To be trained in ventillatory assistance and manage critically Ill-patients in IRCU.

To be trained in re-habilitative medicine and palliative care in respiratory medicine.

## **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

### **• THEORETICAL KNOWLEDGE**

#### **a) Basic sciences:**

To train them in basic sciences pertaining to respiratory medicine

Knowledge about clinical respiratory medicine.

To train them in understating Co-morbid conditions involving other specialties like cardiology, Nephrology , Neurology etc.,

### **• PRACTICAL AND CLINICAL SKILLS**

Elaborate history taking and clinical examination  
To train them in diagnostic procedures like

- Diagnostic Pleurocentesis
- Medical Thorocoscopy
- Performing and interpreting ABGA
- Performing and interpretation of Spiro-metry
- Performing and interpretation of DLCO and sleep study
- Training in USG of pleural spaces
- Intubation and NIV

- **WRITING THESIS/ RESEARCH ARTICLES**

To be trained in research methodology operational research and clinical research during first academic year

To be trained in gathering and compiling data analysis, designing a research protocol and executing research work

To be trained in the critical appraisal of journal articles

**ATTITUDES INCLUDING COMMUNICATION SKILLS**

To be trained in communication skills in case presentation, clinic-pathological discussion, seminars and small conferences

The post graduates should be trained in effective communication skills to deal with the colleagues, patients, patients relatives and with the general public

To instill empathy in patient care and delivery of health services.

**TRAINING IN RESEARCH METHODOLOGY, MEDICAL ETHICS, BIO-ETHICS AND MEDICO LEGAL ASPECTS**

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, moral and legal issues, medical audit are part and parcel of the curriculum and syllabus.

The students should be trained in bio-ethics so that they are aware of the human rights, human dignity and patients rights, to interact with medico legal issues involving respiratory medicine and practice safe health measures, to be trained in computer application to search medical literature with medical evidence from internet

#### **4. Theory syllabus**

##### **Anatomy**

- Clinical and applied anatomy of the respiratory tract
- Histology of the respiratory system
- Embryology of the lung
- Ultrastructure details including electron microscopy of the lung
- Radiographic anatomy of the thorax

##### **Physiology**

- Lung physiology
  - Ventilation
  - Lung mechanics
  - Blood gas transfer
  - Control of respiration
  - Diffusion and compliance
  - Airway resistance
  - Body plethysmography
- Physiology of sleep medicine
- High altitude physiology
- Respiratory reflexes
- Non respiratory functions of the lung

##### **Pathology**

- Pathology of various respiratory ailments
- Analysis of samples for cytology, biopsy, immunohistochemistry etc.

##### **Microbiology**

- Bacterial respiratory pathogens
- Viral pathogens
- Mycobacterium tuberculosis
- Atypical mycobacteria
- Applied respiratory clinical microbiology
- Staining procedures like Ziehl-Neelsen, Auramine fluorescence staining, LED microscopy
- Advanced molecular diagnostics
- Culture methods, radioimmunoassay
- Serological evaluations
- Infection control practices and air-borne infection control

##### **Pharmacology**

- Drugs used in respiratory medicine
- Pharmacovigilance and reporting of ADR
- Newer drugs
- Cancer chemotherapy agents for lung malignancy

## **Biochemistry**

- **Respiratory acidosis, alkalosis,**
- **Acid base balance**
- **Pulmonary surfactants**

## **Respiratory diseases**

- **Clinical approach to signs and symptoms in respiratory medicine**
- **Diagnostic procedures**
- **Congenital respiratory abnormalities**
- **Infectious diseases of respiratory system**
- **Occupational lung diseases**
- **Immunological lung disorders**
- **Airway diseases**
- **Disorders of pulmonary circulation**
- **Sleep disordered breathing**
- **Lung malignancy**
- **Mediastinal diseases**
- **Disorders of pleura**
- **Acute and Chronic respiratory failure**
- **Critical care of lung conditions including ECMO**
- **Management of bio-terrorism and respiratory epidemics**
- **Surgical management of respiratory diseases**
- **Pulmonary rehabilitation and palliative care**
- **Vaccination against lung infections**
- **Geriatric lung care**
- **Smoking cessation, prevention of environmental pollution**
- **National programs and policies**
- **Lung transplantation protocols**
- **Bio-ethics**

## **5. Teaching learning methods (including clinical study)**

**Following teaching learning methods are recommended**

- **Lectures**
- **Case based discussions**
- **Bed side clinics**
- **Teaching on ward rounds**
- **Seminars**
- **Journal clubs**
- **Problem based learning**
- **Training in medical/death audits**
- **Health economics**
- **Telemedicine wherever available**

## **6. Structured training program MD respiratory medicine 3 years**

### **First year**

|                                         |                 |
|-----------------------------------------|-----------------|
| <b>Respiratory medicine</b>             | <b>6 months</b> |
| <b>General medicine</b>                 | <b>1 month</b>  |
| <b>Anesthesia/IRCU</b>                  | <b>1 month</b>  |
| <b>IMC</b>                              | <b>15 days</b>  |
| <b>Radiology</b>                        | <b>15 days</b>  |
| <b>Thoracic surgery</b>                 | <b>15 days</b>  |
| <b>Radiology</b>                        | <b>15 days</b>  |
| <b>Pediatrics</b>                       | <b>15 days</b>  |
| <b>Medical oncology</b>                 | <b>15 days</b>  |
| <b>Radiotherapy</b>                     | <b>15 days</b>  |
| <b>HIV medicine/infectious diseases</b> | <b>15 days</b>  |

### **2<sup>nd</sup> year**

|                                       |                 |
|---------------------------------------|-----------------|
| <b>Respiratory medicine</b>           | <b>9 months</b> |
| <b>IMC</b>                            | <b>15 days</b>  |
| <b>IRCU</b>                           | <b>1 month</b>  |
| <b>General medicine</b>               | <b>1 month</b>  |
| <b>Social and preventive medicine</b> | <b>15 days</b>  |

### **3<sup>rd</sup> year**

|                                                             |                  |
|-------------------------------------------------------------|------------------|
| <b>Respiratory medicine</b>                                 | <b>10 months</b> |
| <b>IMCU/IRCU</b>                                            | <b>1 month</b>   |
| <b>Radiology</b>                                            | <b>15 days</b>   |
| <b>Physical medicine and rehabilitation/Palliative care</b> | <b>15 days</b>   |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## 8. COMPETENCY ASSESSMENT:

- |                                                                                                                       |     |                 |
|-----------------------------------------------------------------------------------------------------------------------|-----|-----------------|
| • <b>OVERALL:</b>                                                                                                     |     |                 |
| a) Communication / commitment / Contribution /                                                                        | ( ) |                 |
| Compassion towards patients and Innovation                                                                            | ( ) | - 5 Marks       |
| b) Implementation of newly learnt techniques/skills                                                                   | ( ) |                 |
|                                                                                                                       |     |                 |
| • Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars                                           |     | - 5 marks       |
|                                                                                                                       |     |                 |
| • Number of Posters/Papers presented in Conferences/<br>Publications and Research Projects                            |     | - 5 marks       |
|                                                                                                                       |     |                 |
| • No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic meetings with details. |     | - 5 marks       |
|                                                                                                                       |     | -----           |
| <b>Total</b>                                                                                                          |     | <b>20 Marks</b> |
|                                                                                                                       |     | -----           |

## PG CLINICAL COURSES

- |                                             |                             |
|---------------------------------------------|-----------------------------|
| <b>VIVA including Competency Assessment</b> | <b>- 80 Marks (60 + 20)</b> |
| <b>Log Book</b>                             | <b>- 20 marks</b>           |

**ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

### **9. Dissertation and University Journal of Medical Sciences:**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

#### **10. Theory exams**

**MD respiratory medicine – 4 papers**

**Paper I – Applied Basic Sciences in Tuberculosis and Respiratory Diseases**

**Paper II– Tuberculosis (Pulmonary and Extra pulmonary)**

**Paper III – Non-Tuberculosis Chest Diseases**

**Paper IV – Recent Advances in Tuberculosis and Chest Diseases**

#### **Question paper Pattern:**

|           |                |                    |
|-----------|----------------|--------------------|
| Paper I : | Write notes on |                    |
| i.        | Anatomy        | 4 x 5 = 20         |
| ii.       | Physiology     | 4 x 5 = 20         |
| iii.      | Biochemistry   | 3 x 5 = 15         |
| iv.       | Pharmacology   | 3 x 5 = 15         |
| v.        | Pathology      | 3 x 5 = 15         |
| vi.       | Microbiology   | 3 x 5 = 15         |
|           | <b>Total</b>   | <b>= 100 marks</b> |

|                      |                |                    |
|----------------------|----------------|--------------------|
| Paper II, III & IV : |                |                    |
| i.                   | Elaborate on : | 2 x 15 = 30        |
| ii.                  | Write notes on | 10 x 7 = 70        |
|                      | <b>Total</b>   | <b>= 100 marks</b> |

## 11. Practical examination pattern

|                                                              |                  |
|--------------------------------------------------------------|------------------|
| Long case (1 X 45 min) (1 X 80 marks)                        | 80 marks         |
| Short cases (2 X 15) (2 X35 marks each)                      | 70 marks         |
| Ward rounds/Case discussion (3 X 5min)<br>(3 X10 marks each) | 30 marks         |
| OSCE 4 stations 5 min each ( 4 X 5 marks)                    | 20 marks         |
| <b>TOTAL</b>                                                 | <b>200 marks</b> |
| Viva Voce                                                    | 80 marks         |
| Log book                                                     | 20 marks         |
| <b>Aggregate (clinical + viva) Total</b>                     | <b>300 marks</b> |
| <b>Minimum required for pass (50%)</b>                       | <b>150 marks</b> |

## 12. Log book

The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

## 13. Viva

Unstructured Viva -80 marks

VIVA including Competency Assessment - 80 Marks (60 + 20)

## 14 OSCE

4 stations with varying combinations which should include evidence based and problem based solutions, PFT, ABG, Clinical problem solving, Chest X-ray, CT chest, Specimens/slides, Sleep study report, Case scenarios, drugs, Devices/instruments.



## 15 Reference books

1. AP Fishman Pulmonary Diseases and Disorders  
IInd Edition Magnabull Book Company, New York.
2. Hand Book of Physiology,  
Respiratory System Volume-1, 'American Physiology Society 1985
3. Baits DV Maclon PT Dchristee  
Respiratory Function and Diseases, 111 Edition,  
Sandoz & Company, Philadelphia
4. Hand Book of Physiology,  
Respiratory System Volume III  
American Physiological Society 1986
5. Regulation of Breathing Part-and H  
M.Decker & Co. 1981
6. Sleep and Breathing:--  
M.Decker & Co. 1984
7. Hand Book of Physiology  
Respiratory System Volume IV,  
American Physiological Society 1987
8. Pathology for Oxygen  
Hardward University, U.S.A. 1984
9. Clinical Examination Testing  
IIIrd Edition, Sandoz, Philadelphia
10. Physiology and Medicine of Diving  
IIIrd Edition  
Best Book Binder, California, 1982
11. Hand Book of Physiology,  
Respiratory System Volume II.  
American Physiological Society.
12. Acid Base – Little Brown & Co.  
Frazer and Boston, 1983
13. Frazer and Perry, Diagnosis of Diseases of Chest  
II nd Edition, W.B. Sandoz, Philadelphia.
14. Clinical Epidamology – A Basic Science for Clinical  
Medicine, Little Brown & Co., Toronto, 1985
15. Morphogenesis of Lung Cancer.  
C.R.C. Press Florida, Vol. I & Vol. II, 1983
16. Principles of Chest X-Ray Diagnosis  
C.Simon Ampletender Gentry Crafts, 1971
17. Pathology of the Lung.  
Spencer, Oxford Personal Press, 1977
18. Computer Tomography of Thorax  
Roman Press – 1984
19. Advanced Imaging Techniques  
Volume II, Claredel Press, California – 1983
20. Text Book of Work Physiology  
Niagra Hills, New York, 1977

21. The Eoesonophil in Health and Deseases  
Grunec and Streton, New York -1980
22. Intestinal Lung Diseases.  
Bercker\*-Philadelphia-1988
23. Respiratory Diseases – by Crafton & Dulgus –Blackwell
24. The Lung Structure and Function.  
G.E. Costs - Blackwell
25. Work related Lung Disorders., G.E. Costs.
26. O.P.Sharma – Text book on Tuberculosis
27. S.K.Jindal – Pulmonary medicine
28. Shankar – Pulmonary medicine
29. Light – Pleural disease
30. Rom and Garay – Tuberculosis
31. Schollberg – Tuberculosis
32. Toman – Case finding and Chemotherapy in tuberculosis
33. Murray and Nada – Textbook of respiratory diseases
34. Thomas Shields – Essentials of thoracic surgery
35. Webb – HRCT chest
36. Armstrong – Pulmonary radiology

## 16. JOURNALS

1. Lung India
2. Indian Journal of Chest Diseases and Allied Sciences
3. Indian Journal of Tuberculosis
4. Thorax
5. Bulletin of IUAT & LD
6. Chest
7. American Review of Respiratory Diseases
8. European Journals of Respiratory Diseases
9. Journals of Infectious Diseases
10. Lancet
11. Journals of Indian Medical Association
12. New England Journal of Medicine
13. Journal of Association of Physicians of India
14. Nature
15. Science
16. Cancer
17. Cancer Research
18. Journal of Thoracic and Cardiovascular Surgery.
19. Chest
20. International Journal of tuberculosis and lung disease
21. British medical journal
22. Thorax
23. Clinics in Chest medicine
24. American journal of respiratory and critical care medicine
25. Critical care medicine.
26. Sleep medicine
27. European respiratory journal

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**M.D. TROPICAL MEDICINE**  
(from the Academic year 2018-19 onwards)

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.D. Tropical Medicine**

**1. GOAL**

The goal of MD Tropical Medicine programme shall be to produce competent specialists and/or medical teachers,

- i. Who are well equipped to recognize and respond to the **health needs specific to tropical countries, especially India**, and carry out professional obligations ethically and in keeping with the objectives of the National Health Policy;
- ii. Who shall have mastered competencies pertaining to tropical diseases that are required to be practiced for the care of individual patients,
- iii. Who shall be able to prioritise, plan and implement appropriate measures with high coverage to achieve effective control of tropical diseases of public health importance at community and national level,.
- iv. Who shall be aware of the contemporary advance and developments in Tropical Medicine;
- iv. Who shall have acquired a spirit of scientific inquiry and have a firm grasp of the principles of research methodology and epidemiology; and
- v. Who shall have acquired the adequate skills in teaching of medical and allied health professionals

**2. OBJECTIVES:**

At the end of the postgraduate training in Tropical Medicine, the student will have obtained

**A) Knowledge**

- i. In prevention, diagnosis, treatment and care interventions for diseases (both communicable and non-communicable) widely prevalent in tropical countries
- ii. About National Health Policy and various diseases control programmes in India
- iii. About the social, economical, environmental, nutritional and biological determinants of health in a given case, and take them

into account while planning therapeutic, rehabilitative, preventive and promotive strategies

**B) Attitude**

- i. Demonstrate empathy and humane approach towards patients and their families, and exhibit interpersonal behaviour in accordance with the societal norms and expectations
- ii. Work as an effective team member for implementing appropriate disease control measures with high coverage

**C) Skills**

- i. Diagnose and treat majority of disease conditions on the basis of clinical assessment, and rationally selected investigations.
  - ii. Plan and implement measures for disease prevention, health promotion and rehabilitation of patients suffering from tropical diseases
  - iii. Coordination with public health officials to implement national disease control programmes
  - iv. Prioritize public health needs of poor and marginalized populations
  - v. Deliver interventions through appropriate technology at sustainable costs
  - vi. Plan collaborative, multi-sectoral (veterinary, agriculture, education) and trans-disciplinary approach for disease control with the goal of achieving optimal health outcomes for people, animals and the environment ("One Health" concept)
  - vii. Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation
  - viii. Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
  - ix. Develop skills in using educational methods and techniques as applicable to the teaching of Medical / Nursing / Allied Health Sciences students / health workers.
  - x. Function as an effective leader of a health team engaged in Health Care Delivery, teaching / training and/or research

### 3. **COMPONENTS OF THE POSTGRADUATE CURRICULUM**

- THEORETICAL KNOWLEDGE  
As per attached theory syllabus
- PRACTICAL AND CLINICAL SKILLS

| No. | Technical Procedures                                                                        | No.  | Technical Procedures                                                                  |
|-----|---------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------|
| I.  | HEMATOLOGY Peripheral                                                                       | III. | CARDIO VASCULAR                                                                       |
|     | smear – [preparation                                                                        |      | • Pericardiocentesis                                                                  |
|     | , staining & interpretation]                                                                |      | Temporary pacing                                                                      |
|     | Bone marrow biopsy                                                                          |      | Defibrillation                                                                        |
|     | • Bone marrow aspiration preparation, collection, transport, processing and interpretation] |      | ECHO cardiogram - training and use in regular and emergency cases and for procedures. |
|     |                                                                                             |      | TMT testing                                                                           |
| II. | RESPIRATORY SYSTEM                                                                          |      | Holter monitoring                                                                     |
|     | • Pulmonary function test                                                                   |      |                                                                                       |
|     | • Peakflow meter                                                                            | IV.  | ABDOMEN                                                                               |
|     | • Endotracheal Intubation                                                                   | A    | Insertion of catheter for-                                                            |
|     | • Ventilator Management                                                                     |      | 1.Peritoneal dialysis                                                                 |
|     | • Pulse oximetry                                                                            |      | 2.Hemodialysis                                                                        |
|     | • Pleural aspiration                                                                        |      | 3.Care of catheter                                                                    |
|     | • Insertion of intercostal tube [ICT]                                                       |      | 4.Catheterization of Bladder                                                          |
|     | • Pleural biopsy                                                                            | B    | Vascular procedures                                                                   |
|     | • Pleurodesis                                                                               |      | 1.Preparing cases for AV                                                              |
|     | • Fiberoptic bronchoscopy                                                                   |      | Fistula                                                                               |
|     | • Bronchial Artery                                                                          |      | 2,Care of AV fistula                                                                  |
|     | • Polysomnography                                                                           |      |                                                                                       |
|     | Embolization                                                                                | VI   | CNS                                                                                   |
|     | • ABG, VBG, Procedure and interpretation                                                    |      | Fundus Examination                                                                    |
|     |                                                                                             |      | Lumbar puncture, EEG                                                                  |
|     |                                                                                             |      | EMG, Muscle Biopsy, Nerve Biopsy                                                      |

|      |                          |    |                 |
|------|--------------------------|----|-----------------|
| VII  | Endocrine investigations | IX | SPECIMEN        |
|      |                          |    | COLLECTION FOR  |
| VIII | OTHERS                   |    | A] Microbiology |
|      | Arterial puncture for    |    | Urine           |
|      | ABG                      |    | Stool           |
|      | Central venous catheter  |    | sputum          |
|      | [insertion & care]       |    | Blood           |
|      | FNAC                     |    | Body fluids     |

|      |                         |  |                                           |
|------|-------------------------|--|-------------------------------------------|
|      |                         |  | Swabs – Throat, nasal, etc.,              |
| XI   | Ultrasonogram –         |  | B] Pathology                              |
|      | training and use in     |  | Body fluids                               |
|      | regular and emergency   |  | Smear analysis                            |
|      | USG guided aspiration   |  | Specimen                                  |
|      | procedures & Biopsy     |  | C]Biochemistry                            |
|      | Echocardiogram          |  | [special investigation]                   |
| XII  | Advanced high support   |  | Collection                                |
| XIII | Newer aspects as felt   |  | Transportation                            |
|      | by the department/      |  | PATIENTS-                                 |
|      | speciality or recommend |  | A]. Radiology & Imaging                   |
|      | by Authorities          |  | X-rays—                                   |
|      | (Audiogram, Evoked      |  | Contrast studies                          |
|      | potential, Joint        |  | CT scan                                   |
|      | aspiration, MRCP/ERCP ) |  | MRI                                       |
|      |                         |  | B]. Radio-isotope studies                 |
|      |                         |  | C]. Radiotherapy                          |
|      |                         |  | D]. Invasive / Non invasive<br>Procedures |

- Skills for COMMUNITY & NATIONAL LEVEL control of Tropical Diseases:

- Identify health problems of the community in the context of the socio - economic - cultural milieu
  - Use of proper screening methods in early diagnosis of common diseases.
  - Identify groups which require special attention (elderly, adolescents, gender, poor and other marginalized groups) including those facing occupational hazards
  - Identify issues related to nutrition, life style
  - Identify threats to the environment
  - Anticipate, prepare for and respond to disasters
  - Take necessary steps in disease outbreak/epidemics/natural disasters – investigation of epidemic, food poisoning; notification; Organizing medical care following disasters.
  - On the basis of epidemiology of communicable and non-communicable diseases, plan preventive measures and manage national health programs
  - Facilitate inter-sectoral coordination for promoting health of communities
- Prioritize health problems, Set objectives; prepare action plan; implement programs; and monitor, supervise and evaluate them
  - Plan health manpower development
  - logistics and materials management
  - Assess costs, plan, implement and supervise budget and alternative health options
  - Perform economic evaluation of illness and health interventions

- f) Manage Health Information System and respond appropriately to the information gathered
- g) Establish Surveillance System and respond to public health threats effectively and efficiently
- h) Understand basics of hospital management
- i) Evaluate health care delivery
- j) Study quality assurance and medical audit.
- k) Initiate, implement and supervise National Health Programs
- l) Understand and Implement public health laws
- m) Promote and establish partnerships - partnering with community, Panchayati Raj institutions, public private partnerships, NGOs and corporate sector
- n) Recommend policies relevant for the local community

- **WRITING THESIS / RESEARCH ARTICLES**

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year.

Thesis shall be submitted at-least 6 Months before the Theory and Clinical/Practical Examination.

**ATTITUDE INCLUDING COMMUNICATION SKILLS :**

- Understand the structure and behavior of communities and identify societal or individual behavior problems that can be improved
- Interact, communicate, educate effectively to people from diverse backgrounds, ages and gender to promote healthy behavior through community involvement
- Analyze different types of health communication initiatives and BCC tools
- Plan and develop environments that enable the maintenance of positive health behaviors,
- Facilitate inter-sectoral coordination for promoting health of communities



- Promote and establish partnerships - partnering with community, Panchayati Raj institutions, public private partnerships, NGOs and corporate sector

## TRAINING IN RESEARCH METHODOLOGY MEDICAL ETHICS BIO ETHICS AND MEDICOLEGAL ASPECTS

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, moral and legal issues, medical audit are part and parcel of the curriculum and syllabus.

### 4. THEORY SYLLABUS

|                            | SUBTOPIC                                                     | COGNITIVE DOMAIN                                                                                                                     | PSYCHOMOTOR DOMAIN                                                                                                                | AFFECTIVE DOMAIN                                                                                                                                                                                 |
|----------------------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            | Hypothermia                                                  | At the end of the training a student would be able to enumerate the causes , incidences and clinical presentations of hypothermia    | At the end of the training a student would be able to examine and treat a patient of hypothermia                                  | At the end of the training a student would be able to assure the patient and make the patient aware regarding the measures to avoid hypothermia                                                  |
| 1. ENVIRONMENTAL DISORDERS | High altitude illnesses                                      | At the end of the training a student would be able to enumerate the causes , incidences and presentations of high altitude illnesses | At the end of the training a student would be able to examine and treat a patient of high altitude illness                        | At the end of the training a student would be able to assure the patient and make the patient aware regarding the measures to avoid high altitude illnesses                                      |
|                            | Podoconiosis                                                 | At the end of the training a student would be able to enumerate the causes , incidences and presentations of Podoconiosis            | At the end of the training a student would be able to examine and treat a patient of Podoconiosis                                 | At the end of the training a student would be able to assure the patient and make the patient aware regarding the measures to avoid Podoconiosis                                                 |
|                            | Adverse health consequences of tobacco( Smoked and smokeless | At the end of the training a student would be able to enumerate the adverse health consequences of tobacco( Smoked and smokeless)    | At the end of the training a student would be able to examine and treat a patient suffering from tobacco related health disorders | At the end of the training a student would be able to convince the patient about the adverse health consequences of tobacco ( Smoked and smokeless) and counsel him/her to get rid of the habit. |
|                            | Air pollution                                                | At the end of the training a student would be able to enumerate the Adverse health consequences of air                               | At the end of the training a student would be able to examine and treat a patient suffering from air                              | At the end of the training a student would be able to convince the patient about the adverse health                                                                                              |

2. NUTRITIONAL DISORDERS

|  |                                                                                                                        |                                                                                                                                                                              |                                                                                                                                                 |                                                                                                                                                                                                      |
|--|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                                                                        | pollution                                                                                                                                                                    | pollution related health disorders                                                                                                              | consequences of air pollution and make him/her aware about the means to avoid the same                                                                                                               |
|  | Indoor air pollution                                                                                                   | At the end of the training a student would be able to enumerate the adverse health consequences of indoor air pollution                                                      | At the end of the training a student would be able to examine and treat a patient suffering from indoor air pollution related health disorders  | At the end of the training a student would be able to convince the patient about the adverse health consequences of indoor air pollution and make him/her aware about the means to avoid the same    |
|  | Occupational lung diseases                                                                                             | At the end of the training a student would be able to enumerate the different occupational lung diseases                                                                     | At the end of the training a student would be able to examine and treat a patient suffering from occupational lung diseases                     | At the end of the training a student would be able to make the patient aware about the lung diseases related to his/her occupation and the means to avoid the same at his work place/ change his job |
|  | Health consequences of large scale natural disasters( Famines, floods, tsunامي, earthquakes, landslides, forest fires) | At the end of the training a student would be able to enumerate the health consequences that may follow large scale natural disasters                                        | At the end of the training a student would be able to examine and treat a patient affected by large scale natural disaster.                     | At the end of the training a student would be able to make the patient aware about the consequences of large scale natural disasters and the measures to prevent them                                |
|  | Health impacts of global warming                                                                                       | At the end of the training a student would be able to enumerate the health consequences that may follow global warming                                                       | At the end of the training a student would be able to examine and treat a patient affected by the adverse health consequences of global warming | At the end of the training a student would be able to make the patient aware about the causes and consequences of global warming and the measures to prevent them                                    |
|  | <b>SUBTOPIC</b>                                                                                                        | <b>COGNITIVE DOMAIN</b>                                                                                                                                                      | <b>PSYCHOMOTOR DOMAIN</b>                                                                                                                       | <b>AFFECTIVE DOMAIN</b>                                                                                                                                                                              |
|  | Assessment of nutritional status                                                                                       | At the end of the training a student would be able to enumerate the methods applicable to assess the nutritional status                                                      | At the end of the training a student would be able to examine and assess the nutritional status of an individual                                | At the end of the training a student would be able to make the patient aware about the importance of regular assessment of nutritional status                                                        |
|  | Malnutrition                                                                                                           | At the end of the training a student would be able to enumerate the causes and common presenting features of malnutrition in an individual                                   | At the end of the training a student would be able to examine, assess and treat a case of malnutrition                                          | At the end of the training a student would be able to make the patient aware about the adverse health outcomes of malnutrition and the measures to prevent them                                      |
|  | Protein energy malnutrition                                                                                            | At the end of the training a student would be able to enumerate the causes and common presenting features of protein energy malnutrition in an individual                    | At the end of the training a student would be able to examine, assess and treat a case of protein energy malnutrition                           | At the end of the training a student would be able to make the patient aware about the adverse health outcomes of protein energy malnutrition and the measures to prevent them                       |
|  | Specific nutrient deficiency(Fe, Vit A, Vit D, Vit C, Beri beri, pellagra, Micronutrient deficiency)                   | At the end of the training a student would be able to enumerate the common presenting features of different Specific nutrient deficiency(Fe, Vit A, Vit D, Vit C, Beri beri, | At the end of the training a student would be able to examine, assess and treat a case of Specific nutrient deficiency                          | At the end of the training a student would be able to make the patient aware about the adverse health outcomes of different Specific nutrient deficiencies and the                                   |

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|                        | pellagra, Micronutrient deficiency)                                                                                                                           |                                                                                                                                     | measures to prevent them                                                                                                                                                                              |
| Alcoholism             | At the end of the training a student would be able to enumerate the adverse health consequences of alcohol                                                    | a At the end of the training a student would be able to examine and treat a patient suffering from alcohol related health disorders | a At the end of the training a student would be able to convince the patient about the adverse health consequences of alcohol and counsel him/her to get rid of the habit.                            |
| Endemic hypothyroidism | At the end of the training a student would be able to enumerate the cause, geographical distribution and common presenting features of endemic hypothyroidism | a At the end of the training a student would be able to examine and treat a patient suffering from endemic hypothyroidism           | a At the end of the training a student would be able to aware the patient regarding the causes of endemic hypothyroidism and inform hi/her about the methods of prevention and necessity of treatment |
| Nutritional anaemia    | At the end of the training a student would be able to enumerate the causes and presenting features of nutritional anaemia                                     | a At the end of the training a student would be able to examine, assess and treat a patient of nutritional anaemia                  | a At the end of the training a student would be able to make the patient aware about the causes of nutritional anaemia and the measures to prevent them                                               |

|                                            | SUBTOPIC                                                                                               | COGNITIVE DOMAIN                                                                                                                                                                                                             | PSYCHOMOTOR DOMAIN                                                                                                                                                                                                  | AFFECTIVE DOMAIN                                                                                                                                                                          |
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| 3. INFECTIOUS DISEASES a. Viral infections | Acute and chronic viral hepatitis                                                                      | At the end of the training a student would be able to enumerate the possible etiologies of viral hepatitis, routes of transmission, presenting features and complications                                                    | At the end of the training a student would be able to examine, assess and treat a patient of viral hepatitis and its complications                                                                                  | At the end of the training a student would be able to make the patient aware about the routes of transmission of viral hepatitis and measures to prevent them including vaccination       |
|                                            | Viral infections of the CNS( Rabies, poliomyelitis, meningitis encephalitis)                           | At the end of the training a student would be able to enumerate the possible etiologies of meningitis, encephalitis, routes of transmission, presenting features and complications of the viral infections affecting the CNS | At the end of the training a student would be able to examine(including ophthalmoscopy), assess( including performance of lumbar puncture) and treat a patient of Viral infections of the CNS and its complications | At the end of the training a student would be able to make the patient aware about the prognosis of Viral infections of the CNS, residual complications, prevention including vaccination |
|                                            | Viral haemorrhagic fevers: Arboviral infections(Dengue and dengue haemorrhagic fevers and Chikungunya) | At the end of the training a student would be able to enumerate the possible etiologies of haemorrhagic fevers, routes and vectors of transmission, presenting features and complications                                    | At the end of the training a student would be able to examine, assess and treat a patient of viral haemorrhagic fever and its complications                                                                         | At the end of the training a student would be able to make the patient aware about the routes and mode of transmission of arboviruses and measures to prevent them .                      |
|                                            | Viral exanthems(varicella, , measles, rubella) & mumps                                                 | At the end of the training a student would be able to enumerate the possible etiologies of viral exanthems & mumps, routes of transmission, presenting                                                                       | At the end of the training a student would be able to examine, assess and treat a patient of viral exanthematous fever &mumps and its                                                                               | At the end of the training a student would be able to make the patient aware about the routes of transmission of viral exanthems & mumps and measures to                                  |

|                                                                                         | features and complications                                                                                                                                                   | complications                                                                                                                                                       | prevent them including vaccination .                                                                                                                                                                                                        |
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| Epstein Barr virus infections                                                           | At the end of the training a student would be able to enumerate the routes of transmission, presenting features and complications caused by EB virus                         | At the end of the training a student would be able to examine, assess and treat a patient of EB Virus infections and its complications                              | At the end of the training a student would be able to make the patient aware about the routes of transmission of EB Virus infections and measures to prevent them.                                                                          |
| Viral Gastroenteritis                                                                   | At the end of the training a student would be able to enumerate the routes of transmission, presenting features and complications caused by viruses                          | At the end of the training a student would be able to examine, assess and treat a patient of viral gastroenteritis and its complications                            | At the end of the training a student would be able to make the patient aware about the routes of transmission of viruses causing gastroenteritis and measures to prevent them.                                                              |
| Viral respiratory infections including influenza                                        | At the end of the training a student would be able to enumerate the causes, presenting features and complications of respiratory infections caused by viruses                | At the end of the training a student would be able to examine, assess and treat a patient of viral respiratory infections including influenza and its complications | At the end of the training a student would be able to make the patient aware about the routes of transmission of Viral respiratory infections including influenza and measures to prevent them including vaccinations.                      |
| Cutaneous viral infections(Molluscum contagiosum, viral warts, hand foot mouth disease) | At the end of the training a student would be able to enumerate the causes, presenting features and complications of cutaneous viral infections                              | At the end of the training a student would be able to examine, assess and treat a patient of cutaneous viral infections and its complications                       | At the end of the training a student would be able to make the patient aware about the routes of transmission of cutaneous viral infections and measures to prevent them.                                                                   |
| HIV/AIDS                                                                                | At the end of the training a student would be able to define the etiology, routes of transmission, natural history, clinical features and possible complications of HIV/AIDS | At the end of the training a student would be able to examine, assess and treat a patient of HIV/AIDS and its complications                                         | At the end of the training a student would be able to make the patient aware about the routes of transmission of HIV/AIDS, its natural history and counsel him/her to adopt measures to prevent further transmission and lead a normal life |
| HIV related Opportunistic conditions                                                    | At the end of the training a student would be able to enumerate the different opportunistic conditions, their presenting features and complications related to HIV/AIDS      | At the end of the training a student would be able to examine, assess and treat a patient of opportunistic condition related to HIV/AIDS                            | At the end of the training a student would be able to make the patient aware about opportunistic conditions that may occur in the different stages of the disease and the importance of preventive and remedial measures                    |

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| 3b                        | Rickettsial Diseases                                                                                      | At the end of the training a student would be able to enumerate the different Rickettsial infections, their presenting features and complications                                                  | At the end of the training a student would be able to examine, assess and treat a patient of Rickettsial infections and its complications                                                       | At the end of the training a student would be able to make the patient aware about the routes of transmission of Rickettsial infections and measures to prevent                                                    |
|                           | <b>SUBTOPIC</b>                                                                                           | <b>COGNITIVE DOMAIN</b>                                                                                                                                                                            | <b>PSYCHOMOTOR DOMAIN</b>                                                                                                                                                                       | <b>AFFECTIVE DOMAIN</b>                                                                                                                                                                                            |
| 3.c. Bacterial Infections | Infections of central nervous system (Brain abscess, meningitis)                                          | At the end of the training a student would be able to enumerate the different bacterial infections affecting the CNS, their presenting features and complications                                  | At the end of the training a student would be able to examine, assess and treat a patient of bacterial infections of the CNS and its complications including performing a lumbar puncture exam. | At the end of the training a student would be able to make the patient aware about the possible consequences of CNS bacterial infections and the need for urgent treatment                                         |
|                           | Pneumonia, sinusitis, tonsillitis, otitis                                                                 | At the end of the training a student would be able to enumerate the different bacterial infections affecting the respiratory tract, their presenting features and complications                    | At the end of the training a student would be able to examine, assess and treat a patient of bacterial infections affecting the respiratory tract and its complications                         | At the end of the training a student would be able to make the patient aware about the route of transmission and methods of prevention including vaccination                                                       |
|                           | Gastro intestinal infections ( typhoid, bacillary dysentery, non typhoidal salmonellosis, cholera)        | At the end of the training a student would be able to enumerate the different gastro intestinal infections, causative organisms, their presenting features and complications                       | At the end of the training a student would be able to examine, assess and treat a patient of Gastro intestinal infection and its complications                                                  | At the end of the training a student would be able to make the patient aware about the route of transmission and methods of prevention of gastro intestinal infections including vaccination                       |
|                           | Skin and soft tissue infections (impetigo, erysipelas)                                                    | At the end of the training a student would be able to enumerate the different Skin and soft tissue infections, causative organisms, their presenting features and complications                    | At the end of the training a student would be able to examine, assess and treat a patient of skin and soft tissue infections and its complications                                              | At the end of the training a student would be able to make the patient aware about the route of transmission and methods of prevention of Skin and soft tissue infections                                          |
|                           | Pulmonary and extrapulmonary Tuberculosis                                                                 | At the end of the training a student would be able to enumerate the types of TB, causative organisms, natural history, their                                                                       | At the end of the training a student would be able to examine, assess and treat a patient of pulmonary and extrapulmonary                                                                       | At the end of the training a student would be able to make the patient aware about the route of transmission and methods                                                                                           |
| 3d. Fungal Infections     | Fungal infections of skin and subcutaneous tissue ( Candidiasis, mycetoma, onychomycosis, sporotrichosis) | At the end of the training a student would be able to discuss the causative organisms, natural history, presenting features and complications of fungal infections of skin and subcutaneous tissue | At the end of the training a student would be able to examine, assess and treat a patient of fungal infections of skin and subcutaneous tissue and its complications                            | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of fungal infections of skin and subcutaneous tissue |
|                           | Systemic fungal infections ( histoplasmosis, cryptococcosis, penicilliosis,                               | At the end of the training a student would be able to discuss the causative organisms, natural history,                                                                                            | At the end of the training a student would be able to examine, assess and treat a patient of systemic                                                                                           | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention,                                                                              |

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| Pneumocystis jiroveci infection | presenting features and complications of systemic fungal infections | fungal infections and its complications | importance of treatment of systemic fungal infections |
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| 3e. Protozoal Infections | SUBTOPIC                             | COGNITIVE DOMAIN                                                                                                                                                                                   | PSYCHOMOTOR DOMAIN                                                                                                                                                                                     | AFFECTIVE DOMAIN                                                                                                                                                                                      |
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|                          | Malaria                              | At the end of the training a student would be able to discuss the epidemiology causative organisms, natural history, presenting features and complications of malaria                              | At the end of the training a student would be able to examine, assess including examination of peripheral blood smear and treat a patient of malaria and its complications                             | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of malaria                              |
|                          | Hyperreactive malarial splenomegaly  | At the end of the training a student would be able to discuss the epidemiology causative organisms, natural history, presenting features and complications of hyperreactive malarial splenomegaly  | At the end of the training a student would be able to examine, assess including examination of peripheral blood smear and treat a patient of hyperreactive malarial splenomegaly and its complications | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of hyperreactive malarial splenomegaly  |
|                          | African Trypanosomiasis              | At the end of the training a student would be able to discuss the epidemiology causative organisms, natural history, presenting features and complications of African trypanosomiasis              | At the end of the training a student would be able to examine, assess including examination of peripheral blood smear and treat a patient of African trypanosomiasis and its complications             | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of African trypanosomiasis              |
|                          | American Trypanosomiasis             | At the end of the training a student would be able to discuss the epidemiology causative organisms, natural history, presenting features and complications of American trypanosomiasis             | At the end of the training a student would be able to examine, assess including examination of peripheral blood smear and treat a patient of American trypanosomiasis and its complications            | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of American trypanosomiasis             |
|                          | Visceral and cutaneous leishmaniasis | At the end of the training a student would be able to discuss the epidemiology causative organisms, natural history, presenting features and complications of visceral and cutaneous leishmaniasis | At the end of the training a student would be able to examine, assess including performing a splenic puncture and treat a patient of visceral and cutaneous leishmaniasis and its complications        | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of visceral and cutaneous leishmaniasis |
|                          | Toxoplasmosis                        | At the end of the training a student would be able to discuss the epidemiology natural history, presenting features and complications of toxoplasmosis                                             | At the end of the training a student would be able to examine, assess and treat a patient of toxoplasmosis and its complications                                                                       | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of toxoplasmosis                        |
|                          | Amoebiasis                           | At the end of the training a student would be able to discuss the epidemiology natural history, presenting features and complications of amoebiasis                                                | At the end of the training a student would be able to examine, assess and treat a patient of amoebiasis and its complications                                                                          | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of amoebiasis                           |

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| 3.f. Helminthic Infections | Amoebic liver abscess      | At the end of the training a student would be able to discuss the risk factors predisposing to, natural history, presenting features and complications of amoebic liver abscess        | At the end of the training a student would be able to examine, assess and treat a patient of amoebic liver abscess and its complications                                                | At the end of the training a student would be able to make the patient aware about the importance of treatment and prognosis of amoebic liver abscess                                                          |
|                            | Giardiasis                 | At the end of the training a student would be able to discuss the epidemiology natural history, presenting features and                                                                | At the end of the training a student would be able to examine, assess and treat a patient of giardiasis and its complications                                                           | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of                                                                                      |
|                            | Soil transmitted helminths | At the end of the training a student would be able to discuss the epidemiology natural history, presenting features and complications of diseases caused by soil transmitted helminths | At the end of the training a student would be able to examine, assess and treat a patient of diseases caused by soil transmitted helminths and its complications                        | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of diseases caused by soil transmitted helminths |
|                            | Filariasis                 | At the end of the training a student would be able to discuss the epidemiology natural history, presenting features and complications of filariasis                                    | At the end of the training a student would be able to examine, including detection of microfilaria under the microscope, assess and treat a patient of filariasis and its complications | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of filariasis                                    |
|                            | Onchocerciasis             | At the end of the training a student would be able to discuss the causative organism, epidemiology natural history, presenting features and complications of onchocerciasis            | At the end of the training a student would be able to examine, assess and treat a patient of onchocerciasis and its complications                                                       | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of onchocerciasis                                |
|                            | Hydatidosis                | At the end of the training a student would be able to discuss the epidemiology, causative organisms, natural history, presenting features and complications of hydatid disease         | At the end of the training a student would be able to examine, assess and treat a patient of hydatid disease and its complications                                                      | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of hydatid disease                               |
|                            | Cysticercosis              | At the end of the training a student would be able to discuss the epidemiology, causative organisms, natural history, presenting features and complications of cysticercosis           | At the end of the training a student would be able to examine, assess and treat a patient of cysticercosis and its complications                                                        | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of cysticercosis                                 |
|                            | Schistosomiasis            | At the end of the training a student would be able to discuss the epidemiology, causative organisms, natural                                                                           | At the end of the training a student would be able to examine, assess and treat a patient of schistosomiasis and its                                                                    | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of                                                                                      |

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| 3g. Ecto parasitic diseases | Pediculosis                             | At the end of the training a student would be able to discuss the epidemiology, causative organisms, natural history, presenting features and complications of infestations by pediculosis | At the end of the training a student would be able to examine, assess and treat a patient of infestation by food borne pediculosis and its complications     | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of infestations by pediculosis                  |
|                             | Scabies                                 | At the end of the training a student would be able to discuss the epidemiology, causative organisms, natural history, presenting features and complications of infestations by Sarcoptes   | At the end of the training a student would be able to examine, assess and treat a patient of infestation by Sarcoptes and its complications                  | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of infestations by Sarcoptes                    |
|                             | Myiasis                                 | At the end of the training a student would be able to discuss the epidemiology, causative organisms, natural history, presenting features and complications of infestations by myiasis     | At the end of the training a student would be able to examine, assess and treat a patient of infestation by myiasis and its complications                    | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of infestations by myiasis                      |
|                             | Arthropod dermatoses                    | At the end of the training a student would be able to enumerate the common arthropod dermatoses, causative organisms, natural history, presenting features and complications .             | At the end of the training a student would be able to examine, assess and treat a patient of infestation by arthropod dermatoses and its complications       | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of infestations by arthropod dermatoses         |
|                             | Insect stings including scorpion stings | At the end of the training a student would be able to discuss the common insects responsible, presenting features and complications following insect stings                                | At the end of the training a student would be able to examine, assess and treat a patient suffering from insect stings and its complications                 | At the end of the training a student would be able to make the patient aware about the methods of prevention, and consequences of insect bites                                                   |
|                             | Bites/ animal bites                     | At the end of the training a student would be able to discuss the common animals responsible, presenting features and complications following bites                                        | At the end of the training a student would be able to examine, assess and treat a patient suffering from animal bite and its complications                   | At the end of the training a student would be able to make the patient aware about the methods of prevention, and consequences of animal bites including importance of treatment and vaccination |
| 3h. Miscellaneous           | Childhood and adult vaccination         | At the end of the training a student would be able to enumerate the common vaccines available, indications, contra indications and complications                                           | At the end of the training a student would be able to administer common vaccines and manage patients related to vaccine related complications                | At the end of the training a student would be able to make the patient /parents in case of children aware about the necessity and assure them about the safety of vaccination                    |
|                             | Advice to international travelers       | At the end of the training a student would be able to enumerate the precautionary measures necessary for an international traveler prior to travel                                         | At the end of the training a student would be able to examine, assess and treat an international traveler suffering from a disease acquired while travelling | At the end of the training a student would be able to make the patient aware about the necessity and assure about the precautions that must be taken prior to international                      |



4.TROPICS SPECIFIC ORGAN RELATED DISEASES

|                                 |                                                                                                                                                                                             |                                                                                                                                                    |                                                                                                                                                                                                                    |
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| Acute rheumatic fever           | At the end of the training a student would be able to discuss the epidemiology, causative organisms, natural history, presenting features and complications of acute rheumatic fever        | At the end of the training a student would be able to examine, assess and treat a patient of acute rheumatic fever and its complications           | At the end of the training a student would be able to make the patient aware about the route of transmission , methods of prevention, importance of treatment of acute rheumatic fever                             |
| Rheumatic heart diseases        | At the end of the training a student would be able to discuss the epidemiology, causative organisms, natural history, presenting features and complications of rheumatic heart disease      | At the end of the training a student would be able to examine, assess and treat a patient of rheumatic heart disease and its complications         | At the end of the training a student would be able to make the patient aware about the methods of prevention, importance of treatment of rheumatic disease and its consequences                                    |
| Endomyocardial fibrosis         | At the end of the training a student would be able to discuss the epidemiology, risk factors, natural history, presenting features and complications of endomyocardial fibrosis             | At the end of the training a student would be able to examine, assess and treat a patient of endomyocardial fibrosis and its complications         | At the end of the training a student would be able to make the patient aware about the importance of treatment of endomyocardial fibrosis and its consequences                                                     |
| Tropical pulmonary eosinophilia | At the end of the training a student would be able to discuss the epidemiology, risk factors, natural history, presenting features and complications of tropical pulmonary eosinophilia     | At the end of the training a student would be able to examine, assess and treat a patient of tropical pulmonary eosinophilia and its complications | At the end of the training a student would be able to make the patient aware about the methods of prevention, importance of treatment of tropical pulmonary eosinophilia and its consequences                      |
| Parasitic pulmonary diseases    | At the end of the training a student would be able to discuss the epidemiology, causative organisms, natural history, presenting features and complications of parasitic pulmonary diseases | At the end of the training a student would be able to examine, assess and treat a patient of parasitic pulmonary diseases and its complications    | At the end of the training a student would be able to make the patient aware about the routes of transmission, methods of prevention, importance of treatment of parasitic pulmonary diseases and its consequences |
| Tropical pancreatitis           | At the end of the training a student would be able to discuss the epidemiology, risk factors, natural history, presenting features and complications of tropical pancreatitis               | At the end of the training a student would be able to examine, assess and treat a patient of tropical pancreatitis and its complications           | At the end of the training a student would be able to make the patient aware about the risk factors, methods of prevention, importance of treatment of tropical pancreatitis and its consequences                  |
| Tropical sprue                  | At the end of the training a student would be able to discuss the epidemiology, risk factors, natural history, presenting features and complications of tropical sprue                      | At the end of the training a student would be able to examine, assess and treat a patient of tropical sprue and its complications                  | At the end of the training a student would be able to make the patient aware about the risk factors, methods of prevention, importance of treatment of tropical sprue and its consequences                         |
| Haemoglobinopathies             | At the end of the training a student would be able to discuss the common haemoglobinopathies in the community, their natural history, presenting                                            | At the end of the training a student would be able to examine, assess and treat a patient suffering from a haemoglobinopathy and                   | At the end of the training a student would be able to make the patient aware about screening of family members, importance of early detection and treatment of haemoglobinopathies and its                         |

|              |                                                           | features and complications                                                                                                                                                                                      | its complications                                                                                                                                     | consequences                                                                                                                                                                                     |
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|              | G6PD deficiency                                           | At the end of the training a student would be able to discuss the prevalence, clinical significance, precipitating factors of haemolysis, presenting features and complications in a patient of G6PD deficiency | At the end of the training a student would be able to examine, assess and treat a patient of G6PD deficiency suffering from haemolysis.               | At the end of the training a student would be able to make the patient aware about the importance of detection of G6PD and its consequences                                                      |
| 5. POISONING | General management of the poisoned patient                | At the end of the training a student would be able to discuss the common poisons, presenting features on their intake and subsequent complications .                                                            | At the end of the training a student would be able to examine, assess and treat a patient of suspected poisoning and its complications                | At the end of the training a student would be able to make the patient aware about the ill effects of poisoning and counsel him/her to avoid similar episodes in the future                      |
|              | Toxidromes                                                | At the end of the training a student would be able to discuss the epidemiology, cause, natural history, presenting features and complications of Toxidromes                                                     | At the end of the training a student would be able to examine, assess and treat a patient of Toxidromes and its complications                         | At the end of the training a student would be able to make the patient aware about the methods of prevention, importance of treatment of Toxidromes and its consequences                         |
|              | Organophosphorus poisoning                                | At the end of the training a student would be able to discuss the mode of poisoning, presenting features and complications of organophosphorus poisoning                                                        | At the end of the training a student would be able to examine, assess and treat a patient of organophosphorus poisoning and its complications         | At the end of the training a student would be able to make the patient aware about the methods of prevention, importance of treatment of organophosphorus poisoning and its consequences         |
|              | Organocarbamate/chlorine poisoning                        | At the end of the training a student would be able to discuss the mode of poisoning, presenting features and complications of Organocarbamate/chlorine poisoning                                                | At the end of the training a student would be able to examine, assess and treat a patient of Organocarbamate/chlorine poisoning and its complications | At the end of the training a student would be able to make the patient aware about the methods of prevention, importance of treatment of Organocarbamate/chlorine poisoning and its consequences |
|              | Aluminium phosphide poisoning                             | At the end of the training a student would be able to discuss the mode of poisoning, presenting features and complications of aluminium phosphide poisoning                                                     | At the end of the training a student would be able to examine, assess and treat a patient of aluminium phosphide poisoning and its complications      | At the end of the training a student would be able to make the patient aware about the methods of prevention, importance of treatment of aluminium phosphide poisoning and its consequences      |
|              | Copper sulphate poisoning                                 | At the end of the training a student would be able to discuss the mode of poisoning, presenting features and complications of copper sulphate poisoning                                                         | At the end of the training a student would be able to examine, assess and treat a patient of copper sulphate poisoning and its complications          | At the end of the training a student would be able to make the patient aware about the methods of prevention, importance of treatment of copper sulphate poisoning and its consequences          |
|              | Heavy metal poisoning ( Lead, arsenic, Thallium, Mercury) | At the end of the training a student would be able to discuss the mode of poisoning, presenting features and complications of heavy metal poisoning                                                             | At the end of the training a student would be able to examine, assess and treat a patient of heavy metal poisoning and its complications              | At the end of the training a student would be able to make the patient aware about the methods of prevention, importance of treatment of heavy metal poisoning and its consequences              |

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| Inhalant substance abuse                   | At the end of the training a student would be able to discuss the mode of inhalation, presenting features and complications of inhalant substance abuse                                  | At the end of the training a student would be able to examine, assess and treat a patient of inhalant substance abuse and its complications                   | At the end of the training a student would be able to make the patient aware about the ill effects of, importance of treatment of inhalant substance abuse and its consequences and counsel him/her to get rid of it. |
| Corrosive ingestion                        | At the end of the training a student would be able to enumerate the corrosives, presenting features and complications of Corrosive ingestion                                             | At the end of the training a student would be able to examine, assess and treat a patient of Corrosive ingestion and its complications                        | At the end of the training a student would be able to make the patient aware about the ill effects of, importance of treatment of Corrosive ingestion and its consequences                                            |
| Snake bite and snake envenomation          | At the end of the training a student would be able to discuss the mode of inhalation, presenting features and complications of Snake bite and snake envenomation                         | At the end of the training a student would be able to examine, assess and treat a patient of Snake bite and snake envenomation and its complications          | At the end of the training a student would be able to make the patient aware about the ill effects of, importance of Snake bite and snake envenomation and its consequences                                           |
| Scorpion stings                            | At the end of the training a student would be able to discuss presenting features and complications of scorpion stings                                                                   | At the end of the training a student would be able to examine, assess and treat a patient of scorpion stings and its complications                            | At the end of the training a student would be able to make the patient aware about the ways to avoid ill effects of, importance of treatment of scorpion stings                                                       |
| Yellow oleander poisoning                  | At the end of the training a student would be able to discuss the presenting features and complications of yellow oleander poisoning                                                     | At the end of the training a student would be able to examine, assess and treat a patient of yellow oleander poisoning and its complications                  | At the end of the training a student would be able to make the patient aware about the ill effects of, importance of treatment of yellow oleander poisoning and its consequences .                                    |
| Mushroom poisoning and other plant poisons | At the end of the training a student would be able to discuss the presenting features and complications of mushroom poisoning and other plant poisons                                    | At the end of the training a student would be able to examine, assess and treat a patient of Mushroom poisoning and other plant poisons and its complications | At the end of the training a student would be able to make the patient aware about the ill effects of, importance of treatment of mushroom poisoning and other plant poisons and its consequences                     |
| Lathyrism                                  | At the end of the training a student would be able to discuss the cause , mechanism of, presenting features, progression and complications of mushroom poisoning and other plant poisons | At the end of the training a student would be able to examine, assess and treat a patient of Lathyrism and its complications                                  | At the end of the training a student would be able to make the patient aware about the ill effects of, importance early detection and treatment of Lathyrism and its consequences .                                   |
| Aflatoxin                                  | At the end of the training a student would be able to discuss the mode of poisoning , mechanism, presenting features, progression and complications of aflatoxin poisoning               | At the end of the training a student would be able to examine, assess and treat a patient of aflatoxin poisoning and its complications                        | At the end of the training a student would be able to make the patient aware about the methods to avoid, ill effects of, importance early detection and treatment of aflatoxin poisoning and its consequences .       |
| Epidemic dropsy                            | At the end of the training a student would be able to discuss the cause , mechanism, presenting features, progression and complications of epidemic dropsy                               | At the end of the training a student would be able to examine, assess and treat a patient of epidemic dropsy and its complications                            | At the end of the training a student would be able to make the patient aware about the methods to avoid, ill effects of, importance, early detection and treatment of epidemic dropsy and its consequences .          |

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| Fluorosis            | At the end of the training a student would be able to discuss the mechanism, presenting features, progression and complications of fluorosis                             | At the end of the training a student would be able to examine, assess and treat a patient of fluorosis and its complications            | At the end of the training a student would be able to make the patient aware about the methods to avoid, ill effects of, importance early detection and treatment of fluorosis and its consequences |
| Epilepsy             | At the end of the training a student would be able to classify epilepsy, its mechanism, presenting features, progression and complications of epilepsy                   | At the end of the training a student would be able to examine, assess and treat a patient of epilepsy and its complications             | At the end of the training a student would be able to make the patient aware about the precautions to be taken and treatment of epilepsy and its consequences .                                     |
| GB syndrome          | At the end of the training a student would be able to enumerate the types of, etiology, its mechanism, presenting features, progression and complications of GB syndrome | At the end of the training a student would be able to examine, assess and treat a patient of GB syndrome and its complications          | At the end of the training a student would be able to make the patient aware about the precautions to be taken and treatment of GB syndrome and its consequences .                                  |
| Alzheimer's dementia | At the end of the training a student would be able to enumerate the presenting features, progression and complications of Alzheimer's disease                            | At the end of the training a student would be able to examine, assess and treat a patient of Alzheimer's disease and its complications  | At the end of the training a student would be able to make the patient aware about the precautions to be taken and importance treatment of Alzheimer's disease and its consequences .               |
| Parkinson's disease  | At the end of the training a student would be able to enumerate the causes of, presenting features, progression and complications of Parkinson's disease                 | At the end of the training a student would be able to examine, assess and treat a patient of Parkinson's disease and its complications  | At the end of the training a student would be able to make the patient aware about the precautions to be taken and importance treatment of Parkinson's disease and its consequences                 |
| Osteoarthritis       | At the end of the training a student would be able to enumerate the natural history, presenting features, progression and complications of osteoarthritis                | At the end of the training a student would be able to examine, assess and treat a patient of osteoarthritis and its complications       | At the end of the training a student would be able to make the patient aware about the precautions to be taken and importance treatment of osteoarthritis and its consequences.                     |
| Infectious arthritis | At the end of the training a student would be able to enumerate the causes, natural history, presenting features, progression and complications of infectious arthritis  | At the end of the training a student would be able to examine, assess and treat a patient of infectious arthritis and its complications | At the end of the training a student would be able to make the patient aware about the precautions to be taken and importance treatment of infectious arthritis and its consequences.               |
| Reactive Arthritis   | At the end of the training a student would be able to enumerate the causes, natural history, presenting features, progression and complications of reactive arthritis    | At the end of the training a student would be able to examine, assess and treat a patient of reactive arthritis and its complications   | At the end of the training a student would be able to make the patient aware about the importance treatment of reactive arthritis and its consequences.                                             |
| Fibromyalgia         | At the end of the training a student would be able to enumerate the natural history, presenting features, progression and complications of fibromyalgia                  | At the end of the training a student would be able to examine, assess and treat a patient of fibromyalgia and its complications         | At the end of the training a student would be able to make the patient aware about the importance treatment of fibromyalgia and its consequences.                                                   |

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| Somatoform disorders     | At the end of the training a student would be able to discuss the natural history, presenting features, progression and complications of somatoform disorders             | At the end of the training a student would be able to examine, assess and treat a patient of somatoform disorders and its complications     | At the end of the training a student would be able to make the patient aware about the importance treatment of somatoform disorders and its consequences.                      |
| Depression               | At the end of the training a student would be able to discuss the natural history, types, presenting features, progression and complications of depression                | At the end of the training a student would be able to examine, assess and treat a patient of depression and its complications               | At the end of the training a student would be able to make the patient aware about the importance treatment of depression and its consequences.                                |
| Anxiety disorders        | At the end of the training a student would be able to discuss the natural history, types, presenting features, progression and complications of anxiety disorders         | At the end of the training a student would be able to examine, assess and treat a patient of anxiety disorders and its complications        | At the end of the training a student would be able to make the patient aware about the importance treatment of anxiety disorders and its consequences.                         |
| Peptic ulcer disease     | At the end of the training a student would be able to discuss the natural history, types, presenting features, progression and complications of Peptic ulcer disease      | At the end of the training a student would be able to examine, assess and treat a patient of Peptic ulcer disease and its complications     | At the end of the training a student would be able to make the patient aware about the importance treatment Peptic ulcer disease and its consequences.                         |
| Irritable bowel syndrome | At the end of the training a student would be able to discuss the natural history, types, presenting features, progression and complications of irritable bowel syndrome  | At the end of the training a student would be able to examine, assess and treat a patient of irritable bowel syndrome and its complications | At the end of the training a student would be able to make the patient aware about the importance treatment of irritable bowel syndrome and its consequences.                  |
| Ulcerative Colitis       | At the end of the training a student would be able to discuss the natural history, types, presenting features, progression and complications of ulcerative colitis        | At the end of the training a student would be able to examine, assess and treat a patient of ulcerative colitis and its complications       | At the end of the training a student would be able to make the patient aware about the importance treatment of ulcerative colitis and its consequences                         |
| Crohn's disease          | At the end of the training a student would be able to discuss the natural history, types, presenting features, progression and complications of Crohn's disease           | At the end of the training a student would be able to examine, assess and treat a patient of Crohn's disease and its complications          | At the end of the training a student would be able to make the patient aware about the importance treatment of Crohn's disease and its consequences.                           |
| Chronic hepatitis        | At the end of the training a student would be able to discuss the causes, natural history, types, presenting features, progression and complications of chronic hepatitis | At the end of the training a student would be able to examine, assess and treat a patient of chronic hepatitis and its complications        | At the end of the training a student would be able to make the patient aware about the importance treatment of chronic hepatitis and its consequences.                         |
| Cirrhosis                | At the end of the training a student would be able to discuss the causes, natural history, types, presenting features, progression and complications of cirrhosis         | At the end of the training a student would be able to examine, assess and treat a patient of cirrhosis and its complications                | At the end of the training a student would be able to make the patient aware about the measures essential to avoid, importance of treatment of cirrhosis and its consequences. |

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| Acute intestinal obstruction          | At the end of the training a student would be able to discuss the causes, natural history, presenting features, progression and complications of acute intestinal obstruction                        | At the end of the training a student would be able to examine, assess and treat a patient of acute intestinal obstruction and its complications          | At the end of the training a student would be able to make the patient aware about the importance of treatment of acute intestinal obstruction and its consequences.          |
| Bronchial Asthma                      | At the end of the training a student would be able to discuss the causes, risk factors, natural history, presenting features, progression and complications of bronchial Asthma                      | At the end of the training a student would be able to examine, assess and treat a patient of bronchial asthma and its complications                      | At the end of the training a student would be able to make the patient aware about the importance of treatment of bronchial asthma and its consequences.                      |
| Chronic obstructive pulmonary disease | At the end of the training a student would be able to discuss the causes, risk factors, natural history, presenting features, progression and complications of chronic obstructive pulmonary disease | At the end of the training a student would be able to examine, assess and treat a patient of chronic obstructive pulmonary disease and its complications | At the end of the training a student would be able to make the patient aware about the importance of treatment of chronic obstructive pulmonary disease and its consequences. |
| Bronchiectasis                        | At the end of the training a student would be able to discuss the causes, risk factors, natural history, presenting features, progression and complications of bronchiectasis                        | At the end of the training a student would be able to examine, assess and treat a patient of bronchiectasis and its complications                        | At the end of the training a student would be able to make the patient aware about the importance of treatment of bronchiectasis and its consequences.                        |
| Lung abscess                          | At the end of the training a student would be able to discuss the causes, risk factors, natural history, presenting features, progression and complications of lung abscess                          | At the end of the training a student would be able to examine, assess and treat a patient of lung abscess and its complications                          | At the end of the training a student would be able to make the patient aware about the importance of treatment of lung abscess and its consequences.                          |
| Pleural effusion                      | At the end of the training a student would be able to discuss the causes, , natural history, presenting features, progression and complications of pleural effusion                                  | At the end of the training a student would be able to examine, assess and treat a patient pleural effusion and its complications                         | At the end of the training a student would be able to make the patient aware about the importance of treatment pleural effusion and its consequences.                         |
| Empyema                               | At the end of the training a student would be able to discuss the causes, ,natural history, presenting features, progression and complications of empyema                                            | At the end of the training a student would be able to examine, assess and treat a patient empyema and its complications                                  | At the end of the training a student would be able to make the patient aware about the importance of treatment of empyema and its consequences.                               |
| Congestive heart failure              | At the end of the training a student would be able to discuss the causes, ,natural history, presenting features, progression and complications of congestive heart failure                           | At the end of the training a student would be able to examine, assess and treat a patient of congestive heart failure and its complications              | At the end of the training a student would be able to make the patient aware about the importance of treatment of congestive heart failure and its consequences.              |
| Pericardial Effusion                  | At the end of the training a student would be able to discuss the causes, , natural history, presenting                                                                                              | At the end of the training a student would be able to examine, assess and treat a patient pericardial                                                    | At the end of the training a student would be able to make the patient aware about the importance of treatment pericardial effusion and                                       |

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|                                                                         | features, progression and complications of pericardial effusion                                                                                                                                                                          | effusion and its complications                                                                                                                            | its consequences.                                                                                                                                                                                               |
| Acid base and electrolyte disorders                                     | At the end of the training a student would be able to classify the various acid base disorders, their precipitating factors, presenting features, progression and complications.                                                         | At the end of the training a student would be able to examine, assess and treat a patient of acid base disorders and its complications                    | At the end of the training a student would be able to make the patient aware about the importance of treatment of acid base disorders and its consequences.                                                     |
| Management of acute/chronic renal failure                               | At the end of the training a student would be able to discuss the causes, natural history, presenting features, progression and complications of acute/chronic renal failure                                                             | At the end of the training a student would be able to examine, assess and treat a patient of acute/chronic renal failure and its complications            | At the end of the training a student would be able to make the patient aware about the importance of treatment acute/chronic renal failure and its consequences.                                                |
| Skin manifestations of internal disease                                 | At the end of the training a student would be able to enumerate the various skin manifestations of internal disease, their precipitating factors, diagnostic and prognostic value in relation to the internal disease and complications. | At the end of the training a student would be able to identify the skin manifestations of internal disease and treat it accordingly and its complications | At the end of the training a student would be able to make the patient aware about the importance of detection of the skin manifestations of the internal disease importance of treatment and its consequences. |
| Eczema                                                                  | At the end of the training a student would be able to discuss the causes, distribution, natural history, presenting features, progression and complications of eczema                                                                    | At the end of the training a student would be able to examine, assess and treat a patient of eczema and its complications                                 | At the end of the training a student would be able to make the patient aware about the importance of treatment of eczema and its consequences.                                                                  |
| Psoriasis                                                               | At the end of the training a student would be able to discuss the causes, distribution, natural history, presenting features, progression and complications of psoriasis                                                                 | At the end of the training a student would be able to examine, assess and treat a patient of psoriasis and its complications                              | At the end of the training a student would be able to make the patient aware about the importance of treatment of psoriasis and its consequences.                                                               |
| Adverse drug Reactions                                                  | At the end of the training a student would be able to enumerate the various drug reactions, the responsible drugs, probable mechanism, presenting features, progression and complications.                                               | At the end of the training a student would be able to examine, assess and treat a patient of adverse drug reactions and its complications                 | At the end of the training a student would be able to make the patient aware about the precipitating drug, to avoid it in the future, importance of treatment and its consequences.                             |
| Principles of transfusion therapy and transfusion related complications | At the end of the training a student would be able to enumerate the indications of transfusion, various complications related to it, their mechanisms, presenting features and progression.                                              | At the end of the training a student would be able to examine, assess and treat a patient of transfusion related complications                            | At the end of the training a student would be able to make the patient aware about the necessity of transfusion if indicated, possible complications that may occur.                                            |

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| Leukemia                            | At the end of the training a student would be able to discuss the epidemiology, causes, , natural history, presenting features, progression and complications of leukemia                               | At the end of the training a student would be able to examine including peripheral blood smear and bone marrow aspiration and microscopical examination, assess and treat a patient of leukemia and its complications | At the end of the training a student would be able to make the patient aware about the importance of treatment of leukemia and its consequences.                                                 |
| Lymphoma                            | At the end of the training a student would be able to discuss the epidemiology, causes, , natural history, presenting features, progression and complications of lymphoma                               | At the end of the training a student would be able to examine including peripheral blood smear and bone marrow aspiration and microscopical examination, assess and treat a patient of lymphoma and its complications | At the end of the training a student would be able to make the patient aware about the importance of treatment of lymphoma and its consequences.                                                 |
| Approach to fever of unknown origin | At the end of the training a student would be able to enumerate the various probable causes of FUO , formulate a plan to investigate the problem                                                        | At the end of the training a student would be able to examine, assess and treat a patient of fever of unknown origin and its complications                                                                            | At the end of the training a student would be able to make the patient aware about the importance of evaluation and diagnosis for proper treatment of FUO and its consequences.                  |
| Diagnostic evaluation of anaemia    | At the end of the training a student would be able to enumerate the causes of anaemia with their characteristics ,formulate a plan to manage a case of anaemia                                          | At the end of the training a student would be able to examine, assess and treat a patient of anaemia and its complications                                                                                            | At the end of the training a student would be able to make the patient aware about the importance of evaluation and diagnosis for proper treatment of anaemia and its consequences.              |
| Diabetes Mellitus                   | At the end of the training a student would be able to discuss the types, epidemiology, etiology , natural history, risk factors presenting features, progression and complications of diabetes mellitus | At the end of the training a student would be able to examine, assess and treat a patient of Diabetes Mellitus and its complications                                                                                  | At the end of the training a student would be able to make the patient aware about the importance of proper management of diabetes including avoidance of risk factors and its consequences      |
| Hypertension                        | At the end of the training a student would be able to discuss the types, epidemiology, etiology , natural history, risk factors presenting features, progression and complications of hypertension      | At the end of the training a student would be able to examine, assess and treat a patient of hypertension and its complications                                                                                       | At the end of the training a student would be able to make the patient aware about the importance of proper management of hypertension including avoidance of risk factors and its consequences. |



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| Coronary artery disease                                         | At the end of the training a student would be able to discuss the types, epidemiology, etiology , natural history, risk factors presenting features, progression and complications of coronary artery disease         | At the end of the training a student would be able to examine, assess and treat a patient of coronary artery disease and its complications                                                       | At the end of the training a student would be able to make the patient aware about the importance of proper management of coronary artery disease including avoidance of risk factors and its consequences.                                        |
| Cerebro vascular disease                                        | At the end of the training a student would be able to discuss the types, epidemiology, etiology , natural history, risk factors presenting features, progression and complications of cerebro vascular disease        | At the end of the training a student would be able to examine, assess and treat a patient of cerebro vascular disease and its complications                                                      | At the end of the training a student would be able to make the patient aware about the importance of proper management of cerebro vascular disease including avoidance of risk factors and its consequences.                                       |
| Low cost management and prevention of non communicable diseases | At the end of the training a student would be able to deduce a low cost plan for management and prevention of non communicable diseases                                                                               | At the end of the training a student would be able to examine, assess and treat a patient of non communicable disease                                                                            | At the end of the training a student would be able to make the patient aware about the importance of proper management of non communicable diseases including avoidance of risk factors and its consequences.                                      |
| Cancers prevalent in tropical settings                          | At the end of the training a student would be able to discuss the cancers prevalent in tropical settings, epidemiology, etiology , natural history, risk factors presenting features, progression and complications . | At the end of the training a student would be able to examine, assess and diagnose a patient of cancers prevalent in tropical settings and treat him/her as per guidelines and its complications | At the end of the training a student would be able to make the patient aware about the methods of prevention, importance of proper management of cancers prevalent in tropical settings, including avoidance of risk factors and its consequences. |
| Connective tissue disorders                                     | At the end of the training a student would be able to discuss common connective tissue disorders, their epidemiology, natural history, presenting features, progression and complications.                            | At the end of the training a student would be able to examine, assess and diagnose a patient of connective tissue disorder and treat him/her as per guidelines and its complications             | At the end of the training a student would be able to make the patient aware about the natural history, presenting features, progression of connective tissue disorders, importance of proper management, and its consequences.                    |
| Schizophrenia                                                   | At the end of the training a student would be able to discuss different types of schizophrenia, their presentation, treatment and side effects of drugs.                                                              | At the end of the training a student would be able to examine, assess, diagnose and treat a patient of Schizophrenia and its complications                                                       | At the end of the training a student would be able to make the patient and their care giver aware about the importance of proper management of Schizophrenia, and its consequences.                                                                |

7. MEDICAL EMERGENCIES

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| Severe dehydration          | At the end of the training the student would be able to enumerate the causes of dehydration, know the methods to assess the degree of dehydration and the complications of dehydration. | At the end of the training the student would be able to find out the cause of dehydration, assess the degree of dehydration and manage a case of dehydration.             | At the end of the training the student would be able to make the patient aware of the causes of dehydration and the ways to prevent dehydration and its causes                                                   |
| Acute myocardial infarction | At the end of the training the student would be able to enumerate the risk factors, presenting features, complications, Treatment guidelines of AMI.                                    | At the end of the training the student would be able to examine, assess, investigate and manage a case of Acute myocardial infarction including performing a bedside ECG. | At the end of the training the student would be able to make the patient aware of the risk factors, alarming features, complications and prognosis of AMI and the life style changes to prevent it.              |
| Malignant hypertension      | At the end of the training the student would be able to enumerate the diagnostic criteria of malignant hypertension, its presenting features, complications and Treatment guidelines    | At the end of the training the student would be able to examine, assess, investigate and manage a case of malignant hypertension                                          | At the end of the training the student would be able to make the patient aware of the alarming features, complications and prognosis of malignant hypertension and the life style changes to prevent it.         |
| Acute stroke                | At the end of the training the student would be able to enumerate the causes of acute stroke, its presenting features, complications and Treatment guidelines                           | At the end of the training the student would be able to examine, assess, investigate and manage a case of acute stroke.                                                   | At the end of the training the student would be able to make the patient aware of the risk factors, alarming features, complications and prognosis of acute stroke and the life style changes to prevent it.     |
| Status epilepticus          | At the end of the training the student would be able to enumerate the causes of status epilepticus, its presenting features, complications and Treatment guidelines                     | At the end of the training the student would be able to examine, assess, investigate and manage a case of status epilepticus                                              | At the end of the training the student would be able to make the patient aware of the causes, alarming features and complications of status epilepticus and the life style changes to prevent it.                |
| Acute severe asthma         | At the end of the training the student would be able to enumerate the precipitating factors, presenting features, complications and Treatment guidelines of acute severe asthma.        | At the end of the training the student would be able to examine, assess, investigate and manage a case of acute severe asthma including interpretation of ABG analysis.   | At the end of the training the student would be able to make the patient aware of the precipitating factors, alarming features and complications of acute severe asthma and the life style changes to prevent it |
| Pneumothorax                | At the end of the training the student would be able to enumerate the causes, presenting features, complications and treatment guidelines of Pneumothorax.                              | At the end of the training the student would be able to examine, assess, investigate and manage a case of Pneumothorax including ability to perform water seal drainage.  | At the end of the training the student would be able to make the patient aware of the precipitating factors and alarming features of Pneumothorax and the need to treat it.                                      |

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| Hypoglycaemia                       | At the end of the training the student would be able to enumerate the precipitating factors, presenting features and complications of Hypoglycaemia.                                 | At the end of the training the student would be able to examine, assess, investigate and manage a case of Hypoglycaemia including bedside monitoring of CBG & urine sugar.                    | At the end of the training the student would be able to make the patient aware of the precipitating factors, alarming features of hypoglycaemia and immediate first aid measures to be taken.     |
| Diabetic ketoacidosis               | At the end of the training the student would be able to enumerate the precipitating factors, presenting features, complications and treatment guidelines of diabetic ketoacidosis.   | At the end of the training the student would be able to examine, assess, investigate and manage a case of diabetic ketoacidosis including bedside monitoring of CBG and urine sugar & ketone. | At the end of the training the student would be able to make the patient aware of the precipitating factors, alarming features of diabetic ketoacidosis and the ways to prevent it.               |
| Acute pancreatitis                  | At the end of the training the student would be able to enumerate the precipitating factors, presenting features and complications of Acute pancreatitis                             | At the end of the training the student would be able to examine, assess, investigate and manage a case of acute pancreatitis.                                                                 | At the end of the training the student would be able to make the patient aware of the precipitating factors, alarming features of acute pancreatitis and the lifestyle changes to prevent relapse |
| Approach to an unresponsive patient | At the end of the training the student would be able to enumerate the causes, their presenting features, complications and immediate treatment guidelines of an unresponsive patient | At the end of the training the student would be able to examine, assess, investigate and manage an unresponsive patient                                                                       | At the end of the training the student would be able to make the patient aware of the causes, alarming features of an unresponsive patient and the need of the first aid measures to be taken     |
| Heat stroke                         | At the end of the training the student would be able to enumerate the precipitating factors, presenting features, complications of heat stroke                                       | At the end of the training the student would be able to examine, assess, investigate and manage a case of heat stroke                                                                         | At the end of the training the student would be able to make the patient aware of the precipitating factors and alarming features of heat stroke and need of first aid measures                   |
| Septic shock and severe sepsis      | At the end of the training the student would be able to enumerate the causes, presenting features and complications of septic shock and severe sepsis                                | At the end of the training the student would be able to examine, assess, investigate and manage a case of septic shock and severe sepsis                                                      | At the end of the training the student would be able to make the patient aware of the precipitating factors, alarming features of septic shock and severe sepsis and need of first aid measures   |
| Oxygen therapy                      | At the end of the training the student would be able to enumerate the indications, methods and complications of oxygen therapy                                                       | At the end of the training the student would be able to examine, assess, investigate a case needing oxygen therapy and also able to initiate it                                               | At the end of the training the student would be able to make the patient aware of the alarming features needing oxygen therapy                                                                    |

# 8. CHILD HEALTH

|                                                         |                                                                                                                                                                                                    |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                   |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pattern of morbidity and mortality in children          | At the end of the training the student would be able to discuss the Pattern of morbidity and mortality in children and the important causes in our country                                         | At the end of the training the student would be able find out the causes of morbidity and mortality in our country and take appropriate measures to reduce it                                       | At the end of the training the student would be able to make the parents aware of the important causes of morbidity and mortality in our country and to adopt appropriate preventive measures to reduce it                                        |
| Management of acute respiratory infection in children   | At the end of the training the student would be able to enumerate the causes, presenting features, complications and guidelines of treatment of acute respiratory infection in children            | At the end of the training the student would be able to examine, assess, investigate and manage a case of acute respiratory infection in children                                                   | At the end of the training the student would be able to make the parents aware of the precipitating factors, alarming features and complications and complications of acute respiratory infection in children and the possible ways to prevent it |
| Pneumonia in children                                   | At the end of the training the student would be able to enumerate the causes, presenting features and complications of Pneumonia in children                                                       | At the end of the training the student would be able to examine, assess, investigate and manage a case of Pneumonia in children                                                                     | At the end of the training the student would be able to make the parents aware of the precipitating factors, alarming features and complications of Pneumonia in children and the need for urgent treatment and vaccination                       |
| Gastroenteritis in children                             | At the end of the training the student would be able to enumerate the causes, presenting features, complications and treatment guidelines of Gastroenteritis in children                           | At the end of the training the student would be able to examine, assess, investigate and manage a case of Gastroenteritis in children including initiation of nasogastric or parenteral rehydration | At the end of the training the student would be able to make the parents aware of the precipitating factors, alarming features and complications of Gastroenteritis in children and the measures to prevent it                                    |
| Dehydration in children                                 | At the end of the training the student would be able to enumerate the causes, presenting features and complications of dehydration in children                                                     | At the end of the training the student would be able to examine, investigate and assess the degree of Dehydration in children and also able to manage it                                            | At the end of the training the student would be able to make the parents aware of the causes, alarming features and complications of Dehydration in children and the first aid measures to be adopted to prevent it                               |
| Tuberculosis in children                                | At the end of the training the student would be able to discuss the routes of transmission, presenting features and complications Tuberculosis in children                                         | At the end of the training the student would be able to examine, assess, investigate and manage a case of Tuberculosis in children                                                                  | At the end of the training the student would be able to make the parents aware of the routes of transmission, presenting features and complications of Tuberculosis in children and the need of BCG vaccination                                   |
| Expanded immunization programme                         | At the end of the training the student would be able to narrate the Expanded immunization programme                                                                                                | At the end of the training the student would be able to arrange an Expanded immunization programme                                                                                                  | At the end of the training the student would be able to make the parents aware of the need of Expanded immunization programme                                                                                                                     |
| Vitamin A prophylaxis                                   | At the end of the training the student would be able to enumerate the causes and features of vitamin A deficiency in children and discuss the Vitamin A prophylaxis programme                      | At the end of the training the student would be able to arrange a Vitamin A prophylaxis programme                                                                                                   | At the end of the training the student would be able to make the parents aware of the causes and features of vitamin A deficiency in children and the need of Vitamin A prophylaxis                                                               |
| IDD Control programme; common dietary sources of iodine | At the end of the training the student would be able to enumerate the causes, presenting features and complications of Iodine deficiency diseases in children and common dietary sources of iodine | At the end of the training the student would be able to examine, assess, investigate and manage a case of Iodine deficiency disease                                                                 | At the end of the training the student would be able to make the parents aware of the iodine deficiency diseases in children, common dietary sources of iodine and the need to adopt the IDD Control programme                                    |

|                                                                                                                                                          |                                                                                                                                                                                                     |                                                                                                                                                                                                      |                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Assessment of nutritional status based on history and physical examination                                                                               | At the end of the training the student would be able to assess the nutritional status based on history and physical examination                                                                     | At the end of the training the student would be able to examine, investigate and assess the nutritional status of children                                                                           | At the end of the training the student would be able to make the parents aware of the importance of the nutritional status of children                                                                                    |
| Protein energy malnutrition-identification, classification, causes and management including complications, planning diet for protein energy malnutrition | At the end of the training the student would be able to identify, classify and enumerate the causes, presenting features and complications of Protein energy malnutrition                           | At the end of the training the student would be able to examine, assess, classify, investigate and manage a case of Protein energy malnutrition and its complications, including planning of a diet. | At the end of the training the student would be able to make the parents aware of the cause, alarming features and complications of protein energy malnutrition and the ways to prevent                                   |
| Breast feeding                                                                                                                                           | At the end of the training the student would be able to discuss the advantages of breastfeeding                                                                                                     | At the end of the training the student would be able to train the mother about the steps and method of breastfeeding                                                                                 | At the end of the training the student would be able to make the mother aware of the advantages of breastfeeding and the ill effects of artificial feeding                                                                |
| Vitamin deficiency disorders                                                                                                                             | At the end of the training the student would be able to discuss the causes and presenting features of vitamin deficiency disorders and daily requirements & important sources of different vitamins | At the end of the training the student would be able to examine, assess, investigate and manage a case of vitamin deficiency disorder                                                                | At the end of the training the student would be able to make the parents aware of the precipitating factors, alarming features and complications of different vitamin deficiency disorders and the measures to prevent it |
| Paediatric HIV                                                                                                                                           | At the end of the training the student would be able to discuss the routes of transmission, presenting features, natural history and complications of Paediatric HIV                                | At the end of the training the student would be able to examine, assess, investigate, diagnose and manage a case of Paediatric HIV                                                                   | At the end of the training the student would be able to make the parents aware of the alarming features and complications of Paediatric HIV and the need of proper testing and treatment.                                 |
| Disease control priorities in developing countries                                                                                                       | At the end of the training a student would be able to enumerate the disease control priorities in developing countries,                                                                             | At the end of the training a student would be able to examine, assess and treat patients suffering from diseases which are of priority in developing countries                                       | At the end of the training a student would be able to appreciate and make people aware of the diseases which have control priorities in developing countries,                                                             |
| Micro and macro economics of health                                                                                                                      |                                                                                                                                                                                                     | At the end of the training a student would be able to outline the different aspects of micro and macro economics of health                                                                           | At the end of the training a student would be able to appreciate and make people aware of the different aspects of micro and macro economics of health                                                                    |
| Social determinants of health                                                                                                                            | At the end of the training a student would be able to enumerate the social determinants of health and discuss their importance in public health                                                     | At the end of the training a student would be able to apply and draw a conclusion about the current health status of the community                                                                   | At the end of the training a student would be able to appreciate the importance of social determinants of health in assessment of health situation                                                                        |

|                                                    |                                                                                                                                                                                                                                   |                                                                                                                                                                                  |                                                                                                                                                                              |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Poverty and disparity in healthcare                | At the end of the training a student would be able to consider poverty and disparity in healthcare                                                                                                                                | At the end of the training a student would be able to handle obstacles due to poverty and disparity in healthcare and delivery                                                   | At the end of the training a student would be able to appreciate the problems of poverty and disparity in healthcare .                                                       |
| Concepts of environmental engineering              | At the end of the training a student would be able to understand and discuss about the Concepts of environmental engineering                                                                                                      | At the end of the training a student would be able to take part in environmental engineering in delivering healthcare efficiently                                                | At the end of the training a student would be able to appreciate and make people aware of the role of environmental engineering in delivering healthcare                     |
| Health policy making and cost effectiveness issues | At the end of the training a student would be able to plan appropriate health policy which is cost effective before placing the same in front of the authorities                                                                  | At the end of the training a student would be able to formulate efficiently an appropriate health policy which is cost effective                                                 | At the end of the training a student would be able to appreciate and make people aware of the health policies which are cost effective and to adopt themselves in the same.  |
| National disease control programmes in India       | At the end of the training a student would be able to discuss the different National disease control programmes in India                                                                                                          | At the end of the training a student would be able to carry out treatment of different diseases as per protocols set in National disease control programmes in India             | At the end of the training a student would be able to make the people of the different National disease control programmes in India and to adopt themselves in the same.     |
| Preventive Tropical Medicine                       | At the end of the training a student would be able to discuss the preventive aspects of Tropical Medicine                                                                                                                         | At the end of the training a student would be able to apply the preventive measures while treating Tropical diseases                                                             | At the end of the training a student would be able to appreciate the importance of prevention in management of Tropical diseases                                             |
| Applied anatomy of Cranial nerves                  | At the end of the training a student would be able to enumerate the cranial nerves, describe their pathways, discuss their major functions and enlist the major causes and complications that may arise due to their dysfunctions | At the end of the training a student would be able to examine, assess and treat a patient suffering from a cranial nerve abnormality                                             | At the end of the training a student would be able to appreciate the variety of functions performed by the cranial nerves and prognosis of different cranial nerve disorders |
| Applied anatomy of Cerebral circulation            | At the end of the training a student would be able to describe the pathways of arteries and veins supplying the different parts of the cerebrum, result of obstruction of flow or anomaly at different levels                     | At the end of the training a student would be able to examine, assess and treat a patient suffering from disorders as a result of obstruction or anomaly of cerebral circulation | At the end of the training a student would be able to make the patient aware about the preventive aspects of, as well as the consequences of cerebro vascular disorders      |
| Applied anatomy of the lymphoreticular system      | At the end of the training a student would be able to describe the different components of the lymphoreticular function, their distribution, functions, result of their obstruction                                               | At the end of the training a student would be able to examine, assess and treat a patient suffering from disorders involving the lymphoreticular system                          | At the end of the training a student would be able to make the patient aware about the importance of treatment of lymphoreticular disorders and their consequences.          |

|                               |                                                      |                                                                                                                                                                                                                               |                                                                                                                                                                                                        |                                                                                                                                                                                                              |
|-------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | Applied anatomy of Portal System                     | At the end of the training a student would be able to describe the portal vasculature in the different parts of the body, causes and results of their obstruction in flow or anomaly at different levels and its consequences | At the end of the training a student would be able to examine, assess and treat a patient suffering from disorders as a result of obstruction or anomaly of portal circulation                         | At the end of the training a student would be able to make the patient aware about the preventive aspects of, as well as the consequences of disorders affecting the portal venous system                    |
| BASIC SCIENCES - Biochemistry | Biochemistry in prevention and prediction of disease | At the end of the training a student would be able to describe the usefulness of biochemical tests in prevention and prediction of diseases                                                                                   | At the end of the training a student would be able to carry out appropriate biochemical investigations which may lead to detection of diseases in their asymptomatic stages                            | At the end of the training a student would be able to make the patient aware about the rationality of different screening tests in biochemistry and the prognostic importance of early detection of diseases |
|                               | Acid base metabolism and liver function test         | At the end of the training a student would be able to describe the acid base metabolism and enumerate the indications of liver function test with their interpretation                                                        | At the end of the training a student would be able to carry out and interpret acid base estimation and liver function tests judiciously in the management of patients suffering from related disorders | At the end of the training a student would be able to appreciate the utility of acid base estimation and liver function tests in the management of diseases                                                  |
|                               | Lipid metabolism, hyperlipidemia                     | At the end of the training a student would be able to describe the lipid metabolism and enumerate the indications of performing a lipid profile of an individual                                                              | At the end of the training a student would be able to interpret lipid profile of a subject and suggest appropriate management thereafter                                                               | At the end of the training a student would be able to appreciate the utility of lipid profile in symptomatic as well as individual who belong to the high risk group                                         |
| BASIC SCIENCES - Physiology   | Renal function test                                  | At the end of the training a student would be able to enumerate the indications of performing a renal function test of an individual                                                                                          | At the end of the training a student would be able to interpret renal function test report of a subject and suggest appropriate management thereafter                                                  | At the end of the training a student would be able to appreciate the utility of renal function test in symptomatic as well as individual who belong to the high risk group                                   |
|                               | Physiology of pain                                   | At the end of the training a student would be able to describe the pathways of pain, physiology of pain generation, enumerate different disorders presenting with pain, its types and origin                                  | At the end of the training a student would be able to relieve pain in patients suffering from various disorders with the help of pharmacological and non pharmacological means                         | At the end of the training a student would be able to appreciate the suffering of the patient due to pain and counsel him appropriately.                                                                     |
|                               | Physiology of autonomic nervous system               | At the end of the training a student would be able to describe the different components of the autonomic nervous system, their distribution, functions, result of the disorders affecting it.                                 | At the end of the training a student would be able to examine, assess and treat a patient suffering from autonomic nervous system disorders                                                            | At the end of the training a student would be able to make the patient aware about the importance of treatment of autonomic nervous system disorders and their consequences.                                 |
|                               | Physiology of breathing and lung function tests      | At the end of the training a student would be able to describe the physiology of breathing along with the principles used and indications of lung function tests                                                              | At the end of the training a student would be able to interpret a lung function test, and apply it appropriately in the management of a patient suffering from disorder of the respiratory system      | At the end of the training a student would be able to appreciate the mechanism of breathing and make the patient aware about the utility of lung function tests in the management of respiratory disorders   |

## **PATHOLOGY INCLUDING MICROBIOLOGY:-**

Central nervous system: Brain and spinal cord Meningitis and Encephalitis, Abscess Tumors, Syphilis .of nervous system, Nutritional and metabolic disorders, epilepsy, vascular diseases.

- Heart: Rheumatic fever and carditis, Coronary artery diseases Hypertension, Atherosclerosis, Cardiomyopathy, Pericarditis, Specific and non specific arteritis, Congenital Heart diseases.
- Kidneys: Nephritis, Nephrosis, Kidney, changes in metabolic and collagen vascular diseases, Acute and chronic renal failure.
- Lungs: Pulmonary tuberculosis, atypical mycobacteria, Tumours of lung.
- Liver: Portal hypertension, Cirrhosis of liver, Tumors of liver.
- Bone: Disorders of Mineral and Bone matrix.
- Endocrine Glands: Myxoedema and Thyrotoxicosis, Hyper and hypoparathyroidism, disease of Pituitary, Adrenal Cortex and Medulla.
- Diabetes Mellitus and its complications – Pathological changes in Viscera.
- Gastro intestinal disorders: Peptic ulcer, Malabsorption syndrome, Ulcerative colitis, Amoebiasis (Intestinal and extraintestinal).
- Lymphomas. Leukemias and other blood dyscrasias.

## **PHARMACOLOGY:**

- Chemotherapy, Antibiotics and antimicrobials
- Antimalarial drugs.
- Antiamoebic drugs.
- Anthelmintics.
- Analgesics.
- Sedatives.
- Tranquilizers.
- Antiviral agents.
- Antimitotics.
- Drugs acting on Autonomic nervous system.
- Hormones.
- Drugs for Epilepsy.
- Diuretics.
- Cardiac glycosides.
- 
- Antiarrhythmic drugs.
- Coagulants and anticoagulants.



- Histamine and antihistamine drugs.
- Alcohol.
- Vaccines and Immune Sera.
- Drug abuse, drug tolerance, drug addiction

## 5. TEACHING LEARNING METHODS

*The teaching and training of the students shall include graded responsibility in the management and treatment of patients entrusted to their care; participation in Seminars, Journal Clubs, Group Discussions, Clinical Meetings, Grand Rounds, and Clinico-Pathological Conferences; practical training in Diagnosis and Medical treatment; training in the Basic Medical Sciences, as well as in allied clinical specialties, Undertaking community based projects for hands on training in control of tropical diseases at community level.*

The following teaching learning methods are recommended.

- Lectures
- Case based discussion
- Bed side clinics
- Teaching on ward rounds
- Symposia
- Seminars
- Journal clubs
- Problem based learning
- Telemedicine
- Community based project relating to control of tropical disease in community.

## STRUCTURED TRAINING PROGRAM

1<sup>st</sup> Year:

|                                                           |         |
|-----------------------------------------------------------|---------|
| Haematology                                               | 15 days |
| Endocrinology                                             | 15 days |
| Paediatrics                                               | 15 days |
| Psychiatry                                                | 15 days |
| Dermatology                                               | 15 days |
| Coronary care unit                                        | 15 days |
| Intensive Medical care unit                               | 15 days |
| Thoracic Medicine                                         | 15 days |
| Radiology including imaging techniques & Nuclear Medicine | 15 days |
| Diabetology                                               | 15 days |

|                                                                                              |           |
|----------------------------------------------------------------------------------------------|-----------|
| Rheumatology                                                                                 | 15 days   |
| Cancer Chemotherapy                                                                          | 15 days   |
| Microbiology                                                                                 | 15 days   |
| Impact of social, economical, environmental, nutritional determinants on health of community | 15 days   |
| General Medical Wards                                                                        | 5 months  |
| TOTAL                                                                                        | 12 months |

2<sup>nd</sup> Year:

|                          |           |
|--------------------------|-----------|
| Cardiology               | 1 Month   |
| Nephrology               | 1 Month   |
| Neurology                | 1 Month   |
| Medical Gastroenterology | 1 Month   |
| Geriatrics               | 1 Month   |
| General Medical Ward     | 7 Months  |
| TOTAL                    | 12 Months |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

3<sup>rd</sup> Year:

|                             |               |
|-----------------------------|---------------|
| General Medical Wards       | ... 10 Months |
| National Health Program     | 1 month       |
| Community Health Management | 1 month       |

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## **8. COMPETENCY ASSESSMENT:**

1 OVERALL:

|                                                                                                                           |          |           |
|---------------------------------------------------------------------------------------------------------------------------|----------|-----------|
| 1. a) Communication / commitment / Contribution /<br>Compassion towards patients and Innovation                           | ()<br>() | - 5 Marks |
| b) Implementation of newly learnt techniques/Skills                                                                       | ()       |           |
| 2. Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars                                              |          | - 5 marks |
| 3. Number of Posters/Papers presented in Conferences<br>/Publications and Research Projects                               |          | - 5 marks |
| 1. No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic<br>meetings with details. |          | - 5 marks |
|                                                                                                                           |          | -----     |
| Total                                                                                                                     |          | 20 Marks  |
|                                                                                                                           |          | -----     |

### PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

### 9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation work should be done by the guide / HOD once in every six months. All the Heads of Department will be held responsible for submission of dissertation in time.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

#### 10. THEORY EXAMINATION

Theory examination will comprise 4 papers.

Paper I: Applied Basics Sciences in General Medicine including Social Determinants of health and communication.

Paper II : Internal Medicine including Psychiatry & Children's Diseases

Paper III : Tropical Medicine and related National Programs

Paper IV : Epidemiology, Biostatistics, Medical Research and Health Care Management including Recent advances.

#### **Question paper Pattern:**

Paper I : Write notes on

- |                 |            |
|-----------------|------------|
| 1. Anatomy      | 4 x 5 = 20 |
| 2. Physiology   | 4 x 5 = 20 |
| 3. Biochemistry | 3 x 5 = 15 |
| 4. Pharmacology | 3 x 5 = 15 |
| 5. Pathology    | 3 x 5 = 15 |
| 6. Microbiology | 3 x 5 = 15 |

**Total = 100 marks**

Paper II, III & IV :

- |                   |             |
|-------------------|-------------|
| 1. Elaborate on : | 2 x 15 = 30 |
| 2. Write notes on | 10 x 7 = 70 |

**Total = 100 marks**

#### 11. PRACTICAL EXAMINATION

|                                                                                          | EXAMINATION<br>TIME     | DISCUSSION<br>TIME | MARKS     |
|------------------------------------------------------------------------------------------|-------------------------|--------------------|-----------|
| LONG CASE - 1X 80 MARKS                                                                  | 60 MIN                  | 30 MIN             | 80        |
| SHORT CASES – 3 x 20 MARKS<br>Community level control as per<br>National Health Programs | 45 MIN                  | 30 MIN             | 60        |
| WARD ROUNDS<br>4 CASES X 10 marks<br>(one case per examiner)                             | 50 MIN                  | 30 MIN             | 40        |
| OSCE<br>4 STATIONS X 5 MARKS                                                             |                         |                    | 20        |
| TOTAL                                                                                    | 155 MIN                 | 90 MIN             | 200 (A)   |
| VIVA                                                                                     |                         |                    | 80        |
| LOGBOOK                                                                                  |                         |                    | 20        |
| VIVA TOTAL                                                                               |                         |                    | 100 (B)   |
| TOTAL AGGREGATE                                                                          |                         |                    | 300 (A+B) |
| MINIMUM REQUIRED FOR PASS<br>(50 %)                                                      |                         |                    | 150       |
| DISSERTATION                                                                             | APPROVED / NOT APPROVED |                    |           |

## 12. LOG BOOK

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

The record or log book shall be checked and assessed periodically by the faculty members imparting the training

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

A detailed log book should be maintained for the entire duration of the course. It should contain the following details.

1. Procedures performed
2. Journal clubs
3. Seminars
4. Important cases discussed/ presented
5. Community based project relating to disease control.

## 13. VIVA including competency Assessment -

80 marks

VIVA including Competency Assessment - 80 Marks (60 + 20)

An unstructured viva will be carried out by the examiners.

#### 14.OSCE (Objective Structural Clinical Examination)

The following are suggested stations for the OSCE. Any 4 can be chosen at the discretion of the examiners.

| S.No. | Stations                                                                          | Marks |
|-------|-----------------------------------------------------------------------------------|-------|
| 1.    | Images (X-ray/CT/MRI)                                                             | 05    |
| 2.    | Lab Data                                                                          | 05    |
| 3.    | Procedures                                                                        | 05    |
| 4.    | Emergency                                                                         | 05    |
| 5.    | Communication Skills                                                              | 05    |
| 6.    | Drugs                                                                             | 05    |
| 7.    | Nutrition                                                                         | 05    |
| 8.    | ECG                                                                               | 05    |
| 9.    | Simulation Lab – Techniques & Procedures                                          | 05    |
| 10.   | Simulated Management case studies relevant to Disease control at community level. | 05    |

#### 15. REFERENCE BOOKS

1. Cook GC, Zumla A, editors. *Manson's Tropical Diseases*. 21st edition. Published by WB Saunders
2. Guerrant RL, Walker DH, Weller PF, editors. *Tropical Infectious Diseases: Principles, Pathogens & Practice*. 2nd edition. Published by Churchill Livingstone.
3. Fauci AS, Braunwald E, Kasper DL, Hauser SL, Longo DL, Jameson JL, Loscalzo J, editors. *Harrison's Principles of Internal Medicine*. 17th edition. Published by McGraw-Hill.
4. Boon NA, Colledge NR, Walker BR, Hunter J, editors. *Davidson's Principles and Practice of Medicine*. 20th edition. Published by Churchill Livingstone.
5. Strachan M, Sharma SK, Hunter JA, editors. *Davidson's Clinical Cases*. 1st edition. Published by Churchill Livingstone.
6. Eddleston E, Davidson R, Brent A, Wilkinson R. *Oxford Handbook of Tropical Medicine*. 3rd edition. Published by Oxford University Press.

7. Peters W, Pasvol G. *Atlas of Tropical Medicine and Parasitology*. 6th edition. Published by Mosby.
8. Park K, editor. *Park's Textbook of Preventive and Social Medicine*. 19th edition. Published by Banarasidas Bhanot Publishers.
9. Detels R, McEwen J, Beaglehole R, Tanaka H. *Oxford Textbook of Public Health*. 4th edition. Published by Oxford University Press.
10. Jamison DT, Breman JG, Measham AR, Alleyne G, Claeson M, Evans DB, Jha P, Mills A, Musgrove P, editors. *Disease Control Priorities in Developing Countries*. Published by World Bank Publications.
11. Schulz K, Grimes DA, editors. *The Lancet Handbook of Essential Concepts in Clinical Research*. 1st edition. Published by Elsevier.
12. Bonita R, Beaglehole R, Kjellstrom T. *Basic Epidemiology*. 2nd edition. Published by the World Health Organization.
13. Katz M, editor. *Study Design and Statistical Analysis: A Practical Guide for Clinicians*. 1st edition. Published by Cambridge University Press.
14. Greenhalgh T, editor. *How to Read a Paper: The Basics of Evidence-based Medicine*. 3rd edition. Published by BMJ Books
15. Mandell, Douglas , Bennet, editors, Principles and Practice of Infectious Diseases. 7th edition published by Churchill Livingstone
16. Oxford Textbook of Medicine
17. API Textbook of Medicine
18. Braunwald's
19. Hurst Cardiology
20. Williams Endocrinology
  
21. Murray and Nadel
22. Fishman Respiratory Medicine

23. Crofton Respiratory Medicine
24. Brain Neurology
25. Adams Neurology
26. Shella Sherlock
27. Shamroth ECG Book

**\*\* Note :** The editions are as applicable and the latest editions shall be the part of the syllabi.

#### 16. JOURNALS

1. New England Journal of Medicine
2. British Medical journal
3. Lancet
4. JAPI
5. National Medical Journal of India
6. WHO Bulletin

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**MD FAMILY MEDICINE**

(from the Academic Year 2018-19 onwards)

## **1. Goal**

The goal of the MD Family Medicine course will be to produce competent specialists in the discipline of Family Medicine who shall

- i. Function as a specialist in Family Medicine at the Community Health Centre, rendering primary and secondary care to individuals and families from a defined population
- ii. Provide undergraduate and postgraduate training in Family Medicine
- iii. Conduct research relevant to the discipline of Family Medicine

## **2. Objectives**

At the end of the post graduate training in Family Medicine the student shall acquire:

### **A. Knowledge**

- i. Describe the role of Family Medicine to provide comprehensive and universal health cover to the country.
- ii. Acquire the knowledge about diagnosis and management of common medical conditions in Family Practice in India
- iii. Describe the principles of patient-centred medicine and the bio-psycho-social and spiritual aspects of medicine
- iv. Describe principles of Community Oriented Primary Care (COPC)

### **B. Attitude**

- i. Develop the attitudes required to be a leader in the health care team providing Community Oriented Primary Care.
- ii. Demonstrate the ability to perform the role of the Family Medicine specialist in the health care services imbuing a spirit of cooperation and respect for all other specialties.
- iii. Demonstrate the ability to practice high standards of ethics and integrity in medicine
- iv. Develop the attitude of a lifelong learner

### C. Skills

- i. Diagnose and manage the breadth of conditions that would present to a family medicine setting at the primary and secondary levels of care and appropriately refer those which needs management in a tertiary care centre.
- ii. Organise care of a defined population using principles of Community Oriented Primary Care.
- iii. Provide preventive, first contact, continuing, coordinated and comprehensive care to a defined population and the members of the families there, in a patient-centred manner.
- iv. Perform a three stage assessment of the patient taking into account the clinical, individual and contextual aspects of diagnosis
- v. Provide leadership to the primary care team involving health workers and other stake holders in the community and the hospital.
- vi. Communicate effectively with patients, family members, colleagues and other members of the health care team including other specialists and allied health professionals
- vii. Management of common emergencies in family practice
- viii. Apply principles of behaviour science in family practice
- ix. Develop skills of being a lifelong learner and practice self-directed learning
- x. Implement National health programs
- xi. Develop skills for teaching health workers, medical students and post graduate trainees
- xii. Identify research topics relevant to Family Medicine and conduct research that is ethical and valid.
- xiii. Demonstrate professionalism and ethical integrity in the practice of medicine.

### 3. Components of Post Graduate Curriculum

## **Theoretical knowledge – as per the theory curriculum**

### **Practical and clinical skills**

#### **General medicine**

1. Cardiopulmonary resuscitation including basic life support and advanced cardiac life support
2. Use of defibrillator including automatic external defibrillator
3. Interpret investigations including lab investigations, Xray of chest, abdomen, limbs and spine; ECG and basic antenatal ultrasound; describe indications for CT and MRI and act on their reports.
4. Abdominal paracentesis
5. Pleural fluid aspiration
6. Nasogastric intubation
7. Intravenous access
8. Lumbar puncture
9. Urinary bladder catheterisation
10. Preparation, staining and preparation of peripheral smear
11. Cerebrospinal fluid examination
12. Intercostal chest tube insertion
13. Management of electrolyte and fluid abnormalities
14. Provide health education on smoking cessation, nutrition, alcohol use, physical fitness and stress management
15. Transfusion of blood and blood products

#### **Paediatrics / Child Health**

At the completion of residency training, a family medicine resident should be able to:

1. Demonstrate the ability to take an age-appropriate history and perform a physical examination
2. Perform health promotion (i.e., well-child care) visits at recommended ages based on nationally recognized periodicity schedules
3. Synthesize an appropriate diagnosis and treatment plan for common pediatric conditions in both the outpatient and inpatient settings
4. Demonstrate the ability to communicate effectively with the patient, as well as the patient's family and caregivers, to ensure the development and clear understanding of an appropriate, acceptable diagnosis and treatment plan
5. Intravenous access, subcutaneous, intramuscular, intradermal injections, intraosseous access and blood sampling
6. Lumbar puncture
7. Neonatal resuscitation
8. Assessment of the newborn
9. Assessment of nutritional status and management of the malnourished child including preparation of a diet sheet
10. Use of appropriate growth charts
11. Bladder catheterization
12. Interpretation of radiologic or other diagnostic studies (e.g., spirometry, Xrays, CT scan, electrocardiogram)
13. Performance of developmental surveillance, as well as administration and interpretation of developmental screening tests
14. Nasogastric tube placement
15. Intravenous fluid calculations: maintenance, replacement, electrolytes and blood
16. Laboratory test interpretation
17. Resuscitation of infants and children/ Pediatric Advanced Life Support (PALS)/ Advanced Pediatric Life Support (APLS)
18. Suctioning: nares, nasopharynx
19. Abdominal paracentesis
20. Pleural fluid aspiration
21. Estimation of haemoglobin, total count, differential count, ESR, preparing and staining of blood smears, AFB, interpretation of CBC.
22. Universal precautions
23. Use of Jackson Rees circuit in children with respiratory distress to provide CPAP

## **General Surgery**

1. Initial assessment, management and appropriate referral of surgical emergencies that present to practice
2. Management of minor trauma and injuries
3. Foreskin dorsal slit
4. Circumcision
5. Fine needle aspiration for cytology
6. Proctoscopy
7. Incision and drainage of abscess
8. Suturing
9. Appropriate dressing of wounds
10. Hydrocoelectomy under supervision
11. Reduction of paraphimosis
12. Excision of superficial swellings
13. Lymph node biopsy under supervision

### **Orthopaedics**

1. Initial assessment, stabilisation and referral with appropriate transport of patient with poly trauma
2. Initial assessment, stabilisation, application of splint , sling or slab and referral of fractures and dislocations
3. Management of Colle's fracture, minor sprains and fracture of clavicle if no indication for referral

### **Maternal and women's health**

1. Antenatal care
2. Conduct normal delivery
3. Detect high risk pregnancy, perform LSCS under supervision, forceps or vacuum delivery or refer appropriately
4. Management and timely referral of post partum haemorrhage

5. Care of the new born
6. Pap smear
7. Cervical and endometrial biopsy
8. Dialatation and curettage
9. Insertion and removal of IUCD
10. Contraception counseling
11. Suction evacuation
12. Medical termination of pregnancy
13. Tubectomy
14. Interpretation of basic antenatal ultrasound

### **Community health**

1. Organise health care of a defined population using principles of COPC
2. Investigate outbreak of an epidemic
3. Organise services for an area affected by a disaster
4. Implement national health programs
5. Provide health education for schools and the community
6. Management of non-communicable diseases in families
7. Provide immunisation services
8. Ensure family support for antenatal and geriatric and other vulnerable groups

### **Otorhinolaryngology**

1. Ear syringing and wax removal
2. Removal of foreign body from ear and nose
3. Management of common ENT problems in family medicine
4. Nasal packing
5. Ear lobe repair

### **Ophthalmology**

1. Testing of visual acuity
2. Examination of the fundus
3. Fluorescent dye examination of the cornea
4. Removal of superficial foreign body from cornea under supervision
5. Epilation under supervision

### **Dermatology**

1. Management of common dermatological problems in family practice
2. Skin biopsy
3. Electrocautery, chemical cautery

### **Geriatrics**

1. Comprehensive geriatric assessment
2. Mini mental status assessment
3. Assessment of risk of falls in the elderly
4. Assessment and management or appropriate referral of the agitated elderly patient
5. Home based care

### **Physical medicine and rehabilitation**



1. Coordinate with other specialists and allied health professionals, the rehabilitative and palliative care of patients with stroke and other neurological conditions, cardiovascular diseases, post-traumatic rehabilitation and musculoskeletal diseases
2. Assessment and coordinated care of patients with disabilities
3. Prevention and management of bed sores
4. Provide and coordinate home and community based rehabilitation

### **Pain and palliative care**

1. Coordinate the pain and palliative care of patients with terminal illnesses
2. Manage common medical problems of patients on palliative care
3. Provide end of life care for the patient and prepare the family members
4. Break bad news appropriately
5. Management of grief

### **Emergency management**

1. Initial care, stabilisation and appropriate referral if needed, of patients presenting with emergencies in family practice
2. Skills for life saving procedures in medical, paediatric, surgical, obstetric and neurological emergencies including poisoning, snake bite and heat stroke.
3. Endotracheal intubation
4. Intravenous access and infusion, including central and peripheral lines. Intraosseous infusion

### **Anaesthesia**

- |  |                                                                                                                                                                                                                          |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ol style="list-style-type: none"><li>1. Administer local, spinal and regional anaesthesia including field, digital, ankle, wrist and penile block.</li><li>2. BLS and ACLS</li><li>3. Endotracheal intubation</li></ol> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### **Mental health**

1. Diagnosis and management of depression and anxiety
2. Diagnosis and referral of patients with psychosis
3. Follow up care of patients on treatment for psychosis
4. Management of patients with medical unexplained symptoms
5. Care of patients with stress, grief and social or family related mental health problems
6. Assessment of risk of suicide
7. Management of patients with substance abuse including assessment, detoxification, use of motivational interview and team based care.

#### **Medical jurisprudence**

1. Documentation of injuries
2. Provision of appropriate medical certificates including pre-employment fitness certificate
3. Knowledge of health legislation and duties of doctor attending to cases
4. Knowledge of medical ethics and principles of good practice
5. Medical negligence

#### **WRITING THESIS / RESEARCH ARTICLES**

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. The thesis topic should be relevant to the discipline of Family Medicine.

Thesis shall be submitted at-least 6 Months before the Theory and Clinical/Practical Examination.

#### **ATTITUDES INCLUDING COMMUNICATION SKILLS**

The student should be able to communicate effectively with family members, health professionals and the community as well as with allied health professionals so that multi- disciplinary care is delivered in a seamless comprehensive manner, by the following:

- Use of patient-centred interviewing techniques during consultations including those with adolescents.
- Effective education, counselling and guidance
- Have an adaptable communication style
  - Able to communicate bad news and deal with conflict situations effectively.
  - Demonstrating competence in *communicating effectively* as outlined below:
    - knowledge of family and support systems,
    - identifying and addressing of ethical, cultural, and spiritual issues associated with health care delivery
    - understanding of psychological, social, and economic factors that are pertinent to the delivery of health care.
    - Ability to assess patient's ideas, concerns and expectations about the illness and in accessing the health care system.

#### **TRAINING IN RESEARCH METHODOLOGY MEDICAL ETHICS BIO ETHICS AND MEDICOLEGAL ASPECTS**

Students should compulsorily attend the research Methodology workshop conducted by this University within first six months of joining the M.D course.

They are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, moral and legal issues, medical audit are part and parcel of the curriculum and syllabus.

## **Theory syllabus**

### **Applied basic sciences as relevant to Family Medicine**

#### **Anatomy:**

Gross applied anatomy of the upper and lower limb,  
Musculoskeletal system, brain, heart, lungs, abdominal and pelvic organs.

#### **Physiology:**

Clinically relevant physiology of heart, lungs, endocrine, gastro- intestinal,  
genitourinary, and CNS

#### **Pharmacology:**

Mode of action, side effects and therapeutic uses of drugs commonly used in family  
practice

#### **Pathology and microbiology:**

Review of clinical pathology and microbiology of common diseases relevant to  
Family Medicine and an understanding of the basis of common investigations.

#### **Radiology**

Interpretation of conventional X-rays, and ultrasound reports in making clinical  
decision-making. The physician should have knowledge of the indications for CT  
scan and MRI scan in various clinical contexts, and be able to act on the reports  
furnished by the radiologist.

#### **ECG, Echo and Treadmill test**

Interpret ECG; understand utility of treadmill and ECHO reports

### **Family Medicine**

#### **Principles of Family Medicine**

| Family medicine is the medical specialty which provides continuing, comprehensive  
| health care for the individual and family. It is a specialty in breadth that integrates the  
| biological, clinical and behavioral sciences. The scope of family medicine  
| encompasses all ages, both sexes, each organ system and every disease entity.

The principles of Family Medicine include:

1. Person centred care:
2. Understanding the context of the illness
3. Health promotion and disease prevention
4. Seeing the practice as a population at risk
5. Collaborative, coordinated, team based care
6. Community based care
7. Home based care
8. Importance of subjective aspects of medicine
9. Resource management and health advocacy

### **Community Oriented Primary Care (COPC)**

Principles and practice of COPC

### **General Medicine**

The student should be able to demonstrate theoretical knowledge to manage the following conditions in Family Medicine setting:

**Infections:** Tropical diseases and common infections (including viral, bacterial rickettsial, mycobacterial, protozoal etc.) like malaria, filariasis, rabies, leptospirosis, dengue fever, enteric fever, hepatitis, poliomyelitis, meningitis, encephalitis, HIV/AIDS, sexually transmitted infections, common fungal infections, skin infections, varicella, herpes zoster, rickettsia, measles, mumps, tetanus, Chikungunya fever, newer emerging infections (avian influenza and Zika virus)

**Cardiovascular diseases:** ischemic heart disease, hypertension, rheumatic fever & rheumatic heart disease, cardiac failure, pulmonary edema, infective endocarditis, pericardial diseases, cerebrovascular disorders, peripheral vascular diseases, common cardiac arrhythmias, valvular heart disease, and common congenital heart diseases.

**Common skin diseases:** Prevention, diagnosis and management of common dermatological conditions including acne vulgaris, dermatitis, fungal infections, skin diseases due to bacterial infection, scabies, pediculosis, wart, corn, pityriasis rosea, lichen planus, psoriasis, H. zoster; principles of dermatological therapy; principles of rehabilitation of chronic dermatological patients; principle of diagnosis and management of sexually transmitted diseases, leprosy, skin disorders in diabetes, urticaria, hypopigmentation and hyperpigmentation, photodermatitis, allergies, eczemas, nutritional skin disorders skin manifestations of systemic diseases and autoimmune disorders.

**Gastro-intestinal diseases:** Jaundice, hepatitis, cirrhosis of liver, portal hypertension, hepatic encephalopathy, hematemesis, non-alcoholic fatty liver disease, cholecystitis, pancreatitis, peptic ulcer disease, non-ulcer dyspepsia, gastrointestinal bleeding, gastritis, dyspepsia, GORD, inflammatory bowel disease, irritable bowel syndrome, malabsorption syndromes, acute and chronic diarrhea, acute infectious diarrhoeal diseases, food poisoning, parasitology including amebiasis/ giardiasis/worm infestations, and investigations in gastro- intestinal diseases.

**Neurological diseases:** headache, memory loss, peripheral neuropathy, seizures, dizziness, vertigo, syncope, migraine, transient loss of consciousness, cerebro-vascular accidents, hemiparesis, hemiplegia, paraplegia, quadriplegia, strokes, Parkinsons' disease, neuropathies and myopathies.

**Metabolic and endocrine diseases:** Common endocrine diseases related to pancreas, thyroid, pituitary and adrenal gland, glucose metabolism, glucose tolerance test, diabetes mellitus, dyslipidaemia, iodine metabolism, thyroid function tests, hypothyroidism, hyperthyroidism, metabolic syndrome, obesity, osteoporosis, Vitamin D deficiency and under nutrition.

**Substance abuse:** alcohol, tobacco, drugs including performance enhancing

drugs

**Poisoning:** General emergency measures, poisoning caused by paracetamol, organo-phosphorous compounds, alcohol, kerosene, barbiturates, corrosives, insecticides, carbon monoxide, sedatives, phosphide, snakebite, scorpion sting and Cerebra Odollum.

**Haematological diseases:** Anemias, Iron deficiency, B12 and folic acid deficiency, polycythemia, and common disorders of RBC, WBC and platelets, coagulopathies, leukaemias, lymphomas.

**Common cancers:** cervical, breast, prostate, haematological, gastro-intestinal, head and neck, lung, cancer screening.

**Common renal disorders:** acute and chronic renal failure, glomerular and tubular renal pathologies, renal replacement therapy, renal failure, hematuria, proteinuria, urinary tract infections, glomerulonephritis, pyelonephritis, genitourinary infections-

**Common genetic/hereditary diseases:** Haemophilia, Haemoglobinopathies, Downs' syndrome, muscular dystrophy.

**Common respiratory diseases:** Diagnostic methods in pulmonary medicine, principles of the pulmonary function tests, approach to chest pain, bronchial asthma, chronic obstructive pulmonary disease (COPD), acute and chronic bronchitis, pneumonia, pleural effusion, pneumothorax, atelectasis, bronchiectasis, allergic disorders, smoking cessation, occupational lung diseases, tuberculosis, bronchodilators and steroids in respiratory medicine, carcinoma lung, sleep apnoea, management of acute exacerbation of bronchial asthma and COPD, sarcoidosis, interstitial lung diseases, chronic cough.

## **Paediatrics**

### **1. Newborn**

Neonatal resuscitation

Normal newborn

Identification of sepsis, respiratory, metabolic and cardiac problems

Good breast feeding practices

Neonatal jaundice

Feeding difficulties and management

### **2. Well-newborn and well-child care**

- a. Regular clinical examinations from birth to adolescence including anthropometry, immunization.
- b) Common breastfeeding problems and management
- c) Importance of social supports and cultural issues
- d) Nutrition, including feeding options and variations
- e) Temperament, developmental crying, and behavior
- f). Developmental stages and milestones
- g). Family and social relationships
- h) Effective parenting
- i). Child abuse and neglect prevention
- j) Injury prevention
- k). School readiness (including school failure, bullying, social media, and peer pressure)
- l). Sleep problems
- m). Physical activity and exercise

### **3. Physical growth**

- i. Feeding strategies
- ii. Growth and caloric requirements
- iii. Nutritional supplementation
- iv. Normal growth and variants, including dental development
- v. Failure to thrive
- vi. Obesity
- vii. Sexual development and sexual maturity rating
- viii. Reproductive health maintenance and health promotion

### **4. Current immunization schedule**



## **5. Screening appropriate to age**

- i) Hemoglobin/ hematocrit for anemia
- ii) High-risk children (e.g., preterm, IUGR, congenital anomalies)
- iii). Development
- iv). Vision and hearing
- v) Hypertension
- vi) Depression
- vii) Alcohol and drug use
- viii) Sexual behavior and sexually transmitted infections (STIs), including HIV
- ix) Physical, psychological, and sexual abuse
- x). Other environmental health issues: media exposure, violence

## **6. Psychological disorders**

- a. Families with high risk for parent-child interaction problems, dysfunction, or psychiatric problems
- b. Evaluation, treatment, and/or referral for:
  - i. Anxiety disorders
  - ii. Bipolar disorder and related disorders
  - iii. Depressive disorders (including disruptive mood dysregulation disorder)
  - iv. Disruptive behavior, impulse control, and conduct disorders
  - v. Feeding and eating disorders
  - vi. Neurodevelopmental disorders including
    - Attention-deficit/hyperactivity disorder (ADHD)
    - Autism spectrum disorder
    - Intellectual development disorder
    - Learning disorders
    - Tic disorders
  - vii. Obsessive-compulsive disorder and related disorders
  - viii. Psychiatric emergencies (including suicidality)
  - ix. Psychotic disorders
  - x. Sleep-wake disorders
  - xi. Somatic symptom disorder and related disorders

## **7. Social and ethical issues**

- a. Adoption and foster care
- b. Child physical abuse and neglect, sexual abuse, sexual assault and trafficking
- c. Divorce, separation, death, and dying
- d. Initiating, withholding and withdrawing life support
- e. Family violence and/or drug/alcohol abuse

## **8. Children with chronic conditions**

- a. Genetic disorders
  - i. Common chromosomal abnormalities
  - ii. Screening issues (including ethical, legal, and social implications)
  - iii. Appropriate referral for necessary genetic diagnosis and counseling
- b. Children with special needs or developmental delays
- c. Cancer survivors
- d. Premature infants
  - i. Chronic lung disease
  - ii. Gestational age correction for growth and development
  - iii. Nutrition

## **9. Evaluation and management of common signs and symptoms that present in the context of acute medical care in the inpatient or outpatient setting**

- i. General
  - 1) Constitutional symptoms
  - 2) Fever of unknown origin
- 3) Altered mental status, including fussiness/irritability and lethargy/ fatigue
- ii. Allergic
  - 1) Anaphylaxis
  - 2) Angioedema
  - 3) Drug allergy
  - 4) Food allergy
  - 5) Rhinitis
  - 6) Stevens-Johnson syndrome/toxic epidermal necrolysis

## **10. Cardiovascular diseases**

- 1) Cardiomyopathy
- 2) Chest pain
- 3) Congenital heart disease
- 4) Endocarditis
- 5) Heart failure
- 6) Hypertension
- 7) Murmurs
- 8) Rheumatic heart disease

### **11. Dermatology**

- 1) Acne
- 2) Atopic dermatitis/eczema
- 3) Burns
- 4) Edema
- 5) Impetigo
- 6) Molluscum
- 7) Purpura
- 8) Rashes
- 9) Skin/soft tissue infection
  - a) Cellulitis
  - b) Abscess
- 10) Tinea
- 11) Urticaria
- 12) Viral exanthema
- 13) Warts

### **12. Eye, ear, nose, and throat**

- 1) Chalazion
- 2) Conjunctivitis
- 3) Dacryocystitis
- 4) Deep neck space infections (e.g., retropharyngeal abscess, peritonsillar abscess, adenitis)
- 5) Dental caries and abscess
- 6) Hordeolum
- 7) Laryngomalacia
- 8) Orbital and periorbital cellulitis
- 9) Otitis media, mastoiditis
- 10) Pharyngitis
- 11) Red eye
- 12) Sinusitis
- 13) Strabismus
- 14) Visual changes

### **13. Endocrine/Metabolic**

- 1) Acid-base disorders
- 2) Adrenal disorders
- 3) Diabetes insipidus
- 4) Diabetes mellitus
  - a) Type 1
  - b) Type 2
  - c) Diabetic ketoacidosis (DKA)
  - d) Nonketotic hyperosmolar coma
- 5) Electrolyte disorders
- 6) Growth failure/delay
- 7) Inborn errors of metabolism
- 8) Precocious or delayed puberty
- 9) Thyroid disease

#### **14. Gastrointestinal**

- 1) Abdominal pain
- 2) Appendicitis
- 3) Bilious emesis
- 4) Bloody stool
- 5) Celiac disease
- 6) Cholecystitis
- 7) Colic
- 8) Diarrhea, chronic
- 9) Food intolerance, malabsorption
- 10) Gastroenteritis/vomiting/diarrhea
- 11) Gastroesophageal reflux disease (GERD)
- 12) Hepatitis
- 13) Hernia
- 14) Inflammatory bowel disease (IBD) and irritable bowel syndrome (IBS)
- 15) Intussusception
- 16) Jaundice (non-neonatal)
- 17) Meckel diverticulum
- 18) Pancreatitis
- 19) Pyloric stenosis

#### **15. Gynecologic**

- 1) Imperforate hymen
- 2) Menstrual disorders
- 3) Pelvic inflammatory disease (PID)
- 4) Sexual assault
- 5) STI
- 6) Vaginitis/vaginal discharge

#### **16. Hematologic**

- 1) Anemias
- 2) Bleeding diatheses, including hemophilia
- 3) Hemoglobinopathies
- 4) Lymphadenopathy
- 5) Sickle cell disease, including crisis and appropriate prophylaxis
- 6) Thrombocytopenia
- 7) Thrombophilias
- 8) Venous thromboembolism

## **17. Immunologic/Rheumatologic**

- 1) Dermatomyositis
- 2) Immunodeficiency (including HIV)
- 3) Juvenile idiopathic arthritis (JIA) and other arthritides
- 4) Rheumatic fever
- 5) Systemic lupus erythematosus (SLE)
- 6) Vasculitis
  - a) Henoch-Schönlein purpura (HSP)
  - b) Kawasaki disease (KD)
  - c) Other

## **18. Common childhood infections** including

Measles mumps, rubella, poliomyelitis, diphtheria, pertussis, acute respiratory infections, tuberculosis, H. Influenza, hepatitis, meningitis, chicken pox, acute diarrhoeal diseases, cholera, food poisoning, worm infestations

## **19. Neurologic**

- 1) Altered mental status/encephalopathy
- 2) Developmental delay
- 3) Diplopia/visual disturbance
- 4) Encephalitis
- 5) Guillain-Barré syndrome
- 6) Headache
- 7) Hearing concerns
- 8) Hypotonia/weakness
- 9) Hypertonia
- 10) Infant and foodborne botulism
- 11) Learning disabilities
- 12) Meningitis
- 13) Seizure
- 14) Stroke
- 15) Syncope
- 16) Traumatic brain injury

## **20. Respiratory**

- 1) Apnea
- 2) Asthma
- 3) Bronchiolitis
- 4) Croup
- 5) Cystic fibrosis
- 6) Epiglottitis
- 7) Pertussis
- 8) Pneumonia
- 9) Bacterial tracheitis
- 10) Upper respiratory illness (URI)
- 11) Foreign body

## **21. Nutrition**

- 1) Failure to thrive
- 2) Protein energy malnutrition
- 3) Obesity prevention, treatment, and complications
- 4) vitamin deficiency diseases

## **22. Oncologic**

- 1) Abdominal mass
- 2) Brain tumors
- 3) Leukemias
- 4) Lymphomas
- 5) Neuroblastoma
- 6) Retinoblastoma
- 7) Wilms tumor

## **23. Renal/Urologic**

- 1) Glomerulonephritis
- 2) Hematuria
- 3) Hemolytic uremic syndrome
- 4) Nephrolithiasis
- 5) Proteinuria/nephrotic syndrome
- 6) Scrotal mass, pain, erythema, or edema
- 7) Urinary tract infection (UTI)/pyelonephritis
- 8) Vesicoureteral reflux

## **24. Musculoskeletal/Orthopedic**

- 1) Aseptic necrosis of the femoral head (Legg-Calve-Perthes)
- 2) Growing pains
- 3) Developmental dysplasia of the hip (DDH)
- 4) Limp
- 5) Muscular dystrophy
- 6) Osteomyelitis
- 7) CTEV (club foot)
- 8) Sprains, dislocations, and fractures, including patterns suspicious for abuse
- 9) Toxic synovitis

## **25. Toxicology**

- 1) Drugs of abuse
- 2) Heavy metal poisoning
- 3) Overdose – acetaminophen, diphenhydramine, nonsteroidal anti-inflammatory drugs (NSAIDs), kerosene, common household substances

## **26. Pediatric Emergencies**

Recognition of critical illness  
Stridor  
Status epilepticus  
Pediatric assessment triangle  
Approach to respiratory distress  
Identification of shock, types and management  
BLS, Airway management  
Emergency management of trauma, burns, poisoning, envenomation

## **26. Integrated Management of Childhood and Neonatal Illnesses (IMNCI)**

### **Guidelines**

### **27. Knowledge on National Immunisation Programme.**

## **28. Adolescent Health**

History taking in adolescents  
| Assessment and management of common behavioral problems, stress, psychosocial problems in adolescents with appropriate referral  
Puberty, sexual maturity rating  
Adolescents and the law  
Nutrition, immunization, exercise  
School health program

### **General Surgery**

Diagnosis and treatment or stabilisation and referral of common surgical conditions including acute abdomen, burns, ulcers, superficial soft tissue trauma, abscess, wound and ulcer management, electrolyte and fluid requirements, blood transfusion, suture methods and materials, universal precautions, Cancer screening, disorders of thyroid, diseases of the breast; neck swellings, varicose veins, deep vein thrombosis, peripheral vascular disease; abdominal pain, dysphagia, nausea, vomiting, haematemesis and melena, peptic ulcer, GORD, gastritis, disorders of gall bladder and pancreas. intestinal obstruction, specific and non specific infections. Common cysts, swellings, sinuses, fistulae, abscess, ulcers and tumours, Lymphadenopathy, Hernia, inguino-scrotal swellings, hydrocoele, prostate diseases, renal and genito-urinary tract disorders; anorectal disorders including fissure in ano, haemorrhoids, pilonidal sinus, phimosis, paraphimosis, ingrowing toe nail, diabetic foot.

### **Orthopaedics**

Inflammatory and degenerative arthritis, osteoporosis, common fractures, dislocations, osteomyelitis, Low back ache, Common bone and joint diseases, entrapment neuropathies and neuromuscular disorders including arthritis, cervical spondylosis, intervertebral disc prolapse, bursitis, ganglion, tenosynovitis, plantar fasciitis, carpal tunnel syndrome, tennis elbow, osteomyelitis, degenerative disorders, Volkmann's ischemia, bone tumours, fibromyalgia.

## **Maternal and Women's Health**

Physiological changes in pregnancy, antenatal care, normal labour and post natal care  
Common problems during pregnancy including hyperemesis gravidarum, urinary tract infections, low back ache

Obstetric complications including hypertensive disorders, obstetric hemorrhage, anaemia in pregnancy, gestational diabetes, multiple pregnancy, complications of third stage of labour

Antenatal care, preconception counselling, prenatal care, ectopic pregnancy, gestational trophoblastic diseases, abortion, teratology, medications during pregnancy, intrapartum assessment

Medical termination of pregnancy

Family planning

Physiology of menstruation and its deviations

Common problems in Gynaecology including genital tract infections

Dysfunctional uterine bleeding

Common disorders of uterus and ovary including fibroid uterus, genital prolapse, ovarian tumours, polycystic ovarian disease

Sexually transmitted diseases including HIV, gonorrhoea, chlamydia, bacterial vaginosis, trichomonas, candidiasis, human papilloma virus, herpes infection

Genital tract malignancies

Preventive oncology- screening and early diagnosis of genital tract malignancies

## **Community health**

Aspects of community medicine relevant for Family Medicine

Concept of health and disease, primary health care and its implementation, principles of epidemiology and epidemiological methods.

Epidemiology of communicable diseases, hospital acquired infections, emerging and reemerging infectious diseases, epidemiology of chronic non-communicable diseases and conditions.

Environment and health, basic principles of household waste management, sanitation, safety and availability of drinking water.

Health care of the community, health services at centre, state and district levels  
National health programmes and policies



Demography and family planning

Health information and basic medical statistics, health education

Principles of health education and methods

Health planning and five year plans

National Health insurance schemes and other private schemes

School health programmes

Management of epidemics and natural disasters

Role of NGOs

Preventive medicine in Obstetrics, Paediatrics and Geriatrics, medical sociology, genetics and health, international health, public health aspects of disaster management.

Hospital waste management.

Anatomy of ear, nose and throat, recognition and first line management of common diseases of ear, nose and throat like acute and chronic otitis media, otalgia, rhinitis, sinusitis, pharyngitis, tonsillitis, laryngitis, foreign body, epistaxis, nasal polyps, vertigo, tinnitus, hoarseness of voice, stridor, deafness, ear wax, dysphagia,, snoring, allergic disorders, temporomandibular joint disorders, otitis externa, facial nerve paralysis, hearing loss, hearing assessment, tumours.

Emergencies in ENT

## **Ophthalmology**

Common eye diseases including conjunctivitis, corneal ulcer, inflammatory disorders of eyelids, allergic conditions of eye, red eye, dry eye, painful eye, cataract, glaucoma, diabetic retinopathy, and hypertensive retinopathy.

Emergencies in eye including eye injuries

National Programme for Prevention of Blindness, Vitamin A deficiency  
Refractive errors,

Indications, contraindications and advantages of contact lens and Intra Ocular Lenses  
Ocular side effects of commonly used pharmacological agents

## **Geriatrics**

Common health problems and diseases in the old age & their management including vascular, musculoskeletal, oncological, psychological, neurological, hearing and vision problems

Special attention to nutrition, falls in elderly, incontinence, constipation, delirium, dementia, aches and pains, pruritus

Drug therapy in elderly

Rehabilitation, management of terminally ill patients

Communication skills in bereavement, problems of the family after death Caregiver support, care of elderly, social and psychological problems in elderly, elderly abuse.

## **Physical medicine and rehabilitation:**

Basics of rehabilitation and basic physiotherapy advice

Role of Family Physician in management of patients with disabilities

Bladder care

Team concept in rehabilitation

Management of the bed-ridden patient; bed sores

Community based rehabilitation.

## **Pain and palliative care**

Common symptoms in terminally ill patients and its management

Management of pain, opioid analgesics, Co-analgesics, hospice care

End of life care

Management of grief

Breaking bad news

## **Accident and Emergency medicine**

Common emergencies including shock, acute respiratory distress, status epilepticus, acute myocardial infarction, trauma, poisonings, acute renal failure, spine injury, disaster management, triaging.

## **Anaesthesia**

Basic principles of local anaesthesia, regional anaesthesia, intravenous sedation, relaxants in anaesthesia, spinal anaesthesia, epidural anaesthesia, pre-anaesthetic health check up.

## **Teaching and learning methods**

The teaching should incorporate adult learning methods which are more student-centred and should result in application of knowledge rather than merely passing on information. Suggested teaching and learning activities should include:

1. Lecture cum demonstration
  2. Small group discussion
  3. Seminars, case presentations
  4. Bedside- Case-Based Learning
  5. Role Play
  6. Simulated Patient Lab
  7. Electronic and Computer Simulators
  8. Web Based
    - Clinical case-discussions both during regular clinical ward rounds, and as special academic sessions, will ensure that the learning is contextual, and that it is continuous. Clinical service and training must be a seamless integrated process.
1. Small group teaching /learning activities are the main methods to be used. Other methods include case-based discussions, seminars, bedside clinics, assignments, projects, and problem-solving. These can be organized in the main teaching hospitals as well as in other places where the students will have their rotations, including district hospitals, PHCs or CHCs.
  2. Didactic teaching is required for basic science concepts as well as core topics in clinical subjects as deemed necessary. Lectures may be used to teach concepts and approaches to clinical situations, rather than factual details which should be left to the student to self-learn.
  3. Self-learning methods are to be encouraged. Students should be directed to explore subjects and topics, which are relevant to their clinical work, thus providing context to the learning. Internet, and library facilities should be available. Assignments and project work are to be encouraged.

### **Structured training program**

#### Distribution of Postings for 3 years

|                                                                                                                                                                                             |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Foundation course at Family Medicine department                                                                                                                                             | 2 months  |
| General Medicine<br>(Including 2 weeks each in Infectious Diseases & ART clinic)                                                                                                            | 3 months  |
| Obstetrics & Gynaecology<br>(Including 1 month of labour room, 2 weeks of antenatal clinic,<br>2 weeks of gynaecology clinic and 1 month of family planning<br>posting including tubectomy) | 3 months  |
| Paediatrics (Including one month of paediatric casualty)                                                                                                                                    | 3 months  |
| Orthopaedics including 2 weeks in anaesthesia<br>(The rotation should be in the OPDs every day across units)                                                                                | 1 month   |
| Psychiatry                                                                                                                                                                                  | 1 month   |
| Surgery (Rotation in OPDs and minor OTs across units every day)                                                                                                                             | 1 month   |
| Dermatology                                                                                                                                                                                 | 1 month   |
| Ophthalmology                                                                                                                                                                               | 1 month   |
| ENT                                                                                                                                                                                         | 1 month   |
| Emergency services                                                                                                                                                                          | 2 months  |
| *Elective                                                                                                                                                                                   | 1 month   |
| Family Medicine Department<br>(Including 3 months in Community based hospital posting in PHC/CHC/Taluk/<br>District Hospital)                                                               | 16 months |

**Total : 36 months**

#### **Foundation course in Family Medicine**

This 2 month rotation at the beginning of the course is meant to enable the student to learn principles of Family Medicine and for observing and learning by working in the Family Medicine department, the role of Family Medicine in the health system.

**Posting in Community based hospitals: District/ Taluk Hospital/**

**Community Health Centers (CHCs)/ PHCs:**

- **Out patient service:** The students should be posted to these peripheral hospitals and the faculty of the teaching hospital should conduct out-patient clinics in anyone community based teaching hospital some days of the week, along with the staff of the concerned hospital, and should use this opportunity to supervise and mentor the PG student who is posted there.
  
- **In-patient beds:** The faculty of the teaching department, along with the students will be involved in the care of these patients. The students will also do emergency on-call duty along with the staff of the hospital.

**Once a week posting in Family Medicine department**

To sustain their identity and training as family medicine specialists, they will **come back to the Family Medicine department one day every week** during the postings in other departments. This day will be utilized for

- Student seminars
- Follow up of their patients in the family medicine out-patients
- Experiencing the long term relationship with patients which is a fundamental principle of family medicine
- Scholarly work including thesis work and teaching under-graduate and paramedical students

**\* Elective posting**

During the elective posting, the student can spend more time in any of the above specialties, or choose a new area such as Haematology, Endocrinology, Cardiology, Neurology, Gastro- enterology, Geriatrics, Palliative care, Physical Medicine and Rehabilitation, TB and chest diseases or Academic Family Medicine in Medical education department/Unit.

### COMPETENCY ASSESSMENT:

#### OVERALL:

|                                                                                                                          |          |           |
|--------------------------------------------------------------------------------------------------------------------------|----------|-----------|
| 1. a) Communication / commitment / Contribution /<br>Compassion towards patients and Innovation                          | ()<br>() | - 5 Marks |
| b) Implementation of newly learnt techniques/Skills                                                                      | ()       |           |
| 2. Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars                                             |          | - 5 marks |
| 3. Number of Posters/Papers presented in Conferences<br>/Publications and Research Projects                              |          | - 5 marks |
| 4.No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic<br>meetings with details. |          | - 5 marks |
|                                                                                                                          |          | -----     |
| Total                                                                                                                    |          | 20 Marks  |
|                                                                                                                          |          | -----     |

### PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

### DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year.

As per MCI Clause 14 (4)(a), thesis shall be submitted at least 6 months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation work should be done by the guide / HOD once in every six months. All the Heads of Department will be held responsible for submission of dissertation in time.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

### **THEORY EXAMINATION**

Theory examination will comprise 4 papers.

|                   |                                                                                                                                                                                                                      |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Paper I:</b>   | Principles of Family Medicine, basic sciences and laboratory sciences relevant for Family Medicine                                                                                                                   |
| <b>Paper II:</b>  | General Medicine including Nutrition, Infectious diseases, Lifestyle Diseases, Non-communicable disease & Allied Sciences including psychiatry, geriatrics, dermatology, pulmonology (As applied to Family Medicine) |
| <b>Paper III:</b> | Surgery and Allied Sciences including ENT, Ophthalmology, Orthopedics, pain, and palliative care, emergency care (As applied to Family Medicine)                                                                     |
| <b>Paper IV:</b>  | Obstetrics and gynecology, pediatrics, community medicine, Recent advances (As applied to Family Medicine)                                                                                                           |

### **Question paper Pattern:**

Paper I: Write notes on

|              |                                                                                                     |                         |
|--------------|-----------------------------------------------------------------------------------------------------|-------------------------|
| i.           | Principles of Family Medicine:                                                                      | 3 x 10 marks = 30 marks |
| ii.          | Basic sciences (Including anatomy/physiology/ pharmacology/ pathology/ Biochemistry / microbiology) | 5x 10 marks = 50 marks  |
| iii.         | Lab investigations                                                                                  | 2 x 10 marks = 20 marks |
| <b>Total</b> |                                                                                                     | <b>= 100 marks</b>      |

Paper II, III & IV:

|              |                |              |                    |
|--------------|----------------|--------------|--------------------|
| i.           | Elaborate on:  | 2 x 15 marks | = 30 marks         |
| ii.          | Write notes on | 10 x 7 marks | = 70 marks         |
| <b>Total</b> |                |              | <b>= 100 marks</b> |

**Total theory marks = 400 marks**

## **PRACTICAL EXAMINATION**

### Clinical/ practical & Viva examination

- a) Long cases: 02 semi-long cases 30 minutes each (from Medicine, Obstetrics & Gynecology, Pediatrics). The aim of this assessment is to test communication skills, ability to take history, perform clinical examination, diagnose and develop management plan.
- b) Short cases: 02 short cases 15 minutes each (Dermatology, Ophthalmology, Otorhinolaryngology, Surgery or Orthopaedics). The aim of this assessment is to test the ability to elicit short relevant history, clinical findings, arrive at a diagnosis, and develop appropriate management plan.
- c) Ward rounds cases: 02 instances of acute cases pertaining to any discipline. Short case history will be given at bedside. The student will do a focused examination under the observation of the examiner, in 10 minutes, and then propose a diagnosis and line of management. The student will also discuss the test results available. The aim is to test the ability to manage acute cases and decide about necessity for referral.

Care must be taken to test each post graduate student on the whole spectrum of cases so that a post graduate student does not get all cases from one specialty alone.

**Oral/Viva voce should incorporate all clinical domains** (ECG, X rays, communication skills, data interpretation, clinical case scenarios, instruments, psychomotor skills etc.) OSCE/spotters can be incorporated into this and stations can be increased if feasible. The aim of this is to test ability to interpret investigations, communication skills, procedural skills, and overall skills. At least four stations should be kept as given below. Each student will have 4 OSCE stations and 4 viva stations.

### Examples of viva stations

- Station 1 – Family medicine case scenarios with charts and case histories
- Station 2 -, ECG, Radiographs, laboratory results from biochemistry, pathology, microbiology, CT scan/ MRI/Ultrasound reports
- Station 3 – Drugs & Routinely used Instruments
- Station 4 – Thesis, Recent trends, Portfolio including log book



|                                                       | MARKS                              |
|-------------------------------------------------------|------------------------------------|
| <b>SEMI-LONG CASES - 2X 50 MARKS</b>                  | <b>100</b>                         |
| <b>SHORT CASES – 2 x 30 MARKS</b>                     | <b>60</b>                          |
| <b>WARD ROUNDS</b>                                    |                                    |
| <b>2 CASES X 10 marks<br/>(One case per examiner)</b> | <b>20</b>                          |
| <b>OSCE 4 STATIONS X 5 MARKS</b>                      | <b>20</b>                          |
| <b>TOTAL</b>                                          | <b>200 (A)</b>                     |
| <b>VIVA ( 4 x 20 = 80)</b>                            | <b>80</b>                          |
| <b>LOGBOOK</b>                                        | <b>20</b>                          |
| <b>VIVA TOTAL</b>                                     | <b>100 (B)</b>                     |
| <b>TOTAL AGGREGATE</b>                                | <b>300 (A+B)</b>                   |
| <b>MINIMUM REQUIRED FOR PASS (50 %)</b>               | <b>150</b>                         |
| <b>DISSERTATION</b>                                   | <b>APPROVED / NOT<br/>APPROVED</b> |

### **LOG BOOK**

The postgraduate students shall maintain a record (log) book of the work carried out by them and the training program undergone during the period of training.

The record or log book shall be checked and assessed periodically by the faculty members imparting the training

Periodic review of Logbook and Dissertation has to be done in the Department by guide/HOD once in every 6 months

**A detailed logbook should be maintained for the entire duration of the course. It should contain the following details.**

- 1.Procedures performed**
- 2.Journal clubs**
- 3.Seminars**
- 4.Importance cases discussed/ presented**

## **Reference books**

1. John Murtagh's Textbook of General Practice
2. Practice tips – John Murtagh
3. Oxford Hand book of General Practice
4. Textbook of Family Medicine- Ian. R. McWhinney, Thomas Freeman
5. Textbook of Family Medicine: Robert. E. Rakel, David. P. Rakel
6. Clinical methods: Macleod's
7. Swanson's Family Medicine Review
8. Harrison's Principles of Internal Medicine
9. Davidson's Principles and Practice of Medicine
10. Park's Text book of Preventive and Social Medicine
11. Bailey and Love's Short practice of Surgery
12. Parsons Diseases of the eye
13. Dhingra: Diagnosis of Ear, Nose and Throat
14. Shaw's Text book of Gynaecology
15. D.C.Dutta's Textbook of Obstetrics
16. O. P. Ghai. Essential Paediatrics

## **Journals**

1. Journal of Family Medicine and Primary care
2. Australian Family Physician
3. Annals of Family Medicine
4. British journal of General Practice
5. American Family Physician
6. Australian prescriber
7. British Medical Journal
8. Journal of Indian Medical Association
9. Family Practice Management
10. Journal of Association of Physicians of India
11. The journal of postgraduate medicine
12. Indian Pediatrics
13. Indian Journal of Practical Pediatrics

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## **MASTER OF SURGERY (M.S.)**

**M.S.OTORHINOLARYNGOLOGY**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.S.OTORHINOLARYNGOLOGY**

OTORHINOLARYNGOLOGY has undergone a major transformation in the past decade. the branch of surgery which initially comprised ENT head and neck surgery has acquired a totally new field in skull base surgery. There have been many advances in endoscopic surgery of the head and neck also. In tune with the continuing changes and the need for the students to update to the emerging new fields in otorhinolaryngology, the curriculum has been devised to acquire the new status

**1 GOAL**

The aim of this curriculum is to create a cadre of medical professionals who are well groomed to meet the challenges in the frontier of newer techniques and treatment in the emerging world of medicine and surgery.

1. This curriculum aims at students to keep abreast with latest in ENT subjects
2. Provide comprehensive diagnostic and therapeutic and surgical options and preventive ENT even in rural areas
3. Carry out research activities in emerging fields of ENT
4. To be a complete ENT surgeon by preventing ,diagnosing and treating ENT disease in the community and implement various health care programmes for the society

**2 OBJECTIVES:**

**❖ Knowledge**

The post graduate students have to acquire the knowledge of anatomy physiology and pathological changes in ENT diseases and , identify the manifestations due to diseases and plan the management and care of the patients.

❖ **Attitude**

Through the training program the student should develop a positive attitude and empathy towards the patient.

❖ **Skills**

The student should develop skills of comprehending ENT diseases in the society and know their pathophysiology and devise intervention both medically and surgically and also to prevent diseases. They are also required to have good communication skills and treat patient with empathy. In this perspective they are to acquire sufficient knowledge of theoretical practical research avenues for implementing preventive programmes in the society

**3 COMPONENT S OF THE POSTGRADUATE CURRICULUM**

• **THEORETICAL KNOWLEDGE**

- a) Basic sciences: it is required of student to acquire knowledge of anatomy physiology and mechanism of disease progression
- b) Clinical ENT :knowledge of various ENT diseases and their related systemic connections should be studied
- c) Diagnostic procedures:knowledge of the various methods to identify and conclude regarding ENT diseases should be well studied
- d) Practical cadaveric and surgical skills should be obtained by constant practice and their skills should be evaluated
- e) Research activities should be learnt in such a way that they study the ENT illness both perspectively and elaborately.
- f) Preventive ENT should be learnt with emphasis on hearing and anticancer studies

## **PRACTICAL AND CLINICAL SKILLS**

### **❖ PRACTICAL SKILLS DIAGNOSTIC PROCEDURES**

1. cadaver FESS dissection
2. temporal bone dissection
3. larynx dissection
4. neck dissection

### **❖ THERAPEUTIC PROCEDURES**

- 1) Tracheostomy
- 2) Nasogastric tube insertion
- 3) Grommet insertion
- 4) Nasal packing
- 5) Antral lavage

### **❖ CLINICAL SKILLS**

1. History taking and physical Examination
2. Functional assessment of hearing equilibrium, voice, smell, taste, airway for OSAS
3. Reading Audiogram, OAE, BERA, HIT assessment, speech assessment, rhinomanometry, smell and taste assessment, radiology of ENT
4. Radiotherapy techniques
5. Chemotherapy techniques

## **WRITING THESIS/ RESEARCH ARTICLES**

**All students will have to carry out a research program and bring out a dissertation (thesis)**

**Students are encouraged to attend CME's, publish research papers and present posters, or platform presentations at State, National and International conferences.**

## **ATTITUDES INCLUDING COMMUNICATION SKILLS**

Student should develop the art of eliciting the maximum information from patients in a given time considering the sensory deficits of the patient and caregivers. Communication skills can be learnt through observation and from formal communication skills training and workshops. Students have to develop patience and empathy in dealing with patients. They have to learn to show sensitivity to their special needs.

## **TRAINING IN RESEARCH METHODOLOGY MEDICAL ETHICS BIO ETHICS AND MEDICOLEGAL ASPECTS**

- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.S course.
- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
- Medical ethics, moral and legal issues, Medical audit are part and parcel of the curriculum and syllabus

## **4. THEORY SYLLABUS**

### **Applied Basic Sciences SYLLABUS**

**Anatomy, Physiology, Biochemistry, Pathology and Bacteriology related to E.N.T. Speciality:**

**Anatomy:**

- **Pre-natal and Post-natal development of the ear: Internal ear  
Fistula ante fenestrum  
Air spaces and lining membrane The Ossicles  
Stapes External Ear  
Pneumatisation of the Mastoid Process**



- **Anatomy of temporal bone:**  
     Squamous  
     portion  
     Mastoid  
     portion  
     Petrus  
     portion  
     Tympanic  
     portion
- **Anatomy of the ear:**  
     External ear  
     Middle ear  
     Internal ear
- **Anatomy of cranial nerves:**  
     with particular reference to facial and auditory nerves
- **Osteology of the cranial bones:**  
     Venous sinuses  
     The brain

**Anatomy of nose and paranasal sinuses:**

    Prenatal and post – natal  
     The external nose  
     The nasal cavity  
     The paranasal sinuses  
     Nasal Mucous membrane  
     Blood supply and nerve supply

**Anatomy of the Pharynx and Nose:**

    Development  
     The tonsils  
     Functions

### **Anatomy of the larynx:**

- Prenatal and postnatal development of the larynx  
Difference between child and adult larynx Muscles and
- cartilages of larynx
- Anatomy of trachea, bronchi and Oesophagus
- The long and Broncho-pulmonary segments
- The Mediastinum
- The visceral arches, their derivatives developmental defects Development of face

### **Bacteriology Syllabus**

#### **1. Elementary Bacteriology pertaining to:**

- *Corynebacterium diphtheriae*
- Staphylo, Strepto, Pneumo, Pseudomonas, H.influenza
- Neisseria group
- Proteus group
- Vincents and Fusiform Bacillus

#### **2. Fungus: Aspergillus group Mucor, Rhizopus**

#### **3. Viruses: Adeno virus, Cocksackie, RSV, E B Virus, HIV,H1N1 virus**

#### **4. Rhinosporidiosis**

#### **5. Immunology – Surgical Immunology & allergy**

#### **6. Biochemistry syllabus:**

- Biochemistry of body fluids and C.S.F
- Electrolyte balance and maintenance of PH of Blood
- Biochemical changes in upper airway obstruction  
and after tracheostomy.
- Biochemistry of labyrinthine fluids and its variations

in diseases.

#### **7. Pharmacology syllabus:**

- Pharmacology of sympathomimetic and their uses  
in Otolaryngology
- Local anaesthetics and analgesics : Merits and Demerits
- Chemotherapy of malignant conditions

- Cortico Steroids and its usage in Otolaryngology
- Antibiotics – recent trends
- Topical steroids

#### **8. Pathology Syllabus:**

- General Pathology – Inflammations, Necrosis, Gangrene

Repair of wounds.

- Shock – Pathology
- Granulomas including midline granulomas Thrombosis and Embolism
- Tumors – Aetiology, Classification, Pathology & Histopathology
- Fungal infections
- Bleeding Disorders

Special Pathology:

- Surgical pathology of Mouth, Jaw, Neck Salivary glands and Oesophagus.

#### **9. Ear:**

- Pathology of the external ear.
- Histopathology of the drum membrane
- Inflammations of the middle ear
- Inflammation of Mastoid
- Inflammation of the Petrous
- Histopathology of the inner ear: Vestibular Schwannoma  
Tuberculosis of ear
- Chronic inflammatory changes in the temporal bone
- Neoplasms of the ear

#### **10. Nose:**

- Pathology of the Nose.
- Chronic specific infections of the Nose and accessory sinuses (Paranasal).
- Cysts and tumours of the nose and accessory sinuses.

#### **11. Pharynx and Larynx:**

- Oral and Pharyngeal pathology as manifestations of constitutional Diseases Pathology of the Nasopharynx larynx. Swellings of the neck.
- Clinical Pathology in its relationship to otolaryngology.

**12. Physiology Syllabus:**

- Regulation of water balance and composition of body fluids by the kidney. Coagulation of blood.
- Physiology of special senses:
  - Taste.
  - Smell.
  - Heat.
- Physiology of respiration including its mechanism and regulation. Physiology of Deglutition.
- Maintenance of balance of body.
- Physiology of nose and paranasal sinuses.
- Carriage of Oxygen by the blood.
- Carbondioxide transport in the body.

**13. Audiology syllabus:**

- Physiology of hearing and balance:
- Hearing including physics of sound. Sound production.
- Physics of sound. The vibration. The decibel.
- Sound Stimuli and its Wave motion in a material medium.
- Propagation. Complex sound various and phase difference.
- Sound conduction.
- Vestibular function and balance. Semicircular canals.
- The otolith organs. Otoacoustic Emissions

**NEWER ADVANCES :**

- 1) ENDOSCOPIC ANATOMY AND SURGERY OF SKULL BASE
- 2) COCHLEAR IMPLANT REHABILITATION
- 3) SIALENDOSCOPY

## **5. TEACHING LEARNING METHODS**

The following teaching learning methods are recommended.

Lectures  
Case based discussion  
Bed side clinics  
Teaching on ward rounds  
Symposia  
Seminars  
Journal clubs  
Problem based learning  
Telemedicine

### **Practical Skills**

**Cadaver Dissection of Ear, Nose and Larynx**  
**Diagnostic Endoscopy**  
**Microscopic Examination**  
**Surgical Techniques**

## **6. STRUCTURED TRAINING PROGRAM**

### **FIRST YEAR:**

|                                              |                |
|----------------------------------------------|----------------|
| E.N.T.                                       | ..... 9 Months |
| General Surgery                              | ..... 2 Weeks  |
| Anaesthesia                                  | ..... 2 Weeks  |
| Plastic Surgery                              | ..... 2 Weeks  |
| Cardio Thoracic Surgery / Pulmonary Medicine | ..... 2 Weeks  |
| Neuro Surgery                                | ..... 2 Weeks  |
| Oral * Facio Maxillary Surgery               | ..... 2 Weeks  |
|                                              | -----          |
| Total                                        | 12 Months      |

---

## SECOND YEAR:

|                           |                |
|---------------------------|----------------|
| Audiology and Neurotology | ..... 1 Month  |
| Paediatric Otolaryngology | ..... 1 Month  |
| ENT                       | .....10 months |
|                           | -----          |
| Total                     | 12 Months      |
|                           | -----          |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## 8. COMPETENCY ASSESSMENT:

|                                                                                                                                   |             |
|-----------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>• OVERALL:</b>                                                                                                                 |             |
| a) Communication / commitment / Contribution /<br>Compassion towards patients and Innovation                                      | ()          |
|                                                                                                                                   | () - 5Marks |
| b) Implementation of newly learnt techniques/skills                                                                               | ()          |
| <b>• Number of cases presented in Clinical Meetings/<br/>Journal clubs/seminars</b>                                               |             |
|                                                                                                                                   | - 5 marks   |
| <b>• Number of Posters/Papers presented in Conferences/<br/>Publications and Research Projects</b>                                |             |
|                                                                                                                                   | - 5 marks   |
| <b>• No. of Medals / Certificates won in the conference /<br/>Quiz competitions and other academic<br/>meetings with details.</b> |             |
|                                                                                                                                   | - 5 marks   |
|                                                                                                                                   | -----       |
| Total                                                                                                                             | 20 Marks    |
|                                                                                                                                   | -----       |

## PG CLINICAL COURSE

|                                      |                      |
|--------------------------------------|----------------------|
| VIVA including Competency Assessment | - 80 Marks (60 + 20) |
| Log Book                             | - 20 marks           |

**ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period   |          |           |          | Total Max.20 marks |
|---------------|----------|----------|-----------|----------|--------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks           |
|               | AVERAGE  |          |           |          | 20 Marks           |

**9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

## 10. THEORY EXAMINATION

- Paper I - Applied Basic Sciences in Oto Rhino Laryngology
- Paper II - E.N.T. Including Audiology and Neuro-Otology
- Paper III - E.N.T. Including Head and Neck Oncology
- Paper IV - Rhinology, Laryngology and Recent Advances including Paediatric E.N.T.

### Question paper Pattern:

|                |                |                  |
|----------------|----------------|------------------|
| Paper I :      | Write notes on |                  |
| i.             | Anatomy        | 4 x 5 = 20       |
| ii.            | Physiology     | 4 x 5 = 20       |
| iii.           | Biochemistry   | 3 x 5 = 15       |
| iv.            | Pharmacology   | 3 x 5 = 15       |
| v.             | Pathology      | 3 x 5 = 15       |
| vi.            | Microbiology   | 3 x 5 = 15       |
| <b>Total =</b> |                | <b>100 marks</b> |

|                      |                |             |
|----------------------|----------------|-------------|
| Paper II, III & IV : |                |             |
| i.                   | Elaborate on : | 2 x 15 = 30 |
| ii.                  | Write notes on | 10 x 7 = 70 |

**Total = 100 marks**



## 11. CLINICAL EXAMINATION

|                                     |                            |
|-------------------------------------|----------------------------|
| LONG CASE - (1 X 80 MARKS)          | 80 MARKS                   |
| SHORT CASE - (2 X 35 MARKS EACH)    | 70 MARKS                   |
| WARD ROUNDS (5 CASES X 5MARKS EACH) | 25 MARKS                   |
| OSCE (5 STATIONS X 5 MARKS EACH)    | 25 MARKS                   |
| TOTAL                               | 200 MARKS (A)              |
| VIVA VOCE                           | 80 MARKS (B)               |
| LOG BOOK                            | 20 MARKS (C)               |
| AGGREGATE (CLINICAL + VIVA) TOTAL   | 300 MARKS (A+B+C)          |
| MINIMUM REQUIRED FOR PASS (50%)     | 150 MARKS                  |
| DISSERTATION                        | APPROVED / NOT<br>APPROVED |

## 12. LOG BOOK

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

**13. VIVA;** VIVA including Competency Assessment- 80 Marks (60 + 20)  
**Unstructured Viva**

## 14.OSCE (Objective Structural Clinical Examination)

**Based on Objective Structured Exam Stations:**

| <b>S.No.</b> | <b>Stations</b>                                           | <b>Marks</b>         |
|--------------|-----------------------------------------------------------|----------------------|
| 1.           | Pathology                                                 | 05                   |
| 2.           | Microbiology                                              | 05                   |
| 3.           | Specimen – Dry – 5                                        | 05                   |
| 4.           | Speciment – Wet – 5                                       | 05                   |
| 5.           | Operative Surgery                                         | 05                   |
| 6.           | Instruments – 5                                           | 05                   |
| 7.           | X-ray – 5 / Laptop video                                  | 05                   |
| 8.           | CT/MRI – 5                                                | 05                   |
| 9.           | Audiogram                                                 | 05                   |
| 10.          | Recent advances in ent<br>(BERA/OAE/VEMP/CHAMP/IMPEDENCE) | 05                   |
|              |                                                           | -----<br>50<br>----- |

**15. RECOMMENDED LIST OF TEXT BOOKS AND JOURNALS**

- 1. Scott Brown's Otolaryngology – Five Volumes**
- 2. Endoscopic sinus surgery by PJ Womald / MV Kirtane**
- 3. Ballenger – Diseases of the Nose, Throat, Ear, Head and Neck**
- 4. Mawson's Diseases of the Ear.**
- 5. Glasscock and Shambaugh – Surgery of the Ear.**
- 6. Learning Ear Surgery by Temporal Bone Dissection by Dr. K.K. Ramalingam and Dr. B. Sreeramoorthy**
- 7. Year Book of Otolaryngolgy, Head and Neck Surgery Edited by Michael M. Paperella and Byron J. Bailey.**
- 8. Tumours of the Head and Neck – Clinical and Pathological Considerations by John. G. Batsakis.**
- 9. Rob and Smith – Operartive Surgery – Three volumesRecent Advances in Otolaryngology.**

10. Jacksons Textbook of Broncho – Oesophagology
11. Radiology of Head and Neck by Valvassori
12. Diseases of the facial nerve by Mark May
13. Otolaryngology Neurology by D. Brachmann

**\*\* Note :** The editions are as applicable and the latest editions shall be the part of the syllabi.

#### **REFERENCES:**

Lore's Atlas of Head and Neck Surgery  
Microsurgery of the skull base by Ugo Fisch and Douglas Matto.  
Text Book of Operative Surgery by Lee.

#### **16. JOURNALS**

1. Indian Journal of Otolaryngology
2. Journal of Otolaryngology
3. Laryngoscope
4. Otolaryngology Clinics of North American
5. Annals of Otolaryngology, Rhinology and Laryngology
6. Acta Otolaryngologica
7. Archives of Otolaryngology, Head and Neck Surgery
8. International Journal of Paediatric Otolaryngology
9. Otolaryngology clinics of North America

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## **M.S. GENERAL SURGERY**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.S. GENERAL SURGERY  
Branch I**

**1. GOAL / OBJECTIVES**

- To practice surgery safely and effectively, backed by scientific knowledge and sound skills.
- To have a keen interest in patient care and develop caring attitude.
- To maintain high ethical standards.
- To have sufficient understanding of basic sciences related to surgery to diagnose and manage majority of the surgical conditions clinically and with the help of relevant investigations through comprehensive training and experience necessary for independence practice.
- To exhibit competence in the basic concepts of research methodology and teaching skills.

**2. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

- THEORETICAL KNOWLEDGE
  - PRACTICAL AND CLINICAL SKILLS
  - WRITING THESIS / RESEARCH ARTICLES
  - ATTITUDES INCLUDING COMMUNICATION SKILLS
  - TRAINING IN RESEARCH METHODOLOGY MEDICAL ETHICS  
BIO ETHICS AND MEDICOLEGAL ASPECTS
- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.S course.
  - Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
  - Medical ethics, Bioethics, moral and legal issues and medical audit are part and parcel of the curriculum and syllabus.

### **3. THEORY SYLLABUS**

#### **POST GRADUATE M.S. DEGREE COURSE IN GENERAL SURGERY – BRANCH -I**

##### **ANAESTHESIA**

- Premedication.
- Cardio Pulmonary resuscitation.
- Various types of regional anaesthesia.
- General anaesthesia – Intubation, maintenance and extubation.
- Anaesthesia in special circumstances like emergency, surgery metabolic derangements, Trauma etc.
- Management of Intractable pain.

##### **RADIOLOGY AND RADIO THERAPY**

- Technique of commonly done investigations in the Radiology department like plane x-ray both for bone and soft tissue.
- Technique of contrast x-rays in various systems in the body and their interpretation.
- Ultrasonogram.
- C.T. Scan.
- Practical Knowledge of Radio Therapy.
- Practical knowledge of telecobalt and other Linear accelerator and other types of irradiation.

##### **ORTHO AND TRAUMA**

(one month in Ortho and one month in Trauma Ward under Orthopaedic Surgeon)

- Principles and management of common fracture.
- Immobilization and plaster Technique.
- Correction of deformities of limbs.
- Diseases of bone and joints including tumours and infections
- Management, nerve, tendon and vascular injury.
- Management of Polytrauma.

## **CARDIO THORACIC**

- Thoraco abdominal injuries.
- Intercostal drain.
- Thoracotomy and closure.
- Surgery of oesophagus, lung and pericardium
- Management of empyema.
- Fundamentals of open heart surgery and Bypass surgery.

## **NEURO SURGERY**

- Management of head injury.
- Diagnosis and management of intra cranial tension
- Practical experience in burrhole and craniotomy.

## **UROLOGY**

- Basic knowledge of endourology.
- Trauma related to Urology.
- Basic investigative aspects of uro-dynamics

## **PLASTIC SURGERY**

- Facio Maxillary injuries.
- Various methods of Raw area coverage including Myocutaneous flap
- Reconstructive surgery for Breast and head and neck cancer.
- Cosmetic reconstructive surgery.
- Management of Burns.
- Bed Sore – prevention and management.

## **PAEDIATRIC SURGERY**

**One short note of 7 marks to be made mandatory in Paper 2**

- Congenital anomalies – gastro intestinal, ano-rectal genitourinary tract etc.
- Management of intestinal obstruction in new born.
- Childhood malignancies.

## **GENERAL SURGERY**

All facets of General Surgery including Endocrine Surgery (Viz. Thyroids, Adrenals etc. breast surgery, surgical Gastroenterology)

General Surgery including Surgical Pathology and applied aspects and Basic Medical Sciences.

#### **4. TEACHING LEARNING METHODS**

1. Lectures
2. Case based Discussions
3. Ward Rounds
4. Seminars
5. Journal Clubs
6. Bed side clinics
7. Interdepartmental meetings(Weekly with Radiology and pathology departments)
8. Clinical Society Meetings
9. Surgeon's Club

All Postgraduates should attend the Clinico-Pathological Conference (CPC) held every month and Clinical combined rounds and Clinical Grand rounds (CGR) which are held weekly. They are also encouraged to attend CME's, conferences and skill workshops

All the activities should be entered in a log book which should be signed by the authorized teacher and head of the department

#### **5. STRUCTURED TRAINING PROGRAM**

##### **POST GRADUATE M.S. DEGREE COURSE IN GENERAL SURGERY – BRANCH I TRAINING PROGRAMME**

##### **FIRST YEAR**

|                                |              |
|--------------------------------|--------------|
| a) General Surgery             | ... 7 Months |
| b) Anaesthesia                 | ... 1 Month  |
| c) Radiology and Radio-therapy | ... 1 Month  |
| d) Ortho and Traumatology      | ... 1 Month  |
| e) Neuro Surgery               | 1 Month      |
| f) Plastic Surgery             | 1 Month      |
|                                | -----        |
| Total                          | 12 Months    |

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## SECOND YEAR

|                               |              |   |
|-------------------------------|--------------|---|
| a) General Surgery            | ... 7 Months | ] |
| b) Surgical gastro enterology | ... 1 Month  | ] |
| d) Paediatric Surgery         | ... 1 Month  | ] |
| e) Cardio Thoracic Surgery    | ... 1 Month  | ] |
| f) Urology                    | ... 1 Month  | ] |
| Surgical Oncology             | ... 15 Days  |   |
| Vascular Surgery              | ...15 days   |   |
|                               | -----        |   |
| Total                         | 12 Months    |   |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

## THIRD YEAR

|                       |              |
|-----------------------|--------------|
| a) General Surgery    | ... 9 Months |
| b) Intensive Coaching | ... 3 Months |
|                       | -----        |
| Total                 | 12 Months    |
|                       | -----        |

Surgical Oncology, Vascular surgery, Endocrine surgery and Surgical Intensive care has to be taught by general surgery where concerned super specialty is not available

**6. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

|                                                                                                                                                                             |                                                       |                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• <b>OVERALL:</b></li> </ul>                                                                                                         |                                                       |                                                             |
| <ul style="list-style-type: none"> <li>a) <b>Communication / commitment / Contribution / Compassion towards patients and Innovation</b></li> </ul>                          | <ul style="list-style-type: none"> <li>( )</li> </ul> | <ul style="list-style-type: none"> <li>- 5 Marks</li> </ul> |
| <ul style="list-style-type: none"> <li>b) <b>Implementation of newly learnt techniques/skills</b></li> </ul>                                                                | <ul style="list-style-type: none"> <li>( )</li> </ul> |                                                             |
| <ul style="list-style-type: none"> <li>• <b>Number of cases presented in Clinical Meetings/ Journal clubs/seminars</b></li> </ul>                                           |                                                       | <ul style="list-style-type: none"> <li>- 5 marks</li> </ul> |
| <ul style="list-style-type: none"> <li>• <b>Number of Posters/Papers presented in Conferences/ Publications and Research Projects</b></li> </ul>                            |                                                       | <ul style="list-style-type: none"> <li>- 5 marks</li> </ul> |
| <ul style="list-style-type: none"> <li>• <b>No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details.</b></li> </ul> |                                                       | <ul style="list-style-type: none"> <li>- 5 marks</li> </ul> |
|                                                                                                                                                                             |                                                       | -----                                                       |
|                                                                                                                                                                             | <b>Total</b>                                          | <b>20 Marks</b>                                             |

|                                             |                             |
|---------------------------------------------|-----------------------------|
| <b>VIVA including Competency Assessment</b> | <b>- 80 Marks (60 + 20)</b> |
| <b>Log Book</b>                             | <b>- 20 marks</b>           |

| Year of study | Period   |          |           |          | Total Max.20 marks |
|---------------|----------|----------|-----------|----------|--------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks           |
|               | AVERAGE  |          |           |          | 20 Marks           |

**As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation**

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the first Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

**As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.**

**A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.**

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

## **9.THEORY EXAMINATION**

PAPER I – Applied Basic Sciences in General Surgery

PAPER II – Surgery

PAPER III – Surgery including Traumatology

PAPER IV – Recent Advances

### **Question paper Pattern:**

|                |                |                  |
|----------------|----------------|------------------|
| Paper I :      | Write notes on |                  |
| i.             | Anatomy        | 4 x 5 = 20       |
| ii.            | Physiology     | 4 x 5 = 20       |
| iii.           | Biochemistry   | 3 x 5 = 15       |
| iv.            | Pharmacology   | 3 x 5 = 15       |
| v.             | Pathology      | 3 x 5 = 15       |
| vi.            | Microbiology   | 3 x 5 = 15       |
| <b>Total =</b> |                | <b>100 marks</b> |

|                      |                |             |
|----------------------|----------------|-------------|
| Paper II, III & IV : |                |             |
| i.                   | Elaborate on : | 2 x 15 = 30 |
| ii.                  | Write notes on | 10 x 7 = 70 |

**Total = 100marks**

### **10.PRACTICAL EXAMINATION**

|                                                                                  |                                    |
|----------------------------------------------------------------------------------|------------------------------------|
| <b>LONG CASE - (CASE SHEET WRITING + EXAMINATION- 30 MIN)<br/>(1 X 70 MARKS)</b> | <b>70 MARKS</b>                    |
|                                                                                  |                                    |
| <b>SHORT CASE – (15 MIN EACH) (2 X 40 MARKS EACH)</b>                            | <b>80 MARKS</b>                    |
|                                                                                  |                                    |
| <b>WARD ROUNDS (4 CASES X 10 MARKS EACH)<br/>(3 MIN EACH CANDIDATE)</b>          | <b>40 MARKS</b>                    |
|                                                                                  |                                    |
| <b>OSCE (5 STATIONS X 2 MARKS EACH)<br/>(3 MIN EACH CANDIDATE)</b>               | <b>10 MARKS</b>                    |
|                                                                                  |                                    |
| <b>TOTAL</b>                                                                     | <b>200 MARKS (A)</b>               |
|                                                                                  |                                    |
| <b>VIVA VOCE (15 MIN EACH)</b>                                                   | <b>80 MARKS (B)</b>                |
|                                                                                  |                                    |
| <b>LOG BOOK (15 MIN EACH)</b>                                                    | <b>20 MARKS (c)</b>                |
|                                                                                  |                                    |
| <b>AGGREGATE (CLINICAL + VIVA) TOTAL</b>                                         | <b>300 MARKS (A+B+C)</b>           |
|                                                                                  |                                    |
| <b>MINIMUM REQUIRED FOR PASS (50%)</b>                                           | <b>150 MARKS</b>                   |
|                                                                                  |                                    |
| <b>DISSERTATION</b>                                                              | <b>APPROVED / NOT<br/>APPROVED</b> |

#### **Ward Rounds:**

**In Ward Rounds, two preoperative cases and two post operative cases to be discussed**

### **11. Log Book:**

The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

### **12. VIVA including Competency Assessment**

VIVA including Competency Assessment - 80 Marks (60 + 20)

**Note : 3 stations each 20 Marks**

- Radiology and Specimens
- Surgical Instruments and operative surgery
- Reason Advances

### **13. OSCE: 5 Stations to be attended**

- Lab investigations
- Drugs and Suture material
- Clinical Scenario
- Surgical anatomy
- Communication skills - Ethics

### **14. RECOMMENDED LIST OF TEXT BOOKS & JOURNALS**

- 1) Bailey and Love's Short Practice of Surgery
- 2) Book of Surgery (SABISTON) Volume I and II
- 3) Principles of Surgery by SCHWARTZ
- 4) Abdominal Surgery by MainGOT
- 5) Operative Surgery Charles Rob
- 6) Farquharson's Text Book of Operative Surgery
- 7) New Airds Companion to Surgical Studies
- 8) Jamieson and Key's Text Book of Surgical Physiology
- 9) Surgical Pathology by Boyd.
- 10) General Pathology by Waltair Isreal.
- 11) Last's Anatomy
- 12) Clinical Pharmacology by Laurence.
- 13) Clinical Pharmacology by Satoskar
- 14) Mastery of Surgery.
- 15) Ackerman's Surgical Pathology

- 16) Wilson: Watson – Jones Fractures and Joint injuries.
- 17) Surgical Pathology – By Illing Worth and Dick.
- 18) Clinical Bio-chemistry – Harper
- 19) Clinical Microbiology – Panikar
- 20) Minimal Invasive surgery by Dr. Palanivel
- 21) Emergency Surgery by Hamilton Bailey

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

### **15. JOURNALS / WEBSITES**

- 1) British Journal of Surgery
- 2) Annals of Surgery.
- 3) American Journal of Surgery.
- 4) Surgical Clinics of North America.
- 5) Diseases of Colon and Rectum.
- 6) Annals of Royal College of Surgeons.
- 7) Indian Journal of Surgery.
- 8) NCCN
- 9) upto date
- 10) Medscape
- 11) National Institute of Clinical Education

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## **M.S OPHTHALMOLOGY**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**M.S OPHTHALMOLOGY**

**STATEMENT OF THE COMPETENCIES**

Keeping in view the general objectives of postgraduate training, each disciplines shall aim at development of specific competencies, which shall be defined and spelt out in clear terms. Each department shall produce a statement and bring it to the notice of the trainees in the beginning of the programme so that he or she can direct the efforts towards the attainment of these competencies.

**COMPONENTS OF THE PG CURRICULUM**

The major components of the PG curriculum shall be:

- Theoretical knowledge
- Practical/clinical Skills
- Training in Quality management systems and safety
- Training in communication skills, Ethics, Empathy, compassion
- Training in research methodology and thesis writing
- Training in outreach work in the community



## **M. S. OPHTHALMOLOGY**

### **1.GOALS**

The goal of postgraduate medical education in ophthalmology shall be to produce competent specialist

1. who shall recognize the Eye health needs of the community, and carry out professional obligations ethically, compassionately and in keeping with the objectives of the national health policy;
2. who shall have mastered all of the competencies, pertaining to the Ophthalmology , that are required to be practiced at primary, secondary levels and most of the tertiary level care of the health care delivery system:
3. who understand quality management systems and are equipped with methods to keep themselves updated in future
4. who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology; and
5. who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

### **2. OBJECTIVES:**

At the end of the postgraduate training the concerned the student should have the following Knowledge, Attitudes and Skills and shall be able to:

1. Recognise the importance of Ophthalmology in the context of the health need of the community and the national priorities in the health sector.
2. Practice Ophthalmology ethically and compassionately.
3. Demonstrate sufficient understanding of the basic sciences relevant to research and practice of Ophthalmology.
4. Diagnose diseases by mastering skills to pick up clinical signs and interpreting test results towards this.
5. Have sound theoretical and practical knowledge to manage illness both medically and where relevant surgically based on principles of Evidence Based Medicine (EBM).
6. Have insight into ones limitations and refer to other centre/colleague for appropriate care of the illness being managed.

7. Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and promotive measures/strategies.
8. Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.
9. Demonstrate skills in documentation of individual case details as well as record morbidity and mortality data relevant to the assigned situation.
10. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
11. Play the assigned role in the implementation of national health programmes in Ophthalmology, effectively and responsibly.
12. Organise and supervise delivery of Ophthalmic care in the clinic/hospital or the field situation.
13. Develop skills as a self-directed learner, recognise continuing educational needs; select and use appropriate learning resources.
14. Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
15. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
16. Function as an effective leader of a health team engaged in health care, research or training.

### **3. COMPONENTS OF POST GRADUATE CURRICULUM**

#### **Essential theoretical knowledge**

The student is trained to become a specialist who will treat all eye conditions at the primary and secondary level and many of the tertiary care problems, there his/her theoretical knowledge should be broad based and should encompass all of what is there in good multi-volume text book of Ophthalmology.

#### **Essential diagnostic skills - instrumentation**

This list is only illustrative and more clinical tests whose importance have not been recognized in the past or newly developed should be learned.

### **Ophthalmic examination:**

- External eye examination with torch and magnification
- Vision assessment and recording in Snellen's notation and LogMar
  - i. Pediatric visual assessment
- Refraction
  - i. Retinoscopy
  - ii. Streak Retinoscopy
  - iii. Use of trial set
  - iv. Use of Jackson's cross-cylinder
  - v. Subjective refinement of refraction
- Autorefractometry
  - i. Use of and interpretation of autorefractometer
- Slit Lamp Examination
  - i. Diffuse examination
  - ii. Focal examination
  - iii. Retroillumination – direct & indirect
  - iv. Sclerotic scatter
  - v. Specular reflection
  - vi. Staining modalities and interpretation
- Slit Lamp Accessories
  - i. Applanation Tonometry
    - 1. Goldman's applanation
  - ii. Gonioscopy
    - 1. Single or two mirror
    - 2. Grading of the angle
    - 3. Testing for occludability
    - 4. Indentation gonioscopy
  - iii. 3- mirror examination of the fundus
  - iv. 78-D / 90-D / 60-D retinal examination
  - v. Hruby lens examination
  - vi. Optical pachymetry
  - vii. Slit lamp photography

- **Tonometry**
  - i. Digital tonometry
  - ii. Applanation
  - iii. Indentation ( commonly Schiotz )
  - iv. Electronic tonometry
- **Pupil examination**
  - i. Direct and Consensual
  - ii. Relative afferent papillary defect
- **Assessment of epiphora**
  - i. Jone's dye test
  - ii. Syringing – performance & interpretation
  - iii. Dye disappearance test
- **Dry eye evaluation**
  - i. Schirmer test
  - ii. Rose Bengal / Lissamine green staining
  - iii. Tear film breakup time
  - iv. Tear meniscus evaluation
- **Direct ophthalmoscopy**
  - i. Distant direct
  - ii. Use of filters provided
- **Indirect ophthalmoscopy**
  - i. Scleral depression
  - ii. Fundus drawing capability
  - iii. Use of filters provided
- **Colour vision evaluation**
  - i. Ishihara pseudoisochromatic plates
  - ii. Other tests like
    1. Farnsworth – Munsell 100 – hue or 15 – hue tests or
    2. Holmgren's wools
- **Use of Amsler's charting**
  - i. Instructing in the use of and interpreting the chart.
- **Corneal topography and corneal mapping**
- **Corneal thickness assessment**
- **Specular microscopy of the corneal endothelium**
- **Keratometry**
  - i. Performance & interpretation of keratometry
  - ii. Diagnosis of situations such as keratoconus
  - iii. Keratotomy

- **Diagnosis & assessment of Squint**
  - i. Hirschberg test
  - ii. Ocular position and motility examination
  - iii. Versions, ductions, and vergences
  - iv. Convergence facility estimation
  - v. Cover / Uncover / Alternate cover test
  - vi. Use of prism bars or free prisms in assessment of squint
  - vii. Use of synaptophore / major amblyoscope
  - viii. Use of Bagolini's striated glasses / red filters / Maddox rod
  - ix. Use of Worth's four dot test
  - x. Use & interpretation of the Hess chart / Lees' screen
  - xi. Performance & interpretation of diplopia charting
  - xii. Diagnosis of amblyopia
  - xiii. Examination for stereopsis
- **Exophthalmometry**
  - i. Detection of early proptosis
  - ii. Use of any exophthalmometer like Hertels or Luedde's
- **Corneal ulcer investigation**
  - i. Taking a corneal scraping
  - ii. Inoculation into media
  - iii. Evaluation of Gram's stain
  - iv. Evaluation of KOH preparation
- **Use and evaluation of ophthalmic ultrasound**
  - i. A- scan ultrasound with biometry
  - ii. B- scan ultrasound : performance & interpretation
- **Interpretation of Optical coherence Tomography images of the eye**
- 
- **Fundus photography & fundus fluorescein angiography (FFA, FAG)**
  - i. Doing and evaluating stereoscopic fundus photographs
  - ii. Performance of and interpretation of FFA
  - iii. Performance of indirect fluorescein angioscopy
- **Interpretation of perimetry**
  - i. Confrontation fields
  - ii. Tangent screen
  - iii. Static computerized perimetry
    - 1. Interpretation of commonly managed problems
- **Interpretation of Electrophysiological studies like ERG, VEP and EOG**
- **Evaluation of donated eye bank eye**

- **Radiology**
  - i. **Interpretation of plain skull films**
    1. PA-20 ( Caldwell's view )
    2. PNS ( Water's view )
    3. Lateral
    4. Optic canal views
    5. Localisation of intra ocular and intra orbital FBs
  - ii. **Interpretations of contrast studies**
    1. Performance & interpretation of dacryocystograms
  - iii. **Interpretation of CT Scans & MRI Scans**
    1. Orbital CT and MRI evaluation
    2. Brain CT interpretation

**Non Ophthalmic clinical examination:**

**General medical examination at the undergraduate level**

**With special emphasis on a good Neurological examination and Examination of the sinus, Anterior nose and mouth**

**Essential Research Skills leading to writing of a thesis**

1. Basic knowledge in epidemiology and biostatistics
2. Ability to undertake clinical or basic research by formulating a research question, Reviewing the literature, designing the appropriate study methodology, identifying the null hypothesis, Writing up a research proposal, Getting IRB approval, Collecting data, Collating and analyzing the results and writing up the research work as a thesis and for scientific publication. (Follow university standards for thesis writing)
3. Ability to constructively criticize published articles.
4. This could be achieved during the course by attending workshops on Research Methodology and statistics, Good clinical practice (GCP) ; Going through the process of doing the thesis with the help of a guide, basic and regularly having Journal Clubs in the department.
5. Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

**Attitudes including Communication skills:**

Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.

## **Training in research methodology, medical ethics, bioethics and medicolegal aspects**

- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.S course.
- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
- Medical ethics, Bioethics, moral and legal issues and medical audit are part and parcel of the curriculum and syllabus.

## **Other skills required**

1. Contact lenses
  - a. Pre fitting assessment
  - b. RGP and soft lens fitting
  - c. Special lens fitting eg keratoconus
  - d. Troubleshooting
2. Low vision assessment (LVA)
  - a. The basics of LVA assessment and selection of aid with knowledge of availability & cost.
  - b. Should have a basic knowledge of the facilities available for the blind including government concessions, and life style supports. Student should be exposed to LVA clinic
  - c. An exposure to Cerebral Visual insufficiency evaluation as part of pediatric ophthalmology posting is desirable.
3. Community ophthalmology
  - a. Ability to organize institutional screening
  - b. Ability to organize peripheral eye screening camps
  - c. Knowledge and ability to execute guidelines of National Program for Prevention of Blindness- Student should be exposed to the activities of the outreach service division.
4. Presentation skills
  - a. Should part take in seminar presentation in the department .
  - b. Should make presentations in conferences and CME programmes. Eg Free paper sessions or posters.
5. Organisation
  - a. Ability to organize meetings, seminars and symposia
  - b. Ability to get along with colleagues and work as a team with the other members of the department.
  - c. Help organize exams in the department for various courses.

6. Communication skills
  - a. With patients and colleagues
  - b. Should read books on clinical communication skills and attend training programmes if available.
7. Record keeping and Quality
  - a. Ability to maintain records as scientifically as possible
  - b. Knowledge of computer software especially Excel and a statistical package. This is best learnt while doing the thesis.
  - c. Should know the components of quality management systems and be able to do clinical audits
8. Teaching
  - a. The ability to pass on skills acquired to one's juniors, theoretical, procedural and surgical

#### **4. THEORY SYLLABUS :**

- a. The Basic Sciences :
  - i. Orbital and Ocular anatomy
    - a. Gross anatomy
    - b. Histology
  - ii. Ocular Physiology
  - iii. Pathology
    - a. General pathology
    - b. Ocular pathology : Gross pathology, Histopathology.
  - iv. Biochemistry: General biochemistry, Biochemistry applicable to ocular function.
    1. Microbiology
      - a. General Microbiology
      - b. Specific microbiology applicable to the eye
      - c. Immunology with particular reference to ocular immunology
- b. Optics and Refraction
  - a. Physical optics
  - b. Geometric optics
  - c. Visual optics
  - d. Applied optics including optical devices and contact lenses
- c. Clinical Ophthalmology
  - i. Disorders of Refraction
  - v. Disorders of the Lids
  - vi. Disorders of the Lacrimal System
  - vii. Disorders of the Conjunctiva
  - viii. Disorders of the Sclera



- ix. Disorders of the Cornea
  - x. Disorders of the Uveal Tract
  - xi. Disorders of the Lens
  - xii. Disorders of the Retina
  - xiii. Disorders of the Optic Nerve & Visual Pathway
  - xiv. Disorders of the Orbit
  - xv. Glaucoma
  - xvi. Neuro ophthalmology
  - xvii. Paediatric ophthalmology
  - xviii. Systemic ophthalmology ( Ocular involvement in systemic disease)
  - xix. Immune ocular disorders
  - xx. Strabismus & Ocular motility disorders
- d. Community Ophthalmology
- 1. Understanding of Ophthalmic disease burden in the community
  - 2. Community based eye care delivery
  - 3. Community based rehabilitation
  - 4. Community based eye research
  - 5. World and National health programmes
  - 6. Basics of epidemiology and biostatistics

## **5.TEACHING LEARNING METHODS:**

Postgraduate training follows adult teaching principles. The faculties are supervisors cum facilitator and not passive transmitters of knowledge.

### **1. Outpatient training**

Students will see out patients (OP) in the clinic initially with the consultant; progressing to independently seeing patients and then discussing with faculty and finally seeing patients independently and treating patients. The faculty will be there in the OP to clear doubts at any stage.

### **2. Inpatient training**

Students will work up the more difficult and surgical patients admitted to the ward and be responsible for their care under the faculty in charge of the wards. The cases in the wards will be discussed during rounds so that students gain practical experience.

### **3. Surgical training:**

This will be graded. The student will first train in the wet lab and get used to handling the microscope and micro-instruments. They will also do minor procedures in the treatment room under supervision. Once wet lab training is over they will go to the operation theatre (OT) and in a graded manner first observing, then assisting and being assisted and finally doing independently and training juniors.

### **4. Emergency training:**

Students will take on calls and attend emergencies and ward calls in a graded basis starting with being first on call. They will also assist and do emergency surgeries while being on call. While on call they will learn how to harvest donated eyes and see inpatients of other department requiring eye consultations. All students will have to attend Basic life support training.

### **5. Clinical Case discussions**

- a) Every effort should be made to include as wide a variety of cases as possible over two years with multiple repetitions.
- b) Case discussions will be a constant feature of round where patient's records written by the student and treatment options will be discussed. Examination methods, evidence based management, latest developments etc can also be discussed.
- c) Case presentation at other, in-hospital multidisciplinary fora may be done.

### **6. Seminars**

- a) Seminars should be conducted at least once weekly.
- b) Seminars could be individual presentations or a continuum (large topic) with many candidates participating.

### **7. Journal Clubs**

- a) This also should be a once a week or once in two week exercise. The topics selected should be current. It could be done topic wise or journal wise. Indexed journals are recommended.

## **8. CPC**

The students should attend Clinico Pathological Conferences (CPCs).

## **9. Lectures**

- a) Lectures to candidates should be in the form of instructional courses at the beginning of the academic term should be given so that students get a broad idea about the speciality.. These would include topics such as dark room techniques, fundus fluorescein angiography, evaluation of perimetry, squint evaluation and management, slit lamp examination with accessories such as gonioscopy etc.
- b) Lectures could also be arranged round the year on subspecialty topics.
- c) During the course, the candidates should have one lecture / one seminar on National programs (eg. National Programme for Control of Blindness, Trachoma program etc.), International assistance schemes for execution of national program ( DAN-PCB , Lion's International, Christoffel-Blunden Mission etc ). These would be addressed to in detail, including current status etc.. In addition, it would be useful to include a few lectures on other non-ophthalmic National programs being undertaken in the country.

## **10. Research Activities leading to Thesis**

A candidate should learn to be conversant with journal browsing, medline search etc. to help in clinical and research work. They should also be given opportunity to attend research methodology classes. They should be involved in departmental research activities other than their thesis so that they can present in national conferences. Dissertation should be the main topic of research for the candidate. This should be a prospective study following all steps of research mentioned elsewhere in this document.

## **11. Teaching skills:**

Every postgraduate student should be involved in undergraduate teaching also. One or two theory classes for undergraduates could be attended and one or two theory classes could be taken for undergraduates for selected topics. Undergraduate clinical teaching is another teaching skill that the student should pick up during the course. At least five to six undergraduate clinical classes should be taken during his / her course.

## **12. Orientation program:**

All postgraduates from all specialties should have an introductory program in the institution where they are informed about candidate responsibilities, working systems, library usage, lab protocols etc. Specific orientation regarding the departmental working could be made as an introductory talk in the department concerned.

## **6.STRUCTURED TRAINING PROGRAMME:**

### **Rotation and Posting in other Departments**

The candidates should be rotated through the different units of the department to get an insight into different modes of functioning and the sub-specialities the units may be focusing on. In institutions where in depth subspecialties is not usually performed, ( eg. VR surgery, orbit surgery etc.), students could be deputed for a month to institutions in which these specialities are highly developed.

For an MS student, optional postings to allied departments would include

Plastic Surgery – 1 week

Neurology / Neurosurgery – 1 week

ENT – 2 weeks

However, posting to these allied specialities would depend upon the head of department's discretion. The total duration of posting should not exceed 3 months.

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

### **Year – wise structured training schedule**

#### **First year:**

##### **1. Theoretical knowledge**

- a. Basic sciences text books should have been read during this period. Optics and refraction book and a medium sized Single volume clinical Ophthalmology text should be read ( Books from 1 to 9 in the text book list).
- b. It is useful to have an internal examination of the basic sciences at the end of the first year, which will decide appearance at the final examination.
- c. Clinical ophthalmology.

##### **2. Clinical examination and diagnostics**

- a. The art of history taking and all clinical examination skills should be learnt. The order of examination and recording should also be learnt during this time.
- b. By third month students should see outpatient cases independently and under supervision be encouraged to make clinical and surgical decisions.
- c. The art of retinoscopy and subjective refraction should be learnt.

### **3. Diagnostics**

- a. Should have an exposure to all the equipments with the students themselves taking the test and then doing the tests themselves under supervision of the technician in charge. They should start to learn to interpret the tests.

### **4. Surgery**

- a. Extra ocular surgery including
  - i. Destructive procedures like evisceration must have been done with or without assistance
  - ii. Local Anaesthesia ( retrobulbar, facial and peribulbar blocks mastered )
  - iii. Subconjunctival injections
  - iv. Assisting for squint surgery
  - v. Assisting for lid surgery. Tarsorrhaphy should be performed independently as also the simpler oculoplastic procedures.
  - vi. Chalazion and Pterygium surgery.
  - vii. Lid and corneal foreign body removal, suture removal on the slit lamp etc.
  - viii. At the end of the first year, the student should have participated as assistant in most of the intra ocular procedures as an assistant.
  - ix. Cataract surgery :
    - 1. Cataract surgery should be approached in stages, emphasis to be given on microscopic surgery.
    - 2. At the end of the first year, the student should be able to do standard extracapsular cataract extraction at least under guidance.

- 5. Special training courses** in Research methodology, Ethics, Good clinical practice, Basic life support, Quality management and clinical audits, communication skills etc should be undertaken.

### **Second year :**

#### **1. Theoretical Knowledge :**

- a. Student should start reading a multi-volume text book and internalize the same.

#### **2. Clinical examination and diagnostics**

- a. The student is encouraged to take diagnostic investigational and therapeutic decisions on his / own. He / she should be able to manage most of the common problems that arise without guidance. However, the degree of freedom allowed in decision making is left to the confidence of the teacher in the student's abilities. It is to be encouraged. May require guidance for more complex cases.

### **3. Diagnostics:**

The student should be conversant and at ease with most of the diagnostic procedures. The basic interpretation of the investigations should be mastered.

### **4. Surgical skills**

- a. At the end of the second year , the student should be capable of operating, without assistance, but under supervision, all varieties of cataract except congenital cataract. He / she should also know the management of cataract induced complications and cataract surgical complications ( management of vitreous loss).
- b. He/she should have performed the basic antiglaucoma procedures such as trabeculectomy either with assistance or under supervision
- c. Extra ocular surgery such as squint surgery could be performed with assistance.
- d. In addition, lacrimal sac surgery such as dacryocystectomy and dacryocystorhinostomy should be possible with assistance or under supervision.
- e. In addition, the Master's candidate should ideally have assisted in the other surgery such as retinal surgery, vitrectomy, orbit surgery, advanced oculoplastic surgery etc.

### **5. Conferences and workshops**

- a. The candidate should have attended one or two regional workshops and one national conference if possible. Presentation of a free paper at these venues is to be encouraged.

## **Third year:**

### **1. Theoretical knowledge :**

- a. Should complete reading a multivolume text book and referring to speciality books when needed.

### **2. Clinical examination and diagnostics**

- a. Should be conversant with all aspects of clinical examination and decision making. Independent decision making and investigational and management freedom should be given at this stage for the more usual situations. However, complex cases could be discussed with consultant and degree of freedom of decision making is left to the consultant's discretion.

### **3. Surgical skills**

- a. Routine skills are honed during this period.
- b. Cataract surgery should be done independently without supervision or assistance.
- c. Antiglaucoma surgery may be done.
- d. Can assist other procedures such as Retinal surgery, orbit surgery etc. The choice of doing the surgery with assistance and supervision should be left to the discretion of the consultant.

#### 4. Conferences and workshops

- a. The candidate by this time should have attended at least one national conference. He / she should be encouraged to attend regional workshops and conferences particularly those dealing with the latest development.

#### Essential surgical skills

| Procedure                                                                     | Nature of activity * & number |   |    |    |
|-------------------------------------------------------------------------------|-------------------------------|---|----|----|
|                                                                               | O                             | A | PA | PI |
| <b>1. Operating theatre</b>                                                   |                               |   |    |    |
| <b>a. Anaesthesia :</b>                                                       |                               |   |    |    |
| i. Retrobulbar anaesthesia                                                    | -                             | - | 20 | 20 |
| ii. Peribulbar anaesthesia                                                    | -                             | - | 20 | 20 |
| iii. Parabolbar anaesthesia                                                   | ✓                             | - | -  | -  |
| iv. Facial blocks                                                             |                               |   |    |    |
| • O'Brein                                                                     | -                             | - | -  | 20 |
| • Atkinson                                                                    | -                             | - | -  | 5  |
| • van Lint & modifications                                                    | -                             | - | -  | 5  |
| v. Frontal blocks                                                             | -                             | - | -  | 2  |
| vi. Infra orbital blocks                                                      | -                             | - | -  | 1  |
| vii. Blocks for sac surgery                                                   | -                             | - | -  | 5  |
|                                                                               |                               |   |    |    |
| <b>b. Magnification :</b>                                                     |                               |   |    |    |
| i. Operating microscope :<br>Familiarity with use is essential                | -                             | - | -  | ✓  |
| ii. Operating loupe                                                           |                               |   |    |    |
|                                                                               |                               |   |    |    |
| <b>c. Lid surgery:</b>                                                        |                               |   |    |    |
| i. Tarsorrhaphy                                                               | -                             | - | -  | 10 |
| ii. Ectropion and entropion procedures                                        | -                             | - | -  | 2  |
| iii. Ptosis surgery                                                           | -                             | 2 | -  | -  |
| iv. Lid repair following trauma and surgical excision of lid for tumours etc. | -                             | - | 2  | -  |
| v. Epilation, electrolysis, cryotherapy etc.                                  | -                             | - | -  | 10 |
| <b>d. Destructive procedures:</b>                                             |                               |   |    |    |
| i. Evisceration with or without implant                                       | -                             | - | -  | 3  |
| ii. Enucleation with or without implant                                       | -                             | - | -  | 5  |
| iii. Modified enucleation procedures for intraocular tumours                  |                               | - | 1  | -  |
|                                                                               |                               |   |    |    |

|           |                                                                                                                                          |   |          |          |           |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------|---|----------|----------|-----------|
| <b>e.</b> | <b>Sac surgery</b>                                                                                                                       |   |          |          |           |
| i.        | <b>Dacryocystectomy</b>                                                                                                                  | - | -        | -        | <b>2</b>  |
| ii.       | <b>Dacryocystorhinostomy</b>                                                                                                             | - | -        | -        | <b>3</b>  |
| iii.      | <b>Probing for congenital obstruction of nasolacrimal duct</b>                                                                           | - | -        | <b>1</b> | -         |
|           |                                                                                                                                          |   |          |          |           |
| <b>f.</b> | <b>Extraocular muscle surgery</b>                                                                                                        |   |          |          |           |
| i.        | <b>Recession and resection procedures on the horizontal recti</b>                                                                        | - | -        | <b>2</b> | -         |
|           |                                                                                                                                          |   |          |          |           |
| <b>g.</b> | <b>Cataract surgery</b>                                                                                                                  |   |          |          |           |
| i.        | <b>Standard ECCE with or without IOL implantation.</b>                                                                                   | - | -        | -        | <b>10</b> |
| ii.       | Small incision ECCE with or without IOL implantation                                                                                     | ✓ |          |          |           |
| iii.      | Membranectomy                                                                                                                            | ✓ |          |          |           |
| iv.       | <b>Secondary AC or PC IOL implantation</b>                                                                                               | ✓ |          |          |           |
| v.        | Phacoemulsification                                                                                                                      | ✓ |          |          |           |
| vi.       | Intra capsular cataract extraction                                                                                                       | ✓ |          |          |           |
| vii.      | <b>Vectis extraction</b>                                                                                                                 |   | -        | <b>1</b> | -         |
|           |                                                                                                                                          |   |          |          |           |
| <b>h.</b> | <b>Retinal surgery</b>                                                                                                                   |   |          |          |           |
| i.        | Needs to know how to assist in external procedures such as buckling                                                                      | - | <b>1</b> | -        | -         |
| ii.       | Prophylactic cryotherapy                                                                                                                 | ✓ | -        | -        | -         |
|           |                                                                                                                                          |   |          |          |           |
| <b>i.</b> | <b>Orbit surgery</b>                                                                                                                     |   |          |          |           |
| i.        | Anterior orbitotomy for diagnostics and therapy                                                                                          | ✓ | -        | -        | -         |
| ii.       | Lateral orbitotomy for tumours                                                                                                           | ✓ | -        | -        | -         |
| iii.      | <b>Incision and drainage via anterior orbitotomy for abscess</b>                                                                         | - | <b>1</b> | -        | -         |
| iv.       | Exenteration                                                                                                                             | ✓ | -        | -        | -         |
| v.        | Fine needle aspiration biopsy of orbital disease                                                                                         | ✓ | -        | -        | -         |
|           | ( if experienced pathologist is available)                                                                                               |   |          |          |           |
| <b>j.</b> | <b>Vitrectomy</b>                                                                                                                        |   |          |          |           |
| i.        | <b>Intra vitreal and intra cameral (anterior chamber) injection techniques and dosages, particularly for endophthalmitis management.</b> | - | -        | <b>2</b> | -         |



|           |                                                                                                                            |   |   |   |    |
|-----------|----------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
| ii.       | Needs to know the basics of open sky vitrectomy (anterior segment) as management of cataract surgery complication          | - | - | - | 2  |
| iii.      | Automated vitrectomy                                                                                                       | ✓ |   |   |    |
| iv.       | Assist vitrectomy surgeon if facility exists.                                                                              |   |   |   |    |
|           |                                                                                                                            |   |   |   |    |
| <b>k.</b> | <b>Keratoplasty</b>                                                                                                        |   |   |   |    |
| i.        | Assisting or doing penetrating keratoplasty ( therapeutic, optical )                                                       | - | - | 1 | -  |
| ii.       | Lamellar keratectomy                                                                                                       | ✓ | - | - | -  |
|           |                                                                                                                            |   |   |   |    |
| <b>l.</b> | <b>Glaucoma surgery</b>                                                                                                    |   |   |   |    |
| i.        | Trabeculectomy                                                                                                             | - | - | - | 3  |
| ii.       | Pharmacological modifications of trabeculectomy                                                                            |   |   |   |    |
| iii.      | Goniotomy                                                                                                                  |   |   |   |    |
| iv.       | Cyclocryotherapy and other cyclodestructive procedures                                                                     | - | - | - | 2  |
|           |                                                                                                                            |   |   |   |    |
| <b>m.</b> | <b>Surface ocular procedures</b>                                                                                           |   |   |   |    |
| i.        | Pterygium excision with modifications                                                                                      | - | - | - | 5  |
| ii.       | Conjunctival grafting                                                                                                      | - | - | 2 | -  |
| iii.      | Biopsy of cornea and conjunctiva                                                                                           | - | - | - | 1  |
| n.        | Pterygium excision                                                                                                         | - | - | - | 10 |
| o.        | Tarsorrhaphy                                                                                                               | - | - | - | 10 |
| p.        | Retrobulbar, parabulbar anaesthesia                                                                                        | - | - | - | 20 |
|           |                                                                                                                            |   |   |   |    |
|           | <b>2. Outpatient :</b>                                                                                                     |   |   |   |    |
|           |                                                                                                                            |   |   |   |    |
| a.        | Manual diagnostic procedures such as syringing, corneal scraping, conjunctival swab collection, conjunctival scraping etc. | - | - | - | 10 |
| b.        | Conjunctival and corneal foreign body removal on the slit lamp                                                             | - | - | - | 10 |
| c.        | Chalazion incision and curettage                                                                                           | - | - | - | 10 |
| d.        | Biopsy of small lid and tumours                                                                                            | - | - | 3 | -  |
| e.        | Suture removal skin, conjunctival, corneal, and corneoscleral                                                              | - | - | - | 5  |
| f.        | Subconjunctival injection                                                                                                  | - | - | - | 10 |



**ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

**9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

**10. Theory Examination:**

Paper I Applied Basic Sciences in Ophthalmology

Paper II Ophthalmology including Community Ophthalmology & Refraction

Paper III Ophthalmology including Neuro Ophthalmology

Paper IV Ophthalmology including Investigative Ophthalmology and Surgery and recent advances

Question paper pattern:

|                |                |                 |
|----------------|----------------|-----------------|
| Paper I :      | Write notes on |                 |
| i.             | Anatomy        | 4 x 5 = 20      |
| ii.            | Physiology     | 4 x 5 = 20      |
| iii.           | Biochemistry   | 3 x 5 = 15      |
| iv.            | Pharmacology   | 3 x 5 = 15      |
| v.             | Pathology      | 3 x 5 = 15      |
| vi.            | Microbiology   | 3 x 5 = 15      |
| <b>Total =</b> |                | <b>100marks</b> |

|                      |                |                 |
|----------------------|----------------|-----------------|
| Paper II, III & IV : |                |                 |
| i.                   | Elaborate on : | 2 x 15 = 30     |
| ii.                  | Write notes on | 10 x 7 = 70     |
| <b>Total =</b>       |                | <b>100marks</b> |

**11. Practical Examination:**

|                                                                  |                                |
|------------------------------------------------------------------|--------------------------------|
| <b>CLINICALS</b>                                                 |                                |
| <b>LONG CASE – (1X (20+10)MIN) (1X50 MARKS)</b>                  | <b>50 MARKS</b>                |
| <b>SHORT CASE – (2X(10+5)MIN) (2X25 MARKS EACH)</b>              | <b>50 MARKS</b>                |
| <b>FUNDUS (1X(10+5)MIN) (1X25 MARKS)</b>                         | <b>25 MARKS</b>                |
| <b>REFRACTION (1X (10+5)MIN) (1X25 MARKS)</b>                    | <b>25 MARKS</b>                |
| <b>WARD ROUNDS (5 CASES X (3+2)MIN) (5 CASES X 6 MARKS EACH)</b> | <b>30 MARKS</b>                |
| <b>OSCE STATIONS (5 CASES X 2 MIN) (5 CASES X 4 MARKS EACH)</b>  | <b>20 MARKS</b>                |
| <b>TOTAL</b>                                                     | <b>200 MARKS (A)</b>           |
| <b>VIVA VOCE</b>                                                 | <b>80 MARKS (B)</b>            |
| <b>LOG BOOK</b>                                                  | <b>20 MARKS(C)</b>             |
| <b>AGGREGATE (CLINICAL + VIVA) TOTAL</b>                         | <b>300 MARKS (A+B+C)</b>       |
| <b>MINIMUM REQUIRED FOR PASS (50%)</b>                           | <b>150 MARKS</b>               |
| <b>DISSERTATION</b>                                              | <b>APPROVED / NOT APPROVED</b> |

## **12. LOG BOOK:**

The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

The record (log) book shall be checked and assessed periodically by the faculty members imparting the training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

## **13. VIVA:**

VIVA including Competency Assessment - 80 Marks (60 + 20)

- a) Students will be examined by all the examiners together about students comprehension of the components of course contents, analytical approach and interpretation of data. This section will carry 60 marks. The examination will include the following:

- i. Community ophthalmology
- ii. Conjunctiva, Cornea, Lens
- iii. Uvea and Glaucoma
- iv. Neuro-ophthalmology & Systemic disorders
- v. Orbit & oculoplastics
- vi. Retina etc.
- vii. Surgical instruments
- viii. Pathology gross specimens
- ix. Pathology slides
- x. Microbiology slides
- xi. Radiology
- xii. Perimetry
- xiii. Miscellaneous including all investigations reports

## **14. OSCE:**

Objective structured clinical exams are clinical pictures or cases with a structured set of questions & answers.

- I Observation station  
(e.g) Schiotz Tonometry  
Observer to note
- a. Whether patient's consent sought
  - b. Whether patient is properly instructed
  - c. Whether Tonometer is checked
  - d. Whether Topical drops applied
  - e. Way of handling
  - f. Whether the chart is referred

- II Microbiology slide
  - a. Identification
  - b. Points for identification
  - c. A clinical Question relevant to the organism
- III Pathology Slide
  - a. Identification
  - b. Points for identification
  - c. A clinical Question relevant to the slide
- IV Anterior segment picture
  - a. Identification
  - b. Points for identification
  - c. A clinical Question relevant to the Picture
- V Posterior segment picture
  - a. Identification
  - b. Points for identification
  - c. **A clinical Question relevant to the Picture**

**15. Recommended basic reading Text books:**

1. Anatomy:
  - a. Wolff
  - b. Snell's
2. Physiology:
  - a. Adler's Physiology of the Eye
3. Immunology:
  - a. Ocular immunology
4. Ophthalmic Pathology:
  - a. Yanoff & Fine
  - b. Zimmerman
5. Pharmacology:
  - a. Havener
6. Refraction:
  - a. Duke Elder's practice of refraction
  - b. Elkington & Frank
7. Jack Kanski: Clinical Ophthalmology
8. Parson's text book of Ophthalmology
9. Stallard's Eye Surgery
10. Cataract Surgery & its Complications by Jaffe
11. Duane's System of Ophthalmology
12. Jakobiec Series

13. Peyman's Series
14. Cataract Surgery & its Complications by Jaffe
15. Duke-Elder's System of Ophthalmology
16. Podos & Yanoff Series

**Reference book:**

1. American Academy of Ophthalmology series BCSC latest edition released – this an update (not textbook) for specialists who have passed their qualification exams
2. Cornea :
  - a. Smolin & Thoft
  - b. Grayson
  - c. Kaufman & Leibowitz
3. Glaucoma
  - a. Bruce Shields Text Book of Glaucoma
  - b. Krupin & Shields Series on Glaucoma
  - c. Becker & Schaeffer's Text Book of Glaucoma
  - d. Anderson's Computerised Perimetry
  - e. Harrington's Text Book of Perimetry
  - f. Leiberman and Drake : Computerised perimetry
4. Retinal disease:
  - a. Stephen Ryan's Retina
  - b. Ron Michel: Retinal Detachment
  - c. Steve Charles: Basic Vitrectomy
5. Ultra Sound:
  - a. Sandra Byrne & Ronald Green: Ophthalmic Ultrasound
6. Uvea:
  - a. Nussenblatt & Palestine
  - b. Smith & Nozik
7. Neuroophthalmology:
  - a. Walsh & Hoyt
8. Orbital diseases:
  - a. Rootman's diseases of the orbit
  - b. Jakobiec & Snow – Diseases of the orbit
9. Tumours:
  - a. Jerry Shields – Diagnosis and management of orbital tumours

10. Strabismus:

- a. Gunter von Noorden
- b. Mein & Trimble
- c. Practical orthoptics in the treatment of squint-Keith Lyle

11. Paediatric ophthalmology

- a. Kenneth Wright

**ADDITIONAL READING**

1. Indian Council of Medical Research, "Ethical Guidelines for Biomedical Research on Human Subjects", I.C.M.R, New Delhi, 2000.
2. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.
3. Francis C M, Medical Ethics, J P Publications, Bangalore, 1993.
4. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.
5. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424-8
6. Kirkwood B R, Essentials of Medical Statistics , 1<sup>st</sup> Ed., Oxford: Blackwell Scientific Publications 1988.
7. Mahajan B K, Methods in Bio statistics for medical students, 5<sup>th</sup> Ed. New Delhi, Jaypee Brothers Medical Publishers, 1989.
8. Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, min. of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi. P - 335.
9. National Health Policy, Min. of Health & Family Welfare, Nirman Bhawan, New Delhi, 1983
10. Srinivasa D K et al, Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry.

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**



16. **JOURNALS** The list is not exhaustive and is just a guide- Other books with similar standard can be used

1. British Journal of Ophthalmology
2. American Journal of Ophthalmology
3. Indian Journal of Ophthalmology
4. Eye Journal Ophthalmology
5. Survey of Ophthalmology
6. IOC
7. Archives of Ophthalmology
8. Ophthalmology

# LOG BOOK

**Table 1 : Academic activities attended**

Name:

Admission Year:

College:

[illegible]

# LOG BOOK

**Table 2 : Academic presentations made by the student**

Name:

Admission Year:

College:

[illegible]

## LOG BOOK

**Table 3 : Diagnostic and Operative procedures performed**

Name:

Admission Year:

College:

| Date | Name | ID No. | Procedure | Category<br>O, A, PA, PI* |
|------|------|--------|-----------|---------------------------|
|      |      |        |           |                           |
|      |      |        |           |                           |
|      |      |        |           |                           |
|      |      |        |           |                           |

**\* Key:**

- O - Washed up and observed
- A - Assisted a more senior Surgeon
- PA - Performed procedure under the direct supervision of a senior surgeon
- PI - performed independently

\*\*\*\*\*

# **MS ORTHOPEDICS**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**MS ORTHOPEDICS**

**1. GOALS AND OBJECTIVES**

***Patient care ability:*** A candidate in orthopaedics surgery at the end of its 3 year course should develop proper clinical acumen to interpret diagnostic results and correlate them with symptoms. He should become capable to diagnose common clinical conditions/diseases in the specialty and to do age appropriate management effectively and without any complications and in the patient's best interest. He should be able to decide for making a referral to consultation with a more experienced colleague/professional friend while dealing with any patient with a difficult problem. He should be familiar with the treatment protocols of all orthopedic conditions and should be able to decide on the level of difficulty for appropriate referral.

***Teaching ability:*** He/she should be able to teach MBBS students about the commonly encountered conditions in orthopaedics, pertaining to their diagnostic features, basic pathophysiological aspects and the general and basic management strategies.

***Research Ability:*** He/she should also acquire elementary knowledge about research methodology, including record-keeping methods, and be able to conduct a research inquiry including making a proper analysis and writing a report on its findings.

***Team work:*** He/she should be capable to work as a team member. He/she should develop general humane approach to patient care with communicating ability with the patients' relatives, especially in emergency situations such as in casualty department, while dealing with cancer patients and victims of accidents.

***Academic Activities:*** He/She should acquire theory knowledge from the prescribed books and journals, which is the basics for application of the clinical practice.

He/she should also maintain human values with ethical consideration.

## **2. COMPONENTS OF THE POST GRADUATE CURRICULUM:**

**Cognitive knowledge:** Describe embryology, applied anatomy, physiology, pathology, clinical features, diagnostic procedures and the therapeutics including preventive methods (medical/surgical) pertaining to musculoskeletal system.

**Skills:** Diagnose conditions from history taking, clinical evaluation and investigations and to develop expertise to manage medically as well as surgically the commonly encountered disorders and diseases in different areas.

**Teaching:** Acquire ability to teach the MBBS students in simple and straightforward language about the common orthopaedic ailments/disorders, especially about their signs/symptoms for diagnosis with their general principles of therapy.

**Research:** Develop ability to conduct a research enquiry on clinical materials available in hospital and in community. Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Training in Medical Audit management, Health economics, Health information system, basics of statistics, exposure to Human behavior studies, knowledge of pharmacoeconomics and introduction to non linear mathematics

### ***Attitude including communication skills:***

What is informed consent? What is its relevance?

How would you declare the news of a dead patient to the relatives?

How would you explain the complications of a surgical procedure and its significance? How much one should inform to patient about the disease?

**Patient doctor relation:** Develop ability to communicate with the patient and his/her relatives pertaining to the disease condition, its severity and options available for the treatment/therapy.

**Preventive Aspect:** Acquire knowledge about prevention of common conditions especially in children such as poliomyelitis, con-genital deformities, cerebral palsy and common orthopaedic malignancies..

***Training in research methodology medical ethics, bioethics and medicolegal aspects***

- Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.S course.
- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
- Medical ethics, Bioethics, moral and legal issues and medical audit are part and parcel of the curriculum and syllabus.

### **3. THEORY SYLLABUS:**

#### **BASIC SCIENCES**

Development of skeleton, histology of cartilage histology & histopathology of bone, physiology of fracture healing, delayed and non-union of bones, histology of skeletal muscle, collagen, physiology and mineralization of bone, physiology of cartilage, biophysical properties of bony and bone disease and related dysfunction of parathyroid glands.

#### **Applied Basic Sciences:**

The course shall cover the following:

Anatomy of the Upper Extremity, Lower Extremity and Spine

Physiology and Biochemistry:

Calcium Homeostasis

Clinical importance of Vitamin D on

Parathyroid function tests

Acid Base Balance

Plasma Proteins

Structure, function and repair of articular cartilage

Physiology of coagulation and coagulation disorders

Parathormone

Structure of Peripheral Nerves and peripheral nerve injuries

## **Pathology**

Infections of bone and joints

Fracture healing

Tumours of bone and joints

Rickets, Osteomalacia and Osteoporosis

Osteoarthritis, Rheumatoid arthritis

Pathology of synovium

Pathology of wound healing

Pathology of tetanus and Gas gangrene

## **Microbiology**

Collection and transport of specimens

Sterilisation, disinfection and theatre sterilization

Post operative wound infection and Hospital infections

Gram Positive and Gram Negative infections

AIDS Awareness and precautions

Mycotic infections

HIV

## **Pharmacology**

Non steroidal anti inflammatory drugs

General principles of chemotherapy of infections of bones and joints

Chemotherapy of Tuberculosis and Hansen's disease

Chemotherapy of bone tumours

Calcium, Phosphorus and Vitamin D



## **General Surgery**

Hemorrhage, shock and blood transfusion

Fluid, electrolyte and acid base balance

Bone grafting

Tumours, cysts and sinuses

Gangrene

Wound infections

Venous thrombosis

Lymphatics and Lymph nodes

## **Traumatology**

1. Fractures and dislocations: This shall include the mechanism of violence causing the injury, pathology of fracture healing- signs and symptoms – the mechanics of displacement of fragments – reduction, maintenance of reduction of fractures and dislocations by various methods – study of complications of osteoarticular injuries and their treatment and rehabilitation.

They shall work in the orthopedic out patient department and 24 hours fracture service and obtain proficiency in First Aid emergency management of fractures and dislocations – Resuscitation and management of multiple injuries. They will also be made conversant with various splints and their uses.

2. Contusions and other soft tissue injuries – sprains of ligaments of various joints – mechanism of production, their pathology, symptomatology and management.

3. Peripheral nerve injuries and spinal cord injuries – mechanism of production – symptomatology – patho physiology, investigation including electrodiagnosis – physiotherapeutic management – surgical treatment – splinting and bracing – rehabilitation

## **General Orthopedics :**

The study of General orthopedics shall include all the diseases that affect the locomotor system including:

- 1) Deformities – congenital and acquired including their management
- 2) Osteo articular tuberculosis – Incidence, bacteriology, pathology, symptomatology, investigations and management, both conservative and surgical.

- 3) Infections: Bacteriology – pathology – clinical features and management in acute, subacute and chronic infections of bone.
- 4) Arthritis – includes the study of various types of arthritis including infective, rheumatoid, metabolic and degenerative conditions – patho physiology, investigations and management including arthroplasty.
- 5) Tumors of bone and joints
- 6) Neuromuscular disorders
- 7) Metabolic disorders of the skeletal system

The course requires the candidates to attend the orthopedic wards and out patient department and shall have performed the common orthopedic procedures during the period of study and learn the principles of all tractions procedures.

### **Physical Medicine and Rehabilitation :**

Principles of Physical therapy including exercise therapy, electro therapy, prescription of splints and braces

Principles of occupational therapy

Principles of electro diagnosis

### **Prosthesis and Orthotics :**

Principles of amputation surgery – rehabilitation of the amputee – examination and prescription for orthosis and prosthesis – check up and fitting

The concept of Total Rehabilitation including Medical, Educational, Vocational and Social Rehabilitation.

### **PRINCIPLES & PRACTICE OF ORTHOPAEDICS INCLUDING RECENT ADVANCES**

Bone infections (Pyogenic, tuberculosis, syphilis, mycotic infections, salmonella & brucella osteomyelitis), congenital deformities (upper & lower extremities, spine and general defects), developmental conditions (osteogenesis imperfecta, dysplasias, hereditary multiple exostosis etc.) diseases of the joints (osteoarthritis, rheumatoid arthritis, neuropathic joints, ankylosing spondylitis, sero-negative spondylo arthropathy, traumatic arthritis etc.) orthopaedic neurology, tumors of bone. Disorders of hand & their management.

**Pediatric orthopaedics-** The student should be exposed to all aspects of congenital and developmental disorders such as CTEV (club-Foot), development dysplasia of hip, congenital deficiency of limbs. Perthe's disease and infections, and also to acquire adequate knowledge about the principles of management of these disorders.

**Orthopaedic oncology-** The resident is expected to be familiar with the tumours encountered in orthopaedic practice. The recent trends towards limb salvage procedures and the advances in chemo-therapy need to be familiar to him.

**Management of Trauma-** The student is expected to be duly conversant with trauma in its entirety. In any type of posting after qualification the orthopaedic surgeon would be exposed to all varieties of acute trauma. Hence, it is his responsibility to be able to recognize, assess and manage it including the medico legal aspects.

**Sports Medicine including arthroscopy :** A lot of importance is being given to sports medicine especially in view of the susceptibility of the athlete to injury and his failure to tide over them. Sport medicine not only encompasses diagnostic and therapeutic aspects athletic injuries but also their prevention, training schedules of personnel and their selection.

**Orthopaedic Neurology:** The student should be exposed to all kinds of nerve injuries with regard to their recognition & management of cerebral palsy and acquired neurological conditions such as post polio residual paralysis and peripheral nerve injuries also need to be emphasized in their entity.

**Spine Surgery -**The student is expected to be familiar with various kinds of spinal disorders such as scoliosis, kyphoscoliosis, spinal trauma, PIVD, infections (tuberculosis and pyogenic), & tumours regarding their clinical presentations and management.

## **GENERAL SURGICAL PRINCIPLES & ALLIED SPECIALITIES**

General surgery, oncology, and medicine as applicable to the musculo-skeletal disorders/disease.

Radiology, Imaging, computed tomography and magnetic resonance imaging and interventional radiology and angiography as related to orthopaedics.

General pathologic aspects such as wound healing and also pathology and pathogenesis of orthopaedic diseases, pharmacology, molecular biology, genetics, cytology, haematology, and immunology as applicable to orthopaedics.

General principles of traumatology.

Plastic surgery, Hand Surgery as applicable to orthopaedics.

Physical Medicine and Rehabilitation. The student is expected to be familiar with this in all its aspects. Adequate exposure in the workshop manufacturing orthotics and prosthetics is mandatory, as is the assessment of the orthopaedically handicapped.

Radiology : Acquire knowledge about radiology/imaging and to interpret different radiological procedures and imaging in musculoskeletal disorders.

There should be collaboration with Radiology department for such activities.

Psychological and social aspects: Some elementary knowledge in clinical Psychology and social, work management is to be acquired for management of patients, especially those terminally ill and disabled-persons and interacting with their relatives.

## **BIOETHICS :**

Humanity/Ethics -Lectures on humanity, personality development, team spirit, Ethical issues in patients, Doctor- patient relation-ship and interpersonal relationship.

#### **4. TEACHING LEARNING METHODS:**

*The teaching and training of the students shall include graded responsibility in the management and treatment of patients entrusted to their care; participation in Seminars, Journal Clubs, Group Discussions, Clinical Meetings, Grand Rounds, and Clinico-Pathological Conferences; practical training in Diagnosis and treatment; training in the Basic Medical Sciences, as well as in allied clinical specialties.*

The following teaching learning methods are recommended.

- Lectures
- Case based discussion
- Bed side clinics
- Teaching on ward rounds
- Symposia
- Seminars
- Journal clubs

#### **STRUCTURED TRAINING PROGRAMME:**

The students of M.S. Orthopedics shall be posted in rotation to all the Orthopedic Units in the department.

Their training shall include following postings in their Second year of the course.

|                                      |   |         |
|--------------------------------------|---|---------|
| Hand Surgery                         | - | 1 month |
| Physical Medicine and Rehabilitation | - | 1 month |
| Pediatric Orthopedics                | - | 1 month |

**During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.**

**Clinical procedures, which the candidates should know**

| <b>S.<br/>No</b> | <b><i>Name of procedure</i></b>                                                                                    | <b><i>As<br/>Observer</i></b> | <b><i>As first<br/>Assistant</i></b> | <b><i>Able to per-<br/>form</i></b> |
|------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------|-------------------------------------|
| 1                | <b>ORTHOPAEDICS</b><br>Skin traction & Plaster application                                                         |                               |                                      | Yes                                 |
| 2                | Skeletal traction of upper<br>Tibia,<br>distal Tibia, lower Femoral,<br>Olecranon,<br>Calcaneal and Skull traction |                               |                                      | Yes                                 |
| 3                | Closed reduction of<br>Fractures                                                                                   |                               |                                      | Yes                                 |

| <b>S.<br/>No</b> | <b>Name of procedure</b>                                                                                                                      | <b>As<br/>Observer</b> | <b>As first<br/>Assistant</b> | <b>Able to per-<br/>form</b> |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------|------------------------------|
|                  |                                                                                                                                               |                        |                               |                              |
| 4                | Management of open frac-<br>tures<br><br>- Debridement, external fixa-<br>tion<br><br>- Soft tissue reconstruction<br>including bone coverage |                        |                               | Yes<br><br>Yes               |
|                  |                                                                                                                                               |                        |                               |                              |
| 5.               | Open reduction and internal<br>fixation of Fractures and<br>Open reduction of<br>dislocations                                                 |                        |                               |                              |
| 6                | Bone & Joint Infections<br>Diagnostic Aspi-<br>ration of joint & Arthrotomy<br><br>Drilling/ Decompression of<br>Metaphysis                   |                        |                               | Yes<br><br>Yes               |

| <b>S.<br/>No</b> | <b>Name of procedure</b>                                                                                      | <b>As<br/>Observer</b> | <b>As first<br/>Assistant</b> | <b>Able to per-<br/>form</b> |
|------------------|---------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------|------------------------------|
|                  | Drainage of abscess<br>Sequestrectomy &<br>saucerisation<br><br>Girdlestone/Excision arthro-<br>plasty of Hip |                        |                               | Yes<br><br>Yes<br><br>Yes    |
| 7.               | Bone tumors<br><br>Biopsy from tumor<br><br>Excision of osteochondroma<br><br>Curettage & Bone grafting       |                        |                               | Yes<br><br>Yes<br><br>Yes    |
|                  |                                                                                                               |                        |                               |                              |
| 8.               | Spine<br><br>Exposure to spine by poste-<br>rior, anterior and<br>anterolateral<br>approaches                 |                        | Yes                           |                              |
| 9.               | CTEV- Ponsetti Method<br><br><br>Tendo Achilles lengthening                                                   |                        |                               | Yes<br><br>Yes               |
| 10.              | Postero-medial soft tissue<br>re-Release<br><br><br>Bony procedures including<br>triple<br>Arthrodesis        |                        |                               | Yes<br><br>Yes               |



| <b>S.<br/>No</b> | <b>Name of procedure</b>                                                                                                                                                                                                            | <b>As<br/>Observer</b>           | <b>As first<br/>Assistant</b>                         | <b>Able to per-<br/>form</b> |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------|------------------------------|
| 11               | High tibial osteotomy                                                                                                                                                                                                               | Yes                              |                                                       |                              |
| 12               | Tendon repair                                                                                                                                                                                                                       |                                  |                                                       | yes                          |
| 13               | Cerebral Palsy/ Neuro<br>muscular disorders -<br>Soft tissue/ bony<br>procedures<br><br>and triple arthrodesis<br><br>Limbs lengthening / Illizarov<br>procedure                                                                    | Yes                              | Yes<br><br>Yes                                        | Yes                          |
| 15               | Arthrolysis of Elbow joint                                                                                                                                                                                                          | Yes                              | Yes                                                   |                              |
| 16               | Amputations                                                                                                                                                                                                                         |                                  |                                                       | Yes                          |
| 17               | Limbs salvage procedures                                                                                                                                                                                                            |                                  | Yes                                                   |                              |
|                  | DESIRABLE PROCE-<br>DURES<br>Endoscopy<br>Arthroscopy of knee<br>Joint replacement<br>Hip joint<br>Knee joint<br>Peripheral nerve repair<br>Tendon transfer procedures<br>Spinal stabilization proce-<br>dures like pedicular screw | Yes<br><br>Yes<br><br>Yes<br>Yes | <br>Yes<br><br>Yes<br>Yes<br>Yes<br>Yes<br>Yes<br>Yes |                              |

## INVESTIGATIONS/ TESTS WHICH THE CANDIDATES SHOULD LEARN TO INTERPRET

| <u>Name of Investigations</u>                                                    |   | <u>Tests</u>                                         |
|----------------------------------------------------------------------------------|---|------------------------------------------------------|
| Hematological investigations in                                                  | - | CBC                                                  |
|                                                                                  | - | C-reactive protein,                                  |
| Orthopaedic conditions like                                                      | - | Rheumatoid factor,                                   |
|                                                                                  | - | HLA-B27,                                             |
|                                                                                  | - | Serum Electrophoresis,                               |
|                                                                                  | - | Serum Ca, P, Alkaline phosphatase, Acid phosphatase, |
|                                                                                  |   | Uric acid, Total proteins &                          |
|                                                                                  |   | A.G. ratio                                           |
|                                                                                  | - | ELISA                                                |
| Urine                                                                            | - | Bence Jones proteins,                                |
|                                                                                  | - | 24hr Urinary Ca                                      |
| Radiological investigations                                                      | - | Plain radiography                                    |
|                                                                                  | - | CT Scan, MRI                                         |
|                                                                                  | - | Radio- isotope bone scan                             |
| Interpretation of Histopathological slides of common Orthopaedic conditions like | - | Tuberculosis/sepsis                                  |
|                                                                                  | - | Myeloma                                              |
|                                                                                  | - | Osteosarcoma                                         |
|                                                                                  | - | Ewing Sarcoma                                        |
|                                                                                  | - | Giant cell tumor                                     |

5. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

**6. COMPETENCY ASSESSMENT:**

• **OVERALL:**

a) Communication / commitment / Contribution / Compassion towards patients and Innovation ( ) ( ) 5 Marks

b) Implementation of newly learnt techniques/skills ( )

• Number of cases presented in Clinical Meetings/ Journal clubs/seminars - 5 marks

• Number of Posters/Papers presented in Conferences/ Publications and Research Projects - 5 marks

• No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks

Total 20 Marks

PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total Max.20 marks |
|---------------|----------|----------|-----------|----------|--------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks           |
|               | AVERAGE  |          |           |          | 20 marks           |

## **7. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

**As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation**

**The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.**

**As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.**

**A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.**

**The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.**

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

## 8. THEORY EXAMINATION :

Paper I    Applied Basic Sciences in Orthopaedic Surgery

Paper II    Traumatology including Recent Advances

Paper III    Orthopaedics including Recent Advances.

Paper IV    Sub-Specialities in Orthopaedics Traumatology  
(includes Paediatric Orthopaedics, Hand Surgery, Spine Surgery, Arthroplasty, Arthroscopy, Sports Medicine and Orthopaedic Oncology)

### Question paper Pattern:

Paper I :    Write notes on

|                |              |                  |
|----------------|--------------|------------------|
| i.             | Anatomy      | 4 x 5 = 20       |
| ii.            | Physiology   | 4 x 5 = 20       |
| iii.           | Biochemistry | 3 x 5 = 15       |
| iv.            | Pharmacology | 3 x 5 = 15       |
| v.             | Pathology    | 3 x 5 = 15       |
| vi.            | Microbiology | 3 x 5 = 15       |
| <b>Total =</b> |              | <b>100 marks</b> |

Paper II, III & IV :

- |     |                |             |
|-----|----------------|-------------|
| i.  | Elaborate on : | 2 x 15 = 30 |
| ii. | Write notes on | 10 x 7 = 70 |

**Total =                      100 marks**

## 9. PRACTICAL EXAMINATION:

|                                                                                |                        |  |                         |
|--------------------------------------------------------------------------------|------------------------|--|-------------------------|
| LONG CASE - (1X30 MIN EXAMINATION+ 30 MIN DISCUSSION)<br>(1 X 75 MARKS)        |                        |  | 75 MARKS                |
| SHORT CASE – (3X 10 MIN EXAMINATION+ 30 MIN DISCUSSION)<br>(3 X 25 MARKS EACH) |                        |  | 75 MARKS                |
| WARD ROUNDS (3 CASES X 10 MIN) (3 CASES x 10 MARKS EACH)                       |                        |  | 30 MARKS                |
| OSCE STATIONS (4 CASES X 5 MARKS EACH)                                         |                        |  | 20 MARKS                |
| TOTAL                                                                          |                        |  | 200 MARKS (A)           |
| VIVA VOCE                                                                      | RECENT ADVANCES        |  | 80 MARKS (B)            |
|                                                                                | OPERATIVE ORTHOPEDICS  |  |                         |
|                                                                                | ORTHOTIC & PROSTHETICS |  |                         |
|                                                                                | ORTHO RADIOLOGY        |  |                         |
| LOG BOOK                                                                       |                        |  | 20 MARKS (C)            |
| AGGREGATE (CLINICAL + VIVA) TOTAL                                              |                        |  | 300 MARKS (A+B+C)       |
| MINIMUM REQUIRED FOR PASS (50%)                                                |                        |  | 150 MARKS               |
| DISSERTATION                                                                   |                        |  | APPROVED / NOT APPROVED |

## **10. LOG BOOK**

The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

The record (log) book shall be checked and assessed periodically by the faculty members imparting the training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

## **11. VIVA**

VIVA including Competency Assessment - 80 Marks (60 + 20)

## **12. OSCE: OSCE/OSPE – 20 marks (4 stations x 5 marks each)**

2 manned stations-Typical deformities, Typical appearance of any orthopedic conditions

2 Unmanned stations- X-rays, Specimens, Instruments, Calipers etc.

## **13. REFERENCE BOOKS:**

- 8) Mercer's orthopaedics surgery, Duthie, Edward Arnold
- 9) Campbell's Operative Orthopaedics, Canale and Beaty
- 10) Outline of orthopaedics, Crawford Adams, Churchill Livingstone
- 11) Closed treatment of fractures, H. John Charnley, Churchill Livingstone
- 12) Apley's
- 6) Text book of orthopaedics, Samuel Turek
- 7) Campbell's Operative Orthopaedics, Canale and Beaty
- 8) AO Principles of internal fixation
- 9) AO Principles of external fixation
- 10) Chapman's Orthopaedics

- 11) Watson Jones fractures and joint injuries, J.N. Wilson, Churchill  
Livingston
- 12) Fractures in adults and children, Rockwood, Greens
- 13) Campbell's Operative Orthopaedics, Canale and Beaty
- 14) Campbell's Operative Orthopaedics, Canale and Beaty
- 15) AO Spinal fixation
- 16) Tumours and tumourous conditions of bones and joints, Jaffe, Lea  
Febiger
- 17) Clinical Evaluation – DAS, McRay, Panday
- 18) SM TULI Tuberculosis of musculoskeletal system
- 19) Limb reconstruction procedures
- 20) Orthopedic pathology – Bullough
- 21) Neglected fractures – Anil Jain
- 22) Pediatric Orthopedics – Staheli
- 23) Lovell & Winter Pediatric Orthopedics

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**



## **JOURNALS**

1. Indian journal of orthopaedics
2. Journal of bone and surgery ( British and American volumes)
3. Orthopaedics clinics of North America
4. Clinical orthopaedics and related research Yearbook of orthopaedics
5. Journal of rehabilitation INJURY
6. Journal of Arthroplasty
7. Journal of Arthroscopy

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## **MS OBSTETRICS & GYNECOLOGY**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**MS OBSTETRICS & GYNECOLOGY**

**1.GOALS**

The goal of MD course in Obstetrics & Gynaecology is to produce a competent Obstetrician & Gynecologist who:

1. Recognizes the health needs of adolescents, females in reproductive age group & post menopausal females
2. Is competent to manage the pathological states related to reproductive system with relevant knowledge of Anatomy, Physiology, Biochemistry, Pharmacology, Pathology, Microbiology and Virology.
3. Is aware of contemporary advances & developments in the field of maternal health & other related issues.
4. Is Oriented to the principles of research methodology and epidemiology
5. Has Acquired the basic skills in teaching of the Medical and Paramedical Professionals.

**2.OBJECTIVES**

A postgraduate resident should be able to achieve objectives in the following domains:

**A. KNOWLEDGE**

1. Learn the basics of the subjects of Obstetrics and Gynaecology, covering all conditions likely to be met in obstetric practice in our country.
2. Provide effective prenatal care depending on the clinical condition of the mother, including nutrition, immunization and risk assessment.
3. Learn in greater detail about common problems like hypertension complicating pregnancy, intrauterine growth restriction, cephalopelvic disproportion, obstructed labour and puerperal sepsis.
4. Appreciate the indications and methods of induction of labour.
5. Acquire thorough knowledge of gynaecologic conditions of public health importance such as cancer cervix and other gynaecological diseases likely to affect pregnancy.
6. Gain knowledge of other branches of medicine which are relevant to Obstetrics and Gynaecology with special stress on diabetes mellitus, hypertension, cardiac disease, anaemia, lower urinary tract disorders and medical and surgical causes of acute abdomen.
7. Aware of medico-legal aspects of practice of Obstetrics and Gynaecology.

8. Able to diagnose and manage normal pregnancy, labour and puerperium and recognize any departure from normal in the above.
9. Able to competently manage cases of abortion, spontaneous and induced, including ectopic gestation and gestational trophoblastic diseases.
10. Diagnose and manage preterm labour and assess the fetal well being, maturity and birth weight and to use that information in deciding the obstetric management.
11. Develop decision making skills by utilizing the clinical and laboratory data.
12. Able to diagnose and manage acute abdomen, haemorrhage in Obstetrics & Gynaecology and other emergencies i.e. eclampsia.
13. Able to medically treat common gynaecologic diseases specially using
  - i) Antibiotics
  - ii) Hormone therapy including contraception
  - iii) Ovulation inducing agents
  - iv) Antineoplastic drugs
14. Understand the need for common obstetric operative interventions i.e. episiotomy, forceps, ventouse, caesarean section, dilatation and evacuation etc.,
15. Understand the importance of population control, contraception and different methods of contraception.
16. Understand the physiology of menstruation and manage common menstrual abnormalities.
17. Identify common adolescent and paediatric gynaecological problems and their management.
18. Learn common causes of infertility and their management and assisted reproductive techniques.
19. Acquire knowledge about common gynaecological problems like leucorrhoea, sexually transmitted infections, displacements, fibroid, endometriosis etc.,
20. Learn about screening and diagnosis of gynaecological malignancies including that of the breast.
21. Acquaint oneself with common gynaecological operative procedures.
22. Learn the proper method of handling data and presenting statistics in a scientific and orderly fashion in seminars, symposia and papers.
23. Utilise journals and reference works effectively.

#### B. ATTITUDE

1. Appreciate the fact that women and children are especially a vulnerable group as regards health problems.

2. Appreciate particularly the problem of patients of advanced and terminal disease and to develop a sympathetic attitude to them and their relatives.
3. Understand the psychological aspects of gynaecologic diseases in general and infertility and unwanted pregnancy in particular.
4. Develop the ability to view the patient's condition in a wider social perspective and to adjust therapy to suit her social and financial reality.
5. Understand the importance of good medical care in preventing most of the morbidity and mortality in Obstetrics and Gynaecology.
6. Develop skills to communicate with patients and their relatives and to elicit a thorough history and explain regarding investigations & management.
7. Understand that Obstetrics and Gynaecology form a hotbed for ethical issues and follow necessary precautions needed for an ethical practice.

#### C. SKILLS

1. Able to select cases for the following Obstetric procedures and able to perform them independently and confidently:
  - i. Lower segment caesarean section including cases of obstructed labour and malpresentations.
  - ii. Outlet and low forceps delivery
  - iii. Vacuum extraction
  - iv. Assisted Breech Delivery
  - v. External cephalic/internal podalic version
  - vi. Manual removal of placenta and exploration of uterine cavity.
  - vii. Management of atonic and traumatic postpartum haemorrhage.
2. Able to perform safe and effective medical termination of pregnancy up to 20 weeks of gestation using methods of
  - i. Suction Evacuation / MVA
  - ii. Dilation and Evacuation
  - iii. Extra amniotic instillations & other newer methods like medical abortion
3. Able to perform the following gynaecological surgical procedures:
  - i. D & C / FC, Menstrual Regulation
  - ii. Polypectomy
  - iii. Minilap tubectomy
  - iv. Vaginal Hysterectomy with pelvic floor repair

- v. Abdominal Hysterectomy for 'Straight-forward' cases
  - vi. Salpingectomy for ectopic pregnancy, Salpingo-ovariectomy
  - vii. Amputation of Cervix/Manchester repair / Conisation
4. Able to competently assist in the following:
- i. Gynaecological Oncology surgery
  - ii. Gynaecological-urology surgery
  - iii. Tubal microsurgery
  - iv. Caesarean Hysterectomy
  - v. Hysterectomy in difficult cases
  - vi. Minilap tubectomy, laparoscopic sterilization
  - vii. Diagnostic laparoscopy
  - viii. Colpocentesis/ colpotomy, laparotomy for septic abortion
  - ix. Cervical encirculation
5. Able to manage the post-operative and intra-operative complications.
6. Able to assist / perform the following investigations:
- i) Obstetric Ultrasonography for
    - pregnancy dating
    - Early pregnancy bleeding
    - Antepartum haemorrhage
    - Biophysical profile
    - fetal anomalies
  - ii) Gynaecological USG for adnexal mass & follicular monitoring
  - iii) Hysterosalpingography / sonohysterosalpingography
  - iv) Colposcopy
  - v) Cystoscopy
7. Able to resuscitate an asphyxiated newborn by emergency measures and recognize signs requiring referral of a baby for specialized care.

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

- ***Theoretical Knowledge*** –(Ref A – KNOWLEDGE' under 'OBJECTIVES')
- ***Practical and Clinical Skills*** – Refer 'C – SKILLS' under 'OBJECTIVES'
- ***Writing Thesis/Research Articles***

All students will have to carry out a research program and bring out a dissertation (thesis).

Students are encouraged to attend CMEs, publish research papers and present posters, or platform presentations at State, National and International conferences.

- ***Attitudes including Communication Skills***
  1. Appreciating Diversity
  2. Conflict Management
  3. Listening – Attention to detail
  4. Are you really listening ? – Picking up non-verbal cues
  5. Lost in translation – Communication within the team
  6. Case Scenario
    - a. Angry patient
    - b. Dealing with error made by college
    - c. Breaking bad news
    - d. Facilitating HIV status – disclosure to the patient and spouse
- ***Training in Research Methodology, Medical Ethics/Bioethics and Medico-legal aspects .***

Students should compulsorily attend the research Methodology workshop conducted by the University within the first six months of the M.S course.

Students are encouraged to attend workshops/CMEs on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, moral and legal issues are part and parcel of the curriculum and syllabus

## ETHICAL DILEMMAS IN OBSTETRICS AND GYNAECOLOGY

### A. At the beginning of life .

- Abortion - how do you make a legal / ethical decision taking into consideration all the laws and regulations, rights of the unborn child and the health of the mother.

- Infertility – Ethical issues of Assisted Reproductive Technologies – Donor programmes

- Gamete cryopreservation
- Embryo cryopreservation
- Fertility preservation
- Future of excess embryos

### B. Contraception

- Autonomy of the individual
- Right to refuse
- Ethical issues of sterilisation being offered as a form of contraception

### C. Counselling of parents with disease affected fetus.

A very difficult task in the event of diagnosis of conditions like Thalassaemia, Haemophilia, Down syndrome.

D. Ethical concerns of emerging medical technologies like Preimplantation Genetic Diagnosis for recurrent pregnancy loss and stem cell therapy.

### E. Decision making process for surgery

Tubal recanalization – a multipara requesting the surgery in the hope of having a male baby.

Surgery for Gynaecological condition, knowing very well it does not improve quality of life.

## **4. THEORY SYLLABUS**

### **OBSTETRICS& NEONATOLOGY**

#### **I. MATERNAL ANATOMY**

- 1. Anatomy of pelvis**
- 2. Embryogenesis**



### **3. Development of placenta.**

### **4. Anatomy of fetus, fetal growth & development, fetal physiology & circulation**

#### **1. ANATOMY OF PELVIS**

Boundaries of Pelvis, Planes and diameters of Pelvis , Diameters: a) Inlet b) Midcavity c) Outlet d) Types of Pelvis: Gynaecoid, Android, Anthropoid, Platypelloid, difference between male and female pelvis, clinical significance of various types of pelvis eg: Android - failure of rotation and deep transverse arrest.

#### **2. EMBRYOGENESIS**

##### **Gametogenesis:**

Oogenesis, Ovulation, Implantation, Trophoblast formation - cytotrophoblast and syncytiotrophoblast formation, Decidua formation – decidua basalis, decidua capsularis, decidua parietalis, Chorion and chorionic villi – chorion and amnion, syncytiotrophoblast, primary stem villi, Structure of mature spermatozoa, Biology of Trophoblast, Embryology applied to in-vitro fertilization.

#### **3. Development of placenta:**

Structure of placenta – amniotic membrane, chorionic plate, basal plate, intervillous space and stem villi.

Placental circulation – Placental membrane (barrier) – no mixing of maternal and fetal blood.

Fetoplacental circulation – two umbilical arteries and one umbilical vein.

Function of the placenta – Transfer of nutrients, production and metabolism of hormones, barrier function, immunological function.

Haemodynamics of fetal circulation – Maternal

Placental Hormones – Human Chorionic gonadotrophin, ACTH, Relaxin, PTH-Rp, Growth Hormone Variant (hGH-V), GnRH, CRH, Leptin, Neuropeptide Y, Inhibin and Activin

#### **4. ANATOMY OF FETUS, FETAL GROWTH DEVELOPMENT**

a)Events of Fetal Development: Eg. 4-6 weeks limb buds, optic vesicles, 8 to 12 weeks external genitalia, 14 to 21 days Notochord, Neural plate. 21 to 28 days Neural tube, cardiac chambers, 36 weeks descent of one testis, 40 weeks descent of both testicles.

##### **b) Fetal Physiology**

Fetal nutrition, fetal haematopoiesis, urinary system, skin, gastro-intestinal tract, respiratory system, endocrine system.

##### **c)Fetal Circulation**

Changes in fetal circulation at birth : closure of umbilical arteries, lateral umbilical ligaments & superior vesical arteries. Closure of umbilical vein – ligamentum teres. Ductus venosus – ligamentum venosum, ductus arteriosus 1-3 months of birth, foramen ovale – 1 year of birth.

## **II. MATERNAL PHYSIOLOGY**

### **I. MATERNAL CHANGES DURING PREGNANCY**

- i) Changes in genital tract
- ii) Hematological changes
- iii) Metabolic changes
- iv) Cardiovascular system
- v) Respiratory system
- vi) Gastrointestinal system
- vii) Urinary system
- viii) Endocrine system

### **III. PRENATAL CARE**

1. Diagnosis of pregnancy
  - In first, second and third trimesters
  - Details of symptoms and signs of pregnancy
  - Pregnancy tests
  - Details and accuracy
  - Details of dating of pregnancy with ultrasound
2. Details of Down's Screening
  - Nuchal thickness on ultrasound
  - Pros and cons of Down's screening
  - First trimester morphology
  - NIPT – Non invasive prenatal testing
3. Lab investigation in pregnancy
  - Rationale for these tests
  - OPT In / OPT Out screening for HIV
  - Role of urine culture, TSH
  - Screening for gestational diabetes
  - Role of Group B hemolytic streptococcus screening
  - Immunization – recommended vaccines, contraindicated vaccines
4. Assessment of risk factors
  - Relevant history
5. Morphology ultrasound
  - Commonly diagnosed anomalies
6. Examination

- a) General – accurate BP measurement, Importance of examining spine, gait, thyroid and breast
- b) Obstetric – symphysiofundal height (metrogram) charts, abdominal grips, pelvis assessment at term.
- 7. Drugs prescribed in pregnancy
  - Common drugs contraindicated in pregnancy
  - Teratogenicity of drugs.
- 8. Prenatal advice to women
  - Nutrition in pregnancy
  - Tips to expectant mothers.
- 9. Antepartum fetal surveillance
  - Use of ultrasound
  - Non stress test

#### IV. PHYSIOLOGY OF LABOUR AND PURPERIUM

Causation and stages of labour, role of hormones in labour,  
Physiological and biochemical processes regulating parturition and induction of labour

- a) **MECHANISM OF LABOUR**
  - Cervical ripening, uterine distension, cardinal movements
- b) **CONDUCT OF NORMAL LABOUR**
  - Diagnosis of labour , management of 1<sup>st</sup> stage, management of 2<sup>nd</sup> stage, management of 3<sup>rd</sup> stage, drugs to prevent and treat PPH
- c) **INTRAPARTUM SURVEILLANCE**
  - Fetal surveillance, surveillance of uterine activity, PRAMS – post partum pregnancy risk assessment monitoring system, maternal early warning systems.
- d) **NORMAL PURPERIUM**

Changes in the genital tract, uterus and other systems, lactation, care of puerperium.  
Changes in the Genital tract & other systems, Changes in the uterus –involution and lochia, Lactation, Colostrum Physiology of lactation, Care of the Puerperium  
Ambulation, bowel & bladder care, Breast, perineal care, Postpartum follow-up care.

**PRAMS**Postpartum - Pregnancy risk assessment monitoring system, Maternal early warning systems

#### V. COMPLICATIONS OF PREGNANCY

- Early pregnancy complication
- Anaemia in pregnancy
- Hypertensive disorders of pregnancy
- Antepartum haemorrhage

- Preterm labour
- Intrauterine growth restriction
- Prolonged pregnancy
- Multiple pregnancy
- Rhesus isoimmunisation

## **EARLY PREGNANCY COMPLICATIONS**

Hyperemesis gravidarum, types of abortions, gestational trophoblastic disease, algorithm for evaluation, expectant management, staging and prognostic scoring, novel serum markers – VEGF, Creatine kinase

**Ectopic pregnancy** – Types, risk factors, clinical features, investigations.

Management – Medical, Surgical, conservative, algorithm for evaluation in expectant management.

## **ANAEMIA IN PREGNANCY**

Iron deficiency, Folic acid & vitamin B12 deficiency, hemoglobinopathies, effects, investigations.

Management – – iron therapy, oral and parenteral, blood transfusion, management of labour.

## **HYPERTENSIVE DISORDERS OF PREGNANCY**

Classification, pathogenesis, preeclampsia, investigations, Predictive Test, Prediction models for preeclampsia (combination of biochemical, biophysical components and history) Chronic hypertension, HELLP syndrome, prophylaxis, management, role of uterine artery, umbilical artery, middle cerebral artery, ductus venosus , doppler in the management of preclampsia.

HYPITAT trial, CHIPS trial,

## **ANTEPARTUM HAEMORRHAGE**

Definition, differential diagnosis, Abruptio placentae, causes for maternal mortality, placenta previa – types and management. Internal iliac artery ligation (Use of stepwise devascularization)

## **PRETERM LABOUR**

Etiology, Management – corticosteroids, tocolytics, preterm (PPROM) premature rupture of membranes, diagnosis, management, antibiotics, corticosteroids, Rescue therapy, atosiban, nitric oxide donors, Pros and Cons of prophylactic, therapeutic and emergency cervical cerclage, role of progesterone therapy, tocolysis, magnesium sulphate – neuro protection before 32 weeks.

## **FETAL GROWTH RESTRICTION**

Definition, types, etiology, diagnosis, assessment and management, Ponderal Index , Doppler – middle cerebral artery, uterine artery doppler. TRUFFLE, GRIT, DIGITAT studies.

## **PROLONGED PREGNANCY**

Definition, etiology, diagnosis and management, evaluation, modes of induction of labour.

## **MULTIPLE PREGNANCY**

Incidence, varieties, presentation, course of pregnancy, diagnosis, complications, management of labour. Complications of monochorionic twins, Acardiac Twin (TRAP) sequence, Twin-Twin transfusion syndrome (TTTS). TAPS (Twin anemia polycythemia sequence), Selective reduction - LASER

## **RHESUS ISOIMMUNISATION**

Factors influencing Rh immunization, Management of RH-immunised pregnancy. Non-invasive tests – MCA, PSV, Marie graph.

## **VI. MEDICAL DISEASES COMPLICATING PREGNANCY**

- a) Diseases of the cardiovascular system
- b) Maternal infections during pregnancy
- c) Diabetes in pregnancy
- d) Tumors of the uterus and adnexa
- e) Surgical emergencies during pregnancy
- f) Liver diseases in pregnancy
- g) Diseases of urinary system

## **DISEASES OF THE CVS**

Changes in the CVS system, types – congenital and rheumatic, functional grading – New York Heart Association, management during pregnancy, labour and puerperium, Prosthetic valves, Use of anticoagulants, Timing of anticoagulants, Complications in women with prosthetic valves.

## **MATERNAL INFECTIONS DURING PREGNANCY**

TORCH infections, Sexually transmitted diseases, HAART therapy, other infections

## **DIABETES IN PREGNANCY**

White's classification, pathophysiology, diagnosis, risk factors management – Diet, insulin, obstetric management, neonatal management, pregestational diabetes, GDM screening, use of oral hypoglycemics in pregnancy. HAPO trial, ACHOIS, IADPSG Recommendations, Oded Langer et al., N Engl J Med 2000, MiG Trial NEJM.

## **TUMOURS COMPLICATING PREGNANCY**

Fibroids, ovarian tumours and carcinoma cervix, effects and management, chemotherapy in pregnancy,

## **SURGICAL EMERGENCIES**

Acute appendicitis, intestinal obstruction, MANTRELS score.

## **LIVER DISEASES**

Intrahepatic cholestasis – Use of ursodeoxycholic acid, AFLP, viral hepatitis, HELLP syndrome

## **DISEASE OF URINARY SYSTEM**

Asymptomatic bacteriuria, acute renal failure, rational use of antibiotic therapy

### **VII. NEW BORN**

- a) Resuscitation of new born
- b) Respiratory distress and neonatal sepsis
- c) Neonatal jaundice
- d) Neonatal problems and their management

## **NEW BORN**

Resuscitation of the new born, neonatal sepsis, neonatal problems and the management, birth trauma

### **VIII. ABNORMAL LABOUR**

Malpresentation, Dystocia, cephalo pelvic disproportion, Cardiotocograph findings. Categorization of cardiotocography – category 1,2,3

### **IX. THIRD STAGE COMPLICATIONS**

Postpartum haemorrhage-etiology, predisposing factors, management, retained placenta, inversion of uterus, injuries to the parturient canal, rupture of the uterus, puerperal infection, venous complications, genital tract infections, mastitis and breast abscess, B-lynch suturing, internal iliac artery ligation, uterine tamponade – condom and Bakri balloon, stepwise devascularization, angiographic embolization, pelvic umbrella pack.

## **OBSTETRIC PROCEDURES**

Forceps, Vacuum extractor, external cephalic version, internal podalic version, caesarean section, induction of labour, complications.

**ULTRASOUND** : Early pregnancy – diagnosis, dating, viability, multiple pregnancy, congenital anomalies, estimation of gestational age, fetal growth, fetal weight, liquor volume, fetal well being.

## **FAMILY PLANNING**

- X. Demography and population dynamics
- XI. Contraception
- XII. Emergency contraception
- XIII. Recent advances in contraception

### **XIV. DEMOGRAPHY AND POPULATION DYNAMICS**

Population dynamics, factors involved, magnitude of the problem, impact of increased population. Vital statistics, maternal morbidities, perinatal mortality, early and late neonatal death.

#### **XV. CONTRACEPTION**

Temporary methods – Barrier methods : Condoms, diaphragm, chemical sponge(Today), natural contraception, IUCD, steroidal contraception, Oral – OCP, triphasic combined pills, mini pill, Newer OCPs, Parenteral – DMPA, NETO, Implants – norplant 1,2, Capronor, Silasticvaginal rings, Skin patches, Centchromin. Permanent methods : vasectomy, tubectomy, laparotomy, minilap, hysteroscopy, vaginal route.

#### **EMERGENCY CONTRACEPTION**

OCP, estrogen, levonorgesterol, mifepristone, centchroman, GnRH agonist, prostaglandins

#### **MEDICAL TERMINATION OF PREGNANCY**

MTP Act, grounds for performing MTP

#### **RECENT ADVANCES, NEW DEVELOPMENT, FUTURE RESEARCH WORK IN CONTRACEPTIVE TECHNOLOGY**

Immunological methods, male contraceptive

#### **ETHICS IN OBSTETRICS & GYNAECOLOGY – MEDICO LEGAL ISSUES**

PCPNDT Act – Preconceptional and prenatal diagnostic test act

MTP Act

Fetal Anomalies – Decision regarding termination or continuation

Multiple Pregnancy – advise regarding fetal reduction

Modern O&G – Regarding ART – Eg .Removal of both ovaries for benign condition in the younger and middle age group women do not warrant removal of a normal uterus – Details

Consent

Consent forms for obstetric emergencies

Consent forms for sterilization eg. For lap sterilization

#### **MEDICO LEGAL ISSUES**

- MTP Act
- PCPNDT Act
- Litigation for poor outcome, complications
- Importance of complete documentation
- Litigation after sterilization failure
  - A. Permanent sterility B. Failure – 1% of patients conceive after sterilization C. May be converted to open surgery in the presence of unexpected problems, technical (or) Otherwise

For planned procedures & Laparotomy, if one is doing any procedure other than for which the consent was previously obtained, the surgeon or the Assistant must explain and get the consent for present procedure during the surgery itself.

Special Consent :Jehovah's witness, Mentally challenged, Unmarried, Medico legal cases.

## **OBSTETRIC ANAESTHESIA & ANALGESIA**

### **NERVE SUPPLY OF FEMALE GENITAL TRACT**

Sympathetic & Para sympathetic nerve supply of the female genital tract & its applied anatomy.

### **PHYSIOLOGY OF PREGNANCY**

Physiological changes in pregnancy

### **PHARMACOLOGY**

Pharmacology of drugs used in Obstetrics, Placental transfer of drugs.

### **LABOUR ANALGESIA**

Various methods of pain relief in labour-.Pharmacological & Non-pharmacological methods, labour epidural analgesia.

### **ANAESTHESIA FOR OPERATIVE OBSTETRICS**

GA, Spinal and epidural anaesthesia for LSCS surgery

### **ANAESTHESIA FOR LAPAROSCOPIC SURGERY**

Anaesthetic implications of GA for Laparoscopic surgery

## **GYNAECOLOGY**

### **I ANATOMY**

Vulva, vagina, uterus, and cervix, fallopian tubes, ovaries, ureter, pelvic musculature, blood supply of genital organs, ovarian artery, uterine artery, vaginal artery, arteries of the vulva and perineum, lymphatic system, inguinal glands, parametrial glands, external iliac glands, common iliac, sacral groups, lumbar group, nerves supply- sympathetic & para sympathetic. Branches of the internal iliac and external iliac vessels, ligaments of the pelvis and supports of uterus

### **NORMAL HISTOLOGY**

Ovary, cortex, Graffian follicle, corpus luteum, endometrium- proliferative phase, secretory phase, menstruation, vaginal epithelium – physiological changes.

### **II PHYSIOLOGY OF OVULATION AND MENSTRUATION**

Hypothalamus, pituitary, ovary, estrogen, progesterone, physiology of ovulation, physiology of menstruation, Hormonal levels in different phases of menstrual cycle, neuro endocrine control of menstruation, role of prostaglandins.



### **III DEVELOPMENT OF FEMALE GENERATIVE ORGANS**

Urogenital Sinus and external genital organs, primitive urinary system, lower end of Mullerian duct, external genital organs, development of ovary.

### **MALFORMATIONS OF THE FEMALE GENERATIVE ORGANS**

Development of female generative organs, the urogenital sinus and the external genital organs, development of ovaries, Mullerian duct anomalies, developmental defects of the urogenital sinus, malformations of the rectum and anal canal, congenital rectovaginal fistula, Wolffian duct anomalies, renal tract anomalies.

### **IV GYNAECOLOGICAL DIAGNOSIS**

History taking, menstrual history, obstetric history, physical examination, general examination, abdominal examination, gynaecological examination, speculum examination, pap smear, vaginal examination, rectal examination, investigations, preoperative investigations, Papanicolaou Test-classification(WHO/SIL Bethesda), Liquid based cytology, Cytochemical Evaluation (Karyopyknotic index(KPI)), Uterine Aspiration cytology, Colposcopy, Endometrial Biopsy, Hormonal Assays, Ultrasonography, Others(CT, MRI, HSG), Gynaecological Endoscopy, Aspiration of Pouch of Douglas

### **V PAEDIATRIC AND ADOLESCENT GYNAECOLOGY**

Pediatric Gynecology, Anatomy, Physiology, genitourinary system of Neonate, Congenital Anomalies, Infection, Tumors, Puberty & Adolescent Problems, Pubertal changes, Management, Precocious Puberty, Delayed Puberty, Oligomenorrhoea, Puberty Menorrhagia, Dysmenorrhoea, Vaginal Discharge, Acne, Unwanted Pregnancy, Tanner & Marshall staging, Neuro endocrinologic control of puberty.

### **VI DISORDERS OF MENSTRUATION**

Menstrual cycle irregularities - Introduction, Definitions, Amenorrhoea, Primary – Classification, Etiology, Management, Secondary amenorrhoea - Etiology, Investigations, Oligomenorrhoea and hypomenorrhoea, Polymenorrhoea, Metrorrhagia, Dysmenorrhoea- Definition, etiology, types, varieties, Clinical features, investigations, Treatment, Premenstrual tension syndrome-Introduction, Etiology, Clinical features, Diagnosis, Treatment.

### **VII MENORRHAGIA AND DYSFUNCTIONAL UTERINE BLEEDING**

Menorrhagia - Causes, General diseases, Local pelvic causes, Endocrine disorders- thyroid dysfunction, Contraceptives, Iatrogenic, Investigations, Management, General measures, Treating the cause, SERM(Ormeloxifene), **PALM COEIN classification**,

### **DYSFUNCTIONAL UTERINE BLEEDING**

Definition, Pathogenesis, classification-ovulatory, anovulatory, pubertal menorrhagia, metropathia hemorrhagica-pathological anatomy, irregular shedding, irregular ripening, diagnosis, treatment, conservative, medical & surgical, medical therapy- OCP, progestogen, danazol, NSAID, antifibrinolytics, GnRH analogue, MIRENA IUCD, Surgical- Curettage, Minimal invasive surgery, Hysteroscopic endometrial ablation(TCRE),

Radiofrequency induced thermal endometrial ablation(RITEA), Cavaterm balloon therapy, Microwave endometrial ablation(MEA), Uterine tamponade, Endometrial laser intrauterine, thermotherapy(ELITT), Bilateral uterine artery embolization, Hysterectomy-Abdominal, Vaginal, Laparoscopic, LAVH. Von Willebrands disease, and other bleeding dyscrasias.

## **VIII FIBROMYOMA OF UTERUS AND UTERINE POLYPS AND ADENOMYOSIS**

Fibromyoma types— intramural,submucous,subserous .Symptoms – menstrual disorders, infertility, pain, pressure symptoms,Complications, Degeneration, Torsion, Inversion, Infection, Treatment, Medical –GnRH analogues, danazol, mifepristone,surgery: Myomectomy—abdominal / vaginal / hysteroscopic / laparoscopic; Hysterectomy — ransabdominal/vaginal/LAVH/laparoscopic, Uterine artery embolization, uterine polyps, Endometrial polyp, Placental polyp, Management, Cervical fibroid.

## **IX ENDOSCOPY IN GYNAECOLOGY**

Laparoscopy - Indications for Laparoscopy, Diagnostic laparoscopy, Operative laparoscopy, General indications, Other indications, Technique of laparoscopy, Complications, Hysteroscopy- Technique, Diagnostic indications, Therapeutic indications, Distension media in hysteroscopy, Contact hysteroscopy, Complications of hysteroscopy, Late complications, Salpingoscopy and Falloposcopy, Colposcopy, Indications, Therapeutic, Technique of Colposcopy, Colposcopic findings, Abnormal findings, Colpomicroscopy, Extragenital Endoscopy, Fluid Management, Hysteroscopy, Endometrial Ablation.

## **X GENITAL PROLAPSE**

Supports of genital tract, Dancey 3 levels of support, Etiology, Birth injuries, menopause, Classification of Prolapse- Anterior vaginal wall, Posterior vaginal wall, Uterine descent, Procidentia, Symptoms of prolapse, Investigations, Differential diagnosis, Anterior vaginal wall cyst, Chronic uterine inversion, Congenital elongation of cervix, Complications of Prolapse, Prophylaxis & Management, Conservative-pessary, Surgery, Vaginal hysterectomy, Anterior & Posterior colporrhaphy&Colpoperineorrhaphy, Fothergills repair, Abdominal sling surgery, Vault prolapse, Recurrent prolapse, Details of Sling Surgeries – Abdomino cervicopexy, Pelvic reconstructive surgery, Synthetic materials, Biological Materials, New system, (Intra vaginal sling plasty, Apogee, Perigee),

## **XI DISEASES OF URINARY SYSTEM**

Common Urinary Malfunctions 1.Acute Retention of Urine- Causes, Management 2.Chronic retention- Causes, Management 3.Retention of Urine due to retroverted gravid uterus, Management 4.Urethral Syndrome 5.Difficult Micturition 6.Painful Micturition 7. Increased Frequency of Micturition 8.Incontinence of Urine 9.Cystitis-Micro Organisms,

Mode of spread, Symptoms, Diagnosis, Treatment ,Diseases of the female urethra, Urethritis, Urethral caruncle.

Urethral prolapse, Urethral Diverticulum, Urethral Stenosis, Urinary Fistulae, Genital Fistulae, Definition, Etiology, Anatomic Classification of Urinary Fistulae, Clinical Features - Investigations, Management, Latzko Procedure, Chassar Moir technique, Vaginal/transvesical / transabdominal Approach, ileal loop bladder, Postoperative Management - Ureteric fistulae, Causes, Diagnosis, Management-Percutaneous nephrostomy, Cystoscopic catheterization & stenting, Boari-flap operation, Ureteroneocystostomy, Urethrovaginal Fistula, Stress urinary incontinence, Mechanism of Female Urinary Incontinence - Genuine stress incontinence, Urge incontinence, Clinical Evaluation, Investigations, Stress test, Cotton swab stick test, Marshall and Bonney's test, Urethroscopy, Urodynamic evaluation, MRI studies, Treatment-Conservative, Surgical, Vaginal/Abdominal/combined Approach, Complications, Outcome following surgical repair, Detrusor instability-Etiology, Pathophysiology, Symptoms, investigations,Treatment. Physiology of micturition, Pregnancy & urinary problems, Urodynamic studies, cystoscopy. Burch Colposuspension, Tension free vaginal T-tape, Injectable Bulking agents, Botox Injection, Augmentation cystoplasty, Neuro Modulation.

## **XII SEXUALLY TRANSMITTED DISEASES**

Condylomata acuminata, Genital ulcers, Genital Herpes, Chlamydia, syphilis, gonorrhoea, LGV,granulomainguinale, Human Immunodeficiency Virus.

## **XIII PELVIC INFLAMMATORY DISEASE**

Etiology, Pathological Anatomy, Stages of PID, Clinical criteria for diagnosis of PID, Acute/chronic Signs & Symptoms, Differential diagnosis, Treatment, Acute PID-Medical/Surgical/ Minimal Invasive Surgery, Chronic PID-Surgery Laparoscopic/Hysteroscopic/Conservative Surgery, Prophylaxis Against PID, Actinomyces PID, Tuboovarian mass, CDC guidelines for treatment of PID.

## **XIV TUBERCULOSIS OF GENITAL TRACT**

Primary sources of infection, mode of spread, Bacteriology, Pathology, TB Fallopian tubes-Exosalpingitis{tobacco pouch appearance and Frozen pelvis} and endosalpingitis, Symptoms of TB genital tract. Infertility, menstrual disorders, fistula Formation, Investigation, **Treatment of genital TB.**

## **DISEASES OF VULVA AND VAGINA**

VULVA - Benign conditions, Atrophy, Dystrophies-Histological classification and clinical Features, Cysts and neoplasms-Bartholin's cyst.

**Vagina** - Leucorrhoea, Infections-Gonococcal, trichomonas, monilial, chlamydial, bacterial vaginosis, Vaginitis-Senile vaginitis, Secondary vaginitis, Cysts, Gartner's cyst, Vulval infections, clinical features, diagnosis & management.

## **XV MENOPAUSE AND POST MENOPAUSAL BLEEDING**

**MENOPAUSE** – Definition, Hormonal changes, Anatomical changes, Symptoms, menstrual, neurological, genitourinary tract, Investigations-PAP smear. Management- Hormone replacement therapy-estrogen, progestogen, raloxifene; soya, bisphosphonates, Post menopausal bleeding-Definition, etiology, investigations-USG –Endometrial thickness, Fractional curettage, endometrial sampling, hysteroscopic biopsy, management, estrogen transdermal patch, HRT and bone mineral density.

## **XVI INFERTILITY**

Issues involved, Male infertility - Spermatogenesis, Endocrine control, pathology, Etiology, Investigations, History, General & Local Examination, Special investigations -Semen analysis hormone assay, testicular biopsy, Immunological test, Patency of vas, Chromosomal study, Management - Education, substances abuse, correct endocrinopathies, surgical, antibiotics, Hormones (HCG, Testosterone, GnRH) Sildenafil, artificial insemination, **Intra uterine insemination**.

Management of azoospermia - **ICSI, TESA, PESA, MESA, TESTICULAR BIOPSY**

Psychological considerations

Female infertility: Etiology, Investigations, History, examination, special investigations, Tests for tubal patency(HSG, Laparoscopic chromotubation, SSG) Management of Tubal infertility Tubal microsurgery(tuboplasty), Laparoscopic tubal adhesiolysis, fimbrioplasty, IVF, Tests for Ovulation -BBT, endometrial biopsy, fern test , USG, Hormonal study, Management of anovulation -Ovulation induction drugs, **Gonadotrophins, Dexamethasone**, laparoscopic drilling. Management of Peritoneal disorders, Endometriosis, unexplained infertility, **Ovarian reserve tests: FSH, AMH, AFC. Legal aspects of ART: ART bill ; ICMR regulations**, Post coital test (Sims test) Sperm penetration test, **Y deletion genetic tests, CFTR testing**.

**IVF TECHNIQUES** (Indications, complications), GIFT, ICSI, Epididymal aspiration. Newer modalities - Hysteroscopy, Fallopscopy, ampullary and fimbrialsalpingoscopy, **Laparoscopy for endometriosis**. ART (indications, types)

## **ENDOMETRIOSIS**

Etiology, Genetic factors, Mutation, Aneuploidy, Immunological factors & inflammation, Endocrinological abnormalities, Endometriosis of the rectovaginal Septum, adenomyosis, Medical treatment -Non hormonal Therapy, Modulation of Cytokines, Leukotriene Receptor, antagonists(Pentoxifylline), Inhibition of matrix metalloproteinases, hormonal therapy - Progesterone, Onapristone, Mifepristone, Aromatase, inhibitors, SERM-Raloxifene, Future research(Rat &Rabbit animal Models, Role of laparoscopy.

## **XVII GESTATIONAL TROPHOBLASTIC DISEASES**

Hydatidiform mole, incidence, pathology, invasive mole, placental site trophoblastic tumour, symptoms and signs, investigations, ultrasound, serum beta HCG, treatment, follow up, persistent trophoblastic disease, recurrent molar pregnancy, choriocarcinoma, Pathology, Signs and symptoms, FIGO staging, Treatment—chemotherapy (triple therapy, EMACO)/surgery, Follow up.

## **XVIII DISORDERS OF THE OVARY AND BENIGN TUMORS**

Non neoplastic enlargements of the ovary, Follicular cysts, Follicular haematomas, Lutein cysts of the ovary, functional cysts, Polycystic ovarian syndrome (PCOS) or disease (PCOD), Ovarian Tumors, Pathology, Borderline ovarian Tumors, Characteristics of borderline ovarian tumors, Risk factors, Pathology, Tumors of the surface epithelium-Serous cystadenoma and cystadenocarcinoma ,Mucinous tumour, Endometrioid tumour, Mesonephroid tumour, Brenner tumour, Spread of epithelial tumors of the ovary, Germ cell Tumour, Incidence, Teratoma Dermoid cysts, Solid teratoma of the ovary strumaovarii, Carcinoid tumors, Dysgerminoma Mixed germ cell tumour, Sex cord stromal Tumour, Feminizing tumours of the ovary, Granulosa cell tumour, Theca cell tumour, Virilizing ovarian tumours -Mesenchymoma, Arrhenoblastoma, Adrenal cortical tumor of the ovary, Hilus cell tumor, Gynandroblastoma, Tumor Arising from connective Tissues of Ovary-Ovarian fibroma, Histogenesis of ovarian tumors, Complications of ovarian tumors, Benign ovarian Tumors - Symptoms, physical signs, Differential diagnosis, Investigations, Treatment.

## **XIX GYNAECOLOGIC ONCOLOGY**

Cancers of the Genital Tract, Cancer of the Vulva, Preinvasive lesions, Invasive carcinoma of the vulva (FIGO staging ) management, Vaginal cancer, Clinical features, Staging, Diagnosis, Management Carcinoma of the cervix, Cervical intraepithelial neoplasia, Metaplasia, Dysplasia, preinvasive cervical cancer (stage0), Invasive cancer of the cervix-signs, symptoms & staging, invasive cancer cervix in Pregnancy (abnormal pap smear in pregnancy), management & treatment - Endocervical cancer, Carcinoma of the Uterus and

Endometrial Cancer, Predisposing factors, Surgery Postoperative radiotherapy, Primary radiotherapy, Progestogens, Recurrent growths, Uterine sarcomas, Fallopian Tube Cancers, FIGO staging, Clinical features, Differential diagnosis, Investigations, Management, Prognosis of Ovarian Cancer, FIGO staging, Epithelial cancers of the ovary, Non-epithelial malignancies of the Ovary, Sex cord stromal tumors, Metastatic carcinomas, Management-staging Laparotomy, Strategies to Reduce the Incidence of Genital Tract Malignancies, (Prophylaxis), Palliative and adjuvant therapy.

Vulval sarcoma, melanoma, Bartholin gland tumour, Pap smear & classification, Colposcopy, cervicography, VIA, Cone biopsy, Radical Hysterectomy, Pelvic Lymphadenectomy, Laser ablation, LLETZ, LEEP, Radiotherapy, HPV vaccine, Histological classification & grading, Endometrial Carcinoma, Uterine sarcoma.

VIN classification, Paget's disease, Bowen's disease, Sarcoma botryoides, Etiology and management, AgNOR, HPV testing & HPV Vaccine, Nerve-Sparing Radical Hysterectomy, Prognostic Variables, Adjuvant Radiation, Neoadjuvant Chemotherapy, Recurrent cervical cancer, Aspiration cytology, Prognostic Variables.

Risk factors, criteria for diagnosis of borderline tumors, Krukenberg tumor, Second look laparotomy, Stem cell therapy.

## **IMAGING MODALITIES IN GYNAECOLOGY**

Plain Radiography, Hysterosalpingography, Sonosalpingography, Intravenous Urography - Indications, Precautions and contraindications, Cystography and Urethrography, Gastrointestinal studies, Barium meal and follow through Barium enema, Arteriography and arterial Embolization, Ultrasonography, Transabdominal Ultrasonography, Transvaginal ultrasound, Diagnostic indications, Therapeutic applications of ultrasonography in clinical practice, Computed Tomography Scan - Technique, Indications, Magnetic Resonance Imaging, Indications, Contraindications, Radionuclide Imaging, Dual Photon Densitometry.

## **OPERATIVE GYNAECOLOGY**

Principles of Anatomy & Perioperative considerations, Surgical Anatomy of Pelvis, Pre operative care, Post Operative care, Principles of Gynaecological Surgical Techniques, Incisions for Gynaecological surgery, Surgery for Fertility, Reconstructive Tubal Surgery, Surgery For Benign Gynaecologic Conditions, Surgery for Anomalies of the Mullerian duct, Suture Material & Surgical Instruments, Water, Electrolyte & Acid-Base Metabolism, Diagnostic and Operative Laparoscopy, Operative Hysteroscopy, Application of Laser in Gynaecology.

## **SURGERY OF THE MULLERIAN DUCTS**

Vaginoplasty, 1 Mc Indoe Operation 2. Williams Vulvovaginoplasty, Tubal Sterilization, Surgical Approach, 1. Minilaparotomy 2. Laparoscopy 3. Tubal Occlusion Vasectomy,

Surgery for Benign Disease of the Ovary, Resection of Benign cysts, Leiomyomata Uteri and Myomectomy, Medical Management of Uterine Leiomyomata, Abdominal Myomectomy, Assisted reproductive techniques, Surgical Technique for Uterine Unification - 1.Modified Jones Metroplasty 2. Tompkins Procedure 3.The Strassman, Metroplasty

## **HYSTERECTOMY**

1. Abdominal Hysterectomy, Indications, Preoperative counselling, Preparation for Hysterectomy, Complications, Post Operative care, 2.Vaginal Hysterectomy – Indications, Preoperative counselling, Preparation for Hysterectomy, Operative Technique, Complications, Post Operative care, Hysterectomy - 1.Laparoscopically assisted vaginal hysterectomy (LAVH), 2.Laparoscopic subtotal hysterectomy (LSH)  
3.Laparoscopic hysterectomy (TLH), Staging system for Laparoscopic hysterectomy,

## **SURGERY FOR CORRECTIONS OF DEFECTS IN PELVIC SUPPORT**

Pelvic Organ Prolapse, Anatomic considerations, Clinical Evaluation, Pelvic Organ Prolapse-Quantification system (POP-Q), Baden-Walker system, SITE-Specific Repair, Cystourethrocele, Paravaginal Defect Repair, Posterior Compartment defects,

## **VAGINAL VAULT PROLAPSE**

1. McCall Culdoplasty, 2.Sacrospinous Ligament Fixation 3.Abdominal Sacral Colpopexy, Non surgical treatment for pelvic organ prolapse—use of vaginal pessaries, High utero Ligament Suspension, Iliococcygeus Fascia Suspension, Le Fort Colpocleisis, Vesico Vaginal Fistula.

## **CANCER OF THE CERVIX**

Surgical treatment for early stage cervical cancer, Concept of radical abdominal hysterectomy and bilateral pelvic lymphadenectomy,

## **ADJUVANT THERAPY IN CONJUNCTION WITH RADICAL SURGERY**

## **ENDOMETRIAL CANCER**

## **SURGICAL STAGING AND TREATMENT**

## **OVARIAN CANCER**

Comprehensive surgical staging, Surgical staging for apparent early stage ovarian cancer, Primary cytoreductive surgery, Neoadjuvant chemotherapy and interval cytoreductive



surgery, Laparoscopically assisted radical vaginal hysterectomy. (SCHAUTA), Second look laparotomy, Secondary cytoreductive surgery.

**5. TEACHING LEARNING METHODS(including Clinical Study)**

1. Seminars / Symposia
2. Journal Clubs
3. Group Discussions
4. Clinical rounds / combined case discussions
5. Case presentations / Bedside teaching
6. Maternal care review meetings
7. Perinatal meetings
8. Clinicopathological meetings
9. Attending conferences, Workshops, CME programmes etc.,

**A) Active involvement in patient care in**

- Antenatal clinic
- General Gynae – OPD
- Postnatal clinic
- Infertility clinic etc.,

**B) Operation Theatre**

- Assist procedures
- Operate under supervision
- Operate independently
- Emergencies – Participation in Management
- In the community – visits to RHC / CAMPS

**6. STRUCTURED TRAINING PROGRAMME**

| <b>CLINICAL POSTINGS -THREE YEAR MS OG</b> |               |                |                 |
|--------------------------------------------|---------------|----------------|-----------------|
|                                            | <b>I Year</b> | <b>II Year</b> | <b>III Year</b> |
| <b>L.Ward</b>                              | 3 months      | 3 months       | 3 months        |
| <b>AN/PN Ward</b>                          | 3 months      | 3 months       | 3 months        |



|                                     |            |            |          |
|-------------------------------------|------------|------------|----------|
| <b>Gyn/P.O Ward</b>                 | 3 months   | 3 months   | 3 months |
| <b>Anaesthesia</b>                  |            | 15 days    | 15 days  |
| <b>Paediatrics</b>                  |            | 1 month    |          |
| <b>Medicine</b>                     | 1 month    |            |          |
| <b>Surgery &amp; Urogynaecology</b> | 15+15 days | 15 days    |          |
| <b>FW</b>                           |            | 15 days    | 15 days  |
| <b>Infertility &amp; USG</b>        | 15 days    | 15 days    |          |
| <b>Colposcopy &amp; Pathology</b>   |            | 15+15 days |          |
| <b>Radiotherapy</b>                 |            |            | 7 days   |
| <b>Oncology</b>                     |            |            | 7 days   |
| <b>Endocrinology</b>                |            |            | 7 days   |
| <b>Genetics</b>                     |            |            | 7 days   |
| <b>Social Obstetrics</b>            |            |            | 1 month  |

#### Clinical Postings-Two year MS OG

|                                     | <b>I Year</b> | <b>II Year</b> |
|-------------------------------------|---------------|----------------|
| <b>L.Ward</b>                       | 3 months      | 3 months       |
| <b>AN/PN Ward</b>                   | 3 months      | 2 1/2months    |
| <b>Gyn/P.O Ward</b>                 | 3 months      | 2 1/2months    |
| <b>Anaesthesia</b>                  |               | 15 days        |
| <b>Paediatrics</b>                  | 15 days       |                |
| <b>Medicine</b>                     | 1 month       |                |
| <b>Surgery &amp; Urogynaecology</b> | 15+15 days    |                |
| <b>FW</b>                           | 15 days       | 15 days        |
| <b>Infertility &amp; Sonar</b>      |               | 15 days        |
| <b>Colposcopy &amp; Pathology</b>   |               | 15days         |
| <b>Radiotherapy</b>                 |               | 7 days         |
| <b>Oncology</b>                     |               | 7 days         |
| <b>Endocrinology</b>                |               | 7 days         |
| <b>Genetics</b>                     |               | 7 days         |
| <b>Social Obstetrics</b>            |               | 1 month        |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**\*\*** The MS (O&G) Post Graduate students shall be posted in the following specialties during their one month postings in the Department of General Medicine:

|                             |         |
|-----------------------------|---------|
| Department of Diabetology   | 10 days |
| Intensive Medical Care Unit | 10 days |
| Medical Ward                | 10 days |

Further, the board has resolved that the Heads of the Department of Medicine and Department of O&G shall draw a schedule with regard to the above postings.

**\*\* Resolved in 55<sup>th</sup> Standing Academic Board held on 18.07.2018.**

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

#### **8. COMPETENCY ASSESSMENT :**

**• OVERALL:**

|                                                                                                                      |    |                            |
|----------------------------------------------------------------------------------------------------------------------|----|----------------------------|
| a) Communication / commitment / Contribution /<br>Compassion towards patients and Innovation                         | () |                            |
| b) Implementation of newly learnt techniques/skills                                                                  | () | - 5 Marks                  |
| • Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars                                          |    | - 5 marks                  |
| • Number of Posters/Papers presented in Conferences/<br>Publications and Research Projects                           |    | - 5 marks                  |
| • No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic meetings with details |    | - 5 marks                  |
| Total                                                                                                                |    | -----<br>20 Marks<br>----- |

## PG CLINICAL COURSE

**VIVA including Competency Assessment - 80 Marks (60 + 20)**  
(Obstetrics-30marks & Gynaecology -30 marks)

**Log Book - 20 marks**

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| III year      | Upto Oct | 10 marks | Upto Feb  | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

### 9. DISSERTATION AND UNIVERSITY JOURNAL OF MEDICAL SCIENCES

As per the 49<sup>th</sup> SAB Resolution under Point No. 2 and in the 52<sup>nd</sup> SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31<sup>st</sup> of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31<sup>st</sup> March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31<sup>st</sup> March of the first Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

A candidate shall be allowed to appear for the Theory and Practical/Clinical Examination only after the acceptance of the Thesis by the Examiners.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper.

## **10. THEORY EXAMINATION**

Paper I-Applied Basic Sciences in Obstetrics & Gynaecology

Paper II-Obstetrics including Recent Advances and Neonatology

Paper III-Gynaecology and Family Welfare including Recent Advances

Paper IV-Sub Specialities including Fertility Sciences, Endoscopy  
and Social Obstetrics

### **Question paper Pattern:**

Paper I : Write notes on

- |      |              |            |
|------|--------------|------------|
| i.   | Anatomy      | 4 x 5 = 20 |
| ii.  | Physiology   | 4 x 5 = 20 |
| iii. | Biochemistry | 3 x 5 = 15 |
| iv.  | Pharmacology | 3 x 5 = 15 |
| v.   | Pathology    | 3 x 5 = 15 |
| vi.  | Microbiology | 3 x 5 = 15 |

**Total = 100 marks**

Paper II, III & IV :

- |     |                |             |
|-----|----------------|-------------|
| i.  | Elaborate on : | 2 x 15 = 30 |
| ii. | Write notes on | 10 x 7 = 70 |

**Total = 100 marks**

## **11. PRACTICAL EXAMINATION**

### **MS OBSTETRICS & GYNAECOLOGY**

|                   |  |  |                      |                 |
|-------------------|--|--|----------------------|-----------------|
|                   |  |  | <b>CLINCALS</b>      |                 |
| <b>LONG CASE</b>  |  |  | <b>1 OBSTETRICS</b>  | <b>50 MARKS</b> |
|                   |  |  |                      |                 |
|                   |  |  | <b>1 GYNAECOLOGY</b> | <b>50 MARKS</b> |
|                   |  |  |                      |                 |
| <b>SHORT CASE</b> |  |  | <b>1 OBSTETRICS</b>  | <b>25 MARKS</b> |

|                                      |  |             |                          |                           |
|--------------------------------------|--|-------------|--------------------------|---------------------------|
|                                      |  |             |                          |                           |
|                                      |  |             | 1 GYNAECOLOGY            | 25 MARKS                  |
|                                      |  |             |                          |                           |
| WARD ROUNDS- 3 CASES X 10 MARKS EACH |  |             | 30 MARKS                 |                           |
| ANTENATAL, FAMILY WELFARE, GYNAEC.   |  |             |                          |                           |
|                                      |  |             |                          |                           |
| OSCE- 4 STATIONS X 5 MARKS EACH      |  |             | 20 MARKS                 |                           |
|                                      |  |             |                          |                           |
| TOTAL                                |  |             |                          | 200 MARKS (A)             |
|                                      |  |             |                          |                           |
|                                      |  | OBSTETRICS  |                          | 40 MARKS (B1)             |
| VIVA VOCE                            |  |             |                          |                           |
|                                      |  | GYNAECOLOGY |                          | 40 MARKS (B2)             |
|                                      |  |             |                          |                           |
| LOG BOOK                             |  |             |                          | 20 MARKS (C)              |
|                                      |  |             |                          |                           |
| AGGREGATE (CLINICAL + VIVA)          |  |             | 300 MARKS<br>(A+B1+B2+C) |                           |
| MINIMUM PASS (50%)                   |  |             | 150 MARKS                |                           |
| DISSERTATION                         |  |             |                          | APPROVED/ NOT<br>APPROVED |

## MS OBSTETRICS & GYNAECOLOGY

### VIVA VOCE- DETAILED SCHEME

|                                                                              |                    |  |          |
|------------------------------------------------------------------------------|--------------------|--|----------|
| OBSTETRICS                                                                   | 10 MIN / CANDIDATE |  | 30 MARKS |
|                                                                              |                    |  |          |
| 1. DUMMY PELVIS 2. INSTRUMENTS 3. DRUGS 4. SPECIMENS 5. CTG/PARTOGRAM 6. USG |                    |  |          |

|                                                                                  |                           |  |                 |
|----------------------------------------------------------------------------------|---------------------------|--|-----------------|
|                                                                                  |                           |  |                 |
| <b>GYNAECOLOGY</b>                                                               | <b>10 MIN / CANDIDATE</b> |  | <b>30 MARKS</b> |
|                                                                                  |                           |  |                 |
| <b>1. INSTRUMENTS 2. SPECIMENS 3. USG 4.DRUGS 5. FAMILY WELFARE 6. ENDOSCOPY</b> |                           |  |                 |
|                                                                                  |                           |  |                 |

### OSCE- DETAILED SCHEME

|                                                 |                                                                                             |
|-------------------------------------------------|---------------------------------------------------------------------------------------------|
| MANNED, COUNSELLING, CONSULTING ,BREAKING NEWS, |                                                                                             |
| <b>COMMUNICATION SKILLS</b>                     | BEREAVEMENT                                                                                 |
| <b>CLINICAL EXAMINATION</b>                     | MANNED                                                                                      |
|                                                 | <b>MANNEQUN,<br/>PAP,AMSTL,CATHETERISATION</b>                                              |
| <b>OUT PATIENT PROCEDURES</b>                   | CTG, USG, Endometrial Sampling                                                              |
| <b>IN-PATIENT PROCEDURES</b>                    | EPISIOTOMY, UTERINE INVERSION<br>CORRECTION, MRP LAPAROSCOPY,<br>HYSTEROSCOPY,VULVAL LESION |
| <b>SPOTTERS ON LAPTOP</b>                       | SLIDES, VAGINAL LESIONS, STD,<br>ENDOCRINES, ENDOMETRIOSIS                                  |
|                                                 | ECTOPIC PREGNANCY, URO GYN,<br>SURGICAL PROCEDURES, ONCOLOGY                                |
| <b>PARTOGRAM</b>                                |                                                                                             |

### 12. LOG BOOK

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months

**13. VIVA : VIVA including Competency Assessment**

VIVA including Competency Assessment

- 80 Marks (60 + 20)

**14. OSCE / OSPE:**

**1.OSCE (Objective Structural Clinical Examination)**

| <u>Based on Objective Structured Exam Stations:</u> |                                        |
|-----------------------------------------------------|----------------------------------------|
| S.No                                                | Stations                               |
| 1.                                                  | Early Diagnosis of Pregnancy           |
| 2.                                                  | Abnormal Pregnancy                     |
| 3.                                                  | Labour related Partogram               |
| 4.                                                  | Contraception                          |
| 5.                                                  | Instruments                            |
| 6.                                                  | Common Drugs                           |
| 7.                                                  | Specimen                               |
| 8.                                                  | Histopathology slides                  |
| 9.                                                  | Radio Diagnosis (USG,CT,DOPPLER,X-ray) |
| 10.                                                 | Latest Management –Obstetrics          |

**15. REFERENCE BOOKS**

- MUDALIAR & MENON'S book of Obstetrics.
- Manual of Obstetrics – Shirish Daftary & Sudip Chakravarti – 3rd Edition.
- Ian Donald - Practice of Obstetrics.
- Human Labor and birth – Oxorn-Foote 6th edition
- William's Text book of Obstetrics

- Obstetrics Normal & Problem Pregnancies – 7th edition – Gabbe.
- Jeffcoate's principles of gynaecology – 8<sup>TH</sup> EDITION
- Clinical Gynaecologic Oncology Disaia JP, Creasman TM 8<sup>TH</sup> edition
- MICHAEL DE SWIET Medical Disorders in Pregnancy
- ARIAS High Risk Pregnancy
- JAMES High Risk Pregnancy
- Berek & Novak's Gynaecology – 15th Edition.
- Shaw's Text Book of Gynaecology – 15th Edition
- Shaw's Text Book of Operative Gynaecology – 7th Edition
- Te Linde's Operative Gynaecology 10th Edition
- Clinical Gynaecologic Oncology: Disaia JP, Creasman TM, 9th Edition, The C.V. Mosby Company 1989
- Clinical Gynaecologic Endocrinology and Infertility – 8th Edition Speroff & Fritz, Lippincott 2005

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **16. JOURNALS**

1. Journal of Obstetrics & Gyn, India
2. British Journal of Obstetrics & Gynaecology
3. American Journal of Obstetrics & Gynaecology
4. International Journal of Obstetrics & Gynaecology
5. Obstetric & Gynae Survey
6. Gynae Oncology
7. Obstetrics & Gynae Clinics of N.America
8. Clinical Obstet & Gyn
9. Recent Advances in O&G
10. STUDD – Progress in O&G

Log Book:



## DEPARTMENT OF OBSTETRICS & GYNAECOLOGY

This is to certify that this log book is a bonafide record of

All the Procedures done and the Academic activities

Participated in by

.....

During his / her training in

Obstetrics and Gynaecology

From ..... to .....

At the .....

In accordance with the requirement of the

Tamil Nadu Dr.M.G.R. Medical University for the

Degree M.D. Branch II (Obstetrics and Gynaecology)

Professor & Head

Department of Obstetrics and Gynaecology

|              |
|--------------|
| <b>Name:</b> |
|              |

### INSTRUCTIONS

This logbook is intended to be a record of all operations performed or participated by a student during his/her course.

The students should enter in the following pages the information required in each operation including the date, patient's hospital number and name, the nature of the operation and the level of their participation.

- P - Principal Operator
- PA - Principal Operator assisted by a senior
- A - Assistant
- T - Teaching (Junior)
- W - Witnessed

The students should obtain the signature of the consultant in each page.

The students should provide a summary of the work they have done by giving the total number of each type of operation carried out during your entire training period on the consolidation sheet. Each operation should be entered under only one heading. Case reports or articles published or presented in conferences, symposia or departmental clinical meetings should be recorded in the sheet provided for the purpose.

***Department of Obstetrics and Gynaecology,***

.....

.....

Name: .....

| 1  | Postings | Date Commenced | Date Completed |
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| 10 |          |                |                |

| Date | Hospital<br>Number | Patient's<br>Name | Diagnosis | Nature      of<br>Operation | P / PA / A / T<br>/ W | Remarks<br>(Complication) |
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Date of this Log Book – Commenced :

Completed :

Signature of Consultant :

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# **POST GRADUATE DIPLOMA**

**DIPLOMA IN ANESTHESIOLOGY  
(D.A.)**

## **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

### **DIPLOMA IN ANESTHESIOLOGY**

The curriculum shall train a candidate to manage anaesthesia in a competent, compassionate and caring manner.

Learning shall be self directed and essentially autonomous.

Exposure to all the sub-specialities shall be achieved

A combination of formative and summative assessments shall ensure completion of goals and training.

#### **1. GOALS:**

To produce competent and compassionate specialists who

a) shall recognize the health needs and ethically carry out the professional obligations towards the patient.

b) shall attain all the required competencies within all the sub-specialities in the speciality of anaesthesiology , enabling good practices at the secondary and tertiary levels of health care delivery.

c) Shall take effort to be aware and update knowledge about the latest advances and developments in the field.

d) shall acquire the basic skills to teach medical and para-medical professionals.

#### **2. OBJECTIVES:(Ref: Bloom's taxonomy of learning domains)**

A. Knowledge to be gained from the syllabus

B. Skills to be learned from the practical training

C. Attitudes to be developed during the training period

The curriculum shall include

a) Anatomy, physiology and biochemistry relevant to anaesthesiology.

b) A thorough knowledge of the pharmacokinetics and pharmacodynamics of anaesthetic drugs .

c) Knowledge of cardiovascular, respiratory, neurological, hepatobiliary, renal and endocrine homeostasis and related drugs used in patients undergoing anaesthesia.

d) Physics and principles involved in the construction and functioning of anaesthesia machine and equipment used to provide anaesthesia and patient vital signs monitoring.

e) Knowledge of the commonly used techniques in General, Regional and Local anaesthesia

f) Understanding the concept of unconsciousness and its implications in anaesthesia.

g) Knowledge and management of acute and chronic intractable pain.

h) Knowledge of intensive care / therapy.

i) Knowledge of medical statistics

- j) Knowledge and gain expertise in cardiopulmonary resuscitation.
- k) Knowledge of medical ethics.

The course content should stimulate the thought processes of the candidate and encourage the candidate to acquire new information from books, journals, lectures, seminars and discussions. It should stimulate reflective thinking and problem solving by critical analysis of events during anaesthesia and interpretation of the data and logical reasoning.

### **3. COMPONENTS OF POST-GRADUATE CURRICULUM**

#### **THEORETICAL KNOWLEDGE, PRACTICAL AND CLINICAL SKILLS** **FIRST YEAR: BASIC TRAINING**

##### **Basic Sciences: Knowledge**

Post-graduates should understand the principles involved in the measurement of relevant variables and the requirements of equipment and monitoring in anaesthesia. Knowledge is expected in the areas outlined below.

Physics and Clinical Measurement Principles of Measurement .

- SI units
- Behaviour of fluids (gases and liquids)
- Flow of fluids
- Measurement of volumes, flows, and pressures
- Measurement of temperature
- Humidification
- Oximetry
- Analysis of gases
- Capnography
- Electrical safety
- Fires and explosions
- Equipment and Apparatus
- Equipment design and standards
- Gas supply in bulk and cylinders
- Anaesthesia delivery system, including pressure valves and regulators
- Vaporisers
- Breathing systems
- Devices to maintain the airway (laryngoscopes, endotracheal tubes, tracheostomy tubes, face masks, laryngeal masks, airways)
- Information systems
- Data storage and retrieval Monitoring
- Anaesthesia record
- Minimum monitoring standards
- Additional monitoring when appropriate (including central venous pressure,

pulmonary artery pressure, cardiac output, cerebral function, temperature, coagulation, blood loss, blood sugar)

### **Preoperative Assessment / Pre-anaesthesia clinics**

- Appropriate history taking
- Physical examination including airway assessment, respiratory, cardiovascular and neurological examinations
- Referral to other specialists when necessary
- Establishment of a rapport with the patient to provide reassurance, disclosure of risk, information, and discussions on complementary medicine and informed consent
- Communication and consultation skills face-to-face, by phone and in writing
- Pulmonary function tests
- Measurement of cardiovascular function
- Interpretation of common radiology and imaging scans and investigations
- Other investigations as appropriate

### **Conducting Anaesthesia**

- Applied cardiac and respiratory physiology
- Applied pharmacology and variability in drug response
- Selection and planning of the anaesthesia technique
- Decision-making relating to postponement or cancellation of surgery
- Routine inhalation and intravenous inductions
- Maintenance of anaesthesia
- Correct usage of anaesthesia delivery systems
- Application and interpretation of monitored variables and neuromuscular blockade
- Use of muscle relaxants
- Application of mechanical ventilation
- Management of the airway and intraoperative complications
- Common regional anaesthesia techniques (eg, epidural and spinal anaesthesia and Regional Nerve blocks)
- Maintenance of accurate records

### **Postoperative Care**

- Safe recovery transport and handover in the post-anaesthesia recovery room
- Post-operative consultations
- Management of postoperative pain, fluid requirements, and nausea and vomiting



## **Communication skills**

- Call for help in Cardio Pulmonary Resuscitation, PACU, in Emergencies
- Establishment of rapport with patients, attenders , relatives of patients  
Especially in PACU, INTENSIVE CARE UNITS, RECOVERY UNITS to provide reassurance , disclosure of current condition & any procedural information.
- To obtain informed consent from patients or attenders /relatives
- Documentation of events correctly /properly for future verification, research activities .

## **Basic Sciences : Skills- Clinical skills**

Post-graduates should provide safe anaesthesia care and pain management for uncomplicated patients undergoing non-major surgery.

Post-graduates should be competent in the following technical skills -

- Maintenance of an adequate airway
- Rapid sequence induction
- Basic and advanced Life Support for adult and paediatrics
- Aseptic techniques
- Venous access
- Arterial blood gas collection
- Arterial cannulation
- Central venous cannulation
- ECG recording and interpretation
- Lumbar puncture
- Blood culture collection
- Emergency management of a pneumothorax

Post-graduates should be familiar with the following clinical protocols in the delivery of safe anaesthesia care, and be able to respond accordingly for crisis management.

- Checking of the anaesthesia delivery system
- Airway assessment and anticipation of Difficult airway and its management which may be acute and may be life threatening
- Inadequate airway; failed intubation, obstructed airway, oesophageal intubation, endobronchial intubation, and unplanned extubation .
- Laryngospasm .
- Bronchospasm .
- Hypertension.
- Hypotension.

- Arrhythmias.
- Myocardial Ischaemia.
- Hypoxia .
- Hypercarbia.
- Hypoventilation.
- Hyperventilation.
- Hypothermia .
- Hyperthermia .
- Malignant hyperthermia.
- Anaphylaxis .
- Residual neuromuscular blockade.
- Inadequate neuraxial blockade .
- Seizures .
- Gas embolism.
- High ventilator peak inspiratory pressures.
- Pulmonary aspiration .
- Pneumothorax.
- 

#### **Basic Sciences: Skills- Educational skills**

- Developing a study plan for the rest of the training period
- Reviewing study plans and correcting for deviations (eg, catching up on deficient knowledge or experience)
- Reflecting on previous learning experiences with the aid of the Learning Portfolio
- Linking basic science teaching with clinical practice & Studying effectively
- Participating in small-group learning and educational activities
- Being aware of decision-making processes
- Managing time effectively for study, work and home/leisure
- Giving and receiving feedback
- Developing insight into personal limitations
- Using the Internet including e-mail
- Conducting and appraising literature searches
- Appraising journal articles including the application of statistics
- Carrying out oral presentations and professional communication.

#### **OBSTETRIC ANAESTHESIA AND ANALGESIA: KNOWLEDGE**

- Maternal physiology
- Process of labour and delivery
- Foetal and neonatal physiology

- Placental physiology
- Obstetric and post partum pharmacology
- Endocrine pharmacology
- Pharmacological considerations for newborn resuscitation
- Pharmacology of placental drug transfer
- Anatomy — airway, spine, pelvis, birth canal, gravid uterus, and nerve

and blood supply in pregnancy

- Drugs used for fertility support and IVF (overview only)
- Ecbolics and tocolytics
- Principles of in-vitro fertilisation
- Antenatal care
- Labour and delivery
- Maternal monitoring during labour
- Caesarean section; indications and levels of urgency
- Abortions and septic abortions
- Postpartum period
- High-risk Obstetrics- medical, obstetric or anaesthesia history
- Pre-existing disease in pregnancy
- Substance abuse during pregnancy
- Pre eclampsia and eclampsia, pathophysiology and management
- Obstetric complications, eg, breech, malpresentation, multiple pregnancy and abnormal placentation
- Obstetric interventions; indications and anticipation of anaesthesia and analgesia
- Amniotic fluid, air and pulmonary embolism, pathophysiology and management
- Obstetric haemorrhage- antepartum, peripartum and postpartum
- Foetal and Neonatal Considerations
- Foetal teratogenicity, carcinogenicity, and congenital abnormalities
- Foetal evaluation and monitoring
- Antepartum and intrapartum foetal compromise
- Foetal death in utero; pathophysiology and psychological issues
- Neonatal resuscitation
- Apgar score and neuro-adaptive scores, and their prognostic significance
- Neonatal surgery - Anaesthesia Management (overview only)
- Pre-anaesthesia assessment of the pregnant patient and identification of high risk patients eg: Risk factors in anaesthesia such as Pre-existing diseases like cardiac disease, hypertension, respiratory disease, diabetes, thyroid disease, intracranial disease, bleeding disorders, renal disease and neuromuscular disease
- Adolescent or elderly primigravid pregnancy
- Morbid obesity
- Thromboembolic disease

- Anaesthesia for non-obstetric surgery in the pregnant patient
- Anaesthesia for elective obstetric procedures
- Anaesthesia for emergency obstetric procedures
- Anaesthesia for Caesarean section
- Pain management in obstetrics
- Complications of General Anaesthesia like Difficult airway management, Pulmonary aspiration, Awareness during general anaesthesia
- Complications of Regional Analgesia and anaesthesia, eg, high block,

local anaesthetic toxicity, neurological sequelae

- Management of inadequate or failed regional anaesthesia and analgesia
- Management of severe haemorrhage; surgical, antepartum and postpartum
- Maternal morbidity and mortality; incidence and legal and ethical issues
- Organisation of an obstetric anaesthesia and analgesia service
- Safe radiation practice during pregnancy

### **Obstetric anaesthesia-Skills**

- Airway assessment in pregnancy
  - Rapid sequence induction and Acid Aspiration prevention protocol
  - Emergency airway management
  - Implementing epidural, spinal, and combined spinal/epidural anaesthesia & analgesia,
  - Management of local anaesthetic toxicity
  - Management of high regional block
  - Management of severe obstetric haemorrhage
- Post-graduates should be familiar with clinical drills for crises management especially
- for airway emergencies
  - Failure to intubate algorithm in obstetrics
  - Advanced Life Support in the obstetric patient
  - Resuscitation of the neonate
  - Management of pulmonary aspiration during general anaesthesia

## **SECOND YEAR- ADVANCED TRAINING:**

### **ANAESTHESIA FOR HIGH-RISK ELECTIVE AND EMERGENCY SURGERY:**

#### **KNOWLEDGE**

- Preoperative evaluation and resuscitation
- Thromboembolism prophylaxis
- Perioperative and prophylactic antibiotics
- Management of coagulopathies
- Regional anaesthesia for abdominal, vascular, and imaging procedures including anatomy, and physiological and pharmacological aspects
- Informed consent and consent for incompetent patients
- Postoperative care, Management of postoperative pain, phantom-limb pain and pain from injury

#### **Anaesthesia for Trauma Surgery**

- Assessment and immediate care; primary and secondary survey
- Trauma severity scores
- Emergency airway management
- Establishing intravenous access
- Priorities of resuscitation, investigations, and surgical procedures
- Physio-biochemical effects of trauma
- Managing facial, head and cervical spine injuries
- Glasgow Coma Scale and other scores of consciousness
- Pathophysiology of head injury including changes in cerebral blood flow, cerebral metabolism and intracranial pressure
- Pathophysiology and management of shock
- Pathophysiology of blood loss and massive blood transfusion
- Volume replacement
- Managing abdominal and chest injuries
- Management of burns procedures, including: – Understanding the pathophysiology of burns – Anaesthesia for debridement and skin grafting – Drills in burns resuscitation .
- Managing coagulopathies .
- Transport of ventilated or injured patients including portable ventilators and monitoring systems

## **Co-existing Medical Conditions Relevant to Anaesthesia**

- ❖ Endocrine disorders including phaeochromocytoma, hyperthyroidism, hypothyroidism, and diabetes mellitus
- ❖ Disorders of the cardiovascular system
- ❖ Disorders of the respiratory system
- ❖ Disorders of the nervous system
- ❖ Disorders of the liver, biliary tract and gastrointestinal system
- ❖ Renal disorders
- ❖ Water, electrolyte and acid-base disturbances
- ❖ Haematological disorders, including coagulopathies
- ❖ Skin and musculoskeletal disorders, including rheumatoid arthritis and ankylosing spondylitis
- ❖ Psychiatric disorders and substance abuse
- ❖ Disorders associated with ageing
- ❖ Obesity

## **ANAESTHESIA FOR HIGH-RISK ELECTIVE AND EMERGENCY SURGERY:**

### **SKILLS:**

Post-graduates should provide safe anaesthesia for

- Major abdominal surgery
- Laparoscopic surgery
- Trauma surgery –post-graduates should revise pre-assessment skills, including taking an appropriate history and performing an appropriate physical examination (including airway assessment, cardiovascular, respiratory and neurological examinations) to assess the patient's status.
- Post-graduates should become competent in the following technical skills--  
Securing an airway, arterial and central venous cannulation, and rapid sequence induction
- Cricothyroidotomy and percutaneous tracheostomy
- Cannulation of major vessels for volume resuscitation
- Awake fiberoptic intubation
- Thoracic and lumbar epidural and spinal anaesthesia
- Blood conservation strategies
- Regional nerve blocks for abdominal and lower limb surgery
- Chest drain insertion
- Immobilisation and care of cervical spine injuries
- Post-graduates should be familiar with clinical drills for crises management.

- Airway emergencies eg, “cannot intubate, cannot ventilate”, difficult airway, hypoxia and abnormal end-tidal CO<sub>2</sub> levels
- Managing major intraoperative events in aneurysm and abdominal surgery

### **Anaesthesia for Trauma Surgery - skills**

- Drill for the primary and secondary survey
- Drill for raised intracranial pressure
- Drill for tension pneumothorax
- Drill for managing severe haemorrhage
- Drill for managing cardiac arrest (ACLS Algorithm)
- Drill for managing malignant hyperthermia

### **ENT, Eye, Dental, Maxillofacial, and Head and Neck Surgery: Knowledge**

- Cardiovascular, respiratory and neurological physiology
- Physiology of gases in closed body cavities
- Pharmacology of local anaesthetic agents
- Pharmacology of local vasoconstrictors
- Anatomy of the head and neck and abnormal facies
- Anatomy of the airway, nasal passages, larynx, pharynx and middle ear
- Effects of surgery and radiation on the airway
- Monitoring in anaesthesia
- Neurological monitoring
- Lasers-- types, uses in surgery, complications and precautions
- Airway devices and types of tracheal tubes, eg, Micro-laryngeal, Rae
- Equipment for difficult tracheal intubation
- Equipment for jet ventilation

### **Anaesthesia for ENT surgery**

- Pre-operative airway assessment
- Tonsillectomy and adenoidectomy, including quinsy and postoperative bleeding
- Microlaryngoscopy
- Radical head and neck surgery
- Laryngectomy and Pharyngolaryngectomy %
- Laser surgery .
- Nasal and sinus operations .
- Parotid tumour surgery .
- Myringoplasty .
- Middle ear surgery .
- Microsurgery of the ear .
- Managing partial airway obstruction including: –

- ▯ Epiglottitis
- ▯ Foreign bodies
- ▯ Laryngeal tumours
- ▯ Oropharyngeal cysts and abscesses
- ▯ Elective and emergency tracheostomy
- ▯ Paediatric problems, eg, relating to disease, airway, larynx and craniofacial disorders
- ▯ Post-operative care

### **Anaesthesia for Dental surgery**

- ▯ Outpatient dental procedures- sedation and general anaesthesia
- ▯ Inpatient dental surgery
- ▯ Dental procedures on the mentally challenged
- ▯ Dental procedures on patients with bleeding disorders
- ▯ Oral surgery
- ▯ Fractured jaw
- ▯ Maxillary fractures according to the Le Fort classification
- ▯ Dental sepsis

### **Anaesthesia for Eye surgery**

- ▯ Anatomy and physiology of extremes of age
- ▯ Anatomy of orbit and contents
- ▯ Physiology of intraocular pressure
- ▯ Ocular perfusion
- ▯ Eye reflexes (oculocardiac, oculo-respiratory, oculoemetic)
- ▯ Anatomy of orbit, extraocular muscles, blood vessels, lacrimal apparatus
- ▯ Local anaesthetic agents for eye surgery
- ▯ Other drugs for eye surgery, eg, topical agents, vasoconstrictors, mydriatics, miotics, and agents to reduce intraocular pressure
- ▯ General anaesthesia for eye surgery including:
- ▯ Examination under anaesthesia
- ▯ Laser eye surgery
- ▯ Intraocular surgery
- ▯ Extraocular surgery
- ▯ Retinal detachment
- ▯ Plastic and orbital surgery
- ▯ Emergency eye surgery and use of suxamethonium in penetrating eye injury
- ▯ Monitoring
- ▯ Postoperative care, management of nausea and vomiting
- ▯ Principles of regional retrobulbar and peribulbar block and choosing between general and regional
- ▯ anaesthesia techniques
- ▯ Sedation for eye procedures



- ▢ Principles of anaesthesia for day-case
- ▢ Paediatric considerations

### **Anaesthesia for Maxillofacial, Thyroid, and Head and Neck Surgery**

- ▢ Pre-operative airway assessment
- ▢ Management of anaesthesia for major maxillofacial surgery, which may involve prolonged anaesthesia, major blood loss, hypothermia and multiple procedures
- ▢ Management of anaesthesia for facial trauma: emergency and semi-elective, including fractured jaw and maxilla
- ▢ Management of anaesthesia for cancer, plastic and cosmetic surgery on the face, head and neck, including surgery for cleft palate
- ▢ Management of thyroid surgery, including
- ▢ Anaesthesia for thyroid and parathyroid surgery
- ▢ Stabilisation of thyroid and parathyroid disorders preoperatively
- ▢ Post thyroidectomy bleeding
- ▢ Managing a “thyroid storm”
- ▢ Sedation for head and neck procedures
- ▢ Post-operative care

### **ENT, Eye, Dental, Maxillofacial, and Head and Neck Surgery : Skills**

- ▢ Tracheal intubation
- ▢ Nasal intubation
- ▢ Use of special tubes
- ▢ Placement and removal of packs
- ▢ Applying topical local anaesthesia to the airway
- ▢ Securing the difficult airway
- ▢ Recognising the high-risk airway
- ▢ Use of stylets and bougies
- ▢ Awake intubation
- ▢ Retrograde catheter technique
- ▢ Fiberoptic intubation
- ▢ Laryngeal mask airway intubation
- ▢ Failed intubation or ventilation drill
- ▢ Cricothyroidotomy and percutaneous tracheostomy
- ▢ Transtracheal ventilation
- ▢ Managing the airway in trauma and burns
- ▢ Upper airway obstruction drill
- ▢ Post extubation of difficult airway drill
- ▢ Spontaneous gaseous induction for airway obstruction
- ▢ Regional and local anaesthesia of the head and neck
- ▢ Management of postoperative nausea and vomiting in head and neck surgery
- ▢ Management of postoperative facial and airway swelling

## **Paediatric Anaesthesia: Knowledge**

- ▢ Anatomy relevant to airway management and breathing
- ▢ The physiology of respiration, circulation, fluid balance and thermoregulation
- ▢ The pharmacology of anaesthetic agents, analgesics and common paediatric medications, especially the relationship of dose to the size/maturity of child
- ▢ The relevance of surface area of children of various ages
- ▢ Stages of development of the normal child and their relevance to hospitalisation
- ▢ General principles of perioperative management relevant to children, emphasising:
  - ▢ common childhood illnesses and their influence on anaesthesia and surgery
  - ▢ fasting guidelines
  - ▢ fluid and electrolyte replacement
  - ▢ temperature control
- ▢ specialised equipment for children of different sizes
- ▢ perioperative monitoring
- ▢ dosage and administration of emergency drugs
- ▢ postoperative apnoea detection and management
- ▢ acute and persistent pain management
- ▢ Relevant features of important childhood conditions: respiratory infections, asthma
- ▢ prematurity and its complications
- ▢ facial anomalies affecting the airway
- ▢ Neonatal emergencies
  - ▢ respiratory distress,
  - ▢ tracheoesophageal fistula,
  - ▢ congenital diaphragmatic hernia,
  - ▢ necrotising enterocolitis,
  - ▢ abdominal wall defects
- ▢ other childhood emergencies- inhaled/ingested foreign bodies, fractures, head injuries and burns /Scalds
- ▢ congenital cardiac disease; especially ASD, VSD, Tetralogy of Fallot
- ▢ cerebral palsy
- ▢ chronic diseases of childhood; especially cystic fibrosis, muscular dystrophy
- ▢ congenital syndromes- Down's, Pierre-Robin, mucopolysaccharidoses
- ▢ malignancy and the treatment of malignancy
- ▢ renal failure

## **Paediatric anaesthesia Knowledge-Clinical management**

- ▢ Applying principles of paediatric anaesthesia for the following surgical subspecialties:
  - ▢ Neurosurgery
  - ▢ Ophthalmology
  - ▢ Dental surgery
  - ▢ Plastics and reconstructive surgery

- ▯ Thoraco-abdominal surgery
- ▯ Cardiac surgery and procedures
- ▯ Urology surgery and procedures/investigations
- ▯ Orthopaedic Surgery Otolaryngology
- ▯ General surgery
- ▯ Trauma and Burns
- ▯ Applying principles of paediatric anaesthesia for diagnostic procedures
- ▯ Recognising and managing the sick child
- ▯ Recognising and managing reversal to transitional fetal circulation
- ▯ Managing fluid therapy in paediatric patients
- ▯ Managing specific childhood syndromes and disorders
- ▯ Applying principles of paediatric anaesthesia for procedures outside the operating theatre, including patient transport
- ▯ Caring for paediatric patients undergoing imaging investigations, which may require sedation or anaesthesia
- ▯ Recognising and managing paediatric emergencies including basic and advanced life support
- ▯ Understanding the organisation of a paediatric anaesthesia and analgesic service

### **Paediatric Anaesthesia: Skills**

Post-graduates should demonstrate decision-making and clinical skills, and perform

- ▯ Paediatric advanced life support
- ▯ Manage emergencies and conditions including
  - ▯ Hypoxia
  - ▯ Bronchospasm
  - ▯ Apnoea
  - ▯ Upper airway obstruction including upper airway infection
  - ▯ Bradycardia and other arrhythmias
  - ▯ Cardiac arrest
  - ▯ Hypovolaemia
  - ▯ Neurological compromise %
  - ▯ Epiglottitis and croup
  - ▯ Inhaled foreign body
  - ▯ Infantile airway obstruction
  - ▯ Laryngospasm
  - ▯ Masseter spasm
  - ▯ Postoperative stridor
  - ▯ Aspiration of gastric contents
- ▯ Technical skills, such as airway management, vascular cannulation and regional anaesthesia should be demonstrated for paediatric patients
- ▯ Interpersonal skills in dealing with paediatric patients and their parents

## **Intensive Care: Knowledge**

Post-graduate should understand

### **Acute Circulatory Failure**

- ▢ Classification, causes, pathogenesis and sequelae of shock
- ▢ Principles of management of all forms of shock
- ▢ Monitoring in the management of shock
- ▢ Causes of cardiorespiratory arrest and the effects on body systems
- ▢ Cardiopulmonary resuscitation and external defibrillators
- ▢ Cardiac dysrhythmias and their current therapies
- ▢ Valvular heart disease
- ▢ Endocarditis
- ▢ Pulmonary embolism
- ▢ Congestive cardiac failure
- ▢ Anaphylaxis
- ▢ Ischaemic Heart Disease and Myocardial Infarction
- ▢ Factors involved in the balance of oxygen supply and demand to the heart
- ▢ Aetiology of coronary artery disease and its effects
- ▢ Signs and symptoms of ischaemic heart disease
- ▢ Signs and symptoms of myocardial infarction
- ▢ Principles of the management of acute myocardial infarction including thrombolysis, angioplasty and surgery
- ▢ Indications for a transvenous pacemaker
- ▢ Right heart catheterisation, angiography and echocardiography
- ▢ Long-term effects of acute myocardial infarction and late complications

### **Respiratory Failure**

- ▢ Causes and pathogenesis of respiratory failure
- ▢ Oxygen therapy and mechanical ventilatory support (invasive and noninvasive)
- ▢ Respiratory disease processes & representative conditions
- ▢ Cardiogenic/non-cardiogenic pulmonary oedema/ARDS
- ▢ Airway obstruction
- ▢ Airway stenosis and tracheomalacia
- ▢ Bronchopleural fistula
- ▢ Pneumothorax
- ▢ Aspiration syndromes
- ▢ Fat embolism
- ▢ Pneumonia (community and nosocomial)
- ▢ Chronic airway limitation
- ▢ Asthma

### **Renal Failure**

- ▯ Definitions of acute and chronic renal failure
- ▯ Causes and pathogenesis of renal failure
- ▯ Acute renal failure
- ▯ Principles of renal replacement therapy and their indications

### **Neurological Failure**

- ▯ Definition and causes of coma
- ▯ Causes, pathogenesis and treatment of cerebral swelling and raised intracranial pressure
- ▯ Principles of cerebral function monitoring, especially intracranial pressure
- ▯ Principles of diagnosing brain stem death
- ▯ Representative conditions to be understood:
  - ▯ Acute vascular disorders of the central nervous system
  - ▯ Acute infective disorders of the central nervous system
  - ▯ Cerebral oedema
  - ▯ Brain stem death
  - ▯ Seizures
  - ▯ Hemiplegia, paraplegia, quadriplegia
  - ▯ Guillain Barre syndrome
  - ▯ Peripheral nerve and or muscle dysfunction associated with critical illness
  - ▯ Myasthenia gravis
  - ▯ Hyperthermia, hypothermia
  - ▯ Tetanus
  - ▯ Delirium

### **Severe Trauma**

- ▯ Effects of severe trauma on organs and organ systems
- ▯ Principles of EMST for the management of trauma and advantages of an organized team approach
- ▯ Technique of cricothyroidotomy/ tracheostomy/mini-tracheotomy
- ▯ Principles of the management of head injury and Glasgow Coma Scale
- ▯ Management of cervical spine injuries
- ▯ Principles of the safe transfer of injured children and adults and portable monitoring systems

### **Sepsis**

- ▯ Definition, pathogenesis and pathophysiology of sepsis and related syndromes
- ▯ Risk factors for nosocomial infection
- ▯ Infection control measures in ICU and operating suites

## **Supportive Care of Critically Ill Patients**

- ▢ Inotropic Therapy
- ▢ Recognise when to use inotropic or vasopressor therapy
- ▢ Choose an appropriate agent, dose, physiological endpoint, rate and route of administration
- ▢ Review the efficacy of inotropic therapy at regular intervals
- ▢ Provide appropriate nutritional support and General Care
- ▢ Appropriate plan for care of bowels, skin, mouth, eyes and maintenance of mobility and muscle strength

## **Intensive Care: Skills**

- ▢ Cardiovascular Related
- ▢ Choosing and using inotropic agents, vasodilators, and vasoconstrictors
- ▢ Managing dysrhythmias
- ▢ Choosing and using antimicrobial agents in heart disease
- ▢ Assisting with intra-aortic balloon pumping
- ▢ Cardioversion
- ▢ Advanced life support
- ▢ Respiratory Related
- ▢ Oxygen therapy
- ▢ CPAP & Non-invasive ventilation
- ▢ Mechanical ventilation, including modes of ventilation
- ▢ Pleural drainage
- ▢ Percutaneous tracheostomy
- ▢ Fiberoptic bronchoscopy
- ▢ Renal Failure
- ▢ General care of continuous dialysis and haemofiltration techniques
- ▢ Neurological Failure
- ▢ Maintaining cerebral perfusion pressures and intracranial pressures
- ▢ Gastro-intestinal Hemorrhage management
- ▢ Assisting with placing a Sengstaken Blakemore tube

## **Diagnostic imaging and interventional procedures (radiology and cardiology): Knowledge**

- ▢ Preanaesthetic preparation
- ▢ Techniques appropriate for adults and children for CT scanning, MR imaging and interventional radiology, angiography and interventional cardiology
- ▢ Post-investigation care

**Diagnostic imaging and interventional procedures (radiology and cardiology): Skills**

- ▢ Pre-anaesthetic preparation
- ▢ Sedation and general anaesthetic techniques for:
  - ▢ angiography and interventional procedures
  - ▢ CT scanning, adults and children
  - ▢ Magnetic resonance imaging
  - ▢ Problems due to magnetic field
  - ▢ Post-investigation care

**Pain Medicine: Knowledge**

- ▢ Neurobiology of Pain
- ▢ Overview of “Pain Pathways”
- ▢ Multi dimensional aspects of pain; role of physiological, psychological and environmental factors
- ▢ Pharmacology of Analgesic Agents
- ▢ Pharmacokinetic and pharmacodynamic principles, drug interactions, and side effects.

**Knowledge of the pharmacology of:**

- ▢ Opioids
- ▢ Paracetamol
- ▢ Non-steroidal anti-inflammatory agents (NSAIDs)
- ▢ Antidepressants (TCAs and SSRIs)
- ▢ Anticonvulsants
- ▢ Membrane-stabilising agents
- ▢ Alpha-2 agonists
- ▢ NMDA-receptor antagonists
- ▢ Local anaesthetics
- ▢ Anti-emetics
- ▢ Agents used to treat hypotension associated with neuraxial blockade
- ▢ Awareness of the role of the following in pain management
- ▢ Anti-migraine agents
- ▢ Steroidal anti-inflammatory agents
- ▢ Topical agents (NSAIDs, Capsaicin)
- ▢ Neurolytic agents
- ▢ Experimental agents for analgesia
- ▢ Knowledge of different routes of analgesic drug delivery, including factors governing choice of route, side effects relevant to particular route,
- ▢ Principles of additive and synergistic effects when agents are combined

- ▢ Oral
- ▢ Intramuscular
- ▢ Subcutaneous (including continuous infusion)
- ▢ Intravenous (including continuous infusion)
- ▢ Patient-controlled analgesia (PCA) via different routes (ie intravenous, subcutaneous, intranasal, epidural, intrathecal)
- Other-methods- topical, transdermal, rectal, transmucosal (intranasal, inhalational and sublingual / buccal), intra-cerebroventricular, intraarticular, infiltration under skin

### **Psychological and Socio cultural Issues**

The importance of psychological (emotional and cognitive), social, and other factors in the presentation and management of pain with emphasis on:

- ▢ Factors involved in the wide variation in individual response to tissue injury
- ▢ The relationship between depression and persistent pain
- ▢ The role of anxiety and/or depression in acute pain
- ▢ Differentiation of active and passive coping strategies
- ▢ The role of illness behaviour
- ▢ The influence of the health care provider on the response to pain treatment
- ▢ The importance of an interdisciplinary approach to pain assessment and treatment including the potential role of other members of the pain team (particularly psychiatrist, clinical psychologist, physiotherapist, nursing staff, occupational therapist, social worker)
- ▢ The placebo effect and its implications for treatment of pain

### **Pain Assessment and Measurement**

- ▢ Assess pain and outcome of pain treatment using history, clinical examination and pain measurement tools
- ▢ Recognise the limitations of pain measurement techniques, particularly in some patient groups (eg, persistent pain, children, those with cognitive impairment)
- ▢ Understanding of – Neuroendocrine and metabolic responses to surgery stressors and impact of analgesic techniques
- ▢ Consequences of poorly controlled pain
- ▢ Current evidence for and against pre-emptive analgesia and clinical implications
- ▢ Current evidence for the effect of analgesic technique on morbidity and mortality
- ▢ Importance of aggressive multimodal postoperative rehabilitation
- ▢ Relationship between acute and persistent pain including factors involved in progression from one to the other, and potential interventions to prevent such progression
- ▢ Choose the most appropriate technique of acute pain management –
- ▢ Pharmacological techniques (opioid and non-opioid) via a variety of routes
- ▢ Regional techniques including central neuraxial, plexus and peripheral nerve blockade
- ▢ Non-pharmacological techniques
- ▢ Formulate a pain management plan based upon –
- ▢ Patient preference, physical and mental status, and available expertise and technology



- ▢ Special requirements in specific patient groups (eg, the elderly, children, pregnant and postpartum patients , Obstructive sleep apnoea, concurrent hepatic or renal disease; non-English speaking, cognitive impairment)
- ▢ Special requirements in patients with opioid-tolerance and/or a substance abuse disorder including an understanding of guidelines and regimens for analgesic drug use (equi-analgesic dosing for opioids; tolerance and dependence)
- ▢ Special requirements under specific clinical situations (eg, spinal injuries, burns, acute back pain, musculoskeletal pain, acute medical pain, acute cancer pain and patients in Intensive Care and the Emergency Department)
- ▢ Include in a pain management plan
- ▢ Appropriate evaluation of the patient's pain
- ▢ Informed consent, including disclosure of risk and appropriate documentation
- ▢ Patient education about the selected technique and alternatives
- ▢ Recognise common presentations of acute musculoskeletal pain (eg, rib fracture, acute back pain) and other non-surgical acute pain syndromes (migraine, renal colic) including in the Emergency Department and Intensive Care Unit
- ▢ Identify when to seek advice from, or refer to, a Pain Medicine Specialist

### **Cancer Pain**

Undertake assessment of pain in patients with cancer based on –

- ▢ Understanding of the multiple potential aetiologies of pain associated with cancer
- ▢ Differentiation between somatic, visceral, and neuropathic pain
- ▢ Evaluation of psychological, social, cultural and spiritual issues
- ▢ Undertake treatment of cancer-related pain syndromes based on therapies available (including chemotherapy, radiotherapy, surgery, invasive and non-invasive analgesic techniques, and psychological approaches)
- ▢ Understand guidelines and regimens for analgesic drug use including equianalgesic dosing for opioids; tolerance and dependence and their management in the patient with cancer
- ▢ Identify when to seek advice from, or refer to, a Palliative Medicine Specialist

### **Neuropathic Pain**

- ▢ Understand diagnostic criteria, clinical features and management of specific neuropathic pain syndromes including–
- ▢ Central pain (pain after stroke, thalamic pain, spinal cord injury pain, deafferentation pain, phantom limb pain)
- ▢ Neuralgias (trigeminal neuralgia, postherpetic neuralgia, occipital neuralgia)
- ▢ Painful peripheral neuropathy (eg, metabolic, toxic, ischaemic)
- ▢ Pain after nerve injury (eg, neuroma)
- ▢ Post-surgical pain syndromes (eg, post-thoracotomy, post-CABG pain, postmastectomy, postamputation)

- ▢ Complex regional pain syndrome types I and 2 (including the differentiation of Sympathetically maintained from sympathetically independent pain)
- ▢ Recognise and understand the ways in which acute and persistent pain in children differ from pain in adults, including–
- ▢ The effect of developmental stage on assessment and management of pain in children
- ▢ The selection of pain assessment tools for children of different developmental stages
- ▢ Principles of managing acute, procedural and persistent pain in children

### **Pain in the Elderly:**

- ▢ The epidemiology of pain syndromes in the elderly
- ▢ Physiological changes associated with ageing and effects of these on pain and pain management (including changes in pharmacokinetics, pharmacodynamics, and pain biology)
- ▢ Effects of concurrent disease, and psychological, social and cognitive changes on assessment and management of pain
- ▢ Risks associated with polypharmacy in the elderly

### **Pain Medicine: Skills-Clinical Evaluation**

- ▢ Post-graduates should demonstrate skills in the clinical evaluation of patients with acute and persistent pain by: .
- ▢ Obtaining a specific pain history – Onset, location, nature, duration, intensity, aggravating and relieving factors
- ▢ Physical, psychological and social consequences of the patient's pain
- ▢ Current and past pain treatments and outcome
- ▢ Other relevant history (past patterns of drug use or misuse, family history, medical and surgical history)
- ▢ Treatment expectations
- ▢ Interpreting relevant investigations
- ▢ Formulating a management plan and evaluating outcome

### **Pain Medicine-Technical Skills**

Post-graduates should become competent in-

- ▢ Central neuraxial blocks
- ▢ Regional techniques (including knowledge of anatomy, technique, indications, contraindications, complications and their management) including
- ▢ Peripheral and plexus blocks of the upper and lower limb
- ▢ Head and neck blocks
- ▢ Truncal blocks including intercostal and paravertebral block

### **Trainees need to understand the anatomy, technique, indications, contraindications, complications and management of (but not necessarily be able to perform)-**

- ▢ Stellate ganglion blockade
- ▢ Coeliac plexus blockade
- ▢ Lumbar sympathetic blockade
- ▢ Intrathecal drug delivery for cancer and persistent pain

### **Anaesthesia and Perioperative Care (including Analgesia) for Patients with Cardiac and Vascular Disease for Non-cardiac Surgery: Knowledge**

- ▢ Pathophysiology, investigation, diagnosis, anaesthesia implications, and management of:
  - ▢ Ischaemic heart disease
  - ▢ Congenital heart disease
  - ▢ Valvular heart disease
  - ▢ Hypertension
  - ▢ Cardiac arrhythmias
  - ▢ Other acquired diseases, eg, myxomas, cardiomyopathies
- ▢ Understanding the principles of anaesthesia and perioperative care for patients with:
  - ▢ Recent myocardial infarction
  - ▢ Ischaemic heart disease
  - ▢ Cardiac valvular lesions
  - ▢ Congenital heart disease, corrected and uncorrected
  - ▢ Hypertensive disease
  - ▢ Cardiac arrhythmias
  - ▢ Other acquired diseases, eg, myxomas, cardiomyopathies
  - ▢ Cerebrovascular disease
  - ▢ Peripheral vascular disease

### **Anaesthesia for Cardiac Surgery-- Understanding the anaesthesia, complications and perioperative care (including analgesia) of:**

- ▢ Coronary revascularisation with/without cardiopulmonary bypass
- ▢ Valvular repair or replacement
- ▢ Emergency cardiac surgery
- ▢ Cardioversion
- ▢ Procedures in the cardiac catheterisation laboratory
- ▢ Electrophysiological procedures
- ▢ Congenital heart disease surgery (paediatric and adult)
- ▢ Procedures on the great vessels, eg, for aortic dissection
- ▢ Heart or heart/lung transplantation

### **Anaesthesia for Vascular Surgery --Understanding the anaesthesia, complications and perioperative care (including analgesia) of:**

- ▢ Surgery on the vessels supplying the head and neck
- ▢ Surgery on the abdominal vessels
- ▢ Surgery on the limb vessels
- ▢ Minimally invasive procedures on the vessels (eg, intraluminal stenting)

Understanding the principles, role, and management of procedures, problems, or events associated with anaesthesia for cardiac and vascular surgery, including:

- ▢ Myocardial protection
- ▢ Cerebral protection
- ▢ Spinal cord protection
- ▢ Blood coagulation and anticoagulation
- ▢ Perioperative arrhythmias
- ▢ Poor cardiac output states
- ▢ Temperature management (including deep hypothermic circulatory arrest)
- ▢ Cardiopulmonary bypass including weaning from bypass and ECMO
- ▢ Cross-clamping of the aorta

**Organ Transplantation** -- Anaesthesia for organ transplantation including:

- ▢ Legal and ethical considerations of organ harvesting and transplantation
- ▢ Brain death and the legal definition of death
- ▢ Physiological and pharmacological considerations

**Protocols and planning Anaesthesia for Patients with Pulmonary Disease Chronic respiratory disease, pathophysiology, diagnosis**

- ▢ Preoperative evaluation of patients with respiratory diseases
- ▢ Lung function tests
  - Thoracic trauma Anaesthesia and Perioperative Care (including Analgesia) for Thoracic Surgery
- ▢ Preoperative assessment for fitness for lung surgery and one-lung ventilation
- ▢ Thoracotomy and – Lung resection, including pneumonectomy and lung reduction surgery
- ▢ Mediastinal mass resection
- ▢ Oesophageal surgery
- ▢ Surgery on the thoracic aorta
- ▢ One-lung anaesthesia, including management of hypoxia and ventilation
- ▢ Differential lung ventilation
- ▢ Tracheal and bronchial surgery (including use of lasers and stents)
- ▢ Thoracoscopic procedures
- ▢ Bronchoscopy, including removal of foreign body
- ▢ Mediastinoscopy
- ▢ Lung or heart/lung transplantation
- ▢ Management of problems or critical events : –
  - ▢ Fluid management postpneumonectomy
  - ▢ Cardiac herniation postpneumonectomy

- ▢ Bronchopleural fistula
- ▢ Lung bullae and cysts
- ▢ Tension pneumothorax
- ▢ Superior vena cava obstruction
- ▢ Empyema

Understanding the types and uses of endotracheal, double-lumen, and endobronchial tubes and bronchial blockers

Understanding chest tube drainage systems and suction

### **Anaesthesia and Perioperative Care (including Analgesia) for Patients with Cardiac and Vascular Disease for Non-cardiac Surgery: Skills – Clinical**

Post-graduates should observe and assist in the following

- ▢ Fibreoptic bronchoscopy
- ▢ Placement and use of vascular monitoring lines (arterial, central venous, pulmonary artery, and femoral and neck vessels)
- ▢ Basic trans-oesophageal echo examinations (subject to local practices)
- ▢ Use of cardiac pacemakers
- ▢ Placement of endobronchial tubes and blockers
- ▢ Use of bougies and tube exchangers

Post graduates should be able to perform

- ▢ Interpretation of ECGs and ECG monitoring
- ▢ Interpretation of chest x-rays and common chest CT and MRI imaging films
- ▢ Assistance with cardiopulmonary bypass
- ▢ Placement and care of chest drains and appropriate use of suction

### **Neuroanaesthesia: Knowledge**

- ▢ Neuro anatomy -- Central nervous system, Spinal cord and meninges
- ▢ Ventricular system and flow of CSF
- ▢ Blood supply to brain and spinal cord
- ▢ Cranial vault and spinal column
- ▢ Cerebral blood flow and Cerebral blood volume
- ▢ Cerebral metabolism
- ▢ Cerebrospinal fluid dynamics and physiology
- ▢ Intracranial pressure
- ▢ Blood-brain barrier
- ▢ Physiology and metabolism of normal and abnormal brain and spinal cord
- ▢ Physiological and metabolic effects of anaesthesia on brain and spinal cord
- ▢ Abnormal water and sodium homeostasis
- ▢ Temperature and CNS function
- ▢ Pharmacology relevant to neuroanaesthesia:
- ▢ Sedatives

- ▢ Hypnotics
- ▢ Analgesics
- ▢ Inhalation agents
- ▢ Neuromuscular blocking drugs
- ▢ Anticholinesterases
- ▢ Neuroprotection
- ▢ Diuretics
- ▢ Hypotensive agents
- ▢ Vasopressors
- ▢ Corticosteroids
- ▢ Drug interactions with neuromuscular disorders
- ▢ Principles of clinical measurement and monitoring in neuroanaesthesia, including techniques and clinical importance.
- ▢ Haemodynamic and respiratory monitoring
- ▢ Cerebral blood flow
- ▢ Intracranial pressure (ICP) and cerebral perfusion pressure
- ▢ Cerebral metabolism
- ▢ Transcranial doppler ultrasonometry
- ▢ Electrophysiological monitoring, eg, electroencephalogram and evoked potentials
- ▢ Electrical safety standards
- ▢ Interventions to minimise Cerebral Damage
- ▢ Principles of cerebral protection
- ▢ Haemodynamic stability
- ▢ Fluid and osmotic therapy
- ▢ Management of intracranial hypertension
- ▢ Sedation and ventilatory support

### **Anaesthesia for Neurosurgery**

- ▢ Understanding the assessment, anaesthesia and perioperative care of patients for:
- ▢ Intra cerebral vascular surgery
- ▢ Extra cerebral vascular surgery
- ▢ Supratentorial surgery
- ▢ Posterior fossa surgery
- ▢ Pituitary surgery
- ▢ Epilepsy surgery
- ▢ 'Awake craniotomy'
- ▢ Craniofacial and craniobasal surgery
- ▢ Spinal surgery
- ▢ Emergency spinal cord decompression
- ▢ Paediatric neurosurgery
- ▢ Principles, role and management of procedures, problems, or events associated with anaesthesia for neurosurgery: –
- ▢ Positioning for neurosurgery

- ▢ Use of inhalation or total intravenous general anaesthesia
- ▢ Induced hypotension
- ▢ Induced hypertension
- ▢ Hypothermia
- ▢ Sitting position
- ▢ Air embolism; precautions, diagnosis and management
- ▢ Injury of head, spinal column and neurological injuries
- ▢ Epilepsy and other neurological disorders
- ▢ Paediatric considerations

### **Neuroanaesthesia: Skills**

- ▢ Pre-anaesthesia preparation for neuroanaesthesia
- ▢ Monitoring in neuroanaesthesia – setting up and calibration, placement of cannulae, interpretation of variables
- ▢ Post-anaesthesia care and post neurosurgical care
- ▢ Protocols and drills for
- ▢ Failed airway intubation
- ▢ Reducing raised ICP
- ▢ Suspected cervical spine injury
- ▢ Intraoperative air embolism
- ▢ Initial management of a head injury
- ▢ Positioning of patients

### **Research and Scientific Enquiry: Knowledge**

- ▢ Proposing a hypothesis
- ▢ Information search and literature review
- ▢ Research design, bias and appropriate methods of measurement
- ▢ Data collection and storage
- ▢ Good record keeping
- ▢ Common statistical tests and application of statistics
- ▢ Interpretation of results
- ▢ Responsibilities of investigator to the ethics committee
- ▢ Principles of writing a scientific paper
- ▢ Principles of oral or poster presentation of a paper
- ▢ Ethical principles
- ▢ The process of obtaining funding and writing a basic grant application

### **Research and Scientific Enquiry : Clinical-Skills**

Post-graduates should acquire skills in scientific learning as a medical specialist

- ▢ Conducting and appraising literature searches
- ▢ Appraising journal articles including the application of statistics
- ▢ Applying the principles of evidence-based medicine to clinical practice
- ▢ Carrying out oral presentations and professional communication
- ▢ Presenting quality assurance exercises or projects
- ▢ Developing facilitation skills, such as tutoring in small-group learning and conducting small-group meetings

### **Research and Scientific Enquiry : Attitudes**

Post-graduates should develop an appreciation of and continue research and scientific enquiry

- ▢ Valuing rigorous educational and scientific processes
- ▢ Distinguishing between practice with a sound scientific basis and that which requires further objective assessment
- ▢ Committing to informed consent, confidentiality and all other ethical principles of research
- ▢ Committing to continuing professional development

### **ATTITUDES INCLUDING COMMUNICATION SKILLS:**

- ▢ To learn the attributes of a
- ▢ Medical expert
- ▢ Communicator
- ▢ Collaborator
- ▢ Manager
- ▢ Teacher
- ▢ Professional
- ▢ To practise good communication with colleagues, patients and others
- ▢ To work as a member of a team, but to assume responsibilities and/or delegate duties as a team leader when necessary
- ▢ To commit to, and believe in, a culture of safety and ethical, high quality care
- ▢ To accept that medical knowledge and skills are not the only requirements of specialist practice
- ▢ To be aware of medicolegal obligations relating to medical practice
- ▢ To have insight into one's own limitations, abilities and areas of expertise
- ▢ To commit to continuing professional development



## **TRAINING IN RESEARCH METHODOLOGY, MEDICAL ETHICS, BIO ETHICS AND MEDICOLEGAL ASPECTS**

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, bioethics, moral and legal issues, medical audit are part and parcel of the curriculum and syllabus

### **Professionalism and Ethics**

To commit to, and believe in the ethical and professional principles –

- ▯ The best care for the patient must be the principal driving force of practice
- ▯ *Patient autonomy*: patients' ability to determine their treatment
- ▯ *Beneficence*: the principle of “doing good” to patients
- ▯ *Non-maleficence*: the principle of not doing harm to patients
- ▯ *Fidelity*: faithfulness to one's duties and obligations. This principle underlies excellence in patient care, confidentiality, telling the truth, a commitment to continuing professional development and lifelong learning, and not neglecting patient care
- ▯ *Social justice*: the right of all patients to be fairly treated
- ▯ Duty to oneself in terms of personal health care, and maintenance of competence to practise
- ▯ *Accountability*: the anaesthetist is responsible for his/her actions
- ▯ Honour and integrity in all conduct, including the generation and use of resources
- ▯ Respect for others, work as a team and practise conflict resolution
- ▯ Appropriate response to clinical error

### **Patient Considerations**

To commit to, and believe in, the rights of patients with respect to:

- ▯ Autonomy
- ▯ Confidentiality of the doctor-patient relationship
- ▯ Appropriate, excellent clinical care, including pre-operative assessment
- ▯ Informed consent
- ▯ Comprehension of the risks of anaesthesia techniques
- ▯ Appropriate care irrespective of race, culture, gender and socio-economic status
- ▯ Research Considerations
- ▯ To value rigorous educational and scientific processes
- ▯ To commit to the ethical principles of research

#### **4. TEACHING AND LEARNING METHODS:**

- ▢ Introductory lectures
- ▢ Seminars, group discussions and symposia.
- ▢ Problem case discussion, before and after the conduct of the case
- ▢ Journal club presentation and discussion
- ▢ Presenting in Conferences and attendance in CME's & Workshops
- ▢ Training in the Operation Theatres (both elective and emergency), Intensive Care Unit , Pre-anaesthetic clinic, Pain Clinics, Peripheral areas like Radiology ( including CT MRI and interventional radiology), Endoscopy suite and Interventional cardiology lab.

#### **5. STRUCTURED TRAINING PROGRAMME**

##### **Duration of the Training -2 years**

##### **Orientation-**

- ▢ To the hospital, wards, operation theatres and peripheral areas
- ▢ Anaesthesiology as a subject

##### **Objectives for 1st year**

- ▢ Orientation- To the hospital, wards, operation theatres and peripheral areas and also to Anaesthesiology as a subject
- ▢ To observe and learn assessment and management of cases in ASA I and II in the specialties of General Surgery, Orthopaedics, Obstetrics & Gynaecology and Recovery room. The level of supervision is slowly graded to facilitate independent management of general and spinal anaesthesia.

## Objectives for 2nd year

- General and regional anaesthesia (including epidural, nerve and plexus blocks) for ASA III AND IV cases in the specialities of Paediatrics, ENT, Dental, ICU, Obstetrics, Eye, Urology, Pain, Peripheral areas and Trauma.
- Should learn BLS, ACLS, PALS and ATLS .
- The post-graduate should be able to analyse a journal article and data and able to present free papers in conferences, and should attend continuous education programme & workshops.
- Post-graduates should be able to anaesthetise under supervision cardiac, neuro, paediatric and all major cases.
- They should be able to anaesthetise all other elective and emergency cases independently and manage acute pain and make decisions and know how to organize mass casualty.
- Simulation based training

## First year : Basic skills and orientation to broad speciality departments

|                              |         |
|------------------------------|---------|
| General surgery              | 3months |
| Orthopaedics surgery         | 3months |
| Pre assessment clinic        | 1 month |
| ENT & Day care surgery       | 2 month |
| PACU/Recovery room/ casualty | 1month  |
| Obstetric & Gynecology:      | 2 month |

Emergency Operation Theatre, Minor operation Theatre & Day care surgery postings on rotation basis.

## **2<sup>nd</sup> year multi speciality training**

|                                                 |         |
|-------------------------------------------------|---------|
| Paediatric surgery OT                           | 1 month |
| Ophthalmic surgery                              | 2 weeks |
| Radiology- USG, CT scan,MRI, IVP Radio oncology | 2 weeks |
| Urology OT                                      | 1month  |
| Plastic surgery OT                              | 1month  |
| Neuro surgery OT                                | 1 month |
| Cardio thoracic surgery OT                      | 1month  |
| Dental/ Oro Facial Maxillary surgery            | 1month  |
| ICU/IRCU/PACU/                                  | 1month  |
| vascular OT / Endocrine/ Geriatrics             | 1month  |
| Laparoscopic Endoscopic & Laser Surgery)OT      | 1month  |
| Pain Management                                 | 1month  |
| Trauma/ Casualty/ organ harvesting (ICU)        | 1month  |

Emergency Operation Theatre, Minor operation Theatre & Day care surgery postings on rotation basis.

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## **8. COMPETENCY ASSESSMENT:**

|                                                                                                                       |    |                 |
|-----------------------------------------------------------------------------------------------------------------------|----|-----------------|
| <b>• OVERALL:</b>                                                                                                     |    |                 |
| a) Communication / commitment / Contribution /                                                                        | () |                 |
| Compassion towards patients and Innovation                                                                            | () | - 5 Marks       |
| b) Implementation of newly learnt techniques/skills                                                                   | () |                 |
| • Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars                                           |    | - 5 marks       |
| • Number of Posters/Papers presented in Conferences/<br>Publications and Research Projects                            |    | - 5 marks       |
| • No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic meetings with details. |    | - 5 marks       |
| <b>Total</b>                                                                                                          |    | <b>20 Marks</b> |

PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

**9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

**10.THEORY EXAMINATION**

Theory examination will comprise 3 papers.

Paper I: Appiled Basic Sciences related to Anaesthesia, History of Anaesthesia and Physics in Anaesthesia

Paper II: Anaesthesiology

Paper III: Anaesthesiology including Critical Care and Recent Advances in Anaesthesia

Question paper pattern: PAPER I, II & III

I. Elaborate on 2 x 15 = 30

II. Write note on 10 x 7 = 70

**Total =100 marks**

## 11. PRACTICAL EXAMINATION

| Particulars.                                                            | Maximum Marks. |
|-------------------------------------------------------------------------|----------------|
| Clinical<br>Long Case 1 X 80 = 80 marks<br>Short case 2 X 35 = 70 marks | 150            |
| OSCE – 5 stations x 5 marks                                             | 25             |
| Ward Rounds/Case Scenario - 5 X 5 marks                                 | 25             |
| Viva-Voce                                                               | 80             |
| Log Book                                                                | 20             |
| Total                                                                   | 300            |
| Minimum for Pass                                                        | 150            |

| Type of case                   | Duration of case examination by student | Duration of candidate examination by examiner | Marks                |
|--------------------------------|-----------------------------------------|-----------------------------------------------|----------------------|
| <b>Morning session</b>         |                                         |                                               | <b>200 marks (A)</b> |
| Long case - 01                 | 20 min                                  | 30 min                                        | 80                   |
| Short cases - 02               | Each 10 min                             | Each 15 min                                   | 35 X02 =70           |
| Ward rounds / Case scenario 05 | Each 05 min                             | Each 05 min                                   | 05X05= 25            |
| OSCE 05                        | Each station 05 min                     | ---                                           | 05X05= 25            |
| <b>Afternoon session</b>       |                                         |                                               | <b>100 marks (B)</b> |
| VIVA VOCE 04                   | -----                                   | Each station 15 min                           | 80                   |
| Log Book                       | -----                                   | -----                                         | 20                   |

## **12. Log book**

- A detailed log book should be maintained for the entire duration of the course. It should contain the following details.
- Procedures performed
- Journal clubs/Clinical Meetings
- Seminars/CME/Conferences
- Important cases discussed/presented
- The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.
- Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

## **13. VIVA including Competency Assessment :**

VIVA including Competency Assessment - 80 Marks (60 + 20)

1. Anaesthesia Machine, Gas cylinders, Equipments, Monitors
2. Drugs, IV fluids, Instruments, Procedure Tray
3. Investigation Charts, ECG, Xray, ABG, Capnograph, Ventilator Graphics, etc..
4. Resuscitation mannequin, Difficult airway mannequin, Defibrillator , Ventilator

## **14. OSCE**

**Five stations – Five minutes each station**

**5X5 =25 marks**

1. Equipments, monitors, circuits, Vaporiser
2. Flow volume loops/ABG/ Capnographs/ Ventilator graphs /
3. Physiology, History relevant to Anaesthesiology
4. Drug Pharmacology, invasive procedure, Nerve block
5. Communication skill assessment- high risk informed consent, Cancellation/ consent for tracheostomy due to difficult intubation, Delayed recovery, Breaking bad news, etc.

## **15. REFERENCE BOOKS:**

| <b>S.no.</b> | <b>Name of the book</b>                           | <b>Author</b>                |
|--------------|---------------------------------------------------|------------------------------|
| 1.           | A synopsis of Anaesthesia                         | J. Alfred Lee                |
| 2.           | Management of pain                                | J.J Bonica                   |
| 3.           | Anaesthesia for infants and children              | R.M Smith                    |
| 4.           | A Practice of Anaesthesia                         | Wylic and Churchill Davidson |
| 5            | Anaesthesia - Vol.I and II                        | Miller                       |
| 6            | Clinical Anaesthesia                              | Barash                       |
| 7.           | Critical Care                                     | Joseph Civetta               |
| 8            | Anaesthesia and neurosurgery                      | Cottrell and Smith           |
| 9            | Cardiac anaesthesia                               | Kaplan                       |
| 10           | Paediatric anaesthesia                            | Gregory                      |
| 11           | Pharmacology & Physiology in Anaesthetic practice | Robert K.Stocling            |
| 12           | Understanding Anaesthesia Equipment               | Dorsch and Dorsch            |
| 13           | Anaesthesia for Co-existing diseases              | Robert K. Stoleting          |

**\*\* Note :** The editions are as applicable and the latest editions shall be the part of the syllabi

## **16. JOURNALS**

| <b>S.no</b> | <b>Name of Journal</b>                           |
|-------------|--------------------------------------------------|
| 1.          | Anaesthesiology                                  |
| 2.          | Anesthesia Analgesia                             |
| 3.          | Anaesthesia                                      |
| 4.          | Anesthesia Intensive Care                        |
| 5.          | Canadian Journal of Anaesthesia                  |
| 6.          | British Journal of Anaesthesia                   |
| 7.          | Indian Journal of Anaesthesia                    |
| 8.          | Journal of Anaesthesiology Clinical Pharmacology |

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# **DIPLOMA IN CLINICAL PATHOLOGY (DCP)**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**DIPLOMA IN CLINICAL PATHOLOGY (DCP)**

**1.GOALS:**

A diploma holder in the subject of Clinical Pathology (DCP) is expected to be a specialist in the subject with adequate skill and competence. This will create suitable manpower with appropriate expertise in pathology and allied fields of laboratory medicine. The student must be able to understand the biochemical & microbiological basis of diseases and the relevance of biochemical and microbiological tests in disease conditions. Supervise modern laboratory techniques and procedures in Pathology, Clinical Biochemistry and Microbiology in the hospital. Suggest, evaluate, interpret pathological, biochemical and microbiological investigation in a given clinical situation and apply knowledge in clinical problems.

**2.OBJECTIVES:**

**Knowledge :**

Attain proficiency in both theoretical and practical aspects of the disciplines of Pathology, Microbiology and Biochemistry.

**Attitude:**

- 1) They must be able to oversee the technical staff and ensure the recommended procedures are followed in collection of samples, registering, processing, reading and interpreting diagnostic tests performed.
- 2) They must be able to share the knowledge and competence with others and strive to achieve the highest quality standards.

**Skills:**

- 1) The candidate should have adequate skill and competence to conduct diagnostic procedure and make confident interpretation in common histopathological, hematological and clinicopathological problems including those in transfusion medicine.
- 2) The candidate should possess adequate knowledge and skill to carry out and interpret majority of microbiological and biochemical investigations
- 3) The candidate must update knowledge and skill and be capable of pursuing clinical and laboratory based research.
- 4) They should be imparted training in teaching methods in the subject, which enables them to impart training to students medical, paramedical and lab technicians and also to take up teaching assignments in Medical Colleges.

### **3.COMPONENTS OF POST GRADUATE CURRICULUM**

#### **THEORETICAL KNOWLEDGE:**

1. They should attain proficiency in theoretical aspects of disciplines of pathology, microbiology, biochemistry and transfusion medicine.
2. The student shall have knowledge about and ability to diagnose / interpret / perform the following.
  - a. Basic general and surgical pathology disease patterns.
  - b. Grossing and histopathology of surgical pathology specimens.
  - c. Haematological investigations with knowledge on high end diagnostic procedures.
  - d. Cytopathology diagnostic procedures and interpretation.
  - e. Blood banking procedures.
  - f. Basic microbiology
  - g. Basic biochemistry.
3. Basic knowledge on good laboratory practice and SOPS.
  - a. Quality control and accreditation protocols.
  - b. Universal precautions and biosafety
  - c. Equipment Care
  - d. Biomedical Waste Management
  - e. Organization of a laboratory.

#### **PRACTICAL AND CLINICAL SKILLS**

The candidate should have hands on experience in techniques, interpretation and reporting of:

- 1) Morbid anatomy cytopathology and histopathology
  - a. Specimen collection, labeling, documentation, fixation.
  - b. Grossing techniques, tissue processing.
  - c. Microtomy, staining, special stains, immunohistochemistry, frozen sections, cell block preparation.
  - d. Museum techniques.
  - e. Cytological techniques – FNAC, fluid, cytology, vaginal cytology, preparation, staining and reporting.

2) Clinical pathology and blood banking

3)

- a. Haemoglobin estimation, blood counts
- b. Staining of smears, interpretation
- c. ESR, PCV, Osmotic fragility, Hb electrophoresis, Red cell indices, Reticulocyte count.
- d. Automated hematology analysers
- e. Cytochemical stains for Leukemia
- f. Peripheral smear & Bone marrow study
- g. Hemolytic work up
- h. Coagulation profile
- i. QBC for malaria
- j. Urine analysis, Semen analysis, Sputum, Stool examination
- k. Basic blood transfusion procedures, screening of donors, blood collection, Coomb's test, Quality control, Component preparation. Disposal methods, voluntary blood donation camp organization.
- l.

4) **BIOCHEMISTRY** : The candidate should develop competency in programming and operating semi-autoanalyser and should be able to perform, report and interpret each of the following tests.

1. Glucose estimation in plasma / serum and Glucose tolerance test.
2. Estimation of HbA1c
3. Estimation of cholesterol, Triacylglycerol and HDL –C plasma/serum.
4. Estimation of serum Proteins , Albumin and calculation of A:G ratio
5. Estimation of Calcium and Phosphorus
6. Estimation of Electrolytes (Sodium, Potassium) in Serum/Plasma using Flame photometer or Ion Selective electrolyte analyser
7. Estimation of urea acid, creatinine in blood and urine.
8. Biochemical analysis CSF, ascitic, pleural and other fluids
9. Estimation of urine proteins and detection of Bence-Jones protein in urine.
10. Analysis of renal and biliary calculi
11. T3 and T4 assays and TSH measurement using ELISA Reader and washer.

5) **MICROBIOLOGY** : The candidate shall be posted to the Department of Microbiology for a period of minimum two months during their course of study .The following skills need to be acquired by the student during their postings.

- Care and operation of light microscopes
- Collection and transport of various clinical specimens
- Performance of different stains including Grams, Albert, Ziehl-Neelsen
- Inoculation of clinical specimen on media for isolation, identification of bacteria
- Identification of Bacteria of Medical importance upto species level by routine and special tests.
- Performance of antibiotic sensitivity test – Kirby bauer method

- Test for drug resistance including MRSA, VRE, ESBL
- Disinfection, sterilization techniques
- Sterility check (Dry / moist methods)
- Decontamination of cultures
- QC of media, reagents, antibiotic discs
- Safe laboratory practices including bio safety

#### 6) **IMMUNOLOGY**

- Collection / separation / preservation of blood samples
- Serological test including rapid / conventional (Latex agglutination test , Immunochromatography, tube agglutination, slide flocculation

#### 7) **GENERAL**

- Laboratory automation
- Principles of sample collection for hematology and clinical pathology
- Pregnancy tests
- Cytogenetics
- Immunopathology
- Computer, Internet in Medicine, microphotography

It is mandatory that the students have to submit atleast one research paper to the University Journal of Medical Sciences.

#### **Attitudes including communication skills**

- 1) Should be able to function as a part of a team, develop an attitude of cooperation with colleagues to provide the best possible diagnosis or opinion.
- 2) Always adopt ethical principles and maintain proper etiquette in dealing with patients, relatives and other health personnel and respect the rights of the patient including the right to information and second opinion.
- 3) Develop communication skills to word reports and professional opinions with clarity as well as to interact with patients, relatives, peers and paramedical staff and also for effective teaching.

#### **Training in research methodology Medical Ethics / Bioethics / Medicolegal aspects**

##### **Training in research methodology**

- Must be able to plan, execute, analyse and present research work.
- Must be familiar with statistical methods in assessing data from patient material and experimental studies.
- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

### **Good Laboratory Practices:**

Should be conversant with good laboratory practices pertaining to universal precautions, biomedical waste management, requirements, storage and maintenance of laboratory samples, equipment and reagents and quality control.

### **Medical Audit:**

Must attend medical audit to analyse the problems and pitfalls faced in laboratory and wards to prevent errors in diagnosis.

## **4.THEORY SYLLABUS:**

### **Pathology**

#### **General Pathology**

- **Cellular components** - Genome, cell metabolism, stem cells
- **Cellular responses** - Adaptation, reversible and irreversible injury, accumulations, cellular ageing
- **Inflammation** – Causes, acute inflammatory events and mediators with examples, chronic inflammation events and mediators with examples, tissue repair mechanisms, abnormalities.
- **Hemodynamic disorders** – Edema, hyperemia, congestion, hemorrhagic disorders, DVC, Embolism and types of emboli, infarction, shock.
- **Genetic disorders** – Mutations, Mendelian disorders, chromosomal disorders – normal karyotype, autosomal disorders, sex chromosomal disorders, principles in molecular genetic diagnosis PCR, FISH, polymorphic markers, Southern blotting, RNA analysis, next generation sequencing.
- **Immune system** – Normal Immune response, cells of immune system, hypersensitivity reactions, autoimmune diseases, rejection of tissue transplants, immunodeficiency syndrome – primary and secondary – AIDS.
- **Neoplasia**– Nomenclature, characteristics of benign and malignant neoplasms, epidemiology of cancer, molecular basis of cancer, metastasis, carcinogenic agents, clinical aspects of neoplasia.
- **Infections** – General principles, special diagnostic techniques, viral infections, bacterial infections, fungal infections, parasitic infections.

- **Environmental and Nutritional Diseases** – Effects of Tobacco, alcohol, drugs, physical injury, nutritional diseases, obesity.
- **Diseases of infancy and childhood** – Congenital abnormalities, prematurity, neonatal respiratory distress syndrome, perinatal infections, inborn errors of metabolism, sudden infant death syndrome, tumours and tumour like lesions of infancy and childhood.

### **Systemic Pathology**

- **Blood vessels** – Hypertensive vascular disease, arteriosclerosis, atherosclerosis, Aneurysms, vasculitis, vascular tumours.
- **Heart** – Heart failure, congenital heart diseases, ischemic heart disease, hypertensive heart disease, valvular heart disease, cardiomyopathy, pericardial diseases.
- **WBC Disorders, Lymph nodes, Spleen, Thymus** – Leucopenia, Leucocytosis, Neoplastic proliferation of white cells, splenomegaly, thymic hyperplasia, thymoma.
- **RBC Disorders, Bleeding disorders** – Anaemias, Polycythemia, bleeding disorders, transfusion reactions.
- **Lung** – Atelectasis, pulmonary edema, ARDS, obstructive and restrictive lung diseases, emphysema, asthma, chronic bronchitis, bronchiectasis, interstitial lung diseases, vascular diseases, pulmonary infections, lung tumours, pleural diseases.
- **Head and Neck** – Precancerous and cancerous lesions of oral cavity, cysts of neck, laryngeal carcinoma, salivary gland inflammation and neoplasms.
- **Gastrointestinal tract** – Barrett's oesophagus, oesophageal tumours, gastritis, gastric polyps and tumours, ischaemic bowel disease, inflammatory bowel disease, polyps of colon, colonic and rectal adenocarcinoma, acute appendicitis, tumours of appendix, peritoneal disorders.
- **Liver and bile ducts** – Gallbladder, liver failure, cirrhosis, portal hypertension, viral hepatitis, alcoholic liver disease, autoimmune hepatitis, drug and toxin induced liver injury. Non alcoholic fatty liver disease, metabolic liver disease, hemochromatosis, Wilson disease,  $\alpha$ 1AT deficiency, cholestatic diseases, benign and malignant tumours of liver.
- **Gall bladder** – Cholelithiasis, cholecystitis, carcinoma,
- **Pancreas** – Acute and chronic pancreatitis, cysts, neoplasms.

- **Kidney** – Glomerular disease – pathogenesis, nephritic syndrome, nephrotic syndrome, tubulointerstitial diseases, vascular diseases, cystic disease, obstructive uropathy, neoplasms of kidney.
- **Lower urinary tract and male genital system** – Cystitis, bladder neoplasm, inflammation and tumours of penis.
  - **Testis** – cryptorchidism, inflammatory disorders, testicular tumours.
  - **Prostate** – Benign prostatic hyperplasia, tumours.
- **Female genital tract** – Vulvar cysts, neoplastic lesions of vulva
  - **Vagina** – Premalignant and malignant neoplasms of vulva.
  - **Cervix** – Cervicitis, premalignant and malignant lesions of cervix, cancer screening.
  - **Uterus** – Endometrial histology in menstrual cycle, functional endometrial disorders, inflammatory disorders, benign and malignant tumours of uterus.
  - **Fallopian tubes** – Inflammation, tumours, cysts.
  - **Ovaries** – Cysts, ovarian tumours
  - **Gestational and placental disorders** - Ectopic pregnancy, gestational trophoblastic disease
- **Breast** – Inflammatory disorders, proliferative breast disease, carcinoma breast, stromal tumours.
- **Endocrine system** - Pituitary Adenomas, Hypopituitarism.
- **Thyroid** – Hyperthyroidism, hypothyroidism, thyroiditis, Gravesdisease, diffuse and multinodular goiter, neoplasms of thyroid.
- **Parathyroid** – Hyperparathyroidism, hypoparathyroidism.
- **Endocrine pancreas** – Diabetes Mellitus, Pancreatic neuroendocrine tumours.
- **Adrenal glands** – Adrenal cortex, hyperadrenalism, adrenocortical insufficiency, adrenocortical neoplasms, adrenal medulla ,phaeochromocytoma, MEN syndromes.
- **Skin** – Nevi, adnexal tumours, premalignant and malignant tumors of skin, chronic inflammatory dermatosis, bullous diseases.
- **Bone, Joints, soft tissue** - Structure and function of bone, Paget disease, osteoporosis, osteomalacia and rickets, fracture healing, osteomyelitis, bone tumors and tumor like conditions.
- **Joints** – Rheumatoid arthritis, gout.



- **Soft tissues** – Benign and malignant soft tissue tumors including benign and malignant peripheral nerve sheath tumours
- **CNS** – Tumours of CNS, Infections of CNS, Cerebrovascular diseases.
- **Cytopathology** - Thyroid, Salivary gland, breast, lymph node, soft tissue, bone, vaginal cytology, sputum cytology, CSF cytology, Body Fluid cytology.

## **MICROBIOLOGY SYLLABUS**

### **General Microbiology:**

- History of Microbiology.
- Microscopy.
- Biosafety including universal containment.
- Sterilization and disinfection.
- Morphology of bacteria and other microorganisms.
- Nomenclature and classification of microorganisms.
- Normal flora of human body.
- Growth & nutrition of bacteria.
- Bacterial metabolism.
- Bacterial toxins.
- Culture media and methods
- Identification of bacteria
- Host-parasite relationship.
- Antibacterial substances and drug resistance.
- Bacterial genetics & bacteriophages.
- Quality assurance & quality control in microbiology.

### **Immunology:**

- Components of immune system.
- Innate and acquired immunity.
- Cells involved in immune response.
- Antigens.
- Immunoglobulins.
- Complement system
- Antigen and antibody reactions
- Hypersensitivity.

- Immunodeficiency diseases
- Auto-immunity.
- MHC complex.
- ImmunoHaematology.

### **Systematic Bacteriology:**

- Gram positive cocci of medical importance including Staphylococcus, Micrococcus, Streptococcus
- Gram negative cocci of medical importance including Neisseria, Moraxella
- Gram positive bacilli including Coryneform organisms, Bacillus, Actinomyces, Nocardia, Listeria
- Non sporing anaerobic bacteria
- Spore bearing Anaerobic bacteria including Clostridium spp
- Gram negative bacilli of medical importance including Vibrios, Aeromonas, Plesiomonas, Haemophilus, Bordetella, Brucella, Pseudomonas, Acinetobacterspp,
- Helicobacter, Campylobacter & Spirillum.
- Enterobacteriaceae.
- Mycobacteria.
- Spirochaetes.
- Chlamydiae.
- Mycoplasmatales; Mycoplasma, Ureaplasma, Acholeplasma and other Mycoplasmas.
- Rickettsiae, Coxiella, Bartonella

### **Mycology :**

- General characteristics & classification of fungi.
- Isolation and identification of fungi.
- Yeasts and yeast like fungi of medical importance including Candida, Cryptococcus, Malassezia.
- Opportunistic Mycelial fungi of medical importance including Aspergillus, Zygomycetes
- Dimorphic fungi
- Dermatophytes.
- Fungi causing mycetoma, keratomycosis & otomycosis.
- Pneumocystis jirovecii
- Rhinosporidium seeberi
- Mycetism & mycotoxicosis.
- Antifungal agents

## **Virology:**

- General properties of viruses.
- Classification of viruses.
- Morphology : Viral structure, Bacteriophages.
- Viral replication.
- Laboratory diagnosis of viruses.
- Pathogenesis of viral infections.
- DNA viruses of medical importance including Poxviridae, Herpesviridae, Adenoviridae, Hepadna virus, Papova and Parvo viruses
- RNA viruses of medical importance including Enteroviruses, Togaviridae, Orthomyxoviruses, Paramyxoviruses, Rhabdoviridae, Arenaviridae, Bunyaviridae, Retroviridae, Filoviruses, Arboviruses and Coronaviridae
- Slow viruses including prions.
- Oncogenic & Teratogenic Viruses.
- Hepatitis viruses.
- Vaccines and anti-viral drugs

## **Parasitology**

- General characters & classification of parasites.
- Laboratory diagnosis of parasitic infections.
- Protozoan parasites of medical importance including Entamoeba, Free living amoebae, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium, Toxoplasma, Cryptosporidium, Microsporidium, Cyclospora, Isospora, Babesia etc
- Helminths of medical importance including those belonging to Cestodes (Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Trematodes (Schistosomes, Fasciola, Fasciolopsis, Paragonimus, Clonorchis etc.) and Nematodes (Trichiuris, Trichinella, Strongyloides, Ancylostoma, Necator, Ascaris, Toxocara, Enterobius, Filarial worms, Dracunculus, etc.).
- Antiparasitic agents.

## **Applied Microbiology**

- Hospital acquired infections and infection control
- Management of hospital waste.
- Standard Precautions
- Vaccines.

## **BIOCHEMISTRY SYLLABUS**

### **THEORY**

1. **Principles of laboratory analyses and safety**- Units of measurement. International system of units in laboratory medicine. Conversion from conventional units to SI units. Reference materials.
2. **Instrumentation and techniques**: Centrifugation. Spectrophotometry. Flame emission photometry. Principles of ELISA and immunochemistry. Automation in clinical chemistry.
3. **Laboratory Management**: Common hazards in the laboratory. Management of biological, chemistry and radioactive wastes. Computer applications in clinical chemistry.
4. **Sample Collection**: Anticoagulants and preservatives for blood. Timed urine collections and urine preservatives
5. **Quality assurance**: Use of reference values. Quality assurance in clinical laboratories.
6. **Overview of the Chemistry and Metabolism** (including digestions and absorption) of Carbohydrates, Proteins , Lipids, Nucleic acids with specific emphasis on biochemical basis of diseases and relevant investigations .Inherited and storage disorders involving each metabolism.
7. **Enzymes**: Biomedical importance. Nomenclature. Classification. General properties. Coenzymes and cofactors. Mechanism of action. Inhibitors of enzymes, naturally occurring enzyme inhibitors. Enzymes in clinical medicine. Isoenzymes and the use of enzymes as laboratory tools (for diagnostic and research applications)
8. **Porphyrins and Heme metabolism**, laboratory diagnosis of jaundice
9. **Vitamins**: Structure, sources, recommended dietary allowances (RDA), biochemical role, metabolism in the body and deficiency manifestations of water soluble and fat-soluble vitamins. Use of vitamins in therapy.
10. **Minerals** : Sources , functions , daily requirements and disorders of Calcium, Phosphorus, Iron, Sodium, Potassium, Magnesium
11. **Hydrogen ion homeostasis**: Maintenance of pH, Associated disorders and laboratory diagnosis.

12. **Cerebrospinal and other body fluids:** Analysis in health and disease
13. **Laboratory diagnosis of Diabetes mellitus** including gestational diabetes mellitus, Diabetic ketoacidosis. Hypoglycemia .Urinary albumin excretion.
14. **Function tests:** Liver, Kidney, Thyroid , Pancreas.
15. **Human Nutrition:** General nutritional requirements. Energy requirements. Balanced diet. Dietary fibre. Dietary supplements. Fortification of foods. Disorders of nutrition (protein malnutrition and protein energy malnutrition).
16. **Basics of Human Genetics** , Antibiotics and transcription. Post-transcriptional and Post-translational modifications, Viral genetics – DNA and RNA viruses. HIV and drugs in the treatment of HIV.
17. **Molecular basis of carcinogenesis**, Inherited conditions that predispose to development of cancer (e.g., ataxia telangiectasia, xerodermapigmentosum, Fanconi syndrome). Mechanisms of action of cytotoxic drugs. Basics of Cytogenetics.

## **BIOETHICS**

Must strictly adhere to bioethics pertaining to

- a) Careful handling, precautions, disposal and preservation of biological samples.
- b) Must follow and abide by ethical issues pertaining to blood transfusion with reference to blood donation, screening of donors, promptdespatch of appropriate blood component with strict adherence to integrity and quality.
- c) Must adhere to ethics in analyzing the necessity and prudence in choice of investigations.
- d) Confidentiality needs to be maintained in report disclosure, pre and post test counselling.
- e) In case of refusal of tests an informed consent must be obtained.
- f) Practice of dichotomy should be strongly condemned.
- g) Should be conversant with quarantine and its impact on patient, vector carrier, bioterrorism.

## **Pathology**

1. Ethics related to use of Biological material
2. Ethics in Blood transfusion.
3. Ethical pathologists

### **Biochemistry**

1. Necessity and prudence in the choice of tests.
2. Informed consent and refusal of tests.
3. Confidentiality.
4. Dichotomy.

### **Microbiology**

1. Lab reports – Confidentiality, privacy, notification & report disclosure Pre & Post-test counselling.
2. Quarantine & its impact – patient, vector, carrier specimen transport Bioterrorism.

## **5.TEACHING LEARNING METHODS:**

Based on the available facilities, the department can prepare a list of post graduate experiments pertaining to basic and applied pathology, biochemistry and microbiology. Active learning should form the main stay of post graduate training. There should be lectures for post graduates at least 20 year along with seminars, symposia, group discussion, journal clubs. Each college should have a medical education unit to conduct PG orientation programmes. The post graduate should regularly interact with various clinical departments and learn cases of interest for discussion with surgical medical, superspeciality faculty. The post graduate should actively involve in generating teaching resource material for undergraduate and evolving of problem solving modules.

## **6.STRUCTURED TRAINING PROGRAMMES**

The two year training programme for the Diploma in Clinical Pathology may be arranged in the form of Postings to different laboratories for specified periods as outlined below. The period of such posting is recommended for 23 months. Posting schedules may be modified depending on needs, feasibility and exigencies.

### **First Year :**

|                    |   |           |
|--------------------|---|-----------|
| Clinical Pathology | : | 2½ months |
| Hematology         | : | 15 Days   |
| Blood Bank         | : | 15 Days   |
| Microbiology       | : | 2 months  |
| Biochemistry       | : | 1½ months |
| Surgical Pathology | : | 3 months  |
| Cytology           | : | 2 months  |
|                    |   | -----     |
| Total              | : | 12 Months |
|                    |   | -----     |

**Second Year :**

|                    |   |            |
|--------------------|---|------------|
| Clinical Pathology | : | 2½ months  |
| Hematology         | : | 15 days    |
| Blood Bank         | : | 15 days    |
| Microbiology       | : | 1 Month    |
| Biochemistry       | : | 1 ½ months |
| Surgical Pathology | : | 3 months   |
| Cytology           | : | 2 months   |
| -----              |   |            |
| Total              | : | 11 Months  |
| -----              |   |            |

During II<sup>nd</sup> year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**7. Evaluation of the candidates in both theory and practical aspects at the end of every unit/posting. This will help the candidate in improvement of his/her knowledge, skills and attitude.**

**8. COMPETENCY ASSESSMENT:**

- OVERALL:
- OVERALL:

- |                                                                                                                          |        |           |
|--------------------------------------------------------------------------------------------------------------------------|--------|-----------|
| a) Communication / commitment / Contribution /<br>Compassion towards patients and Innovation                             | (<br>) | - 5 Marks |
| b) Implementation of newly learnt techniques/skills                                                                      | (      |           |
|                                                                                                                          |        |           |
| • Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars                                              |        | - 5 marks |
|                                                                                                                          |        |           |
| • Number of Posters/Papers presented in Conferences/<br>Publications and Research Projects                               |        | - 5 marks |
|                                                                                                                          |        |           |
| • No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic meetings<br>with details. |        | - 5 marks |

-----  
20 marks  
-----

## **PG NON - CLINICAL COURSE**

**VIVA including Competency Assessment - 60 Marks (40 + 20)**

### **ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

### **9. UNIVERSITY JOURNAL OF MEDICAL SCIENCES**

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

### **10. THEORY EXAMINATIONS:**

Paper I : General and systemic pathology

Paper II : Biochemistry & Microbiology

Paper III :Haematology, Clinical Pathology and Cytology

### **PATTERN OF THEORY PAPER**

**Paper I :**  
I .Elaborate on: 2 X 15 = 30 marks  
II. Write notes on: 10 X 7 = 70 marks

**Paper II :**  
Sec A – Biochemistry I .Elaborate on: 1 X 15 = 15 marks  
II. Write notes on: 5 X 7 = 35 marks

Sec B – Microbiology I .Elaborate on: 1 X 15 = 15 marks  
II. Write notes on: 5 X 7 = 35 marks

**Paper III :**  
I .Elaborate on: 2 X 15 = 30 marks  
II. Write notes on: 10 X 7 = 70 marks



## **11. PRACTICAL EXAMINATION**

The practical examination is scheduled for two days with the following exercises.

### **Clinical – Day 1**

#### **Forenoon**

|                                           |            |
|-------------------------------------------|------------|
| Microbiology Culture                      | - 25 marks |
| Gross spotters - 5x2 marks                | - 10 marks |
| Cytology / hematology slides – 10x2 marks | - 20 marks |

#### **Afternoon**

|                                                    |            |
|----------------------------------------------------|------------|
| Histopathology techniques                          | - 10 marks |
| Special stains (Van Gieson, Perls, Reticulin, PAS) | - 5 marks  |
| Pap Stain                                          | - 5 marks  |
|                                                    | -----      |
|                                                    | 75 marks   |
|                                                    | -----      |

|                                 |            |
|---------------------------------|------------|
| OSPE – 2 stations x 5 marks     | - 10 marks |
| Spotters – 2 spotters x 5 marks | - 10 marks |
|                                 | -----      |
|                                 | 20 marks   |
|                                 | -----      |

### **Clinical – Day 2**

|                                                         |            |
|---------------------------------------------------------|------------|
| Clinical Pathology (case examination and investigation) | - 25 marks |
| Histopathology slides – 5x2 marks                       | - 10 marks |
| Biochemistry                                            | - 25 marks |
| Serology                                                | - 15 marks |
|                                                         | -----      |
|                                                         | 75 marks   |
|                                                         | -----      |

**Viva including Competency Assessment (40 + 20) = 60 marks**

| <b>scheme for distribution of marks:</b> |                     |
|------------------------------------------|---------------------|
| <b><u>Particulars</u></b>                | <b><u>Marks</u></b> |
| Clinical                                 | 150                 |
| OSPE (2 x 5 marks)                       | 10                  |
| Spotters (2 x 5 marks)                   | 10                  |
| Viva                                     | 60                  |
| Log Book                                 | 20                  |
| <b>Total</b>                             | <b>250</b>          |

## **12. LOG BOOK**

**The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.**

Periodic review of Log book and Dissertation have to be done in the Department by guide/HOD once in every 6 months.

## **13.VIVA**

An unstructured Viva will be carried out by the examiners.

**Viva including Competency Assessment (40 + 20) = 60 marks**

## **14. OSPE (Objective Structured Practical Examination)**

The following are suggested stations for the OSPE. Any 2 can be chosen at the discretion of the examiners:

Blood Grouping, charts pertaining to Karyotyping, Immunohistochemistry, Frozen section, QBC, interpretation of hematology analyser report.

## **15.REFERENCE BOOKS & JOURNALS**

### **PATHOLOGY**

1. Pathology, Edby E. Rubin and J.L. Farber – Lippincott.
2. Anderson's Pathology, (Latest ED) EdbyKlbsane. – C.V. Mosby.
3. Robbin's pathologic basis of diseases EdbyCotran – W.B. Saunders.
4. Clinical diagnosis and management by laboratory methods 18<sup>th</sup> Ed. Edby Henry – W.B. Saunders.
5. Haematology by J.H.Jandl. – Little Brown and Co.
6. Practical Haematology, 7<sup>th</sup> Ed. Dacie and Lewis – Churchill – living stone.
7. Comprehensive cytopathology Bibbo – W.B.Saunders.
8. Blaustein's pathology of Female Genital Tract. Edbykurman 3<sup>rd</sup> Ed. – Springer Verlag.
9. Soft Tissue TumoursEnzinger and Weiss – C.V. Mosby.
10. Ackerman's Surgical Pathology Rosai – C.V. Mosby.

11. Ackerman's Surgical Pathology Rosai – Little Brown.
12. Theory and Practice of Histological Techniques 3<sup>rd</sup> Ed. Edby Bancroft and Stevens – Churchill – Livingstone.
13. WHO classification of tumours – WHO Publication.

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **JOURNALS**

1. American Journal of surgical pathology.
2. Histopathology
3. American Journal of Clinical pathology.
4. Journal of Clinical pathology.
5. Human pathology.
6. Clinics in Laboratory Medicine.
7. Clinics in Haematology and Oncology.
8. Cancer.
9. Pathology.
10. New England Journal of Medicine.
11. The Lancet
12. A.M.A. Archives of Pathology and Laboratory Medicine.
13. Diagnostic histopathology.
14. Journal of Pathology.

## **MICROBIOLOGY**

- 1) Textbook of Microbiology by Ananthanarayan and Paniker
- 2) Practical Medical Microbiology J.G. Mackie and MC Cartney
- 3) Bailey and Scott's Diagnostic Microbiology
- 4) Roitt Ivan M, Essential Immunology
- 5) Parasitology by K.D.Chatterjee

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **JOURNALS**

1. Journal of Clinical Microbiology
2. Journal of Infectious Diseases
3. European Journal of Clinical Microbiology & Infectious Diseases
4. American Journal Of Bacteriology
5. PLOS Pathogen
6. Indian Journal of Medical Microbiology
7. Indian Journal of Pathology & Microbiology
8. Indian journal of Medical Microbiology
9. International journal of Medical Microbiology
10. International Journal of Antimicrobial Agents

## **BIOCHEMISTRY**

- 1) Textbook of Biochemistry for Medical Students, 8<sup>th</sup> Ed. - D.M. Vasudevan.
- 2) Lippincott's Illustrated Reviews: Biochemistry, 5<sup>th</sup> Ed.
- 3) Harper's Illustrated Biochemistry, 30<sup>th</sup> Ed.

**\*\* Note :** The editions are as applicable and the latest editions shall be the part of the syllabi.

## **JOURNALS**

1. Science
2. Nature and its associated publications (Eg, Nature Medicine, Nature Genetics, etc)
3. Annual Review of Biochemistry
4. Clinical Chemistry
5. The Journal of Biological Chemistry (JBC)
6. Proceedings of National Academy of Sciences of the United States of America (PNAS)
7. Public Library of Sciences (PLOS) publications
8. Journal of Clinical Investigation (JCI)
9. Indian Journal of Clinical Biochemistry

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**DIPLOMA IN DERMATOLOGY, VENEROLOGY  
AND LEPROSY (DDVL)**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**DIPLOMA IN DERMATOLOGY, VENEREOLOGY  
AND LEPROSY (DDVL)**

**I GOALS**

The goals of postgraduate training course would be to train a MBBS doctor who will:

- To practice Dermatology, Venereology and Leprosy efficiently and effectively, backed by scientific knowledge, skill base, ethics and tenets of good medical practice.
- Recognize the economic costs of treatment and use the most effective therapy within the available economic resources.
- Communicate to patients and families the advantage of preventive as well as the importance of compliance to prescribed therapies.
- Be able to co-operate, collaborate with colleagues and contribute to the management, when the problem is a multi-system disease process.

**II OBJECTIVES**

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. Behavior: Affective domain: Human values, Ethical practice and Communication, Partnership, Leadership and Teamwork abilities
4. Safety and quality
5. Maintaining trust

## **Knowledge:**

- **Attain cognitive proficiency in the diagnosis and management of dermatological conditions, sexually transmitted diseases and leprosy through a patient oriented structured curriculum.**
- **Describe the etiology, pathogenesis, clinical features, prognosis, differential diagnosis and treatment of diseases relevant to DVL.**
- **Demonstrate understanding of basic sciences relevant to the specialty and its application.**
- **Attain adequate knowledge in the clinical management of Sexually Transmitted Diseases and Infections (STDs & STIs) including HIV, surveillance and reporting, prevention of morbidity and mortality due to STDs and HIV by initiating treatment, partner notification and behavioral change. To know the importance of early diagnosis, prevention and transmission, management of long term risks of STDs including HIV.**
- **Attain knowledge about various sexual dysfunctions in both male and female and their management.**
- **Attain adequate knowledge about the importance of other departments like microbiology, obstetrics and gynecology, forensic medicine, medicine, public health and psychiatry.**
- **Attain knowledge about the care and support of male, female, transgender individuals of all age groups especially sexually active people, and vulnerable groups like drug abusers, sex workers etc.,**
- **Ability to teach and train different persons from undergraduate students, health care workers and community about STDs and STIs including HIV.**
- **Attain adequate knowledge of management of patients through a “work-based, hands- on” curriculum which entails 1) supervised management of patients,2) ward duties,3) 24 hour “on-call duties” which requires one to attend dermatological emergencies.**
- **Attain adequate knowledge of management of complex dermatology problems by attending consultations from other specialties,and attending multidisciplinary clinics and meetings.**

- Describe methods, indications, and interpretation of common Dermatology, Venereology and Leprosy laboratory procedures.
- Describe method, indications, contraindications and complications of common dermatosurgical and cosmetic procedures, phototherapy, patch tests, Lasers, and injectables.
- Demonstrate adequate knowledge of acquiring consent prior to performing procedures and taking clinical photographs.
- Identify social and economic determinants in a given case, and take them into account for planning therapeutic measures
- Recognize conditions that may be outside the area of his specialty/competence and to refer them to the appropriate specialist.

### **Skills:**

- Record the patient's history in a structured format that benefits the patient and allows the physician to arrive at a diagnosis. This applies to both out-patient and in-patient setting with emphasis on patient confidentiality and effective time management (OPD setting).
- Perform a structured clinical examination of patients with Dermatology, Venereology and Leprosy related problems taking into account the specific systems that need to be examined in patients with Leprosy and Venereology related problems. Document clinical findings using acceptable terminology (relevant to DVL) in a structured manner.
- Document in- patient problems in a problem sheet with the management and discharge plan.
- Document progress, treatment, complications and the intervention strategies adopted in the care of in- patients.
- Provide treatment according to available best clinical evidence keeping in mind the economic impact of treatment on the patient.



- Perform and interpret results of common laboratory and other procedures relevant to Dermatology, Venereology and Leprosy.
- Interpret the histopathological features of benign and malignant diseases relevant to Dermatology, Venereology and Leprosy.
- Perform common dermatosurgical procedures in a safe and sterile environment.
- Provide basic and advanced life saving support services (BLS ) in emergency situations

## **Safety and Quality:**

Contribute to the safety of patients, self and community:

1. Regular audits of patient records, treatment administered, and guidelines followed
2. Report suspected adverse drug reactions
3. Report adverse event occurring during surgical and other procedures
4. Report needle stick injury and spills
5. External quality check of procedures done in the laboratory
6. Proper disposal of hospital wastes

## **BEHAVIOR**

**Affective Domain: Human values, Ethical practice and Communication, Partnership, Leadership and Teamwork abilities**

- Adopt ethical principles in all aspects of his/her practice.
- Be aware of personal prejudices and judgmental attitude when confronted with diseases such as HIV, STDs, and leprosy. One should be able to deal with these positively through self-reflection or counseling.

- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Develop partnership, leadership and teamwork abilities with colleagues, subordinates and others in the departments and in the community.
- Apply ethical standards while carrying out human or animal research.
- Recognize limitations in his knowledge and skill and refer to more competent colleagues, when needed.
- Observe professional decorum regarding comments on diagnostic or management practices of professional colleagues.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

**Maintaining trust**

**Maintaining trust with patients.**

**Maintaining confidentiality and concern about the community in managing the various diseases of his/her specialty.**

**Application of the best of his/her knowledge for the well-being of the patient/community.**

### **Learning Objectives for Diploma DVL students (Venereology)**

**STDs- Sexually Transmitted Diseases, STIs - Sexually Transmitted Infections, PEP- Post Exposure Prophylaxis, HIV- Human Immunodeficiency Virus, ART – Anti Retrovirus Therapy, NACP – National AIDS Control Program, FSW – Female Sex Worker, MSM – Men having Sex with Men, TG – Transgender, HAART – Highly Active Anti Retroviral Therapy, RPR – rapid Plasma Reagin Test, ViAViLi Test – Visual Inspection of Cervix with Acetic Acid and Lugols Iodine.**

### **III.COMPONENTS OF THE POST GRADUATE CURRICULUM**

- ***Theoretical Knowledge***
- ***Practical and Clinical Skills***
- ***Writing Thesis/Research Articles***
- ***Attitudes including Communication Skills***
- ***Training in Medical Ethics /Bioethics and Medicolegal aspects***

*Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.*

*Medical ethics, bioethics, moral and legal issues and medical audit are part and parcel of the curriculum and syllabus.*

### **IV. THEORY SYLLABUS**

#### **Dermatology**

***(Source: ROOK'S TEXT BOOK OF DERMATOLOGY  
Volume 1-4, Ninth Edition, 2016***

***Edited by – Christopher Griffiths, Jonathan Barker, Tanya Bleiker, Robert Chalmers, Daniel Creamer)***

- 1.History of Dermatology**
- 2.Structure and Function of the Skin**
- 3.Histopathology of the Skin: General Principles**
- 4.Diagnosis of Skin Disease**
- 5.Epidemiology of Skin Disease**
- 6.Health Economics and Skin Disease**
- 7.Genetics and the Skin**
- 8.Inflammation, Immunology and Allergy**
- 9.Photobiology**
- 10.Cutaneous Response to Injury and Wound Healing**
- 11.Psychological and Social Impact of Long-term Dermatological Diseases**
- 12.Adverse Immunological Reactions to Drugs**

- 13.Topical Drug Delivery**
- 14.ClinicalPharmacology**
- 15.Principles of Holistic Management of Skin Disease**
- 16.Principles of Measurement and Assessment in Dermatology**
- 17.Principles of Evidence-based Dermatology**
- 18.Principles of Topical Therapy**
- 19.Principles of Systemic Therapy**
- 20.Principles of Skin Surgery**
- 21.Principles of Phototherapy**
- 22.Principles of Photodynamic Therapy**
- 23.Principles of Cutaneous Laser Therapy**
- 24.Principles of Radiotherapy**
- 25.Viral Infections**
- 26.Bacterial Infections**
- 27.Mycobacterial Infections**
- 28.HIV and the Skin**
- 29.Fungal Infections**
- 30.Parasitic Diseases**
- 31.Arthropods**
- 32.Psoriasis and Related Disorders**
- 33.Pityriasis Rubra Pilaris**
- 34.Lichen Planus and Lichenoid Disorders**
- 35.Graft-versus-host Disease**
- 36.Eczematous Disorders**
- 37.Seborrhoeic Dermatitis**
- 38.Atopic Eczema**
- 39.Urticaria**
- 40.Recurrent Angio-oedema without Wheals**
- 41.Urticarial Vasculitis**
- 42.Autoinflammatory Diseases Presenting in the Skin**

43. Mastocytosis
44. Reactive Inflammatory Erythemas
45. Adamantiades–Behcet Disease
46. Neutrophilic Dermatoses
47. Immunobullous Diseases
48. Lupus Erythematosus
49. Antiphospholipid Syndrome
50. Dermatomyositis
51. Mixed Connective Tissue Disease
52. Dermatological Manifestations of Rheumatoid Disease
53. Systemic Sclerosis
54. Morphoea and Allied Scarring and Sclerosing Inflammatory Dermatoses
55. Cutaneous Amyloidoses
56. Cutaneous Mucinoses
57. Cutaneous Porphyrias
58. Calcification of the Skin and Subcutaneous Tissue
59. Xanthomas and Abnormalities of Lipid Metabolism and Storage
60. Nutritional Disorders Affecting the Skin
61. Skin Disorders in Diabetes Mellitus
62. Inherited Disorders of Cornification
63. Inherited Acantholytic Disorders
64. Ectodermal Dysplasias
65. Inherited Hair Disorders
66. Genetic Defects of Nails and Nail Growth
67. Genetic Disorders of Pigmentation
68. Genetic Blistering Diseases
69. Genetic Disorders of Collagen, Elastin and Dermal Matrix
70. Disorders Affecting Cutaneous Vasculature
71. Genetic Disorders of Adipose Tissue
72. Congenital Naevi and Other Developmental Abnormalities Affecting the Skin

- 73.Chromosomal Disorders**
- 74.Poikiloderma Syndromes**
- 75.DNA Repair Disorders with Cutaneous Features**
- 76.Syndromes with Premature Ageing**
- 77Hamartoneoplastic Syndromes**
- 78.Inherited Metabolic Diseases**
- 79.Inherited Immunodeficiency**
- 80.Pruritus, Prurigo and Lichen Simplex**
- 81.Mucocutaneous Pain Syndromes**
- 82.Neurological Conditions Affecting the Skin**
- 83.PsychodermatologyandPsychocutaneous Disease**
- 84.Acquired Disorders of Epidermal Keratinization**
- 85.Acquired Pigmentary Disorders**
- 86.Acquired Disorders of Hair**
- 87.Acne**
- 88.Rosacea**
- 89.HidradenitisSuppurativa**
- 90.Other Acquired Disorders of the Pilosebaceous Unit**
- 91.Disorders of the Sweat Glands**
- 92.Acquired Disorders of the Nails and Nail Unit**
- 93.Acquired Disorders of Dermal Connective Tissue**
- 94.Granulomatous Disorders of the Skin**
- 95.Sarcoidosis**
- 96.Panniculitis**
- 97.Other Acquired Disorders of Subcutaneous Fat**
- 98.Vascular Disorders Involving the Skin**
- 99.Purpura**
- 100.Cutaneous Vasculitis**
- 101.Dermatoses Resulting from Disorders of the Veins and Arteries**
- 102.Ulceration Resulting from Disorders of the Veins and Arteries**

- 103. Disorders of the Lymphatic Vessels**
- 104. Flushing and Blushing**
- 105. Dermatoses of the Scalp**
- 106. Dermatoses of the External Ear**
- 107. Dermatoses of the Eye, Eyelids and Eyebrows**
- 108. Dermatoses of the Oral Cavity and Lips**
- 109. Dermatoses of the Male Genitalia**
- 110. Dermatoses of the Female Genitalia**
- 111. Dermatoses of Perineal and Perianal Skin**
- 112. Cutaneous Complications of Stomas and Fistulae**
- 113. Dermatoses of Pregnancy**
- 114. Dermatoses of the Neonate**
- 115. Dermatoses and Haemangiomas of Infancy**
- 116. Benign Cutaneous Adverse Reactions to Drugs**
- 117. Severe Cutaneous Adverse Reactions to Drugs**
- 118. Cutaneous Side Effects of Chemotherapy and Radiotherapy**
- 119. Dermatoses Induced by Illicit Drugs**
- 120. Dermatological Manifestations of Metal Poisoning**
- 121. Mechanical Injury to the Skin**
- 122. Pressure Injury and Pressure Ulcers**
- 123. Cutaneous Reactions to Cold and Heat**
- 124. Burns and Heat Injury**
- 125. Cutaneous Photosensitivity Diseases**
- 126. Allergic Contact Dermatitis**
- 127. Irritant Contact Dermatitis**
- 128. Occupational Dermatology**
- 129. Stings and Bites**
- 130. Benign Melanocytic Proliferations and Melanocytic Naevi**
- 131. Benign Keratinocytic Acanthomas and Proliferations**
- 132. Cutaneous Cysts**

- 133.Lymphocytic Infiltrates**
  - 134.Cutaneous Histiocytoses**
  - 135.Soft-tissue Tumours and Tumour-like Conditions**
  - 136.Tumours of Skin Appendages**
  - 137.Kaposi Sarcoma**
  - 138.Cutaneous Lymphomas**
  - 139.Basal Cell Carcinoma**
  - 140.Squamous Cell Carcinoma and its Precursors**
  - 141.Melanoma Melanoma Clinicopathology Systemic Treatment of Melanoma**
  - 142.Dermoscopy of Melanoma and Naevi**
  - 143.Merkel Cell Carcinoma**
  - 144.Skin Cancer in the Immunocompromised Patient**
  - 145.Cutaneous Markers of Internal Malignancy**
  - 146.The Skin and Disorders of the Haematopoietic and Immune Systems**
  - 147.The Skin and Endocrine Disorders**
  - 148.The Skin and Disorders of the Heart**
  - 149.The Skin and Disorders of the Respiratory System**
  - 150.The Skin and Disorders of the Digestive System**
  - 151.The Skin and Disorders of the Kidney and Urinary Tract**
  - 152.The Skin and Disorders of the Musculoskeletal System**
  - 153.Skin Ageing**
  - 154.Cosmeceuticals**
  - 155.Soft Tissue Augmentation (Fillers)**
  - 156.Aesthetic Uses of Botulinum Toxins**
  - 157.Chemical Peels**
  - 158.Lasers and Energy-based Devices**
  - Sexually Transmitted Infections**
- (Source: SEXUALLY TRANSMITTED INFECTIONS 2<sup>nd</sup> edition  
Editors: Dr. Somesh Gupta & Bhushan Kumar)*

## **1. Historical aspects of Sexually Transmitted Infections**



2. **Global Epidemiology of Sexually Transmitted infections**
3. **Global Epidemiology of HIV infection**
4. **Sexual Behavior and Sexually Transmitted infections**
5. **Prevention strategies for the control of sexually transmitted infections**
  6. **Behavioral and counseling aspects of sexually transmitted infections**

(Including HIV)
7. **Condoms and other Barrier methods of STI and HIV prevention**
  8. **Prevention of HIV and other Sexually Transmitted Infections: Male**

circumcision
9. **Microbicides for prevention of Sexually Transmitted Infections**
10. **Vaccines for Sexually Transmissible infections**
11. **Vaccines for HIV**
12. **Partner Notification for Sexually Transmitted Diseases**
13. **Implementation of STI programs**
14. **Monitoring and Evaluating Sexually Transmitted Infection Control Programs**
15. **Anatomy of the Male Genital Tract**
16. **Anatomy of the Female Genital Tract**
17. **Normal Genital Flora**
18. **History and Physical examination**
19. **Genital Mucosal Immunity Against Sexually Transmitted Infections**
20. **Laboratory Diagnosis of Sexually Transmitted Infections**
21. **Rapid tests for the Detection of Sexually Transmitted infections**
22. **Genital herpes simplex infections**
23. **Anogenital Human Papillomavirus infection: Natural History: Epidemiology, and vaccination**
24. **Anogenital Warts, Intraepithelial Neoplasia and their clinical management**
25. **Molluscum Contagiosum**
26. **Hepatitis Viruses**
27. **Human Cytomegalovirus infection**
28. **Epstein-Barr Virus Infections**
29. **Kaposi Sarcoma Herpesvirus**
30. **Infectious Syphilis**
31. **Late Syphilis**
32. **Endemic Treponematoses**
33. **Gonococcal Infections**
34. **Chlamydia Trachomatis Infections**
35. **Lymphogranuloma Venereum**
36. **Chancroid**
37. **Donovanosis**
38. **Bacterial Vaginosis**
39. **Pelvic Inflammatory disease**
40. **Genital Mycoplasmas**
41. **Sexually Transmitted Anorectal Infections and Enteric Bacterial Infections**
42. **Genital Candidal Infections**

43. **Trichomonas vaginalis Infections**
44. **Intestinal Protozoa**
45. **The syndromic approach for the management of STIs: An overview**
46. **Genital Ulcer-Adenopathy syndrome**
47. **Urethral Discharge**
48. **Epididymitis and Epididymo-orchitis**
49. **Abnormal Vaginal Discharge: Syndromic management**
50. **Syndromic Management of Lower Abdominal pain in women**
51. **Inguinal and Femoral Bubo**
52. **Vulvar Vestibulitis Syndrome**
53. **Male Genital pain syndromes**
54. **Ocular Manifestations of Sexually transmitted infections**
55. **Arthritis associated with sexually transmitted infections**
56. **Human Immunodeficiency Virus: Biology and Natural history of infections**
57. **HIV Diagnosis**
58. **Pharmacology of Antiretroviral Drugs**
59. **Surrogate Markers of Antiretroviral Efficacy**
60. **Antiretroviral Drugs for HIV Prevention**
61. **Acute HIV infection**
62. **Opportunistic Infections**
63. **Mucocutaneous Manifestations of HIV**
64. **Pulmonary Manifestations of HIV Disease**
65. **Neurological Manifestations of HIV**
66. **Gastrointestinal Manifestations of HIV Infections and AIDS**
67. **Renal Manifestations of HIV Infection and AIDS**
68. **HIV and Endocrine Manifestations**
69. **AIDS Associated Malignancies and their treatment**
70. **Rheumatic Manifestations of HIV and AIDS**
71. **Cardiac Involvement in HIV Infection/AIDS**
72. **Ocular Manifestations of HIV Infection and AIDS**
73. **Sexually Transmitted Infections in HIV-Infected Patients**
74. **Human Immunodeficiency Virus infection in women**
75. **HIV in children**
76. **HIV infection in Homosexual Men**
77. **HIV in blood and blood product recipients**
78. **HIV in Injection and other drugs users**
79. **Sexually transmitted infections and pregnancy**
80. **Sexually Transmitted infections in Neonates and Infants**
81. **Congenital Syphilis**
82. **Sexually Transmitted Infections and Infertility**
83. **Aging, Sexual Behavior, and HIV/STI Risk**
84. **Sexually Transmitted infections in the Female Sex Worker Community**
85. **Sexually Transmitted Infections Associated with Sexual Assault**
86. **Sexual Health of Migrant Populations**
87. **Human Sexuality**

88. Homosexuality, Bisexuality and Sexual Orientation
89. Sexually Transmitted Infections among women who have Sex with Women
90. Sexually Transmitted Infections in Transgender
91. Sexual Abuse in Children
92. Male Sexual Dysfunction
93. Women's Sexual Dysfunction
94. Sexuality Education for Young People
95. Dhat Syndrome: A Culture Bound Sex Related disorder in Indian Subcontinent
96. Clinical Services for Sexually Transmitted Infections and HIV
97. Medicolegal Aspects of Sexually Transmitted Infections and Sexual Assault
98. Sexually Transmitted Infections: Screening and Diagnostic Practices
99. Sexually Transmitted Infections Related Genital Neoplasias
100. HIV, Sexually Transmitted Infections, and Human Right
101. Animal Models of Sexually Transmitted Infections
- Guidelines for the Treatment of HIV and AIDS in Resource Limited Countries
102. Guidelines for Prevention of Perinatal HIV Infection
103. Guidelines for the Management of HIV-Associated opportunities Infections Leprosy

***(Source: IAL TEXT BOOK OF LEPROSY***

***Editors: Dr. Bhushan Kumar & Hemanta Kumar Kar 2<sup>nd</sup> edition, 2016)***

1. History of Leprosy in India: A Historical overview from Antiquity to the introduction of MDT
2. Epidemiology of Leprosy
3. Global Leprosy situation: Historical perspective, Achievements, Challenges and future steps
4. Changing National Scenario, National Leprosy Control programmes, National Leprosy Eradication Programme, and New Paradigms of Leprosy Control
5. Immunogenetics of Leprosy
6. Bacteriology of Leprosy
7. Immunological Aspects
8. Biochemical Aspects of Leprosy
9. Pathological Aspects of Leprosy
10. Structure Electrophysiological and Ultrasonographics studies of Peripheral Nerve
11. Pathomechanisms of Nerve Damage

12. Naturally occurring Leprosy: Mycobacterium leprae and other environmental mycobacteria in Nature
13. Experimental Leprosy: Contributions of Animal Models to Leprosy Research
14. History taking and clinical examination
15. Case definition and clinical types of Leprosy
16. Classification
17. Methods of Nerve examination
18. Histoid Leprosy
19. Laboratory diagnosis
20. Serological and molecular diagnosis of leprosy
21. Differential diagnosis of Dermatological Disorders in relation to Leprosy
22. Differential diagnosis of Neurological disorders in relation to Leprosy
23. Systemic involvement in Leprosy
24. Leprosy and Human immunodeficiency virus coinfection
25. Leprosy and pregnancy
26. Childhood Leprosy
27. Ocular Leprosy
28. Neuritis: Definition, Clinicopathological manifestations and Proforma to record nerve impairment in Leprosy
29. Leprosy Reactions: Pathogenesis and clinical features
30. Chemotherapy of Leprosy
31. Chemotherapy: Development and evolution of WHO-MDT and Newer treatment regimens
32. Management of Leprosy reactions
33. Management of neuritis and neuropathic pain
34. Chemoprophylaxis in Leprosy
35. Leprosy vaccine: Immunoprophylaxis and Immunotherapy
36. Nursing care in Leprosy patients
37. Deformities of Face, Hands, Feet and Ulcers and their management
38. Deformity and Disability prevention
39. Relapse in Leprosy
40. Drug resistance in Leprosy
41. Morbidity and Mortality in Leprosy Rehabilitation
42. Community-based initiatives in Comprehensive Leprosy Work
43. Psychosocial Aspects in Leprosy
44. Human Rights and Stigma in Leprosy
45. Health Promotion, Education and Counseling
46. Role of NGOs in National Leprosy Eradication Programme

## **V. TEACHING AND LEARNING METHODS**

**The emphasis should be on patient oriented learning**

- i. Acquire skills in clerking patients and communication through structured bedside clinics.**
- ii. “On the job teaching” by faculty in the OPD and during ward rounds.**
- iii. “One-One” or small group teaching of dermatosurgery and other procedures**
- iv. Grand rounds**
- v. Structured “class-room” based clinics to prepare the candidate for the final summative exam (University)**
- vi. Monthly Seminars**
- vii. Monthly Symposia**
- viii. Weekly Journal clubs**
- ix. Group discussions**
- x. Multidisciplinary team meetings- Skin malignancies, Leprosy, Tuberculosis, HIV, Genodermatoses, and for management of leprosy reactions.**
- xi. Tutorials- dermatopathology, clinical microbiology and virology, instruments**
- xii. Didactic lectures (optional)**
- xiii. Students should be encouraged to attend the following training programmes to attain basic competence in: Biostatistics, Research Methodology, Medical Ethics, Good medical practice, Communication skills, Medical education**
- xiv. Students should update their knowledge through attendance of subject related CMEs, workshops and conferences.**
- xv. However during any of the above training postings, the Postgraduates will be attached to the Dermatology Department.**

**VI. STRUCTURED TRAINING PROGRAM FOR DIPLOMA COURSE- DVL  
(2 years DIPLOMA – DD DVL COURSE)**

The Students will be in the Department of Dermatology during their course period. However, the Students are encouraged to undergo special postings for learning new advanced techniques / Procedure / Skills in institutions of higher reputaion where the request facilities are available without affecting the duties of the parent department

| <b>S. No</b> | <b>First Year</b>                                                                                                                                                                                                                                                                                    | <b>Final Year (Second Year)</b>                                                                                                                                                                                                                                                                                                           |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b>     | <b>Knowledge : General Dermatology, Leprosy and Venereology including basic sciences, pathology, clinical microbiology and virology</b>                                                                                                                                                              | <b>General Dermatology, Leprosy and Venereology including basic sciences therapeutics, pathology, clinical microbiology and virology</b>                                                                                                                                                                                                  |
| <b>2</b>     | <b>General DVL OPD clinics (minimum of 3/week) and ward postings- minimum of 6 months/year</b><br><br><b>Special clinics: Vitiligo, Pigmentary, immunobullous, contact dermatitis, connective tissue diseases, psoriasis, Pediatric Dermatology Leprosy / POD(Prevention of Deformity), and STI,</b> | <b>General DVL OPD clinics (minimum of 3/week)and ward postings-minimum of 6 months/year</b><br><br><b>Special clinics: Vitiligo, Pigmentary, immunobullous, contact dermatitis, connective tissue diseases, psoriasis, Pediatric Dermatology, Leprosy / POD, POP window dressing and STI</b>                                             |
| <b>3</b>     | <b>1.Elicit history and perform a clinical examination, arrive at a diagnosis, list differential diagnosis, select appropriate investigations and device a treatment plan.</b>                                                                                                                       | <b>1.Elicit history and perform a clinical examination, arrive at a diagnosis, list differential diagnosis, select appropriate investigations and device a treatment plan. Provide information about the disease in terms of prognosis, complications and treatment outcome. Counseling and follow up of patients should be advocated</b> |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 | <p><b>Procedural skills for trainees:</b></p> <ol style="list-style-type: none"> <li>1. Hand washing and sterile technique for procedures.</li> <li>2. Take an informed consent for procedures</li> <li>3. Methods of administration of local anesthesia for biopsies and other procedures</li> <li>4. Biopsies: Skin (punch, shave, elliptical, wedge) biopsies under sterile conditions, under supervision</li> <li>5. Describe histological features of common diseases including leprosy</li> <li>6. Intralesional injections</li> <li>7. Cryotherapy</li> <li>8. Paring</li> <li>9. Nail Avulsion</li> <li>10. Electrosurgery</li> <li>11. Radiofrequency surgery</li> <li>12. Molluscum needling</li> <li>13. Chemical cautery</li> <li>14. Auto Inoculation of Wart</li> <li>15. Vitiligo grafting</li> <li>16. Acne Scar Surgeries</li> <li>17. Dermaroller</li> <li>18. PRP</li> </ol> | <p><b>Procedural skills for trainees: (in addition procedural skills attained in 1<sup>st</sup> year )</b></p> <ol style="list-style-type: none"> <li>1. Biopsies: nail, oral, nerve biopsies (under supervision)</li> <li>2. Phototherapy- Administer Narrow UVB, PUVA, targeted phototherapy, hand and foot phototherapy, bath PUVA, soak PUVA</li> <li>3. Perform Patch tests-standard and photopatch, interpret results and counsel</li> <li>4. Perform Contact immunotherapy for alopecia areata</li> <li>5. Perform a drug challenge (under supervision)</li> <li>6. Administer all Dermatology, Leprosy and Venereology related drugs and biologics in appropriate doses under supervision, after counseling patients on the side effects, expected benefits, interactions and teratogenic potential</li> <li>7. Describe histologic features of common benign and malignant lesions and leprosy, interpret special stains and immunohistochemistry</li> <li>8. Observe preparation (grossing, staining) of dermatopathology specimens. (optional)</li> <li>9. Observe direct and indirect immunofluorescence procedures of immunobullous and connective tissue diseases (Optional)</li> <li>10. Microbiology and Virology:             <ol style="list-style-type: none"> <li>i) Learn techniques of plating and culture of bacteria associated with skin</li> </ol> </li> </ol> |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 | <p><b>Safety and Quality–Trainees should:</b></p> <ol style="list-style-type: none"> <li>1.Report adverse events during procedures to the supervisor</li> <li>2. Report needle stick injuries</li> <li>3. Be able to dispose medical waste correctly</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <p><b>Safety and Quality</b></p> <ol style="list-style-type: none"> <li>1.Report adverse drug reactions</li> </ol> <p><i>In addition to those already mentioned (1<sup>st</sup> year)</i></p>                                                                                                                                                                                                                                                                                                     |
| 6 | <p><b>Dermatology Laboratory:</b></p> <ol style="list-style-type: none"> <li>1.Learn methods for appropriate specimen collection- pus culture, throat culture, nasal swab,Tzanck smear, herpes culture, fungal culture, Mycobacterium Tb and atypical Mycobacteria, Leishmaniasis, and STIs</li> <li>2.Trainees should be trained to perform KOH, Gram stain, Leishman’s stain/ Giemsa stain, Tzanck, , ZN stain, demonstrate sclerotic bodies</li> </ol> <p>Leprosy- Perform slit skin smears, stain and interpret slides</p> <p>STI-Students should be able to identify STI pathogens- trichomonas, gonococci, H.ducreyi, clue cells and Donovan bodies. Should be able to identify MNGs in herpetic infections</p> <p>Dark field examination for treponema pallidum</p> | <p><b>Dermatology Laboratory:</b> Trainees should be able to perform KOH, Gram stain, Leishman’s stain/ Giemsa stain, Tzanck smear , ZN stain, demonstrate sclerotic bodies</p> <p>Leprosy- Perform slit skin smears, stain, interpret slides , Calculate BI and MI and POP cost /window dressing</p> <p>STI-Students should be able to identify STI pathogens- trichomonas, gonococci, H.ducreyi, clue cells and Donovan bodies</p> <p>Perform Dark field examination for treponema pallidum</p> |
| 7 | <p><b>Dermatology emergencies- Trainees should attend to dermatology emergencies during their 24 hour “on call” duties under supervision</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p><b>Dermatology emergencies- Trainees should attend to dermatology emergencies during their 24 hour “on call” duties under supervision</b></p>                                                                                                                                                                                                                                                                                                                                                  |
| 8 | <p><b>Internal rotation:</b></p> <p>Venereology posting – 3months / year – This is for Institutions where Venereology is present as a separate department.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p><b>Community dermatology</b></p> <ol style="list-style-type: none"> <li>1.Attend school and other DVL related camps (optional)</li> </ol>                                                                                                                                                                                                                                                                                                                                                      |



|   |                                                              |                                                                                                                           |
|---|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| 9 | <b>Academic Activities</b><br><b>Attend CME-1 (optional)</b> | <b>Academic activities</b><br><b>Attend National and State level conference -CME</b><br><br><b>Undergraduate teaching</b> |
|---|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|

### **Leprosy**

| <b>First Year</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Final Year (Second Year)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. Trainees should be able to take a history, examine skin lesions, peripheral nerves, perform a sensory-motor examination and record findings, list deformities and signs of reaction and classify the disease</p> <p>2.Trainees should learn to counsel patients and attenders about early signs and symptoms of leprosy, ameliorating the taboo against leprosy .</p> <p>3. Trainees should develop skills in interacting with the patients, persuading them to bring the family members for examination</p> <p>4. Stress should be given to acquire knowledge on medical ,occupational and social rehabilitation of patients</p> | <p>1.Trainees should be able to take a focused history, perform a relevant clinical examination, do slit skin smears for AFB, interpret results, treat and counsel patients with leprosy.</p> <p>2. Trainees should attain a sound knowledge of the principles of rehabilitative surgery, use of prostheses and disability prevention.</p> <p>3. Trainees should be encouraged to attend various camps organized at periphery level by district authorities.</p> <p>4. Trainees should take part in health education regarding prevention of damage to eyes, deformities of limbs.</p> <p>5.Trainees should be posted to leprosy homes rehabilitation centres, district leprosy hospitals for Institutions where leprosy patient load is inadequate for satisfactory training of postgraduates</p> |

| Knowledge Skills                                                 | Attitude Skills                                     | Psychomotor Skills                                    |
|------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------|
| <b><u>First Year</u></b>                                         |                                                     |                                                       |
| Classification of STDS                                           | Communication skills and Case holding               | Blood sample collection, labeling                     |
| Impact of STDs on the World – past, present and future           | Non Judgmental and Non Moralistic history taking    | Smear preparation, Staining and microscopy            |
| Incubation period and Window period and their importance in STDS | Psychological impact of STDS                        | Examination of a patient and describing the findings. |
| Difference between STDs and STIs                                 |                                                     | Disposal of Waste                                     |
| Hospital Waste Management                                        |                                                     |                                                       |
| <b><u>Second Year (in addition to 1<sup>st</sup> year)</u></b>   |                                                     |                                                       |
| Syndromic Management and other Managements of STDS               | Attitude towards HRB persons like FSW, MSM, TGs etc | RPR Test, HIV Test, Smear preparation from lesions    |
| PEP for HIV                                                      | Pre test and Post test Counseling for HIV           | Vaginal Speculum examination                          |
| Complications of STDs                                            | Sexual Orientation                                  | ViAViLi Testing                                       |
| Gender Identity, Gender Role                                     | Initiation of HAART                                 | Colposcopy (Optional)                                 |
| Human Sexual Behavior and Sexual Response cycle, Sex problems    | Premarital and Pre employment testing               | Podophylline application                              |
| ART drugs                                                        | Partner revelations, Partner Participation,         | Prostatic massage                                     |
| Govt. Program(NACP)                                              | Follow Up Skills                                    | Paraphimosis reduction (Optional)                     |
| Legal aspects of STDs, Sex and Sexuality                         | Case reporting                                      | Semen analysis, and Circumcision(Optional)            |

|                                                                                         |                      |                            |
|-----------------------------------------------------------------------------------------|----------------------|----------------------------|
| Use of newer investigations tools in the management of STDs                             | Partner notification | Lumbar Puncture (Optional) |
| Vaccines in STDS                                                                        |                      | Proctoscopy                |
| Sex Reconstruction Surgery                                                              |                      |                            |
| Pre marital and Pre employment tests                                                    |                      |                            |
| Interpretation of tests                                                                 |                      |                            |
| Marriage and STDs, Infertility                                                          |                      |                            |
| ART Failure and 2 <sup>nd</sup> line ART, Resistance and Reinfection, Partner treatment |                      |                            |
| Emergency contraception                                                                 |                      |                            |

**VII. Evaluation of the candidates in both theory and practicals will help the candidate in improvement of his/her knowledge, skills and attitude.**

#### **VIII. COMPETENCY ASSESSMENT:**

|                                                                                                                     |    |                 |
|---------------------------------------------------------------------------------------------------------------------|----|-----------------|
| <b>1. OVERALL:</b>                                                                                                  |    |                 |
| a) Communication / commitment / Contribution / Compassion towards patients and Innovation                           | () | - 5 Marks       |
| b) Implementation of newly learnt techniques /Skills                                                                | () |                 |
| 2. Number of cases presented in Clinical Meetings/ Journal clubs/seminars                                           |    | - 5 marks       |
| 3. Number of Posters/Papers presented in Conferences/ Publications and Research Projects                            |    | - 5 marks       |
| 4. No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. |    | - 5 marks       |
| <b>Total</b>                                                                                                        |    | <b>20 Marks</b> |

#### PG CLINICAL COURSES

|                                      |                      |
|--------------------------------------|----------------------|
| VIVA including Competency Assessment | - 80 Marks (60 + 20) |
| Log Book                             | - 20 marks           |

**ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

**IX.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:**

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

**X. THEORY EXAMINATION:**

**Paper I - Applied Basic sciences in relation to the Dermatology, Venereology & Leprosy**

**Paper II - Principles of Dermatology, Diagnosis and Therapeutics**

**Paper III - Venereology and Leprology**

**Question paper pattern:**

**PAPER – I**

**Sec. A – (Dermatology & Leprosy)**

Elaborate on  $1 \times 15 = 15$

Write Notes on  $7 \times 7 = 49$

**Sec. B – (Venereology)**

Elaborate on  $1 \times 15 = 15$

Write Notes on  $3 \times 7 = 21$

**PAPER – II**

Elaborate on  $2 \times 15 = 30$

Write Notes on  $10 \times 7 = 70$

### **PAPER – III**

#### **Sec. A – (Leprology)**

Elaborate on  $1 \times 15 = 15$

Write Notes on  $5 \times 7 = 35$

#### **Sec. B – (Venereology )**

Elaborate on  $1 \times 15 = 15$

Write Notes on  $5 \times 7 = 35$

### **XI. CLINICAL EXAMINATION:**

#### **DIPLOMA IN DERMATOLOGY VENEREOLOGY & LEPROSY (Dip. DVL)**

|                                                                                       |                                                                   |                        |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------|
| <b>CLINICALS</b>                                                                      |                                                                   |                        |
| <b>One Long case x 50 marks</b>                                                       |                                                                   | <b>50 Marks</b>        |
| <b>Two short cases x 25 Marks<br/>(Leprosy 1 + STD 1)</b>                             |                                                                   | <b>50 Marks</b>        |
| <b>Ward rounds - and Spotters –<br/>(Ward rounds - 20 Marks + Spotters -30 Marks)</b> |                                                                   | <b>50 Marks</b>        |
| <b>OSCE (10 Stations x 5 marks)</b>                                                   |                                                                   | <b>50 Marks</b>        |
| <b>Clinical Total</b>                                                                 |                                                                   | <b>200Marks(A)</b>     |
| <b>VIVA</b>                                                                           |                                                                   |                        |
| <b>Dermatology<br/>(Including<br/>Leprosy)<br/>40 + 10 marks</b>                      | <b>Discussion Instruments<br/>Drugs</b>                           | <b>80 Marks</b>        |
| <b>STD<br/>(10 marks)</b>                                                             | <b>Discussion<br/>Instruments<br/>Chats<br/>Kits &amp; Condom</b> |                        |
| <b>LOG BOOK</b>                                                                       |                                                                   | <b>20 Marks</b>        |
| <b>Viva</b>                                                                           |                                                                   | <b>100 Marks (B)</b>   |
| <b>Aggregate (Clinical + Viva Total)</b>                                              |                                                                   | <b>300 Marks (A+B)</b> |
| <b>Minimum required Pass Marks</b>                                                    |                                                                   | <b>150 Marks</b>       |

### Clinical Examination in DDVL Detailed

|                                                                                                                  |                  |
|------------------------------------------------------------------------------------------------------------------|------------------|
| <b>PARTICULARS</b>                                                                                               |                  |
| <b>Clinical</b><br>Long case 1 x 50 = 50 Marks<br>Short case 2 x 25 = 50 Marks                                   | <b>100 marks</b> |
| <b>Ward Rounds –</b><br>4 cases each 5 marks = 20 marks<br><b>Spotters –</b><br>10 spotters x 3 marks = 30 marks | <b>50 marks</b>  |
| <b>OSCE/OSPE – 10 Stations x 5 marks</b>                                                                         | <b>50 marks</b>  |
| <b>Viva – Voce including Competency Assessment</b>                                                               | <b>80 marks</b>  |
| <b>Log Book</b>                                                                                                  | <b>20 marks</b>  |
| <b>Total</b>                                                                                                     | <b>300 marks</b> |
| <b>Minimum for pass</b>                                                                                          | <b>150 marks</b> |

### **Clinical Exam Detail –DDVL**

| <b>I. LONG CASE</b>                                                                           |                                                           |                 |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------|
| <b>Duration : 40 mins<br/>for Examination;<br/>15 mins for Assessment<br/>Total – 55 mins</b> | <b>A)History</b>                                          | <b>10 marks</b> |
|                                                                                               | <b>B) Physical findings &amp; Clinical Bedside tests</b>  | <b>15 marks</b> |
|                                                                                               | <b>C) Diagnosis and differential Diagnoses</b>            | <b>5 marks</b>  |
|                                                                                               | <b>D) Management</b>                                      | <b>15marks</b>  |
|                                                                                               | <b>1. Investigation</b>                                   | <b>5 marks</b>  |
|                                                                                               | <b>2. General Measures</b>                                | <b>5 marks</b>  |
|                                                                                               | <b>3. Specific Treatment<br/>(Topical &amp; Systemic)</b> | <b>5 marks</b>  |
|                                                                                               | <b>E) Communication &amp; Counseling</b>                  | <b>5 marks</b>  |
| <b>Total</b>                                                                                  |                                                           | <b>50 marks</b> |

| <b>II. SHORT CASE</b>                                                                                   |                                                                                                        |                 |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-----------------|
| <b>STD</b><br><b>Examination 15 mins</b><br><b>Assessment 10 mins</b><br><br><b>Total – 25 mins</b>     | <b>Focused History</b>                                                                                 | <b>5 marks</b>  |
|                                                                                                         | <b>Physical Findings</b>                                                                               | <b>5 marks</b>  |
|                                                                                                         | <b>Investigations</b>                                                                                  | <b>3 marks</b>  |
|                                                                                                         | <b>Diagnosis and differential Diagnoses</b>                                                            | <b>3 marks</b>  |
|                                                                                                         | <b>Treatment</b>                                                                                       | <b>3 marks</b>  |
|                                                                                                         | <b>Counseling</b>                                                                                      | <b>3 marks</b>  |
|                                                                                                         | <b>Follow up / Partner Management</b>                                                                  | <b>3 marks</b>  |
| <b>Leprosy</b><br><b>Examination 15 mins</b><br><b>Assessment 10 mins</b><br><br><b>Total – 25 mins</b> | <b>Focused History</b>                                                                                 | <b>5 marks</b>  |
|                                                                                                         | <b>Physical Findings</b>                                                                               | <b>10 marks</b> |
|                                                                                                         | <b>Diagnosis</b>                                                                                       | <b>3 marks</b>  |
|                                                                                                         | <b>Management</b>                                                                                      | <b>7 marks</b>  |
|                                                                                                         | <b>Investigation</b> <b>Treatment</b><br><b>Medical Surgical, Counseling</b><br><b>&amp; Education</b> |                 |
| <b>Total (STD Case + Leprosy)</b>                                                                       |                                                                                                        | <b>50 marks</b> |

### **Spotters:**

**10 Spotters including at least 1 case/ case scenario of STD and 1 case/ case scenario of Leprosy**

**Total – 30 marks**

**Time – 30 mins**

**Each spotter- 3 mins**

**1 min for Examination**

**2 mins – Assessment**

**Ward Rounds (Management based discussion)**

**Four stations including 1 case/case scenario of STD and 1 case/case scenario of Leprosy**

**5 mins(3 + 2 mins) each station x 4    Total-20 mins**

**Marks: 5 marks each station x 4    - 20 marks**

## **XII. LOG BOOK**

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

### **13. VIVA**

#### **VIVA including competency assessment**

VIVA including Competency Assessment - 80 Marks (60 + 20)

|                                                       |                                          |                      |
|-------------------------------------------------------|------------------------------------------|----------------------|
| <b>DERMATOLOGY and LEPROSY</b><br>8- mins<br>50 marks | <b>General dermatology &amp; Leprosy</b> | <b>10 marks</b>      |
|                                                       | <b>Instruments</b>                       | <b>10 marks</b>      |
|                                                       | <b>Drugs</b>                             | <b>10 marks</b>      |
|                                                       | <b>Recent Advances</b>                   | <b>10 marks</b>      |
|                                                       | <b>Aesthetic / Dermato-surgery</b>       | <b>10 marks</b>      |
| <b>STD</b><br>2-mins<br>10 marks                      | <b>Applied Basics</b>                    | <b>10 marks</b>      |
|                                                       | <b>Instruments</b>                       |                      |
|                                                       | <b>Charts</b>                            |                      |
|                                                       | <b>Kit &amp; Condom</b>                  |                      |
| <b>Total</b>                                          |                                          | <b>60 marks</b>      |
| <b>Log book</b>                                       |                                          | <b>20 marks</b>      |
| <b>Viva</b>                                           |                                          | <b>80 marks</b>      |
| <b>Log Book + Viva</b>                                |                                          | <b>100 marks (B)</b> |



#### **14. OSCE /OSPE**

**10 Stations, Each -2 mins**

**Marks: 5 X 10 = 50 marks**

- 1. Histopathology – Malignancy**
- 2. Histopathology – Non-Malignancy**
- 3. Wet Mount / KOH / Tzanck / SSS / Grams Stain / Any culture**
- 4. STD Station I**
- 5. STD Station II**
- 6. Leprosy – Splint / Prosthesis**
- 7. Occupational Dermatology**
- 8. Dermato-surgery**
- 9. Aesthetic Dermatology**
- 10. X-rays / CT scans / MRI / Any image.**

#### **15.RECOMMENDED JOURNALS**

- 1) JAMA of Dermatology**
- 2) British Journal of Dermatology**
- 3) Indian Journal of Dermatology**
- 4) Indian Journal of Dermatology, Venereology & Leprosy**
- 5) Journal of American Academy of Dermatology**
- 6) Journal of European Academy of Dermatology & Venereology**
- 7) International Journal of Dermatology**
- 8) Seminars in Cutaneous Medicine & Surgery**
- 9) Clinical and Experimental Dermatology**
- 10) Journal of Investigative Dermatology**
- 11) Dermatology online**
- 12) Indian dermatology online journal**
- 13) Indian Journal of Leprosy**
- 14) Leprosy Review**
- 15) International Journal of STD & AIDS**
- 16) Indian journal of Sexually transmitted diseases**
- 17) Genitourinary Medicine**
- 18) Pediatric Dermatology**

**16.RECOMMENDED BOOKS (The latest Edition of the text books listed is recommended)**

- 1. *Rook's Text book of Dermatology.* Edited by Christopher Griffiths, Jonathan Barker, Tanya Bleiker, Robert Chalmers & Daniel Creamer. 9<sup>th</sup> edition.**
- 2. *Fitzpatrick's Dermatology in General Medicine.* Lowell A. Goldsmith, Stephen I. Katz, Barbara A. Gilchrest, Amy S. Paller, David J. Leffell, Klaus Wolff. 8<sup>th</sup> Edition**
- 3. *Dermatology (Bologna, Dermatology).* Jean L. Bologna MD, Joseph L. Jorizzo MD, Julie V. Schaffer MD, Jean L. Bologna, Joseph L. Jorizzo, Julie V. 3<sup>rd</sup> Edition**
- 4. *IADVL Text Book of Dermatology.* Editor S. Sacchidanand, Co-editors Chetan Oberai, Arun C. Inamadar. 4<sup>th</sup> edition**
- 5. *Andrew's Diseases of the Skin – Clinical Dermatology.* James DJ, Berger TG, Elston DM, Neuhaus 12<sup>th</sup> edition**
- 6. *Sexually Transmitted Diseases.* King K. Holmes, P. Frederick Sparling, Walter E. Stamm, Peter Piot, Judith N. Wasserheit, Lawrence Corey, Myron S. Cohen and D. Heather Watts. 4<sup>th</sup> edition.**
- 7. *Sexually Transmitted Infections,* Bhushan Kumar, Somesh Gupta. 2<sup>nd</sup> Edition.**
- 8. *Sexually Transmitted Diseases and HIV/AIDS.* Vinod K. Sharma. Second edition**
- 9. *Oxford Handbook of Genito Urinary Medicine, HIV and Sexual Health* Edited by Richard Pattman and K Nathan Sankar**
- 10. *Donovanosis* By R V Rajam and P N Rangiah, Published by WHO**
- 11. *Sexually Transmitted Infections The Facts* – David Barlow**
- 12. *Sexually Transmitted Infections and Sexually Transmitted Diseases* Edited by Gerd Gross and Stephen K Tyring**

- 13. *ABC of Sexually Transmitted Infections, Sixth Edition by Karen E Rogstad***
- 14. *Color atlas and synopsis of Sexually Transmitted Diseases, Third Edition by Hunter Handsfield***
- 15. *Sexually Transmitted Infections and HIV- An illustrated guide to management by VeerakathyHarindra, VerapolChandeying, and N. Usman***
- 16. *Websites of WHO, CDC and NACO for current updates***
- 17. *Hand book of Sexual dysfunction Edited by Richard Balon and R. Taylor Segraves***
- 18. *Textbook of Clinical Sexual Medicine by IsHak and Waguih***
- 19. *Leprosy, 2nd edition. Robert C. Hastings. Churchill. Livingstone: 1994***
- 20. *IAL text book of Leprosy. Editors Bhushan Kumar, Hemanta Kumar Kar. 2<sup>nd</sup> edition***
- 21. *Handbook of Leprosy. by W.H. Jopling***
- 22. *Dharmendra, Leprosy 2 Volumes – 1<sup>st</sup> Edition 1985, Samant and Company.***
- 23. *Histopathology of the Skin. Walter – F. Lever Gundula Schaumburg Lever, 11<sup>th</sup> edition.***
- 24. *Weedon'sSkin Pathology.4<sup>th</sup> edition***
- 25. *Comprehensive dermatologic drug therapy. Stephen E. Wolverton. 3<sup>rd</sup> edition.***

- 26. Fisher's Contact Dermatitis. Robert L. Rietschel, Joseph F. Fowler, Alexander A. Fisher. 6<sup>th</sup> edition**
- 27. Diseases of the nails and their management. Baran R, Dawber RPR, De Berker. 4<sup>th</sup> edition**
- 28. A Textbook of Skin Disorders of Childhood and Adolescence. Hurwitz Clinical Pediatric Dermatology. Amy S Paller, Anthony J. Mancini MD. 5th Edition.**
- 29. Dermatological Signs of Systemic Disease. Jeffrey Callen Joseph Jorizzo John Zone Warren Piette Misha Rosenbach Ruth Ann Vleugel. 5th Edition.**
- 30. Surgical Management of Vitiligo. Somesh Gupta, Mats J. Olsson, Amrinder J. Kanwar, Jean-Paul Ortonne**
- 31. ACS(I) Textbook on Cutaneous and Aesthetic Surgery Hardcover – 2012 by Venkataram .**
- 32. Text Book & Atlas of Dermato Surgery & Cosmetology. Satish S. Savant, Radha Atalshah, Deepak Gore**

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

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**DIPLOMA IN OBSTETRICS &  
GYNECOLOGY (DGO)**

## **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

### **DIPLOMA IN OBSTETRICS & GYNECOLOGY (DGO)**

#### **1.GOALS**

The goal of DGO course in Obstetrics & Gynaecology is to produce a competent Obstetrician & Gynecologist who:

1. Recognizes the health needs of adolescents, females in reproductive age group & post menopausal females
2. Is competent to manage the pathological states related to reproductive system with relevant knowledge of Anatomy, Physiology, Biochemistry, Pharmacology, Pathology, Microbiology and Virology.
3. Is aware of contemporary advances & developments in the field of maternal health & other related issues.
4. Is Oriented to the principles of research methodology and epidemiology
5. Has Acquired the basic skills in teaching of the Medical and Paramedical Professionals.

#### **2.OBJECTIVES**

A postgraduate resident should be able to achieve objectives in the following domains:

##### **A. KNOWLEDGE**

1. Learn the basics of the subjects of Obstetrics and Gynaecology, covering all conditions likely to be met in obstetric practice in our country.
2. Provide effective prenatal care depending on the clinical condition of the mother, including nutrition, immunization and risk assessment.
3. Learn in greater detail about common problems like hypertension complicating pregnancy, intrauterine growth restriction, cephalo pelvis disproportion, obstructed labour and puerperal sepsis.
4. Appreciate the indications and methods of induction of labour.
5. Acquire thorough knowledge of gynaecologic conditions of public health importance such as cancer cervix and other gynaecologic diseases likely to affect pregnancy.
6. Gain knowledge of other branches of medicine which are relevant to Obstetrics and Gynaecology with special stress on diabetes mellitus, hypertension, cardiac disease, anaemia, lower urinary tract disorders and medical and surgical causes of acute abdomen.
7. Aware of medico-legal aspects of practice of Obstetrics and Gynaecology.

8. Able to diagnose and manage normal pregnancy, labour and puerperium and recognize any departure from normal in the above.
9. Able to competently manage cases of abortion, spontaneous and induced, including ectopic gestation and gestational trophoblastic diseases.
10. Diagnose and manage preterm labour and assess the fetal well being, maturity and birth weight and to use that information in deciding the obstetric management.
11. Develop decision making skills by utilizing the clinical and laboratory data.
12. Able to diagnose and manage acute abdomen, haemorrhage in Obstetrics & Gynaecology and other emergencies i.e. eclampsia.
13. Able to medically treat common gynaecologic diseases specially using
  - i) Antibiotics
  - ii) Hormone therapy including contraception
  - iii) Ovulation inducing agents
  - iv) Antineoplastic drugs
14. Understand the need for common obstetric operative interventions i.e. episiotomy, forceps, ventouse, caesarean section, dilatation and evacuation etc.,
15. Understand the importance of population control, contraception and different methods of contraception.
16. Understand the physiology of menstruation and manage common menstrual abnormalities.
17. Identify common adolescent and paediatric gynaecological problems and their management.
18. Learn common causes of infertility and their management and assisted reproductive techniques.
19. Acquire knowledge about common gynaecological problems like leucorrhoea, sexually transmitted infections, displacements, fibroid, endometriosis etc.,
20. Learn about screening and diagnosis of gynaecological malignancies including that of the breast.
21. Acquaint oneself with common gynaecological operative procedures.
22. Learn the proper method of handling data and presenting statistics in a scientific and orderly fashion in seminars, symposia and papers.
23. Utilise journals and reference works effectively.

## B. ATTITUDE

1. Appreciate the fact that women and children are especially a vulnerable group as regards health problems.
2. Appreciate particularly the problem of patients of advanced and terminal disease and to develop a sympathetic attitude to them and their relatives.
3. Understand the psychological aspects of gynaecologic diseases in general and infertility and unwanted pregnancy in particular.
4. Develop the ability to view the patient's condition in a wider social perspective and to adjust therapy to suit her social and financial reality.
5. Understand the importance of good medical care in preventing most of the morbidity and mortality in Obstetrics and Gynaecology.
6. Develop skills to communicate with patients and their relatives and to elicit a thorough history and explain regarding investigations & management.
7. Understand that Obstetrics and Gynaecology forms a hotbed for ethical issues and follow necessary precautions needed for an ethical practice.

## C. SKILLS

1. Able to select cases for the following Obstetric procedures and able to perform them independently and confidently:
  - i) Lower segment caesarean section including cases of obstructed labour and malpresentations.
  - ii) Outlet and low forceps delivery
  - iii) Vacuum extraction
  - iv) Assisted Breech Delivery
  - v) External cephalic/internal podalic version
  - vi) Manual removal of placenta and exploration of uterine cavity.
  - vii) Management of atonic and traumatic post partum haemorrhage.
2. Able to perform safe and effective medical termination of pregnancy up to 20 weeks of gestation using methods of
  - i) Suction Evacuation / MVA
  - ii) Dilation and Evacuation
  - iii) Extra amniotic instillations & other newer methods like medical abortion



3. Able to perform the following gynaecological surgical procedures:
  - i) D & C / FC, Menstrual Regulation
  - ii) Polypectomy
  - iii) Minilap tubectomy
  - iv) Vaginal Hysterectomy with pelvic floor repair
  - v) Abdominal Hysterectomy for 'Straight-forward' cases
  - vi) Salpingectomy for ectopic pregnancy, Salpingo-ovariectomy
  - vii) Amputation of Cs/Manchester repair / Conisation
4. Able to competently assist in the following:
  - i) Gynaecological Oncology surgery
  - ii) Gynaecological-urological surgery
  - iii) Tubal microsurgery
  - iv) Caesarean Hysterectomy
  - v) Hysterectomy in difficult cases
  - vi) Minilap tubectomy, laparoscopic sterilization
  - vii) Diagnostic laparoscopy
  - viii) Colpocentesis/ colpotomy, laparotomy for septic abortion
  - ix) Cervical encerclage
5. Able to manage the post-operative and intra-operative complications.
6. Able to assist / perform the following investigations:
  - i) Obstetric Ultrasonography for – pregnancy diagnosis
    - pregnancy dating
    - Early pregnancy bleeding
    - Antepartum haemorrhage
    - Biophysical profile
    - fetal anomalies

- ii) Gynaecological USG for adnexal mass, uterine pathology & follicular monitoring
- iii) Hysterosalpingography / sonohysterosalpingography
- iv) Colposcopy
- v) Cystoscopy

7. Able to resuscitate an asphyxiated newborn by emergency measures and recognize signs requiring referral of a baby for specialized care.

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

- ***Theoretical Knowledge*** –(Refer 'A – KNOWLEDGE' under 'OBJECTIVES')
- ***Practical and Clinical Skills*** – Refer 'C – SKILLS' under 'OBJECTIVES'
- ***Writing Research Articles***

All students will have to carry out a research program and bring out a Research paper. Students are encouraged to attend CME's, publish research papers and present posters, or platform presentations at State, National and International conferences.

- | <b><i>Attitudes</i></b>                                           | <b><i>including</i></b> | <b><i>Communication</i></b> | <b><i>Skills</i></b> |
|-------------------------------------------------------------------|-------------------------|-----------------------------|----------------------|
| 1. Appreciating Diversity                                         |                         |                             |                      |
| 2. Conflict Management                                            |                         |                             |                      |
| 3. Listening – Attention to detail                                |                         |                             |                      |
| 4. Are you really listening ? – Picking up non-verbal cues        |                         |                             |                      |
| 5. Lost in translation – Communication within the team            |                         |                             |                      |
| 6. Case Scenario                                                  |                         |                             |                      |
| a. Angry patient                                                  |                         |                             |                      |
| b. Dealing with error made by colleague                           |                         |                             |                      |
| c. Breaking bad news                                              |                         |                             |                      |
| d. Facilitating HIV status – disclosure to the patient and spouse |                         |                             |                      |

#### ***• Training in Medical Ethics/Bioethics and Medico-legal aspects .***

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, Bioethics, moral and legal issues and Medical Audit are part and parcel of the curriculum and syllabus

## ETHICAL DILEMMAS IN OBSTETRICS AND GYNAECOLOGY

### A. At the beginning of life .

- Abortion - how do you make a legal / ethical decision taking into consideration all the laws and regulations, rights of the unborn child and the health of the mother.

- Infertility – Ethical issues of Assisted Reproductive Technologies – Donor programmes
  - Gamete cryopreservation
  - Embryo cryopreservation
  - Fertility preservation
  - Future of excess embryos

### B. Contraception

- Autonomy of the individual
- Right to refuse
- Ethical issues of sterilisation being offered as a form of contraception

### C. Counselling of parents with disease affected fetus.

A very difficult task in the event of diagnosis of conditions like Thalassaemia, Haemophilia, Down's syndrome.

D. Ethical concerns of emerging medical technologies like Pre implantation Genetic Diagnosis for recurrent pregnancy loss and stem cell therapy.

### E. Decision making process for surgery

Tubal recanalization – a multipara requesting the surgery in the hope of having a male baby.

Surgery for Gynaecology condition, knowing very well it does not improve quality of life.

## **4. THEORY SYLLABUS**

### **OBSTETRICS& NEONATOLOGY**

#### **I. MATERNAL ANATOMY**

- 1. Anatomy of pelvis**
- 2. Embryogenesis**
- 3. Development of placenta.**
- 4. Anatomy of fetus, fetal growth & development, fetal physiology & circulation**

## 1. ANATOMY OF PELVIS

Boundaries of Pelvis, Planes and diameters of Pelvis , Diameters: a) Inlet b) Midcavity c) Outlet d) Types and tendency of Pelvis: Gynaecoid, Android, Anthropoid, Platypelloid, difference between male and female pelvis, clinical significance of various types of pelvis eg: Android - failure of rotation and deep transverse arrest.

## 2. EMBRYO GENESIS

### **Gametogenesis:**

Oogenesis, Ovulation, Implantation, Trophoblast formation - cytotrophoblast and syncytiotrophoblast formation, Decidua formation – decidua basalis, decidua capsularis, decidua parietalis, Chorion and chorionic villi – chorion and amnion, syncytiotrophoblast, primary stem villi, Structure of mature spermatozoan, Biology of Trophoblast, Embryology applied to in-vitro fertilization.

## 3. Development of placenta:

Structure of placenta – amniotic membrane, chorionic plate, basal plate, intervillous space and stem villi.

Placental circulation – Placental membrane (barrier) – no mixing of maternal and fetal blood.

Fetoplacental circulation – two umbilical arteries and one umbilical vein.

Function of the placenta – Transfer of nutrients, production and metabolism of hormones, barrier function, immunological function.

Haemodynamics of fetal circulation – Maternal

Placental Hormones – Chorionic ACTH, Relaxin, PTH-Rp, Growth Hormone Variant (hGH-V), Gn RH, CRH, GHRH Leptin, Neuropeptide Y, Inhibin and Activin

## 4. ANATOMY OF FETUS, FETAL GROWTH DEVELOPMENT

**a) Events of Fetal Development:** Eg. 4-6 weeks limb buds, optic vesicles, 8 to 12 weeks external genitalia, 14 to 21 days Notochord, Neural plate. 21 to 28 days Neural tube, cardiac chambers. 28 weeks fetus viable, 36 weeks descent of one testis, 40 weeks descent of both testicles.

### **b) Fetal Physiology**

Fetal nutrition, fetal haemopoiesis, urinary system, skin, gastro-intestinal tract, respiratory system, endocrine system.

### **c) Fetal Circulation**

Changes in fetal circulation at birth : closure of umbilical arteries, lateral umbilical ligaments & superior vesical arteries. Closure of umbilical vein – ligamentum teres. Ductus venosus – ligamentum venosum, ductus arteriosus 1-3 months of birth, foramen ovale – 1 year of birth.

## **II. MATERNAL PHYSIOLOGY**

### **I. MATERNAL CHANGES DURING PREGNANCY**

- i) Changes in genital tract
- ii) Hematological changes
- iii) Metabolic changes
- iv) Cardiovascular system
- v) Respiratory system
- vi) Gastrointestinal system
- vii) Urinary system
- viii) Endocrine system

### **III. PRENATAL CARE**

1. Diagnosis of pregnancy
  - In first, second and third trimester
  - Details of symptoms + signs of pregnancy
  - Pregnancy tests
  - Details and accuracy
  - Details of dating of pregnancy with ultrasound
2. Details of Down's Screening
  - Nuchal thickness on ultrasound
  - Pros and cons of Down's screening
  - First trimester morphology
  - NIPT – Non invasive prenatal testing
3. Lab investigation sent in pregnancy
  - Rationale for these tests
  - OPT In / OPT Out screening for HIV
  - Role of urine culture, TSH
  - Screening for gestational diabetes
  - Role of Group B hemolytic streptococcus screening
  - Immunization – recommended vaccines, contraindicated vaccines
4. Assessment of risk factors
  - Relevant history

5. Morphology ultrasound
  - Commonly diagnosed anomalies
6. Examination
  - a) General – accurate BP measurement. Importance of examining spine, gait, thyroid and breast
  - b) Obstetric – symphysiofundal height (metrogram) charts, abdominal grips, pelvis assessment at term.
7. Drugs prescribed in pregnancy
  - Common drugs contraindicated in pregnancy
  - Teratogenicity of drugs.
8. Prenatal advice to women
  - Nutrition in pregnancy
  - Tips to expectant mothers.
9. Antepartum fetal surveillance
  - Use of ultrasound
  - Non stress test

#### **IV. PHYSIOLOGY OF LABOUR AND PURPERIUM**

Causation and stages of labour, role of hormones in labour.

Physiological and biochemical process, regulating parturition and induction of labour.

##### **a) MECHANISM OF LABOUR**

- Cervical ripening, uterine distension, cardinal movements

##### **b) CONDUCT OF NORMAL LABOUR**

- Diagnosis of labour , management of 1<sup>st</sup> stage, management of 2<sup>nd</sup> stage, management of 3<sup>rd</sup> stage, drugs to prevent and treat PPH

##### **c) INTRAPARTUM SURVEILLANCE**

- Fetal surveillance, surveillance of uterine activity, PRAMS – post partum pregnancy risk assessment monitoring system, maternal early warning systems.

##### **d) NORMAL PURPERIUM**

Changes in the genital tract, uterus and other system, lactation, care of puerperium.

Changes in the Genital tract & other system, Changes in the uterus -involution, lochia, Lactation, Colostrum Physiology of lactation, Care of the Puerperium Ambulation, bowel & bladder care, Breast, perineal care Postpartum follow-up care.

## **PRAMS**Postpartum - Pregnancy risk assessment monitoring system, Maternal early warning systems

### **V. COMPLICATIONS OF PREGNANCY**

- Early pregnancy complication
- Anaemia in pregnancy
- Hypertensive disorders of pregnancy
- Antepartum haemorrhage
- Preterm labour
- Intrauterine growth restriction
- Prolonged pregnancy
- Multiple pregnancy
- Rhesus isoimmunisation

### **EARLY PREGNANCY COMPLICATIONS**

Hyperemesis gravidarum, types of abortions, gestational trophoblastic disease, algorithm for evaluation, expectant management, staging and prognostic scoring, novel serum markers – VEGF, CA125, Creatine kinase, arterial embolization.

**Ectopic pregnancy** – Types, risk factors, clinical features, investigations.

Management – Medical, Surgical, conservative, algorithm for evaluation in expectant management.

### **ANAEMIA IN PREGNANCY**

Iron deficiency, Folic acid & vitamin B12 deficiency, hemoglobinopathies, effects, investigations.

Management – Prevention treatment – iron therapy, oral and parenteral blood transfusion, management of labour.

### **HYPERTENSIVE DISORDERS OF PREGNANCY**

Classification, pathogenesis, preeclampsia, investigations, Predictive Test, Prediction models for preeclampsia (combination of biochemical, biophysical components and history) Chronic hypertension, HELLP syndrome, prophylaxis, management, role of uterine artery, umbilical artery, middle cerebral artery, ductus venosus artery, doppler in the management of preclampsia.

HYPITAT trial, CHIPS trial,

### **ANTEPARTUM HAEMORRHAGE**

Definition, differential diagnosis, Abruptio placentae, causes for maternal mortality, placenta previa – types and management. Internal iliac artery ligation (Use of stepwise devascularization)

## **PRETERM LABOUR**

Etiology, Management – corticosteroids, tocolytics, preterm (PPROM) premature rupture of membranes, diagnosis, management, antibiotics, corticosteroids. Rescue therapy, atosiban nitric oxide donors, \*Pros and Cons of prophylactic, therapeutic and emergency cervical cerclage, role of progesterone therapy, tocolysis, magnesium sulphate – neuro protection before 32 weeks.

## **INTRAUTERINE GROWTH RESTRICTION**

Definition, types, etiology, diagnosis, assessment and management. Ponderal Index, Doppler – middle cerebral artery, uterine artery doppler. TRUFFLE, GRIT, DIGITAT studies.

## **PROLONGED PREGNANCY**

Definition, etiology, diagnosis and management. Critical evaluation, modes of induction of labour.

## **MULTIPLE PREGNANCY**

Incidence, varieties, presentation, course of pregnancy, diagnosis, complications management of labour. Complications of monochorionic twins, Acardiac Twin (TRAP) sequence, Twin-Twin transfusion syndrome (TTTS). TAPS (Twin anemia polycythemia sequence). Selection reduction - LASER

## **RHESUS ISOIMMUNISATION**

Factors influencing Rh immunization, Management of RH-immunised pregnancy. Non-invasive tests – MCA, PSV, Marie' graph.

## **VI. MEDICAL DISEASES COMPLICATING PREGNANCY**

- a) Diseases of the cardiovascular system
- b) Maternal infections during pregnancy
- c) Diabetes in pregnancy
- d) Tumors of the uterus and adnexa
- e) Surgical emergencies during pregnancy
- f) Liver diseases in pregnancy
- g) Diseases of urinary system

## **DISEASES OF THE CVS**

Changes in the CVS system, types – congenital and rheumatic, functional grading – New York Heart Association management during pregnancy, labour and puerperium. \*Prosthetic valves, Use of anticoagulants, Timing of anticoagulants, Complications in women with prosthetic valves.

## **MATERNAL INFECTIONS DURING PREGNANCY**

TORCH infections, sexually transmitted diseases, HAART therapy, other infections



## **DIABETES IN PREGNANCY**

White's classification, pathophysiology, diagnosis, risk factors management – Diet, insulin, obstetric management, neonatal management, pregestational diabetes. GDM screening, use of oral hypoglycemics in pregnancy. HAPO trial, ACHOIS, IADPSG Recommendations, Oded Langer et al., N Engl J Med 2000, MiG Trial NEJM.

## **TUMOURS COMPLICATING PREGNANCY**

Fibroids, ovarian tumours and carcinoma cervix, effects and management, chemotherapy in pregnancy,

## **SURGICAL EMERGENCIES**

Acute appendicitis, intestinal obstruction, MANTRELS score.

## **LIVER DISEASES**

Intrahepatic cholestasis – Use of ursodeoxycholic acid, AFLP, viral hepatitis, HELLP syndrome

## **DISEASE OF URINARY SYSTEM**

Asymptomatic bacteriuria, acute renal failure, rational use of antibiotic therapy

### **VII. NEW BORN**

- a) Resuscitation of new born
- b) Respiratory distress and neonatal sepsis
- c) Neonatal jaundice
- d) Neonatal problems and their management

### **NEW BORN**

Resuscitation of the new born, neonatal sepsis, neonatal problems and the management, birth trauma

### **VIII. ABNORMAL LABOUR**

Malpresentation, Dystocia, cephalo pelvic disproportion, Cardiotocograph findings. Categorization of cardiotocography – category 1,2,3

### **IX. THIRD STAGE COMPLICATION**

Postpartum haemorrhage etiology, predisposing factors management, retained placenta, inversion of uterus, injuries to the parturient canal, rupture of the uterus, puerperal infection, venous complications, genital tract infections, mastitis and breast abscess, B-lymph node suturing, internal iliac artery ligation, uterine tamponade – condom and Bakri balloon, stepwise devascularization, angiographic embolization, pelvic umbrella pack.

## **OBSTETRIC PROCEDURES**

Forceps, Vacuum extractor, external cephalic version, internal podalic version, caesarean section, induction of labour, complications.

**ULTRASOUND** : Early pregnancy – diagnosis, dating, viability, multiple pregnancy, congenital anomalies, estimation of gest age, fetal growth, fetal weight, liquor volume, fetal well being.

## **FAMILY PLANNING**

- X. Demography and population dynamics
- XI. Contraception
- XII. Emergency contraception
- XIII. Recent advances in contraception

### **XIV. DEMOGRAPHY AND POPULATION DYNAMICS**

Population dynamics, factors involved, magnitude of the problem, impact of increased population. Vital statistics, maternal morbidities, perinatal mortality, early and late neonatal death.

### **XV. CONTRACEPTION**

Temporary methods – Barrier methods : Condoms, diaphragm, chemical sponge(Today), combination natural contraception, IUCD, steroidal contraceptions, Oral – OCP, triphasic combined pills, mini pill, Newer OCPs, Parenteral – DMPA, NETO, Implants – norplant 1,2, Capronor, Silastic vaginal rings, Skin patches, Centchroman. Permanent methods : vasectomy, tubectomy, laparotomy, minilaprosopy, hysteroscopy, vaginal route.

## **EMERGENCY CONTRACEPTION**

OCP, estrogen, levonorgesterol, mifepristone, centchromin, GnRH agonist, prostaglandins

## **MEDICAL TERMINATION OF PREGNANCY**

MTP Act, grounds for performing MTP

## **RECENT ADVANCES, NEW DEVELOPMENT, FUTURE RESEARCH WORK IN CONTRACEPTIVE TECHNOLOGY**

Immunological methods, male contraceptive

## **ETHICS IN OBSTETRICS & GYNAECOLOGY – MEDICO LEGAL ISSUES**

PCPNDT Act – Preconceptional and perinatal diagnostic test act

MTP Act

Fetal Anomalies – Decision reg. termination or continuation

Multiple Pregnancy – decision reg. fetal reduction

Modern O&G – Regarding ART – Ex. Removal of both ovaries for benign condition in the younger and middle age group women. Do not warrant removal of a normal uterus – Details

Consent

Consent forms for obstetric emergencies

Consent forms for sterilization eg. For lap sterilization

### **MEDICO LEGAL ISSUES**

- MTP Act
- PCPNDT Act
- Litigation for poor outcome, complications
- Importance of complete documentation
- Litigation after sterilization failure
  - A. Permanent sterility
  - B. Failure – 1% of patients conceive after sterilization
  - C. May be converted to open surgery in the presence of unexpected problems, technical (or) Otherwise

For planned procedures & Laprotomy, if one is doing any procedure other than for which the consent was previously obtained, the surgeon or the Assistants must explain and get the consent for present procedure during the surgery itself.

Special Consent : Jehovahs witness, Mentally challenged, Unmarried, Medico legal cases.

## **OBSTETRICS ANAESTHESIA & ANALGESIA**

### **NERVE SUPPLY OF FEMALE GENITAL TRACT**

Sympathetic & Para sympathetic nerve supply of the female genital tract & its applied anatomy.

### **PHYSIOLOGY OF PREGNANCY**

Physiological changes in pregnancy

### **PHARMACOLOGY**

Pharmacology of drugs used in Obstetrics, Placental transfer of drugs.

## **LABOUR ANALGESIA**

Various methods of pain relief in labour. Pharmacological & Non-pharmacological methods, labour epidural analgesia.

## **ANAESTHESIA FOR OPERATIVE OBSTETRICS**

GA, Spinal and epidural anaesthesia for LSCS surgery

## **ANAESTHESIA FOR LAPAROSCOPIC SURGERY**

Anaesthetic implications of GA for Laparoscopic surgery

## **GYNAECOLOGY**

### **I ANATOMY**

Vulva, vagina, uterus, and cervix, fallopian tubes, ovaries, ureter, pelvic musculature, blood supply of genital organs, ovarian artery, uterine artery, vaginal artery, arteries of the vulva and perineum, lymphatic system, inguinal glands, parametrial glands, external iliac glands, common iliac, sacral groups, lumbar group, nerves supply, sympathetic & para sympathetic. Branches of the internal iliac and external iliac vessels, ligaments of the pelvis and supports of uterus

### **NORMAL HISTOLOGY**

Ovary, cortex, Graafian follicle, corpus luteum, endometrium, proliferative phase, secretory phase, menstruation, vaginal epithelium – physiological changes.

### **II PHYSIOLOGY OF OVULATION AND MENSTRUATION**

Hypothalamus, pituitary, ovary, estrogen, progesterone, physiology of ovulation, physiology of menstruation, menstruation, Hormonal levels in different phases of menstrual cycle, neuro endocrine control of menstruation, role of prostaglandins.

### **III DEVELOPMENT OF FEMALE GENERATIVE ORGANS**

Urogenital Sinus and external genital organs, primitive urinary system, lower end of Mullerian duct, external genital organs, development of ovary.

### **MALFORMATIONS OF THE FEMALE GENERATIVE ORGANS**

Development of female generative organs, the urogenital sinus and the external genital organs, development of ovaries, Mullerian Anomalies, Mullerian duct anomalies, developmental defects of the urogenital sinus, malformations of the rectum and anal canal, congenital rectovaginal fistula, Wolffian duct anomalies, renal tract anomalies.

#### **IV GYNAECOLOGICAL DIAGNOSIS**

History taking, menstrual history, obstetric history, physical examination, general examination, abdominal examination, gynaecological examination, exam in situ, speculum examination, pap smear, vaginal examination, rectal examination, investigations, preoperative investigations, Papanicolaou Test-classification (WHO/SIL Bethesda), Liquid based cytology, Cytochemical Evaluation (Karyopyknotic index (KPI), Uterine Aspiration cytology, Colposcopy, Endometrial Biopsy, Hormonal Assays, Ultrasonography, Others (CT, MRI, HSG), Gynaecological Endoscopy, Aspiration of Pouch of Douglas

#### **V PAEDIATRIC AND ADOLESCENT GYNAECOLOGY**

Pediatric Gynecology, Anatomy, Physiology, genitourinary system of Neonate, Congenital Anomalies, Infection, Tumors, Puberty & Adolescent Problems, Pubertal changes, Management, Precocious Puberty, Delayed Puberty, Oligomenorrhoea, Puberty Menorrhagia, Dysmenorrhoea, Vaginal Discharge, Acne, Unwanted Pregnancy, Tanner & Marshall staging, Neuro endocrinologic control of puberty.

#### **VI DISORDERS OF MENSTRUATION**

Menstrual cycle irregularities - Introduction, Definitions, Amenorrhea, Primary – Classification, Etiology, Management, Secondary amenorrhea - Etiology, Investigations, Oligomenorrhea and hypomenorrhea, Polymenorrhea, Metrorrhagia, Dysmenorrhea- Definition, etiology, types, varieties, Clinical features, investigations, Treatment, Premenstrual tension syndrome-Introduction, Etiology, Clinical features, Diagnosis, Treatment.

#### **VII MENORRHAGIA AND DYSFUNCTIONAL UTERINE BLEEDING**

Menorrhagia - Causes, General diseases, Local pelvic cause, Endocrine disorders- thyroid dysfunction, Contraceptives, Iatrogenic, Investigations, Management, General measures, Treating the cause, SERM (Ormeloxifene), **PALM, COEIN classification,**

#### **DYSFUNCTIONAL UTERINE BLEEDING**

Definition, Pathogenesis, classification-ovulatory, anovulatory, pubertal menorrhagia, metropathic haemorrhagic-pathological anatomy, irregular shedding, irregular ripening, diagnosis, treatment, conservative, medical & surgical, medical therapy- OCP, progestogen, danazol, NSAID, antifibrinolytic, GnRH analogue, MIRENA IUCD, Surgical- Curettage, Minimal invasive surgery, Hysteroscopic endometrial ablation (TCRE), Radiofrequency induced thermal endometrial ablation (RITEA), Cavaterm balloon therapy, Microwave endometrial ablation (MEA), Uterine tamponade, Endometrial laser intrauterine, thermotherapy (ELITT), Bilateral uterine artery embolization, Hysterectomy-Abdominal, Vaginal, Laparoscopic LAVH. Von Willibrands, disease, and other bleeding, dyscrasias.

## **VIII FIBROMYOMA OF UTERUS AND UTERINE POLYPS AND ADENOYOUS**

Fibromyoma types— intramural, submucous, subserous symptoms – menstrual disorders, infertility, pain, pressure symptoms, Complications, Degeneration, Torsion, Inversion, Infection, Treatment, Medical – GnRH analogues, danazol, mifepristone, surgery Myomectomy — abdomina l/vaginal/hysteroscopic/ laprascopic/ Hysterectomy—transabdominal/vaginal/LAVH/laprascopic, Uterine artery embolization, UTERINE POLYPS, Endometrial polyp, Placental polyp, Management. Cervical fibroid.

## **IX ENDOSCOPY IN GYNAECOLOGY**

Laparoscopy - Indications for Laparoscopy, Diagnostic laparoscopy, Operative laparoscopy, General indications, Other indications, Technique of laparoscopy, Complications, Hysteroscopy Technique, Diagnostic indications, Therapeutic indications, Distension media in hysteroscopy, Contact hysteroscopy, Complications of hysteroscopy, Late complications, Salpingoscopy and Falloposcopy, Colposcopy, Indications, Therapeutic Indications, Technique of Colposcopy, Colposcopic findings, Abnormal findings, Colpomicroscopy, Extragenital Endoscopy, Fluid, Management, Hysteroscopy, Endometrial Ablation.

## **X GENITAL PROLAPSE**

Support of genital tract, Delancey 3 levels of system of support, Etiology, Birth injuries, menopause, Classification of Prolapse, Anterior vaginal wall, Posterior vaginal wall, terine descent, Procidentia, Symptoms of prolapse, Investigations, Differential diagnosis, Anterior vaginal wall cyst, Chronic uterine inversion, Congentialelagation of cervix, Complication of Prolapse, Prophylaxis & Management, Conservative-pessary, Surgery, Vaginal hysterectomy, Anterior & Posterior colporrhaphy&Colpoperineorrhaphy, Fothergills repair, Abdominal sling surgery, Vault prolapse, Recurrent prolapse, Details of Sling, Surgeries – Abdomino cervico plexy, Pelvic reconstructive surgery, Synthetic materials, Biological, Materials, New system, (Intra vaginal sling plasty, Apogee, Perigee).

## **XI DISEASES OF URINARY SYSTEM**

Common Urinary Malfunctions 1.Acute Retention of Urine Causes, Management 2.Chronic retention Causes, Management 3.Retention of Urine due to retroverted gravid uterus Management 4.Urethral Syndrome 5.Difficult Micturition 6.Painful Micturition 7. Increased Frequency of Micturition 8.Incontinence of Urine 9.Cystitis-Micro Organisms, Mode ofspread, Symptoms Diagnosis, Treatment Diseases of the female urethra, Urethritis, Urethral caruncle.

Urethral prolapse, Urethral Diverticulum, Urethral Stenosis, Urinary Fistulae, Genital Fistulae, Definition, Etiology, Anatomic Classification of Urinary Fistulae, Clinical Features - Investigations, Management, Latzko Procedure, ChassarMair technique, Vaginal/transvesical / transabdominal Approach, ileal loop bladder, Postoperative Management - Ureteric fistulae, Causes, Diagnosis, Management-Percutaneous nephrostomy, Cystoscopic catheterization & stenting, Boari-flap operation, Ureteroneocystostomy, Urethrovaginal Fistula, Stress urinary incontinence, Mechanism of Female Urinary Incontinence - Genuine stress incontinence, Urge incontinence, Clinical Evaluation, Investigations, Stress test, Cotton swab stick test, Marshall and Bonney's Urethroscopy, Urodynamic evaluation, MRI studies, Treatment, Conservative, Surgical, Vaginal/Abdominal/combined Approach, Complications, Outcome following surgical repair, Detrusor instability, Etiology, Pathophysiology, Symptoms, investigations, Treatment.

Physiology of micturition, Pregnancy & urinary problems, Urodynamic studies, cystoscopy. Burch Colposuspension, Tension free vaginal T-tape Injectable Bulking agents, Botox Injection, Augmentation cystoplasty, Neuro Modulation.

## **XII SEXUALLY TRANSMITTED DISEASES**

Condylomata acuminata, Genital ulcers, Genital Herpes, Chlamydia, syphilis, gonorrhoea, LGV, granuloma inguinale, Human Immunodeficiency Virus.

## **XIII PELVIC INFLAMMATORY DISEASE**

Etiology, Pathological Anatomy, Stages of PID, Clinical criteria for diagnosis of PID, Acute/chronic Signs & Symptoms, Differential diagnosis, Treatment, Acute PID-Medical/Surgical/ Minimal Invasive Surgery, Chronic PID-Surgery Laproscopic/Hystroscopic/Conservative Surgery, Prophylaxis Against PID, Actinomyces PID, Tuboovarian mass, CDC guidelines for treatment of PID.

## **XIV TUBERCULOSIS OF GENITAL TRACT**

Primary sources of infection, mode of spread, Bacteriology, Pathology, TB Fallopian tubes-Exosalpingitis{tobacco pouch appearance and Frozen pelvis} and endosalpingitis, Symptoms of TB genital tract. Infertility, menstrual disorders, fistula Formation, Investigation, **Treatment of genital TB.**

## **DISEASES OF VULVA AND VAGINA**

**VULVA** - Benign condition, Atrophy, Dysmorphies-Histological classification and clinical Features, Cysts and neoplasms-Bartholins cyst.

**Vagina** - Leucorrhea, Infections-Gonococcal, trichomonas, monilial, chlamydial, bacterial vaginosis, Vaginitis-Senile vaginitis, Secondary vaginitis, Cysts, Gartner's cyst, Vulval infections, clinical features, diagnosis & management.

## **XV MENOPAUSE AND POST MENOPAUSAL BLEEDING**

**MENOPAUSE** - Definition, Hormonal changes, Anatomical changes, Symptoms, menstrual, neurological, genitourinary tract, Investigations-PAP smear, Management, Hormone replacement therapy-estrogen, progestogen, raloxifene; soya, bisphosphonates, Post menopausal bleeding, Definition, etiology, investigations-USG –EM thickness, Fractional curettage, endometrial sampling, hysteroscopic biopsy management, estrogen transdermal patch, HRT and bone mineral density.

## **XVI INFERTILITY**

Issues involved, Male infertility - Spermatogenesis, Endocrine control, pathology, Etiology, Investigations, History, General & Local Examination, Special investigations -Semen analysis hormone assay, testicular biopsy, Immunological test, Patency of vas, Chromosomal study, Management - Education, substances abuse, correct endocrinopathies, surgical, antibiotics, Hormones (HCG, Testosterone, GnRH, Sildenafil, artificial insemination) - **Intra uterine insemination**.

Management of azoospermia - **ICSI, TESA, PESA, MESA, TESTICULAR BIOPSY**

Psychological consideration. Female infertility, Etiology, Investigations, History, examination, special investigations. Test for tubal patency, (HSG, Laparoscopic chromotubation, SSG) Management of Tubal infertility Tubal microsurgery (tuboplasty), Laparoscopic tubal adhesiolysis, fimbrioplasty, IVF Test for Ovulation BBT, endometrial biopsy, fern test, USG, Hormonal study, Management of anovulation Ovulation induction drugs, **Gonadotrophins, Dexamethasone**, lap, drilling. Management of Peritoneal disorder, Endometriosis, unexplained infertility, **Ovarian reserve test: FSH, AMH, AFC. Legal aspects of ART: ART bill ; ICMR regulations**. Post coital test (sims or Huhner test) Sperm penetration test, **Y deletion genetic tests, CFTR testing**.

**IVF TECHNIQUE**, (Indications, complications), GIFT, MZ, ICSI, Epididymal aspiration. Newer modalities - Hysteroscopy, Falloscopy, ampullary and fimbrialsalpingoscopy, **Laparoscopy for endometriosis**. ART (indications, types)



## **ENDOMETRIOSIS**

Etiology, Genetics factors, Mutation, Aneuploidy, Immunological factors & inflammation Endocrinological abnormalities, Endometriosis of the rectovaginal Septum, adenomyosis, Medical treatment -Non hormonal Therapy, Modulation of Cytokines, Leukotriene Receptor, antagonists(Pentoxifylline), Inhibition of Matrix Metalloproteinase, hormonal therapy - Progesterone, Antagonists, Onapristone, Mifepristone, Aromatase, inhibitors-fadrozole, SERM-Raloxifene, Future research(Rat & Rabbit animal Models, Role of laparoscopy).

## **XVII GESTATIONAL TROPHOBLASTIC DISEASES**

Hydatiform mole, incidence, pathology, invasive mole, placental site trophoblastic tumour, symptoms and signs, investigations, ultrasound, serum beta Hcg, treatment, follow up, persistent trophoblastic disease, recurrent molar pregnancy, choriocarcinoma, Pathology, Signs and symptoms, FIGO staging, Treatment—chemotherapy (triple therapy, EMACO)/surgery, Follow up.

## **XVIII DISORDERS OF THE OVARY AND BENIGN TUMORS**

Non neoplastic Enlargements of the ovary, Follicular cysts, Follicular haematomas, Lutein cysts of the ovary, Multiple function cysts, Polycystic ovarian syndrome (PCOS) or disease (PCOD), Ovarian Tumors, Pathology, Borderline ovarian Tumors, Characteristics of borderline ovarian tumors, Risk factors, Pathology, Tumors of the surface, Epithelium Serous cystadenoma and cystadenocarcinoma Mucinous tumour, Endometrioid tumour, Mesonephroid tumour Brenner tumour, Spread of epithelial tumors of the ovary, Germ cell Tumour, Incidence, Teratoma Dermoid cysts, Solid teratoma of the ovary struma ovarii, Carcinoid tumors Dysgerminoma Mixed germ cell tumour, Sex cord stromal Tumour, Feminizing functioning Mesenchymoma Granulosa cell tumour, Theca cell tumour, Virilizing Mesenchymoma, Arrhenoblastoma, Adrenal cortical tumor of the ovary, Hilus cell tumor, Gynandroblastoma, Tumor Arising from connective Tissues of Ovary, Ovarian fibroma, Histogenesis of ovarian tumors, Complications of ovarian tumors, Benign ovarian, Tumors Symptoms, physical signs, Differential diagnosis, Investigations, Treatment.

## **XIX GYNAECOLOGIC ONCOLOGY**

Cancers of the Genital Tract, Cancer of the Vulva, Preinvasive lesions, Invasive Carcinoma of the vulva (FIGO staging ) management, Vaginal cancer, Clinical features, Staging, Diagnosis, Management Carcinoma of the cervix, Cervical intraepithelial neoplasia, Metaplasia, Dysplasia, preinvasive cervical cancer (stage0), Invasive cancer of the cervix- signs, symptoms & staging, invasive cancer cervix and Pregnancy (abnormal pap smear in pregnancy), management & treatment - Endocervical cancer, Carcinoma of the Uterus and Endometrial Cancer, Predisposing factors, Surgery, Postoperative radiotherapy, Primary radiotherapy, Progestogens, Recurrent growths, Uterine sarcomas, Fallopian Tube Cancers, FIGO staging, Clinical features, Differential diagnosis, Investigations, Management,

Prognosis of Ovarian Cancer, FIGO staging, Epithelial cancers of the ovary, Non-epithelial malignancies of the Ovary, Sex cord stromal tumors, Metastatic carcinomas, Management-staging Laprotomy, Strategies to Reduce the Incidence of Genital Tract Malignancies, (Prophylaxis), Palliative and adjuvant therapy.

Vulval sarcoma, melanoma, bartholin's gland tumour, Pap smear & classification, Colposcopy, cervicography, VIA , Cone biopsy, Radical Hysterectomy, Pelvic Lymphadenectomy, Laser ablation, LLETZ, LEEP, Radiotherapy, HPV vaccine, Histological classification & grading, Endometrial CA, Uterine sarcoma.

VIN classification, paget's disease, Bowen's disease. Sarcoma, botryoides, Etiology and management, AgNOR, HPV testing & HPV Vaccine, Nerve-Sparing Radical Hysterectomy, Prognostic Variables, Adjuvant Radiation, Neoadjuvant Chemotherapy, Recurrent cervical cancer, Aspiration cytology, Prognostic Variables.

Risk factors, criteria for diagnosis of borderline tumors, krukemberg tumor, Second look laparotomy, Stem cell therapy.

## **IMAGING MODALITIES IN GYNAECOLOGY**

Plain Radiography, Hysterosalpingography, Sonosalpingography, Intravenous Urography - Indications, Precautions and contraindications, Cystography and Urethrography, Gastrointestinal studies, Barium meal and follow through Barium enema, Arteriography and arterial Embolization, Ultrasonography, Transabdominal Ultrasonography, Transvaginal ultrasound, Diagnostic indications, Therapeutic applications of ultrasonography in clinical practice, Computed Tomography Scan - Technique, Indications, Magnetic Resonance Imaging, Indications, Contraindications, Radionuclide Imaging, Dual Photon Densitometry.

## **OPERATIVE GYNAECOLOGY**

Principles of Anatomy & Perioperative considerations, Surgical Anatomy of Pelvis, Pre operative care, Post Operative care, Principles of Gynecological Surgical Techniques, Incisions for Gynecological surgery, Surgery for Fertility, Reconstructive Tubal Surgery, Surgery For Benign Gynaecologic Conditions, Surgery for Anomalies of the Mullerian, Suture Material, & Surgical Instruments, Water, Electrolyte & Acid-Base Metabolism, Diagnostic and Operative Laparoscopy, Operative Hysteroscopy, Application of Laser in Gynaecology.

## **SURGERY OF THE MULLERIAN DUCTS**

VaginoPlasty, 1.Abbe-wharton Mc Indoe Operation, 2.Williams Vulvovaginoplasty, Uteral Sterilization, Surgical Approach, 1.Minilaparotomy 2.Laparoscopy 3.Tubal Occlusion Vasectomy, Surgery for Benign Disease of the Ovary, Resection of Benign cysts, Leiomyomata Uteri and Myomectomy, Medical Management of Uterine, Leiomyomata, Abdominal Myomectomy, Assisted reproductive techniques, Surgical Technique for Uterine Unification - 1.Modified Jones Metroplasty 2) Tompkins Procedure 3.The Strassman Metroplasty

## **HYSTERECTOMY**

1. Abdominal Hysterectomy, Indications, Preoperative counseling, Preparation for Hysterectomy, Complications, Post Operative care, 2.Vaginal Hysterectomy – Indications, Preoperative counseling, Preparation for Hysterectomy, Operative Technique, Complications, Post Operative care, Hysterectomy - 1.Laparoscopically assisted vaginal hysterectomy (LAVH), 2.Laparoscopic subtotal hysterectomy (LSH)

Total 3.Laparoscopic hysterectomy (TLH), 4.Vaginally assisted laparoscopic hysterectomy, (VALH), Staging system for Laparoscopic hysterectomy.

## **SURGERY FOR CORRECTIONS OF DEFECTS IN PELVIC SUPPORT**

Pelvic Organ Prolapse, Anatomic considerations, Clinical Evaluation, Pelvic Organ Prolapse-Quantification system (POP-Q), Baden-Walker Halfway system, SITE-Specific Repair, Cystourethrocele, Paravaginal Defect Repair, Posterior Compartment defects.

## **VAGINAL VAULT PROLAPSE**

1. McCall Culdoplasty, 2.Sacrospinous Ligament Fixation 3.Abdominal Sacral Colpopexy, Non surgical treatment for pelvic organ prolapse—use of vaginal pessaries, High Uterosacral Ligament Suspension, Iliococcygeus Fascia Suspension, Le Fort atrial Colpocleisis, Vesico vaginal fistula.

## **CANCER OF THE CERVIX**

Surgical treatment for early stage cervical cancer, Concept of radical abdominal hysterectomy and bilateral pelvic lymphadenectomy,

ADJUVANT THERAPY IN CONJUNCTION WITH RADICAL SURGERY

ENDOMETRIAL CANCER

SURGICAL STAGING AND TREATMENT

OVARIAN CANCER

Comprehensive surgical staging, Surgical staging for apparent early stage ovarian cancer, Primary cytoreductive surgery, Neoadjuvant chemotherapy and interval cyto reductive surgery, Laprascopically assisted radical vaginal hysterectomy. (SCHAUTA), Second look laparotomy, Secondary cyto reductive surgery.

## **5. TEACHING LEARNING METHODS(including Clinical Study)**

1. Seminars / Symposia
2. Journal Clubs
3. Group Discussions
4. Clinical rounds / combined case discussions
5. Case presentations / Bedside teaching
6. Maternal care review meetings
7. Perinatal meetings
8. Clinicopathological meetings
9. Attending conferences, Workshops, CME programmes etc.,

A) Active involvement in patient care in

- Antenatal clinic
- General Gynae – OPD
- Postnatal clinic
- Infertility clinic etc.,

B) Operation Theatre

- Assist procedures
- Operation under supervision
- Operate independently
- Emergencies – Participation in Management
- In the community – visits to RHC / CAMPS

## **6. STRUCTURED TRAINING PROGRAMME**

Clinical Postings:

|                                   | <b>I Year</b> | <b>II Year</b> |
|-----------------------------------|---------------|----------------|
| <b>L.Ward</b>                     | 3 months      | 3 months       |
| <b>AN/PN Ward</b>                 | 3 months      | 2 1/2months    |
| <b>Gyn/P.O Ward</b>               | 3 months      | 2 1/2months    |
| <b>Anaesthesia</b>                |               | 15 days        |
| <b>Paedetrics</b>                 | 15 days       | 15 days        |
| <b>FW</b>                         | 15 days       | 15 days        |
| <b>Infertility &amp; Sonar</b>    | 15 days       |                |
| <b>Colposcopy &amp; Pathology</b> | 15 days       | 15days         |
| <b>Radiotherapy</b>               | 7 days        |                |
| <b>Oncology</b>                   | 7 days        |                |
| <b>Endocrinology</b>              | 7 days        |                |
| <b>Genetics</b>                   | 7 days        |                |
| <b>Social Obstetrics</b>          |               | 1 month        |

**7. Evaluation of the candidates in both theory and practicals will help the candidate in improvement of his/her knowledge, skills and attitude.**

## 8. COMPETENCY ASSESSMENT:

- OVERALL:
    - a) Communication / commitment / Contribution / Compassion towards patients and Innovation () - 5 Marks
    - b) Implementation of newly learnt techniques/skills ()
  - Number of cases presented in Clinical Meetings/ Journal clubs/seminars - 5 marks
  - Number of Posters/Papers presented in Conferences/ Publications and Research Projects - 5 marks
  - No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks
- Total 20 Marks

## PG CLINICAL COURSES

- VIVA including Competency Assessment - 80 Marks (60 + 20)
- Log Book - 20 marks

## ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total Max.20 marks |
|---------------|----------|----------|-----------|----------|--------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks           |
|               | AVERAGE  |          |           |          | 20 Marks           |

## 9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

## 10. THEORY EXAMINATION

Paper I- Applied Basic Sciences related to Obstetrics and Gynaecology

Paper II-Obstetrics including Neonatology

Paper III-Gynaecology including Family Welfare

### Question paper pattern:

I. Elaborate on      2 x 15 = 30

II. Write notes on      10 x 7 = 70

**TOTAL = 100 Marks**

## 11. PRACTICAL EXAMINATION

| Particulars.                                                            | Maximum Marks. |
|-------------------------------------------------------------------------|----------------|
| Clinical<br>Long Case 1 X 80 = 80 marks<br>Short case 2 X 35 = 70 marks | 150            |
| OSCE – 5 stations x 5 marks                                             | 25             |
| Ward Rounds/Spotters - 5 X 5 marks                                      | 25             |
| Viva-Voce                                                               | 80             |
| Log Book                                                                | 20             |
| Total                                                                   | 300            |
| Minimum for Pass                                                        | 150            |

Long Case-Obstetrics - 1X80marks=80marks

Short Case -Gynaecology- 2 X35marks=70 marks

## 12. LOG BOOK

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

### **13. VIVA**

#### **VIVA including Competency Assessment**

VIVA including Competency Assessment - 80 Marks (60 + 20)

### **14. OSCE**

#### **OSCE- DETAILED SCHEME**

|                                                 |                                                                                              |
|-------------------------------------------------|----------------------------------------------------------------------------------------------|
| MANNED, COUNSELLING, CONSULTING ,BREAKING NEWS, |                                                                                              |
| <b>COMMUNICATION SKILLS</b>                     | BEREAVEMENT                                                                                  |
| <b>CLINICAL EXAMINATION</b>                     | MANNED                                                                                       |
|                                                 | <b>MANNEQUIN,<br/>PAP, AMSTL, CATHETERISATION</b>                                            |
| <b>OUT PATIENT PROCEDURES</b>                   | CTG, USG, ENDOMETRIAL SAMPLING                                                               |
| <b>IN-PATIENT PROCEDURES</b>                    | EPISIOTOMY, UTERINE INVERSION<br>CORRECTION, MRP, LAPAROSCOPY,<br>HYSTEROSCOPY,VULVAL LESION |
| <b>SPOTTERS ON LAPTOP</b>                       | SLIDES, VAGINAL LESIONS, STD,<br>ENDOCRINES, ENDOMETRIOSIS                                   |
|                                                 | ECTOPIC PREGNANCY, URO GYN,<br>SURGICAL PROCEDURES, ONCOLOGY                                 |
| <b>PARTOGRAM</b>                                |                                                                                              |



## **15. REFERENCE BOOKS**

1. MUDHALIAR&MENON'S book of Obstetrics.
2. Manual of Obstetrics – Shirish Daftary & Sudip Chakravarti – 2<sup>nd</sup> Edition.
3. Ian Donald. Practice of Obstetrics.
4. Human Labor and birth – Oxorn-Foote 6<sup>th</sup> edition
5. William's Text book of Obstetrics
6. Obstetrics Normal & Problem Pregnancies – 4<sup>th</sup> edition – Gabbe.
7. Jeffcoate's principles of gynaecology – International Edition 2001
8. Clinical Gynaecologic Oncology Disaia JP, Creasman TM 5<sup>th</sup> Edition. 1989
9. MICHAEL DE SWIET Medical Disorders in Pregnancy
10. ARIAS High Risk Pregnancy
11. JAMES High Risk Pregnancy
12. Berek & Novak's Gynaecology – 14<sup>th</sup> Edition. 2007
13. Shaw's Text Book of Gynaecology – 13<sup>th</sup> Edition – Elsevier 2004
14. Shaw's Text Book of Operative Gynaecology – 6<sup>th</sup> Edition 2004
15. Jeffcoate's principles of Gynaecology – International Edition 2001
16. Te Linde's Operative Gynaecology 9<sup>th</sup> Edition – Lippincott 2003
17. Clinical Gynaecologic Oncology: Disaia JP, Creasman TM, 5<sup>th</sup> Edition, The C.V. Mosby Company 1989
18. Clinical Gynaecologic Endocrinology and Infertility – 7<sup>th</sup> Edition Speroff & Fritz, Lippincott 2005

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **16. JOURNALS**

1. Journal of Obstetrics & Gyn, India
2. British Journal of Obstetrics & Gynaecology
3. American Journal of Obstetrics & Gynaecology
4. International Journal of Obstetrics & Gynaecology
5. Obstetric & Gynae Survey
6. Gynae Oncology
7. Obstetrics & Gynae Clinics of N.America
8. Clinical Obstet & Gyn
9. Recent Advances in O&G
10. STUDD – Progress in O&G

# DEPARTMENT OF OBSTETRICS & GYNAECOLOGY

This is to certify that this log book is a bonafide record of  
All the Procedures done and the Academic activities  
Participated in by

.....

.....  
During his / her training in  
Obstetrics and Gynaecology

From ..... to  
.....

At the .....

In accordance with the requirement of the  
Tamil Nadu Dr.M.G.R. Medical University for the  
Degree D.G.O.(Obstetrics and Gynaecology)

Professor & Head  
Department of Obstetrics and Gynaecology

|              |
|--------------|
| <b>Name:</b> |
|              |
|              |
|              |
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|              |

## INSTRUCTIONS

This logbook is intended to be a record of all operations performed or participated by a student during his/her Course.

The students should enter in the following pages the information required on each operation including the date, patient's hospital number and name, the nature of the operation and the level of their participation.

|    |   |                                         |
|----|---|-----------------------------------------|
| P  | - | Principal Operator                      |
| PA | - | Principal Operator assisted by a senior |
| A  | - | Assistant                               |
| T  | - | Teaching (Junior)                       |
| W  | - | Witnessed                               |

The students You should obtain the signature of the consultant for each page.

The students should provide a summary of the work they have done by giving the total number of each type of operation carried out during the entire training period on the consolidation sheet. Each operation should be entered under only one heading. Case reports or articles published or presented in conferences, symposia or departmental clinical meetings should be recorded on the sheet provided for the purpose.

**Department of Obstetrics and Gynaecology,**

.....

.....

Name: .....

|    |          |                |                |
|----|----------|----------------|----------------|
| 1  | Postings | Date Commenced | Date Completed |
| 2  |          |                |                |
| 3  |          |                |                |
| 4  |          |                |                |
| 5  |          |                |                |
| 6  |          |                |                |
| 7  |          |                |                |
| 8  |          |                |                |
| 9  |          |                |                |
| 10 |          |                |                |

Date of this Log Book – Commenced :

Completed :

| Date | Hospital Number | Patient's Name | Diagnosis | Nature of Operation | P / PA / A / T / W | Remarks (Complication) |
|------|-----------------|----------------|-----------|---------------------|--------------------|------------------------|
|      |                 |                |           |                     |                    |                        |
|      |                 |                |           |                     |                    |                        |
|      |                 |                |           |                     |                    |                        |
|      |                 |                |           |                     |                    |                        |
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|      |                 |                |           |                     |                    |                        |
|      |                 |                |           |                     |                    |                        |
|      |                 |                |           |                     |                    |                        |
|      |                 |                |           |                     |                    |                        |

Signature of Consultant :

.....

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# **DIPLOMA IN OPHTHALMOLOGY (D.O.)**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**DIPLOMA IN OPHTHALMOLOGY (D.O.)**

**1.GOAL**

The goal of postgraduate medical education in ophthalmology shall be to produce competent specialist

1. who shall recognize the Eye health needs of the community, and carry out professional obligations ethically, compassionately and in keeping with the objectives of the national health policy;
2. who shall have mastered all of the competencies, pertaining to the Ophthalmology that are required to be practiced at primary and secondary levels.
3. who understand quality management systems and are equipped with methods to keep themselves updated in future
4. who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology; and
5. who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

**2.OBJECTIVES:**

At the end of the postgraduate training the concerned the student should have the following Knowledge, Attitudes and Skills and shall be able to:

1. Recognise the importance of Ophthalmology in the context of the health need of the community and the national priorities in the health sector.
2. Practice Ophthalmology ethically and compassionately.
3. Demonstrate sufficient understanding of the basic sciences relevant to research and practice of Ophthalmology.
4. Diagnose diseases by mastering skills to pick up clinical signs and interpreting test results towards this.

5. Have sound theoretical and practical knowledge to manage illness both medically and where relevant surgically based on principles of Evidence Based Medicine (EBM).
6. Have insight into one's limitations and refer to other centre/colleague for appropriate care of the illness being managed.
7. Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and promotive measures/strategies.
8. Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.
9. Demonstrate skills in documentation of individual case details as well as record morbidity and mortality data relevant to the assigned situation.
10. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
11. Play the assigned role in the implementation of national health programmes in Ophthalmology, effectively and responsibly.
12. Organise and supervise delivery of Ophthalmic care in the clinic/hospital or the field situation.
13. Develop skills as a self-directed learner, recognise continuing educational needs; select and use appropriate learning resources.
14. Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
15. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
16. Function as an effective leader of a health team engaged in health care, research or training.

### **3. COMPONENTS OF POST GRADUATE CURRICULUM**

#### **Essential theoretical knowledge**

The student is trained to become a specialist who will treat all eye conditions at the primary and secondary level and many of the tertiary care problems, there his/her theoretical knowledge should be broad based and should encompass all of what is there in good multi-volume text book of Ophthalmology.

#### **Essential diagnostic skills - instrumentation**

This list is only illustrative and more clinical tests whose importance have not been recognized in the past or newly developed should be learned.

#### **Ophthalmic examination:**

- External eye examination with torch and magnification
- Vision assessment and recording in snellen's notation and LogMar
  - i. Pediatric visual assessment
- Refraction
  - i. Retinoscopy
  - ii. Streak Retinoscopy
  - iii. Use of trial set
  - iv. Use of Jackson's cross-cylinder
  - v. Subjective refinement of refraction
- Autorefractometry
  - i. Use of and interpretation of autorefractometer
- Slit Lamp Examination
  - i. Diffuse examination
  - ii. Focal examination
  - iii. Retroillumination – direct & indirect
  - iv. Sclerotic scatter
  - v. Specular reflection
  - vi. Staining modalities and interpretation
- Slit Lamp Accessories
  - i. Applanation Tonometry
    - 1. Goldman's applanation



- ii. Gonioscopy
    - 1. Single or two mirror
    - 2. Grading of the angle
    - 3. Testing for occludability
    - 4. Indentation gonioscopy
  - iii. 3- mirror examination of the fundus
  - iv. 78-D / 90-D / 60-D retinal examination
  - v. Hruby lens examination
  - vi. Optical pachymetry
  - vii. Slit lamp photography
- Tonometry
  - i. Digital tonometry
  - ii. Applanation
  - iii. Indentation ( commonly Schiottz )
  - iv. Electronic tonometry
- Pupil examination
  - i. Direct and Consensual
  - ii. Relative afferent papillary defect
- Assessment of epiphora
  - i. Jone's dye test
  - ii. Syringing – performance & interpretation
  - iii. Dye disappearance test
- Dry eye evaluation
  - i. Schirmer test
  - ii. Rose Bengal / Lissamine green staining
  - iii. Tear film breakup time
  - iv. Tear meniscus evaluation
- Direct ophthalmoscopy
  - i. Distant direct
  - ii. Use of filters provided
- Indirect ophthalmoscopy
  - i. Scleral depression
  - ii. Fundus drawing capability
  - iii. Use of filters provided
- Colour vision evaluation
  - i. Ishihara pseudoisochromatic plates
  - ii. Other tests like
    - 1. Farnsworth – Munsell 100 – hue or 15 – hue tests or
    - 2. Holmgren's wools

- Use of Amsler's charting
  - i. Instructing in the use of and interpreting the chart.
- Corneal topography and corneal mapping
- Corneal thickness assessment
- Specular microscopy of the corneal endothelium
- Keratometry
  - i. Performance & interpretation of keratometry
  - ii. Diagnosis of situations such as keratoconus
  - iii. Keratoscopy
- Diagnosis & assessment of Squint
  - i. Hirschberg test
  - ii. Ocular position and motility examination
  - iii. Versions, ductions, and vergences
  - iv. Convergence facility estimation
  - v. Cover / Uncover / Alternate cover test
  - vi. Use of prism bars or free prisms in assessment of squint
  - vii. Use of synaptophore / major amblyoscope
  - viii. Use of Bagolini's striated glasses / red filters / Maddox rod
  - ix. Use of Worth's four dot test
  - x. Use & interpretation of the Hess chart / Lees' screen
  - xi. Performance & interpretation of diplopia charting
  - xii. Diagnosis of amblyopia
  - xiii. Examination for stereopsis
- Exophthalmometry
  - i. Detection of early proptosis
  - ii. Use of any exophthalmometer like Hertels or Luedde's
- Corneal ulcer investigation
  - i. Taking a corneal scraping
  - ii. Inoculation into media
  - iii. Evaluation of Gram's stain
  - iv. Evaluation of KOH preparation
- Use and evaluation of ophthalmic ultrasound
  - i. A- scan ultrasound with biometry
  - ii. B- scan ultrasound : performance & interpretation
- Interpretation of Optical coherence Tomography images of the eye

- Fundus photography & fundus fluorescein angiography (FFA, FAG)
  - i. Doing and evaluating stereoscopic fundus photographs
  - ii. Performance of and interpretation of FFA
  - iii. Performance of indirect fluorescein angiography
- Interpretation of perimetry
  - i. Confrontation fields
  - ii. Tangent screen
  - iii. Static computerized perimetry
    - 1. Interpretation of commonly managed problems
- Interpretation of Electrophysiological studies like ERG, VEP and EOG
- Evaluation of donated eye bank eye
- Radiology
  - i. Interpretation of plain skull films
    - 1. PA-20 ( Caldwell's view )
    - 2. PNS ( Water's view )
    - 3. Lateral
    - 4. Optic canal views
    - 5. Localisation of intra ocular and intra orbital FBs
  - ii. Interpretations of contrast studies
    - 1. Performance & interpretation of dacryocystograms
  - iii. Interpretation of CT Scans & MRI Scans
    - 1. Orbital CT and MRI evaluation
    - 2. Brain CT interpretation

#### **Non Ophthalmic clinical examination:**

**General medical examination at the undergraduate level**

**With special emphasis on a good Neurological examination and Examination of the sinus, Anterior nose and mouth**

#### **Essential Research Skills leading to writing of a Research paper**

Basic knowledge in epidemiology and biostatistics

#### **Medical Ethics/bioethics and Medicolegal aspects:**

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, moral and legal issues, Medical Audit are part and parcel of the curriculum and syllabus.

## **Other skills required**

1. Contact lenses
  - a. Pre fitting assessment
  - b. RGP and soft lens fitting
  - c. Special lens fitting eg keratoconus
  - d. Troubleshooting
2. Low vision assessment (LVA)
  - a. The basics of LVA assessment and selection of aid with knowledge of availability & cost.
  - b. Should have a basic knowledge of the facilities available for the blind including government concessions, and life style supports. Student should be exposed to LVA clinic
  - c. An exposure to Cerebral Visual insufficiency evaluation as part of pediatric ophthalmology posting is desirable.
3. Community ophthalmology
  - a. Ability to organize institutional screening
  - b. Ability to organize peripheral eye screening camps
  - c. Knowledge and ability to execute guidelines of National Program for Prevention of Blindness- Student should be exposed to the activities of the outreach service division.
4. Presentation skills
  - a. Should part take in seminar presentation in the department .
  - b. Should make presentations in conferences and CME programmes. Eg Free paper sessions or posters.
5. Organisation
  - a. Ability to organize meetings, seminars and symposia
  - b. Ability to get along with colleagues and work as a team with the other members of the department.
  - c. Help organize exams in the department for various courses.
6. Communication skills
  - a. With patients and colleagues
  - b. Should read books on clinical communication skills and attend training programmes if available.
7. Record keeping and Quality
  - a. Ability to maintain records as scientifically as possible
  - b. Knowledge of computer software especially Excel and a statistical package. This is best learnt while doing the Research paper.
  - c. Should know the components of quality management systems and be able to do clinical audits

## 8. Teaching

- a. The ability to pass on skills acquired to one's juniors, theoretical, procedural and surgical

## **4.THEORY SYLLABUS:**

### a. The Basic Sciences :

- i. Orbital and Ocular anatomy
  - a. Gross anatomy
  - b. Histology
- ii. Ocular Physiology
- iii. Pathology
  - a. General pathology
  - b. Ocular pathology : Gross pathology, Histopathology.
- iv. Biochemistry: General biochemistry, Biochemistry applicable to ocular function.

### 1. Microbiology

- a. General Microbiology
- b. Specific microbiology applicable to the eye
- c. Immunology with particular reference to ocular immunology

### b. Optics and Refraction

- a. Physical optics
- b. Geometric optics
- c. Visual optics
- d. Applied optics including optical devices and contact lenses

### c. Clinical Ophthalmology

- i. Disorders of Refraction
- v. Disorders of the Lids
- vi. Disorders of the Lacrimal System
- vii. Disorders of the Conjunctiva
- viii. Disorders of the Sclera
- ix. Disorders of the Cornea
- x. Disorders of the Uveal Tract
- xi. Disorders of the Lens
- xii. Disorders of the Retina
- xiii. Disorders of the Optic Nerve & Visual Pathway
- xiv. Disorders of the Orbit
- xv. Glaucoma
- xvi. Neuro ophthalmology
- xvii. Paediatric ophthalmology
- xviii. Systemic ophthalmology ( Ocular involvement in systemic disease)
- xix. Immune ocular disorders
- xx. Strabismus & Ocular motility disorders

- d. Community Ophthalmology
  - 1. Understanding of Ophthalmic disease burden in the community
  - 2. Community based eye care delivery
  - 3. Community based rehabilitation
  - 4. Community based eye research
  - 5. World and National health programmes
  - 6. Basics of epidemiology and biostatistics

## **5.TEACHING LEARNING METHODS:**

Postgraduate training follows adult teaching principles. The faculties are supervisors cum facilitator and not passive transmitters of knowledge like in schools. An apprentice training model is followed.

### **1. Outpatient training**

Students will see out patients (OP) in the clinic initially with the consultant; progressing to independently seeing patients and then discussing with faculty and finally seeing patients independently and treating patients. The faculty will be there in the OP to clear doubts at any stage.

### **2. Inpatient training**

Students will work up the more difficult and surgical patients admitted to the ward and be responsible for their care under the faculty in charge of the wards. The cases in the wards will be discussed during rounds so that students gain practical experience.

### **3. Surgical training:**

This will be graded. The student will first train in the wet lab and get used to handling the microscope and micro-instruments. They will also do minor procedures in the treatment room under supervision. Once wet lab training is over they will go to the operation theatre (OT) and in a graded manner first observing, then assisting and being assisted and finally doing independently and training juniors.

### **4. Emergency training:**

Students will take on calls and attend emergencies and ward calls in a graded basis starting with being first on call. They will also assist and do emergency surgeries while being on call. While on call they will learn how to harvest donated eyes and see inpatients of other department requiring eye consultations. All students will have to attend Basic life support training.

## **5. Clinical Case discussions**

- a) Every effort should be made to include as wide a variety of cases as possible over two years with multiple repetitions.
- b) Case discussions will be a constant feature of round where patient's records written by the student and treatment options will be discussed. Examination methods, evidence based management, latest developments etc can also be discussed.
- c) Case presentation at other, in-hospital multidisciplinary fora may be done.

## **6. Seminars**

- a. Seminars should be conducted at least once weekly. The topics selected should be repeated once in 2 years so as to cover as wide a range of topics as possible.
- b. Seminars could be individual presentations or a continuum (large topic) with many candidates participating.

## **7. Journal Clubs**

This also should be done a once a week or once in two week exercise. The topics selected should be current. It could be done topic wise or journal wise. Indexed journals are recommended.

## **8. CPC**

Students are encouraged to do Clinico pathological conferences (CPCs)

## **9. Lectures**

- a) Lectures to candidates should be in the form of instructional courses at the beginning of the academic term should be given so that students get a broad idea about the speciality.. These would include topics such as dark room techniques, fundus fluorescein angiography, evaluation of perimetry, squint evaluation and management, slit lamp examination with accessories such as gonioscopy etc.
- b) Lectures could also be arranged round the year on subspecialty topics.
- c) During the course, the candidates should have one lecture / one seminar on National programs (eg. National Programme for Control of Blindness, Trachoma program etc.), International assistance schemes for execution of national program ( DAN-PCB , Lion's International, Christoffel-Blunden Mission etc ). These would be addressed to in detail, including current status etc.. In addition, it would be useful to include a few lectures on other non-ophthalmic National programs being undertaken in the country.

## **10. Research Activities leading to Research paper**

A candidate should learn to be conversant with journal browsing, medline search etc. to help in clinical and research work. They should also be given opportunity to attend research methodology classes. They should be involved in departmental research activities so that they can present in national conferences.

## **11. Teaching skills:**

Every postgraduate student should be involved in undergraduate teaching also.

One or two theory classes for undergraduates could be attended and one or two theory classes could be taken for undergraduates for selected topics.

Undergraduate clinical teaching is another teaching skill that the student should pick up during the course. At least five to six undergraduate clinical classes should be taken by the final year student (MS) before completion of his/her course.

## **12. Orientation program:**

All postgraduates from all specialties should have an introductory program in the institution where they are informed about candidate responsibilities, working systems, library usage, lab protocols etc. Specific orientation regarding the departmental working could be made as an introductory talk in the department concerned.

## **6.STRUCTURED TRAINING PROGRAM**

### **Year – wise structured training schedule**

#### **First year:**

##### **1. Theoretical knowledge**

- a. Basic sciences text books should have been read during this period. Optics and refraction book and a medium sized Single volume clinical Ophthalmology text should be read ( Books from 1 to 9 in the text book list).
- b. It is useful to have an internal examination of the basic sciences at the end of the first year, which will decide appearance at the final examination.
- c. Clinical ophthalmology.



## **2. Clinical examination and diagnostics**

- a. The art of history taking and all clinical examination skills should be learnt. The order of examination and recording should also be learnt during this time.
- b. By third month students should see outpatient cases independently and under supervision be encouraged to make clinical and surgical decisions.
- c. The art of retinoscopy and subjective refraction should be learnt.

## **3. Diagnostics**

- a. Should have an exposure to all the equipments with the students themselves taking the test and then doing the tests themselves under supervision of the technician in charge. They should start to learn to interpret the tests.

## **4. Surgery**

- a. Extra ocular surgery including
  - i. Destructive procedures like evisceration must have been done with or without assistance
  - ii. Local Anaesthesia ( retrobulbar, facial and peribulbar blocks mastered )
  - iii. Subconjunctival injections
  - iv. Assisting for squint surgery
  - v. Assisting for lid surgery. Tarsorrhaphy should be performed independently as also the simpler oculoplastic procedures.
  - vi. Chalazion and Pterygium surgery.
  - vii. Lid and corneal foreign body removal, suture removal on the slit lamp etc.
  - viii. At the end of the first year, the student should have participated as assistant in most of the intra ocular procedures as an assistant.
  - ix. Cataract surgery :
    1. Cataract surgery should be approached in stages, emphasis to be given on microscopic surgery.
    2. At the end of the first year, the student should be able to do standard extracapsular cataract extraction at least under guidance.

5. **Special training courses** in Research methodology, Ethics, Good clinical practice, Basic life support, Quality management and clinical audits, communication skills etc should be undertaken.

## **Second year :**

### **1. Theoretical Knowledge :**

- a. Student should read the standard text books and should also read a multi-volume text book for the more common diseases.

### **2. Clinical examination and diagnostics**

- a. The student is encouraged to take diagnostic investigational and therapeutic decisions on his / own. He / she should be able to manage most of the common problems that arise without guidance. However, the degree of freedom allowed in decision making is left to the confidence of the teacher in the student's abilities. It is to be encouraged. May require guidance for more complex cases.

### **3. Diagnostics:** The student should be conversant and at ease with most of the diagnostic procedures. The basic interpretation of the investigations should be mastered.

### **4. Surgical skills**

- a. At the end of the second year , the student should be capable of operating, without assistance, but under supervision, all varieties of cataract except congenital cataract. He / she should also know the management of cataract induced complications and cataract surgical complications ( management of vitreous loss ).
- b. He/she should have performed the basic antiglaucoma procedures such as trabeculectomy either with assistance or under supervision
- c. Extra ocular surgery such as squint surgery could be performed with assistance if possible.
- d. In addition, lacrimal sac surgery such as dacryocystectomy and dacryocystorhinostomy should be possible with assistance or under supervision.
- e. In addition, should ideally have assisted or atleast observed other surgeries such as retinal surgery, vitrectomy, orbit surgery, advanced oculoplastic surgery etc.

### **5. Conferences and workshops**

- a. The candidate should have attended one or two regional workshops and can attend one national conference. Presentation of a free paper in the workshop / National Conferences is to be encouraged.

|                                                                                                            |   |          |
|------------------------------------------------------------------------------------------------------------|---|----------|
| Details of Training :-                                                                                     |   |          |
| FIRST YEAR:                                                                                                |   |          |
| Out Patient and Casualty                                                                                   | : | 6 months |
| In Patient and O.T.                                                                                        | : | 6 months |
| SECOND YEAR: Concurrently with OP and IP work candidate should have exposure to special clinics as follows |   |          |
| Cornea Clinic                                                                                              | : | 1 5 days |
| Glaucoma Clinic                                                                                            | : | 1 5 days |
| Neuro Ophthalmology Clinic                                                                                 | : | 1 5 days |
| Orbit Clinic                                                                                               | : | 1 5 days |
| Orthoptic Clinic                                                                                           | : | 1 5 days |
| Retina Clinic                                                                                              | : | 1 5 days |
| Uvea Clinic                                                                                                | : | 15 days  |
| Refraction Room                                                                                            | : | 2 months |
| Eye campus & Community Ophthalmology                                                                       | : | 45 days  |
| Out Patient                                                                                                | : | 5 months |

### **Rotation and Posting in other Departments**

There will be no external posting and the whole two years should be spent in the department.

## Essential surgical skills

| Procedure                                                                            | Nature of activity * & number |   |    |    |
|--------------------------------------------------------------------------------------|-------------------------------|---|----|----|
|                                                                                      | O                             | A | PA | PI |
| <b>1. Operating theatre</b>                                                          |                               |   |    |    |
| <b>a. Anaesthesia :</b>                                                              |                               |   |    |    |
| <b>i. Retrobulbar anaesthesia</b>                                                    | -                             | - | 20 | 20 |
| <b>ii. Peribulbar anaesthesia</b>                                                    | -                             | - | 20 | 20 |
| <b>iii. Parabulbar anaesthesia</b>                                                   | ✓                             | - | -  | -  |
| <b>iv. Facial blocks</b>                                                             |                               |   |    |    |
| • O'Brein                                                                            | -                             | - | -  | 20 |
| • Atkinson                                                                           | -                             | - | -  | 5  |
| • van Lint & modifications                                                           | -                             | - | -  | 5  |
| <b>v. Frontal blocks</b>                                                             | -                             | - | -  | 2  |
| <b>vi. Infra orbital blocks</b>                                                      | -                             | - | -  | 1  |
| <b>vii. Blocks for sac surgery</b>                                                   | -                             | - | -  | 5  |
|                                                                                      |                               |   |    |    |
| <b>b. Magnification :</b>                                                            |                               |   |    |    |
| <b>i. Operating microscope : Familiarity with use is essential</b>                   | -                             | - | -  | ✓  |
| <b>ii. Operating loupe</b>                                                           |                               |   |    |    |
|                                                                                      |                               |   |    |    |
| <b>c. Lid surgery:</b>                                                               |                               |   |    |    |
| <b>i. Tarsorrhaphy</b>                                                               | -                             | - | -  | 10 |
| <b>ii. Ectropion and entropion procedures</b>                                        | -                             | - | -  | 2  |
| <b>iii. Ptosis surgery</b>                                                           | -                             | 2 | -  | -  |
| <b>iv. Lid repair following trauma and surgical excision of lid for tumours etc.</b> | -                             | - | 2  | -  |
| <b>v. Epilation, electrolysis, cryotherapy etc.</b>                                  | -                             | - | -  | 10 |
|                                                                                      |                               |   |    |    |
| <b>d. Destructive procedures:</b>                                                    |                               |   |    |    |
| <b>i. Evisceration with or without implant</b>                                       | -                             | - | -  | 3  |
| <b>ii. Enucleation with or without implant</b>                                       | -                             | - | -  | 5  |
| <b>iii. Modified enucleation procedures for intraocular tumours</b>                  |                               | - | 1  | -  |
|                                                                                      |                               |   |    |    |
| <b>e. Sac surgery</b>                                                                |                               |   |    |    |
| <b>i. Dacryocystectomy</b>                                                           | -                             | - | -  | 2  |
| <b>ii. Dacryocystorhinostomy</b>                                                     | -                             | - | -  | 3  |
| <b>iii. Probing for congenital obstruction of nasolacrimal duct</b>                  | -                             | - | 1  | -  |
|                                                                                      |                               |   |    |    |

|             |                                                                                                                                          |   |          |          |           |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------|---|----------|----------|-----------|
| <b>f.</b>   | <b>Extraocular muscle surgery</b>                                                                                                        |   |          |          |           |
| <b>i.</b>   | <b>Recession and resection procedures on the horizontal recti</b>                                                                        | - | -        | <b>2</b> | -         |
|             |                                                                                                                                          |   |          |          |           |
| <b>g.</b>   | <b>Cataract surgery</b>                                                                                                                  |   |          |          |           |
| <b>i.</b>   | <b>Standard ECCE with or without IOL implantation.</b>                                                                                   | - | -        | -        | <b>10</b> |
| <b>ii.</b>  | Small incision ECCE with or without IOL implantation                                                                                     | ✓ |          |          |           |
| <b>iii.</b> | Membranectomy                                                                                                                            | ✓ |          |          |           |
| <b>iv.</b>  | <b>Secondary AC or PC IOL implantation</b>                                                                                               | ✓ |          |          |           |
| <b>v.</b>   | Phacoemulsification                                                                                                                      | ✓ |          |          |           |
| <b>vi.</b>  | Intra capsular cataract extraction                                                                                                       | ✓ |          |          |           |
| <b>vii.</b> | <b>Vectis extraction</b>                                                                                                                 |   | -        | <b>1</b> | -         |
|             |                                                                                                                                          |   |          |          |           |
| <b>h.</b>   | <b>Retinal surgery</b>                                                                                                                   |   |          |          |           |
| <b>i.</b>   | Needs to know how to assist in external procedures such as buckling                                                                      | - | <b>1</b> | -        | -         |
| <b>ii.</b>  | Prophylactic cryotherapy                                                                                                                 | ✓ | -        | -        | -         |
|             |                                                                                                                                          |   |          |          |           |
| <b>i.</b>   | <b>Orbit surgery</b>                                                                                                                     |   |          |          |           |
| <b>i.</b>   | Anterior orbitotomy for diagnostics and therapy                                                                                          | ✓ | -        | -        | -         |
| <b>ii.</b>  | Lateral orbitotomy for tumours                                                                                                           | ✓ | -        | -        | -         |
| <b>iii.</b> | <b>Incision and drainage via anterior orbitotomy for abscess</b>                                                                         | - | <b>1</b> | -        | -         |
| <b>iv.</b>  | Exenteration                                                                                                                             | ✓ | -        | -        | -         |
| <b>v.</b>   | Fine needle aspiration biopsy of orbital disease                                                                                         | ✓ | -        | -        | -         |
|             | ( if experienced pathologist is available)                                                                                               |   |          |          |           |
| <b>j.</b>   | <b>Vitrectomy</b>                                                                                                                        |   |          |          |           |
| <b>i.</b>   | <b>Intra vitreal and intra cameral (anterior chamber) injection techniques and dosages, particularly for endophthalmitis management.</b> | - | -        | <b>2</b> | -         |
| <b>ii.</b>  | <b>Needs to know the basics of open sky vitrectomy (anterior segment) as management of cataract surgery complication</b>                 | - | -        | -        | <b>2</b>  |
| <b>iii.</b> | Automated vitrectomy                                                                                                                     | ✓ |          |          |           |
| <b>iv.</b>  | Assist vitrectomy surgeon if facility exists.                                                                                            |   |          |          |           |
|             |                                                                                                                                          |   |          |          |           |

|                                                                                                                               |   |   |   |    |
|-------------------------------------------------------------------------------------------------------------------------------|---|---|---|----|
| <b>k. Keratoplasty</b>                                                                                                        |   |   |   |    |
| i. Assisting or doing penetrating keratoplasty ( therapeutic, optical )                                                       | - | - | 1 | -  |
| ii. Lamellar keratectomy                                                                                                      | ✓ | - | - | -  |
|                                                                                                                               |   |   |   |    |
| <b>l. Glaucoma surgery</b>                                                                                                    |   |   |   |    |
| i. Trabeculectomy                                                                                                             | - | - | - | 3  |
| ii. Pharmacological modifications of trabeculectomy                                                                           |   |   |   |    |
| iii. Goniotomy                                                                                                                |   |   |   |    |
| iv. Cyclocryotherapy and other cyclodestructive procedures                                                                    | - | - | - | 2  |
|                                                                                                                               |   |   |   |    |
| <b>m. Surface ocular procedures</b>                                                                                           |   |   |   |    |
| i. Pterygium excision with modifications                                                                                      | - | - | - | 5  |
| ii. Conjunctival grafting                                                                                                     | - | - | 2 | -  |
| iii. Biopsy of cornea and conjunctiva                                                                                         | - | - | - | 1  |
| n. Pterygium excision                                                                                                         | - | - | - | 10 |
| o. Tarsorrhaphy                                                                                                               | - | - | - | 10 |
| p. Retrobulbar, parabulbar anaesthesia                                                                                        | - | - | - | 20 |
|                                                                                                                               |   |   |   |    |
| <b>2. Outpatient :</b>                                                                                                        |   |   |   |    |
| a. Manual diagnostic procedures such as syringing, corneal scraping, conjunctival swab collection, conjunctival scraping etc. | - | - | - | 10 |
| b. Conjunctival and corneal foreign body removal on the slit lamp                                                             | - | - | - | 10 |
| c. Chalazion incision and curettage                                                                                           | - | - | - | 10 |
| d. Biopsy of small lid and tumours                                                                                            | - | - | 3 | -  |
| e. Suture removal skin, conjunctival, corneal, and corneoscleral                                                              | - | - | - | 5  |
| f. Subconjunctival injection                                                                                                  | - | - | - | 10 |
| g. Posterior Sub- Tenon's injections                                                                                          | - | - | - | 5  |
| h. Artificial eye fitting                                                                                                     | - | - | - | 5  |
| i. Laser procedures                                                                                                           | ✓ | - | - | -  |
| i. Laser capsulotomy                                                                                                          | ✓ | - | - | -  |
| ii. Laser iridotomy                                                                                                           | ✓ | - | - | -  |
| iii. Laser trabeculoplasty                                                                                                    | ✓ | - | - | -  |
| iv. Panretinal photocoagulation                                                                                               | ✓ | - | - | -  |
| v. Focal photocoagulation                                                                                                     | ✓ | - | - | -  |

\* The procedures that the student should have:

O = Watched and Observed

A = Assisted the operating surgeon

PA = Performed with Assistance

PI = Performed Independently

7. Evaluation of the candidates in both theory and practicals will help the candidate in improvement of his/her knowledge, skills and attitude.

#### 8. COMPETENCY ASSESSMENT:

- OVERALL:

|                                                                                                                          |          |           |
|--------------------------------------------------------------------------------------------------------------------------|----------|-----------|
| a) Communication / commitment / Contribution /<br>Compassion towards patients and Innovation                             | ()<br>() | - 5 Marks |
| b) Implementation of newly learnt techniques/skills                                                                      | ()       |           |
| • Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars                                              |          | - 5 marks |
| • Number of Posters/Papers presented in Conferences/<br>Publications and Research Projects                               |          | - 5 marks |
| • No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic meetings<br>with details. |          | - 5 marks |
|                                                                                                                          |          | -----     |
|                                                                                                                          | Total    | 20 Marks  |
|                                                                                                                          |          | -----     |

#### PG CLINICAL COURSES

|                                      |                      |
|--------------------------------------|----------------------|
| VIVA including Competency Assessment | - 80 Marks (60 + 20) |
| Log Book                             | - 20 marks           |

#### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20<br>marks |
|---------------|----------|----------|-----------|----------|--------------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks                 |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks                 |
|               | AVERAGE  |          |           |          | 20 Marks                 |

#### 9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

## 10.THEORY EXAMINATION

Paper I : Applied Basic Sciences in Ophthalmology including Microbiology, Anatomy Physiology and Pathology of the Eye.

Paper II : Refraction, Principles of Orthoptics and Community Ophthalmology

Paper III : Ophthalmic Medicine and Surgery

### Question Paper Pattern : Paper I, II & III

I .Elaborate on: 2 X 15 = 30 marks

II. Write notes on: 10 X 7 = 70 marks

**Total:** 100 marks

## 11. CLINICAL EXAMINATION :

|                                                                        | No. of Cases |                         | Examination |                                            | Questioning time              |
|------------------------------------------------------------------------|--------------|-------------------------|-------------|--------------------------------------------|-------------------------------|
| Long Case                                                              | 1            |                         | 30 minutes  | 50 marks                                   | 10 minutes                    |
| Short Case<br>Short Case (Clinical) 2<br>Retinoscopy 1<br>Funduscopy 2 | 5            | ( 5 X 20 )              | 50 minutes  | 100 marks<br><br>-----<br><b>150 marks</b> | 5 minutes x 5<br>= 25 minutes |
| OSCE                                                                   |              | 5 stations<br>x 4 marks |             | 20 marks                                   |                               |
| Ward Rounds/Spotters                                                   |              | 5 x 6<br>marks          |             | 30 marks                                   | 5 minutes x 5<br>= 25 minutes |
| VIVA VOCE                                                              |              |                         |             | 80 marks                                   |                               |
| Log Book                                                               |              |                         |             | 20 marks                                   |                               |
| <b>Total</b>                                                           |              |                         |             | -----<br><b>300 marks</b><br>-----         |                               |



1. Long case :
  - a. Duration: 30 minutes (20 minutes for examination 10 min for questions)
  - b. Marks : 50 marks
  - c. Type of case:
    - i. Neuro ophthalmology
    - ii. Proptosis
    - iii. Sclerokeratouveitis
    - iv. Uveitis with complications
    - v. Lens induced complications
    - vi. Keratoplasties
    - vii. Complex posterior segment problems
    - viii. Glaucoma
2. Short cases:
  - a. Two short cases of 20 marks each. (2 x 20) = 40
  - b. Duration: 15 minutes ( 10+5)
3. Fundus cases:
  - a. Two fundus case each of 20 marks (2 x 20) = 40 marks
  - b. Duration: 15 minutes (10 + 5)
  - c. Type of cases:
    - i. Rhegmatogenous retinal detachment
    - ii. Diabetic retinopathy, background & proliferative
    - iii. Vasculitis
    - iv. Tractional RD
    - v. Hypertensive retinopathy and combinations of the same with DR
    - vi. Mass lesions
    - vii. High myopia with degeneration
    - viii. Coloboma choroids, simple or with detachment
    - ix. Posterior uveitis, retinitis etc.
    - x. Pigmentary Retinopathy
4. Refraction: (1 x 20) = 20 marks
  - a. One refraction case of 20 marks each. Only retinoscopy need to be done. 15 minutes (10+5)

## **12.LOG BOOK**

The log book is a record of the important activities of the candidates during his training.

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book and Dissertation have to be done in the Department once in every 6 months and the review report to be submitted to the University for all Postgraduate Degree courses.

The Log Book includes academic activities as well as the presentations and procedures carried out by the candidate.

## **13.VIVA:**

**VIVA including Competency Assessment - 80 Marks (60 + 20)**

- 80 Marks ( 60 marks viva + 20 marks competency)

Students will be examined by all the examiners together about students comprehension of the components of course contents, analytical approach and interpretation of data. This section will carry 60 marks. The examination will include the following:

- i. Community ophthalmology
- ii. Conjunctiva, Cornea, Lens
- iii. Uvea and Glaucoma
- iv. Neuro-ophthalmology & Systemic disorders
- v. Orbit & oculoplastics
- vi. Retina etc.
- vii. Surgical instruments
- viii. Pathology gross specimens
- ix. Pathology slides
- x. Microbiology slides
- xi. Radiology
- xii. Perimetry
- xiii. Miscellaneous including all investigations reports

### **Ward rounds/Spotters :**

This tests the students ability to manage the cases admitted to the ward. The skill assistant will give a 30 second case history and then the student is asked to do a 2 minute examination that is indicated for the case. Subsequently the candidate is quizzed about the case for another 2 to 3 minutes.

Examples of possible ward round cases:

- A patient who had complications during cataract surgery.
- Patient following a squint surgery.
- Patient following trabeculectomy
- Patient admitted for methyl-prednisolone injection.
- Case of corneal ulcer
- Case of ocular trauma- penetrating, blunt, IOFB etc
- Orbital or lid surgeries
- Posterior segment surgeries

#### **14. OSCE : (5 x 3 = 15)**

Objective structured clinical exams are clinical pictures or cases with a structured set of questions. There will be 5 stations 4 to 5 minutes and each question will be of 4 marks.

- I      Observation station  
      (e.g) Schiotz Tonometry  
      Observer to note
  - a) Whether patient's consent sought
  - b) Whether patient is properly instructed
  - c) Whether Tonometer is checked
  - d) Whether Topical drops applied
  - e) Way of handling
  - f) Whether the chart is referred
  
- II     Microbiology slide
  - a) Identification
  - b) Points for identification
  - c) A clinical Question relevant to the organism
  
- III    Pathology Slide
  - a) Identification
  - b) Points for identification
  - c) clinical Question relevant to the slide
  
- IV    Anterior segment picture
  - a) Identification
  - b) Points for identification
  - c) A clinical Question relevant to the Picture
  
- V     Posterior segment picture
  - a) Identification
  - b) Points for identification
  - c) A clinical Question relevant to the Picture

**15. Recommended Text books:**

1. Anatomy:
  - a. Wolff
  - b. Snell's
2. Physiology:
  - a. Adler's Physiology of the Eye
3. Immunology:
  - a. Ocular immunology
4. Ophthalmic Pathology:
  - a. Yanoff & Fine
  - b. Zimmerman
5. Pharmacology:
  - a. Havener
6. Refraction:
  - a. Duke Elder's practice of refraction
  - b. Elkington & Frank
7. Jack Kanski: Clinical Ophthalmology
8. Parson's text book of Ophthalmology
9. Stallard's Eye Surgery
10. Cataract Surgery & its Complications by Jaffe
11. Duane's System of Ophthalmology
12. Jakobiec Series
13. Peyman's Series
14. Cataract Surgery & its Complications by Jaffe
15. Duke-Elder's System of Ophthalmology
16. Podos & Yanoff Series

**Reference books:**

1. American Academy of Ophthalmology series BCSC latest edition released – this an update (not textbook) for specialists who have passed their qualification exams
2. Cornea :
  - a. Smolin & Thoft
  - b. Grayson
  - c. Kaufman & Leibowitz
3. Glaucoma
  - a. Bruce Shields Text Book of Glaucoma
  - b. Krupin & Shields Series on Glaucoma
  - c. Becker & Schaeffer's Text Book of Glaucoma
  - d. Anderson's Computerised Perimetry
  - e. Harrington's Text Book of Perimetry
  - f. Leiberman and Drake : Computerised perimetry
4. Retinal disease:
  - a. Stephen Ryan's Retina
  - b. Ron Michel: Retinal Detachment
  - c. Steve Charles: Basic Vitrectomy

5. Ultra Sound:
  - a. Sandra Byrne & Ronald Green: Ophthalmic Ultrasound
6. Uvea:
  - a. Nussenblatt & Palestine
  - b. Smith & Nozik
7. Neuroophthalmology:
  - a. Walsh & Hoyt
8. Orbital diseases:
  - a. Rootman's diseases of the orbit
  - b. Jakobiec & Snow – Diseases of the orbit
9. Tumours:
  - a. Jerry Shields – Diagnosis and management of orbital tumours
10. Strabismus:
  - a. Gunter von Noorden
  - b. Mein & Trimble
  - c. Practical orthoptics in the treatment of squint-Keith Lyle
11. Paediatric ophthalmology
  - a. Kenneth Wright

## **ADDITIONAL READING**

1. Indian Council of Medical Research, "Ethical Guidelines for Biomedical Research on Human Subjects", I.C.M.R, New Delhi, 2000.
2. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.
3. Francis C M, Medical Ethics, J P Publications, Bangalore, 1993.
4. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.
5. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424-8
6. Kirkwood B R, Essentials of Medical Statistics , 1<sup>st</sup> Ed., Oxford: Blackwell Scientific Publications 1988.
7. Mahajan B K, Methods in Bio statistics for medical students, 5<sup>th</sup> Ed. New Delhi, Jaypee Brothers Medical Publishers, 1989.
8. Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, min. of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi. P - 335.

9. National Health Policy, Min. of Health & Family Welfare, Nirman Bhawan, New Delhi, 1983
10. Srinivasa D K et al, Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry.

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **16.JOURNALS**

1. British Journal of Ophthalmology
2. American Journal of Ophthalmology
3. Indian Journal of Ophthalmology
4. Eye Journal Ophthalmology
5. Survey of Ophthalmology
6. IOC
7. Archives of Ophthalmology
8. Ophthalmology

**Recommended Books and Journals:** The list is not exhaustive and is just a guide- Other books with similar standard can be used

## LOG BOOK

**Table 1 : Academic activities attended**

Name:

Admission Year:

College:

[illegible]

## LOG BOOK

**Table 2 : Academic presentations made by the student**

Name:

Admission Year:

College:

[illegible]



## LOG BOOK

**Table 3 : Diagnostic and Operative procedures performed**

Name:

Admission Year:

College:

| Date | Name | ID No. | Procedure | Category<br>O, A, PA, PI* |
|------|------|--------|-----------|---------------------------|
|      |      |        |           |                           |
|      |      |        |           |                           |
|      |      |        |           |                           |
|      |      |        |           |                           |

**\* Key:**

- O - Washed up and observed
- A - Assisted a more senior Surgeon
- PA - Performed procedure under the direct supervision of a senior surgeon
- PI - performed independently

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# **DIPLOMA IN ORTHOPEDICS**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**DIPLOMA IN ORTHOPEDICS**

**1. GOALS AND OBJECTIVES:**

***Patient care ability:*** A candidate in orthopaedics surgery at the end of its 2 year course should develop proper clinical acumen to interpret diagnostic results and correlate them with symptoms. He should become capable to diagnose common clinical conditions/diseases in the specialty and to do age appropriate management effectively and without any complications and in the patient's best interest. He should be able to decide for making a referral to consultation with a more experienced colleague/professional friend while dealing with any patient with a difficult problem. He should be familiar with the treatment protocols of all orthopedic conditions and should be able to decide on the level of difficulty for appropriate referral.

***Teaching ability:*** He/she should be able to teach MBBS students about the commonly encountered conditions in orthopaedics, pertaining to their diagnostic features, basic pathophysiological aspects and the general and basic management strategies.

***Research Ability:*** He/she should also acquire elementary knowledge about research methodology, including record-keeping methods, and be able to conduct a research inquiry including making a proper analysis and writing a report on its findings.

**Team work:** He/she should be capable to work as a team member. He/she should develop general humane approach to patient care with communicating ability with the patients' relatives, especially in emergency situations such as in casualty department, while dealing with cancer patients and victims of accidents.

**Academic Activities:** He/She should acquired theory knowledge from the prescribed books and journals, which is the basic for application of the clinical practice.

He/she should also maintain human values with ethical consideration.

## **2. COMPONENTS OF THE POST GRADUATE CURRICULUM:**

**Cognitive knowledge:** Describe embryology, applied anatomy, physiology, pathology, clinical features, diagnostic procedures and the therapeutics including preventive methods (medical/surgical) pertaining to musculoskeletal system.

**Skills:** Diagnose conditions from history taking, clinical evaluation and investigations and to develop expertise to manage medically as well as surgically the commonly encountered disorders and diseases in different areas.

**Teaching:** Acquire ability to teach the MBBS students in simple and straightforward language about the common orthopaedic ailments/disorders, especially about their signs/symptoms for diagnosis with their general principles of therapy.

**Research:** Develop ability to conduct a research enquiry on clinical materials available in hospital and in community

Training in Medical Audit management, Health economics, Health information system, basics of statistics, exposure to Human behavior studies, knowledge of phamaco economics and introduction to non linear mathematics

***Attitude including communication skills:***

What is informed consent? What is its relevance?

How would you declare the news of a dead patient to the relatives?

How would you explain the complications of a surgical procedure and its significance? How much one should inform to patient about the disease?

***Patient doctor relation:*** Develop ability to communicate with the patient and his/her relatives pertaining to the disease condition, its severity and options available for the treatment/therapy.

***Preventive Aspect:*** Acquire knowledge about prevention of common conditions especially in children such as poliomyelitis, con-genital deformities, cerebral palsy and common orthopaedic malignancies..

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics,Bioethics, moral and legal issues and Medical Audit are part and parcel of the curriculum and syllabus.

### **3. THEORY SYLLABUS:**

Syllabus for Post Graduate Diploma in Orthopedics

#### **Applied Basic Sciences:**

Basic Sciences-Development of skeleton, Histology & Histopathology of cartilage & bone, Histology of skeletal muscle, collagen, Physiology of cartilage, Biophysical properties of bone and bone dis-eases and related dysfunction of parathyroid glands, Physiology of fracture healing, Delayed union & non-union of bones

Anatomy of the Upper Extremity, Lower Extremity and Spine

Physiology and Biochemistry:

Calcium Homeostasis

Clinical importance of Vitamin D on

Parathyroid function tests

Acid Base Balance

Plasma Proteins

Structure, function and repair of articular cartilage

Physiology of coagulation and coagulation disorders

Paratharmone

Structure of Peripheral Nerves and peripheral nerve injuries

#### **Pathology**

Infections of bone and joints

Fracture healing

Tumours of bone and joints

Rickets, Osteomalacia and Osteoporosis

Osteoarthritis, Rheumatoid arthritis

Pathology of synovium

Pathology of wound healing

Pathology of tetanus and Gas gangrene

## **Microbiology**

Collection and transport of specimens

Sterilisation, disinfection and theatre sterilization

Post operative wound infection and Hospital infections

Gram Positive and Gram Negative infections

AIDS Awareness and precautions

Mycotic infections

HIV

## **Pharmacology**

Non steroidal anti inflammatory drugs

General principles of chemotherapy of infections of bones and joints

Chemotherapy of Tuberculosis and Hansen's disease

Chemotherapy of bone tumours

Calcium, Phosphorus and Vitamin D

## **General Surgery**

Hemorrhage, shock and blood transfusion

Fluid, electrolyte and acid base balance

Bone grafting

Tumours, cysts and sinuses

Gangrene

Wound infections

Venous thrombosis

Lymphatics and Lymph nodes

## **Traumatology**

1. Fractures and dislocations: This shall include the mechanism of violence causing the injury, pathology of fracture healing- signs and symptoms – the mechanics of displacement of fragments – reduction, maintenance of reduction of fractures and dislocations by various methods – study of complications of osteoarticular injuries and their treatment and rehabilitation.

They shall work in the orthopedic out patient department and 24 hours fracture service and obtain proficiency in First Aid emergency management of fractures and dislocations – Resuscitation and management of multiple injuries. They will also be made conversant with various splints and their uses.

2. Contusions and other soft tissue injuries – sprains of ligaments of various joints – mechanism of production, their pathology, symptomatology and management.

3. Peripheral nerve injuries and spinal cord injuries – mechanism of production – symptomatology – patho physiology, investigation including electrodiagnosis – physiotherapeutic management – surgical treatment – splinting and bracing – rehabilitation

## **General Orthopedics :**

The study of General orthopedics shall include all the diseases that affect the locomotor system including:

- a. Deformities – congenital and acquired including their management
- b. Osteo articular tuberculosis – Incidence, bacteriology, pathology, symptomatology, investigations and management, both conservative and surgical.
- c. Infections: Bacteriology – pathology – clinical features and management in acute, subacute and chronic infections of bone.
- d. Arthritis – includes the study of various types of arthritis including infective, rheumatoid, metabolic and degenerative conditions – patho physiology, investigations and management
- e. Tumors of bone and joints



- f. Neuromuscular disorders
- g. Metabolic disorders of the skeletal system
- h. Interpretation of plain x-rays and clinico-radiological co-relation
- i. Interpretation of C.T., MRI, Bone Scanning - Techniques and clinico- radiological co-relation.

The course requires the candidates to attend the orthopedic wards and out patient department and shall have performed the common orthopedic procedures during the period of study and learn the principles of all tractions procedures.

Pediatric Orthopaedics with emphasis on CTEV, CDH, Perthes disease, S.C.F.E., club hand.

Orthopaedic Oncology

Surgical stabilizations of orthopaedic trauma

Peripheral nerve injuries

Clinical orthopaedics

Biomaterials in orthopaedics

### **Vascular surgery**

Reconstructive orthopaedics Sports medicine and arthroscopy

Arthroplasty

Spinal disorders including scoliosis, trauma, infections, degeneration and tumours

Clinical orthopaedics

Recent advances in orthopaedics

### **Physical Medicine and Rehabilitation :**

Principles of Physical therapy including exercise therapy, electro therapy, prescription of splints and braces

Principles of occupational therapy

Principles of electro diagnosis

with emphasis on electro diagnosis and various physiotherapy and occupational therapy techniques

Orthopaedic neurology including Polio, Cerebral palsy, spina-bifida

1. Hand Surgery
2. Plastic Surgery related to orthopaedics

### **Prosthesis and Orthotics :**

Principles of amputation surgery – rehabilitation of the amputee – examination and prescription for orthosis and prosthesis – check up and fitting

The concept of Total Rehabilitation including Medical, Educational, Vocational and Social Rehabilitation.

### **Practicals:**

Techniques of application of plaster of Paris – casts and jackets, shells and corrective plasters.

Techniques of manipulations for fractures, dislocations and deformities

Techniques of tractions procedures, skin traction, sling traction and skeletal tractions

Operative techniques of common orthopedic operations

Prescription of braces, calipers, splints and other orthopedic appliances.

Emergency management of the Injured patient including critical care-lectures by Anaesthetist for airway maintenance & shock management,

Basic splintage and transportation techniques, ATLS

Medical record keeping and bio-statistics

History taking and clinical examination of the patient

Common fractures/dislocations diagnosis and management including traction techniques

Interpretation of plain x-rays and clinico-radiological co-relation

Humanity/Ethics -Lectures on humanity, personality development, team spirit, Ethical issues in patients, Doctor- patient relation-ship and interpersonal relationship.

#### **4.TEACHING LEARNING METHODS:**

*The teaching and training of the students shall include graded responsibility in the management and treatment of patients entrusted to their care; participation in Seminars, Journal Clubs, Group Discussions, Clinical Meetings, Grand Rounds, and Clinico-Pathological Conferences; practical training in Diagnosis and treatment; training in the Basic Medical Sciences, as well as in allied clinical specialties.*

The following teaching learning methods are recommended.

1. Lectures
2. Case based discussion
3. Bed side clinics
4. Teaching on ward rounds
5. Symposia
6. Seminars
7. Journal clubs

#### **1. STRUCTURED TRAINING PROGRAMME:**

The students of Diploma in Orthopedics shall be posted in rotation to all the Orthopedic Units in the department.

Their training shall include postings to the following:

|                                      |           |
|--------------------------------------|-----------|
| Hand Surgery                         | – 2 weeks |
| Physical Medicine and Rehabilitation | – 2 weeks |
| Pediatric Orthopedics                | – 2 weeks |

**Clinical procedures, which the candidates should know**

| <b>S.<br/>No</b> | <b><i>Name of procedure</i></b>                                                                                    | <b><i>As<br/>Observer</i></b> | <b><i>As first<br/>Assistant</i></b> | <b><i>Able to per-<br/>form</i></b> |
|------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------|-------------------------------------|
| 1                | <b>ORTHOPAEDICS</b><br>Skin traction & Plaster<br>application                                                      |                               |                                      | Yes                                 |
| 2                | Skeletal traction of upper<br>Tibia,<br>distal Tibia, lower Femoral,<br>Olecranon,<br>Calcaneal and Skull traction |                               |                                      | Yes                                 |
| 3                | Closed reduction of<br>Fractures                                                                                   |                               |                                      | Yes                                 |

| <b>S.<br/>No</b> | <b>Name of procedure</b>                                                                                                              | <b>As<br/>Observer</b> | <b>As first<br/>Assistant</b> | <b>Able to per-<br/>form</b> |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------|------------------------------|
| 4                | Management of open frac-<br>tures<br>- Debridement, external fixa-<br>tion<br>- Soft tissue reconstruction<br>including bone coverage |                        |                               | Yes<br><br>Yes               |
| 5.               | Open reduction and internal<br>fixation of Fractures and<br>Open reduction of<br>dislocations                                         |                        |                               |                              |
| 6                | Bone & Joint Infections<br>Diagnostic Aspi-<br>ration of joint & Arthrotomy<br>Drilling/ Decompression of<br>metaphysis               |                        |                               | Yes<br><br>Yes               |

| <b>S.<br/>No</b> | <b>Name of procedure</b>                                                                                          | <b>As<br/>Observer</b> | <b>As first<br/>Assistant</b> | <b>Able to per-<br/>form</b> |
|------------------|-------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------|------------------------------|
|                  | Drainage of abscess<br>Sequestrectomy&<br>saucerisa-<br>tion<br><br>Girdlestone/Excision arthro-<br>plasty of Hip |                        |                               | Yes<br><br>Yes<br><br>Yes    |
| 7.               | Bone tumors<br><br>Biopsy from tumor<br><br>Excision of ostochondroma<br><br>Curettage & Bone grafting            |                        |                               | Yes<br><br>Yes<br><br>Yes    |
| 8.               | Spine<br><br>Exposure to spine by poste-<br>rior, anterior and<br>anterolateral<br>approaches                     |                        | Yes                           |                              |
| 9.               | CTEV- Ponsetti Method<br><br><br>Tendo Achilles lengthening                                                       |                        |                               | Yes<br><br>Yes               |
| 10.              | Postero-medial soft tissue<br>re-<br>Lease<br><br>Bony procedures including<br>triple<br>arthrodesis              |                        |                               | Yes<br><br>Yes               |

| <b>S.<br/>No</b> | <b>Name of procedure</b>                                                                                                                                                                     | <b>As<br/>Observer</b>      | <b>As first<br/>Assistant</b> | <b>Able to per-<br/>form</b> |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|------------------------------|
| 11               | High tibial osteotomy                                                                                                                                                                        | Yes                         |                               |                              |
| 12               | Tendon repair                                                                                                                                                                                |                             |                               | yes                          |
| 13               | Cerebral Palsy/ Neuro<br>muscular disorders -<br>Soft tissue/ bony<br>procedures<br><br>Knee & Ankle arthrodesis<br>and triple arthrodesis<br><br>Limbs lengthening / Illizarov<br>procedure | <br><br><br><br><br><br>Yes | <br><br>Yes<br><br><br>Yes    | <br><br>Yes                  |
| 15               | Arthrolysis of Elbow joint                                                                                                                                                                   | Yes                         | Yes                           |                              |
| 16               | Amputations                                                                                                                                                                                  |                             |                               | Yes                          |
| 17               | Limbs salvage procedures                                                                                                                                                                     |                             | Yes                           |                              |
|                  | DESIRABLE PROCE-<br>DURES<br>Endoscopy<br><br>Arthroscopy of knee                                                                                                                            | <br>Yes<br><br>Yes          | <br><br>Yes                   |                              |

|  |                                                      |     |     |  |
|--|------------------------------------------------------|-----|-----|--|
|  | Joint replacement                                    |     |     |  |
|  | Hip joint                                            | Yes | Yes |  |
|  | Knee joint                                           | Yes | Yes |  |
|  | Peripheral nerve repair                              |     | Yes |  |
|  | Tendon transfer procedures                           |     | Yes |  |
|  | Spinal stabilization procedures like pedicular screw |     | Yes |  |

### INVESTIGATIONS/ TESTS WHICH THE CANDIDATES SHOULD LEARN TO INTERPRET

#### **Name of Investigations**

#### **Tests**

Hematological investigations in

- CBC
- C-reactive protein,

Orthopaedic conditions like

- Rheumatoid factor,
- HLA-B27,
- Serum Electrophoresis,
- Serum Ca, P, Alkaline phosphatase, Acid phosphatase, Uric acid, Total proteins & A.G. ratio
- ELISA

Urine

- Bence Jones proteins,
- 24hr Urinary Ca

-



Radiological investigations

- Plain radiography
- CT Scan, MRI
- Radio- isotope bone scan

Interpretation of Histopathological slides of common Orthopaedic conditions like

- Tuberculosis/sepsis
- Myeloma
- Osteosarcoma
- Ewing Sarcoma
- Giant cell tumor

**6. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**

## **7. COMPETENCY ASSESSMENT:**

- **OVERALL:**

a) Communication / commitment / Contribution /  
Compassion towards patients and Innovation () - 5 Marks

b) Implementation of newly learnt techniques/skills ()

- Number of cases presented in Clinical Meetings/  
Journal clubs/seminars - 5 marks

- Number of Posters/Papers presented in Conferences/  
Publications and Research Projects - 5 marks

- No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings  
with details. - 5 marks

Total -----  
20 Marks  
-----

### PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

#### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

#### 8.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

#### 9.THEORY EXAMINATION:

Paper I - Applied Basic Sciences in orthopedics and General Principles of Surgery

Paper II – Traumatology

Paper III - Orthopaedics and Rehabilitation

#### Question paper Pattern: I,II & III

I. Elaborate on : 2 x15 = 30

II. Write notes on : 10 x 7 = 70

**Total = 100 marks**

#### 10. Practical Examination:

| Particulars.                                                            | Maximum Marks. |
|-------------------------------------------------------------------------|----------------|
| Clinical<br>Long Case 1 X 80 = 80 marks<br>Short case 2 X 35 = 70 marks | 150            |
| OSCE – 5 stations x 5 marks                                             | 25             |
| Ward Rounds/Spotters - 5 X 5 marks                                      | 25             |
| Viva-Voce                                                               | 80             |
| Log Book                                                                | 20             |
| Total                                                                   | 300            |
| Minimum for Pass                                                        | 150            |

#### 11. Log Book:

The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

#### 12. Viva including Competency Assessment - 80 Marks

VIVA including Competency Assessment - 80 Marks (60 + 20)

#### 13. OSCE: OSCE/OSPE – 25 marks (5 stations x 5 marks each)

2 manned stations-Typical deformities, Typical appearance of any orthopedic conditions

3 Unmanned stations- X-rays, Specimens, Instruments, Calipers etc.

#### **14. Reference Books:**

1. Mercer's orthopaedics surgery, Duthie, Edward Arnold
2. Campbell's Operative Orthopaedics, Canale and Beaty
3. Outline of orthopaedics, Crawford Adams, Churchill Livingstone
4. Closed treatment of fractures, H. John Charnley,  
Churchill Livingstone
5. Apley's
6. Text book of orthopaedics, Samuel Turek
7. Campbell's Operative Orthopaedics, Canale and Beaty
8. AO Principles of internal fixation
9. AO Principles of external fixation
10. Chapman's Orthopaedics
11. Watson Jones fractures and joint injuries, J.N. Wilson,  
Churchill Livingstone
12. Fractures in adults and children, Rockwood, Greens
13. Campbell's Operative Orthopaedics, Canale and Beaty
14. Campbell's Operative Orthopaedics, Canale and Beaty
15. AO Spinal fixation
16. Tumours and tumourous conditions of bones and joints, Jaffe,  
Lea Febiger
17. Clinical Evaluation – DAS, McRay, Panday
18. SM TULI Tuberculosis of musculoskeletal system
19. Limb reconstruction procedures
20. Orthopedic pathology – Bullough
21. Neglected fractures – Anil Jain
22. Pediatric Orthopedics –Staheli
23. Lovell & Winter Pediatric Orthopedics

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **15. JOURNALS**

3. Indian journal of orthopaedics
4. Journal of bone and surgery ( British and American volumes)
5. Orthopaedics clinics of North America
6. Clinical orthopaedics and related research Yearbook of orthopaedics
7. Journal of rehabilitation INJURY
8. Journal of Arthroplasty
9. Journal of Arthroscopy

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**DIPLOMA IN OTO-RHINO  
LARYNGOLOGY(D.L.O)**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**DIPLOMA IN OTO-RHINO LARYNGOLOGY(D.L.O)**

OTORHINOLARYNGOLOGY has undergone a major transformation in the past decade, the branch of surgery which initially comprised ENT head and neck surgery has acquired a totally new field in skull base surgery. There have been many advances in endoscopic surgery of the head and neck also. In tune with the continuing changes and the need for the students to update to the emerging new fields in otorhinolaryngology, the curriculum has been devised to acquire the new status

**1 GOAL**

The aim of this curriculum is to create a cadre of medical professionals who are well groomed to meet the challenges in the frontier of newer techniques and treatment in the emerging world of medicine and surgery.

1. This curriculum aims at students to keep abreast with latest in ENT subjects
2. Provide comprehensive diagnostic and therapeutic and surgical options and preventive ENT even in rural areas
3. Carry out research activities in emerging fields of ENT
4. To be a complete ENT surgeon by preventing ,diagnosing and treating ENT disease in the community and implement various health care programmes for the society

**2 OBJECTIVES:**

**a) Knowledge**

The post graduate students have to acquire the knowledge of anatomy physiology and pathological changes in ENT diseases and , identify the manifestations due to diseases and plan the management and care of the patients.

**b) Attitude**

Through the training program the student should develop a positive attitude and empathy towards the patient.

**c) Skills**

The student should develop skills of comprehending ENT diseases in the society and know their pathophysiology and devise intervention both medically and surgically and also to prevent diseases. They are also required to have good communication skills and treat patient with empathy. In this perspective they are to acquire sufficient knowledge of theoretical practical research avenues for implementing preventive programmes in the society

**3 COMPONENTS OF THE POSTGRADUATE CURRICULUM**

**THEORETICAL KNOWLEDGE**

- a. Basic sciences: it is required out of student to acquire knowledge of anatomy physiology and mechanism of disease progression
  - b. Clinical ENT : Knowledge of various ENT diseases and their related systemic connections should be studied
  - c. diagnostic procedures: knowledge of the various methods to identify and conclude regarding ENT diseases should be well studied
  - d. practical cadaveric and surgical skills should be obtained by constant practice and their skills should be evaluated
  - e. research activities should be learnt in such a way that they study the ENT illness both perspectively and elaborately.
  - f. preventive ENT should be learnt with emphasis on hearing and anticancer studies.
- **PRACTICAL AND CLINICAL SKILLS**



❖ **PRACTICAL SKILLS DIAGNOSTIC PROCEDURES**

1. Cadaver FESS dissection
2. Temporal bone dissection
3. Larynx dissection
4. Neck dissection

❖ **THERAPEUTIC PROCEDURES**

- 1) Tracheostomy
- 2) Nasogastric tube insertion
- 3) Grommet insertion
- 4) Nasal packing
- 5) Antral lavage

❖ **CLINICAL SKILLS**

1. History taking and physical Examination
2. Functional assessment of hearing equilibrium, voice, smell, taste, airway for OSAS
3. Reading Audiogram, OAE, BERA, HIT assessment, speech assessment, rhinomanometry, smell and taste assessment, radiology of ENT
4. Radiotherapy techniques
5. Chemotherapy techniques

• **WRITING THESIS/ RESEARCH ARTICLES**

All students will have to carry out a research program and bring out a Research paper

Students are encouraged to attend CME's, publish research papers and present posters or platform presentations at State, National and International conferences.

❖ **ATTITUDES INCLUDING COMMUNICATION SKILLS**

Student should develop the art of eliciting the maximum information from patients in a given time considering the sensory deficits of the patient and caregivers. Communication skills can be learnt through observation and from formal communication skills training and workshops. Students have to develop patience and empathy in dealing with patients. They have to learn to show sensitivity to their special needs.

**A) TRAINING IN RESEARCH METHODOLOGY MEDICAL ETHICS, BIO ETHICS AND MEDICOLEGAL ASPECTS**

- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
- Medical ethics, Bioethics, moral and legal issues, medical Audit are part and parcel of the curriculum and syllabus

**4. THEORY SYLLABUS**

**Applied Basic Sciences**

**Anatomy, Physiology, Biochemistry, Pathology and Bacteriology related to E.N.T. Speciality:**

**Anatomy:**

- Pre-natal and Post-natal development of the ear:
  - 1) Internal ear –bony labyrinth and the membranous labyrinth
- Cochleo vestibular development and malformations
  - 2) Middle Ear cleft– Middle ear folds and ossicles
    - Air spaces and lining membrane
    - Eustachian tube and mastoid development theories
  - 3) External Ear - development of pinna & external auditory canal

**Pneumatisation of the Mastoid Process ; development theories**

- Anatomy of temporal bone:
  - Microscopic anatomy
  - Endoscopic anatomy
  - Squamous Portion
  - Mastoid Portion
  - Petrous Portion
  - Tympanic Portion

- **Anatomy of the ear:**

|              |                     |
|--------------|---------------------|
| External ear | Microscopic anatomy |
| Middle ear   | Endoscopic anatomy  |
| Internal ear |                     |

- **Anatomy of cranial nerves:**  
with particular reference to facial and auditory nerves

- **Osteology of the cranial bones:**

Venous  
sinuses

The brain

**Anatomy of nose and paranasal sinuses:**

Prenatal and post – natal development

The external nose - development

The nasal cavity – Lateral, Medial walls, choana & roof and  
floor of nasal cavity

The paranasal sinuses – Development of sinuses & endoscopic  
anatomy of nose & PNS

Nasal Mucous membrane

Blood supply and nerve supply

**Anatomy of the Pharynx and Nose:**

Development of Pharynx 1. nasopharynx

2. Oropharynx

3. Hypopharynx

The tonsils / Waldeyer's ring

Parapharyngeal space & its structures

Functions

## **Anatomy of the larynx:**

**Prenatal and postnatal development of the larynx, Difference between child and adult larynx Muscles and cartilages of larynx (external & internal muscles, ligaments spaces in larynx.**

**Anatomy of trachea, bronchi and Oesophagus, The long and Broncho-pulmonary, segments The Mediastinum**

**The visceral arches, their derivatives, developmental defects  
Development of face**

**ANATOMY OF SKULL BASE – ANTERIOR, LATERAL &  
POSTERIOR SKULL BASE.**

## **Bacteriology Syllabus**

- 1. Elementary Bacteriology pertaining to:**
  - a. Corynebacterium diphtheriae**
  - b. Staphylo, Strepto, Pneumo, Pseudomonas, H.influenza**
  - c. Neisseria group**
  - d. Proteus group**
  - e. Vincents and Fusiform Bacillus**
  - f. Mycobacterium tuberculosis, M. leprae**
- 2. Fungus: Aspergillus group, Mucor, Rhizopus**
- 3. Viruses: Adeno virus, Coxsackie, RSV, E B Virus, HIV, H1N1 virus  
RHINO Virus, MUMPS, MEASLES**
- 4. Rhinosporidiosis**
- 5. Immunology – Surgical Immunology & allergy**

## **Biochemistry syllabus:**

- Biochemistry of body fluids and C.S.F**
- Electrolyte balance and maintenance of PH of Blood**
- Biochemical changes in upper airway obstruction and after tracheostomy.**

- Biochemistry of labyrinthine fluids and its variations in diseases.

#### **Pharmacology syllabus:**

- Pharmacology of sympathomimetic and their uses in Otolaryngology
- Local anaesthetics and analgesics : Merits and Demerits
- Chemotherapy of malignant conditions
- Cortico Steroids and its usage in Otolaryngology
- Antibiotics – recent trends
- Anti Emetics & Labyrinthine Sedatives
- Topical steroids

#### **Pathology Syllabus:**

**General Pathology – Inflammations, Necrosis, Gangrene Repair of wounds.**

**Shock – Pathology**

**Coagulation**

**Granuloma including midline**

**granulomas**

**Thrombosis and Embolism**

**Tumors – Aetiology, Classification, Pathology & Histopathology**

**Fungal infections**

**Bleeding Disorders**

#### **Special Pathology:**

**Surgical pathology of Mouth, Jaw, Neck Salivary glands and Oesophagus.**

**Ear:**

**Pathology of the external ear.**

**Histopathology of the drum membrane**

**Inflammations of the middle ear**

**Inflammation of Mastoid**

**Inflammation of the Petrous**

**Histopathology of the inner ear: Vestibular Schwannoma**

**Tuberculosis of ear**

**Chronic inflammatory changes in the temporal bone**

**Neoplasms of the ear**

**Nose:**

**Pathology of the Nose.**

**Chronic specific infections of the Nose and accessory sinuses (Pre Nasal).**

**Cysts and tumours of the nose and accessory sinuses.**

**Pharynx and Larynx:**

**Oral and Pharyngeal pathology as manifestations of constitutional Diseases, Pathology of the Nasopharynx, larynx. Swellings of the neck.**

**Diseases of skull base**

**Clinical Pathology in its relationship to otolaryngology.**

**Physiology Syllabus:**

**Regulation of water balance and composition of body fluids by the kidney. Coagulation of blood.**

**Physiology of special senses:**

**Taste.**

**Smell.**

**Heat.**

**Physiology of respiration including its mechanism and regulation.**

**Physiology of deglutition.**

**Maintenance of balance of body. Physiology of nose and paranasal sinuses. Carriage of Oxygen by the blood. Carbondioxide transport in the body.**

**Audiology syllabus:**

**Physiology of hearing and balance:**

**Hearing including physics of sound. Sound production.**

**Physics of sound. The vibration. The decibel.**

**Sound Stimuli and its Wave motion in a material medium. Propagation. Complex sound various and phase difference. Sound conduction.**

**Vestibular function and balance. Semicircular canals. The otolith organs. Otoacoustic Emissions**

## **5. TEACHING LEARNING METHODS**

The following teaching learning methods are recommended.

Lectures

Case based discussion

Bed side clinics

Teaching on ward rounds

Symposia

Seminars

Journal clubs

Problem based learning

Telemedicine

### **Practical Skills**

**1. Cadaver Dissection of Ear, Nose and Larynx**

**2. Diagnostic Endoscopy**

**3. Microscopic Examination**

**4. Surgical Techniques**

### **6. STRUCTURED TRAINING PROGRAM**

I Year- ENT Department

II Year

- ENT Department -9months

#### **Special Postings:**

- General surgery-one month
- Audiology - 15 days
- Anesthesia - 15 days
- Radiotherapy - 15 days
- Pediatrics - 15 days

**7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.**



## 8. COMPETENCY ASSESSMENT:

- OVERALL:
    - a) Communication / commitment / Contribution / Compassion towards patients and Innovation ( ) - 5 Marks
    - b) Implementation of newly learnt techniques/skills ( )
  - Number of cases presented in Clinical Meetings/ Journal clubs/seminars - 5 marks
  - Number of Posters/Papers presented in Conferences/ Publications and Research Projects - 5 marks
  - No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks
- Total -----  
20 Marks  
-----

### PG CLINICAL COURSES

- VIVA including Competency Assessment - 80 Marks (60 + 20)
- Log Book - 20 marks

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

## 9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

## 10. THEORY EXAMINATION

PAPER I - Applied Basic Sciences in relation to ENT

PAPER II - Otorhinolaryngology including Audiology and Neuro-Otology

PAPER III - Otorhinolaryngology including Head and Neck Oncology  
and Endoscopy

### Question Paper Pattern: (Paper I, II & III)

I .Elaborate on: 2 X 15 = 30 marks

II. Write notes on: 10 X 7 = 70 marks

**Total:** 100marks

## 11. CLINICAL EXAMINATION

| Particulars.                                                            | Maximum Marks. |
|-------------------------------------------------------------------------|----------------|
| Clinical<br>Long Case 1 X 80 = 80 marks<br>Short case 2 X 35 = 70 marks | 150            |
| OSCE – 5 stations x 5 marks                                             | 25             |
| Ward Rounds/Spotters - 5 X 5 marks                                      | 25             |
| Viva-Voce                                                               | 80             |
| Log Book                                                                | 20             |
| Total                                                                   | 300            |
| Minimum for Pass                                                        | 150            |

## 12. LOG BOOK

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book have to be done in the Department by guide / HOD once in every 6 months

## 13. VIVA including Competency Assessment

VIVA including Competency Assessment - 80 Marks (60 + 20)

## 14.OSCE (Objective Structural Clinical Examination)

Based on Objective Structured Exam Stations:

| S.No.                            | Stations                 | Marks |
|----------------------------------|--------------------------|-------|
| 1.                               | Pathology                | 05    |
| 2.                               | Microbiology             | 05    |
| 3.                               | Specimen – Dry – 5       | 05    |
| 4.                               | Speciment – Wet – 5      | 05    |
| 5.                               | Operative Surgery        | 05    |
| 6.                               | Instruments – 5          | 05    |
| 7.                               | X-ray – 5 / Laptop video | 05    |
| 8.                               | CT/MRI – 5               | 05    |
| 9.                               | Audiogram                | 05    |
| 10.                              | Recent advances in ENT   | 05    |
| (BERA/OAE/VEMP/CHAMP/ IMPEDENCE) |                          | ----- |
|                                  |                          | 50    |
|                                  |                          | ----- |

## **15. RECOMMENDED LIST OF TEXT BOOKS AND JOURNALS**

- 1. Scott Brown's Otolaryngology – Five Volumes**
- 2. Endoscopic sinus surgery by PJ Womald / MV Kirtane**
- 3. Ballenger – Diseases of the Nose, Throat, Ear, Head and Neck**
- 4. Mawson's Diseases of the Ear.**
- 5. Glasscock and Shambaugh – Surgery of the Ear.**
- 6. Learning Ear Surgery by Temporal Bone Dissection by Dr. K.K. Ramalingam and Dr. B. Sreeramoorthy**
- 7. Year Book of Otolaryngology, Head and Neck Surgery Edited by Michael M. Paperella and Byron J. Bailey.**
- 8. Tumours of the Head and Neck – Clinical and Pathological Considerations by John. G. Batsakis.**
- 9. Rob and Smith – Operative Surgery – Three volumes**
- 10. Recent Advances in Otolaryngology.**
- 11. Jackson's Textbook of Broncho – Oesophagology**
- 12. Radiology of Head and Neck by Valvassori**
- 13. Diseases of the facial nerve by Mark May**
- 14. Otolaryngology Neurology by D. Brachmann**

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **REFERENCES:**

**Lore's Atlas of Head and Neck Surgery**

**Microsurgery of the skull base by Ugo Fisch and Douglas Matto.**

**Text Book of Operative Surgery by Lee.**

## **16. JOURNALS**

- 1. Indian Journal of Otolaryngology**
- 2. Journal of Otology**
- 3. Laryngoscope**
- 4. Otolaryngology Clinics of North American**
- 5. Annals of Otology, Rhinology and Laryngology**
- 6. Acta Otolaryngologica**
- 7. Archives of Otolaryngology, Head and Neck Surgery**
- 8. International Journal of Paediatric Otolaryngology**

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# **DIPLOMA IN PAEDIATRICS (D.CH.)**

## **CHAPTER I**

### **GOALS AND GENERAL OBJECTIVES OF POSTGRADUATE MEDICAL EDUCATION PROGRAM**

#### **1. GOALS**

The goal of postgraduate medical education shall be to produce competent specialist and /or Medical teacher:

- (i) who shall recognise the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy;
- (ii) who shall have mastered most of the competencies, pertaining to the specialty, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system:
- (iii) who shall be aware of the contemporary advances and developments in the discipline concerned;
- (iv) who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology; and
- (v) who shall have acquired the basic skills in teaching of the medical and paramedical professionals.

#### **2. GENERAL OBJECTIVES**

At the end of the postgraduate training in the discipline concerned the student shall be able to:

- i) Recognise the importance of the concerned speciality in the context of the health need of the community and the national priorities in the health sector.
- ii) Practice the speciality concerned ethically and in step with the principles of primary health care.
- iii) Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
- iv) Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and promotive measures/strategies.
- v) Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.

- vi) Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.
- vii) Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation.
- viii) Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
- ix) Play the assigned role in the implementation of national health programmes, effectively and responsibly.
- x) Organise and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- xi) Develop skills as a self-directed learner, recognise continuing educational needs; select and use appropriate learning resources.
- xii) Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
- xiii) Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- xiv) Function as an effective leader of a health team engaged in health care, research or training.

### **STATEMENT OF THE COMPETENCIES**

Keeping in view the general objectives of postgraduate training, each discipline shall aim at development of specific competencies, which shall be defined and spelt out in clear terms. Each department shall produce a statement and bring it to the notice of the trainees in the beginning of the programme so that he or she can direct the efforts towards the attainment of these competencies.

Source: Medical Council of India, Regulations on postgraduate medical education, 2016



# **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

## **DIPLOMA IN PAEDIATRICS (DCH)**

### **1. GOALS**

The goals of postgraduate training in Paediatrics would be to train a basic medical graduate (MBBS)

- To practice as a Child Health specialist equipped with appropriate knowledge and skills necessary to care for the normal and sick child.
- To practice Child Health in the community (urban or rural) and to perform professionally at all levels of the existing health care system.
- To practice with empathy and the highest ethical standards of the profession.
- To continue to strive for excellence by continuing medical education throughout his or her professional career.
- To teach by sharing knowledge and skills with colleagues
- To research and find solutions to challenges in health care.

### **2. OBJECTIVES**

The objectives to be fulfilled at the completion of the course are as follows:

At the end of the program, the student should be able to:

- **Knowledge:**
  - Describe, identify and monitor normal patterns of growth and development of children.
  - Describe etio-pathogenesis, principles of clinical diagnosis, investigations and treatment of diseases of childhood.
  - Demonstrate an understanding of Basic (Pre and Para-clinical) Sciences and its application to the normal and abnormal processes.
  - Analyze clinical and investigation data approach and manage a health-related problem.
  - Identify and understand socio-economic-environmental-cultural factors in health care.
  - Recognize problems outside his or her abilities and appropriately refer.
  - Update one's knowledge and skills by self directed learning and by participating in continued medical education programs utilizing media – spoken, written, Print and electronic.
  - Teach and share knowledge and skills with colleagues.
  - Audit and analyze work, assist in research and publish scientific articles in peer reviewed journals.

- **Skills:**
  - Elicit an appropriate clinical history.
  - Demonstrate appropriate clinical physical examination skills on children.
  - Plan, decide upon and interpret appropriate cost effective investigations.
  - Perform essential procedures both diagnostic and therapeutic.
  - Manage, resuscitate and stabilize children in Pediatric or Neonatal emergencies.
- **Communication and attitudes:**
  - Communicate appropriately with guardians and children, assisting in their health care decision making.
  - Practice child health care at the highest ethical level, protecting the child at all costs.
  - Respect Patient's (and their guardian's) rights and professional relationships (Doctor-Doctor, Doctor-Nurse, Doctor-Patient, Doctor-Society).
  - Apply the highest level of ethics in Research, Publication, References and Practice of Paediatrics.

### **3. COMPONENTS OF THE PG CURRICULUM**

The major components of the PG curriculum shall be:

- Theoretical knowledge
- Practical/clinical Skills

Students are encouraged to attend CME's, publish research papers and present posters, or platform presentations at State, National and International conferences.

- Attitudes, including communication.
- Training in medical ethics/bioethics and medico legal aspects is recommended
  - Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
  - Medical ethics, Bioethics, moral and legal issues, Medical Audit are part and parcel of the curriculum and syllabus

#### **4. THEORY SYLLABUS**

##### **Course Contents**

###### **The Field of Paediatrics**

1. Evaluating Medical Literature Critical appraisal of Journal articles
2. History of Paediatrics
3. Traditions and Cultural Issues pertaining to Child Care
4. Overview of Child Health
5. The Normal Child
6. Preventive and Social Paediatrics
7. Epidemiology, Statistics and Research Methodology
8. Ethical Issues in Paediatrics

###### **Growth and Development**

1. Biopsychological Models of Development
2. IQ assessment
3. Fetal growth and development
4. The newborn G/D
5. Infant, Preschool, Early school, Adolescence G/D
6. Assessment of Growth
7. Development Assessment
8. Standards/Normograms (including Indian)
9. Approach to short stature
10. Approach to Obesity
11. Approach to Undernutrition

###### **Psychological Disorders**

1. Assessment and Interviewing
2. Psychiatric considerations of CNS injury
3. Vegetative Disorders-Rumination, Pica, Enuresis, Encopresis, Sleep disorders
4. Habit Disorders
5. Mood Disorders
6. Anxiety Disorders
7. Disruptive Behavioral disorders
8. Suicide
9. Sexual behavior variations
10. ADHD
11. Psychosis

12. Autism
13. Psychological treatment
14. Poor Scholastic performance
15. Neurodevelopment dysfunction in school age child
16. Psychosomatic Illness
17. Learning Disorders

### **Social Issues**

1. Adoption
2. Effects of a mobile society
3. Street Child
4. Impact of Violence
5. Child Care
6. Single parent child
7. Separation, death
8. Foster care
9. Abuse and Neglect
10. Child Labor
11. Media (TV, Movies) and its effect on the child

### **Children with Special Needs**

1. Failure To Thrive – Problems, Approach and Evaluation
2. Children in Poverty
3. Developmental disabilities, Chronic Illness
4. Homeless children
5. Mental Retardation – Problems, Approach and Evaluation
6. Foster Children
7. Care of Child with fatal illness
8. Runaway Children

### **Nutrition**

1. Nutritional Requirements- Water, energy, proteins, CHO, Fats, Minerals, Vitamins,
2. Diet/Nutrition Evaluation
3. Athletic Diet
4. Diet for later childhood and Adolescent
5. Infant and Child Feeding
6. Breast Milk Feeding, Human Lactation Management, BFHI
7. Nutrition Values of Indian Foods, Recipes
8. Weaning foods
9. Feeding through 1 and 2nd years
10. Nutritional Disorders Including Obesity
11. Protein Energy Malnutrition
12. Vitamin Deficiencies and Excess
13. Micro-nutrient Malnutrition
14. Nutrition in Special situations – LBW, Premature, IEM, Chronic illness, Surgery, Critically ill child
15. TPN

## **Patho-physiology of Body Fluids and Fluid therapy (Approach and Management)**

1. Physiology of Fluids, Electrolytes and Acid Bases
2. Dehydration and fluid management
3. Dyselectrolytemia
4. Acid Base Disorders
5. Special Situations - Pyloric stenosis, CNS disorders, Burns, Peri-operative, Endocrine disorders, Renal Failure.

## **Acutely Ill child**

1. Evaluation in Emergency
2. Pediatric Anesthesia
3. Injury Control
4. Emergency Medical Services
5. Organization of a PICU/NICU
6. Pediatric Critical Care
7. Equipment for Intensive care  
Respiratory Failure, Ventilation  
Circulatory Failure and Shock(all types)  
Acute Neurological Dysfunction- approach to a child with altered sensorium  
Resuscitation – Basic and Advanced, NALS/PALS  
Post Resuscitation stabilization  
Cold/Heat Injury
8. Transportation of Sick Child/neonate
9. Post-operative supportive care

## **Emergencies/ Critical Care Paediatrics**

1. Fluid abnormalities
2. Electrolyte abnormalities
3. Thermoregulation problems
4. Acute Renal failure
5. Hypertensive crisis
6. Congestive Cardiac failure
7. Cardiogenic shock
8. Pericardial tamponade
9. Cyanotic spells
10. Unstable and stable Arrhythmias
11. Vomiting and Diarrhea
12. Recognition of critical illness pediatric assessment Triangle
13. Stridor
14. Pulmonary edema-cardiogenic and non cardiogenic
15. Traumatic brain injury
16. Polytrauma
17. Diabetic ketoacidosis
18. GI Bleeds - Hematemesis, Melena, Hematochezia
19. Adrenal Crisis
20. Metabolic problems – hyperammonemia, lactic

- acidosis, acid base abnormalities, Hypoglycemia
21. Septicemic shock, Viral infections and shock
  22. Pneumothorax, empyema, pleural effusion, ascites
  23. Severe Anemia, Bleeding child, Neutropenia
  24. Pain management, Drug therapy
  25. ARDS
  26. Respiratory Failure
  27. Burns/ electrocution
  28. Animal Bites
  29. Preanesthetic check up PAC
  30. Sick cell crisis, severe complicated malaria
  31. Acute severe asthma, Bronchiolitis
  32. Status epilepticus
  33. Febrile seizure
  34. Coma, Increased intra-cranial pressure
  35. Cardiopulmonary resuscitation
  36. Shock
  37. Upper airway obstruction
  38. Near drowning
  39. Poisoning
  40. Snake bite
  41. Scorpion sting
  42. Physical abuse
  43. Sexual abuse

### **Human Genetics**

1. Molecular Basis of Disorders
2. Molecular Diagnosis
3. Human Genome Project
4. Inheritance Patterns
5. Chromosomal/genetic clinical Abnormalities
6. Genetic Counseling
7. Dysmorphism
8. Gene therapy

### **Metabolic Disorders**

1. Approach to IEM
2. Purine and pyrimidine metabolism defects
3. Amino acid Metabolic defects - Common
4. Porphyria
5. Amino acid Metabolic Defects – Rare
6. Lipid Metabolism - Common
7. Lipid Metabolism - Rare
8. CHO Metabolism – Common
9. CHO Metabolism – Rare
10. Mucopolysaccharidosis
11. Mucopolidosis
12. Hypoglycemia

## **Fetus and Newborn**

1. Mortality and morbidity
2. Newborn – history, examination, routine delivery care, nursery care, bonding
3. High risk pregnancies
4. Dysmorphology
5. Fetus
  - Growth/Development
  - Fetal distress
  - Maternal diseases
  - Maternal medications
  - Detection, treatment, prevention of fetal disease
    - Antenatal diagnosis
    - Fetal therapy
    - Antenatal therapy
    - Counseling
    - Teratogens, radiation
6. High risk infant
  - Multiple pregnancies
  - Prematurity
  - Postdated
  - IUGR/LBW
  - LFD
7. Congenital anomalies/ malformations
8. Birth injuries
9. Hypoxia - ischemia, asphyxia
10. Organization and levels of newborn care
11. Normal Newborn
12. Common problems in a normal newborn
13. Delivery room emergencies
14. Respiratory disorders
15. Oxygen therapy, toxicity
16. Ventilation
16. GI disturbances including NEC
17. Hyperbilirubinemia
18. Cardiac problems
19. PPHN
20. Blood disorders
  - Polycythemia
  - Anemia
  - Hemorrhagic disease of newborn
  - Hemolytic disease of newborn
  - Thrombocytopenia
21. Genitourinary disturbances
22. Metabolic disorders
22. Endocrine disorders- IDM, CAH
23. Ambiguous genitalia
24. Fluid and electrolytes in Newborn care
25. Nutrition and feeding the newborn – term/preterm, LBW, IUGR

- 26. Neonatal transport
- 27. Surgical problems
  - TEF
  - Anorectal malformations
  - Diaphragmatic Hernia/Eventration
  - Hirschsprung
  - Urogenital anomalies
  - NEC
  - Congenital Lobar Emphysema
  - Volvulus
- 28. Thermoregulation
- 29. Neonatal follow-up

### **Neonatal Infections**

- 1. Epidemiology
- 2. Intrauterine infections
- 3. Viral Infections
- 4. Neonatal sepsis/meningitis
- 5. Pneumonia
- 6. UTI
- 7. Hepatitis
- 8. Nosocomial
- 9. Universal precautions
- 10. Prevention of infections
- 11. Therapy- antimicrobials, adjuvants

### **Adolescent Health**

- 1. Epidemiology
- 2. Depression
- 3. Sexual development and SMR stages
- 4. Suicide
- 5. Deliveries of health care
- 6. Pregnancy
- 7. Contraception
- 8. STD
- 9. Menstrual problems
- 10. Substance abuse
- 11. Anorexia nervosa, bulimia
- 12. Sleep disorders
- 13. Skin/Orthopedics

### **Immunological system**

- 1. Basics of Immunology
- 2. Approach to immunodeficiency
- 3. HIV
- 4. Bone marrow transplantation
- 5. Primary B cell diseases
- 6. Primary T cell diseases
- 7. Complement and phagocytic diseases



8. Chronic granulomatous disease
9. Chediak Higashi Disease
10. Neutrophil abnormalities
11. Adhesion disorders

### **Allergic disorders**

1. Allergy and Immunological basis
2. Insect allergy
3. Diagnosis
4. Ocular allergy
5. Therapy – principles
6. Adverse food reaction
7. Allergic Rhinitis
8. Asthma
9. Atopic dermatitis
10. Urticaria, Angioedema
11. Anaphylaxis
12. Serum sickness
13. Adverse drug reactions

### **Rheumatology**

1. Autoimmunity
2. Ankylosis spondylosis
3. Laboratory evaluation
4. Neonatal Lupus
5. JRA
6. Scleroderma
7. SLE
8. Mixed connective Tissue Disease
9. Vasculitis
10. Dermatomyositis
11. Erythema Nodosum
12. Behcet syndrome
13. Sjogren syndrome
14. Nonrheumatic conditions
15. Painsyndromes, panniculitis, polychondritis, amyloidosis

### **Infectious diseases**

1. Fever
2. Clinical use of Micro Lab
3. Fever without a focus
4. Sepsis and Shock
5. CNS Infections
6. Pneumonia
7. Gastroenteritis
8. Osteomyelitis, Septic arthritis
9. Compromised host infections
10. Bacterial Infections
11. Anaerobic infections
12. Viral Infections

13. Mycotic infections
  - Candidiasis
  - Aspergillosis
14. Parasitic infections
  - Helminthiasis
15. Protozoal
  - Malaria
  - Kalaazar
  - Leishmania
  - Giardia
  - Amoeba
16. Antiparasitic drugs
17. Antimicrobials
18. Antiviral drugs, interferon
19. Preventive measures
  - Health advice for travelling
  - Infection control
20. Immunization
  - Principles
  - Schedules
  - Controversies
  - Standard and Optional Vaccines
  - Recent advances in Vaccines

### **Digestive system**

1. Normal tract – Physiology, Anatomy, Development
2. Clinical features of Disorders
3. Disorders of Esophagus
4. Disorders of Stomach
5. Disorders of Intestines except Food allergy
6. Disorders of Pancreas
7. Disorders of Liver and biliary system
  - Acute Hepatitis, Chronic Hepatitis, Cirrhosis,
  - Metabolic Liver Diseases, Cholestatic liver disease,
  - Neonatal Obstructive Cholangiopathy, Complications
  - of Liver Disease – Portal Hypertension, Encephalopathy,
  - Coagulopathy,
8. Disorders of Peritoneum
9. GI function tests
10. Approach to Malabsorption

### **Respiratory system**

1. Development and function
2. Congenital disorders of nose
3. Disorders of Upper Respiratory tract
4. Disorders of Lower respiratory tract
5. Hypoventilation
6. Pleural disorders

7. Chronic Respiratory Disease
  - Interstitial fibrosis, ILD, empyema,
  - lung abscess, bronchiectasis
8. Hypostatic pneumonia
9. Kyphoscoliosis
10. Recurrent Respiratory Disease
11. Ventilation
12. Central hyperventilation
13. Pulmonary Function tests
14. Obesity
15. Cystic Fibrosis
16. Obstructive sleep apnea
17. Pulmonary Hemosiderosis
18. Neuromuscular skeletal disorders
19. Cough Syncope
20. Bronchial Asthma

### **Cardiovascular System**

1. Investigations –Lab, ECG, CXR, ECHO, Cath
2. Physiology and Pathophysiology of Transitional Circulation
3. Sick Sinus Embryology
4. Tumors of Heart
5. Congenital Heart Disease
  - Epidemiology
  - Approach
  - Cyanotic
  - Acyanotic
6. Heart Lung, Heart Transplants
7. Aneurysms and fistulae
8. Cardiac Arrhythmia
9. Acquired heart disease
  - Infective Endocarditis
  - Rheumatic Heart Disease
10. Diseases of the Myocardium – Myocarditis, Cardiomyopathy
11. Cardiac Therapeutics
12. Diseases of the pericardium

### **Blood**

1. Development of Hematopoietic system
2. Elliptocytosis
3. Anemias
  - Inadequate production
    - Nutrition – Iron, Folate, B12
    - Bone Marrow failure
  - Hemolytic
    - Congenital and Acquired

4. Constitutional pancytopenia
5. Stomatocytosis
6. Other membrane defects
7. Polycythemia
8. Granulocyte transfusions
9. Pancytopenia
10. Blood and component transfusions
11. Thrombotic disorders
12. Hemorrhagic disorders – acquired and congenital
  - Physiology
  - Bleeding disorders
  - Coagulation disorders
13. Hypersplenism, trauma, splenectomy
14. Physiology and Disorders of the Spleen
15. Lymphatic vessel disorders
16. Lymphatics

### **Neoplasms**

1. Principles of diagnosis
2. Epidemiology
3. Principles of treatment
4. Molecular pathogenesis
5. Leukemia
6. Soft tissue sarcomas
7. Lymphomas
8. Gonadal, germ cell tumours
9. Neuroblastoma
10. Liver neoplasm
11. Kidney tumors
12. GI neoplasm
13. Bone Neoplasms
14. Carcinomas
15. Retinoblastoma
16. Skin Cancer
17. Benign tumours

### **Nephrology**

1. Structure and function of kidney
2. Hematuria and conditions
3. Membranous GN
4. HUS Evaluation
5. Lupus nephritis
6. MembranoProlif GN
7. Proteinuria
8. Chronic infectious GN
9. Nephrotic syndrome
10. Goodpasture
11. Acute Glomerulonephritis

## 12. Tubular disorders

1. Function
2. RTA
3. DI

## 13. Renal Failure

## 14. RPGN

## 15. Renal Replacement therapy

## 16. Bartter syndrome Investigations

## 17. Interstitial nephritis

## 18. Toxic nephropathy

## 19. Cortical necrosis

## **Urological disorders**

1. UTI
2. Congenital anomalies, dysgenesis kidney
3. Vesico-ureteral reflux
4. Bladder anomalies
5. Obstructions
6. Penis, urethra anomalies
7. Voiding dysfunction
8. Scrotal anomalies
9. Genitourinary trauma
10. Urolithiasis
11. Investigations – imaging, renal function tests
12. Neurogenic bladder

## **Gynecological problems**

1. Menstrual Problems
2. Neoplasms
3. Vulvovaginitis
4. Breast Disorders
5. Developmental anomalies
6. Hirsutism, polycystic ovaries
7. A child with special Gynec needs
8. Gynec imaging
9. Athletic problems

## **Endocrine**

1. Hypothalamus and pituitary
  - Hyperpituitarism
  - Hypopituitarism, Growth hormone
  - DI
  - ADH
  - Physiology of Puberty

Disorders of puberty  
Precocious Puberty

Delayed puberty

2. Thyroid
  - Thyroid studies
  - Hypothyroidism
  - Thyroiditis
  - Goitre
  - Hyperthyroidism
  - Carcinoma of thyroid
3. Parathyroid and disorders
4. Diabetes mellitus
5. Tumours of testis/ovary
6. Multiple Endocrine Disorders
7. Adrenal Disorders
  - CAH
  - Cushing
  - Addisons
  - Excess mineralocorticoids
  - Feminizing adrenal tumours
  - Pheochromocytoma

## **CNS**

1. Examination, Localization of lesions
2. Movement disorders
3. Congenital anomalies
4. Seizures
5. Headaches
6. Neurocutaneous disorders
7. Coma
8. Brain death
9. Head Injury
10. Neurodegenerative disorders- Approach, Grey/white
11. Acute Stroke
12. Brain abscess
13. Tumors
14. Spinal cord disorders
15. Investigations
16. Antiepileptic drugs
17. SSPE
18. Rabies Vaccine Encephalomyelitis,
19. Acute Demyelinating Encephalomyelitis
20. Approach, Investigations of UMN, LMN, Extrapyramidal, Cerebellar lesions
21. Cerebral Palsy
22. Neuroinfections
23. Encephalopathies

## **Neuromuscular**

1. Evaluation, investigations of muscle
2. Development disorders  
Muscular Dystrophies, Congenital Myopathy, Myositis
3. Endocrine disorders
4. Neuromuscular transmission and motor neuron
5. Metabolic Abnormalities
6. GB syndrome
7. Motor sensory neuropathy
8. Bell's Palsy
9. Autonomic disorders
10. Floppy Infant
11. Myasthenia Gravis

## **Eye**

1. Examination of eye
2. Refraction, accommodation
3. Diseases of Eye movement and alignment disorders
4. Vision
5. Diseases of Conjunctiva - Conjunctivitis
6. Pupils and iris
7. Diseases of Lens - Cataracts
8. Lids
9. Diseases of Optic nerve – Papillitis, Neuritis,
  - Papilledema
10. Diseases of Cornea – Clouding
11. Uveal tract
12. Vitamin A deficiency
13. Retina and vitreous
14. Lacrimal problems - Dacrocystitis
15. Glaucoma
16. Retinopathy of Prematurity
17. Orbital abnormalities
18. VER
19. Injuries to eye

## **Ear**

1. Clinical manifestations
2. Congenital malformations
3. Hearing loss
4. Inner ear discharge
5. External Otitis
6. Trauma
7. Otitis media
8. Tumors
9. BAER

## **Skin**

1. Morphology
2. Cutaneous defects
3. Evaluation
4. Hypersensitivity
5. Principles of therapy
6. Epidermis disorders
7. Diseases of the neonate
8. Keratinization disorders
9. Ectodermal dysplasias
10. Dermis disorders
11. Vascular disorders
12. Subcutaneous disorders
13. Cutaneous nevi
14. Sweat glands
15. Pigment Disorders
  - Hyperpigmentation
  - Hypopigmentation
16. Vesiculobullous disease
17. Eczema
18. Hair
19. Nail
20. Mucous Membrane
21. Tumors
22. Cutaneous Infections – Bacterial, Viral, Fungal
23. Arthropod bites, infestations
24. Acne
25. Nutritional diseases
26. Drug Reactions

## **Bone/Joint**

1. Evaluation
2. Sports medicine
3. Diseases of Foot, toes
4. Pseudoachondroplasia
5. Torsional, angular deformities
6. Diagnosis, assessment of genetic and skeletal disorders
7. Leg length discrepancy
8. Dysplasias- Thantophoric, diastrophic, camptomelic
9. Diseases of Knee
10. Ellis van Creveld
11. Diseases of Hip
12. Osteochondrodysplasia
13. Diseases of Spine
14. Inherited osteoporosis
15. Diseases of Neck
16. Upper limb
17. Hypophosphatasia
18. Arthrogryposis
19. Primary Chondrodystrophy



20. Common Fractures
21. Idiopathic hypercalcemia
22. Arthritis – approach, investigations, Management
23. Hyperphosphatasia
24. Congenital Dislocation of Hip
25. Osteomyelitis
26. Septic Arthritis
27. Rickets – Nutritional and non nutritional

### **Genetic skeleton**

1. Lethal and nonlethal bone dysplasias
2. Achondroplasia
3. Osteopetrosis
4. Marfans

### **Metabolic Bone disease**

1. Bone and vitamin D
2. Familial Hypophosphatemia
3. Rickets – Nutritional and non nutritional

### **Unclassified disease**

1. SIDS
2. Sarcoidosis
3. Histiocytosis
4. Progeria
5. Cystic fibrosis
6. Chronic fatigue syndrome

### **Environmental**

1. Lead poisoning
2. Chemical pollutants
3. Envenomation
4. Radiation
5. Mercury
6. Mammalian bites
7. Nonbacterial poisoning
8. Common Poisonings – OP, Kerosene, Phenobarbitone, Iron, etc

## **HEALTH STATISTICS, NATIONAL PROGRAMS**

### **ORGANIZATION OF OFFICE PRACTICE**

Equipment, Documentation, Records, Space and functioning

## RECENT ADVANCES IN PAEDIATRICS - ALLIED SUBJECTS

### Anatomy

Applied Embryology, Development of major organ systems

### Physiology

Applied Physiology with regard to major organ systems

### Biochemistry

Biochemical basis of diseases in children – Nutritional and metabolic

### Pathology

Pathophysiology of diseases in children, Pathogenesis, Basic Histopathology

### Microbiology

Clinical Microbiology applied to investigations for diseases in childhood, serology, staining, cultures

### Pharmacology

Clinical Pharmacology, Therapeutics of childhood diseases, drug interactions, Rational drug therapy, Adverse Drug Reactions.

### Community Medicine

Health Care Delivery Systems – structure and function, Health Statistics, National Programs

### Pediatric Surgery

Recognition and referral of surgical conditions in Paediatrics

### Radiology

Clinical Indications and interpretations of Xray, Ultrasound, CT, MRI

## MEDICAL ETHICS

Doctors and health professionals are confronted with many ethical problems. It is, therefore necessary to be prepared to deal with these problems. To accomplish this **ethical sensitisation** should be achieved by lectures or discussion on ethical issues, clinical case discussion of cases with an important ethical component and by including ethical aspects in discussion in all case presentation, bedside rounds and academic postgraduate programmes.

Course content should include *definition of Medical Ethics*, difference between medical ethics and bio-ethics, major Principles of Medical Ethics, the Hippocratic oath, the Declaration of Helsinki, the WHO Declaration of Geneva, International code of Medical Ethics (1993), Medical Council of India Code of Ethics, *Profession Ethics* (Code of conduct, Contract and confidentiality, Malpractice and Negligence) prolongation of life and euthanasia

## **Legal and Ethical Medicine**

Rights and protection of children, Consumer Protection Act, Basic Principles of Ethics

### **I. Postgraduate skills**

Please note code:

PI: Perform Independently

PA: Perform with assistance

#### ***List of PI Skills***

Clinical History and Physical examination  
Human Lactation management (counseling and practical skills)  
Neonatal resuscitation  
Pediatric resuscitation  
Teaching encounters  
Intravenous injections  
Intravenous cannulation  
Lumbar puncture  
Test dose  
Infusions  
Blood transfusions  
Neonatal Exchange transfusions  
ABG  
Central line, CVP  
Intraosseous  
Bone marrow aspiration, trephine biopsy  
Pleural tap  
Paracentesis – diagnostic and therapeutic  
Mantoux test  
DPT, OPV, Measles vaccination  
Sampling for Fluid cultures  
Liver biopsy  
Neonatal, Pediatric Partial exchange

#### ***Respiratory management (All PI)***

Nebulization  
Inhaler therapy  
Oxygen delivery

#### ***Critically Ill child (All PI)***

Monitoring a sick child  
Pulse oximetry  
Infant feeding tube/ Ryles tube, stomach wash  
Urinary catheterization  
Restraining a child for a procedure  
ORS and ORT  
Prognostication

**Laboratory- Diagnostic (All PI)**

Urine Protein, sugar, microscopy  
Peripheral bloods smear  
Malarial smear  
Ziehl Nielson smear – sputum, gastric aspirate  
Grams smear – CSF, pus  
Stool pH, reducing substances, microscopy  
KOH smear

**Neonatal tests (All PI)**

Apt test  
Shake test

**Clinical Assessment skills (All PI)**

Clinical History and Physical examination  
Anthropometry  
Dietary recall, calorie and protein estimation  
Nutritional advice  
Gestational assessment  
Neurological examination of newborn  
Primitive reflexes  
Fundoscopy  
Otoscopy  
Examination of external genitalia – male and female  
Tanner's SMR scales  
DST or Baroda scales, TDS  
Amiel Telson's angles  
Per rectal examination

**Interpretation (All PI)**

Clinical History and Physical examination  
Blood, Urine, CSF and Fluid investigations – hematology, biochemistry

Chest Xray  
ECG  
ABG interpretation  
Abdominal Xray  
Bone and joint Xray  
CT scan Brain  
Barium studies  
IVP, VUR studies  
Ultrasound abdomen  
Neurosonogram

## Communication skills

### **All PI:**

- Clinical History and Physical examination
- Communicating health, disease
- Communicating about a seriously ill or mentally abnormal child
- Communicating death
- Informed consent
- Empathy with a family
- Referral letters, Replies
- Discharge summaries
- Death Certificates
- Pre-counseling for HIV
- Post counseling for HIV
- Basic Pedagogy sessions – teaching students, adults  
Lectures, bedside clinics, discussions
- Medline search, internet, Computer usage

### **List of Observations:**

Genetic counseling

Classification of diseases

### **List of PA skills:**

Sedation

Analgesia

Brain death

Intercostal tube placement with underwater seal

### **List of PA skills:**

Peritoneal dialysis

Subdural, Ventricular tap

## **5.TEACHING LEARNING ACTIVITIES**

### **Methods suggested for Pediatric Postgraduate Training Programs:**

- **Didactic Lectures:** (Faculty lectures)

*Objective:* To introduce a broad-based concept in an important area of learning to orient the postgraduate student.

*Examples:* Potential introductory topics to Paediatrics like Fluid and Electrolytes, Early recognition of Shock and Respiratory Failure, DTTU management, Recent advances, Basic Science/ Concepts and ARI program.

*Frequency:* Three times a week during the introductory phase of the first one-two months of the new postgraduates joining the course. Following this period of orientation, it does not serve a purpose of self-directed learning and is best avoided as a regular activity except as an exceptional guest lecture.

- **Seminars:**

*Objective:* To enable a student to study in depth an important area of learning important to the training of the student.

*Examples:* Examples of potential seminar topics would be Protein Energy Malnutrition, Pediatric Tuberculosis, Pediatric HIV, Bronchial Asthma, Chronic Liver Disease and its complications.

*Frequency:* Once a week. Topic to be shared among students and to be equally distributed depending upon the number of postgraduate students in the department.

- **Journal Club:**

*Objective:* To appreciate and enable the critical analysis of scientific literature published in peer reviewed journals – studies, reviews.

*Examples:* Articles like the study on prophylactic Zidovudine to HIV positive pregnant women in prevention of vertical transmission to the fetus, Digoxin versus Captopril in VSD in CCF, etc.

*Frequency:* Ideally, once in 1-2 times per month.

- **Undergraduate Teaching Clinics**

*Objective:* To teach effectively undergraduate and colleagues utilizing simple educational methods.

*Examples:* Bedside Clinic, Didactic lecture, skill workshop (e.g. NALS, PALS)

*Frequency:* During teaching undergraduate in the department each postgraduate should have a minimum of 2 opportunities per year after the first year of the postgraduate course is completed.

- **Bedside Clinics**

*Objective:* To learn bedside techniques - interview, physical examination, analysis, diagnostic decision making, investigation decisions, treatment and communication.

*Examples:* Child with hemiplegia, hepatosplenomegaly, anemia, jaundice, etc.

*Frequency:* Once in a week is the minimum as it forms the basis of good clinical training activities.

- **Mortality Review Meeting**

*Objective:* To analyze, discuss and learn from mortalities.

*Frequency:* Once in a month preferably in the first week to allow the previous months mortality to be presented for discussion.

- **Grand Rounds**

*Objective:* To improve on bedside techniques – interview, physical examination, analysis, diagnostic decision making, investigation decisions, treatment, communication.

*Examples:* The child with pyrexia of unknown origin, undiagnosed hepato-splenomegaly, multi-systemic disease.

*Frequency:* Once in a week.

- **Inter-departmental Meetings**

*Objective:* To experience inter-departmental cooperation and develop a healthy professional respect for each others opinions in addition to the subject learning experience.

*Methodology:* Case discussions or students present investigations to members of all faculty. The discussion is a learning experience and improves communications between departments.

*Examples:* Chest X-rays of a complicated bronchopneumonia progressing to an empyema, CT scans of intra-cranial pathology, Tracheo-esophageal fistulae and supportive care.

*Frequency:* Once or twice in a month and rotated between departments – Radiology, Pediatric Surgery, Cardiology, Nephrology, Neurology, Clinical Hematology, etc.

- **Clinical Pathological Conference CPC**

*Objective:* To analyze clinical material to reach a differential diagnosis and correlate with the pathological biopsy findings.

*Frequency:* Once in two months.

- **Records Round**

*Objective:* To appreciate the importance of documentation of facts and record keeping.

*Methodology:* Faculty in the presence of the team scrutinizes random case records. History sheets, doctor order sheets, progress sheets and discharge summaries are discussed.

*Frequency:* Once a week with the entire team present at the session.

## **6. STRUCTURED TRAINING PROGRAM**

### **DCH – Post Graduates Postings – 2 Years Course (2017-18)**

#### **I Year Postings**

|                                        |                  |        |
|----------------------------------------|------------------|--------|
| Paediatric Medical Ward                | - 6              | Months |
| New born postings                      | - 3              | Months |
| Paediatric Emergency Medicine          | - 1              | Month  |
| Paediatric Intensive Medical Care Unit | - 1              | Month  |
| <u>PPC / SHC /School Health</u>        | <u>- 15 Days</u> |        |
| <u>Nutrition/Immunisation clinic</u>   | <u>- 15 Days</u> |        |

## **II Year Postings**

|                               |           |
|-------------------------------|-----------|
| Paediatric Medical Ward       | -6 Months |
| Pediatric Emergency Medicine  | - 1 month |
| Pediatric Intensive Care Unit | -1 month  |

## **Recommended Special postings**

|                               |           |
|-------------------------------|-----------|
| Cardiology                    | - 15 Days |
| Neurology                     | - 15 days |
| Gastroenterology / ORT Centre | - 15 Days |
| Pulmonology                   | - 15 Days |
| Haematology                   | - 15 Days |
| Nephrology                    | - 15 Days |



|                   |           |
|-------------------|-----------|
| Pediatric surgery | -15 days  |
| Endocrinology     | - 15 days |

If any speciality is not available in the parent institution the postgraduate may be posted in the general pediatric ward during that period.

7. Evaluation of the candidates in both theory and practicals will help the candidate in improvement of his/her knowledge, skills and attitude.

Theory exams and practical exams can be conducted once in 6 months

#### 8. COMPETENCY ASSESSMENT:

##### 1) OVERALL:

- |                                                |    |           |
|------------------------------------------------|----|-----------|
| a) Communication / commitment / Contribution / | () |           |
| Compassion towards patients and Innovation     | () | - 5 Marks |
| b) Implementation of newly learnt techniques   | () |           |

|                                                                              |           |
|------------------------------------------------------------------------------|-----------|
| 2) Number of cases presented in Clinical Meetings/<br>Journal clubs/seminars | - 5 marks |
|------------------------------------------------------------------------------|-----------|

|                                                                                             |           |
|---------------------------------------------------------------------------------------------|-----------|
| 3) Number of Posters/Papers presented in Conferences/<br>Publications and Research Projects | - 5 marks |
|---------------------------------------------------------------------------------------------|-----------|

|                                                                                                                       |           |
|-----------------------------------------------------------------------------------------------------------------------|-----------|
| 4) No. of Medals / Certificates won in the conference /<br>Quiz competitions and other academic meetings with details | - 5 marks |
|-----------------------------------------------------------------------------------------------------------------------|-----------|

|       |                            |
|-------|----------------------------|
| Total | -----<br>20 Marks<br>----- |
|-------|----------------------------|

#### PG CLINICAL COURSES

|                                      |                      |
|--------------------------------------|----------------------|
| VIVA including Competency Assessment | - 80 Marks (60 + 20) |
|--------------------------------------|----------------------|

|          |            |
|----------|------------|
| Log Book | - 20 marks |
|----------|------------|

#### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

#### 9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

#### 10.THEORY EXAMINATION

Paper I : Applied Basic Sciences related to Paediatrics

Paper II : Neonatology Developmental Paediatrics and  
Community Paediatrics

Paper III : Clinical Paediatrics

Question Paper pattern: PAPER I,II & III

• Elaborate on 2 x 15 = 30

• Write notes on 10 x 7 = 70

**Total 100 marks**

#### 11. CLINICAL EXAMINATION

| Particulars.                                                            | Maximum Marks. |
|-------------------------------------------------------------------------|----------------|
| Clinical<br>Long Case 1 X 80 = 80 marks<br>Short case 2 X 35 = 70 marks | 150            |
| Ward Rounds / Spotters - 2 X 15 marks                                   | 30             |
| OSCE – 5 stations x 4 marks                                             | 20             |
| Viva-Voce                                                               | 80             |
| Log Book                                                                | 20             |

|                         |            |
|-------------------------|------------|
|                         |            |
| <b>Total</b>            | <b>300</b> |
| <b>Minimum for Pass</b> | <b>150</b> |

**12.Log book:** The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

**13.VIVA** All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may also be given case reports, charts, gross specimens, pathology slides, instruments, X- rays, ultrasound, CT scan images, for interpretation.

VIVA including Competency Assessment - 80 Marks (60 + 20)

#### **14.OSCE :**

- DRUGS,
- LAB DATA,
- EMERGENCY,
- IMNCI
- CLINICAL SIGN DEMONSTRATION (MANNED STATION) / COUNSELING

#### **15. RECOMMENDED BOOKS AND JOURNALS**

##### **Texts:**

##### **Essential**

1. Nelson's Textbook of Paediatrics, Harcourt Asia Saunders
2. Cloherty's Manual of Neonatal Care
3. Meharban Singh's Care of the Newborn
4. Harriat Lane
5. Manual of Pediatric Therapeutics, Little Brown's Children's Hospital, Boston.
6. O.P. Ghai's Textbook of Paediatrics

##### **Reference**

1. Rudolf's Paediatrics, Appelton and Lange

2. Forfar and Arneil's Textbook of Paediatrics, ELBS
3. Frank Oski's Principles and Practice of Paediatrics
4. Avery's Disease of the Newborn
5. Robertson's Textbook of Neonatology
6. Illingworth's The normal child
7. Guha's Textbook of Neonatology
8. IAP Textbook of Paediatrics
9. Nadas' Pediatric Cardiology
10. Perloff's Approach to Congenital Heart Disease
11. Moss and Adam's Heart Disease in Infants, children and Adolescent
12. Miller's Blood Diseases of Infancy and Childhood
13. DeGruchy's Clinical Hematology in Medical Practice
14. Barret and Holiday's Pediatric Nephrology
15. Caffey's Pediatric X-Ray diagnosis
16. Alleyne's Protein Energy Malnutrition
17. Miller, Tuberculosis
18. Vimlesh Seth, Tuberculosis
19. Swanson's Pediatric Surgery
20. Cherry and Feigen's Pediatric Infectious Diseases
21. Fenichel's Pediatric Neurology
22. Kendig's Respiratory Diseases in Paediatrics
23. Alex Mowat's Liver Disease in Children
24. Roger's Pediatric Critical Care
25. H.P.S. Sachdev's Principles of Pediatric and Neonatology Emergencies
26. Smith's Recognition patterns of Human Malformations

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **16. INDEXED JOURNALS**

1. Indian Paediatrics
2. Indian Journal of Paediatrics
3. Pediatric Clinics of North America
4. New England Journal of Medicine
5. Lancet
6. British Medical Journal
7. Journal of Paediatrics
8. Archives Disease of Childhood and Adolescence
9. Paediatrics
10. Perinatal Clinics of North America
11. Indian Journal of Practical Paediatrics

## **Reference Series**

1. Suraj Gupta's Recent Advances in Paediatrics
2. David's Recent Advances in Paediatrics

3. Advances in Paediatrics
4. Year Book of Paediatrics

### **ADDITIONAL READING**

1. Indian Council of Medical Research, "Ethical Guidelines for Biomedical Research on Human Subjects", I.C.M.R, New Delhi, 2000.
2. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.
3. Francis C M, Medical Ethics, J P Publications, Bangalore, 1993.
4. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi, 1994.
5. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424-8
6. Kirkwood B R, Essentials of Medical Statistics , 1<sup>st</sup> Ed., Oxford: Blackwell Scientific Publications 1988.
7. Mahajan B K, Methods in Bio statistics for medical students, 5<sup>th</sup> Ed. New Delhi, Jaypee Brothers Medical Publishers, 1989.
8. Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, min. of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi. P - 335.
9. National Health Policy, Min. of Health & Family Welfare, Nirman Bhawan, New Delhi, 1983
10. Srinivasa D K et al, Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry

### **LOG BOOK**

**Table 1 : Academic activities attended**

Name:

Admission Year:

College:

| Date | Type of Activity<br>Specify Seminar, Journal Club,<br>Presentation, UG teaching | Particulars |
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## LOG BOOK

**Table 2 : Academic presentations made by the student**

Name:

Admission Year:

College:

| Date | Topic | Type of Presentation<br>Specify Seminar, Journal Club,<br>Presentation, UG teaching etc. |
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## LOG BOOK

**Table 3 : Diagnostic and Therapeutic Procedures Performed**

Name:

Admission Year:

College:

| Date | Name | ID No. | Diagnostic and Therapeutic Procedures | Category<br>O, A, PA, PI* |
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- \* Key:**
- O - Washed up and observed
  - A - Assisted a more senior faculty
  - PA - Performed procedure under the direct supervision of a senior faculty
  - PI - performed independently

\*\*\*\*\*



**DIPLOMA IN PHYSICAL MEDICINE &  
REHABILITATION (D. Phy. Med. & R.)**

# **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

## **DIPLOMA IN PHYSICAL MEDICINE & REHABILITATION**

### **1. GOAL:**

The **goal** of this programme is to standardize Physical Medicine and Rehabilitation (PM&R) teaching at the Post Graduate level throughout the country so that it will benefit in achieving uniformity in postgraduate as well as undergraduate medical teaching.

World Health Organization estimated that 10 percent of the population is differently abled. According to UN Development Program (UNDP) 80 percent of the differently abled people live in developing countries. Population growth, increasing number of older people, increase in vehicular traffic, expansion of industry, mechanization of agriculture along with social-economic backwardness will magnify the problem in future.

Physical Medicine and Rehabilitation, also called physiatry, is an important branch of medical sciences emphasizing the prevention, diagnosis and treatment of disorders, particularly those of the neuro-musculo-skeletal, cardiovascular, and pulmonary systems, that may produce temporary or permanent activity limitation, disability, or participation restriction. Physical Medicine and Rehabilitation is an independent clinical discipline. It has a vast scope as it provides integrated comprehensive care in the diagnosis, treatment and rehabilitation management of neurological, musculo-skeletal, cardio-pulmonary disabilities from acquired or congenital conditions presenting at any stage in life from pediatric to geriatric phases. This specialty focuses on the restoration of function of people to the highest possible level, through a multi-disciplinary team approach, making use of diagnostic and therapeutic armamentarium including education and counseling, prescription of medicines, therapeutic exercises, equipments (mobility aids, orthotic-prosthetic appliances, assistive technology, physical agents and modalities, etc.), injections, surgical interventions for correction of deformities etc. in an institution-based (out-door and in-door/wards/ICUs/Nursing Homes/Old-Age Homes etc.), out-reach

(Camps, Mobile Units), or community-based settings (CBR), based on the evaluation of the individual under consideration. It is also involved in disability prevention, evaluation and certification, besides development, monitoring and supervision of a rehabilitation plan and conducting research and development.

## **2. OBJECTIVES:**

The objective of post graduate training is to enable the candidate to acquire sufficient theoretical knowledge, develop clinical skills and competence, and provide medical care with an attitude of compassion and sensitivity.

The overall objective is to impart a thorough and comprehensive training to a medical graduate so that at the end of this training he/she becomes a knowledgeable, skilled, and competent Physical Medicine and Rehabilitation specialist, capable of discharging his/her duties as expected under different settings, in an ethical manner.

He/she should be able to investigate, diagnose, treat, and rehabilitate a person is suffering from a limitation in function, disability, or restriction in participation. He should also be able to prescribe, monitor and lead the execution of rehabilitation plan through an integrated, multi-disciplinary team involving various medical, nursing, paramedical or allied health professionals. He/she should be able to interpret reports and plan research, teach medical and paramedical personnel, educate the person with disability, family, rehab team members and community, and be well versed with recent advances, administrative, financial, ethical and legal aspects related to the specialty.

## **3. COMPONENTS OF POST GRADUATE CURRICULUM**

Upon completion of the training and successfully qualifying in the MD (Physical Medicine and Rehabilitation) examinations he/she should be able to demonstrate:

1. **Theoretical knowledge:** He/she should have adequate knowledge of
  - (1) The basic medical sciences such as Anatomy, Physiology, Biochemistry, Pathology, Microbiology Pharmacology and other disciplines related to Physical Medicine and Rehabilitation
  - (2) Factors which may disturb structure or function and result in disability

(3)Diagnosis, pathogenesis, prevention, treatment and rehabilitation of neuromusculoskeletal and other system disorders

(4)Orthotics and prosthetics including fitting and manufacturing

(5)Indications and complications of drugs used in Physical Medicine and Rehabilitation

## **2. Practical and clinical skills:**

(1)Understand and develop competence in executing common diagnostic, therapeutic and surgical procedures employed in diagnosis, investigations and management of conditions encountered in Physical Medicine and Rehabilitation.

(2)He/she should be able to practice and handle independently most of the day to day problems as encountered in Physical Medicine and Rehabilitation in a safe, effective and ethical manner.

(3)He/she should be able to plan a comprehensive rehabilitation service independently. (4)He/she should be able to demonstrate understanding of the design and fabrication and have competence in prescription and check out of orthoses and prostheses, the principles, prescription and supervision of physiotherapy, occupational therapy and psycho-socio-vocational counselling. He should be familiar with the common problems occurring in the urban, semi-urban, and rural areas and deal with them effectively, should be able to organize, conduct, and supervise surveys in rural, urban and industrial communities and in specified groups of population; organise and conduct camps for disability prevention and rehabilitation of disabled persons, and guide rehabilitation workers at the community level for rehabilitation of persons with disabilities.

3. **Attitudes and Communication skills:** The post graduate trainee must be able to communicate effectively with patients, families as well as with members of the treating team and other specialists involved in the care of the patients. The candidate should conduct professional responsibilities with integrity, adhering to the ethical principles, respecting the autonomy and privacy of the patient. The candidate should recognize one's professional limitation, seek advice when necessary and accept advice graciously. Thus he should be able to provide compassionate, appropriate and effective patient care.

#### 4. Medical ethics/ Bioethics and Medicolegal aspects:

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, Bioethics, moral and legal issues, Medical Audit are part and parcel of the curriculum and syllabus in Diploma in Physical Medicine and Rehabilitation.

The postgraduate trainee must demonstrate knowledge of biomedical, epidemiological, socio behavioral issues relevant to the patient care. He should have skills in preparing medicolegal reports.

5. He/she should be able to plan educational programs in Physical Medicine and Rehabilitation in association with his senior colleagues and be familiar with the modern methods of teaching and evaluation. He should be able to teach medical students, residents, other health professionals and persons with disabilities and their family members and hold clinical demonstrations for them; discuss a seminar or a symposium and critically discuss it and methodically summarise published articles.

### 3. THEORY SYLLABUS

#### Section A

#### Basic Sciences as applied to Physical Medicine and Rehabilitation

|                                                                                                                                    | Knowledge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Attitude | Skills/Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| 1. Basic Anatomy and Physiology of the Musculoskeletal, Urogenital, Cardio-pulmonary and Nervous Systems, Biomechanics, Biophysics | <ol style="list-style-type: none"><li>1. Describe the anatomy of muscles that govern the joints of the body.</li><li>2. Discuss the biomechanics and kinesiology of various joints of the body.</li><li>3. Review the basic cell physiology, biophysics, action potential, muscle contraction, neuromuscular transmission</li><li>4. Principles of exercise physiology and energy expenditure.</li><li>5. Outline autonomic nervous system functions. Explain the structure and function of bladder, bowel and its control and mechanism of deglutition.</li></ol> |          | <ol style="list-style-type: none"><li>1. Manual muscle charting</li><li>2. Goniometry</li><li>3. Musculoskeletal examination</li><li>4. Assessment of muscle tone</li><li>5. Understanding of dermatomes and myotomes</li><li>6. Interpret nerve conduction studies</li><li>7. Bedside evaluation of respiratory system, and interpret pulmonary function tests</li><li>8. Bedside evaluation of the cardiovascular system and interpret ECG, stress ECG and ECHO findings and results of cardiac enzyme evaluation</li><li>9. Interpret coagulation profile</li><li>10. Assessment of swallowing,</li></ol> |

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|                                                                                | <p>6. Describe the blood supply of heart. Discuss the cardiac cycle, basic principles of conduction systems, ECG, maintenance of blood pressure.</p> <p>7. Review physiology of blood, plasma, coagulation, blood groups, erythropoiesis, iron metabolism.</p> <p>8. Review the fluid compartments of the body and mechanisms of dyselectrolytaemia.</p> <p>9. Discuss anatomy of the lung and bronchopulmonary segments. Understand mechanics of respiration including pulmonary function tests.</p> <p>10. Discuss structure and function of brain and spinal cord, the major pathways and blood supply. Recall physiology of consciousness, temperature regulation, maintenance of muscle tone, posture.</p> <p>Anatomy and functions of the vestibular system. Understand CSF and its flow and mechanism of coning.</p> <p>11. Anatomy and functions of kidneys</p> <p>12. Anatomy and functions of skin</p> <p>13. Biophysics of physical agent modalities used in PMR- Heat, Light, Electromagnetic Spectrum, Electricity and Sound, LASER</p> |  | <p>bladder and bowel at bed side.</p> <p>11. Perform indwelling urethral and suprapubic catheterization, Ryles tube insertion and change of tracheostomy</p> <p>12. CNS Examination- Higher mental functions, cranial nerves, sensory motor testing, cerebellar functions, evaluation of autonomic function.</p> |
| 2.Basics of biochemical aspects of Metabolism, Hormones, Vitamins and Minerals | <p>1. Explain the metabolism of calcium, Vitamin D, PTH, Calcitonin, physiology of bone remodelling</p> <p>2. Review glucose metabolism and its regulations, actions of insulin.</p> <p>3. Causes of obesity, metabolic syndrome, inborn errors of metabolism</p> <p>4. Review structure and functions of endocrine system including pituitary, adrenal, thyroid and endocrine pancreas. Chemistry of steroids</p> <p>5. Immunity and Immunoglobulins</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | <p>1. Interpret results with respect to calcium, glucose and fat metabolism, evaluation of bone mineral density.</p> <p>2. Interpret liver function test, kidney function test, serum electrolytes, endocrine function tests, metabolic profile and biomarkers.</p>                                              |

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| <p>3.Basic Pathology and Microbiology of diseases and disabilities</p> | <p>1.CNS: Meningitis, encephalitis, pyogenic abscess, tuberculosis, poliomyelitis, stroke,vasculitis, epilepsies, neurodegenerative disorders, ataxias, multiple sclerosis, demyelinating illness, transverse myelitis, tumours, nutritional and metabolic disorders, craniovertebral junction anomalies, neural tube defects, hydrocephalus</p> <p>2.Disorders of muscle and nerve: Peripheral nerve injuries, neuropathies, hereditary sensory neuropathy, GuillenBarre syndrome, myopathy</p> <p>3. CVS: Ischemic heart disease, Rheumatic heart disease, hypertension, atherosclerosis, cardiomyopathy, congenital heart disease, cardiac failure and shock</p> <p>4. Kidneys- acute and chronicglomerulo nephritis, nephrolithiasis, hydronephrosis, acute and chronic renal failure, nephrotic syndrome, metabolic and vasculitic nephropathy.</p> <p>5.Pulmonary: Restrictive and obstructive lung diseases, ARDS, Tuberculosis, Pleural diseases, Pneumonia, Lung abscess, Occupational lung diseases, Pulmonary embolism, Tumors</p> <p>6. Bone and joints: Congenital disorders including CDH&amp;CTEV, Infections, Degenerative disorders, Avascular necrosis, Epiphyseal dysplasias, Bone tumours, Metabolic bone disease, Fractures-Types, complications, stages of healing, common principles of management.</p> <p>7.Review Rheumatological diseases, Categorise different types of joint diseases and principles of treatment</p> <p>8.Immunological diseases</p> |  | <p>1.Clinical skills to diagnose all these diseases mentioned</p> <p>2.Skills to interpret pathological reports, culture reports, and imaging findings related to these conditions</p> |
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|                                                                                                                       | <p>including HIV</p> <p>9..Endocrine system: dysfunction of pituitary, adrenals, thyroid, pancreas</p> <p>10.Gastrointestinal system: Peptic ulcers, malabsorption syndrome, ulcerative colitis</p> <p>11.Hematological: Dyscrasias, leukaemias, multiple myeloma, deep vein thrombosis, Hemophilia and other coagulation disorders</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                                                                                                                                                          |
| 4. Basic principles of Pharmacology as applied to the conditions encountered in Physical Medicine and Rehabilitation. | <p>Review the pharmacology of</p> <ol style="list-style-type: none"> <li>Antibiotics</li> <li>Antituberculous drugs</li> <li>Analgesics</li> <li>Steroids</li> <li>Anti rheumatic medications and biological agents</li> <li>Oral hypoglycemic agents and Insulin</li> <li>Medications for Osteoporosis</li> <li>Statins</li> <li>Bronchodilators</li> <li>Anticoagulants and antiplatelet agents</li> <li>Anti Parkinsonian agents</li> <li>Antispasticity drugs and Botulinum toxin</li> <li>Cognitive stimulants</li> <li>Anticonvulsants</li> <li>Drugs for bladder and bowel dysfunction</li> <li>Drugs acting on neuromuscular junction</li> <li>Drugs for erectile dysfunction</li> <li>Antidepressants, sedatives, anti-psychotics</li> <li>Vitamins, mineral supplements and Antioxidants</li> <li>Hormones</li> <li>Vaccines and Immunoglobins</li> </ol> |  | Be familiar with drug dosages, indications and contraindications, interactions and routes of administration                                                              |
| 5.Biostatistics and Genetics                                                                                          | <p>Sampling and sample size</p> <p>Randomization</p> <p>Tests of significance</p> <p>Patterns of inheritance</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | <p>Be familiar with sample size calculation</p> <p>Should be able to interpret scientific data statistically</p> <p>Be familiar with different tests to analyse data</p> |



**SECTION B****Principles and Practice of Physical Medicine and Rehabilitation, Diagnostic modalities in PMR, Physiotherapy, Occupational therapy, Orthopedics & Sports Injuries and Musculoskeletal Rehabilitation**

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| 1. Philosophy, history, scope and need of Physical Medicine and Rehabilitation.   | Understanding the principles of rehabilitation, recall history and evolution of this specialty after major world wars.                                                                                                                                                                                                                                                                                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 2. Basic concepts in Physical Medicine and Rehabilitation                         | Incorporating the clinical situation within social, psychological, vocational and cultural contexts. Describe the spectrum of disease, diagnosis and disability with respect to attitudinal and architectural barriers. Define Rehabilitation team. Recognize and incorporate the role and responsibilities of allied health professionals, including physiotherapy, occupational therapy, speech therapy, prosthetics & orthotics, psychology, social work. |  | Get a physiatric evaluation<br>Plan rehabilitation in the context of the real environment.<br><br>To be able to organize, lead and function in a multi-disciplinary team.                                                                                                                                                                                                                                                      |
| 3. Principles of evaluation and rehabilitation management of social problems.     | Describe the impact of disability beyond the affected individual and dynamics of disability on the family, colleagues and community and society.<br>Recognize the concepts of restoration of independence, interdependency, respect and dignity                                                                                                                                                                                                              |  | To analyze the various socio-economic factors influencing a person with disability.<br>To plan clinical management with due regard to dependency, interdependency, economic status and medical co-morbidities.<br>To form an inter-disciplinary team for evaluation and planning community based rehabilitation.<br>To be able to guide persons with disability regarding access to disability benefits and government schemes |
| 4. Principles of evaluation and rehabilitation management of vocational problems. | Outline the purpose of vocation and the principles of restoration of identity and dignity by integrating into the society productively. Understand the economic impact of the disability for the individual                                                                                                                                                                                                                                                  |  | Assessment of the multiple factors influencing functional independence and return to education or work.<br>Be able to advise regarding sheltered                                                                                                                                                                                                                                                                               |

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|                                                                                                 | and beyond.                                                                                                                                                                                                                                                                                                                                                                                                                          |  | workshops, self-help groups, home based programs, transitional employment .                                                                                                                                                                                                        |
| 5.Organisation and administration of Physical Medicine and Rehabilitation Services.             | Describe infrastructure, clinical services and personnel required with suitable links to primary, secondary and tertiary centers in order to provide seamless service for patients who need rehabilitation.                                                                                                                                                                                                                          |  | To create an organogram for a department of Physical Medicine and Rehabilitation along with optimal proportional utilization of funds and personnel.                                                                                                                               |
| 6.Disability process Impairment, disability, International Classification of function.          | Define and discuss with suitable examples, the concepts of impairment, disability, handicap and integrate with ICF and various levels of prevention<br><br>Explain the concept of ICF. Calculate the spectrum of physical capabilities.                                                                                                                                                                                              |  | To apply ICF classification to an individual, thereby estimating the restriction to activity and participation.                                                                                                                                                                    |
| 7.Disability Prevention                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Institute effective ways to prevent disabilities and minimize complications following a disabling event or injury.                                                                                                                                                                 |
| 8.Epidemiology of Disability                                                                    | Categorize the spectrum of disability in India and compare with developed nations.<br>State the proportion of physical, mental, visual, auditory and communication disabilities.<br>Determine the changes in trend of causes of disability from infections to lifestyle related, geriatric disabilities due to advances in life expectancy. Recognize the problems related to perinatal health and disabilities from cerebral palsy. |  | To apply the relevant knowledge of epidemiology of various conditions causing disability in India and worldwide so as to determine suitable strategies to limit the extent of physical, mental, visual, auditory and communication disabilities.                                   |
| 9.Basic principles of diagnostic modalities as applied to Physical Medicine and Rehabilitation. | Diagnostic imaging- Xrays, CT Scan, MRI, Musculoskeletal ultrasound<br>Electrodiagnostic testing<br>Cystometrogram<br>Endoscopic procedures including cystoscopy and laryngoscopy<br>Gait analysis of common movement disorders<br>Pulmonary function tests<br>Laboratory tests                                                                                                                                                      |  | Apply skills in using diagnostic modalities to evaluate conditions and complications of degenerative, overuse and inflammatory joint diseases, musculo-skeletal trauma, lung diseases, acquired brain injury, stroke, cerebral palsy, spinal cord injury, demyelinating disorders. |

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| 10.Gait Analysis                                             | Understand the biomechanics and temporal parameters of normal human locomotion, different phases of gait cycle, determinants of normal gait, components of gait analysis, energy expenditure to identify common pathological gaits.                                                                                                                                                                                               |  | Clinically identify and describe various phases of normal gait cycle.<br>Describe common gait deviations in stroke, neuropathies, myopathies, spinal cord injury, amputation, cerebral palsy.<br>Be able to plan appropriate interventions.                                                                                                                                                                                                        |
| 11.Electrodiagnostic Medicine                                | Review action potential generation and mechanisms of normal and abnormal wave forms from nerve and muscle.<br>Recognize abnormal patterns of nerve and muscle potentials in common conditions including anterior horn cell diseases, radiculopathies and plexopathies, neuropathies, nerve injuries, myopathies and neuromuscular junction disorders.<br>Categorize different types of nerve injuries and prognosticate recovery. |  | To perform sensory and motor nerve conduction tests, elicit F-wave and H-reflex as part of electrodiagnostic evaluation.<br>To plan and perform electromyographic (EMG) evaluation based on clinical findings and arrive at a diagnosis.<br>To interpret findings of tests like somato-sensory evoked potentials, auditory and visual evoked potentials, to prognosticate recovery.<br>To demonstrate proper care of electro-diagnostic equipment. |
| 12.Outcome Measures in Physical Medicine and Rehabilitation. | Identify and implement common outcome measures in rehabilitation medicine.<br>Summarize essential principles of quality improvement                                                                                                                                                                                                                                                                                               |  | To use various outcome measures relevant to underlying condition thereby aiding both subjective and objective assessment.<br><br>Assessment of ADL, IADL<br>Disease and injury specific scales used in Acquired brain injury, Stroke, Arthritis, Parkinson's disease, Spinal cord injury, Amputations, Hemophilia, and Pediatric disabilities etc.<br>Scales to assess hand function, pain and affective disorders                                 |

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| 13. Therapeutic Exercises           | <p>Describe effect of exercises on muscle physiology- strength, endurance, flexibility, and coordination.</p> <p>Evaluate different energy systems in the body</p> <p>Cardiovascular responses to physical exercise and effect of training.</p> <p>Pelvic floor and Antenatal exercises</p> <p>.</p>                                                                                                                                                                                                                                             |                                                                          | <p>Assess range of motion, muscle strength, and tone.</p> <p>To plan and prescribe specific therapeutic exercises in due consideration of multiple factors.</p> <p>Determine contra-indications to specific exercises and to communicate the same with a multi-disciplinary team and the care givers</p> <p>Design exercise programme for cardio respiratory endurance</p> |
| 14. Physical Agents/Modalities      | <p>Review the physiological benefits of different types of physical modalities of heating and cryotherapy.</p> <p>Distinguish various modalities, principles, methods of application, indications and define precautions and contraindications.</p>                                                                                                                                                                                                                                                                                              | Patient education on the scope and limitations of modalities.            | To prescribe physical modalities - heat and cold appropriately                                                                                                                                                                                                                                                                                                             |
| 15. Manipulation, Traction, Massage | <p>Recall the principles and biomechanics of different types of manipulation, traction, muscle energy techniques.</p> <p>State indications, precautions and contraindications to these measures</p>                                                                                                                                                                                                                                                                                                                                              | Patient education on the scope and limitations of manipulation           | To prescribe manipulative therapies, stating the precautions to be taken.                                                                                                                                                                                                                                                                                                  |
| 16. Electrical Stimulation          | <p>Describe the types of current used in electrical stimulation</p> <p>Outline the principles behind the use of neuromuscular electrical stimulation.</p> <p>Describe the types and methods of electrical stimulation.</p> <p>To recall the precautions, indications and contra-indications for the use of electrical stimulation.</p> <p>Explain the various theories of pain control and modulation by transcutaneous electrical nerve stimulation (TENS)</p> <p>Discuss the principles and practice of Functional Electrical stimulation.</p> | Patient education regarding the scope and limitations of these measures. | <p>Evaluate clinically to determine likely candidates to benefit from electrical stimulation.</p> <p>Prescription of neuromuscular electrical stimulation in appropriate clinical setting</p> <p>Application of FES in appropriate clinical contexts</p>                                                                                                                   |

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| 17.Principles of Occupational Therapy                                    | Evaluation of occupational and functional performance, access to home, community and workplace. Understand the principles of interventions for physical retraining, cognitive training and sensory re education                                                                                                                                      | Understand these issues in the social and cultural contexts with sensitivity and compassion               | Understand the principles of common therapeutic approaches like Rood approach, Bobathneuro developmental approach, Brunnstrom technique, proprioceptive neuromuscular facilitation and use of biofeedback to enhance performance in neuromuscular rehabilitation. Apply common scales to assess function in disability Prescription of orthoses and self help devices to improve functional outcomes. |
| 18. Integrative Medicine and Physical Medicine and Rehabilitation.       | List common complementary and alternative medicine systems, outline the categories of alternate medical systems including chiropractic, osteopathic medicine, meditation, art therapy, music therapy, dance therapy and movement therapies like Tai Chi, yoga, energy therapy, acupuncture, acupressure, reflexology. common biological supplements. | Patient education and counseling regarding limitations and scope of these systems                         | Appraise and discuss the scope and limitation of these complementary second line therapies with the patient.                                                                                                                                                                                                                                                                                          |
| 19.Assistive Technology related to Physical Medicine and Rehabilitation. | Discuss the devices to augment functional abilities and meet felt need of patients with disability. Enumerate the different assistive technology for communication disorders, mobility impairment of upper and lower limbs, visual and hearing impairment Outline the principles of selecting appropriate assistive technology.                      | Patient education on use of technology in social, cultural and economic contexts, addressing apprehension | Prescription of various assistive devices to improve communication, vision, hearing, functional status and mobility with due consideration of medical, psychological, environmental and socio-economic factors.                                                                                                                                                                                       |
| 20. Low back pain and Neck pain.                                         | Review the anatomy and biomechanics of the Lumbosacral spine and cervical spine. Causes & source of lower lumbar pain and neck pain with differential diagnosis. Outline the investigations for neck                                                                                                                                                 | Patient education. Provide reassurance, counseling and follow up.                                         | Clinically assess trunk balance, strength, mobility, spinal deformity and neurological deficits. Recognise underlying pathological processes causing back/neck pain                                                                                                                                                                                                                                   |

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|                             | <p>and backpain.</p> <p>Role of therapeutic exercises and physical modalities in management of low back pain and neck pain.</p> <p>Evaluation and management of back pain in pregnancy</p> <p>Describe the technique of interventional procedures available in management of low back pain and neck pain.</p> <p>Indications for surgical management of low back pain and neck pain.</p> |                                                                                                                                             | <p>including infections and neoplasms</p> <p>Determine the appropriate radiological imaging for these conditions.</p> <p>Prescribe therapeutic exercises and physical modalities, and orthosis for low back and neck pain.</p> <p>Pharmacological management</p> <p>Interventional spinal management –Epidural and caudal injections, Radiofrequency ablation</p>                                                                                                                                                                             |
| 21.Musculoskeletal injuries | <p>Discuss the common fractures and its complications and sequelae</p> <p>Management of common traumatic conditions to the upper and lower limbs.</p>                                                                                                                                                                                                                                    | <p>Addressing apprehensions. Explain simple biomechanics, overuse, ergonomics of the problems contextually and the solutions available.</p> | <p>To diagnose common musculoskeletal injuries by clinical history, examination and investigation.</p> <p>Prescription of orthosis to facilitate tissue repair and prevent deformity in common musculoskeletal conditions.</p> <p>Prescription of therapeutic exercise and physical modalities in common musculoskeletal injuries.</p> <p>Application of splints and casts to immobilize the extremity in acute musculoskeletal trauma.</p> <p>Pharmacological management of pain and spasm in musculoskeletal trauma: acute and chronic.</p> |
| 22.Sports Medicine          | <p>Understand the principles of conditioning, training, over-training syndrome and altitude training.</p> <p>Outline the biomechanics of common sports.</p> <p>Role of pre-participant examination for sports events.</p> <p>Performance enhancing drugs and its demerits.</p> <p>Benefits of exercise and common sports injuries.</p>                                                   | <p>Explain biomechanics of problems and suitable solutions and options of treatment.</p>                                                    | <p>Clinically examine and investigate for common sports related injuries in the acute, sub acute and chronic settings.</p> <p>Interpret imaging findings as well as manage these conditions appropriately.</p>                                                                                                                                                                                                                                                                                                                                |

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| 23.Holistic Rehabilitation of persons suffering from:<br>i.Rheumatic and Degenerative joint diseases | <p>Description of etio-pathogenesis of inflammatory and non-inflammatory arthritis</p> <p>Role of radiological investigation, metabolic profile, serum biomarkers and immunological investigations</p> <p>Medical and surgical management of inflammatory and non-inflammatory arthritis.</p> <p>To enumerate the mechanism of action, indications and contra indications for biologicals in inflammatory arthritis.</p> <p>Discuss the physical modalities - mode, timing, duration, technique of application in non inflammatory and inflammatory arthritis.</p> <p>Review the different orthoses and exercise program in arthritis.</p> | <p>Patient education and family counseling in the long term management respecting patients emotions, anxieties.</p> | <p>Clinically assess the small and large joints for range of motion, synovitis and deformity. Identify the findings on diagnostic imaging.</p> <p>To aspirate synovial fluid from the joints (with USG guidance wherever required) and interpret analysis</p> <p>To be familiar with use of classification criteria to diagnose rheumatological diseases</p> <p>Plan pharmacological management in inflammatory and non inflammatory arthritis.</p> <p>To be able to do Therapeutic injections</p> <p>To assess functional status by the use of appropriate outcome measures.</p> <p>Prescribe an exercise program and orthosis in case of arthritis.</p> |
| ii.Spinal deformity                                                                                  | <p>Biomechanics of spine and causes of spinal deformities.</p> <p>Medical and surgical management.</p> <p>Role of orthotics.</p> <p>Role of therapeutic exercises</p> <p>Congenital vertebral anomalies and management.</p>                                                                                                                                                                                                                                                                                                                                                                                                                | <p>Counseling related to diagnosis, complications and long term treatment plan and follow up.</p>                   | <p>Perform clinical tests to assess type and degree of curve in spinal deformities, respiratory function, limb length discrepancy.</p> <p>Serial assessment (clinical and radiological) to determine the degree of curve progression and plan the management.</p> <p>Identify radiological features in spinal deformities and vertebral anomalies</p> <p>Application of spinal brace. and plan management.</p>                                                                                                                                                                                                                                            |
| iii.Upper and Lower limb pain syndromes                                                              | <p>Discuss common causes of upper and lower limb pain.</p> <p>Evaluate to identify source of pain and assess severity of pain</p> <p>Pharmacological management of neuropathic pain.</p> <p>To elaborate role of conservative and surgical management to</p>                                                                                                                                                                                                                                                                                                                                                                               | <p>Patient education and counseling ergonomics benefits and limitations of interventions.</p>                       | <p>Previously outlined in musculoskeletal conditions.</p> <p>To use musculoskeletal ultrasound for diagnosis</p> <p>Performing therapeutic injections of joints and soft tissues- intraarticular,</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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|                                                                | manage pain                                                                                                                                                                                                                                                                                                                  |                                                                                                                     | periarticular and trigger point injections<br>Use of ultrasonographic guidance to aid in the above joint injections.                                                                                                                                                                                                                                                                                            |
| iv.Osteoporosis                                                | Recall vitamin D, calcium and PTH metabolism Explain causes and types of osteoporosis<br>Evaluation of osteoporosis<br>Pharmacological and non pharmacological management.                                                                                                                                                   | Patient education and counseling on nutrition, posture ergonomics benefits and limitations of interventions.        | To investigate so as to establish etiology in osteoporosis including plain radiography, DEXA and markers of bone turnover.<br>Identify features suggestive of osteoporosis on a plan radiograph.<br>Interpret DEXA scan with due reference to age and sex.<br>Pharmacological management and follow up of osteoporosis<br>Prescription of orthosis with appropriate modifications<br>Planning spinal exercises. |
| v.Burns                                                        | Classification of burns<br>To discuss the acute complications and sequele of superficial partial thickness and full thickness burns<br>Assess the concomitant injuries like inhalational, electrical, nutritional components of the trauma.<br>Discuss the strategies for preventing scars, contractures and its management. | Sensitivity and attitude of caring.<br>Providing pain relief and emotional support, respecting privacy and dignity. | Plan prevention and management of complications following different degrees of burns, assess concomitant injuries<br>Prescribe appropriate splints and supports to prevent deformities<br>Prescribe pressure garments to manage hypertrophic scars<br>To be able to work as part of a burn rehabilitation team.<br>Plan and perform simple soft tissue release, skin graft for deformity correction.            |
| 24.Rehabilitation of persons after fractures, and arthroplasty | Describe biomechanics of various joints and the relevant anatomy. To discuss indications, types and technique of arthroplasty.<br>To recall the indications and technique of plaster cast application.<br>To discuss the classification of fractures and management of complications.                                        |                                                                                                                     | To interpret imaging findings post arthroplasty and prescribe a therapeutic exercise program considering the type and site of arthroplasty, duration following arthroplasty and associated co-morbidities.<br>To apply plaster cast                                                                                                                                                                             |



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| 25.Rehabilitative surgeries | <p>Discuss the etiopathogenesis of deformity / contracture in poliomyelitis, CTEV, muscular dystrophy and cerebral palsy and outline principles of management</p> <p>Description of pre-operative preparation, steps involved in surgical correction and post-operative care.</p> <p>Describe the surgical options for management of spasticity.</p> <p>Indication, side effects, adverse effects, surgical technique for intra thecal baclofen pump.</p> <p>Recall the principles of surgery in amputation at various levels. Describe how to choose residual limb length and technique of surgery. Indications and technique for revision of residual limb.</p> <p>Technique of fractional lengthening or tendon transfers in upper and lower extremity.</p> <p>To recall techniques of excision and closure for pressure ulcers-</p> | Patient education family counseling on scope and limitations of these interventions. | <p>Planning pre-operative investigations.</p> <p>To perform surgeries and plan appropriate post operative care for the conditions mentioned.</p> |

## Section C

### Rehabilitation of Neurological, Pediatric, Geriatric and Cardiopulmonary Disorders

|              | KNOWLEDGE                                                                                                                                                                                                                                                                                                                                                                                                    | ATTITUDE                                                                                       | SKILLS                                                                                                                                                                                                                                                                                                                                         |
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| 1.Spasticity | <p>Understand the mechanism involved in pathogenesis of spasticity.</p> <p>To outline the non pharmacological management of spasticity.</p> <p>Discuss the pharmacodynamics of common anti-spastic drugs, nerve blocks, motor point blocks, Baclofen pump, role of surgical intervention in spasticity management.</p> <p>Role of intra-vesical botulinum toxin in management of detrusor over activity.</p> | Patient education and family counseling about treatment options in the socio-economic context. | <p>Assess the extent and grade of spasticity. Administer Botulinum toxin injection using appropriate technique with due consideration of its indications, route, site of injection, side-effects and dosing interval.</p> <p>To perform neurolysis with phenol, tone inhibiting cast and soft tissue surgery for management of spasticity.</p> |

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| 2.Speech and Language Dysfunction | <p>Understand different types of aphasia.</p> <p>Outline the evaluation and management of aphasia including speech therapy and alternate augmentative communication methods.</p>                                                                             | <p>Patient education and family discussions regarding available treatment options.</p>       | <p>Assess extent and type of language dysfunction; suggest appropriate interventions.</p>                                                                                                                                                                                                                        |
| 3.Swallowing disorders            | <p>Pathophysiology of common swallowing disorders</p> <p>Evaluation of swallowing dysfunction</p> <p>Common methods in treatment of dysphagia Strategies to prevent aspiration pneumonia.</p> <p>Indications for PEG and PEJ and its merits and demerits</p> | <p>Patient counseling and family discussions in the cultural and socio economic context.</p> | <p>To perform bed-side test for assessment of swallowing.</p> <p>To interpret findings on barium swallow assessment.</p> <p>To prescribe investigations to establish an etiology including video or endoscopic assessment.</p> <p>To suggest appropriate measures for reduction of dysphagia and aspiration.</p> |
| 4.Bladder dysfunction             | <p>Describe evaluation and classification of neurogenic bladder dysfunction.</p> <p>Describe the management of neuropathic bladder.</p> <p>Outline the acute and chronic complications of neuropathic bladder.</p>                                           | <p>Counseling patient and family regarding the long term care needs.</p>                     | <p>Evaluation of neurogenic bladder.</p> <p>To perform ultrasonography of kidneys and bladder, cystometrogram and cystocopy. Classify neurogenic bladder based on above findings and plan management - conservative and surgical (suprapubiccystostomy and cystolitholapaxy).</p>                                |
| 5.Bowel dysfunction               | <p>Describe the common symptoms and complications of neurogenic bowel.</p> <p>Discuss the evaluation and management options for bowel dysfunction.</p>                                                                                                       | <p>Counseling patient and family regarding the long term care needs.</p>                     | <p>Evaluation of neurogenic bowel and its causes. To perform proctoscopy to evaluate the bowel and prescribe appropriate solutions.</p>                                                                                                                                                                          |

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| 6. Sexuality and disability           | Understand the types of sexual dysfunction, evaluation and treatment.                                                                                                                                                                                                 | Counseling and discuss management options, ensuring privacy and dignity. | Be familiar with ALLOW, PLLISSIT and BETTER models for facilitating discussion on sexuality as well as fertility.<br>Prescription of medications to enhance sexual function.<br>Use of common assistive devices to facilitate erection or ejaculation and intra-cavernosal injections<br>To familiarize with assisted fertilization, pregnancy and delivery following spinal cord injury |
| 7. Pressure ulcers and chronic wounds | Etiopathogenesis of chronic wounds and pressure ulcers<br>Systemic and local evaluation of a patient with neuropathic joints and chronic ulcers<br>Staging of pressure ulcers<br>Conservative and surgical management of pressure sore<br>Management of diabetic foot |                                                                          | Evaluate the cause for chronic ulcers and neuropathic foot<br>Conservative management of ulcers<br>Plan and perform common surgical procedures like STSG, direct closure and local rotation flap for chronic ulcers                                                                                                                                                                      |

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| <p>8.Spinal Cord Injury</p> | <p>Describe etiology and pathogenesis in spinal cord injury.<br/> Classification of spinal cord injury and the various spinal cord injury syndromes<br/> Biomechanics of the spine and the relation of mode of trauma to type of injury.<br/> Assess instability of the spine following injury.<br/> Principles of acute management-surgical and conservative<br/> Describe acute and chronic complications following spinal cord injury.<br/> Mechanism of autonomic dysreflexia and outline algorithm to manage the same<br/> To recall etiopathogenesis and staging of pressure ulcers.<br/> To describe features of neurogenic bladder and it's types and management<br/> Recall the pathophysiology of neurogenic bowel, types and management<br/> To outline the neuronal pathway involved in sexual function and management of sexual dysfunction following spinal cord injury.<br/> Discuss rehabilitation management of a patient with spinal cord injury<br/> To discuss the recent advances including role of stem cells in its repair</p> | <p>Communication with patient and family with sensitivity and compassion.<br/> Be aware of the anxieties and apprehension<br/> Develop communication skills on breaking bad news.<br/> Organize long term treatment plans with active involvement of the team members.</p> | <p>Clinical examination and determining neurological level of injury using AIS<br/> To identify clinical syndromes following spinal cord injury.<br/> To recognize clinical signs of autonomic dysreflexia, evaluate for its cause, plan appropriate treatment and prevention<br/> Evaluation of neurogenic bladder: To perform ultrasonography of kidneys and bladder, cystometrogram and cystoscopy<br/> Classify neurogenic bladder based on above findings and plan management - conservative and surgical<br/> Evaluation of neurogenic bowel and its management.<br/> Management of pressure ulcers, including surgical debridement, skin grafts, direct excision and closure of pressure ulcer, flap closure of pressure ulcer and pressure relief techniques.<br/> Prescribe and check out appropriate orthosis, wheelchair with suitable modifications, special seating.<br/> Evaluation of cause of spasticity and management using drugs, nerve blocks and common surgical procedures for spasticity and contractures.<br/> Recognise late complications like syringomyelia and osteoporosis<br/> Management of neuropathic pain<br/> Psychosocial and vocational rehabilitation</p> |
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| 9.Traumatic Brain Injury | <p>Recall the pathophysiology associated with traumatic brain injury and scope of neuro-plasticity in recovery of function.</p> <p>Outline the evaluation and treatment following acute TBI, management of moderate and severe TBI, vegetative state and coma.</p> <p>Describe the post TBI complications.</p> <p>Pharmacotherapy and interventions for acute and chronic TBI sequelae</p> <p>Biomarkers and imaging for prognostication following TBI.</p> <p>Discuss the outcome measures for traumatic brain injury</p> | To counsel care-givers in long term care and prognosis respecting their emotions in the cultural and social context. | <p>Assess patients with brain injury and investigate to plan suitable goals relevant to the TBI sequelae.</p> <p>Recognise and manage complications arising as a result of the TBI.</p> <p>Assessment of cognition and cognitive rehabilitation strategies</p> <p>Evaluation and management of neurobehavioural symptoms following TBI</p>                                                                                                                                                                                                                                                                             |
| 10.Stroke                | <p>Recall risk factors of stroke and pathology of different types of stroke.</p> <p>Review the vascular segments and anatomical basis of different stroke syndromes</p> <p>Discuss investigations and early interventions following stroke.</p> <p>Rehabilitation and management of complications.</p> <p>Evaluation of young stroke</p>                                                                                                                                                                                   | To counsel care-givers in long term care and prognosis respecting their emotions in the cultural and social context. | <p>Determine the risk factors and drug therapy to modify the risk.</p> <p>Therapeutic approach for stroke in upper and lower limbs</p> <p>Orthotic support</p> <p>Spasticity management with botulinum toxin or phenol injection or tone inhibiting cast</p> <p>Constraint induced movement therapy</p> <p>Alternate augmentative communication methods</p> <p>Treatment of co-morbidities.</p> <p>Scope and limitation of FES to aid function</p> <p>Be able to set suitable goals contextually and organize treatment plan with the team.</p> <p>Be familiar with outcome tools of use in stroke rehabilitation.</p> |

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| 11. Parkinson's disease, Multiple sclerosis, Ataxia, Neurodegenerative disorders | <p>Understand the pathophysiology of common neuro degenerative disorders including Parkinson's disease, motor neuron disease, multiple sclerosis, hereditary ataxia, dementias.</p> <p>Recall diagnostic criteria of conditions like Parkinson's disease, multiple sclerosis etc. Discuss pharmacodynamics of medications used in these conditions and basis of deep brain stimulation.</p> <p>Outline rehabilitation management of these conditions</p> | Counseling and discussions on course of disease and limitations of treatment                                 | <p>Clinical evaluation and interpretation of investigations including imaging and electro diagnosis to establish the diagnosis</p> <p>Management and planning long term care. Prescribe, monitor and titrate medications for these disorders.</p>                                                                                                                                                                                                                               |
| 12. Plexopathies and Neuropathies                                                | <p>Classify nerve injuries. Outline its etiology and investigations to establish the diagnosis</p> <p>Recall the management following nerve / plexus injury – conservative and surgical.</p> <p>Indications for use of various orthosis following nerve injury.</p> <p>To outline findings in neuropathic conditions on electrodiagnosis.</p> <p>Describe foot complications following peripheral neuropathy.</p>                                        | Patient education, counseling regarding cause, management and prognosis.                                     | <p>Clinical evaluation, electrodiagnostic testing, and diagnostic imaging.</p> <p>Prescribe orthoses following nerve injury – both static and dynamic.</p> <p>Therapeutic exercise prescription following nerve injury, planning activity modification and methods to improve functional status.</p> <p>Prevent and treat foot complications (including ulcers and Charcot joint).</p> <p>Be familiar in techniques to offload the joints in case of peripheral neuropathy.</p> |
| 13. Poliomyelitis and its sequelae                                               | <p>To discuss the etio-pathogenesis and epidemiology of poliomyelitis.</p> <p>To recall methods of prevention employed in India.</p> <p>Outline the pathogenesis of deformities in poliomyelitis and its management.</p> <p>To describe the diagnostic criteria of post-polio syndrome.</p>                                                                                                                                                              | Counsel regarding post-polio syndrome addressing apprehensions and discuss scope and limit of interventions. | <p>Evaluation to establish diagnosis of poliomyelitis.</p> <p>Conservative or surgical management for correction of deformity including casting, skeletal traction, surgical release and common tendon transfers.</p> <p>Prescription of orthosis in a patient with post polio residual paralysis</p>                                                                                                                                                                           |

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| 14.Diseases of Muscles | <p>Recall the various clinical features differentiating various myopathies and dystrophies.</p> <p>To outline the co-morbidities associated with myopathies or dystrophies.</p> <p>To discuss findings of various investigations including metabolic studies, electro diagnostic studies, muscle biopsy, genetic analysis and histopathology.</p> <p>Outline principles of management</p>                                                                                                                                                                                                                          | Counsel about etiology, limitations in management and prognosis with sensitivity and compassion.  | <p>To obtain clinical history followed by a detailed clinical examination thereby framing a clinical diagnosis.</p> <p>To investigate appropriately so as to establish the etiology.</p> <p>Prescription of pharmacological agents, therapeutic exercise and orthoses after due consideration of the diagnosis and clinical co-morbidities.</p>                                                                                                                                                                                                                                                                                                           |
| 15.Cerebral Palsy      | <p>Recall the etiology and risk factors associated with cerebral palsy.</p> <p>Outline the classification of CP.</p> <p>Discuss the clinical features, diagnosis, pattern of involvement, investigations and management in CP.</p> <p>Enumerate the non neurological complications.</p> <p>Discuss the scope and benefits of early intervention and different therapy approaches for CP</p> <p>Common antispastic medications, Botulinumtoxin and phenol injections, intrathecal baclofen.</p> <p>Soft tissue surgery in upper and lower limbs to improve function.</p> <p>Principles of orthopedic management</p> | Family counseling and discuss the spectrum of management options with its merits and limitations. | <p>Assess the type of cerebral palsy, extent of involvement, motor control, cognition, soft tissue contractures and deformity at each joint.</p> <p>Interpret gait analysis for children with cerebral palsy.</p> <p>Management of spasticity</p> <p>Perform soft tissue release for contractures</p> <p>Prescribe appropriate orthotic devices and mobility aids, assistive devices, augmentative communication aids, wheelchair and special seating system to enhance function and community integration.</p> <p>Evaluate and manage behavioural problems in cerebral palsy</p> <p>Assessment for special education and sociovocational integration</p> |

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| 16. Neural tube defects like meningocele and hydrocephalus                                                                      | <p>Outline the clinical classification of spinal dysraphism</p> <p>Discuss the management of meningocele and its long term complications.</p>                                                                                                                                                                               | <p>Counseling patient and family regarding the long term care needs within the cultural, social and economic contexts.</p>                        | <p>Clinical assessment and management of meningocele, addressing the mobility, bladder, bowel, sexual problems.</p> <p>Recognize complications including hydrocephalus, trophic ulcers and tethered cord syndrome.</p> <p>Prescribe appropriate appliances for mobility, independence and vocational rehabilitation.</p>                                                                                                                                  |
| 17. Rehabilitation of children with Autism Spectrum Disorders, learning disabilities, multiple disabilities, mental retardation | <p>Understand normal development and learning. General principles and scales of normal development. Contemporary theories of normal learning and appropriate interventions to enhance attention, memory, cognition and learning.</p>                                                                                        | <p>Family counseling, spectrum of management options with its merits and limitations. Acknowledge the role of team work in enhancing outcome.</p> | <p>Plan rehabilitation strategies in a child with multiple disabilities.</p> <p>To consider environmental modifications to address barrier to community integration</p> <p>Provide mobility devices and address seating issues</p> <p>Address language dysfunction and use of communication aids as appropriate</p> <p>Evaluate psychological status and organise social and family support.</p> <p>Explore special school facilities.</p>                |
| 18. Geriatric Rehabilitation                                                                                                    | <p>Recall the biology of ageing</p> <p>Outline the common problems encountered by the elderly- evaluation and management.</p> <p>Recognize features of dementia, depression, normal pressure hydrocephalus in the elderly.</p> <p>Evaluate the risk of falls and its prevention and management of falls in the elderly.</p> | <p>Counsel family and care givers on outcome, benefits and limitations of interventions, respecting autonomy and ensuring dignity.</p>            | <p>Systematic and methodical approach to problems encountered by geriatric population.</p> <p>Evaluate metabolic, neurological, musculo-skeletal problems, cardio-pulmonary problems and suggest remedial measures.</p> <p>Describe suitable assistive devices available for elderly</p> <p>Evaluate dementia, pseudo-dementia, Alzheimer's.</p> <p>Prevention and management of complications like falls, fractures, memory and visual disturbances.</p> |



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| 19. Visual Rehabilitation                    | Outline common ocular disorders causing visual impairment and recognize features of cortical blindness, hemianopsia, hemi-inattention                                                                                                                                                                                                                                                                                                                      | Patient education and family discussions regarding available treatment options.                                                                                   | Detect common visual and auditory disabilities and suggest relevant interventions including low vision aids.                                                                                                                                                                                                                                                                                                                                                                                                    |
| 20. Auditory Rehabilitation                  | Management of visual problems- Mention the common low vision aids and assistive technology for visual impairment.<br><br>Mention the common causes of hearing impairment and the role of assistive devices in its management.                                                                                                                                                                                                                              |                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 21. Vestibular Rehabilitation                | Recall the anatomy of the vestibular system and outline etiology and the types of vestibular dysfunction.                                                                                                                                                                                                                                                                                                                                                  | Discussions of long term plans with attitude of care and compassion.                                                                                              | To clinically assess the vestibular system and localize the pathology.<br>To suggest rehabilitation for the vestibular dysfunction.                                                                                                                                                                                                                                                                                                                                                                             |
| 22. Psychological problems or mental illness | To discuss management in vestibular dysfunction.                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                   | Determine the extent of psychological issues and social support system available.<br>Be able to address depression and anxieties associated with disability.                                                                                                                                                                                                                                                                                                                                                    |
| 23. Cardiovascular Disease                   | Discuss the risk factors for the coronary artery disease and cardiac evaluation before exercise prescription.<br>Understand the concept of MET<br>Outline methods of cardiac stress testing and mention the factors associated with poor stress tolerance. Discuss the changes in physiology following exercise and aerobic training.<br>To recall the pharmacodynamics of drugs like anti-arrhythmics, anti-hypertensives, anti-anginals and vasodilators | Patient and care givers education regarding risk factors for cardiovascular disease and role of diet, exercise and drugs with the care givers. Explain prognosis. | Clinical assessment to predict maximum heart rate and exercise tolerance.<br>Interpret electrocardiogram.<br>To investigate for risk factors of cardiovascular disease.<br>Risk assessment prior to exercise prescription in cardio-vascular disease.<br>Prescription of aerobic training to enhance cardiac endurance.<br>To consider various co-morbidities and plan rehabilitation following coronary artery disease, myocardial infarction, post coronary artery by-pass grafting, cardiac transplantation. |

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| 24.Obesity and life style diseases | Describe methods to measure obesity and categorization based on body mass index. Diagnostic criteria of metabolic syndrome.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Patient counseling, education on treatment options and monitoring. Advice on benefits of life-style modification.              | To investigate the metabolic status and interpret the results. To prescribe appropriate pharmacological and non pharmacological methods in metabolic syndrome.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 25.Pulmonary Disease               | <p>Mention the mechanism of ventilation and perfusion and role of arterial blood gas analysis.</p> <p>Mention common lung capacities and lung volumes and its characteristics in different pulmonary disorders.</p> <p>Recall the pulmonary physiology and role of <math>\dot{V}O_2</math> max.</p> <p>Role of exercises for chronic obstructive pulmonary disease, bronchial asthma, myopathies, spinal cord injury</p> <p>Understand the principles of postural drainage and different methods of chest physiotherapy</p> <p>Types of respiratory failure</p> <p>Benefits of continuous positive airway pressure and mechanical ventilation</p> <p>Indications, complications and postoperative management following thoracotomy</p> | Counsel the family and patients regarding benefit of respiratory exercises and precautions to improve the pulmonary endurance. | <p>To investigate and interpret arterial blood gas analysis, pulmonary function tests, ventilation-perfusion ratio</p> <p>To be familiar with findings of pulmonary disease on contrast or non-contrast tomography.</p> <p>To prescribe drugs and therapeutic exercises in COPD and asthma.</p> <p>To diagnose various types of pneumonia by clinical examination and interpret the findings on radiological imaging followed by initiation of timely management.</p> <p>Prescription of exercises to facilitate airway clearance and improve pulmonary endurance in patients with neurological disabilities</p> |



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| 30. Emergencies in Physical Medicine and Rehabilitation | Recognize and take appropriate steps for the medical emergencies like falls and fractures, deep venous thrombosis, acute pulmonary embolism, anaphylaxis or drug allergy, postural hypotension, autonomic dysreflexia, myocardial infarction, status epilepticus, dyselectrolytemia, cerebrovascular accident, status asthmaticus, septic shock syndrome, aspiration atelectasis, hydrocephalus and hypoxia. | Counseling the family regarding the magnitude and gravity of the condition. | Respond swiftly and assess situation and prioritize the possible interventions.<br>Algorithm for management of Cardio respiratory arrest and anaphylactic shock.<br>Clinical assessment and investigation aimed at finding causes of autonomic dysreflexia along with appropriate clinical management.<br>To institute early management for the listed conditions. |
| 31. ICU                                                 | Early recognition and management of critical illness neuropathy                                                                                                                                                                                                                                                                                                                                              |                                                                             | Plan rehabilitation goals with interdisciplinary team and suggest strategies in the context of comorbidities                                                                                                                                                                                                                                                       |

## Section D

### Recent Advances in Physical Medicine and Rehabilitation, Prosthetics and Orthotics, Community Based Rehabilitation, Disability Evaluation

|                                                            |                                                                                                                                                                                                                     |                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                               |
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| 1. Recent Advances in Physical Medicine and Rehabilitation | Keep abreast with the latest advances in the field of Physical Medicine and Rehabilitation                                                                                                                          |                                                                                                                                                    | Be familiar with the recent literature, scientific journals and attend conferences and workshops.                                                                                                                                                                                                                                                                                                             |
| 2. Evidence-based Medicine                                 | Apply evidence-based guidelines and high quality published literature to advance clinical practice. Understand the levels of evidence and basic statistical methods to analyze / evaluate a scientific publication. | Demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application and translation of medical knowledge | Able to search the medical literature and use critical analytical skills on publications.<br>Interpret the information and apply relevant knowledge to clinical practice.<br>Able to plan, organize, write, perform a scientifically sound, statistically robust study with ethical and legal standing.<br>To interpret and analyze scientific publications relevant to Physical Medicine and Rehabilitation. |
| 3. Upper limb Orthosis                                     | Describe the materials used in the fabrication of upper limb orthosis<br>Classify upper limb orthosis<br>Recall the principles of                                                                                   | Respecting emotions, anxieties and ensuring autonomy and dignity during                                                                            | Clinical evaluation to determine the need for orthotic intervention.<br>Prescribe orthosis selecting appropriate components and materials<br>Check out orthosis                                                                                                                                                                                                                                               |

|                                                      |                                                                                                                                                                                                                                                                |                                                                           |                                                                                                                                                                                                                                                     |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                      | static and dynamic orthosis used in upper limb<br>Describe the biomechanical principles involved in upper extremity deformity correction with orthoses with specific reference to conditions like arthritis, contractures and paralysis and fractures          | evaluation and prescription of orthosis                                   |                                                                                                                                                                                                                                                     |
| 4.Lower limb orthotics                               | Describe the materials used in the fabrication of orthosis<br>Biomechanical principles in prescription<br>Classify lower limb orthoses<br>Indications of different types of orthoses<br>Parts of shoes and modifications                                       | Respecting autonomy and privacy during prescription of orthosis           | Clinical evaluation to determine the need for orthotic intervention.<br>Prescribe and check out appropriate orthotic appliances.                                                                                                                    |
| 5.Spinal orthoses                                    | Describe materials used in fabrication of spinal orthosis<br>Biomechanical principles in prescription of spinal orthosis<br>Classify common spinal orthosis<br>Indications, precautions and contra indications for spinal orthosis                             | Education regarding role, limitations and application of orthosis         | Prescribe appropriate spinal orthosis to prevent further instability in the spine and facilitate healing, reduce progression of an existing spinal deformity.<br>Check out spine orthosis                                                           |
| 6.Upper limb prosthetics and amputee rehabilitation. | Describe etiology, incidence and prevalence, morbidity of upper limb amputations<br>Recall levels of upper limb amputation<br>Summarize the surgical principles of amputation at various levels.<br>Explain pre-prosthetic management and post-operative care. | Respecting emotions, anxieties and ensuring autonomy, privacy and dignity | Wound care and prescription of temporary prosthesis following amputation.<br>To prescribe prosthesis for individuals with upper limb amputation at various levels in due consideration of medical co-morbidities, age, expected functional outcome. |

|                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                             | <p>Categorize components of upper limb prosthesis</p> <p>Principles governing prescription of upper limb prosthesis</p> <p>Goal setting for prosthetic training.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                          | <p>Prescription of prosthesis in a child with acquired amputation or congenital limb deficiency.</p>                                                                                                                                                                                                                                                                                                                                                                                   |
| <p>7.Lower limb prosthetics and amputee rehabilitation.</p> | <p>Different levels of amputation of lower limb, advantages of different levels.</p> <p>Post-operative management following amputation surgery.</p> <p>Preprosthetic training, role of immediate post operative prosthetic fitting and advantage of temporary prosthesis</p> <p>Categorize the components of lower limb prosthesis.</p> <p>Principles governing prescription of lower limb prosthesis</p> <p>Outline the recreational activities possible and be familiar with the energy expenditure involved.</p> <p>Classify and describe common congenital limb deficiencies and the measures involved in its rehabilitation.</p> | <p>Patient education.</p> <p>Suggest different options and cost effective solutions.</p> | <p>To assist performing lower limb amputation at various levels.</p> <p>To prescribe appropriate prosthesis</p> <p>Organise and lead an amputee clinic</p> <p>To perform prosthetic check-out and analyze residual limb along with gait deviations.</p> <p>To interpret causes and management of residual limb pain and phantom limb pain.</p> <p>Management of complications</p> <p>Prescription of prosthesis in a child with congenital limb deficiency or acquired amputation.</p> |
| <p>8.Mobility aids, wheelchairs and seating systems.</p>    | <p>Describe the components of a manual and powered wheelchair and its basic dimensions.</p> <p>Outline the body measurements taken for wheelchair prescription and factors to be considered for proper seating, pressure relief and positioning.</p> <p>Outline the different aids for mobility and its advantages.</p>                                                                                                                                                                                                                                                                                                               | <p>Respecting the privacy and autonomy of the patient.</p>                               | <p>Prescription of a manual / motorized wheelchair after a proper clinical assessment:</p> <p>Prescription of devices like cane, crutches or walker after assessment.</p>                                                                                                                                                                                                                                                                                                              |

|                                                       |                                                                                                                                                                          |  |                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9.Community Based Rehabilitation                      | Concept of CBR<br>Advantages over Institution based Rehabilitation<br>Organisation and implementation of CBR<br>Linking CBR with primary, secondary and tertiary centres |  | Identify local resources<br>Train volunteers to identify, intervene appropriately and refer when required                                                                                                                                                                                                                                                                                         |
| 10.Legislation in relation to disability              | Know the legal rights of the disabled and discuss the salient features of Rights of Persons with Disability Act and Persons With Disability Act (PWD)                    |  | Discuss the legal provisions and benefit schemes applicable to a person with a disability.                                                                                                                                                                                                                                                                                                        |
| 11.Schemes and Benefits for persons with disabilities | Understand the schemes and benefits for the person with disabilities offered by the Govt. of India.                                                                      |  | Home visits to fully understand community integration issues.                                                                                                                                                                                                                                                                                                                                     |
| 12.Barrier-free Environment                           | Outline the architectural barriers encountered by the disabled and simple measures to address this                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                   |
| 13.Impairment Rating and Disability Evaluation.       | Principles of disability evaluation<br>.                                                                                                                                 |  | Elicit clinical history and perform a detailed clinical examination, followed by review of investigations to evaluate the degree of impairment, disability and handicap in an individual with regards to various factors.<br>To determine extent of loco-motor disability in accordance with the national guidelines<br>To determine vocational ability following a detailed clinical assessment. |

## 4. TEACHING LEARNING METHODS

### A. Theoretical training:

The students pursuing post-graduation in Physical Medicine and Rehabilitation would be expected to engage in self-study. Theoretical knowledge would be imparted to the candidates through the following:

1. **Symposia/Seminars:** The post-graduate student would be required to present topics to the group of teachers and students. A free discussion would be encouraged during these sessions. The candidate should be able to deliver lectures to undergraduates and hold clinical demonstrations for them.
2. **Lectures:** Formal teaching lectures by the faculty.
3. **Journal Club:** This should be a regular activity. The candidate would be assigned /allowed to choose an article from amongst the recent publications from the list of recommended journals, present, summarise, and discuss the published article critically. The contributions made by the article in furtherance of the scientific knowledge as well as limitations should be highlighted.

### B. Practical and Clinical Training:

1. **Case discussions:** The student would be attached to a Faculty member to be able to pick up methods of historytaking and examination in rehabilitation practice. During this period the student would also be oriented to the common problems that present in the OPD or Wards/ICUs or are encountered in the community. The student would be supervised by Senior Residents and Faculty members.
2. **Bedside teaching:** The student would work up cases; learn management of cases by discussion with the senior residents and faculty of the department. He/she would be trained in management of in-patients including performing certain procedures such as debridement, Plaster cast application, traction, catheterization, intubation etc.



3. **Rehabilitative Surgery:** The student would be provided with an opportunity, as far as possible, to observe, learn, assist and once proficient, perform rehabilitative surgical operations such as for correction of deformities in polio, cerebral palsy, amputation, clubfoot, pressure sore etc. including post-operative care with the assistance of the Senior Residents and/or under the direct supervision of a Faculty member.
4. The student would also be oriented to the various sections in a comprehensive rehabilitation set up (such as occupational therapy, orthotics-prosthetics, physiotherapy, social works, clinical psychology, vocational guidance/counseling, educational institution and Non-Governmental Organization in the disability sector etc.) and be well informed about the various equipments and methods used there, and the scope, role and responsibilities of different members of a rehabilitation team.

## 5. STRUCTURED TRAINING PROGRAM

***Post graduate education is a process by which an undergraduate medical doctor is transformed into a highly skilled and competent specialist with adequate knowledge, judgement and appropriate attitude to ensure highest level of care to the patients. The post graduates are expected to engage in self-study. It is physically, emotionally, and intellectually demanding and requires consistent and concentrated effort by the candidate. The skills, knowledge and attitude are imparted to the trainee through interaction with faculty and patients and they gain expertise to perform with greater independence. By the end of the training program, the trainee will be able to perform all medical, diagnostic and surgical procedures essential for the condition and context. The faculty provides the guidance, support and environment and serves as a role model for the trainee as he / she acquires the ability to enter into independent practice of medicine and professional growth. The faculty must ensure availability of adequate resources and actively participate in organized clinical discussions, journal clubs, ward rounds, seminars to foster scholarship for the postgraduate trainee.***

The course will be conducted at the Department of Physical Medicine & Rehabilitation of the Medical College. During their tenure the Post-Graduate would be posted in the Department of PMR and he/she may also be posted in various other departments related to Rehabilitation for their clinical training for the duration.

The teaching sessions in the department shall include the following:

|                                                                       |             |
|-----------------------------------------------------------------------|-------------|
| Formal lecture                                                        | Once a week |
| Journal club                                                          | Once a week |
| Seminar/ Symposium                                                    | Once a week |
| Case discussions                                                      | Once a week |
| Bed side teaching                                                     | Daily       |
| Disabilities evaluation & prosthetic<br>and orthotic check out clinic | Once a week |

Attendance in accredited scientific meetings (CME, symposia, and conferences)

A recommended list of peripheral departments to which the candidate may be posted with suggested duration is given below.

|                                           |         |
|-------------------------------------------|---------|
| 1. Rheumatology                           | 2weeks  |
| 2. Cardiology                             | 1 week  |
| 3. Neurology/ Neuro Surgery               | 3 weeks |
| 4. Orthopaedics including Sports injuries | 3 weeks |
| 5. Hand surgery and Rehabilitation        | 1 week  |
| 6. Leprosy & Dermatology                  | 1 week  |
| 7. Diabetology and foot care              | 1 week  |
| 8. Pulmonary Medicine                     | 1 week  |
| 9. Community Medicine                     | 1 week  |
| 10. Urology                               | 1 week  |
| 11. Geriatrics                            | 1 week  |
| 12. Radio diagnosis                       | 1 week  |
| 13. Vascular Surgery                      | 1 week  |
| 14. Plastic surgery                       | 1 week  |

- 6. Evaluation of the candidates in both theory and practicals will help the candidate in improvement of his/her knowledge, skills and attitude.**

## 7. COMPETENCY ASSESSMENT:

- **OVERALL:**

- a) Communication / commitment / Contribution /  
Compassion towards patients and Innovation ( ) - 5 Marks
- b) Implementation of newly learnt techniques ( )

- Number of cases presented in Clinical Meetings/  
Journal clubs/seminars - 5 marks
- Number of Posters/Papers presented in Conferences/  
Publications and Research Projects - 5 marks
- No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings with details. - 5 marks

-----  
Total 20 Marks  
-----

### PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

## 8. PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

## 10.THEORY EXAMINATION

|           |                                                                                          |
|-----------|------------------------------------------------------------------------------------------|
| Paper I   | Applied Basic Sciences in relation to Physical Medicine and Rehabilitation               |
| Paper II  | Physical Medicine and Rehabilitation of Neurological and Cardio Thoracic Disorders       |
| Paper III | Physical Medicine and Rehabilitation of Musculoskeletal Disorders and Amputation Surgery |

### PAPER I, II & III

**Elaborate on** **2 x 15 = 30**

**Write Notes on** **10 x 7 = 70**

**Total** **-----**  
**100 marks**  
**-----**

### 11.Clinical/ Practical Examination:

| Particulars.                                                            | Maximum Marks. |
|-------------------------------------------------------------------------|----------------|
| Clinical<br>Long Case 1 X 80 = 80 marks<br>Short case 2 X 35 = 70 marks | 150            |
| OSCE – 5 stations x 5 marks                                             | 25             |
| Ward Rounds/Spotters - 5 X 5 marks                                      | 25             |
| Viva-Voce                                                               | 80             |
| Log Book                                                                | 20             |
| Total                                                                   | 300            |
| Minimum for Pass                                                        | 150            |

System of marking/evaluation and weightage given to each area shall be as follows: -

#### I. One Long Case, 80 marks

|      | Item                                                                                 | Marks |
|------|--------------------------------------------------------------------------------------|-------|
|      | Written Work<br>(including history, examination,<br>summary & provisional diagnosis) | 10    |
| i)   | Presentation Style                                                                   | 10    |
| ii)  | Elicitation of signs or maneuvers                                                    | 20    |
| iii) | Discussion                                                                           |       |
| iv)  | Differential Diagnosis                                                               | 10    |
|      | Investigations                                                                       | 10    |
|      | Management                                                                           | 10    |
| v)   | Attitudes                                                                            | 10    |

## **II. Short Cases, Two Cases, 35 marks each case. 35 x 2 = 70**

|      | <b>Item</b>                           | <b>Marks</b> |
|------|---------------------------------------|--------------|
| i)   | Written Work                          | 10           |
| ii)  | Diagnosis                             | 5            |
| iii) | Elicitation of signs (two signs)      | 5            |
| iv)  | Differential diagnosis and management | 10           |
| v)   | Attitudes                             | 5            |

## **III. Ward Rounds 5 Cases X 5 Marks = 25 Marks**

### **12. Log book:**

**The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.**

Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

### **13. VIVA including Competency Assessment :**

VIVA including Competency Assessment - 80 Marks (60 + 20)

**Viva voce, comprising of 60 Marks, shall be in the following areas:**

|      | <b>Item</b>                                         | <b>Marks</b> |
|------|-----------------------------------------------------|--------------|
| i.   | Physical Medicine Equipments                        | 15           |
| ii.  | X-rays, US Scan, CT Scan, MRI                       | 15           |
| iii. | Surgical Instruments                                | 15           |
| iv.  | Prosthetics and Orthotics and Disability Evaluation | 15           |

### **14. OSCE 5 Spotters X 5 marks each= 25 Marks**

|      | <b>Item</b>                              | <b>Marks</b> |
|------|------------------------------------------|--------------|
| i.   | Xrays/ MRI                               | 5            |
| ii.  | Prosthetics and Orthotics                | 5            |
| iii. | CMG/EMG/Gait Analysis /Other lab reports | 5            |

|     |                            |   |
|-----|----------------------------|---|
| iv. | Surgical Instruments       | 5 |
| v.  | Rehab Appliance/ Equipment | 5 |

## 15.REFERENCE BOOKS AND JOURNALS

### Books:

1. Braddom RL *Physical Medicine & Rehabilitation*, Saunders (latest edition)
2. DeLisa JA. *Rehabilitation Medicine: Principles and Practice*. Lippincott (latest edition)
3. Rusk HA. *Rehabilitation Medicine*. CV Mosby (latest edition)
4. Solomon L. *Apley's System of Orthopaedics and Fractures*. Arnold London (latest edition)
5. Vernon W Lin. *Spinal Cord Medicine- Principles and Practice*. Demos
6. *Introduction to Psychology*, Clifford T. Morgan, Richard A. King, Tata McGraw Hill Edition
7. *Behavioral Medicine- A guide for clinical Practice* , Mitchell D.Feldman, John F. Christensen
8. *Physiological Basis of Rehabilitation Medicine*,(Downey and Darling's) Erwin G. Gonzalez
9. *Clinical evaluation and diagnostic tests for Neuromuscular disorders*, Tulio E. Bertorini
10. *Electrodiagnosis in diseases of nerve and muscle: Principles and practice*, Jun Kimura
11. *Essentials of Exercise Physiology*, William D. Mc Ardle
12. *Fundamentals of Pain Medicine*, J.D. Hoppenfeld
13. *Kinesiology: The mechanics and pathomechanics of human movement*, Carol A. Oatis
14. *Movement disorders: A Clinical and therapeutic approach*, Shyamal K Das
15. *Muscles testing and function with posture and pain*, Florence Peterson Kendall, Elizabeth Kendall McCreary
16. *Rheumatology Principles and practice*, Ashit Syngle, SD Deodhar
17. *Hutchison's Paediatrics*, Krishna M Goel, Devendra K Gupta

18. *Atlas of Musculoskeletal Ultrasound*, PK Srivastava
19. *Atlas of nerve conduction studies and electromyography*, A. Arturo Leis, Michael P. Schenk
20. *Neurological rehabilitation*, Richard Greenwood, Michael P. Barnes
21. *Occupational therapy for physical dysfunction*, Catherine A. Trombly
22. *Clayton's Electrotherapy*, Shiela Kitchen
23. *ISCOS, The textbook on comprehensive management of Spinal Cord Injuries*, Dr H S Chhabra
24. *Joint structure and function: A Comprehensive analysis*, Cynthia C. Norkin
25. *Tidy's Physiotherapy*, Stuart Porter
26. *Brain's diseases of nervous system*, Michael Donaghy
27. *Dejong's : The neurological examination*, William W. Campbell
28. *Disabled Village Children*, David Werner
29. *Nothing about us without us: Developing innovative technologies For, By, and with disabled persons*, David Werner
30. Helander E, Mendis P, Nelson G, Goerdts A, *Training in the Community for People with Disabilities* WHO, Geneva, 1989.
31. *Atlas of Orthoses and Assistive Devices*, John D. Hsu
32. *Atlas of Amputations and Limb deficiencies*, Douglas G. Smith

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**



**16. Journals:**

1. Archives of Physical Medicine & Rehabilitation
2. American Journal of Physical Medicine & Rehabilitation
3. Journal of Rehabilitation Research and Development
4. PM & R journal
5. Disability and Rehabilitation
6. Clinical Rehabilitation
7. Neuro Rehabilitation
8. Physical Medicine & Rehabilitation Clinics of North America
9. Orthopaedics Clinics of North America
10. Stroke
11. Spinal Cord
12. Arthritis and Rheumatism
13. Journal of Prosthetics Orthotics International
14. Physical Therapy
15. American Journal of Occupational Therapy
16. Neurology India
17. Indian Journal of Orthopaedics (IJO)
18. Indian Journal of Physical Medicine & Rehabilitation (IJPMPR)
19. National Medical Journal of India (NMJI)

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## **DIPLOMA IN PSYCHIATRY (DPM)**

# **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

## **DIPLOMA IN PSYCHIATRY (DPM)**

### **1. GOAL**

A person who has obtained the qualification of a Diploma in Psychological Medicine (DPM) should be well-versed in / should have skills and expertise in

1. Basic concepts in the subject
2. Recognizing mental health, distress, illness and disease
3. Training should empower her/him to lead a multidisciplinary team to manage mental disorders
4. Understand the principles of ethical medical and professional clinical practice and employ it in their work

### **Rationale**

The purpose of this curriculum is to outline the competencies the trainee must demonstrate and the learning and assessment processes that must be undertaken. The curriculum is outcome- based allowing the trainee to explore the field while being encouraged and supported by clinical supervisors.

### **2. SPECIFIC LEARNING OBJECTIVES**

At the end of the DPM training program, the trainee should have acquired /achieved the following objectives. These are linked to the competencies listed above.

#### **1. Knowledge and understanding of the psychosocial and biological basis of mental health and illness**

The trainee should understand basics of genetics, biology, psychology, sociology and anthropology in order to be able to comprehend mental health, distress, illness and disease and provide holistic care.

#### **2. Elicit details of psychiatric history and perform mental state and physical examinations to assess psychiatric disorders**

The trainee should have the theoretical knowledge related to symptoms and signs of mental illness and possess the skills to elicit psychiatric history and perform comprehensive mental state and physical examinations.

#### **3. Able to master detailed psychiatric presentations, summary, diagnostic formulation and differential diagnosis for patients with different mental disorders**

The trainee should possess knowledge, skill and confidence in reaching appropriate conclusions about different clinical presentations of mental disorders.

#### **4. Able to recommend appropriate investigations including psychological assessment, laboratory tests and radiological investigations and suggest a management plan**

The trainee should be able to document a detailed investigation and management plan for treating mental disorders.

**5. Able to communicate effectively with patients, their families, colleagues, members of the multidisciplinary team and with other health care staff**

The trainee should have the necessary communication skills to establish rapport, provide education about mental disorders and their treatment and communicate effectively.

**6. Able to assess and manage psychiatric emergencies, and evaluate and manage the risk of harm to self and to others in patients with mental disorders**

The trainee should have the necessary knowledge and skill in evaluating risk and managing people who present with psychiatric emergencies.

**7. Able to assess the need for psychotropic medication and employ it appropriately in managing mental disorders**

The trainee should have the necessary knowledge about the mechanisms of action, pharmacodynamic and pharmacokinetic properties, adverse effects, drug interaction, dosing schedules and cost of psychotropic medication.

**8. Able to assess the need for and deliver psychotherapeutic and psychosocial interventions for mental disorders.**

The trainee should be able to employ basic psychotherapy techniques, employ psychosocial intervention in individual, family, and group settings.

**9. Able to understand the principles of ethical medical practice and employ it in day- to- day health care.**

The trainee should be well versed in the principles of bioethics and know the common situations and the applications of these principles.

**10. Able to understand the importance of documentation in medical practice**

The trainee should be able to document clinical details, diagnostic evaluations, treatment and interventions, maintain progress notes, write discharge summaries and maintain legal documents.

**11. Able to develop leadership skills**

The trainee should learn leadership skills in order to be able to work effectively with other colleagues in the multidisciplinary team and in general hospital settings

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

The components include

- (i) Theoretical knowledge,
- (ii) Practical and clinical skills,
- (iii) Professional attitudes including communication skills
- (iv) Training in bioethics and medicolegal aspects of care

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, Bioethics, moral and legal issues, Medical Audit are part and parcel of the curriculum and syllabus

#### **Competencies to be achieved**

At the end of the 2 years of training, the trainee should achieve the competencies listed below. S/he should

1. Acquire knowledge and understanding of the biopsychosocial models and approach to mental health, distress, illness and disease
2. Be able to use such knowledge and understanding to effectively manage people with mental distress, illness and disease
3. Be able to manage a clinical unit/service in psychiatry, ensuring good quality psychiatric care and to interact with clinicians from other disciplines to contribute to holistic management of patients
4. Have a good knowledge of principles of bioethics and their application in day-to-day clinical practice.
5. Develop the potential and enthusiasm to pursue life-long learning to keep up with developments in the field, and to constantly work to improve skills and expertise, in order to develop as a professional who will become a clinician, teacher, mentor and guide for future trainees.

### **4. THEORY SYLLABUS**

The syllabus should be comprehensive covering important aspects of the etiology, psychopathology, diagnosis, differential diagnosis, psychological assessments, laboratory and radiological investigations, treatment and management plans, and rehabilitation of mental and behavioral disorders in children and adults.

The syllabus consists of:

**Paper –I :Applied basic sciences related to psychiatry:**

Basic aspects of biological sciences and their relation/application/ association with mental health, illness and disease:

1. Structural and functional neuroanatomy
2. Neurodevelopment and neurogenesis
3. Neurophysiology
4. Receptors, neurotransmitter, neuropeptides and neurotrophic factors
5. Basic and applied electrophysiology
6. Basic science of sleep
7. Psycho neuro endocrinology
8. Chronobiology
9. Genetics
10. Brain imaging in psychiatry

Behavioral Sciences as applied to Psychiatry:

Basic aspects of psychological and social sciences and their relation/application/association with mental health, illness and disease:

1. Growth and developmental process in childhood and adolescence
2. Sensation, perception and cognition
3. Consciousness
4. Intelligence and aptitude
5. Motivation
6. Feelings and emotions
7. Learning and memory
8. Information processing
9. Personality
10. Communication
11. Abnormal psychology and psychopathology
12. Sociology and psychosocial work
13. Anthropology and culture
14. Public opinion, consumer- survivor movement, antipsychiatry movement
15. Research methodology, epidemiology and statistics
16. Evidence-based medicine and psychiatry
17. Principles of Bioethics

**Paper- II :Clinical psychiatry including recent advances**

Etiology, pathology, clinical features, diagnosis, differential diagnosis, treatment and management of psychiatric disorders including:

1. History of psychiatry
2. Signs and symptoms of psychiatric illnesses: psychiatric interview, history and mental status examination
3. Diagnosis in psychiatry, classificatory systems, psychiatric rating scales, medical assessment and laboratory testing in psychiatry, clinical neuropsychology, psychiatry report

4. Delirium, dementia and neurocognitive disorders
5. Psychiatric disorders secondary to medical disease
6. Substance related disorders
7. Schizophrenia and other psychotic disorders
8. Mood disorders
9. Anxiety disorders
10. Somatoform disorders
11. Chronic fatigue syndrome
12. Factitious disorder
13. Dissociative disorders
14. Eating disorders
15. Sleep and sleep disorder
16. Impulse control disorders
17. Adjustment disorders
18. Personality disorders
19. Psychiatry and reproductive medicine
20. Relational problems
21. Problems related to abuse and neglect
22. Emergency psychiatric medicine
23. Aggression and violence
24. Suicide and deliberate self -harm
25. Death, dying, grief and bereavement
26. Culture bound syndromes
27. Psychotherapies: Psychoanalytical/dynamic, cognitive behavioral, interpersonal, family, group therapy, etc
28. Biological therapies: psychotropic medication, ECT and other brain stimulation techniques, psychosurgery, etc
29. Complementary and alternative medicine in psychiatry
30. Ethics in psychiatry

**Paper- III :Psychiatric specialties, general medicine and neurology related to psychiatry**

Etiology, pathology, clinical features, diagnosis, differential diagnosis, treatment and management of psychiatric disorders including:

1. Child and adolescent psychiatry including intellectual disability, learning disorders, developmental and communication disorders, attention deficit disorders, disruptive behavior, eating, feeding and elimination disorders, movement and tic disorders, attachment disorders, anxiety and mood disorder, suicide, psychosis and substance abuse, legal aspects
2. Psycho-active substance use disorders
3. Psycho-sexual and- gender identity disorders
4. Community psychiatry and national programs
5. Geriatric psychiatry
6. Forensic psychiatry
7. Clinical and legal issues
8. Consultation-Liaison Psychiatry
9. Psychosocial rehabilitation
10. Prevention of mental distress, illness and disease

Neuropsychiatric aspects of neurological, medical and organic diseases including:

1. Methods of history taking: clinical neurological examination, localization of lesions.
2. Special methods of examination: Lumbar puncture; tests of cranial nerve function, clinical electroencephalography, clinical electromyography and nerve conduction studies, neuroradiology including contrast studies, CT scan and MRI, PET, SPECT, FMRI
3. Disorders of language function and of body image.
4. Disorders of cranial nerves
5. Cranio-cerebral trauma
6. Meningitides
7. Viral infections
8. Syphilis, HIV/AIDS
9. Cerebrovascular disorders
10. Malignancies, Intracranial tumors and space occupying lesions
11. Degenerative disorders
12. Movement disorders
13. Endocrine and metabolic disorders
14. Autoimmune and/or allergic disorders
15. Paroxysmal disorders and epilepsies
16. Headaches, migraine and related conditions
17. Disorders of the spinal cord
18. Nutritional deficiencies
19. Reproductive health

## **5. TEACHING LEARNING METHODS (including clinical study)**

The learning/teaching methods will include:

- i.* Bedside clinics
- ii.* Case demonstration
- iii.* Didactic lectures
- iv.* Seminars
- v.* Case conference
- vi.* Journal Club
- vii.* Research Forum
- viii.* Case presentations
- ix.* Ward and Grand rounds
- x.* Attendance in special clinics/units
- xi.* Training in ECT administration
- xii.* Library and resources on the internet



## 6. STRUCTURED TRAINING PROGRAM

The 2-year course should provide the trainee adequate opportunity to be exposed to the different aspects of psychiatric practice; general and adult psychiatry, child and adolescent psychiatry, psychiatry of old age, forensic psychiatry, substance misuse, neuropsychiatry, consultation-liaison psychiatry, community and rehabilitation psychiatry and medical psychotherapy.

The course should provide adequate exposure and learning opportunities for supervised out-patient and in-patient work, and in managing emergencies and “on-call” duties. Training placements should be in psychiatric facilities, general medical settings and in the community.

The curriculum should be delivered through workplace learning with appropriate clinical supervision. The learning methods and components will also include:

1. Clinical supervision
2. Interview skills
3. Diagnostic and psychological assessment experience and supervision
4. Management experience and supervision
5. Psychotherapy experience and supervision
6. Emergency psychiatry experience and supervision
7. Training in Electroconvulsive Therapy (ECT)

The training should be rotated through the different departments to include the following schedule:

| Component                                                                                                                                                    | Duration<br>Total 52 x 2 =104 weeks |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| General psychiatry including adult, old age, consultation liaison, substance misuse through posting in out-patient, inpatient, and general hospital postings | 74 weeks                            |
| Child and Adolescent Psychiatry                                                                                                                              | 16 weeks                            |
| Community psychiatry                                                                                                                                         | 4 weeks                             |
| Forensic psychiatry                                                                                                                                          | 2 weeks                             |
| Neurology                                                                                                                                                    | 8 weeks                             |

The trainees will have weekly lectures/seminars in general, abnormal and social psychology and psychodiagnostics during the first year of training. Lectures and seminars will also be arranged in neuroanatomy and neurophysiology.

**7. Evaluation of the candidates in both theory and practicals will help the candidate in improvement of his/her knowledge, skills and attitude.**

## 8. COMPETENCY ASSESSMENT:

- **OVERALL:**

- a) Communication / commitment / Contribution / Compassion towards patients and Innovation ( ) 5 Marks
- b) Implementation of newly learnt techniques/skills ( )

- Number of cases presented in Clinical Meetings/ Journal clubs/seminars - 5 marks
- Number of Posters/Papers presented in Conferences/ Publications and Research Projects - 5 marks
- No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks

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Total 20 Marks  
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### PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

## 9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

## 10.THEORY EXAMINATION

The candidates will have to appear for three papers, which will test their theoretical knowledge. The pattern of questions and their marking system will be consistent with the recommended University standards. There will be three theory papers of 3 hours each and each will carry 100 marks/

## THEORY EXAMINATION

Paper I - Applied Basic Sciences as related to Psychiatry (Neuro Anatomy, Neuro Physiology, Neuro Chemistry, Biostatistics, General Psychology, Abnormal Psychology, Social Psychology, Psychometry and Genetics)

Paper II – Clinical Psychiatry Including recent advances

Paper III – Psychiatry Specialties and General Medicine and Neurology related to Psychiatry

### Question Paper pattern: PAPER I, II & III

|                |                  |
|----------------|------------------|
| Elaborate on   | 2 x 15 = 30      |
| Write Notes on | 10 x 7 = 70      |
| -----          |                  |
| <b>Total</b>   | <b>100 marks</b> |
| -----          |                  |

## 11. PRACTICAL EXAMINATION :

|                                                                         |        |            |                  |
|-------------------------------------------------------------------------|--------|------------|------------------|
| 1. Clinical cases<br>a) One Long case(Psychiatry)<br>b) Two Short cases | 1 x 80 | 45minutes  | 80 marks         |
| i. Neurology<br>ii. Psychiatry                                          | 2 x 35 | 20 minutes | 70 marks         |
| 2. Spotters (5x5)                                                       |        |            | 25 marks         |
| 3. OSCE                                                                 |        |            | 25 marks         |
| 4. Viva voce                                                            |        |            | 80 marks         |
| 5. Logbook                                                              |        |            | 20 marks         |
| <b>Total</b>                                                            |        |            | <b>300 marks</b> |
| <b>Minimum for pass</b>                                                 |        |            | <b>150 marks</b> |

## 12. LOG BOOK

The trainee will maintain a log of activities during the course. The assessment of the Logbook carries 20 marks in the practical examination. The clinical postings including OPD, ward rounds, academic sessions (case seminars, journal clubs, symposia) are written in the logbook on a day-to-day basis for the entire 24 months of training. The Assistant Professor of Psychiatry who supervises the resident and the Consultant under whom he/she is posted will sign the logbook.

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

### 13. VIVA

VIVA including Competency Assessment

- 80 Marks (60 + 20)

### 14. OSCE

There will be five stations and the following topics have to be elicited by the trainee:

- i. Mental Status examination
- ii. Eliciting symptoms like delusion, hallucination, obsessions etc
- iii. Bedside lobe function tests
- iv. Assessing motivation for abstinence in people with substance use
- v. Assessment of suicide risk
- vi. Assessment of mood
- vii. Assessment of cognitive function like memory, orientation, attention and concentration
- viii. Psychoeducation for different mental disorders
- ix. Psychoeducation for different drug therapies like lithium, clozapine etc
- x. Side effects of medication

### 15. RECOMMENDED REFERENCE BOOKS:

| <b>Authors</b>                                                         | <b>Name of Book</b>                                                                                       | <b>Year</b> | <b>Publisher</b>                                |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------|
| Femi Oyeode                                                            | <b><i>Sims' Symptoms in the Mind: Textbook of Descriptive Psychopathology, 5<sup>th</sup> edition</i></b> | 2015        | Elsevier Ltd, Edinburgh                         |
| Brendan Kelly and Patricia R. Casey                                    | Fish's Clinical Psychopathology: Signs and Symptoms in Psychiatry, 3 <sup>rd</sup> edition                | 2007        | Royal College of Psychiatrists, London          |
| American Psychiatric Association                                       | Diagnostic and Statistical Manual of Mental Disorders 5th edition                                         | 2013        | American Psychiatric Association: Arlington, VA |
| Benjamin J Sadock and Virginia A Sadock                                | <b><i>Kaplan And Sadock's Comprehensive Textbook of Psychiatry 9th Edition</i></b>                        | 2009        | Lippincott, William Wilkins, Philadelphia       |
| Benjamin J Sadock and Virginia A Sadock                                | <b><i>Kaplan And Sadock's Synopsis of Psychiatry 10th Edition</i></b>                                     | 2007        | Lippincott, William Wilkins, Philadelphia       |
| <b>Michael Gelder</b> , Nancy Andrea sen, Juan Lopez-Ibor, John Geddes | New Oxford Textbook of Psychiatry 2nd Edition                                                             | 2009        | Oxford University Press, Oxford                 |

| <b>Authors</b>                                                                                                | <b>Name of Book</b>                                                                                                                | <b>Year</b> | <b>Publisher</b>                            |
|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------|
| Anthony S David, Simon Fleminger, Michael Kopelman, Simon Lovestone, John Mellors                             | Lishman's Organic Psychiatry: A Textbook of Neuropsychiatry, 4th Edition                                                           | 2009        | Wiley-Blackwell, Chichester                 |
| <b>David Taylor, Carol Paton, ShitijKapur</b>                                                                 | The Maudsley Prescribing Guidelines in Psychiatry, 12th Edition                                                                    | 2015        | Wiley-Blackwell, Chichester                 |
| World Health Organization                                                                                     | The International Classification of Diseases 10: mental and behavioral disorders, clinical descriptions and diagnostic guidelines. | 1992        | World Health organization, Geneva           |
| Stephen M Stahl                                                                                               | Stahl's Essential Psychopharmacology: Neuroscientific Basis and Practical Applications 4 <sup>th</sup> edition                     | 2013        | Cambridge University Press, Cambridge       |
| <b>J.N. Vyas , NirajAhuja</b>                                                                                 | Textbook of Postgraduate Psychiatry 2 <sup>nd</sup> edition                                                                        | 2003        | Jaypee Publishers, New Delhi                |
| Michael J. Rutter, Dorothy Bishop, Daniel Pine, Stephen Scott, Jim S. Stevenson, Eric A. Taylor, Anita Thapar | Rutter's Child and Adolescent Psychiatry, 6th Edition                                                                              | 2015        | John Wiley, Chichester                      |
| Andrés Martin, Fred R. Volkmar, Melvin Lewis                                                                  | Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook 4 <sup>th</sup> edition                                          | 2007        | Lippincott, Williams, Wilkins, Philadelphia |
| Wen-Shing Tseng                                                                                               | Handbook of Cultural Psychiatry                                                                                                    | 2001        | Academic Press, San Diego                   |
| <b>AllanRopper, Martin Samuels, Joshua Klein</b>                                                              | Adams and Victor's Principles of Neurology 10th Edition                                                                            | 2014        | McGraw Hill, Toronto                        |
| <b>Dennis L. Kasper, Anthony S. Fauci, Stephen Hauser, Dan Longo, J. Larry Jameson, Joseph Loscalzo</b>       | Harrison's Principles of Internal Medicine 19 <sup>th</sup> Edition                                                                | 2015        | McGraw Hill, Toronto                        |

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## 16. RECOMMENDED JOURNALS:

- i. Indian Journal of Psychiatry
- ii. Indian Journal of Psychological Medicine
- iii. Indian Journal of Clinical Psychology
- iv. Annals of Indian Academy of Neurology
- v. British Journal of Psychiatry
- vi. Advances in Psychiatric Treatment
- vii. American Journal of Psychiatry
- viii. Archives of General Psychiatry
- ix. Journal of Clinical Psychiatry
- x. Psychiatric Clinics of North America
- xi. Acta Psychiatrica Scandinavia
- xii. Psychosomatic Medicine
- xiii. Schizophrenia Bulletin
- xiv. Lancet Psychiatry
- xv. Child and Adolescent Psychiatric Clinics of North America
- xvi. [Journal of the American Academy of Child and Adolescent Psychiatry](#)
- xvii. [Journal of the American Academy of Child Psychiatry](#)
- xviii. [Journal of autism and developmental disorders](#)

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## **DIPLOMA IN PUBLIC HEALTH (DPH)**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**DIPLOMA IN PUBLIC HEALTH (DPH)**

**1. GOAL:**

The overall goal of training programme is to produce a competent public health specialist

who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy who can function as a leader of health team and is able to provide effective health care at the primary, secondary and tertiary levels.

who shall be aware of the contemporary advance and developments in the discipline concerned;

who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology; and

**2. SPECIFIC LEARNING OBJECTIVES**

**A.HEALTH CARE**

1. Acquiring clinical skills at the generalist level in relation to common health problems and MCH
2. Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
3. Diagnose and manage majority of the conditions of public health importance, on the basis of clinical assessment, and appropriately selected and conducted investigations.
4. Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability
5. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.



## B. EPIDEMIOLOGY AND RESEARCH

6. Developing scientific knowledge & skill with attitude for continued learning with latest advances in the field of public health.
7. Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
8. Acquiring skills to use computer as an aid to their routine functions

## C. COMMUNICATION AND ADVOCACY

9. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
10. Formulation of strategies and organization IEC activities at various levels from the district level to the periphery

## D. MANAGEMENT, LEADERSHIP AND ADMINISTRATION

11. Organize health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation
12. Supervise Health facilities periodically. This would require performance review, indicator of facilities and steps to improve them
13. The HMIS data need to be reviewed
14. Collection and transmission of performances reports from private sectors.
15. Organizing and conducting surveys as part of programme evaluation
16. Interpretation and utilization of surveillance data for effective prevention and management of epidemics
17. Convene monthly review meeting with BMOHs, MOIC, PHCs, Superintendent, Rural Hospital, and monitor all Health programme including National Public Health Programme, IDSP and pinpoint poor performing units/facilities, take/suggest corrective measures
18. Supervise the work of Infant/Maternal Death audit
19. Acquiring managerial / leadership skill in the area of human resource, material and other resource management
20. Reserve Store
21. Condemnation and Disposal of various unserviceable instruments/Equipments/articles

## E. PUBLIC HEALTH CARE

22. To Co-ordinate with Panchayat and Urban local bodies for maintenance of sanitation and water quality requirements
23. Necessary sanitation and public health measures will also be Co-ordinated by him/her during large congregates of people during Melas, Fairs and festivals
24. Assess the Public Health situation with respect to seasonal variation and take all preventive and promotive measures well ahead.
25. Identification of common parasites and vector species interpretation and use of water quality analysis kits
26. During natural calamities undertake relief measures by Co-ordinating with the local administration by pooling all his/her resources inclusive of manpower, medicine etc. and co-ordinate with District level Epidemic Control Officer who will mobilize the Rapid response team for containment of epidemic, major outbreak and submit daily report
27. Conduct Epidemiological Investigations
28. Nodal Officer for all Health Programmes including Public Health Programmes in his/her jurisdiction. This will also include Externally Aided Projects and Co-ordinate with District level programme officers (Dy. CMOH-I/II/III, ZLO, DTO) and also pinpoint progress, anomalies, deficiency if any
29. Organize and co-ordinate the Health Service Providers like Local bodies, NGOs of his Subdivision and utilize them particularly in Disaster management, epidemic control including preventive measures
30. coordinate with other local departmental officers like Panchayat & Rural Development Department, Education, Women & Child Development Department etc. for better implementation of the programme
31. Inspect and facilitate implementing the various Public Health Acts. Inspection of Hotel, industry and certification of the same.

## 3. COMPONENTS OF POST GRADUATE CURRICULUM

The curriculum is planned that ALL LEARNING OBJECTIVES are achieved at the end of the course.

- ◆ Theoretical knowledge: would be imparted during the afternoon sessions at the institute, covering topics of
  - i. Epidemiology, biostatistics and towards identifying needs of the community.
  - ii. Nutrition, Environments, Sociology and epidemiology of diseases of public health importance towards identifying the multiple facets of “health needs “ of the community
  - iii. Policy planning management and leadership for effective planning and achieving objective of meeting health needs of the community.

- iv. Health care systems and care of special groups for providing appropriate health care as per their needs.
  - v. Public health Acts for ensuring their effective implementation for healthy communities.
  - vi. Communication and education technology to complement medical management with behaviour change.
- ◆ Practical and clinical skills training is provided by posting in the different clinical departments and primary care centres (rural and urban) in addition to offices of District level and state level health authorities.
  - ◆ The students are encouraged to undergo Training in Research Methodology writing/Research activities.
  - ◆ Attitude including communication skills are inculcated by microteaching sessions (Paedagogy) for guided practice and under graduate classes and group health education sessions for independent practice in addition to clinico-social case studies for individual comprehensive communication.
  - ◆ Bioethics:
    - 1.Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
    - 2. Medical ethics,Bioethics, moral and legal issues, medical audit are part and parcel of the curriculum and syllabus
  - ◆ Medicological Aspects: A detailed orientation to the public health acts/laws related to health is given through regular theory sessions and guest lectures and posting directly under health authorities in charge of implementing those Acts.

#### 4. THEORY SYLLABUS

**PAPER I:**History of Public Health, Epidemiology of Communicable and Non communicable diseases along with relevant National Programs, Environmental Health and Nutrition

##### 1. History of Public Health

1. History of different systems of Medicine
2. Public health events - Sanitary awakening, germ theory of disease, rise of Public health in various countries
3. Primary Health Care

4. Definition of health; appreciation of health as a relative concept; determinants of health.
5. Characteristics of agent, host and environmental factors in health and disease and the multifactorial aetiology of disease.
6. Difficulties in measurement of health
7. Indices used in measurement of health.

## **2. Epidemiology of communicable and non-communicable diseases of public health Importance and their control.**

The specific objectives of selected communicable diseases of public health importance for which National Disease Control/Eradication Programmes have been formulated are described here .e.g Infective hepatitis, ARI, T.B. Malaria, Filariasis, STDs & AIDS, Diarrhoeal diseases, Kala Azar, Mental Health, Non communicable diseases, Blindness, Hypertension, Leprosy, Accidents, JE, VPDs, Plague, Chickenpox etc.

1. Extent of the problem, epidemiology and natural history of the disease.
2. Relative public health importance of a particular disease in a given area.
3. Influence of social, cultural and ecological factors on the epidemiology of the disease.
4. Control of communicable and non-communicable disease by:

a. Diagnosing and treating a case and in doing so demonstrate skills in:

- (i) Clinical methods
- (ii) Use of essential laboratory techniques, Selection of appropriate treatment regimes.
- (iv) Follow-up of cases.

b. Principles of planning, implementing and evaluating control measures (incorporating various levels of prevention) for the diseases at the community level bearing in mind the relative importance of the disease.

2. Causation and prevention of diseases amongst individuals and communities
3. Institution of programmes for the education of individuals and communities.
4. Knowledge of the relevant National Health Programmes
5. Epidemiological basis of national health programmes.
6. Awareness of programmes for control of non-communicable diseases.
7. Emerging and Reemerging diseases
8. Hospital Acquired Infections

## **Entomology**

1. Role of vectors in the causation of diseases.
2. Steps in management of a case of insecticide toxicity.
3. Identifying features of and mode of transmission of vector borne diseases.
4. Methods of vector control with advantages and limitations of each.
5. Mode of action, dose and application cycle of commonly used insecticides

## **Environmental Sanitation**

1. Awareness of relation of Environment to Health.
2. Awareness of the concept of safe and wholesome water.
3. Awareness of the requirements of sanitary sources of water.
4. Understanding the methods of purification of water on large scale and small scale with stress on chlorination of water
5. Swimming pool sanitation.
6. Physical, chemical standards; tests for assessing quality of water Various biological standards
7. Concepts of safe disposal of human excreta.
8. Disposal of solid waste, liquid wastes both in the context of urban and rural conditions in the community.
9. Problems in the disposal of refuse, sullage and sewage.
10. Sources, health hazards and control of environmental pollution.
11. Influence of physical factors – like heat, humidity, cold, radiation and noise – on the health of the individual and community.
12. Indices of thermal comfort
13. Standards of housing and the effect of poor housing on health
14. Assessing environment for safety and level of acceptable standards.
15. Global warming.
16. Biomedical Waste Management

## **Nutrition**

1. Nutritional problems of the country; Role of nutrition in Health and Disease, Social factors influencing nutrition.
2. Common sources of various nutrients and special nutritional requirement according to age, sex, activity, physiological conditions.
3. Nutritional assessment of individual, families and the community by selecting and using appropriate methods such as : anthropometry, clinical, dietary, laboratory techniques.
4. Compare, recommended allowances of individual and families with actual intake.
5. Plan and recommend a suitable diet for the individuals and families bearing in mind local availability of foods, economic status etc.

6. Common nutritional disorders: protein energy malnutrition, Vitamin A deficiency, anemia, iodine deficiency disorders, fluorosis, food toxin diseases and their control and management.
7. National Nutritional Policy.
8. National programmes in nutrition and their evaluation.
9. Food adulteration: prevention and control.

## **PAPER II: Epidemiology, Biostatistics and Care of Special groups.**

### **Epidemiology**

Use of epidemiological tools to make a community diagnosis of the health situation in order to formulate appropriate intervention measures.

1. Epidemiology - definition, concept and role in health and disease.
2. Definition of the terms used in describing disease transmission and control.
3. Natural history of a disease and its application in planning intervention.
4. Modes of transmission and measures for prevention and control of communicable and non-communicable disease.
5. Principal sources of epidemiological data.
6. Definition, calculation and interpretation of the measures of frequency of diseases and mortality.
7. Common sampling techniques, simple statistical methods for the analysis, interpretation and presentation of data.
8. Frequency distribution, measures of central tendency, measures of variability,
9. Statistical tests of significance, Confidence Intervals and their application.
10. Need and uses of screening tests. The derivation of normal values and the criteria for intervention in case of abnormal values.
11. Accuracy and clinical value of diagnostic and screening tests (sensitivity, specificity, & predictive values).
12. Planning and investigation of an epidemic of communicable diseases in a community setting.
13. Institution of control measures and evaluation of the effectiveness of these measures.
14. Various types of epidemiological study designs.
15. Qualitative methods: Describe the range and purpose of different approaches to qualitative inquiry and identify the range of qualitative data collection techniques.
16. Planning an intervention programme with community participation based on the Community diagnosis.
17. Applications of computers in epidemiology.
18. Critical evaluation of published research.
19. Disaster Management
20. Bio ethics

## **Biostatistics**

The scope and use of Biostatistics

- a. Collection, classification and presentation of statistical data.
- b. Analysis and interpretation of data.
- c. Obtaining information, computing indices (rates and ratio) and making comparisons.
- d. Apply statistical methods in designing of studies.
- e. Choosing of appropriate sampling methods and sample size.
- f. Applying suitable test of significance
- g. Use of statistical tables.

## **Demography and Family Planning**

1. Definition of demography and its relation to Community Health.
2. Stages of the demographic cycle and their impact on population.
3. Definition, calculation and interpretation of demographic indices like birth rate, death rate, growth rate, fertility rates.
4. Reasons for rapid population growth in the world, especially in India.
5. Need for population control measures and the National Population Policy.
6. Identify and describe the different family planning methods and their advantages and shortcomings.
7. Principles of Counselling; Client satisfaction.
8. Medical Termination of Pregnancy Act.
9. Organisational, technical and operational aspects of the National Family Welfare Programme and participation in the implementation of the Programme. Target Free Approach.
10. Give guidelines for MTP and infertility services.
11. Recent advances in contraception.
12. National Population Policies.

## **Reproductive and Child Health**

- (a) Antenatal – examination of the mother; application of the risk approach in antenatal care.
- (b) Intranatal – conducting a normal delivery; early recognition of danger signals in intranatal period; referral of cases requiring special care.
- (c) Postnatal – assessment of the mother and new born, advice about appropriate family planning method; promotion of breast-feeding; advice on weaning.
- (d) Assessment of growth and development of the child – use of 'road to health' card; recording important anthropometric assessments of the child; giving immunisation to the child; identifying high-risk infant.

(e) Management guidelines as per the 'Integrated Management of Neonatal and Childhood Illness' (IMNCI)

(f) Objectives, Justification, Strategy, Implementation Achievements with regard to the Reproductive Child Health Program.

### **At risk groups**

1. Adolescent Health
2. High risk group children – juvenile delinquents, orphans,
3. Geriatric Problems, Management and Policy for the elderly.
4. Person living With Disabilities (PWD).

### **Genetics and Mental Health**

1. Public health importance of mental health
2. Public health approach to mental health problems: types, diagnosis and management of mental health problems in the community
3. Genetics, diseases mediated through genetic abnormalities, Gene mapping, Genetic engineering and therapy.

### **School Health**

1. Problems of school and adolescents; Objectives of the School Health Programme.
2. Activities of the Programmes like :
  - (a) Carrying out periodic medical examination of the children and the teachers.
  - (b) Immunisation of the children in the school.
  - (c) Health Education
  - (d) Mid-day meals.
3. Obtaining participation of the teachers in the school health programme including maintenance of records; defining healthful practices; early detection of abnormalities.
4. Organization, implementation, supervision and evaluation of School Health Programme

### **Occupational Health**

1. Relate the history of symptoms with the specific occupation including agriculture.
2. Identification of the physical, chemical and biological hazards to which workers are exposed to while working in a specific occupational environment.
3. Diagnostic criteria of various occupational diseases.
4. Preventive measures against these diseases including accident prevention.
5. Various legislations in relation to occupational health.
6. Employees State Insurance Scheme.
7. Migrant Workers



**PAPER III: Recent Advancements, Health planning, Management and Public Health Administration, Sociology and Communication.**

Explain the terms: public health, public health administration, regionalisation, comprehensive health care, primary health care, delivery of health care, planning, management, evaluation, National Health Policy, Development of Health Services in India and various committee reports.

**Components of health care delivery**

- (i) Describe the salient features of the National Health Policy concerning :
  - (a) provision of medical care;
  - (b) primary health care and Health for All;
  - (c) health manpower development;
  - (d) planned development of health care facilities;
  - (e) encouragement of indigenous systems of medicine.
- (ii) Explain the process of health planning in India by demonstrating awareness of various important milestones in the history of health planning including various committees and their recommendations.
- (iii) The health systems and health infrastructure at Centre, state district and block levels.

The inter-relationship between community development block and primary health centre. The organisation, function and staffing pattern of community health centre, primary health centre, rural health centre and sub-centre etc.
- (iv) The job descriptions of health supervisor (male and female); health workers; village health guide; anganwadi workers; traditional birth attendants.
- (v) The activities of the health team at the primary health centre, Community health centre, district hospital.
- (vi) Health Insurance
- (vii) National Health Mission – Rural and Urban Component.

**Urban health**

1. Impact of urbanisation on health and disease.
2. Common health problems (Medical, Social, Environmental, Economic, Psychological) of urban slum dwellers.
3. Organisation of health services for slum dwellers.
4. Organisation of health services in urban areas.

## **Health Management**

- i. Familiarity with management techniques: define and explain principles of management; explain broad functions of management; personnel and materials management.
- ii. Finance Management: Budgeting systems
- iii. Explain general principles of health economics and various techniques of health management e.g., cost-effectiveness, cost-benefit, Supply – demand, Price elasticity etc.
- iv. Health Management Information System
- v. Be aware of the constitutional provisions for health in India.
- vi. Enumerate the major divisions of responsibilities and functions (concerning health) of the union, local and the state governments.
- vii. Appreciate the role of national, international voluntary agencies in health care delivery.
- viii. Appreciate the need for International Health Regulations and Disease surveillance.

## **Public Health Acts**

Legal provisions protecting health of the community.

1. The Tamil Nadu Public Health Act
2. MTP Act, PNDTA Act.
3. PFA Act
4. Acts regulating Organ Donation, Child adoption.
5. Prevention of Immoral trafficking Act.
6. Acts against substance abuse
7. Biomedical Waste Management Act and Acts protecting environment from pollution.
8. ESI Act, Factories Act.

## **Sociology**

1. Assessment of barriers in health behaviour and identification of obstacles to good health, recovery from sickness and to leading a socially and economically productive life.
2. Development of a good doctor – patient relationship, public relations and community participation for health sectors.
3. Identification of social factors related to health and disease in the context of urban and rural societies.
4. Social Stratification and the value of the different methods.

## **Communication**

1. General principles of teaching/learning, methods of instructions, methods of evaluation.
2. Various teaching aids (including A.V aids) and skills to use them correctly.
3. Behavioral change communication strategy - Health education

## **Recent Advances**

1. Newer vaccines
2. New screening/diagnostic methods applicable to public health problems
3. Role of New Technology in Community Health and provision of Care at various level.
4. Recent Policies, Acts, Programs.
5. Evolving diseases, Health issues.

## **5. TEACHING AND LEARNING METHODS**

To achieve the stated objectives, various modalities and methods are recommended:-

The proportion of these modalities and methods will vary from Institution to Institution due to varying facilities for exposure and number of postgraduate students and recognized teachers. However, modality wise minimum exposure is suggested below:-

### **Class room and field learning:**

1. Self-directed: At least twice a week in which the student will present articles, abstracts from journals, seminars, group work, epidemiological and statistical exercises, case studies, family presentation.
2. Lectures: Recognized teachers should take lectures.
3. Participation in scientific activities, Participation in Panel, Symposia, debates, workshops, Conferences
4. They should conduct group teaching of undergraduate students. They should participate in the training programme conducted by the Department.

### **Field posting and work**

- (1) Posting at Urban and Rural Health Training Centres for a period of one year.
- (2) Posting in the hospital for exposure to clinical departments namely Pediatrics, Gynaecology and Obstetrics, Medicine and Surgery for one month each.
- (3) Wherever possible work attachment at District Health Office and Directorate of Health Services
- (4) Short duration posting in various camps, melas, public health emergencies, Investigation of epidemics, implementation of National Health Programmes
- (5) Visits to various institution of Public Health Importance and related development organizations.

## **Research**

1. They should be involved in departmental research projects.
2. They should be encouraged to publish papers in scientific journals
3. They should be exposed to application of computers in medical science

**Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper**

## **6. STRUCTURED TRAINING PROGRAM for Achieving Learning Objectives:**

### **SUBJECT SPECIFIC PRACTICAL COMPETENCIES**

#### **Part I: General Skills**

The postgraduate student should be able to :

1. Recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy
2. Function as a leader of health team and is able to provide effective health care at the primary, secondary and tertiary levels.
3. Shall be aware of the contemporary advance and developments in the discipline concerned;
4. Have a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology;.

**Coded list of Skills:**

|              | <b><u>CATEGORISED ACTIVITY - CONTENTS</u></b>                 |                |
|--------------|---------------------------------------------------------------|----------------|
| <b>S.No</b>  | <b>DETAILS</b>                                                | <b>PAGE NO</b> |
|              | <b>HEALTH CARE</b>                                            |                |
| <b>HC1a</b>  | <b>CLINICO-SOCIAL CASE STUDIES (Presented)</b>                |                |
| <b>HC1b</b>  | <b>CLINICO-SOCIAL CASE STUDIES (Attended)</b>                 |                |
| <b>HC2.</b>  | <b>ANTENATAL CLINIC / LABOUR WARD / POSTNATAL CLINIC/</b>     |                |
|              | <b>FAMILY PLANNING CLINIC</b>                                 |                |
| <b>HC3.</b>  | <b>PAEDIATRIC CLINIC/ ADOLESCENT CLINIC/ GERIATRIC CLINIC</b> |                |
| <b>HC4.</b>  | <b>RNTCP CENTRE/ STI CLINIC/ ART CENTRE/ DERMATOLOGY</b>      |                |
|              | <b>CLINIC</b>                                                 |                |
| <b>HC5</b>   | <b>NCD CLINIC/ OPHTHALMOLOGY CLINIC</b>                       |                |
|              | <b>PUBLIC HEALTH CARE</b>                                     |                |
| <b>PH1</b>   | <b>COMMUNITY DIAGNOSIS</b>                                    |                |
| <b>PH2</b>   | <b>PLACES OF PUBLIC HEALTH IMPORTANCE - VISITED</b>           |                |
| <b>PH3</b>   | <b>OTHER PUBLIC HEALTH ACTIVITIES</b>                         |                |
|              | <b>EPIDEMIOLOGY</b>                                           |                |
| <b>EPI1a</b> | <b>JOURNAL ARTICLE PRESENTED</b>                              |                |
| <b>EPI1b</b> | <b>JOURNAL CLUBS ATTENDED</b>                                 |                |
| <b>EPI2</b>  | <b>PAPER / POSTER PRESENTATIONS</b>                           |                |
| <b>EPI3a</b> | <b>LIST OF PUBLICATIONS</b>                                   |                |
| <b>EPI3b</b> | <b>PROJECTS ASSISTED</b>                                      |                |
| <b>EPI4</b>  | <b>TIMELINE OF DISSERTATION/THESIS ACTIVITIES</b>             |                |
| <b>EPI5</b>  | <b>SIMULATION EXERCISES</b>                                   |                |
|              | <b>COMMUNICATION AND EDUCATION TECHNOLOGY</b>                 |                |
| <b>C1a</b>   | <b>UNDER GRADUATE CLASSES ATTENDED</b>                        |                |
| <b>C1b</b>   | <b>PAEDAGOGY SESSIONS</b>                                     |                |
| <b>C1c</b>   | <b>UNDER GRADUATE CLASSES TAKEN</b>                           |                |
| <b>C2</b>    | <b>UNDER GRADUATE BLOCK POSTINGS (Community Orientation</b>   |                |
|              | <b>Program)</b>                                               |                |
| <b>C3a</b>   | <b>SEMINARS (PRESENTED)</b>                                   |                |
| <b>C3b</b>   | <b>DEPARTMENT SEMINARS ATTENDED</b>                           |                |
| <b>C4</b>    | <b>TRAINING / HEALTH EDUCATION/ COUNSELING SESSIONS</b>       |                |
|              | <b>CONDUCTED / ATTENDED</b>                                   |                |
| <b>C5</b>    | <b>CONTINUED MEDICAL EDUCATION PROGRAMS ( ATTENDED)</b>       |                |
| <b>C6</b>    | <b>GUEST LECTURE- ATTENDED</b>                                |                |

| S.No        | DETAILS                                                                        | PAGE NO |
|-------------|--------------------------------------------------------------------------------|---------|
|             | <b>MANAGEMENT AND LEADERSHIP</b>                                               |         |
| <b>MLA1</b> | <b>HOSPITAL MANAGEMENT</b>                                                     |         |
| <b>MLA2</b> | <b>OUT REACH CLINICS-RURAL / URBAN - National Program 1,2,3</b>                |         |
| <b>MLA3</b> | <b>OUT REACH CLINICS-RURAL / URBAN – National Program 4 &amp; 5.</b>           |         |
| <b>MLA4</b> | <b>OUT REACH CLINICS-RURAL / URBAN – Materials Management.</b>                 |         |
| <b>MLA5</b> | <b>OUT REACH CLINICS-RURAL / URBAN – Health manpower development</b>           |         |
| <b>MLA6</b> | <b>OUT REACH CLINICS-RURAL / URBAN – Health Management Information System.</b> |         |
| <b>MLA7</b> | <b>OUT REACH CLINICS-RURAL / URBAN – Health centre evaluation</b>              |         |
| <b>MLA8</b> | <b>MEDICAL AUDITS/ INFANT DEATH AUDIT/ MATERNAL DEATH AUDIT (Attended)</b>     |         |
| <b>MLA9</b> | <b>REVIEW MEETINGS (CONDUCTED/ATTENDED)</b>                                    |         |

## Part II : Skills in Relation to Specific Topics

Documentation of training in each skill to be recorded in the logbook in the relevant coded section as given.

A. **HEALTH CARE:** Recognise and assist in management of common health problems of the community:

| Skill                                                                                                                                                                                             | Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Quality assessment                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <p>a. Elicit the clinico-social history to describe the agent, host and environmental factors that determine and influence health.</p> <p>b. Adequate and appropriate treatment and follow-up</p> | <p>Case studies on patients with ADD, ARI, fever with no localising sign or symptom, Chronic cough, anaesthetic patches or deformities, (covering diseases like tetanus, malaria, filariasis, rabies, cholera, typhoid, intestinal parasites, leprosy, tuberculosis, HIV, Non communicable diseases like diabetes, hypertension)</p> <p>Cases could be obtained during their clinical postings or during their PHC &amp; UHC posting – a minimum of 15 case studies</p> | <p>Documented case study reports with follow up to be reviewed by Faculty.</p> <p>HC1a and HC1b, HC2, HC3, HC4, HC5</p> |

|                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                          |                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| c. Collection of appropriate material for microbiological, pathological or biochemical tests.<br>d. Fixing, staining, and examining smears – peripheral blood smear for malaria and filariasis, sputum for AFB; Hb estimation; urine and stool examination. | Posting in laboratory where they should have performed the related simple tests.<br>Minimum tests:<br>Peripheral thick smear 1<br>Peripheral thin smear 1<br>AFB smear 1<br>Hb estimation 1<br>Stool exam for ova cyst 1 | Document preparation of smears and their examination findings with confirmation from guiding faculty                                               |
| e.. Advice on the prevention and prophylaxis of common diseases                                                                                                                                                                                             | Health advice to individual<br>Health advice to small groups                                                                                                                                                             | Document context of health advice as counselling for all the 15 case studies in the GATHER (Greet, Ask, Tell, Help, Explain and Return) format. C4 |

**B. EPIDEMIOLOGY & BIOSTATISTICS:** Use effectively the tools of epidemiology for understanding disease distribution and determinants of diseases

| Skill                                                                       | Activity                                                                                                                                                                                                                          | Quality assessment                                                                                                                                                          |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. Design and implement Epidemiological and Health Systems research studies | Project for university journal (Research 1) /                                                                                                                                                                                     | Completed project to be submitted to the university EPI4                                                                                                                    |
| b. Analyze data and present findings                                        | <ul style="list-style-type: none"> <li>- Component activity of research project</li> <li>- Use statistical software for analysis of data.</li> <li>- Solve simulation exercises utilising various statistical methods.</li> </ul> | Document solutions worked out for various simulation exercises. EPI5                                                                                                        |
| c. Effectively document and disseminate findings                            | <ul style="list-style-type: none"> <li>- Publish one original article.</li> <li>- Critically review journal articles.</li> </ul>                                                                                                  | <ul style="list-style-type: none"> <li>- Document details of publication. EPI2</li> <li>- Document details of journal club with articles critiqued. EPI1a, EPI1b</li> </ul> |

### C. COMMUNICATION AND ADVOCACY: Behavioral Change Communication

| Skill                                                 | Activity                                                                                                                                                                       | Quality assessment                                                                                                                                                                      |
|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. Formulate learning objectives.                     | - Plan a project on health communication to a special group. (Component part of community survey or independent study).                                                        | Document the small group BCC by stating the steps of Set Induction, Content/ Message of Communication, Motivators and System support during trial behaviour <b>C4</b>                   |
| b. Select and implement appropriate learning methods. |                                                                                                                                                                                |                                                                                                                                                                                         |
| c. Evaluate learning experiences.                     | Evaluation of BCC/learning session either individually or as a comparative evaluation of different types of health communication initiatives and BCC tools. <b>(Research4)</b> | Document BCC evaluation report either as part of community survey/ following UG teaching session/ independent study comparing different health communication initiatives. <b>EPI3iv</b> |

### D. MANAGEMENT, LEADERSHIP AND ADMINISTRATION

| Skill                                                                                                                            | Activity                                                                                                                                                                                                              | Quality assessment                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| a. Prioritize health problems, Set objectives; prepare action plan; implement programs; and monitor, supervise and evaluate them | Short term Health care outreach project/ training/ workshop to be planned and organised as a team.                                                                                                                    | Record of HEALTH CARE OUTREACH PROGRAM activity and its repercussions/ impact. <b>EPI3i</b> |
| b. Plan health manpower development                                                                                              | Simulation activity of comparing existing health manpower of a chosen system against the required and prepare a feasible action plan for its development including costing                                            | Record of Health manpower development action plan evaluated by faculty. <b>MLA5</b>         |
| c. logistics and materials management                                                                                            | Simulation activity of material management (of any component activity of purchase, indend, storage, logistics, maintenance, documentation and condemnation) for any material essential for health care of a community | Report of materials management simulation report, evaluated by faculty. <b>MLA4</b>         |



|                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                     |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                   | (e.g. drugs, equipments, utilities like gloves, bins, electronic gadgets for HIMS, vehicle for transport of patients, students, health workers) based on the standard guidelines of the Director General of Health Services.                                                                                                                                                                                                                                   |                                                                                                                                     |
| d. Assess costs, plan, implement and supervise budget and alternative health options              | As a component activity enclose costing and budget for the Outreach Health Care Management Project.                                                                                                                                                                                                                                                                                                                                                            | Work out simulation exercises on costing, budgeting and economic evaluation. EPI3iii                                                |
| f. Manage Health Information System and respond appropriately to the information gathered         | Prepare a report of Management health information system at a specific centre, interpreting the findings and recommendations to correct the limitations.                                                                                                                                                                                                                                                                                                       | Report on MIS to be evaluated by faculty and recorded. MLA6                                                                         |
| g. Establish Surveillance System and respond to public health threats effectively and efficiently | Prepare a critical report on the existing surveillance/ HIS system for any specific region and give recommendations/ solutions in accordance with the standard guidelines. ( One of SRS Unit, CRS, Regular Reports)                                                                                                                                                                                                                                            | Report on surveillance system, evaluated by faculty to be enclosed. PH1i                                                            |
| h. Understand basics of hospital management                                                       | Components of hospital administration ( Patient care OP, IP, Nursing, Pharmacy and Stores, Lab, Radiology, Operation theatres, Infection Control, Support services of Central Sterile Supply Dept., kitchen, laundry, Sanitation, Security, Hospital waste management, Records and Office Procedures, Grievance redressal) to be studied for any hospital, and report on the arrangement for monitoring and quality assurance of these components be prepared. | Report on components of hospital management with recommendations for problem solving to be documented with faculty evaluation. MLA1 |
| i. Evaluate health care delivery                                                                  | To evaluate health care delivery of a primary care centre/ sub centre based on NRHM guidelines (IPHS) for patient services offered, supervision and monitoring services, infrastructure in the form of buildings, manpower, drugs,                                                                                                                                                                                                                             | Health centre evaluation report to be documented. MLA7                                                                              |

|                                               |                                                                                                                                                                       |                                                |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
|                                               | equipment and furniture and Quality control in the form of availability of citizen's charter, standard guidelines, internal and external periodic records evaluation. |                                                |
| j. Study quality assurance and medical audit. | Attend a medical audit/ Infant, Maternal death audit.                                                                                                                 | Report on audit as per guidelines. <b>MLA8</b> |

#### E. PUBLIC HEALTH CARE

| Skill                                                                                               | Activity                                                                                                                                                                                                              | Quality assessment                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. Identify health problems of the community in the context of the socio-economic - cultural milieu | Family Study (Minimum 6)<br>Community Diagnosis of a hamlet of 100 families assigned to each Postgraduate. <b>(Research Project 2)</b>                                                                                | Record of detailed Family study report. (Guidelines available in Annexure) PH1c<br>Based on survey of hamlet, details of COMMUNITY DIAGNOSIS to be provided in proper format <b>PH1d</b>                                        |
| d. Identify issues related to nutrition, life style                                                 | Component activity during Community Survey, Quantifying and measurement of at risk lifestyles should be done either as part of community survey or as an independent qualitative research <b>(Research Project 3)</b> | Document on nutrition assessment should have indicators used for nutrition assessment of the community – both at individual level and family level. <b>PH1f</b><br>Documentation of result of lifestyle assessment. <b>PH1g</b> |
| e. Identify threats to the environment                                                              | Component activity during Community Survey                                                                                                                                                                            | Document on environment assessment should state variables related to environment that were studied, how they were measured and the corrective action initiated. <b>PH1h</b>                                                     |
| f. Anticipate, prepare for and respond to disasters                                                 | Component activity during Community Survey.                                                                                                                                                                           | Make a statement of risks the community is prone to, the infrastructure available for disaster preparedness, contact numbers of the local authorities in charge of disaster preparedness. <b>PH1j</b>                           |

|                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| g. Take necessary steps in disease outbreak/epidemics/natural disasters – investigation of epidemic, food poisoning; notification; Organizing medical care following disasters. | To complete a project on investigation of an epidemic/ clustering of cases/ food poisoning                                                                                                                                                                                            | Study document should explain how the epidemic was suspected, confirmed and determinants identified. Details of management of epidemic & corrective action taken to be given PH3PH1 |
| i. Facilitate inter-sectoral coordination for promoting health of communities                                                                                                   | Make educational visits to various health related departments, updating current activities favouring health (TWAD board, TNPCB, Social Welfare Board, Aavin Milk Society, Veterinary Institute, Board for Rehabilitation of PWD, Prison Authorities, Airport and Seaport authorities) | Document report of visits along with contact number of liaison officers, especially for the field practice region assigned to the Post Graduate. PH2                                |
| k. Initiate, implement and supervise National Health Programs                                                                                                                   | Formative evaluation of any one of the National programs as per the guidelines.                                                                                                                                                                                                       | Report of National Program evaluation to be documented after evaluation by faculty. MLA2, MLA3.                                                                                     |
| l. Understand and Implement public health laws                                                                                                                                  | Hotel Inspection<br>Canteen, Food Establishment, Industry Inspection.<br>Identify one violation of TN Public Health Act relating to environment sanitation and action taken report                                                                                                    | Report of Hotel Inspection, Action taken report on violation of environmental sanitation. PH4                                                                                       |
| m. Promote and establish partnerships - partnering with community, Panchayati Raj institutions, public private partnerships, NGOs and corporate sector                          | One activity partnering with any of the NGOs, Corporate sector or private hospital in any aspect of national program or community project.                                                                                                                                            | Report on Community, partnership project and its outcome. EPI3ii                                                                                                                    |

**DPH**  
**TRAINING SCHEDULE ENSURING COVERAGE OF LEARNING OBJECTIVES.**  
**FORENOON CLINICAL SESSIONS**

| Month | I st year Postings                                       | II nd year Postings                                |
|-------|----------------------------------------------------------|----------------------------------------------------|
| 1     | ObG/ Family planning HC1, HC2                            | PHC – 1 MLA3                                       |
| 2     | Paediatrics/ICH Nutrition HC3                            | PHC – 2 MLA4                                       |
| 3     | Medicine/ Diabetology<br>HC5, Research 3                 | Inst. Of Phys. Rehab/ NLE PHC4                     |
| 4     | Psychiatry/ Geriatrics HC3                               | ART/NIRT/RNTCP HC4                                 |
| 5     | Derm/ Ophthalmology<br>HC5, Hospital Administration MLA1 | UHC PH1 (Research 2)                               |
| 6     | Communicable Diseases Hospital<br>(CDH),PH3              | PHC – 3 MLA5                                       |
| 7     | Data collection for Research Project<br>Research 1       | PHC -1 MLA6                                        |
| 8     | PHC – 1                                                  | PHC – 2 MLA7                                       |
| 9     | PHC – 2 MLA2                                             | O/o Deputy Director of Hlth Services<br>MLA8, MLA9 |
| 10    | PHC – 3 MLA2                                             | NRHM/ Health Insurance EPI3i                       |
| 11    | UHC MLA2                                                 | Social Welfare/ Social Rehab PH2                   |
| 12    | Corporation of Chennai MLA8, MLA9                        | Special Vists Port/ Occupational health<br>PH4     |

**AFTERNOON SESSIONS**

| Day     | I year DPH                                                 | II year DPH                                                                   |
|---------|------------------------------------------------------------|-------------------------------------------------------------------------------|
| Monday  | 9 mths: Health care of special groups<br>3 mths: Nutrition | 4 mths: Health Financing & Health Economics<br>8 mths Legal Aspects of health |
| Tuesday | Case Presentation - HC1a, HC1b                             | Teaching UG C1b / Health administration                                       |

|           |                                                                                                                                                                                                                      |                                                                                                                  |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Wednesday | Seminar/ Journal club/ Family Study/ Management Case Study - <b>C1a, EPI1, PH1c.</b>                                                                                                                                 |                                                                                                                  |
| Thursday  | 3 mths: Social & behavioral science<br>3 mths: Environmental Health<br>3 mths: Medical Entomology<br>3 mths: Bio statistics                                                                                          | 8 mths: Health care delivery & Disaster Management/ Injury<br>2 mths: International health<br>2 mths: Bio Ethics |
| Friday    | Epidemiology & Research methodology <b>EPI5</b><br><b>Research1 EPI4</b>                                                                                                                                             | 4 mths Occupational Health<br>8 mths – National Health Programs                                                  |
| Saturday  | <b>1<sup>st</sup></b> week - Log book evaluation by faculty i/c; <b>3<sup>rd</sup></b> week – Special Lectures for PGs /Formative evaluation<br>evaluation by HOD in rotation. <b>4<sup>th</sup></b> week – Log book |                                                                                                                  |

**7. Evaluation of the candidates in both theory and practicals will help the candidate in improvement of his/her knowledge, skills and attitude.**

#### **8. COMPETENCY ASSESSMENT:**

**OVERALL:**

|                                                                                                                  |          |                                   |
|------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------|
| a) Communication / commitment / Contribution / Compassion towards patients and Innovation                        | ()<br>() | - 5 Marks                         |
| b) Implementation of newly learnt techniques/skills                                                              | ()       |                                   |
| Number of cases presented in Clinical Meetings/ Journal clubs/seminars                                           |          | - 5 marks                         |
| Number of Posters/Papers presented in Conferences/ Publications and Research Projects                            |          | - 5 marks                         |
| No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. |          | - 5 marks                         |
| Total                                                                                                            |          | -----<br><b>20 Marks</b><br>----- |

### PG CLINICAL COURSES

**VIVA including Competency Assessment** - 80 Marks (60 + 20)

**Log Book** - 20 marks

#### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

### **9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES :**

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at least one research paper. Case Reports are not considered as Research Paper

### **10. ASSESSMENT METHODS**

There are 2 major components:

**A) Formative Assessment:** Ongoing evaluation during the course –

During each posting/ Module, learning activities are evaluated as given in the activity log, by faculty in charge at the end of each month and by HOD once every 3 months.

**B) Summative Assessment:** Final assessment after 2 years.

#### **A. FORMATIVE ASSESSMENT/ (Ongoing Evaluation)**

Formative assessment will be conducted during each posting/module/unit. This will include the following:

1. HEALTH CARE through documented case study reports with follow up.
- 2.EPIDEMIOLOGY & BIostatistics through solutions worked out for various simulation exercises, and epidemiology studies completed as research for university journal publication.
- 3.COMMUNICATION AND ADVOCACY (Behavioral Change Communication) through health communication to a special group and documented lesson plans for undergraduate classes

4. PUBLIC HEALTH POLICY PLANNING, LEADERSHIP AND MANAGEMENT through their analytical report and recommendations of the different components of management at the public health care units they are posted.

5. PUBLIC HEALTH CARE through survey of hamlet and details of COMMUNITY DIAGNOSIS and recommendations provided. To conduct an activity partnering with any of the NGOs, Corporate sector or private hospital in any aspect of national program as a community health care project. Conduct Hotel, Canteen, Food Establishment or Industry Inspection to identify violation of TN Public Health Act relating to environment sanitation and action taken report.

## **B. SUMMATIVE ASSESSMENT (FINAL ASSESSMENT)**

**1) THEORY** -Should consist of

**Final Theory papers:** 3 Papers each 100 marks

**PAPER I : History of Public Health, Communicable and Non communicable diseases Environmental Health and Nutrition**

**PAPER II: Epidemiology, Biostatistics and Care of Special groups.**

**PAPER III: National Programs, Health Management, Economic Evaluation of Programs, Health Education, International Health and Public Health acts.**

### **Question paper Pattern:**

|                   |              |
|-------------------|--------------|
| 1. Elaborate on   | 2 x 15 marks |
| 2. Write Notes on | 10 x 7 marks |
|                   | -----        |
| Total             | 100 marks    |
|                   | -----        |

\* The topics assigned to the different papers are given as general guidelines. A strict division of the subjects may not be possible. Some overlapping of topics is inevitable. Students should be prepared to answer the overlapping topics.

## 11. PRACTICALS

| Particulars                              | . MaximumMarks        |
|------------------------------------------|-----------------------|
| Clinical:                                |                       |
| Long case: Clinical Social case study    | 1 X 80 = 80 marks     |
| Short case 1: Hotel & Lodging Inspection | 1 X 35 = 35 marks     |
| Short case 2:Public Health related       | 1 X 35 = 35 marks     |
| Epidemiological exercises / problems     |                       |
| OSPE - 5 stations                        | 5 x 5 marks = 25marks |
| SPOTTER- Management Case Study           | 25 marks              |
| Clinical:TOTAL                           | 200 marks             |
| Viva-Voce                                | 80 marks              |
| Log Book                                 | 20 marks              |

**TOTAL | 300 marks**

**Minimum for Pass 150**

The duration of practical exams for DPH course is scheduled for 2 days for each candidate.



The practical examination should be structured and as objective as possible

**Specification for Long case:**

|                                                                        |                                                                     |              |          |
|------------------------------------------------------------------------|---------------------------------------------------------------------|--------------|----------|
| <b>A. Family study</b>                                                 |                                                                     | (60 minutes) | 80 marks |
| Structured Assessment                                                  |                                                                     |              |          |
| 1.                                                                     | Oral skills/presentation with clarity of observations and decisions |              | 20 marks |
| 2.                                                                     | Comprehensiveness of Diagnosis                                      |              | 20 marks |
| 3.                                                                     | Management based on related National Programs and Policies          |              | 20 marks |
| 4.                                                                     | Completeness of Appropriate Recommendations                         |              | 20 marks |
| <b>B. Epidemiology with applied biostatistics simulation exercises</b> |                                                                     | (40 minutes) | 35 marks |

Exercises to test competency in statistics and its application in demography, RCH indicators, study designs, screening and diagnostics, materials management, money management, environment & entomology.

**C. Inspection to assess violation of Public Health Acts: (60 minutes) 35 marks**

Inspection of Places affecting Public Hygiene and Health (like hotels, lodges, canteens, markets, industries etc) to test competence in identification of violations of common Public Health Acts like the Tamil Nadu Public Health Act.

**D. Management Simulation Exercise as Spotter (Time 30 minutes) 25 marks**

Simulation exercise to evaluate attainment of following competencies

F1 Manages programs within resource constraints and monitors program performance

F2 Develops strategies for determining priorities and prepares proposals.

F3 Applies basic human relations skills to the management of organizations, motivation of personnel, and resolution of conflicts

F4 Manages information systems for collection, retrieval, and use of data for decision-making

F5 Understands cost-effectiveness, cost-benefit and cost utility analysis.

## **12. LOG BOOK EVALUATION:**

20 marks

The logbook is a record of the important activities of the candidates during his training. Collectively, log books are a tool for the evaluation of the training program of the institution. The record includes academic activities as well as the presentations and procedures carried out by the candidates.

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

## **13. VIVA**

### **VIVA-VOCE (Structured)**

80 marks

Viva Voce examination shall aim at assessing thoroughly depth of knowledge, logical reasoning, confidence and oral communication skills. It includes discussion on dissertation.

### **VIVA including Competency Assessment**

- **80 Marks (60 + 20)**

## **14. OSPE: 5 stations with checklists (5 minutes for each) 25 marks**

Stations should evaluate competency relating to Public Health Entomology/ Microbiology/ Communication Skills/ Epidemiology and Research/ Environment Assessment (Public Health Chemistry)/ Clinical Diagnosis of Diseases of Public Health Importance

## **15. Recommended reading:**

### **A. Books**

1. Public Health and Preventive Medicine (Maxcy-Rosenau-Last Public Health and
2. Preventive Medicine) by Robert B. Wallace
3. Basic Epidemiology. R Bonita, R Beaglehole, T Kjellstrom. World Health Organization, Geneva.
4. Epidemiology by Leon Gordis.
5. Oxford Textbook of Public Health. Holland W, Detel R, Know G.
6. Practical Epidemiology by D.J.P Barker
7. Park's Textbook of Preventive and Social Medicine by K.Park
8. Principles of Medical Statistics by A. Bradford Hill, The Lancet Ltd

9. Interpretation and Uses of Medical Statistics by Leslie E Daly, Geoffrey J Bourke, James, McGraw..
9. Epidemiology, Principles and Methods by B. MacMahon, D. Trichopoulos
10. Hunter's Diseases of Occupations by Donald Hunter, PAB Raffle, PH Adams, Peter J. Baxter, WR Lee.
10. Sathe PV and Sathe AP Epidemiology and Management for Health Care for All. 11. Vaccines by Stanley A. Plotkin.
12. All reports and documents related to all National Programmes from the Ministry of Health and Family Welfare.
13. National Health Programs of India 12<sup>th</sup> edition, by J. Kishore, Century Publication
14. Survey methods in community medicine – J.H Abramson
15. Principles of health care and management- Seth B. Goldsmith
16. A dictionary of public health – John M. Last
17. Infectious disease epidemiology 2nd edition – Kenrad E. Nelson
18. Biostatistics – The bare essentials 2nd edition – Norman streiner.
19. Public Health in Medicine for Medical Professional - Burton & Smith
- 20.b) Human Nutrition and diet – Swaminathan. M
21. c) Nutrition in Health and Disease – Lenna.F Cooper et al
22. Hunters diseases of Occupations
- 23.b) Health in industry – Donold Hunter
24. c) Occupational Health practice – Schilling
25. Principles and practice of infectious disease - Mandell, Benett and Dolin
26. Social Epidemiology edited by – Lisa F Berkman
27. Text book of Sociology in Medicine – Renisan
28. Medico sociology – Susser and Watson
29. Hand book of Medical Sociology – Graham S & L. Reeder
30. Essentials in Qualitative research – a Note Book for the field – Willms D.G. & Johnson N A
31. John J. Hanlon, Public Health Administration and Practice, MOSBY 32.. Robert S. Godheart Mauliee E. Shills, Modern Nutrition in Health, K.M.Narghese & Co.
33. Mawner & Kramer, Epidemiology: An Introductory Text. 1985, W.B. Sanuders Co.
34. Indian Council of Medical Research, "Policy Statement of Ethical considerations involved in Research on Human Subjects". 1982 I.C.M.R., New Delhi.
35. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi. 36. Francis C M Medical Ethics, J P Publications, Bangalore, 1993. 37. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424 – 8
36. Kirkwood B.R., Essentials to Medical Statistics, 1st Ed., Oxford: Blackwell Scientific Publications 1988.

B. Committee Report and policy documents- medical education and health policy:

1. Bhore Committee Report (1946) Health Survey and Development Committee, Govt. of India, Delhi
2. Mudaliar Committee Report (1961) Health Survey and Planning Committee, Govt. of India, Delhi.
3. Shrivastav Report (1947), Health Services and Medical Education – A programme for immediate action, Group on Medical Education and Support Manpower, Ministry of Health and Family Welfare, Govt. of India, New Delhi.
4. ICSSR/CMR (1981), Health for All – An alternative strategy – Report of a Joint study group of ICSSR / ICMR, Indian Institute of Education, Pune.
5. National Health Policy, (1982) Ministry of Health and Family Welfare, Government of India, New Delhi.
6. Compendium of Recommendations of various committees on Health and Development (1943 – 1975), Central Bureau of Health Intelligence
7. (1985) Directorate General of Health Services, Ministry of Health and Family Planning, New Delhi.
8. Bajaj, J.S. Etal (1990) Draft National Education Policy for Health Sciences, I.J.M.E...., Vol 29, No. 1 & 2 (Jan – August 1990)

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

**16 Journals**

**National**

- a) Indian Journal of Community Medicine
- b) Indian Journal of Public Health
- c) Indian Journal of Community Health
- d) Journal of Communicable Diseases
- e) Indian Journal of Maternal and Child Health
- f) Indian Journal of Preventive and Social Medicine
- g) Indian Journal of Occupational Health and Industrial Medicine
- h) Indian Journal of Medical Research
- i) Indian Paediatrics
- j) Indian Journal of Paediatrics
- k) The National Medical Journal of India
- l) Journal of Vector Borne Diseases (previously Indian Journal of Malariology)
- m) Indian Journal of Environmental Health
- n) Indian Journal of Medical Education
- o) Journal of Indian Medical Association
- p) Journals of Medicine, Paediatrics, Obstetrics and Gynecology, Dermatology and Venereology, Leprosy, Tuberculosis and Chest Diseases
- q) Indian Journal of Dental Research

## **International**

- a) WHO Publications – All
- b) Tropical Diseases Bulletin
- c) Vaccine
- d) Lancet
- e) British Medical Journal
- f) New England Journal of Medicine.
- g) BMC infectious diseases
- h) The Journal of Communicable Diseases
- i) Journal of Travel Medicine: official publication of the International Society of Travel Medicine and the Asia Pacific Travel Health Association
- j) The Lancet infectious diseases
- k) American Journal of Epidemiology
- l) International Journal of Epidemiology
- m) American Journal of Public Health
- n) Journal of Epidemiology and Community Health
- o) Population Reports
- p) The American Journal of Clinical Nutrition
- q) MMWR. Morbidity and mortality weekly report
- r) MMWR. Recommendations and reports: Morbidity and mortality weekly report  
Recommendations and reports / Centers for Disease Control
- s) MMWR. Surveillance summaries: Morbidity and mortality weekly report  
surveillance summaries / CDC
- t) Quality Management in Health Care
- u) Journal of Public Health Management & Practice.
- v) International Journal of Rehabilitation Research
- w) The Health Care Manager
- x) Health Care Management Review
- y) Current Opinion in Endocrinology, Diabetes and Obesity

#### D. Useful Websites

- a) [www.icmr.nic.in](http://www.icmr.nic.in)
- b) [www.mohfw.nic.in](http://www.mohfw.nic.in)
- c) [www.nacoonline.org](http://www.nacoonline.org)
- d) [www.npsindia.org](http://www.npsindia.org)
- e) [www.tbcindia.org](http://www.tbcindia.org)
- f) [www.iapsm.org.in](http://www.iapsm.org.in)
- g) [www.iphaonline.org](http://www.iphaonline.org)
- h) [www.who.int](http://www.who.int)
- i) [www.whoindia.org](http://www.whoindia.org)
- j) [www.cdc.gov](http://www.cdc.gov)
- k) [www.unicef.org](http://www.unicef.org)
- l) [www.pitt.edu/~super1](http://www.pitt.edu/~super1) (supercourse epidemiology)
- m) <https://dish.tn.gov.in> (Directorate of Industrial Safety and Health)
- n) <https://nrhm-mis.nic.in> ( HMIS, NRHM web portal)

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# **DIPLOMA IN RADIO-DIAGNOSIS (DMRD)**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**DIPLOMA IN RADIO-DIAGNOSIS (DMRD)**

**1. GOAL**

To optimally train a student in all aspects of medical imaging and image guided procedures to obtain ability to be a safe and efficient radiologist.

The candidate is fully competent to practice, teach and do research in the broad discipline of radiology. A resident on completing his/her Diploma In Medical Radiodiagnosis (DMRD) should be well versed with legal and regulatory aspects of imaging / intervention including medical ethics.

**2. OBJECTIVES**

In order to achieve the goal of this course, following objectives are to be accomplished by the time the candidate completes the 2 years course.

**Three broad domains of the objectives are:**

**2 (A) Knowledge**

Principles of the various imaging equipment

Imaging anatomy, anatomical variations

Relevant etiology, pathology

Knowing the approach to a clinical problem

Patient positioning

Imaging protocols

Imaging appearances of various abnormalities

Contrast agents, medicines used in Radiology

Safety in the work area including self, colleagues, patients and the equipment – in terms of radiation, biohazard etc.

Familiarity of the existing governing rules from the concerned government ministries (like PCPNDT act) and AERB.

Audit of reports and image guided procedures

An enthusiasm for knowledge and understanding to support lifelong learning.

A reflective attitude allowing accurate self-assessment and learning from practice.

maintenance of equipments, documents



## **2 (B) Attitude**

Follow the commitment and ethical principles of medical practice

Respect patient's rights

Empathetic attitude towards patients' needs

Understanding human values and commitment to the society

Clinical Radiology relies on a multi professional team and so radiologists should work with other healthcare professionals to put the needs of the patient above their own.

scientific attitude

commitment to clinical excellence

## **2 (C) Skills**

Ability to interact with the patients with communication skills

Ability to examine the patients

Communication skills with patients and colleagues

Critical reporting in case of acute findings, potentially requiring an immediate intervention

Sound judgment through intelligent application of knowledge.

Basic life support; ability to manage anaphylactic reactions.

Image guided interventions – including vascular and non-vascular procedures

Teaching skills – role in teaching undergraduates, juniors, technician students etc..

Interdepartmental conferences- clinico radiologic meetings

Update oneself by self-study and by attending courses, seminars, conferences and workshop which are relevant to the field of radio-Diagnosis.

Carry out research with the aim of publishing his/her work and presenting work at various scientific fora.

Leadership and mentorship: The student must take on a leadership role where needed in order to ensure clinical productivity and patient satisfaction.

Organize CME in the speciality utilizing modern methods of teaching and evaluation.

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

#### **Theoretical Knowledge**

Clinical imaging has significantly grown expanded over a period of time, especially in the last few decades. This knowledge to be acquired in a comprehensive manner during the postgraduate period. A detailed plan is mentioned in the subsequent section.

#### **Practical and Clinical Skills**

The practical and clinical skills are important as the subject is a clinical specialty. Interaction with the patients and the accompanying persons is very important in deciding the right choice of imaging. As some of the imaging involve ionizing radiation, one should be careful in using such imaging technology.

Image guided interventions help in the diagnosis and management. The postgraduate student should learn under supervision these skills. Consenting and counseling are essential.

#### **Writing Research Articles**

A formal training with respect to writing research articles is important. This can be from a centralized system within the institution along with the postgraduates of other broad specialties. Time to time appraisal by the guide and the head of the department is strongly recommended.

#### **Attitudes including Communication Skills**

Knowing the patients' requirement helps in deciding which imaging is needed in problem solving. At the same time, unnecessary imaging, especially the ones with ionizing radiation should be implemented only when required. Role of radiology during medical emergencies is even higher, as the decision making needs to be quick. Learning and practising empathetic approach while interacting with the patients is essential component of the training.

#### **Training in Medical Ethics /Bioethics and Medico-legal aspects**

A. Some the general training in research methodology should be common within the institution with invited faculty if needed. This is recommended in the beginning of the course, preferably in the first month.

The subject specific medico-legal aspects to be studied in the department like PCPNDT act, AERB rules etc.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, Bioethics, moral and legal issues, Medical Audit are part and parcel of the curriculum and syllabus.

## 4. THEORY SYLLABUS

### 4 (A) Physics of Medical imaging

#### **X-ray Production**

Discovery – Production – Properties of X-rays – Characteristics and continuous spectra – Design of hot cathode X-ray tube – Basic requirements of Medical diagnostic and therapeutic radiographic tubes – Rotating anode tubes – Hooded anode tubes – Rating of tubes – safety devices in X-ray tubes – Ray proof and shock proof tubes – Insulation and cooling of X-ray tubes – Mobile and dental units – faults in X-ray tubes – Limitations on loading. Modern xray tubes

#### **Generators**

Electric Accessories for X-ray tubes – Filament and high voltage transformers – High voltage circuits – Half-wave and full-wave rectifiers – Condenser discharge apparatus – Three phase apparatus – voltage doubling circuits – Current and Voltage stabilizers – Automatic exposure control – Automatic Brightness control – Measuring instruments – measurement of kV and mA - timers – control panels – Complete X-ray circuit

**Radioactivity:** Natural and artificial radioactivity-alpha decay-beta decay and spectra – gamma emission-positron decay electron capture and internal conversion-Exponential decay- Half life-Unit of activity-specific activity. Nuclear Fission-Nuclear reactor. Radiation sources- Natural and artificial-production of radio isotopes-reactor produced isotopes-Fission products- Gamma ray source for Medical uses.

**Interaction of X-and Gamma rays:** Attenuation of X-ray or Gamma rays-absorption and scattering-half value layer-coherent scattering-Photo electric absorption-compton scattering pair production and photoelectric disintegration. X-Ray transmission through medium-linear and mass attenuation coefficients. HVT - TVT and interaction of charged particle and neutrons with matter. Interaction of X-and Gamma rays in body-fat-soft-tissue-bone-cont rast medium-Total attenuation coefficient. Relative important of different types of interactions.

#### **Radiation detection and Measurements:**

Ionization of gases- Fluorescence and Phosphorescence -Effects on photographic emulsion. Ionization Chambers – proportional counters- G.M counters- scintillation detectors – liquid semiconductor detectors – DAP meter. Measuring systems – free air ionization chamber – thimble ion chamber – condenser chamber –electrometer – secondary standard dosimeters – film dosimeter – chemical dosimeter- thermoluminescent Dosimeter. -Pocket dosimeter-Radiation survey meter- wide range survey meter -zone monitor-contamination monitor -their principle function and uses.

Advantages & disadvantages of various detectors & its appropriateness of different detectors for different type of radiation measurement.

**Biological Effects of radiation:** Ionization, excitation and free radical formation, hydrolysis of water, action of radiation on cell -Chromosomal aberration and its application for the biological dosimetry- Effects of whole body and acute irradiation, dose fractionation, effects of ionizing radiation on each of major organ system including fetus -Somatic effects and hereditary effects- stochastic and deterministic effects-Acute exposure and chronic exposure-LD50 - factors affecting radiosensitivity. .

## **Principles of X-ray Diagnosis & Conventional Imaging**

### **Physical Principle of diagnostic radiology:**

Interactions of X-rays with human body, differential transmission of x-ray beam, spatial image formation, visualization of spatial image, limitations of projection imaging technique viz. superimposition of overlying structures and scatter, application of contrast media and projections at different angles to overcome superimposition of overlying structures.

### **Radiography techniques:**

Prime factors (kVp, mAs and SID/SFD), influence of prime factors on image quality, selection criteria of prime factors for different types of imaging, different type of projection and slices selected for imaging, objectives of radio-diagnosis, patient dose Vs Image quality.

### **Scatter reduction:**

Factors influencing scatter radiation, objectives of scatter reduction, contrast reduction factor, scatter reduction methods; **beam restrictors** (diaphragms, cones/cylinders & collimators). **Grids** (grid function, different types of stationary grids, grid performance evaluation parameters, moving grids, artifacts caused by grids, grid selection criteria), air gap technique. **Filtration**: Inherent and added filters, purpose of added filters, beryllium filters, filters used for shaping X-ray spectrum (K-edge filters: holmium, gadolinium, molybdenum)

### **Radiography:**

**Radiographic Film**: Components of Radiographic Film, physical principle of image formation on film, double and single emulsion film, sensitometric parameters of film (density, speed, latitude etc.) **Intensifying screens**: Function of intensifying screens, screen function evaluation parameters, emission spectra and screen film matching, conventional screens Vs rare earth screens. Quality assurance in film, developer etc

**Digital radiography**: Computed Radiography (C.R) –equipment parts –advances-principle of imaging –applications- advantages & disadvantages. Photostimulable phosphors-image acquisition- Direct and indirect DR systems. Laser imager and multiframmer- recent trends

### **Mammography**

Imaging requirements- Mammography system - construction/types accessories - tube, compression, grids, AEC etc.- nature of X-Ray beam suitable – accessories for immobilization - film processing - image quality - image recording devices - interventional procedures – accessories-biopsy equipment attachments - radiation dose- & digital mammo

**Dental Radiography** – Equipment Basics –types of equipments- Intra oral radiography, orthopantomography, cone beam CT, image reconstruction techniques

**Fluoroscopy and angiography:** Fluoroscopic equipment- Conventional fluoroscopy – factors affecting the Fluoroscopic image. Image intensifier tubes – principle construction and function regarding intensified image- cine fluorography-mode of operation – Image intensifiers - optical coupling - cameras - Automatic brightness control- over and under couch tubes safety features. Flat panel fluoroscopy systems, digital subtraction techniques. Quality assurance tests for fluoroscopic equipment. Angiography, DSA, road mapping, pixel shift, reconstruction techniques.

**Dexa Scan & Bone Mineral Densitometry :** Physics ,Principles, Applications

### **Tomography and Computed tomography**

Conventional tomography (Principle only), orthopan tomography (OPG), Basic physics – Tomography principle - detectors technology - Basic data acquisition concepts - Image reconstruction- artifacts- Equipment for computed tomography – Table, scanning gantry X-Ray generator – CT control console. Scanner types -technologic considerations of sequential /spiral volume zoom - image processing system- QA of CT equipment. CT dosimetry

### **Magnetic Resonance Imaging (MRI)**

Magnetic Resonance image – proton density, relaxation time T1 & T2 images – Image characteristics – MRI system components – Magnets, Magnetic fields, Gradients, Magnetic field shielding, Radio Frequency systems, Computer functions – Imaging process – Pulse sequences, Advanced sequences – spectroscopy, fMRI, BOLD, DTI, SWI etc, Image artifacts – MRI safety.

### **Ultrasound Imaging**

Basic acoustics principle- Basic physics of sound propagation in different media, production of Ultrasound (piezoelectric effect), ultrasound terminologies – interaction of ultrasound with matter – ultrasound properties propagation in tissue, absorption, scattering, reflection and refraction- acoustic impedance – piezoelectric effect – transducer – Pulsar – receiver – beam/sensitivity and gain - generators- A, B and M scanning & echo modes- transducers techniques of sonography - equipment selection- display methods – ultrasound image formation - data storage and display – image and artifacts – Doppler instrumentation – Doppler equation – transducer – quality assurance and performance tests – bio effects and safety considerations. Types of machines –portable systems- acoustic coupling agents ingredients/ preparation.

**Image quality and PACS:**

Image quality parameters: sources of un-sharpness, reduction of un-sharpness factors influencing radiographic contrast, resolution, factors influencing resolution, evaluation of resolution (point spread function (PSF), line spread function (LSF), edge spread function (ESF), modulation transfer function (MTF), focal spot size evaluation. PACS, archival systems, DICOM,

**Nuclear Medicine Equipments:** Nuclear Physics - basics in Nuclear Medicine- Nuclear medicine equipments – Gamma Cameras- rectilinear scanners- radioisotope generators- Handling of isotopes- SPECT-CT & PET-CT- introduction basic physics and principle involved- equipments basic structure—differences- fusion techniques- image formation-storage devices— advantages- limitations.

**Radiation protection:**

Radiation protection of self and patient- Principles of radiation protection, time - distance and shielding, shielding - calculation and radiation survey –ALARA- personnel dosimeters (TLD and film batches)- occupational exposure. Radiation safety accessories in Radiology modalities.

**Regulatory Bodies & regulatory Requirements:**

Calculation of Work load, weekly calculated dose to radiation worker & General public Good work practice in Diagnostic Radiology. Planning consideration for radiology, including Use factor, occupancy factors, and different shielding material. Evaluation of workload versus radiation factors – Occupational exposure and protection Tools/devices.

National Regularity body (AERB - Atomic Energy Regulatory Board) - Responsibilities, organization, Safety Standard, Codes and Guides, Responsibilities of licenses, registrants & employers and Enforcement of Regulatory requirements. e LORA ,Registration/ license of X-Ray /other equipment installation- Certification.

PCPNDT, clinical establishment act, NABH

International bodies: ICRP, NRPB, NCRP and WHO guidelines for radiation protection, pregnancy and radiation protection.

**Quality Assurance (QA) in Diagnostic Radiology**

Meaning of the terms used and aspects of a QA programme, equipment and staff requirements, benefits of QA procedures in an imaging department –NABH guidelines. QA in X-ray unit, CT scanner, Mammography, DEXA, OPG, Dental, Lithotripsy, Angiography/Fluoroscopy

Picture archiving and communication system (PACS) and Radiology information system (RIS)

Basic sciences related to radiology as applied physics

#### **4 (B) Radiology (diagnostic and interventional)**

The entire human body systems and vulnerable patient groups in the following category to be considered in the following systems but not limited to -

**Central nervous**

**Head and neck**

**Pulmonary**

**Cardiovascular**

**Gastrointestinal tract and hepato-biliary**

**Genitourinary**

**Musculoskeletal**

**Endocrine**

**Paediatric**

**Women's imaging – including obstetrics and breast**

The body systems to be covered with **relevant anatomy, etiology, patho-physiology, essential clinical features, biochemical findings, confirmative tests, complications** etc

In respective systems, knowledge regarding the **patient positioning, imaging protocols** etc should be emphasized.

The relevant imaging like **plain radiography, ultrasound, Doppler, CT, MRI, Angiogram, Nuclear medicine** including **contrast studies**

Role of **image guided interventions** like FNA, FNAB, drainage procedures, angiogram, vascular interventional procedures, foetal interventions, radiofrequency ablations etc. in all the systems.

Special emphasis on **emergency radiology** findings in all the systems.  
Understanding of **multi-system involvement of diseases**.

Ability to give **differential diagnosis** and to suggest **further relevant management**

To have some idea regarding the medical and surgical management.

**Recent advances** are to be learnt from the journals.

## **5. TEACHING LEARNING METHODS (including Clinical Study)**

Students are trained by

### **I. Rotational postings**

### **II. Various teaching methods. Some recommendations are below**

1. Theory classes / lectures by Faculties - 2/week.
2. Clinical symposium organized every month with 3 senior residents & faculty
3. clinical seminars - Every day floor presentation of short topic by residents
4. practical classes by faculty- like ultrasound demonstration-1/week.
5. Once in a week journal club –presented by the student and critical review by faculty
6. Case presentations -3 days a week of all modalities to be covered (with due importance to X ray, contrast, methodology, description of procedures and reading the films)- discussion for a period of 45 min to 60 min. Competitive/interesting case presentation by PG s -once in a week (case of the week)
7. Clinico radiological Inter-departmental meets -every week
8. Guest lectures – once in a month
9. Group discussions-2 days a week -Special practical classes with images - clinicoradiologic approach and possible differential diagnosis - discussion by faculty & residents
10. Special focus on recent advances once in 3 months- paper discussion/ implementation in dept / AJC staging / implementation of newer classifications e.g. –Thyrads, Pirads, Atlanta etc.
11. Audits: Mortality, Reporting, Image guided procedures etc. – once in every month
12. Every day lobby quiz/ electronic quiz –open to all.
13. Competency assessment
14. Logbook ,journal publication and research review -- once in every month
15. Spotters /Quiz & film reading session By faculty-every week



**Weekly Post Graduate Academic Timetable (Model)**

|                               | <b>Number<br/>per week</b> | <b>Day in<br/>which held</b> | <b>Time</b>             | <b>Number<br/>per<br/>month</b> | <b>Number / year</b> |
|-------------------------------|----------------------------|------------------------------|-------------------------|---------------------------------|----------------------|
| <b>Theory<br/>Classes</b>     | 2                          | Tuesday /<br>Thursday        | 1.30 pm<br>to<br>2.30pm | 8                               | <b>96</b>            |
| <b>Clinical<br/>Seminars</b>  | 1                          | Friday                       | 8 to 9<br>am            | 4                               | <b>48</b>            |
| <b>Journal Clubs</b>          | 1                          | Wednesday                    | 12 noon<br>to 1 pm      | 4                               | <b>48</b>            |
| <b>Case<br/>presentations</b> | 3                          | Mon / Wed /<br>Friday        | 12:30 to<br>1:30 pm     | 12                              | <b>144</b>           |
| <b>Group<br/>Discussions</b>  | 2                          | Tuesday /<br>Thursday        | 12:30 to<br>1:30 pm     | 8                               | <b>96</b>            |
| <b>Guest lectures</b>         | -                          | Fourth<br>Saturday           | 11 am<br>to 12<br>noon  | 1                               | <b>12</b>            |

Note:

All sessions will be co-ordinated by the faculty members.

**III. ACADEMIC REQUIREMENTS:**

Student are encouraged to attend conference and CME

Basic life support (BTLS / ATLS) certificate

Bioethics and spastics training certificate

## 6. STRUCTURED TRAINING PROGRAMME

Students are trained by the following methods.

### I. Rotational postings

| S. NO | TRAINING TOPICS                                                                                      | 1 ST YEAR                            | 2 ND YEAR                            |
|-------|------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------|
| 1     | CONVENTIONAL: DIGITAL XRAY/ DENTAL XRAY, OPG/ DEXA                                                   | 2months                              | 15 days                              |
| 2     | CONTRAST & SPECIAL PROCEDURES: BARIUM/ IVU                                                           | 1 month                              | 15 days                              |
| 3     | ULTRASONOGRAM/ ABDOMEN/ SMALL PARTS/ MSK/ BREAST                                                     | 2 months                             | 2 months                             |
| 4     | DOPPLER STUDIES                                                                                      | 1 month                              | 1 month                              |
| 5     | CT SCAN                                                                                              | 2 months                             | 2 months                             |
| 6     | MRI SCAN                                                                                             | 1 month                              | 2 months                             |
| 7     | NUCLEAR MEDICINE / SPECT, PET                                                                        | -                                    | 1 month                              |
| 8     | VASCULAR INTERVENTIONAL RADIOLOGY, DSA                                                               | -                                    | 15 days                              |
| 9     | ECHO - CARDIOLOGY                                                                                    | 15 days                              | 15 days                              |
| 10    | ENDOSCOPIC ULTRASONOGRAMS,INTRAOPERATIVE USG AND INTRAVASCULAR USG                                   | 15 days                              | 15 days                              |
| 11    | OBSTETRICS AND GYNAEC ULTRASOUND & DOPPLER                                                           | 1 month                              | 15 days                              |
| 12    | EMERGENCY RADIOLOGY- FASTULTRASOUND,WHOLE BODY ULTRASOUND, EMERGENCY IMAGE GUIDED INTERVENTIONS,.... | Minimum 1 month (concurrent posting) | Minimum 1 month (concurrent posting) |
| 13    | PAEDIATRIC RADIOLOGY                                                                                 | -                                    | 15 days                              |
| 14    | NON VASCULAR IMAGE GUIDED INTERVENTIONS WITH SPECIMEN (SLIDE) PREPARATION AND PRESERVATION           | 15 days                              | 15 days                              |
| 15    | MAMMOGRAM                                                                                            | 15 days                              | -                                    |

## **II .Practical skill assessment with scores using structured skill modules**

E.g. Structured skill module to demonstrate segments of the liver in the ultra sonography for radiology residence

| S. NO | DEMONSTRATION                                                                  | SCORE (MAX) | SCORE |
|-------|--------------------------------------------------------------------------------|-------------|-------|
| 1.    | Clinical History                                                               | 1           |       |
| 2.    | Position and proper exposure for USG                                           | 1           |       |
| 3.    | plane of scanning - inter costal and sub costal                                | 2           |       |
| 4.    | Position – supine / right anterior oblique, depends on the patient built       | 2           |       |
| 5.    | To show all the 3 hepatic veins from confluence into IVC up to margin of liver | 3           |       |
| 6.    | To show horizontal segment of right and left portal vein                       | 2           |       |
| 7.    | Gall bladder fossa, falciform ligament and IVC                                 | 3           |       |
| 8.    | To show hepatic artery and CBD at porta hepatis                                | 2           |       |
| 9.    | To identify caudate lobe                                                       | 1           |       |
| 10.   | Show divisions of right and left lobe                                          | 1           |       |
| 11.   | To identify the segment 5, 6,7 and 8                                           | 4           |       |
| 12.   | To identify the segment 2,3 and 4                                              | 3           |       |
|       | Total                                                                          | 25          |       |

Total score of 25 given and each radiology post graduate student was evaluated.

This will help both the student and training faculty to identify the mistake to specific areas and correct at ease. This will improve the confidence of the students a lot. The bias in assessment is also removed.

To device this kind of modules for each and every system / organs / modality in radiology in a feasible way to individual training institute.

Specific scores to be fixed by the institutes to allow the students to do the cases under a faculty and to allow them to handle the patients individually.

**7. Evaluation of the candidates in both theory and practicals will help the candidate in improvement of his/her knowledge, skills and attitude.**

## 8. COMPETENCY ASSESSMENT:

- **OVERALL:**

- a) Communication / commitment / Contribution /  
Compassion towards patients and Innovation ( ) - 5 Marks
- b) Implementation of newly learnt /skills ( )

- Number of cases presented in Clinical Meetings/  
Journal clubs/seminars - 5 marks

- Number of Posters/Papers presented in Conferences/  
Publications and Research Projects - 5 marks

- No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings with details. - 5 marks

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**Total** **20 Marks**  
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### PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

### ASSESSMENT SCHEDULE IS AS FOLLOWS

| Year of study | Period         |          |           |          | Total<br>Max.20 marks |
|---------------|----------------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec       | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec       | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | <b>AVERAGE</b> |          |           |          | <b>20 Marks</b>       |

## **9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:**

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

## **10.THEORY EXAMINATION**

| <b>THEORY</b> | <b>TITLE</b>                                            |
|---------------|---------------------------------------------------------|
| Paper I       | Medical Radiation Physics as applied to Radio Diagnosis |
| Paper II      | Radio Diagnosis and Imaging                             |
| Paper III     | Radio Diagnosis including Nuclear Medicine              |

### **Question paper pattern : PAPER I, II & III**

|                       |                    |
|-----------------------|--------------------|
| <b>Elaborate on</b>   | <b>2 x 15 = 30</b> |
| <b>Write Notes on</b> | <b>10 x 7 = 70</b> |
|                       | -----              |
| <b>Total</b>          | <b>100 marks</b>   |
|                       | -----              |

## 11. PRACTICAL EXAMINATION

### POST GRADUATE DIPLOMA IN MEDICAL RADIODIAGNOSIS (DMRD)

#### COURSE EXAMINATION

#### MARK DISTRIBUTION

| PARTICULARS                                                                               | MAXIMUM MARKS |
|-------------------------------------------------------------------------------------------|---------------|
| Long case 1 x 60 = 60<br>Short case 2 x 45 = 90 (including ultrasound case demonstration) | 150           |
| Spotters (40 x1.25mark)                                                                   | 50            |
| Viva-voce                                                                                 | 80            |
| Log Book                                                                                  | 20            |
| Total                                                                                     | 300           |
| Minimum for pass (50%)                                                                    | 150           |

#### **DMRD details:**

| CLINICAL EXAMINATION | NO. OF CASES | DURATION IN HOURS | MAXIMUM MARKS |
|----------------------|--------------|-------------------|---------------|
| 1. LONG CASE         | ONE          | 30 MINS           | 60            |
| 2. SHORT CASE        | TWO          | 30 MINS           | 90            |
| 3. SPOTTERS          | FORTY        | 40 minutes        | 50            |
|                      |              | TOTAL             | 150           |

## 10. LOG BOOK

Log book should be regularly maintained, signed by the faculty supervising the area. This should represent the academic and clinical work done by the candidate. this also includes Internal assessment , the presentations and procedures carried out by the candidate.

Format for the logbook for the different activities is given in Tables.

**Table 1: Academic activities attended**

| <b>Date</b> | <b>Type of Activity</b><br><b>CME ,conferences by national societies</b> | <b>Particulars</b> |
|-------------|--------------------------------------------------------------------------|--------------------|
|             |                                                                          |                    |

**Table 2: Academic papers/posters presentation**

| <b>Date</b> | <b>CME ,conferences by national societies</b> | <b>Particulars</b> |
|-------------|-----------------------------------------------|--------------------|
|             |                                               |                    |

**Table 3: Academic presentations made by the student in the department**

| <b>Date</b> | <b>Topic</b> | <b>Type of Presentation</b><br><b>Specify Seminar, Journal Club, Presentation, UG teaching etc.</b> |
|-------------|--------------|-----------------------------------------------------------------------------------------------------|
|             |              |                                                                                                     |

**Table 4: Diagnostic and interventional procedures performed**

| <b>Date</b> | <b>Patient particulars</b> | <b>Procedure</b> | <b>Diagnosis/DD</b> | <b>Remarks/<br/>Follow up</b> |
|-------------|----------------------------|------------------|---------------------|-------------------------------|
|             |                            |                  |                     |                               |

**Table 5: abstract of Diagnostic and interventional procedures performed**

| <b>Period</b> | <b>Procedure</b> | <b>Number Seen</b> | <b>Number Done</b> |
|---------------|------------------|--------------------|--------------------|
|               |                  |                    |                    |

**Table 6: publications in indexed journals**

| Date | Journal | Title | Authours |
|------|---------|-------|----------|
|      |         |       |          |

Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

### **13. VIVA**

VIVA including Competency Assessment - 80 Marks (60 + 20)

#### **Viva:**

(4 X 15 = 60 marks)

1. RAPID FILM READING
2. INSTRUMENTS/ RADIOLOGIC PHYSICS
3. COMPETENCY ASSESSMENT /CONTRAST AGENTS
4. CATHETERS/NEEDLES QUALITY CONTROL AND REGULATIONS

### **14. OSCE -Objective Structured Clinical Examination (OSCE)**

The following items in different combinations can be used as OSCE.

Medical images with a clinical scenario, asking for a diagnosis and suitable management.  
Digital images of medical grade high resolution are acceptable.

Contrast agents, Emergency drugs relevant to treating anaphylaxis

Interventional Radiology material

Radiology physics items



## **15. REFERENCE BOOKS**

### **Text books of Physics:**

1. Curry,T.S. Dowdey,J.E. Murry,R.C,(1990), Christensen's introduction to the Physics of diagnostic radiology, 4th edition, Philadelphia,Lea & Febiger
2. Bushberg,S.T; Seibert,J.A; Leidholt,E.M & Boone,J.M.(1994), The essential Physics of Medical imaging, Baltimore, Williams & Wilkins
3. David J. Dowsett; Patrick A. Kenny; Eugene Johnston R. The Physics of Diagnostic imaging
4. Johns,H.E.& Cunningham,J.R, The Physics of radiology, 4th edition
5. Hendee,W.R. & Ritenour,R.(1993) Medical Imaging Physics, 3rd edition
6. Dendy,P.P. & Heaton,B. Physics for diagnostic radiology, 2nd edition
7. E.Seeram, X-ray imaging equipment, An introduction
8. Hashemi,R.H. Bradley, W.G;& Lisanti C.J. MRI the basics
9. RF Farr and PJ Allisy-Roberts Physics for Medical Imaging
10. Sprawls,P; Magnetic resonance imaging principles, methods and techniques
11. Chesney,D.N. & Chesney,M.O. X-ray equipment for student radiographers
12. Chesney,D.N. & Chesney,M.O. Radiographic imaging

### **Radiology text books**

1. Diagnostic Radiology-An Anglo American Text Book of Imaging – Grainger & Allison
2. Text Book of Radiology & Imaging – Sutton
3. CT & MRI Imaging of the Whole Body –Haaga
4. Diagnostic ultrasound by- Rumack
5. Essential of skeletal Radiology – Yochum and Rowe's
6. Thoracic Imaging – W. Richard Webb & Charles B. Higgins
7. Chapman's Radiological Differential Diagnosis
8. Chapman's Radiological Procedures
9. Radiology review manual – Wolfgang Dahnert

10. Radionuclide section scanning. An atlas of clinical practice-khan
11. Alimentary tract Radiology – Abdominal Imaging – Margulies
12. Diagnostic Imaging of Neuro Radiology – Osborn
13. Christensen's physics of Diagnostic Radiology
14. Clark's Positioning Radiology – A. Stewart Whitley Charles Sloane, Craig Anderson, Graham Hoadley, Gail Jefferson, & Ken Holmes
15. Bushberg, S.T; Seibert, J.A; Leidholt, E.M & Boone, J.M.(1994), The essential Physics of Medical imaging, Baltimore, Williams & Wilkins
16. Hashemi, R.H. Bradley, W.G; & Lisanti C.J. MRI the basics
17. Sprawls, P; Magnetic resonance imaging principles, methods and techniques

**REFERENCE BOOK: (Latest Editions)**

1. Text Book of GastroIntestinal Radiology – Richard M.Gore
2. Head & Neck Imaging - Som & Curtin
3. Clinical Urography – Pollack
4. Diagnostic Imaging – Brain & Spine Anatomy
5. Diagnostic Imaging - Brain
6. Diagnostic Imaging - spine
7. Diagnostic Imaging - ultrasound
8. Diagnostic Imaging - abdomen
9. Diagnostic Imaging - Head & Neck
10. Diagnostic Imaging - Interventional Radiology
11. Diagnostic Imaging - Caffey's Pediatric
12. Applied Radiological Anatomy – Paul Butler, Adam W.M. Mitchell & Jeremiah C. Healy
13. Orthopedic Imaging – A Practical Approach – Adam Greenspan & Javier Beltran
14. Caffey's Paediatric X-Ray Diagnosis – Frederic silverman
15. Abrams Angiography – Interventional Radiology – Jean-Francois H. Geschwind & Michael D. Dake
16. Callen's Ultrasonography in Obstetrics and Gynecology – Mary E. Norton, Leslie M. Scoutt, Vickie A. Feldstein

17. Breast Imaging – Daniel B. Kopans
18. Introduction to Vascular Ultrasonography – Zwiebel & Pellerito
19. A Practical Guide to Fetal Echocardiography - Normal and Abnormal. Hearts – Alfred Abuhamad & Rabih Chaoul
20. MRI of the Musculoskeletal System – Thomas H. Berquist
21. Nuclear Medicine in Clinical Diagnosis & Treatment – I.P.C Murray & P.J. Ell
22. Essentials of Nuclear Medicine Imaging

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **16. JOURNALS**

1. Radiographics
2. Radiology
3. British Journal of Radiology
4. Clinical Radiology
5. American Journal of Roentgenology
6. Radiology Clinics of North America
7. Recent Advances in Radiology and Medical Imaging
8. American Journal of Neuroradiology
9. Indian Journal of Radiology & Imaging
10. Seminars in Roentgenology
11. Journal of Ultrasound
12. JCIR (Journal of Clinical Interventional Radiology)

\*\*\*\*\*

## **DIPLOMA IN RADIO-THERAPY (DMRT)**

**THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

**DIPLOMA IN RADIO-THERAPY (DMRT)**

**1. GOAL**

The main goal of the radiation oncology residency program is to produce radiation oncologists with the necessary knowledge, skill and attitude to prevent, diagnose, manage and follow up various cancers.

**2. OBJECTIVES**

As a result of training in radiation oncology, the resident should become competent in the use of the various diagnostic methods, radiation equipments, techniques, treatment planning, radiation dose prescription, treatment verification, treatment delivery; chemotherapy administration and management of related complications.

In order to be considered a competent radiation oncologist, a resident must possess humanistic qualities, attitude and behavior necessary for the development of appropriate patient-doctor relationship.

**(A) KNOWLEDGE**

1. Proper history taking and clinical examination
2. Understand anatomy, pathology and natural history of common neoplasms.
3. Learn the algorithmic approach to image these patients based on the suspected disease, its biological behavior and potential and limitations of various imaging modalities.
4. Perform appropriate investigation (both conventional and advanced methods), interpret the results and reach at a reasonable diagnosis/differential diagnosis based on the clinical and biochemical results.
5. Interpretation of results and to come up with the treatment plan for the individual.

**(B) ATTITUDE**

1. To be aware of the department protocol in the management of patient
2. To be competent enough to break the bad news
3. To be able to differentiate the radical Vs palliative intent of treatment and effectively communicate with the patient and relatives

4. To communicate a balanced view of the advantages, disadvantages, risks and benefits of various forms of treatment appropriate to individual patients
5. To communicate effectively with relatives
6. To help deal with disappointment
7. To be involved in the initial management of complaints
8. To obtain consent appropriately
9. To keep good records
10. To identify priorities
11. To attempt by conscientious care to recognise problems early
12. To allocate resources and call for assistance appropriately
13. To be aware of local audits and self audit
14. Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste or religion of the patient.

### **(C) SKILLS**

1. Competence in history taking, physical examination, formulating diagnosis, identifying etiology, ordering further investigation, planning comprehensive management including pharmacological treatment and radiotherapy.
2. Be familiar with literature search and computer skills.
3. Constant update of knowledge including advanced diagnostic methods and radiotherapeutic management
4. Critically review and comment on research papers and make oral presentations.
5. Prepare research protocols, conduct experimental studies analyze and solve clinical and experimental problems.

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

#### **Theoretical Knowledge**

1. A student should have good knowledge of basic sciences as applied to Clinical Oncology and Radiotherapy and medical physics.
2. Should acquire in-depth knowledge of Cancer diagnosis, staging, management and follow up including recent advances.
3. Should have basic knowledge to identify co-existing physical, social, economical and psychiatric problems.
4. Should be knowledgeable about cancer registry, National health care plans for NCDs, national cancer control program at various levels of health sectors. Preventive oncology, various cancer screening methods and their implications
5. Should be knowledgeable about epidemiology of cancers and preventive oncology including various cancer screening methods and their implications

#### **Practical and Clinical Skills**

1. Competence in history taking, physical examination, formulating diagnosis, identifying etiology, ordering further investigation, planning comprehensive management including pharmacological treatment and radiotherapy.
2. Competency in various radiotherapy planning process including simulation, imaging contouring, treatment calculation, verification and delivery with or without supervision.
3. Develop effective communication skills including breaking bad news and counselling during end of life care
4. Acquire skills to lead a multi disciplinary team of nurses, Medical Physicists and Technologists and social workers

Teaching: He / she should learn the basic methodology of teaching and develop competence in teaching medical and paramedical students.

## **Attitudes including Communication Skills**

### **HUMAN VALUES, ETHICAL PRACTICE AND COMMUNICATION ABILITIES:**

- 1.** Adopt ethical principles in all aspects of his/her practice. Professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste or religion of the patient.
- 2.** Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- 3.** Provide leadership and get best out of his team in a congenial working atmosphere.
- 4.** Apply high moral and ethical standards while carrying out human or animal research.
- 5.** Be humble and accept limitations in his knowledge and skill and to ask for help from colleagues when needed.
- 6.** Respect patient's rights and privileges including patient's right to information and right to seek a second option.

- **Training in Research Methodology, Medical Ethics /Bioethics and Medicolegal aspects**

Medical Ethics – Autonomy & Consent, Equality, Justice & Equity, Privacy & Confidentiality, Benefit & Harm, Human dignity & Human rights, Vulnerable population, Gender disparity and protection, Ethics & Professionalism.

- Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.
- Medical ethics, Bioethics, moral and legal issues and Medical Audit are part and parcel of the curriculum and syllabus



## 4. THEORY SYLLABUS

### 1. BASIC SCIENCES

#### 1.1 Anatomy

- 1.1.1 Knowledge of surface anatomy pertaining to Oncology
- 1.1.2 Knowledge of the anatomy of all organs
- 1.1.3 Knowledge of the lymphatic system of all regions
- 1.1.4 Practical familiarity with the radiographic appearance
- 1.1.5 Cross sectional anatomy

#### 1.2. Pathology

- 1.2.1 Definitions of & distinction between different types of growth disorders (i.e. Distinction between hyperplasia, hypertrophy, regeneration, malformation & neoplasia)
- 1.2.2 Malignant transformation
  - a) Initiation & promotion stages of carcinogenesis
  - b) Mode of origin - monoclonal, polyclonal, unifocal, multifocal
  - c) Structural & functional changes in the cellular components
- 1.2.3 Apoptosis and cell signaling pathways
- 1.2.4 Mechanisms of spread
- 1.2.5 Local effects of tumors
- 1.2.6 Local & systemic reactions to tumors
- 1.2.7 Effects of therapy on tumors & normal tissues
- 1.2.8 Criteria for tumor diagnosis - macroscopic, histological & cytological uses & value of biopsy material
- 1.2.9 Nomenclature - solid tumors, lymphomas, leukemias
- 1.2.10 Classification of tumors
- 1.2.11 Structure & organization of tumors - vascular supply, stroma etc.
- 1.2.12 Systems of grading
- 1.2.13 Tumor Markers
- 1.2.14 Tumor Immunology
- 1.2.15 Cytogenetics, Molecular Pathology and Immunohistochemistry

#### 1.3. Radiation Oncology Physics

The aim of this subject is to provide the future Clinical Oncologist with the knowledge of physics required in clinical practice. An understanding of the principles of planning & carrying out treatment is a necessary prerequisite & will be enhanced by the study of this subject.

A familiarity with the physics of atomic structure & electromagnetic radiation will also be required in order to understand parts of the syllabus. As they are studied they should be analyzed critically with respect to their implications for accurate dose delivery in clinical radiation therapy.

Applicability limitations, advantages, & disadvantages of the various devices & techniques should receive particular attention. Candidates should be encouraged to observe & gain practical experience with the equipment & techniques used in radiotherapy in clinical oncology departments.

- 1.3.1 Structure of Matter
- 1.3.2 Nuclear Transformations
- 1.3.3 Production of X-rays
- 1.3.4 Radioactivity
- 1.3.5 Interaction of Radiation with Matter
- 1.3.6 Measurement of Radiation – Radiation quantities and units
- 1.3.7 Radiation detection and measurements
- 1.3.8 Radioisotopes and Radiotherapy Equipments
- 1.3.9 Principles of Radiologic physics, Dosimetry and Treatment Planning
- 1.3.10 Photon External Beam Dosimetry and Treatment Planning
- 1.3.11 Physics, Biology and Dosimetry of Brachytherapy
- 1.3.12 Clinical Applications of Brachytherapy –LDR, HDR and PDR
- 1.3.13 Electron Beam Therapy- Dosimetry, Planning and Techniques
- 1.3.14 Three Dimensional Conformal Radiation Therapy- Physics, Treatment Planning and Clinical Aspects
- 1.3.15 Intensity Modulated Radiation Treatment, Planning and Clinical Application
- 1.3.16 Particle Beam Radiotherapy: Clinical Perspectives
- 1.3.17 Magna Field Irradiation
- 1.3.18 Intraoperative Radiation Therapy
- 1.3.19 Stereotactic Irradiation
- 1.3.20 Nonsealed Radionuclide Therapy
- 1.3.21 Radioimmunoglobulins in Cancer Therapy
- 1.3.22 Quality Assurance in radiotherapy (QART)
- 1.3.23 Radiation Protection and Regulatory Aspects
- 1.3.24 Image Guided Radiotherapy (IGRT) and Clinical Aspects
- 1.3.25 Recent Advancements in Radiation Oncology

#### 1.4. Radiobiology

- 1.4.1 The Physics and Chemistry of Radiation Absorption
- 1.4.2 DNA Strand Breaks and Chromosomal Aberrations
- 1.4.3 Cell Survival Curves
- 1.4.4 Radiosensitivity and Cell Age in the Mitotic Cycle
- 1.4.5 Repair of Radiation Damage and the Dose Rate Effect
- 1.4.6 The Oxygen Effect and Reoxygenation
- 1.4.7 Linear Energy Transfer and Relative Biological Effectiveness
- 1.4.8 Acute Effects of Total Body Irradiation
- 1.4.9 Cell Tissue and Tumor Kinetics
- 1.4.10 Predictive Assay
- 1.4.11 Radiation Carcinogenesis
- 1.4.12 Hereditary Effects of Radiation
- 1.4.13 Effects of Radiation on the Embryo and Fetus

- 1.4.14 Molecular Techniques In Radiobiology
- 1.4.15 Dose Response Relationship for Model Normal Tissues

- 1.4.16 Effect of Radiation on Normal Tissues
- 1.4.17 Time, Dose and Fractionation in Radiotherapy
- 1.4.18 Alternative Radiation Modalities
- 1.4.19 Radioprotectors
- 1.4.20 Radiosensitizers and Bio-reductive Drugs
- 1.4.21 Hyperthermia

## 1.5 Clinical trials - Statistical basis for planning & interpretation

### Clinical Trials

- a) Advantages & disadvantages
- b) Retrospective & Prospective studies
- c) Controlled & uncontrolled trials
- d) Single-blind & double-blind studies
- e) Phase I, II & III trials and meta-analysis
- f) Ethics

## 2. PRINCIPLE OF ONCOLOGY

### 2.1 Etiology of Cancer

- a) Genetic predisposition, congenital syndromes
- b) Chromosomal abnormalities, hereditary tumours
- c) Proto-oncogenes, oncogenes, tumor suppressor genes,
- d) Multifactorial causation
- e) Nutritional aspects in cancer causation and prevention.
- f) Environmental causes of cancer
- g) Biological - protozoal, bacterial, viral
- h) Chemical - Classes of carcinogenic chemicals, smoking
- i) Physical - trauma, irradiation (UV rays, other electromagnetic radiation including X rays and Gamma rays and particulate radiations)
- j) Occupational cancers.

### 2.2 Epidemiology of Cancer

### 2.3 Cancer Screening and Prevention

### 2.4 Cancer Registries & National Cancer Control Programme

### 2.5 Cancer Chemotherapy

- a) Classification and mode of action of cytotoxic drugs
- b) Pharmacokinetics and Pharmacodynamics
- c) Principles of combinations of therapy, dose response curves, sequential and concomitant chemotherapy, sanctuary sites, high dose chemotherapy, and regional chemotherapy
- d) Standard chemotherapy schedules
- e) Drug administration and Precautions in the safe handling of cytotoxic drugs
- f) Drug Toxicity

- g) Supportive care for chemotherapy
- h) Resistance to Chemotherapy
- i) Basic concepts of Chemotherapy and Irradiation Interaction

## 2.6 Cancer Biotherapeutics

- a) Hormonal Therapy
- b) Differentiation Agents
- c) Monoclonal Antibodies
- d) Interferons
- e) Interleukins
- f) Antiangiogenesis Agents
- g) Molecular Targeted Therapy
- h) Vaccines
- i) Gene Therapy

## 2.7 Imaging in Oncology

## 2.8 Pharmacogenomics

# 3. CLINICAL RADIOTHERAPY, CHEMOTHERAPY AND TARGETED THERAPY IN MANAGEMENT OF MALIGNANCIES

- 3.1 Skin Cancer
- 3.2 Central Nervous System Tumor/ orbital tumors/Spinal tumors
- 3.3 Head and Neck Tumors
- 3.4 Thoracic Tumors
- 3.5 Breast Tumors
- 3.6 Gastrointestinal Tumors
- 3.7 Liver, Gall bladder , bile duct and pancreatic tumors
- 3.8 Pediatric Tumors
- 3.9 Gynecologic Tumors
- 3.10 Male Genitourinary Tumors
- 3.11 Urinary Tract Tumors
- 3.12 Endocrine Tumors
- 3.13 Hematological Malignancies –Leukemias,lymphomas and Plasma cell neoplasm
- 3.14 Sarcomas of Bone and Soft tissues
- 3.15 Metastasis of Unknown Origin
- 3.16 AIDS related Malignancies
- 3.17 Oncologic Emergencies
- 3.18 Endocrine aspects of malignancy:- production of hormones by tumors, effect of hormones on tumors, paracrine effects of tumors
- 3.19 Paraneoplastic syndromes
- 3.20 Benign Diseases
- 3.21 Hereditary cancer syndromes

#### 4. OTHER DISCIPLINES ALLIED TO RADIOTHERAPY AND ONCOLOGY

##### 4.1 Surgical Oncology

4.1.1 Basic principles of surgical oncology, biopsy, conservation surgery, radical surgery, palliative surgery

4.1.2 Basics of surgical techniques - head & neck, breast, thorax, abdomen, gynecological, genitourinary, musculoskeletal, CNS

4.1.3 Combined treatments: with radiotherapy, chemotherapy, and hormone therapy

##### 4.2 Rehabilitation

##### 4.3 Complementary alternative medicine

#### 5. PALLIATIVE CARE

##### 5.1 Guidelines for palliative care

##### 5.2 Symptoms of advanced cancer

##### 5.3 Different pharmacologic & non-pharmacologic methods

##### 5.4 Pain control, WHO guidelines for adults & children

##### 5.5 Palliative radiotherapy

##### 5.6 Palliative chemotherapy

##### 5.7 Home care

##### 5.8 Hospice care

##### 5.9 Physical, social, spiritual & other aspects

#### 6. ADMINISTRATION

##### 6.1 Training Programme in Radiotherapy and Oncology

6.1.1 Participation in the daily routine work of the department including work rounds of patients admitted for radiotherapy, symptomatic treatment for acute and late radiation reactions, administration of cytotoxic drugs, management of chemotherapy induced side effects and complications, cancer pain management and palliative care.

6.1.2 Presentation of cases in the reporting sessions of the department

6.1.3 Participation in various procedures and techniques (e.g. Simulation and Treatment Planning; Mould Room Procedures etc.) External Beam Radiotherapy- 2-D & 3- DCRT, IMRT; Brachytherapy- Interstitial, Intracavitary, Intraluminal, Surface;

6.1.4 Active participation in the Tumor Board meetings with other departments for case discussions.

##### 6.2 Administration in Radiotherapy and Oncology

6.2.1 Clinical Oncologist's role as an administrator.

6.2.2 Responsibilities towards radiation safety & quality assurance.

## 5. TEACHING LEARNING METHODS (including Clinical Study)

Seminars, Journal clubs, Symposia, Reviews and Guest lectures should get priority for theoretical knowledge.

### A) Seminars:

There should be a weekly seminar attended by the residents as well as the faculty in which the junior residents present material on assigned topic in rotation. It should be followed by discussion in which all trainees are supposed to participate.

### B) Journal club:

Journal club is held every week in which a junior resident presents a critical evaluation of a research paper from a journal.

### C) Case presentations:

New inpatient and outpatient cases should be routinely worked up in detail by the residents and discussed with the consultant. They are also encouraged to bring their follow up patients to the consultant for presentation and discussion. In addition, the residents are required to present case material at ward rounds.

## 6. STRUCTURED TRAINING PROGRAMME

Posting Schedule Total Duration: 2 years

| First Year<br>(In Rotation) | Second Year<br>(In Rotation)                                     |
|-----------------------------|------------------------------------------------------------------|
| Ward Posting –Monthly       | OPD Posting – Monthly                                            |
| OPD Posting- Monthly        | Ward Posting – Monthly                                           |
|                             | Simulator Planning – Monthly                                     |
| Conventional RT planning    | Conventional and conformal RT planning<br>Brachytherapy- Monthly |
| Tumor Board Meetings        | Tumor Board Meetings                                             |

### Peripheral Postings

|                       |            |
|-----------------------|------------|
| 1.Surgical Oncology   | - 1 month  |
| 2.Medical Oncology    | - 1 month  |
| 3.E.N.T.              | - 15 days. |
| 4.Radiology           | - 15 days  |
| 5.IMRT/3DCRT Training | - 1 month. |

During II<sup>nd</sup> year, The Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

**7. Evaluation of the candidates in both theory and practicals will help the candidate in improvement of his/her knowledge, skills and attitude.**

**8. COMPETENCY ASSESSMENT:**

• **OVERALL:**

|                                                                                              |          |         |
|----------------------------------------------------------------------------------------------|----------|---------|
| a) Communication / commitment / Contribution /<br>Compassion towards patients and Innovation | ()<br>() | 5 Marks |
| b) Implementation of newly learnt techniques/skills                                          | ()       |         |

- Number of cases presented in Clinical Meetings/  
Journal clubs/seminars - 5 marks

- Number of Posters/Papers presented in Conferences/  
Publications and Research Projects - 5 marks

- No. of Medals / Certificates won in the conference /  
Quiz competitions and other academic meetings with details - 5 marks

Total 20 Marks

PG CLINICAL COURSES

|                                      |                      |
|--------------------------------------|----------------------|
| VIVA including Competency Assessment | - 80 Marks (60 + 20) |
| Log Book                             | - 20 marks           |

**ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

**9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:**

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

## 10.THEORY EXAMINATION

Paper I - Medical Radiation Physics as applied to Radio Therapy

Paper II - General Principles of Radio Therapy including Radio-biology and Oncology

Paper III - Clinical practice and Techniques of Radio Therapy & Cancer Chemotherapy

Question paper pattern:

Paper I, II, III & IV :

i. Elaborate on :  $2 \times 15 = 30$

ii. Write notes on  $10 \times 7 = 70$

**Total = 100 marks**

## 11. PRACTICAL EXAMINATION:

| Particulars.                                                            | Maximum Marks. |
|-------------------------------------------------------------------------|----------------|
| Clinical<br>Long Case 1 X 80 = 80 marks<br>Short case 2 X 35 = 70 marks | 150            |
| OSCE – 5 stations x 5 marks                                             | 25             |
| Ward Rounds/Spotters - 5 X 5 marks                                      | 25             |
| Viva-Voce                                                               | 80             |
| Log Book                                                                | 20             |
| Total                                                                   | 300            |
| Minimum for Pass                                                        | 150            |



#### Long Case- One

80 Marks

1. Case Documentation-----25 marks
2. Patient Examination -----25 marks
3. Differential Diagnosis-----10 marks
4. Case discussion-----20 marks

#### Short Case- Two

2 x 35 = 70 Marks

1. Case Presentation and examination-15 marks
2. Differential Diagnosis----- 5 marks
3. Case discussion----- 15 marks

## 12. LOG BOOK

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

Following details will be entered in the log book:

1. Treatment planning and procedures performed
2. Presentation in departmental seminars
3. Cases presented in clinical meetings
4. Presentations in journal clubs along with Title, Journal & Issue.
5. Schedule of intradepartmental rotation
6. Details of peripheral postings
7. Conferences attended – National/International
8. Papers/Posters presented at conferences with title name of the conference, date of presentation
9. Paper published with title, name & issue of the journal
10. Physics Practical
  - a. Output measurement
  - b. Determination of optical and radiation field congruence
  - c. Determination of % depth dose for cobalt beam
  - d. Verification of inverse square law
  - e. Quality Assurance in Radiotherapy

### **13. VIVA including Competency Assessment:**

VIVA including Competency Assessment

- 80 Marks (60 + 20)

### **14. OSCE**

1. Pathological specimens /Histopathology slides
2. X-ray films, CT and MR Images
3. Isodose charts
4. Cases
5. Medical Physics Instruments and Brachytherapy Applicators
6. Chemotherapeutic agents

Spotters- Identification and Description

### **15. REFERENCE BOOKS**

#### **SUGGESTED BOOKS AND AUTHORS**

1. Principle & Practice of Radiation Oncology Carlos Perez 6<sup>th</sup> Edn, 2013 Halperin
2. Cancer (2 Volumes) Devita 10<sup>th</sup> Edn, 2012 LWW
3. ACS Textbook of Clinical Oncology Murphy 2<sup>nd</sup> Edn
4. The Physics of Radiation Therapy Faiz M Khan
5. Radiobiology For The Radiologist Eric J. Hall 6<sup>th</sup> Edn LWW
6. AJCC Cancer Staging Handbook, American Cancer Society, 7<sup>th</sup> Edn, 2010 Springer Verlag
7. The Physics of Radiology H.E.Johns 4th Charle.C.Thomas
8. The Physics of Modern Brachytherapy in Oncology Baltas 1<sup>st</sup> Edn, 2007 Taylor & Francis
9. Clinical Oncology Abeloff 3<sup>rd</sup> Edn, 2004 Elsevier
10. Practical Essentials of Intensity Modulated Radiation Therapy Chao 2<sup>nd</sup> Edn, 2005 LWW
11. Textbook of Radiation Oncology Principles and Practice G. K. Rath 2<sup>nd</sup> Edn Elsevier
12. Radiation Therapy Planning Bentel Gunilla C McGraw-Hill
13. Clinical Radiation Oncology Gunderson 2<sup>nd</sup> Edn, 2007 Elsevier
14. Principles and Practice of Radiation Therapy: Introduction to Radiation Therapy
15. C. Washington 2<sup>nd</sup> Edn Elsevier
16. Intensity modulated radiation therapy: a clinical perspective Arno J. Mundt PMPH-USA
17. Handbook of Evidence-based Radiation Oncology Eric K. Hansen
18. Fundamental Physics of Radiology Meredith & Massey
19. The Manual of Clinical Oncology Casciato 5<sup>th</sup> Edn.2004 LWW

20. Clinical Target Volumes in Conformal and Intensity Modulated Radiation Therapy V. Gregorie
21. Textbook of Radiation Oncology L. Phillips Elsevier
22. Bethesda Hand Book of Clinical Oncology Abraham 2<sup>nd</sup> Edn, 2005 LWW
23. Treatment Planning in Radiation Oncology Faiz M Khan 2<sup>nd</sup> Edn, 2007 LWW
24. Diagnostic and Surgical Imaging Anatomy H. RichHarnsberger 1<sup>st</sup> Edn, 2006 LWW
25. Cancer- Diagnosis and Management Ackermann
26. Text Book of Radiotherapy G. Fletcher
27. Surface and Radiological Anatomy A. Halim
28. Essentials of Surface and Radiological Anatomy V. Kapur
29. Handbook of Radiation Oncology: Basic Principles and Clinical Protocols Bruce Haffty

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **16. JOURNALS**

### **SUGGESTED JOURNALS**

1. Annals of Oncology
- 2 British Journal of Cancer
3. Cancer Wiley
4. Cancer Genetics and Cytogenetics Elsevier
5. Clinical Oncology (R Coll Radiol) Elsevier
6. European Journal of Cancer Elsevier
7. Gynecologic Oncology
8. Journal of cancer research and therapeutics Medknow
9. Journal of medical physics Medknow
10. Indian Journal of Cancer Indian J Cancer
11. International Journal of Cancer Int J Cancer Wiley
12. International Journal of Clinical Oncology Springer-Verlag
13. International Journal of Gynecological Cancer Blackwell
14. International Journal of Oncology
15. International Journal of Radiation Oncology, Biology, and Physics Elsevier
16. Journal of Cancer Research and Clinical Oncology Springer-Verlag
17. Journal of the National Cancer Institute OUP
18. Lancet
19. The Lancet Oncology

20. New England Journal of Medicine
21. Radiation Oncology Investigations Wiley
22. Radiation Research
23. Radiotherapy and Oncology Elsevier
24. Recent Results in Cancer Research Springer-Verlag
25. Seminars in Oncology Saunders
26. Seminars in Radiation Oncology Saunders
27. Radiation Oncology

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**DIPLOMA IN TUBERCULOSIS &  
CHEST DISEASES (D.T.C.D)**

**THE TAMIL NADU Dr. M. G. R MEDICAL UNIVERSITY, CHENNAI**  
**DIPLOMA IN TUBERCULOSIS & CHEST DISEASES (D.T.C.D)**

**1. GOAL:**

To train the post graduate medical students in the specialty of respiratory medicine in different medical institutions with the common broad based curriculum.

To enable them to become efficient teachers for undergraduates, Para-medicals, nursing, post graduate students in the specialty of respiratory medicine.

To sensitize them to take part in National Programme and community intervention involving respiratory medicine, so that they are sensitive to the needs of the society.

To train them to conduct interactive meeting with public.

To instill confidence in them in problem solving approach while managing various clinical scenario.

**2. OBJECTIVES:**

**A) Knowledge**

The students are expected to get trained in basics of anatomy, embryology, physiology, bio-chemistry, microbiology and pathology related to respiratory medicine.

To make them understand the patho-physiology of various respiratory ailments.

They should be adequately trained to recognize and diagnose various respiratory ailments and epidemics involving respiratory pathogens.

To train them to handle various respiratory emergencies independently with available resources.

## **B) Attitude**

To train them communicative skills to interact with patients and their relatives and their colleagues so as to make them responsible physicians.

To instill inter-disciplinary approach so as to make them capable to interact with other specialty departments, nursing and para-medical personnel.

To instill in them the concept of teamwork in their day to day activities to deliver better patient care.

## **C) Skills**

Able to perform and interpret procedures like Spirometry, Bronchoscopy, Pleural aspirations, Intercostal tube drainage and Endotracheal intubation etc.,

## **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

### **• THEORETICAL KNOWLEDGE**

#### **a) Basic Sciences:**

To train them in basic sciences pertaining to respiratory medicine  
Knowledge about clinical respiratory medicine.

To train them in understanding co-morbid conditions involving other specialties like cardiology, nephrology, neurology etc.,

### **• PRACTICAL AND CLINICAL SKILLS**

Elaborate history taking and clinical examination  
To train them in diagnostic procedures like

- Diagnostic Pleurocentesis
- Performing and interpreting ABGA
- Performing and interpreting Spirometry
- Performing and interpretation of DLCO

## **ATTITUDES INCLUDING COMMUNICATION SKILLS**

To be trained in communication skills in case presentation, clinic-pathological discussion, seminars and small conferences.

The post graduates should be trained in effective communication skills to deal with the colleagues, patients and their relatives and with general public.

To instill empathy in patient care and delivery of health services.

The students should be trained in bio-ethics so that they are aware of the human rights, human dignity and patients rights.

To interact with medico-legal issues involving respiratory medicine and practice safe health measures.

To be trained in computer application to search medical literature with medical evidence from internet.

## **MEDICAL ETHICS/ BIOETHICS AND MEDICOLEGAL ASPECTS:**

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics,Bioethics, moral and legal issues, Medical Audit are part and parcel of the curriculum and syllabus.

## **4. THEORY SYLLABUS**

### **ANATOMY**

- Clinical and applied anatomy of the respiratory tract
- Histology of respiratory system
- Embryology of the lung
- Ultrastructure details including electron microscopy of the lung
- Radiographic anatomy of thorax

### **PHYSIOLOGY**

- Lung physiology
  - o Ventilation
  - o Lung mechanics
  - o Blood gas transfer
  - o Control of respiration
  - o Diffusion and compliance
  - o Airway resistance
  - o Body plethysmography



- Physiology of sleep medicine
- High altitude physiology
- Respiratory reflexes
- Non-respiratory functions of the lung

#### **PATHOLOGY**

- Pathology of various respiratory ailments
- Analysis of samples for cytology, biopsy, immuno-histochemistry etc.,

#### **MICROBIOLOGY**

- Bacterial respiratory pathogens
- Viral pathogens
- Mycobacterium tuberculosis
- Atypical mycobacteria
- Applied respiratory clinical microbiology
- Staining procedures like Ziehl-Neilsen, AuraminFlourescence staining, LED microscopy
- Advanced molecular diagnostics
- Culture methods, radioimmunoassay
- Infection control practices and their air-borne infection control

#### **PHARMACOLOGY**

- Drugs used in respiratory medicine
- Pharmaco-vigilance and reporting ADR
- Newer drugs
- Cancer chemotherapy agents for lung malignancy

#### **BIOCHEMISTRY**

- Respiratory acidosis and alkalosis
- Acid base balance
- Pulmonary surfactants

#### **RESPIRATORY DISEASES**

- Clinical approach to signs and symptoms in respiratory medicine
- Diagnostic procedures
- Congenital respiratory abnormalities
- Infectious diseases of respiratory system
- Occupational lung diseases
- Immunological lung diseases
- Airway diseases
- Disorders of pulmonary circulation
- Sleep disordered breathing

- Lung malignancy
- Mediastinal diseases
- Disorders of Pleura
- Acute and chronic respiratory failure
- Management of bio-terrorism and respiratory epidemics
- Surgical management of respiratory diseases
- Vaccination against lung infections
- Smoking cessation, prevention of environmental pollution
- National programs and policies
- Lung transplantation protocols

#### **5. TEACHING& LEARNING METHODS(INCLUDING CLINICAL STUDY)**

- Lectures
- Case based discussions
- Bed side clinics
- Teaching on ward rounds
- Seminars
- Journal clubs
- Problem based learning
- Training in medical/death audits
- Health economics

#### **6. STRUCTURED TRAINING PROGRAM D.T.C.D (2 YEARS)**

##### **First Year**

|                                     |                  |
|-------------------------------------|------------------|
| <b>TB &amp; Chest Diseases ward</b> | <b>9 months</b>  |
| <b>Thoracic Surgical ward</b>       | <b>15 days</b>   |
| <b>IRCU</b>                         | <b>15 days</b>   |
| <b>Infectious diseases and HIV</b>  | <b>1 month</b>   |
| <b>Radiology Unit</b>               | <b>15 days</b>   |
| <b>General Medicine ward</b>        | <b>15 days</b>   |
| <b>Total</b>                        | <b>12 months</b> |

##### **SECOND YEAR**

|                                             |                 |
|---------------------------------------------|-----------------|
| <b>TB &amp; Chest Diseases ward</b>         | <b>9 months</b> |
| <b>IRCU</b>                                 | <b>15 days</b>  |
| <b>Thoracic surgical ward</b>               | <b>15 days</b>  |
| <b>Physiotherapy and Rehabilitation</b>     | <b>15 days</b>  |
| <b>Radiology Unit</b>                       | <b>15 days</b>  |
| <b>Medical Oncology &amp; Radio Therapy</b> | <b>15 days</b>  |
| <b>Anaesthesia</b>                          | <b>15 days</b>  |
| <b>Total</b>                                | <b>12months</b> |

7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

**8. COMPETENCY ASSESSMENT :**

• **OVERALL:**

- a) Communication / commitment / Contribution / Compassion towards patients and Innovation ( ) - 5 Marks
- b) Implementation of newly learnt techniques/skills ( )
- Number of cases presented in Clinical Meetings/ Journal clubs/seminars - 5 marks
  - Number of Posters/Papers presented in Conferences/ Publications and Research Projects - 5 marks
  - No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks

Total -----  
20 Marks  
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PG CLINICAL COURSES

- VIVA including Competency Assessment - 80 Marks (60 + 20)
- Log Book - 20 marks

**ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period   |          |           |          | Total<br>Max.20 marks |
|---------------|----------|----------|-----------|----------|-----------------------|
| I year        | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
| II year       | Upto Dec | 10 marks | Upto June | 10 marks | 20 Marks              |
|               | AVERAGE  |          |           |          | 20 Marks              |

**9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:**

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

## 10.THEORY EXAMINATION

Theory examination will comprise 3 papers.

Paper I: Applied Basic Sciences as applied to Pulmonary Medicine

Paper II: Tuberculosis (Pulmonary and Extrapulmonary)

Paper III: Non-Tuberculous Chest Diseases

### Question paper pattern:

I. Elaborate on 2 x 15 = 30

II. Write note on 10 x 7 = 70

**Total = 100 marks**

## 11. PRACTICAL EXAMINATION

| Particulars.                                                            | Maximum Marks. |
|-------------------------------------------------------------------------|----------------|
| Clinical<br>Long Case 1 X 80 = 80 marks<br>Short case 2 X 35 = 70 marks | 150            |
| OSCE – 5 stations x 5 marks                                             | 25             |
| Ward Rounds/Case Scenario - 5 X 5 marks                                 | 25             |
| Viva-Voce                                                               | 80             |
| Log Book                                                                | 20             |
| Total                                                                   | 300            |
| Minimum for Pass                                                        | 150            |

## **12. LOG BOOK**

The post graduate students shall maintain a record(log)book of the work carried out by them and the training program undergone during the period of training.

Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

## **13. VIVA - VIVA including Competency Assessment :**

VIVA including Competency Assessment - 80 Marks (60 + 20)

## **14.OSCE**

**5 stations with varying combinations which should include evidence based and problem based solutions, PFT, ABG, Clinical problem solving, Chest X-Ray, CT Chest, Specimens/Slides, Sleep study report, case scenarios, Drugs, Devices/instruments**

## **15. REFERENCE BOOKS**

### **RECOMMENDED BOOKS AND JOURNALS (TEXT BOOKS)**

1. AP Fishman – Pulmonary Diseases and Disorders.  
IInd Edition Magnabull Book Company, New York.
2. Hand Book of Physiology  
Respiratory System Volume – I  
American Physiology Society, 1985
3. Baits DV Maclon PT Dchristee,  
Respiratory Function and Diseases,  
III Edition, Sandoz & Company,  
Philadelphia
4. Hand Book of Physiology  
Respiratory System Volume III  
American Physiological Society 1986
5. Regulation of Breathing Part-I and II,  
M.Decker & Co., 1984
6. Sleep and Breathing  
M.Decker & Co., 1984
7. Hand Book of Physiology,  
Respiratory System Volume IV  
American Physiological Society 193

8. Pathology for Oxygen.  
Harvard University U.S.A. 1984
9. Clinical Examination Testing,  
IIIrd Edition, Sandoz Philadelphia.
10. Physiology and Medicine of Diving,  
IIIrd Edition,  
Best Book Binder, California, 1982
11. Hand Book of Physiology,  
Respiratory System Volume II,  
American Physiological Society.
12. Acid Base – Little Brown & Co.,  
Frazer and Boston, 1983
13. Frazer and Perry, Diagnosis of Diseases of Chest  
Clinical Medicine,  
Little Brown & Co., Toronto, 1985
14. Clinical Epidemiology – A Basic Science for  
Clinical Medicine,  
Little Brown & Co., Toronto, 1985
15. Morphogenesis of Lung Cancer,  
C.R.C. Press, Florida, Vol.I & Vol.II, 1983
16. Principles of Chest X-Ray Diagnosis,  
C.Simon Amptender Centry Crafts, 1971
17. Pathology of the Lung,  
Spencer, Oxford Personal Press, 1977
18. Computer Tomography of Thorax  
Roman press – 1984
19. Advanced Imaging Techniques, Volume II  
Claredel Press, California – 1983
20. Text Book of Work Physiology  
Niagra Hills, New York, 1977
21. The Eosinophil in Health and Diseases,  
Grunec and Streton, New York – 1980
22. Intestinal Lung Diseases,  
Bercker – Philadelphia – 1988

23. Respiratory Diseases – by Crafton & Dulgus – Blackwell
24. The Lung Structure and function  
G.E.Costs – Blackwell.
25. Work related Lung Disorders.  
G.E.Costs.

#### **LIST OF ADDITIONAL BOOKS FOR REFERENCE:**

1. Textbook Of Pulmonary & Critical Care Medicine by Jindal
2. Light's Diseases Of Pleura
3. Tuberculosis by SurendraMenon and Sharma
4. Fundamentals Of Respiratory Care by Egan
5. Mcloeods Clinical Methods
6. Respiratory Infections by Torres Ewing
7. The Essentials Of Respiratory Care by Kacmarek
8. Imaging Of Disease Of The Chest by Hansell
9. Essentials of Chest Radiology by Collins
10. Textbook Of Pulmonary Medicines by Behera
11. TB & Non Tuberculosis Mycobacterial Infection by Schlossberg
12. Diseases Of Lung Pathological & Radiological Correlation by Muller
13. Current Diagnosis And Treatment In Pulmonary Medicine by Henry Weish
14. Chest Roentgenology by Benjamin Felson
15. Flexible Bronchoscopy by Atul C Mehta and Kope Wang
16. Text Book of Radiology & Imaging by David Sutton
17. Textbook Of Respiratory Medicine by Murray and Nadel
18. Clinical Respiratory Medicine by Spiro
19. Basic And Clinical Pharmacology by Katsung
20. Robbins & Cotran's Pathologic Basis Of Disease by Kumar and Abbas
21. High Resolution CT of Lung by Webb
22. Non-invasive respiratory support by Simmonds
23. Essential Of Tuberculosis In Children by Seth and Kebra
24. Tuberculosis by Rom and Gary
25. Textbook of Respiratory Medicine by Gibson

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

## **16. JOURNALS**

1. Chest
2. International Journal of tuberculosis and lung disease
3. British medical journal
4. Thorax
5. Clinics in Chest medicine
6. American journal of respiratory and critical care medicine
7. Critical care medicine.
8. Sleep medicine
9. European respiratory journal

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# **DIPLOMA IN DIABETOLOGY**

# **THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI**

## **DIPLOMA IN DIABETOLOGY**

India has the largest prevalence of diabetes in the world next only to China. According to latest WHO estimates, the prevalence of diabetes in India is about 77 million (i.e. 7.7 crores). More alarming is the figure that in addition about 75 million (7.5 crores) people also have pre-diabetes. The need for specialized training in the field of Diabetology has been realized in recent years. There is an initiative in developing Post Graduate Degree course in the field of Diabetology across the country in various medical institutions to cater the increasing demand for diabetology care across various levels.

### **1. GOAL**

The aim of this curriculum is to create a cadre of medical professionals with excellence in diabetes care and empathy towards diabetes patients

- ❖ Provide comprehensive diabetes care, to create preventive strategies for prevention of both diabetes and its complications and rehabilitation of patients with diabetes complications in both hospital and domiciliary settings.
- ❖ To educate and train medical and paramedical personnels about diabetes
- ❖ To conduct future research activities in the field of Diabetology.
- ❖ To organize and implement various NCD programs

### **2. OBJECTIVES:**

#### **A) Knowledge**

The post graduate students have to acquire the knowledge of normal physiology of metabolism and metabolic changes in diabetes, preventive aspects of diabetes care and comprehensive diabetes management strategies.

#### **B) Attitude**

Through the training program the student should develop a positive attitude, individualize the patient needs and empathy towards the treating patient.

#### **C) Skills**

The student should develop communication and interpersonal skills encompass the ability to gather information in order to facilitate accurate diagnosis, give therapeutic instructions and establish caring relationship with diabetes patients. The student also needs to acquire skills in carrying out various diagnostic and therapeutic procedures and use of comprehensive assessment tools.

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM**

- **THEORETICAL KNOWLEDGE**

- Normal metabolism of human being in various stages of life cycle including pregnancy.
- Changes in metabolism during pre-diabetes and diabetes.
- Knowledge on etio-pathogenesis of diabetes and its complications, early diagnosis and preventive strategies.
- Future directions of diabetes management and research

- **PRACTICAL AND CLINICAL SKILLS**

- Assess and provide strategies for the management of diabetes with regard to pathogenesis, life style, affordability, availability and acceptability.
- Comprehensive diabetes management skills including the management of co-morbid conditions.
- Acquire knowledge to educate about diabetes prevention, management and rehabilitation to the patients, paramedical and medical professionals.
- Involvement and participation in teaching and training programs of undergraduate students and interns.
- Presentation of clinical materials and information to various training programs include Lectures, Seminars, Journal Clubs, Group Discussions and participation in Clinical and Clinico-Pathological Conferences.
- Able to conduct and implement various levels NCD programs including outreach camps.
- Able to setup a diabetes clinic and care centre in various levels include primary, secondary and tertiary care level.

- **WRITING THESIS/ RESEARCH ARTICLES**

The post graduate Diploma in Diabetology student should submit at least one publication in University Journal Medical Sciences as Research paper.

Students are encouraged to attend CME's, publish research papers and present posters, or platform presentations at state, national and international conferences.

- **ATTITUDES INCLUDING COMMUNICATION SKILLS**

Student should develop the art of eliciting the maximum information from patients in a given time considering the sensory deficits of the patient and caregivers. Communication skills can be learnt through observation and from formal communication skills training and workshops. Students have to develop patience and empathy in dealing with patients. They have to learn to show sensitivity to their special needs.

- **TRAINING IN RESEARCH METHODOLOGY / MEDICAL ETHICS / BIO ETHICS AND MEDICOLEGAL ASPECTS**

Students are encouraged to attend workshops/CME's on Bioethics conducted by the University and other reputed Institutions.

Medical ethics, Bioethics, moral and legal issues are part and parcel of the curriculum and syllabus in Diploma in Diabetology.

Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behavior studies, introduction to non-linear mathematics, knowledge of pharmaco – economics and medico legal aspects shall be imparted to the Post Graduate students.

**Bio-Medical ethics:**

1. Respect human life and the dignity of every individual
2. Treat the sick and injured with competence and compassion and without prejudice and apply the knowledge and skills when needed.
3. Protect the privacy and confidentiality of those for whom we care and breach that confidence only when keeping it would seriously threaten their health and safety or that of others.
4. Work freely with colleagues to discover, develop, and promote advances in medicine and public health that ameliorate suffering and contribute to human well being.
5. Educate the public about present and future threats to the health of humanity.
6. Always consider the benefit risk ratio while treating patients and educate the patients about the risk.

#### **4. THEORY SYLLABUS**

##### **Post Graduate Diploma in Diabetology**

##### **PART- I**

##### **PAPER – I BASIC MEDICAL SCIENCES**

**Anatomy** : Applied Anatomy of Gastrointestinal tract with special reference to pancreas and developmental anatomy of Hepatobiliary system, Autonomic nervous system, other basic anatomical factors, Anatomy and applied anatomy of Foot, Eyes and Genitourinary system, Anatomy of Cardiovascular, Cerebrovascular, and Peripheral vascular system.

**Physiology** : Applied Physiology of gastrointestinal Hormones, Exocrine and endocrine functions of pancreas, Other hormones of clinical importance including Pituitary, thyroid, and Incretins, evaluation of insulin sensitivity – clamp studies, cloning, Physiology of Pregnancy, Physiology of Cardiovascular system, Physiology of Kidneys, Physiology of Nervous system including Autonomic nervous system

**Biochemistry** : Metabolism in general and carbohydrate, protein, fat and vitamins metabolism. Useful and practical pancreatic function tests, other endocrine function tests, hormonal assay and insulin assay in particular, inborn-errors of metabolism of clinical importance. Recombinant human DNA technology, instrumentation, chemistry of analyzers and glucose monitoring devices.

**Microbiology** : General revision of microbial agents and infections like viral infections and their relationship to diabetes, serological tests, Immunology and autoimmunity as a problem in disease, Urinary tract infections, foot infection in relation to diabetes, basics of Stem cell therapy.

**Pathology** : Tissue changes in diabetes, vasculopathies, tumours of pancreas islet cells, problem of pancreatitis and pancreolithiasis, secondary diabetes and its pathology, atherosclerosis and its application in disease, Micro vascular abnormalities, target organ changes, Endothelium – in Normal and Disease states, Pathology of diabetes related complications.

**Pharmacology** : General mode of action of drugs, pharmacology of drugs used in diabetes and their side effects, toxicity of vaccines and sera, animal experiments and problems of islet transplant. Antibiotics selection, combination and contraindication, Insulin analogues, Alternate modes of insulin delivery.

## **PART-II**

### **PAPER – I GENERAL DIABETOLOGY**

1. Aetiopathogenesis of Diabetes Mellitus ( D.M )
2. Pathology of Diabetes and its complications
3. Obesity, Metabolic syndrome and diabetes associated syndromes
4. Diagnostic criteria, classification and evaluation of D.M
5. Clinical features – usual and unusual
6. Co-morbid conditions associated with diabetes
7. Diabetic emergencies and acute complications of diabetes
8. Management of diabetes and diabetes related complications
9. Pregnancy and diabetes
10. Nutrition and diabetes
11. Psychological aspects of diabetes care
12. Diabetes management with reference to different special situations – travel, employment, pregnancy, surgery, injury, sports, driving etc.,
13. Rehabilitation of patients with diabetes related complications
14. Diabetes education and life style modification

## **PART II**

### **PAPER – II RECENT ADVANCES IN DIABETOLOGY**

1. Guidelines, recommendations and algorithms of comprehensive diabetes diagnosis, evaluation & management
2. Clinical studies, trials and hypothesis in diabetes
3. Newer drugs in diabetes management
4. Gene therapy, Stem cell therapy
5. Preventive aspects of Diabetes Mellitus - Immunotherapy, Immuno modulators
6. Community and social aspects of diabetes prevention and management
7. Transplantation techniques in diabetes
8. Personalized / individualized diabetes management goals and strategies
9. Evolving concepts in diabetes care
10. Future directions in diabetes management and research

## **5. TEACHING LEARNING METHODS**

- Lectures
- Case based discussion
- Bed side clinics
- Teaching on ward rounds
- Symposia
- Seminars
- Journal clubs
- Mortality audit meetings
- Problem based learning
- Telemedicine (where available)

## **6. STRUCTURED TRAINING PROGRAM**

### **POST GRADUATE DIPLOMA IN DIABETOLOGY**

Duration of Course – Two years

#### **FIRST YEAR :**

**Focused on**                      **1. Basic Medical Sciences**  
                                         **2. General Diabetology**

Department of Diabetology                      -                      12 Months.

#### **SECOND YEAR :**

**Focused on**                      **1. Diabetes Complications**  
                                         **2. Advances in Diabetology**

Department of Diabetology                      -                      10 Months

#### **Other Departments :**

|     |                 |          |
|-----|-----------------|----------|
| a). | Neurology       | One week |
| b). | Nephrology      | One week |
| c). | Cardiology/ CCU | One week |
| d). | Endocrinology   | One week |
| e). | Podiatry        | One week |

- f). Ophthalmology One week
- g). Maternity & Family welfare One week
- h). Bio-Chemistry & Epidemiology One week

**Total 8 weeks**

**7. Evaluation of the candidates in both theory and practicals will help the candidate in improvement of his/her knowledge, skills and attitude.**

**8. COMPETENCY ASSESSMENT:**

• **OVERALL:**

a) Communication / commitment / Contribution / Compassion towards patients and Innovation () - 5 Marks

b) Implementation of newly learnt techniques/skills ()

• Number of cases presented in Clinical Meetings/ Journal clubs/seminars - 5 marks

• Number of Posters/Papers presented in Conferences/ Publications and Research Projects - 5 marks

• No. of Medals / Certificates won in the conference / Quiz competitions and other academic meetings with details. - 5 marks

**Total 20 Marks**

**PG CLINICAL COURSES**

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

**ASSESSMENT SCHEDULE IS AS FOLLOWS**

| Year of study | Period         |          |           |          | Total Max.20 marks |
|---------------|----------------|----------|-----------|----------|--------------------|
| I year        | Upto Dec       | 10 marks | Upto June | 10 marks | 20 Marks           |
| II year       | Upto Dec       | 10 marks | Upto June | 10 marks | 20 Marks           |
|               | <b>AVERAGE</b> |          |           |          | <b>20 Marks</b>    |



## **9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES:**

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

## **10.THEORY EXAMINATION**

### **Scheme of Examination**

#### **Post Graduate Diploma in Diabetology**

| <b>Theory</b> | <b>Title</b>                                  | <b>Duration</b> | <b>Max.marks</b> |
|---------------|-----------------------------------------------|-----------------|------------------|
| Paper I       | Applied Basic Medical sciences in Diabetology | 3 hrs           | 100              |
| Paper-II      | Diabetology                                   | 3 hrs           | 100              |
| Paper-III     | Recent Advances in Diabetology                | 3 hrs           | 100              |

### **Question Paper Pattern :**

I .Elaborate on: 2 X 15 = 30 marks

II. Write notes on: 10 X 7 = 70 marks

Total: 100marks

## **11. PRACTICAL EXAMINATION**

| <b>Particulars</b>                          | <b>Maximum Marks</b> |
|---------------------------------------------|----------------------|
| <b>Clinicals</b>                            |                      |
| Long case (1 case x 80 marks) – 80 marks    | <b>150</b>           |
| Short cases (2 cases x 35 marks) – 70 marks |                      |
| Ward rounds (5 cases x 5 marks)             | <b>25</b>            |
| OSCE (5 stations x 5 marks)                 | <b>25</b>            |
| Viva-voce                                   | <b>80</b>            |
| Log book                                    | <b>20</b>            |
| <b>Total</b>                                | <b>300</b>           |
| <b>Minimum for pass (50%)</b>               | <b>150</b>           |

### **Marks break up for clinical:**

| Particulars                     | Marks           |
|---------------------------------|-----------------|
| <b>Long Case</b>                | <b>80 Marks</b> |
| History taking                  | 15              |
| Physical examination            | 15              |
| Demonstration of clinical signs | 15              |
| Diagnosis                       | 10              |
| Differential diagnosis          | 10              |
| Discussion & Management         | 15              |
| <b>Short Case</b>               | <b>35 Marks</b> |
| Clinical Examination            | 15              |
| Diagnosis & DD                  | 10              |
| Discussion & Management         | 10              |

### **12. LOG BOOK**

A detailed log book should be maintained for the entire duration of the course. It should contain the following details.

1. Procedures performed
2. Journal clubs/Clinical Meetings
3. Seminars/CME/Conferences
4. Important cases discussed/presented

The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.

Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

### **13. VIVA including Competency Assessment**

**An unstructured viva will be carried out by the examiners mainly focused on problem based and evidence based science.**

VIVA including Competency Assessment

- 80 Marks (60 + 20)

#### **14. OSCE (Objective Structural Clinical Examination)**

The following are suggested stations for the OSCE. Any 5 can be chosen at the discretion of the examiners. All the 5 stations should be common to all candidates appearing on that day.

| S.No. | Stations                                             | Marks |
|-------|------------------------------------------------------|-------|
| 1.    | Images (ECG/X-ray/CT/MRI)                            | 05    |
| 2.    | Lab Data/Tests/Clinical case scenario interpretation | 05    |
| 3.    | Demonstration of clinical skills/Procedures          | 05    |
| 4.    | MNT/Nutrition imparting skills                       | 05    |
| 5.    | Communication Skills                                 | 05    |
| 6.    | Drugs/Devices                                        | 05    |
| 7.    | Case studies/Spl. reports                            | 05    |
| 8.    | Diabetes Education & Counseling                      | 05    |
| 9.    | Specimen/Slides                                      | 05    |
| 10.   | Fundus photographs                                   | 05    |

#### **15.TEXT BOOKS :**

1. Joslin's Diabetes Mellitus
2. Oxford Text book of Medicine
3. Diseases of Metabolism by Funcan
4. Biochemistry of Diseases by Podalsky
5. Textbook of Physiology by Samson Wright
6. Monograms of Pancreatic Diabetes by Dr. Gee Verghese
7. Clinical Diabetes Mellitus by Tattersall & Gale
8. Diabetic coma by David Shade
9. Handbook of Diabetes Mellitus by Prof. V. Seshaiiah
10. Manual on Diabetes Mellitus by Joslin

11. Text book of Diabetes Mellitus by John C.Pickup & Williams / Edited by Holt & Cockram
12. International Textbook of Diabetes Mellitus – Wiley Publications
13. Harpers Illustrated Biochemistry - Robert K .Murray
14. Textbook of Diabetes Mellitus by Ellenberg & Rifkin
15. Williams Textbook of Endocrinology
16. Harrison's Principles of Internal Medicine
17. Davidson's Principles and Practice of Medicine
18. Hutchinson's clinical Methods – Michael Swash
19. Neurological Differential Diagnosis-John Paten
20. Textbook of Cardiovascular Medicine- Braunwald
21. The Kidney- H.E.De Wardener
22. Signs and symptoms in Medicine- Chamberlain
23. Principles of Neurology by Raymond Adams

**\*\* Note : The editions are as applicable and the latest editions shall be the part of the syllabi**

### **16.JOURNALS**

1. Diabetes Care (International)
2. Diabetes (International)
3. New England Journal of Medicine (International)
4. The Lancet (International)
5. British Medical Journal (International)
6. Diabetologia (International)
7. Journal of Clinical Endocrinology & Metabolism (International)
8. Indian Journal of Clinical Endocrinology & Metabolism (National)
9. International Journal for Diabetes in Developing Countries (National)
10. Journal of Association of Physicians of India (National)
11. Indian Journal of Clinical Practice (National)
12. Postgraduate Medicine (National)

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