

**THE TAMILNADU Dr.M.G.R. MEDICAL UNIVERSITY,
No.69, Anna Salai, Guindy, Chennai – 600 032.**

**D.M/ M.Ch
SUPER SPECIALTY DEGREE COURSE**



SYLLABUS AND CURRICULUM

2017-2018

M.Ch – ENDOCRINE SURGERY

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI
Syllabus - M.Ch. – ENDOCRINE SURGERY

Introduction:

The following is a curriculum for Endocrine Surgeons outlining the knowledge and skill objectives that should be taught, learned, and demonstrated by the completion of Endocrine surgery. A Post graduate successfully demonstrating all of these objectives will have the appropriate background to perform common endocrine surgical procedures commensurate with his/her skill and expertise.

1.AIMS:

At the end of the course Endocrine the student should have acquired:

1. Broad understanding of the principles of basic medical sciences related to Endocrine Surgery.
2. Ability and skill to perform and interpret investigative procedures related to the Endocrine Surgery.
3. Skills in clinical diagnosis, planning of investigation and manage common conditions in the Endocrine Surgery by relevant current therapeutic methods.
4. Capabilities to take independent decisions in emergency situations perform required procedures in Endocrine and manage complications.
5. Competence in intensive care with practical knowledge of work with resuscitative and monitoring equipments.
6. Ability to critically appraise published literature, interpret data and to broaden his/her knowledge by keeping abreast with modern developments in the Endocrine Surgery.
7. Ability to teach Post-graduates, undergraduates and Nursing students in the basic management of the diseases in Endocrine Surgery.
8. Ability to get acquainted with allied and general clinical disciplines to ensure appropriate and timely referral.
9. Ability to conduct research.
10. Ability to become a consultant and capability of organizing Endocrine Surgery Departments.

2. OBJECTIVES:

Demonstrate knowledge and understanding of endocrine gland anatomy and physiology, both the normal and pathological states.

- Demonstrate the ability to diagnose clinical endocrinopathies associated with endocrine surgical diseases.

- Develop knowledge of the inherited endocrine disorders and understand the role of genetic counseling and testing.
- Have an appreciation of the current controversies and current areas of research in the literature within endocrine surgical diseases.
- Demonstrate the ability to apply this knowledge and safely perform the appropriate surgical operation for a given endocrine surgical disease.
- Develop ability to think critically and communicate effectively with patients and referring physicians.
- Develop Appreciation of humanistic and ethical aspects.
- Ability to work as part of a team as Endocrine disorders involves multidisciplinary management.

3.THEORY SYLLABUS:

(I).Pituitary

1. Hypothalamus and pituitary anatomy and its relation to adjacent structure
2. Pituitary embryogenesis
3. Physiology and secretion of various hormones like
 - *Growth hormone
 - *TSH
 - *ACTH
 - *Prolactin
 - *LH
 - *FSH
 - *Melanocyte Stimulating Hormone
4. Physiology and secretion of insulin like growthfactor.
- 5.Pathology of various pituitary adenomas and prognostic clinical, pathological classification of pituitary endocrine tumour.
6. Diagnosis of various pituitary diseases like
 - *Acromegaly
 - *Prolactinomas
 - *Cushings disease
 - *TSH producing adenoma
7. Pituitary tumour management in pregnancy
8. Pituitary apoplexy

(II).Thyroid

1. Demonstrate normal thyroid anatomy in a cadaver or in the operating room, including the thyroid gland, its vascular supply and venous drainage,

the parathyroid glands, recurrent laryngeal nerves, strap muscles, and platysma.

2. Normal variants in recurrent laryngeal nerve anatomy including frequency
3. Normal thyroid embryogenesis and descent.
4. Normal thyroid hormone synthetic pathway including iodine metabolism and feedback mechanisms.
5. Impact of specific medications on the thyroid hormone synthetic pathway and thyroid function.
6. Impact of aging and various diseases of the thyroid hormone synthetic pathway and thyroid function.
7. Appropriate thyroid function testing for the following clinical scenarios, including interpretation of predicted test results:
 - Thyroid nodule
 - Goiter
 - Hyperthyroidism
 - Hypothyroidism
 - An algorithm development that includes pertinent history, examination findings, and diagnostic evaluation of:
 - A palpable thyroid nodule
 - A nodule discovered on ultrasound performed for thyroid pathology
8. Recognition, evaluation, and management of the following early postoperative complications:
 - Hematoma
 - Hypocalcaemia
9. Outpatient management of the following postoperative conditions
 - Thyroid hormone replacement, postoperative
 - Postoperative hypocalcaemia
 - Postoperative voice changes
10. Algorithms for the evaluation and treatment of:
 - Well-differentiated thyroid cancer
 - Medullary thyroid cancer
 - Thyroid lymphoma
 - Anaplastic thyroid cancer
11. Risk factors for well-differentiated thyroid cancer, medullary thyroid cancer, and anaplastic thyroid cancer.
12. Algorithms for the evaluation and treatment of hyperthyroidism due to Graves' disease, toxic nodule, medications, pregnancy.
13. Clinical presentation of thyroid storm and outline the treatment of thyroid storm.

14. Algorithm development for the evaluation and management of nontoxic multinodular goiter, including substernal goiter with and without airway involvement.
15. Pathophysiology of:
 - Multinodular goiter
 - Grave's disease
 - Thyroid cancer
16. Operative approaches to thyroid pathology
17. Staging and prognosis in thyroid cancer
18. Recognition and treatment of common postoperative complications
 - Hematoma
 - Hypocalcemia
 - Thyroid storm
 - Voice changes
19. Complete evaluation and management of patients with thyroid cancer (papillary, follicular, medullary, anaplastic lymphoma) including:
 - Preoperative evaluation including radiographic studies
 - Operative approaches including discussion of lobectomy vs. total thyroidectomy
 - Indications for and extent of neck dissection
 - Incidental finding of cancer in resected specimen
 - Metastatic thyroid cancer
 - Large remnant in patient with thyroid cancer
 - Tracheal invasion
 - Esophageal invasion
 - Postoperative treatment, surveillance, and monitoring
20. Complete evaluation and management of nontoxic multinodular goiter and substernal goiter
21. Approaches for reoperative thyroid surgery
22. Management of intraoperative recurrent nerve injury

(III).Parathyroid Disease

1. Normal parathyroid anatomy in a cadaver or in the operating room, including typical gland locations, blood supply, and relationship to the recurrent laryngeal nerves and other adjacent structures.
2. Normal parathyroid embryogenesis and descent. Describe how this affects ectopic gland location.

3. Normal calcium metabolic pathway including vitamin D metabolism, parathyroid hormone production and regulation, and calcitonin production and regulation.
4. Impact of specific medications and medical conditions on serum calcium and calcium metabolism.
5. Impact of aging on calcium metabolism.
6. Evaluation and treatment of life-threatening hypercalcemia.
7. Appropriate evaluation for the following clinical scenarios, including interpretation of expected test results:
 - Primary hyperparathyroidism
 - Secondary hyperparathyroidism
 - Tertiary hyperparathyroidism
 - Hypercalcemia associated with malignancy
 - Hypercalcemia associated with medications
8. Algorithm Development that includes pertinent history, examination findings, and initial diagnostic evaluation of:
 - Asymptomatic primary hyperparathyroidism
 - Symptomatic primary hyperparathyroidism
 - Normocalcemic Hyperparathyroidism
9. Recognition, evaluation, and management of the following postoperative complications:
 - Hematoma
 - Hypocalcemia
 - Voice changes
10. Demonstration of typical locations for ectopic parathyroid glands in a cadaver or the operating room .
11. Current Consensus guidelines for surgical treatment of asymptomatic patients. Initial evaluation of patients with asymptomatic hyperparathyroidism being considered for observation including an outline of the appropriate follow up of these patients including diagnostic evaluation, frequency of testing, and

anticipated outcomes. Describe which patients are appropriate candidates for nonoperative management of hyperparathyroidism.

- Indications for and interpretation of results of bone density testing.
- Outpatient follow up after parathyroidectomy.
- An algorithm for the preoperative localization of parathyroid adenoma in patients with primary hyperparathyroidism. Discuss the rationale and accuracy of the various localizing strategies and tests.
- An algorithm for intraoperative confirmation of successful parathyroidectomy during full neck exploration and minimally invasive parathyroidectomy.
 - Differences between a bilateral 4- gland exploration, a unilateral exploration and a focused exploration
- Prevention, recognition, and management of hungry bone syndrome after parathyroidectomy..

12. A diagnostic and treatment pathway for patients with non-MEN familial hyperparathyroidism Describe the technique of cryopreservation and its role in the treatment of patients with multigland disease or during reoperative parathyroid surgery.

13. Interpretation of intraoperative PTH monitoring results and their correlation with postoperative eucalcemia.

14. Complete evaluation and management of patients with parathyroid cancer including:

- Preoperative evaluation including radiographic studies
- Operative approaches
- Extent of resection
- Postoperative treatment, surveillance, and monitoring

15. Different techniques of focused parathyroidectomy including:

1. Mini incision open
2. Radioguided
3. Video-assisted and endoscopic approaches

16. Complete evaluation and management of recurrent or persistent hyperparathyroidism, including imaging studies and selective venous sampling.
17. Regional anesthesia for minimally invasive parathyroidectomy.
18. Treatment pathway for MEN 1 and 2A patients, including the order in which the different manifestations should be treated.

IV. Adrenal Disease

1. Embryology, histology, and physiology of the adrenal gland, distinguishing differences in the cortex and medulla.
2. Anatomy of the adrenal gland, including the arterial supply, venous drainage and relationship to adjacent structures.
3. Biosynthesis and physiologic effects of glucocorticoids, mineralocorticoids, and adrenal sex steroids.
4. Catecholamine synthetic pathway.
5. Etiologies, common signs and symptoms, and clinical presentations of Cushing's syndrome.
6. Diagnostic evaluation of hypercortisolism.
7. Protocol for perioperative steroid use in a patient taking exogenous steroids.
8. Etiologies, clinical presentation, evaluation and management of adrenal insufficiency.
9. Complications of adrenalectomy, including adrenal insufficiency and the diagnosis, treatment, and causes.
10. Signs, symptoms, and evaluation of primary hyperaldosteronism.
11. Differentiate between primary and secondary hyperaldosteronism.
12. General attributes of adrenocortical carcinoma.
13. Physiology, clinical presentation, treatment, and preoperative preparation of pheochromocytoma.
14. Perform a thorough physical examination and be familiar with signs of hormone excess. (hirsutism, striae, acne, facial changes, clitoral hypertrophy, etc)

- 15.** Diagnostic pathway of ACTH dependent vs. ACTH independent Cushing's syndrome, including the role of the low and high dose dexamethasone suppression test. Understanding of normal ranges and those expected for suppression of cortisol and be familiar with the utility and role of salivary, venous and urinary cortisol assessments.
- 16.** Localization studies available for adrenal tumors, including CT scanning, MIBG, PET scanning, and MRI.
- 17.** Distinguish bilateral hyperplasia vs. unilateral disease in Cushing's syndrome and primary hyperaldosteronism.
- 18.** Diagnostic algorithm for primary hyperaldosteronism.
- 19.** Treatment and outcome for primary hyperaldosteronism in patients treated with adenoma vs. bilateral adrenal hyperplasia.
- 20.** Diagnostic evaluation and treatment of adrenocortical carcinoma.
- 21.** Diagnostic pathway for pheochromocytoma and review of the treatment modalities and recommendations.
- 22.** Evaluation and treatment of an adrenal incidentaloma.
- 23.** Etiology, diagnosis, and treatment of adrenal cystic disease.
- 24.** Role of fine needle aspiration biopsy in the evaluation of adrenal tumors.
- 25.** Operative approaches for adrenal surgery, including the laparoscopic trans- and extraperitoneal approaches and anterior, lateral and posterior open approaches.
- 26.** Understanding of functioning imaging modalities for pheochromocytoma and adrenal hyperplasia (i.e., MIBG or NP 59 scanning)
- 27.** Understanding technique involved with adrenal vein sampling; role of ACTH stimulation and cortisol assessment to document accuracy of catheter location.
- 28.** Understanding algorithm and dosing of preoperative preparation/blockade for pheochromocytoma
- 29.** Be familiar with medications that can alter interpretation of catecholamines (i.e. antidepressants, Tylenol, etc)
- 30.** Congenital adrenal hyperplasia.
- 31.** Surgical approaches to pheochromocytoma.

- 32.** Review all the surgical options/approaches for adrenalectomy and the indications for each.
- 33.** Intraoperative management of patients with pheochromocytoma during surgery regarding anesthetic management, surgical technique, and pre and postoperative care.
- 34.** Distinguishing characteristics of extraadrenal pheochromocytomas.
- 35.** Evaluation and treatment of multiple endocrine neoplasia type 2 syndrome in a patient with adrenal lesions.
- 36.** Treatment options for a patient with malignant pheochromocytoma.
- 37.** Steps for a safe and successful right and left laparoscopic transabdominaladrenalectomy. Be familiar with operative technique (positioning, steps of the operation)
- 38.** Diagnosis and treatment of paragangliomas.
- 39.** Be familiar with common complications following adrenalectomy and ways to avoid them.
- 40.** Be comfortable with maintenance or physiologic dosing of steroids and fludrocortisone following bilateral adrenalectomy. Be comfortable with conversion of steroid supplementation.(ex: Dexamethasone, Methylprednisolone hydrocortisone)
- 41.** Indications and technique of subtotal adrenalectomy
- 42.** Intraoperative medical management of adrenergic crisis.

V. Gastrointestinal Neuroendocrine Tumors

Gastrointestinal neuroendocrine tumors are rare entities. Therefore, the focus of this section is on gastrointestinal hormone pathophysiology and recognition of syndromes associated with tumors producing these hormones. Because of the rarity of these tumors and syndromes, only knowledge objectives are incorporated in this section of the curriculum.

- 1.** Site of synthesis, mechanism of action, and normal physiologic effects of the following gastrointestinal hormones
 - Gastrin
 - Insulin

- Glucagon
- Vasoactive Intestinal Peptide
- Somatostatin

2. Different cell types of the endocrine pancreas, their synthetic products, stimuli and inhibitors to these products, and distribution in the pancreas.

3. Symptoms and syndromes associated with the hypersecretion of the following gastrointestinal hormones:

- Gastrin
- Insulin
- Glucagon
- Vasoactive Intestinal Peptide
- Somatostatin

4. Typical presentation of carcinoid tumors.

5. Sites of occurrence of carcinoid tumors including their frequency and propensity for developing carcinoid syndrome.

6. Pathophysiology of carcinoid syndrome.

7. Diagnostic approach including biochemical evaluation, ancillary studies, and recommended localization methods for the following tumors:

- Gastrinoma/ Zollinger-Ellison syndrome
- Insulinoma
- Glucagonoma
- VIPoma
- Somatostatinomas
- Nonfunctional neuroendocrine tumors

8. Indications for surgery, operative approaches, and expected outcomes for the following tumors:

- Gastrinoma
- Insulinoma
- Glucagonoma
- VIPoma

- Somatostatinomas
- Nonfunctional neuroendocrine tumors

9. Understanding of diagnosis and treatment of syndrome of post gastric bypass hypoglycemia

10. Algorithm for surgical management of carcinoid tumors based on site, size, and presence of carcinoid syndrome.

11. Follow up of patients who have undergone resection of carcinoid tumors.

12. Management of liver metastases of the neuroendocrine tumors.

VI. Familial Endocrinopathies

Familial endocrinopathies are rare entities; however they have important screening and treatment implications. Because of their rarity only knowledge objectives are incorporated in this section of the curriculum.

VII. Multiple Endocrine Neoplasia Syndromes

1. Components of each of the following multiple endocrine neoplasia (MEN) syndromes, their mode of inheritance, and the frequency of expression of each component:

- MEN type 1
- MEN type 2A
- MEN type 2B

2. Diagnostic approach for each of the MEN syndromes.

3. Treatment, including timing of operative approach, for each component of the following syndromes:

- MEN type 1
- MEN type 2A
- MEN type 2B

4. Recommended genetic testing for patients suspected of having one of the MEN syndromes.

5. Recommended screening for kindred of patients with the different MEN syndromes.
6. Recommended follow up of patients with the different MEN syndromes.
7. Prognosis for each of the MEN syndromes.

VIII. Familial Medullary Thyroid Cancer

1. Mode of inheritance of Familial Medullary Thyroid Cancer (FMTC).
2. Diagnostic evaluation, including genetic testing, of FMTC.
3. Recommended treatment, including the role of prophylactic thyroidectomy, for FMTC.
3. Recommended screening for kindred of patients with the different MEN syndromes.
4. Recommended follow up of patients with FMTC.
5. Prognosis for FMTC.
6. Compare and contrast the evaluation and management of FMTC with sporadic medullary thyroid cancer.

IX. Familial Papillary Thyroid Cancer

1. Diagnostic criteria for familial papillary thyroid cancer (FPTC).
2. Mode of inheritance of FPTC.
3. Recommended screening for FPTC.
4. Recommended treatment of FPTC.
5. Recommended follow up of patients with FPTC.
6. Prognosis for FPTC.
7. Compare and contrast the evaluation and management of FPTC with sporadic papillary thyroid cancer.

X. Familial Non-MEN Hyperparathyroidism

1. Diagnostic criteria for familial non– MEN hyperparathyroidism (FHPTH).
2. Mode of inheritance of FHPTH.
3. Recommended screening for FHPTH.

4. Compare and contrast the evaluation and management of FHPTH with sporadic primary hyperparathyroidism.

XI. Familial Non-MEN Syndromes

Knowledge about the endocrine pathology and management of familial non-MEN syndromes including;

1. vonHippelLindau (VHL)Neurofibromatosis
2. Paraganglioma syndromes (SDH-B, SDH-D)
3. Cowden's Disease
4. Familial HPT
5. Jaw-Tumor Syndrome
6. Familial Medullary thyroid cancer (MTC)
7. Carney Complex
8. Carney's Triad
9. FHH

XII. Imaging Modalities:

Role and apply the appropriate utilization of the following imaging and diagnostic studies in the surgical management of endocrine surgical disease:

- Ultrasound
- CT, MRI, PET
- Scintigraphy including; radioactive iodine, meta- iodobenzylguanine [MIBG], sestamibi, Octreotide scan, NP-59 scan.
- Selective venous sampling (parathyroid and adrenal)
- Intraoperative tumor localization (gamma probe, Intra-Op U/S)

XIII. Diabetic Foot

- Anatomy of diabetic foot
- Blood supply and venous drainage of lower limb
- Physiology of insulin secretion
- Aetiology and pathology of Diabetes Mellitus and its complications
- Medical, nutritional therapy and treatment of Diabetes Mellitus
- Risk factors for diabetic foot ulceration
- Neuropathic and neuroischemic ulcer

- Patho physiology of various types of gangrene
- Neuroosteoarthropathy and charcot foot

XIV. Bariatric and Metabolic Surgery

1. Epidemiology of obesity
2. Pathophysiology of morbid obesity and the metabolic syndrome
3. Therapeutic options for morbid obesity
4. Indications for weight loss and metabolic surgery
5. The principles of perioperative management of the obese patient
5. Types of operations performed and mechanisms of action
6. Complications of metabolic surgery and their management
7. Revisional metabolic surgery
8. Long term management of the bariatric patient following surgery
9. Essential components of a bariatric service
10. Psychology of the morbidly obese patient

XV. Breast Surgery

1. Normal anatomy, physiology and lymphnode of the breast
2. Benign condition of the breast
3. Pathology, clinical features, prognostic factors and treatment of breast cancer
4. Various imaging modalities for breast cancer
5. Molecular pathology of breast cancer

XVI 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 suffering 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.

4. CLINICAL TRAINING:

The students will be clinically trained in parent department during the 3 years course.

1. Minimum one month posting in the department of medical endocrinology
2. Minimum 15 days posting in the department of Diabetology.
3. Minimum 15 days posting in the department of Nuclear Medicine
4. Minimum 15 days posting in the department of minimal access surgery

During II year, 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.

I. Pituitary

1. Develop skill to diagnose and treat complications of various pituitary adenomas.
2. Develop skill to interpret the MRI Brain and CT Skull bones. Develop skill to identify pituitary
3. Learn various types of complications of pharmacological agents used in various pituitary disorders
4. Learn about various surgical approaches for pituitary surgery
5. Describe the outcome of endoscopic sphenoidal pituitary surgery

II. Thyroid

1. Obtain a focused history, perform an examination, and institute the diagnostic evaluation of a patient with the following conditions:
 - Thyroid nodule

- Goiter
 - Hyperthyroidism
2. Palpate and describe a thyroid nodule
 3. Palpate and describe a goiter
 4. Identify exophthalmos
 5. Demonstrate normal anatomy in the operating room
 6. Palpate and describe a thyroid nodule
 7. Perform a fine needle aspiration biopsy of a palpable thyroid nodule
 8. Perform the initial steps in thyroid surgery, including
 - Patient positioning and marking
 - Skin incision and raising subplatysmal flaps
 - Opening strap muscles
 - Close strap muscles, platysma, and skin
 9. Perform and interpret head and neck ultrasonography
 - Identify which ultrasound equipment/probes are best used for head and neck ultrasonography.
 - Identify normal structures visualized during ultrasound of the head and neck (Thyroid, parathyroid, lymph nodes, trachea, carotid artery, internal jugular vein, inferior and superior thyroid vessels, parotids, submandibular glands)
 - Describe the echogenicity of a visualized structure as hypoechoic, isoechoic, anechoic or hyperechoic relative to the normal thyroid gland
 - Use ultrasound to identify thyroid nodules, parathyroid adenomas and adenopathy
 - Describe which features of a thyroid nodule on ultrasound are more worrisome for malignancy
 10. If possible perform an ultrasound guided fine needle aspiration biopsy of a thyroid nodule
 11. Assess vocal cord function either by flexible transnasal endoscopy or indirect laryngoscopy.
 12. Interpret the CT Neck

13. Identify the thyroid nodule, trachea, oesophagus and intra vascular structures.
14. Identify malignant features of thyroid nodule
15. Identify the neck nodes
16. Identify extra glandular infiltration and thyroid carcinoma

III. Parathyroid Disease

1. Obtain a focused history, perform an examination, and institute the diagnostic evaluation of a patient with hypercalcemia
2. Demonstrate normal parathyroid anatomy in the operating room at the time of parathyroidectomy or thyroidectomy.
4. Interpret a sestamibi scan.
5. Perform the following steps of parathyroidectomy (Be able to describe difference in performing a full neck exploration, minimally invasive approach, unilateral or focused)
 - Patient positioning and marking
 - Skin incision and raising subplatysmal flaps
 - Opening strap muscles
 - Close strap muscles, platysma, and skin
6. Perform a parathyroidectomy (preferably both full neck exploration and minimally invasive), including
 - Intraoperative identification and resection of adenoma
 - Intraoperative identification of normal parathyroid glands
 - Intraoperative identification of hyperplasia
7. Reimplant a parathyroid gland
8. Participate in or perform re-exploration for persistent or recurrent hyperparathyroidism.
9. Assess vocal cord function either by flexible transnasal endoscopy or indirect laryngoscopy.
10. Interpret a neck ultrasound, demonstrating the thyroid gland, adjacent structures and a parathyroid adenoma or hyperplasia.
 - Identify which ultrasound equipment/probes are best used for head and neck ultrasonography

- Identify typical locations where an abnormal parathyroid may be visualized during ultrasound of the head and neck
- Use ultrasound to identify parathyroid adenomas, hyperplastic parathyroids and learn about the ultrasound features that help differentiate them from thyroid nodules and adenopathy.
- Participate in or learn the protocol and value of performing a fine needle aspiration of a parathyroid with measurement of PTH levels on the needle washout.

IV. Adrenal Disease

1. Identify both adrenal glands in a cadaver or in the operating room.
2. Locate the adrenal glands on a CT scan
3. Identify adrenal anatomy, blood supply, and surrounding structures at the time of adrenalectomy or other operation.
4. Demonstrate operative exposure (open or laparoscopic; human, cadaver, or animal) of either adrenal gland.
5. Perform an adrenalectomy (open or laparoscopic), including patient positioning, dissection, resection, and postoperative care.

V. Gastrointestinal Neuroendocrine Tumors

1. Interpret CT Abdomen identify the pancreas, the stomach and others
2. Normal anatomy of stomach pancreas in the operating room
3. Skill to do and interpret intra operative ultrasound
4. Skill to do laparotomy
5. Skill to resect NET in the tail of the pancreas
6. Skill to do bowel resection and mesentery dissection and lymphonodes

VI. Diabetic Foot

1. Develop skill to identify the various risk factors for diabetic foot
2. Develop skill to debride the wound
3. Learn types and uses of various dressing appliances and learn the method of applying
4. Learn skills in various amputations
5. Describe the preventive and therapeutic

VII. Bariatric and Metabolic Surgery

- History and examination of the obese patient
- Interpretation of investigations in the obese patients
- Preoperative evaluation and optimization
- Assessment of the post-operative bariatric patient
- Management decisions for early and late complications of bariatric surgery

VIII. Interdepartmental Disciplines

1. Gain exposure to and / or to work with colleagues in other disciplines related to the diagnoses and treatment of endocrine surgical disease such as;

- Nuclear medicine
- Medical Oncology
- Genetics
- Interventional Radiology
- Gastroenterology
- Voice lab
- Pathology

IX. Breast Surgery

1. Interpret the various imaging modalities of breast cancer
2. Learn about various surgeries performed for breast cancer

Students are encouraged to undergo special postings for learning new advanced techniques / Procedure / Skills in institutions of higher reputation where the requisite facilities are available without affecting the duties of the parent department.

5. SKILL TRAINING:

Develop ability to do

- Video laryngoscopy
- Ultrasonogram neck
- Interpret imaging of CT & MRI of Neck, Abdomen and foot
- Develop skill to do FNAC of thyroid

- Develop skill to do ultrasound guided FNAC of thyroid
- Surgeries 1. Hemithyroidectomy
 - 2. Total thyroidectomy
- Various compartmental lymph node dissection
- Parathyroidectomy
 - Focal and four gland exploration
- Abdominal both open and laproscopic adrenelectomy
- Laparoscopic access in the morbidly obese
- Roux en Y gastric bypass
- Insertion of laparoscopic gastric band
- Sleeve gastrectomy
- Amputation of foot and leg
- Tracheostomy

6. TEACHING METHODOLOGY:

1. Daily bedside didactic lectures by faculty
2. Monthly seminar and symposium and journal check by post graduate
3. Post graduate oriented training in the form of case discussion and ward rounds
4. Inter disciplinary meeting with departments of pathology, nuclear medicine, radiology, ENT, gastro enterology
5. Monthly departmental statistical meeting
6. Departmental morbidity and mortality meeting
7. The training will be given full responsibility of patients he will be encourage to improve and develop his decision making ability under the supervision of teacher
8. Theory examination once in six months from the first year onwards and model practical examination at the end of second year and third year.

7. RESEARCH WORK:

1. Understand the design of both clinical and basic science research studies

2. Develop a basic understanding of the statistical method applied to various study design
3. Develop a basic knowledge of molecular biology as it apply to endocrine surgical disease
4. Be able to critically apprai the medical literature
5. To develop a research question in endocrine surgical disease and pursue an appropriate research project
6. To present the work in written and oral form at conference
7. Help mentor in preview of articles submitted for publication
8. Students should compulsorily attend Research Methodology workshop conducted by the University with in first six months of M.Ch. Course.

8. LOG BOOK:

The Postgraduate student of a Postgraduate Degree Course in Super specialties shall maintain Log Book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently.

The Log Book shall be checked and assessed by the faculty members imparting the training.

Periodical evaluation of Log Book to be done by the Head of the Department as per 52nd SAB.

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

9. COMPETENCY ASSESSMENT:

Overall:

- | | | |
|---|---|----------|
| 1. Communication / Commitment / Contribution / Compassion towards patients and Innovation | - | 10 Marks |
| 2. Implementation of Newly learnt techniques | - | 10 Marks |
| 3. Documentation of case sheets / discharge Summary / Review | - | 10 Marks |
| 4. Number of cases presented in Clinical Meetings/ Journal Clubs / Seminars / Papers presented in Conference. | - | 10 Marks |

5.	No. Of Medals/ Certificates won in the conference / Quiz competitions and other academic meetings with Details.	-	10 Marks

		Total	50 Marks

Assessment	I - February	-	First Year
	II - August	-	First Year
	III - February	-	Second Year
	IV - August	-	Second Year
	V - February	-	Third Year
	VI - May	-	Third Year

VIVA INCLUDING COMPETENCY ASSESSMENT – 100 Marks (50+50)

10. THEORY EXAMINATION

Paper I: Basic Sciences as applied to Endocrine Surgery (Applied Anatomy, Physiology, Biochemistry, Pharmacology and Pathology)

Paper II: Endocrine surgery – General

Paper III: Endocrine surgery – Focused to Thyroid & Thyroid related diseases

Paper IV: Recent Advances in Endocrine Surgery and Investigations for Endocrine diseases.

Each paper will contain:

1. Essay questions (2)	-	2 X 15 =	30 Marks
2. Short Notes (10)	-	10 X 7 =	70 Marks

	Total		100 Marks

11. CLINICAL EXAMINATION:

Particulars	Time for candidate to examine the cases	Time examiners question candidates for to the	Maximum Marks
Long Case	1 Case X 60 Minutes	60 Minutes	100
Short Case	2 Cases X 15 Minutes	30 Minutes	100
Ward Rounds	3 Patients X 10 Minutes	30 Minutes	100
OSCE	5 stations X 3 Minutes	15 Minutes	50
Viva Voce		15 Minutes	100
Log Book			50
Total			500

13.9 A Postgraduate student of a Postgraduate degree Course in broad specialties/ Super Specialties would be required to present one poster presentation to read one paper at a National/State conference and to present one Research paper which should be published/accepted for publication/sent for publication during the period of his Postgraduate studies so as to make him eligible to appear at the Postgraduate Degree Examination.

Apart from Poster/Oral paper presentation in National/State conferences, the Research paper published by the candidate in the University Journal of Medical Sciences will be considered as equivalent to the Research Paper as mentioned in 13.9. clause. Case Reports can also be published in University Journal of Medical Sciences but case reports will not be considered as Research Paper.

The candidate can also present Research Paper as per Clause 13.9 of Post Graduate Education Regulation 2000, and if the article sent for publication by the candidate as primary author or corresponding author which has not yet been published/accepted for publication, the candidate should submit a letter from the HOD, stating that the article sent for publication is of publishable merit and the proof of the Research Article submitted to the Journal for publication should be sent to the university forwarded through the HOD [as per 53rd SAB]

The student can submit articles for the University journal anytime from the time of registration till 6 months prior to theory examination.

12. OSCE: 5 STATIONS:

- Pathology slide/ cytology/ HPE
- Instrument/ open/ laproscopic
- Radiology imaging- x-ray/CT scan/ MRI
- Nuclear imaging
- Interpretation of biochemical volume

13. REFERENCE BOOKS:

- 1 TEXTBOOK OF ENDOCRINE SURGERY CLARK DUH KEBEBEW 2015
- 2 THE THYROID - A FUNDAMENTAL AND CLINICAL TEXT VOL 1 "LEWIS E BRAVERMAN DAVID S.COOPER" 2013.
- 3 THE THYROID - A FUNDAMENTAL AND CLINICAL TEXT VOL 2 "LEWIS E BRAVERMAN DAVID S.COOPER" 2013
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- 5 "ENDOCRINOLOGY ADULT AND PEDIATRIC 6TH EDITION
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- 6 WILLIAMS TEXTBOOK OF ENDOCRINOLOGY 12TH EDITION
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- 7 ELEMENTS OF MEDICAL GENETICS PETER TURNPENNY 2007.
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- 9 ENDOCRINE SURGERY MADE EASY AGARWAL 2010 JAYPEE
- 10 AN ATLAS OF HEAD AND NECK SURGERY VOL 1 JOHN M.
LORE 1985.
- 11 NETTER'S ATLAS OF HUMAN EMBRYOLOGY LARRY R
COCHARD 2002
- 12 REOPERATIVE SURGERY RONALD K. TOMPKINS 1988.
- 13 APPLIED PHYSIOLOGY 13TH EDITION CYRIL A. KEELE 1988
- 14 ATLAS OF ENDOCRINE SURGICAL TECHNIQUES DUH CLARK
KEBEBEW 1996
- 15 ENDOSCOPIC AND ROBOTIC NECK SURGERY EUN CHANG
CHOI 2013
- 16 ENDOCRINE PATHOLOGY JOHN R. GOLDBLUM 2010.
- 17 SURGICAL ENDOCRINOLOGY STANLEY FRIESEN 2000.
- 18 MANUAL OF PRACTICAL ANATOMY VOL 3 HEAD NECK AND BRAIN
15TH EDITION G J ROMANES 1992.
- 19 SURGERY OF THE THYROID AND PARATHYROID GLANDS
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- 20 THYROID DISEASE ENDOCRINOLOGY SURGERY NUCLEAR
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- 21 DIFFICULT PROBLEMS IN GENERAL SURGERY JOHN L.
SAWYERS
- 22 CLINICAL AND EXPERIMENTAL PHEOCHROMOCYTOMA WILLIAM
Manger 2012
- 23 ENDOCRINE SURGERY A COMPANION TO SPECIALIST SURGICAL
PRACTICE THOMAS W J LENNARD
- 24 TIPS AND TRICKS IN ENDOCRINE SURGERY JUH C WATKINSON
- 25 ENDOCRINE SURGERY WILLIAM B INABNET
- 26 TEXT BOOK OF ENDOCRINE SURGERY 3RD EDITION ORLO H
CLARK
- 27 BENIGN DISORDERS AND DISEASE OF THE BREAST 3RD
EDITION RE MANSEL SAUNDERS
- 28 SUPREME TRIUMPH OF SURGEONS ART A NARRATIVE HISTORY
OF ENDOCRINE SURGERY MARTHA ZEIGER
- 29 MOLECULAR BIOLOGY OF THE GENE 6TH EDITION WATSON

30. CONTEMPORARY OF MANAGEMENT OF DIABETIC FOOT BY SHARAD PENDSY
31. MANAGING THE DIABETIC FOOT WILEY BLACKWELL
32. THE DIABETIC FOOT – MEDICAL AND SURGICAL MANAGEMENT – HUMAN PRESS
33. DIABETIC FOOT – CLINICAL ATLAS – SHARAD PENDSY
34. OBESITY BARIATRIC AND METABOLIC SURGERY - SPRINGER
35. THE ASMBS TEXT BOOK OF BARIATRIC SURGERY – SPRINGER
36. MINIMALLY INVASIVE BARIATRIC AND METABOLIC SURGERY SPRINGER
37. METOBOLISM AND PATHOPHYSIOLOGY OF BARIATRIC SURGERY – ELSEVIDR
38. BUCHWALDS ATLAS OF METABOLIC AND BARIATRIC SURGICAL TECHNIQS AND PROCEDURES

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

14. JOURNALS:

1. WORLD JOURNAL OF ENDOCRINE SURGERY
2. JOURNAL OF INDIAN ASSOCIATION OF ENDOCRINE SURGERY
3. WORLD JOURNAL OF SURGERY
4. INDIAN JOURNAL OF SURGERY
5. BRITISH JOURNAL OF SURGERY
6. THYROID
7. THYROID RESEARCH AND PRACTICE
8. SURGERY
9. ANNALS OF SURGERY
10. JOURNAL OF CLINICAL ENDOCRINOLOGY AND METABOLISM
11. DIABETIC FOOT AND ANKLE JOURNAL
12. JOUNAL OF DIABETIC FOOT COMPLICATION
