

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

No. 69, ANNA SALAI, GUINDY, CHENNAI – 600 032.

POST GRADUATE IN DIPLOMA COURSES



SYLLABUS AND CURRICULUM

DIPLOMA IN ORTHOPEDICS

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THE JAMES H. BECK OF A. G. B. MEDICAL UNIVERSITY CHAIRMAN

DIPLOMA IN ORTHOPEDICS

1. GOALS AND OBJECTIVES:

At the end of the 2 year course should be able to: (1) identify the common orthopaedic conditions, (2) be able to do the appropriate management effectively and without any complications and (3) be able to do the appropriate management effectively and without any complications.

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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

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:

- 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

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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

S. No	Name of procedure	As Observer	As first Assistant	Able to per- form
1	ORTHOPAEDICS Skin traction & Plaster application	YES	YES	Yes
2	Skeletal traction of upper Tibia, distal Tibia, lower Femoral, Olecranon, Calcaneal and Skull traction	YES YES YES	YES YES YES	Yes YES YES YES
3	Closed reduction of Fractures	YES	YES	Yes

S. No	Name of procedure	As Observer	As first Assistant	Able to per- form
4	Management of open frac- tures - Debridement, external fixa- tion - Soft tissue reconstruction including bone coverage	YES YES YES	YES YES YES	YES Yes Yes
5.	Open reduction and internal fixation of Fractures and Open reduction of dislocations	YES	YES	YES

6	Bone & Joint Infections			
	Diagnostic Aspiration of joint & Arthrotomy	YES	YES	Yes
	Drilling/ Decompression of metaphysis	YES	YES	Yes

S.	Name of procedure	As Observer	As first Assistant	Able to perform
No	Drainage of abscess	YES	YES	Yes
	Sequestrectomy & saucerisation			Yes
	Girdlestone/Excision arthroplasty of Hip	YES	YES	Yes NO
7.	Bone tumors			
	Biopsy from tumor	YES	YES	Yes
	Excision of osteochondroma	YES	YES	Yes
	Curettage & Bone grafting	YES	YES	Yes
8.	Spine			

	Exposure to spine by posterior, anterior and anterolateral approaches	YES	Yes	NO
9.	CTEV- Ponsetti Method	YES	YES	Yes
	Tendo Achilles lengthening	YES	YES	Yes
10.	Postero-medial soft tissue re-Release	YES	YES	Yes
	Bony procedures including triple arthrodesis	YES	YES	Yes
		YES	YES	NO
S. No	Name of procedure	As Observer	As first Assistant	Able to perform
11	High tibial osteotomy	Yes	YES	NO
12	Tendon repair	YES	YES	yes
13	Cerebral Palsy/ Neuro muscular disorders - Soft tissue/ bony procedures	YES	Yes	Yes
	Knee & Ankle arthrodesis and triple arthrodesis	YES	Yes	NO
	Limbs lengthening / Ilizarov	Yes	Yes	NO.

	procedure	YES	YES	no
15	Arthrolisis of Elbow joint	Yes	Yes	no
16	Amputations	YES	YES	Yes
17	Limbs salvage procedures	YES	Yes	YES
	DESIRABLE PROCES- DURES	Yes	YES	no
	Endoscopy	Yes	Yes	no
	Arthroscopy of knee			
	Joint replacement			
	Hip joint	Yes	Yes	no
	Knee joint	Yes	Yes	no
	Peripheral nerve repair	YES	Yes	no
	Tendon transfer procedures	YES	Yes	no
	Spinal stabilization proce- dures like pedicular screw	YES YES	Yes	no

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 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 : $2 \times 15 = 30$

II. Write notes on : $10 \times 7 = 70$

Total = 100 marks

10. Practical Examination:

Particulars.	Maximum Marks.
Clinical Long Case 1 X 80 = 80 marks 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

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
