MAHATMA GANDHI UNIVERSITY
of
MEDICAL SCIENCES & TECHNOLOGY
JAIPUR

Super Specialty Courses

SYLLABUS
DM Endocrinology

Edition 2022-23

Notice

1. Amendment made by the National Medical Commission (NMC) in Rules/Regulations of Post Graduate Medical Courses shall automatically apply to the Rules/Regulations of the Mahatma Gandhi University of Medical Sciences & Technology (MGUMST), Jaipur.
2. The University reserves the right to make changes in the syllabus/books/guidelines, fees-structure or any other information at any time without prior notice. The decision of the University shall be binding on all.
3. Jurisdiction of all the court cases shall be Jaipur Bench of Hon'ble Rajasthan High Court only.

Syllabus of DM / M.Ch. Courses
DM Endocrinology

Selection of Candidates:

There shall be a uniform entrance examination for all the Medical Educational Institutions at the Postgraduate level namely 'National Eligibility-cum-Entrance Test' for admission to the postgraduate courses in each academic year and shall be conducted under the overall supervision of the Ministry of Health & Family Welfare, Government of India.

In order to be eligible for the admission to the Postgraduate Course for an academic year, it shall be necessary for a candidate to obtain minimum of marks at 50th percentile in the 'National Eligibility-Cum-Entrance Test for Postgraduate courses' held for the said academic year, however, in respect of candidates belonging to Scheduled Castes, Scheduled Tribes, and Other Backward Classes, the minimum marks shall be at 40th percentile. In respect of candidates with benchmark disabilities specified under the Rights of Persons with Disabilities Act, 2016, the minimum marks shall be at 45th percentile for General Category and 40th percentile for SC/ST/OBC.

Percentile shall be determined on the basis of highest marks secured in the All India Common merit list in National Eligibility-cum-Entrance Test for the Postgraduate courses.

Provided sufficient number of candidates in the respective categories fail to secure minimum marks as prescribed for National Eligibility-cum-Entrance Test held for any academic year for admission to the Postgraduate Courses, the Central Government in consultation with the National Medical Commission of India may at its discretion lower the minimum marks required for admission to Post Graduate Course for candidates belonging to respective categories and marks so lowered by the Central Government shall be applicable for the academic year only.

Reservation of seats in Medical Colleges/institutions for respective categories shall be as per applicable laws prevailing in States/Union Territories. An all India merit list as well as State-wise merit list of the eligible candidates shall be prepared on the basis of the marks obtained in National Eligibility-cum-Entrance Test and candidates shall be admitted to Postgraduate Courses from the said merit lists only.

There shall be no admission of students in respect of any academic session beyond 31st August under any circumstances. The Universities shall not register any student admitted beyond the said date.

ELIGIBILITY:

S. No.	Area of Specialisation	Prior Requirement
1	DM Cardiology	MD (Medicine / Paediatrics)
2	DM Medical Gastroenterology	
3	DM Nephrology	
4	DM Neurology	
5	M.Ch. Cardio vascular & Thoracic Surgery	MS (Surgery)
6	M.Ch. Urology	
7	M.Ch. Neuro-Surgery	
8	M.Ch. Plastic Reconstructive Surgery	
9	M.Ch. Surgical Gastroenterology	

Common Counseling:
There shall be a common counseling for admission to all the Postgraduate Super specialty Courses (DM/ M.Ch.) in all Medical Educational Institutions on the basis of merit list of the National Eligibility-cum-Entrance Test.

Period of Training:
The period of training for obtaining DM/M.Ch Degrees shall be three completed years including the examination period.

Migration:
Under no circumstance, Migration/transfer of student undergoing any Super Specialty course shall be permitted by any University/Authority.

Staff - Faculty:
Only those teachers who possess 6 years teaching experience out of which at least 2 years teaching experience as Assistant Professor gained after obtaining the higher specialty degree shall be recognized post graduate teacher.

No teacher shall be considered as a postgraduate teacher in any other institution during the period till the postgraduate course at the institute which has been granted permission considering him as a postgraduate teacher is recognized u/s 11(2) of the Indian Medical Council Act, 1956.

Minimum staff required (Super-speciality):

1- Professor	: 01
2- Associate Professor	: 01
3- Assistant Professor	: 01
4- Senior Resident	: 01
5- Junior Resident	: 02

Training programme:
All candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic year (Academic Term of 6 months) including assignments, assessed full time responsibilities and participation in all facets of the educational process.

No candidate shall be permitted to run a clinic/work in clinic/laboratory/nursing home while studying in postgraduate super specialty course. No candidate shall join any other course or appear for any other examination conducted by this university or any other university in India or abroad during the period of registration for a superspeciality postgraduate course in MGUMST.

Every institution undertaking Post Graduate training programme shall set up an Academic cell or a curriculum committee, under the chairmanship of a senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other department faculty staff and also coordinate and monitor the implementation of these training Programmes.

The training programmes shall be updated as and when required. The structured training programme shall be written up and strictly followed, to enable the examiners to determine the training undergone by the candidates and the National Medical Commission inspectors to assess the same at the time of inspection.

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 including details of surgical operations assisted or done independently by the DM candidates.

Record (Log) Books shall be checked and assessed periodically by the faculty members imparting the training.

During the training for award of Degree / Superspecialty in clinical disciplines, there shall be proper training in Basic medical sciences related to the disciplines concerned; so also in the applied aspects of the subject; and allied subjects related to the disciplines concerned. In the Post Graduate training programmes including both Clinical and Basic medical sciences, emphasis has to be laid on Preventive and Social aspects. Emergency care, facilities for Autopsies, Biopsies, Cytopsies, Endoscopy and Imaging etc. shall also be made available for the training purposes.

Superspeciality Post Graduate students shall be required to participate in the teaching and training programme of undergraduate and post graduate students as well as the interns.

Training in Medical Audit, Management, Health Economics, Health Information System, basics of statistics, exposure to human behaviour studies, knowledge of pharmaco – economics and introduction to nonlinear mathematics shall be imparted to the Post Graduate students.

The teaching and training of the students shall include graded responsibility in the management 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 and Surgical treatment; training in the Basic Medical Sciences, as well as in allied clinical specialitites.

Training programme shall be on the same pattern as for M.D. / M.S. in clinical disciplines; with practical training including advanced Diagnostic, Therapeutic and Laboratory techniques, relevant to the subject of specialization. Postgraduate Superspecialty Residents in Surgical Specialties shall participate in Surgical operations as well.

As student of a postgraduate degree course in super specialities 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 the publication/sent for the publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

ENROLMENT AND REGISTRATION

Every candidate who is admitted to DM/MCh. course in Mahatma Gandhi Medical College & Hospital shall be required to get himself/herself enrolled and registered with the Mahatma Gandhi University of Medical Sciences & Technology (MGUMST) after paying the prescribed eligibility and enrolment fees.

The candidate shall have to submit an application to the MGUMST through Principal of College for the enrolment/eligibility along with the following original documents and the prescribed fees within two months of his/her admission or up to November 30 of the year of admission whichever is later without late fees. Then after, student will have to pay applicable late fees as per prevailing University Rules.

(a) MD/MS pass Marks sheet/Degree certificate issued by the concerned University.
(b) Migration certificate issued by the concerned University (in case the University is other than the MGUMST).

(c) Date of Birth Certificate
(d) Certificate regarding registration with Rajasthan Medical Council / National Medical Commission of India / Other State Medical Council.

No candidate shall be allowed to appear in University examination without his/her enrolment with the University.

ELIGIBILITY TO APPEAR FOR UNIVERSITY EXAMINATION

1. **Work diary or Logbook**: Every candidate shall maintain a work diary for recording his/her participation in the training program conducted in the department. The work diary and logbook shall be verified and certified by the Department Head.
2. Every student would be required to present one poster presentation, one plateform paper at a National/State Conference / one research paper which should be published/accepted for publication/ sent for publication to an indexed journal during the period of his/her post graduate studies so as to make him/her eligible to appear at the Post Graduate Degree Examination.
3. **Attendance:** Every candidate shall have fulfilled the requirement of 80% attendance during each academic year of the postgraduate course (as per NMC rules).

SCHEME OF EXAMINATION

The examination shall be held at the end of three academic years (six academic terms). The academic term shall mean six months training period. The examination shall consist of: Theory and Clinical/Practical and Oral.

The examinations shall be organised on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence.

For passing DM/M.Ch. examination as a whole, a candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory (2) Clinical / Practical and Oral examination.

(1) **Theory:**

There shall be four theory papers of 3 hours duration and 100 marks each. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

Paper I and II will be set by one external examiner from outside of the state and paper III and IV by another external examiner from outside of the state. The external examiner, who is paper setter for paper I & II shall evaluate the answer books of paper II. The external examiner, who is paper setter for paper III & IV shall evaluate the answer books of paper III. The answer books of paper I & IV shall be evaluated by internal examiners. The answer books of paper IV shall be evaluated by the Head of the Department and the answer books of paper I shall be evaluated by the second Internal Examiner.

Candidates will be required to attempt all the questions in every question paper. In Paper I, Paper II and Paper III there will be 10 questions. Each question shall carry 10 marks. In Paper IV there will be 5 questions of 20 marks each.

Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers shall be compulsory to pass the examination.

Nomenclature of Papers

There will be four papers, each of three hours duration.

Paper I: Basic sciences relevant to the discipline of endocrinology and metabolism

Paper II: Clinical aspects and diagnosis of endocrinology and metabolism disorders

Paper III: Therapeutic aspects of endocrinology and Metabolism and Laboratory technology

Paper IV: Recent Advances in Endocrinology & Metabolism

(2) **Clinical / Practical and Oral:**

Clinical/Practical examination shall be conducted to test / aimed at assessing the knowledge and competence of the candidate for undertaking independent work as a specialist / teacher. Practical examination shall consist of carrying out special investigative techniques for Diagnosis and Therapy. M.Ch candidates shall also be examined in surgical procedures. Oral examination may be comprehensive enough to test the candidate's overall knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which shall form a part of the examination.

There shall be one long case of 150 marks, two short cases of 75 marks each and oral examination of 100 marks. Obtaining of 50% marks in Clinical / Practical and Oral examination shall be mandatory for passing the Clinical / Practical and Oral examination.

Candidate will have an internal assessment at the end of first two years and there will be one examination at the end of three years of the training.

Assessment of Logbook and dissertation

Clinical Examination:

1. Long case – 1 hour
2. Short case – A selection of short cases covering a wide range of problems (1 hour)
3. Clinical ward round

Viva voce:

This is to assess the competences of the candidate in interpreting various diagnostic aids, Pathology specimens, slides and surgical instruments, radiological images of relevance to the subject are to be identified and discussed to evaluate analytical skills in all settings and their appropriateness.

Result:

For passing DM/M.Ch. Examination, a candidate will be required to obtain at least 40% marks in each theory paper, 50% marks in the aggregate of all the four theory papers and 50% marks in the aggregate of Clinical / Practical and Oral examination separately. A candidate failing in any theory paper or in the aggregate of all four theory papers or Clinical / Practical and Oral examination shall have to repeat the whole DM/M.Ch. examination.

Grace Marks

No grace marks will be provided in DM/M.Ch. examinations.

Revaluation / Scrutiny

No Revaluation shall be permitted in the DM/M.Ch. examinations. However, the student can apply for scrutiny of the answer books as per University Rules

Examiners:

As per the Amendment Notification of the MCI dated June 5, 2017, no person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.

For all Post Graduate Super specialties examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, who shall be invited from other recognised universities from outside the State.

Number of Candidates:

The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed three for D.M./M.Ch examinations.

Number of Examinations:

The university shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and not more than 6 months between the two examinations

GUIDELINES FOR COMPETENCY BASED POSTGRADUATETRAINING PROGRAMME FOR DM IN ENDOCRINOLOGY

Preamble

The programme aims at training a physician in the specialty of Endocrinology encompassing the related knowledge, skills and attitudes so as to enable him/her to function as an independent clinician/consultant and a teacher well acquainted with research methods in endocrine medicine.

A post graduate student pursuing DM (Endocrinology) course must acquire adequate knowledge of (a) Basic Sciences as applied to Endocrinology, Diabetes and Metabolism, (b) clinical, experimental, comparative, investigative, relevant surgical and applied aspects of Endocrinology and Metabolism, as well as (c) recent advances in this field.

Eligibility Requirements

Students who have completed MD/DNB in General Medicine or Pediatrics are eligible for DM in Endocrinology

SUBJECT SPECIFIC LEARNING OBJECTIVES

At the end of the course the candidate who is eligible for a DM degree in Endocrinology should acquire:

a. knowledge in the basic, comparative and translational and clinical endocrinology, diabetes and metabolism,

b. clinical diagnostic critical thinking, problem solving, self-directed learning and procedural skills,

c. Skills as related to formulating research questions, initiating, conducting and analysing translational, clinical and epidemiologic research,

d. Team leadership and networking skills,

e. Communication skills necessary for working with and educating patients and team members,

f. Attitudes and values that will allow him or her to provide compassionate, responsive and respectful ethical care to the patient.

A. Theoretical Knowledge:

- The post graduate student in Endocrinology must acquire knowledge in all aspects relevant to the practice of Endocrinology. This includes training and expertise in Endocrinology capable of providing specialist care, being a teacher and guiding researcher in Endocrine medicine.
- She/ He should acquire and be able to impart necessary knowledge, skills and attitudes to diagnose and manage in a cost effective manner various clinical problems in endocrinology as seen in the community and at secondary and tertiary care centers. Special emphasis should be placed on preventive Endocrinology.

B. TEACHING SKILLS:

Should be able to teach relevant aspects of endocrine diseases to resident doctors, junior colleagues, nursing and para-medical staff.

C. RESEARCH METHODOLOGY:

Should be able to identify and investigate a research problem in Endocrinology using appropriate methodology.

E. GROUP APPROACH:

Should participate in multi-disciplinary meetings with experts in General Medicine, Radiology, Pathology, Oncology, Laboratory Medicine and other allied clinical disciplines.

SUBJECT SPECIFIC COMPETENCIES

At the end of the course, the DM student should acquire the following competencies under the three domains:

A. Cognitive domain (Knowledge domain)

By the end of the course, the DM student should be able to:

i. Demonstrate that he/she is well versed with the past and current literature on relevant aspects of basic, preventive, investigative, clinical and interventional endocrinology, including diabetology that should include practical aspects of handling the diabetes foot and ocular problems.

ii. Demonstrate a thorough knowledge of epidemiology, natural history, pathological abnormalities, etiopathogenesis, clinical manifestations and principles of management of various endocrine disorders of adults and children.

iii. Plan appropriate investigations applicable for diagnosis and management of patients in a cost-effective manner and interpret correctly the results of various routine and specialized investigations necessary for proper management of the patients with endocrine diseases. Should be able to provide best management even in resource-limited settings a well

iv. Recognize and manage endocrine emergencies.

v. Acquire adequate knowledge of application of various endocrine laboratory techniques, especially, immunoassays and other methods of hormonal assay and interpretation of laboratory values and a basic knowledge of molecular genetics.

vi. Acquire knowledge of the functioning of various equipments in routine use in the Endocrinology lab.

vii. Be able to plan and conduct a research proposal in the specialty in accordance with guidelines of Ethics Committee and critically evaluate published literature in medical journal.

viii. Be able to establish a research laboratory.

ix. Acquire relevant knowledge of biostatistics so as to be able to critically read and judge new literature.

x. Recognize the value of ethical principles of patient care and research.

xi. Be able to take decisions regarding hospitalization or timely referral to other consultants of various specialties recognizing his/her limitations in these areas.

xii. Have a basic knowledge of data science as it applies to endocrinology and diabetes - including artificial intelligence machine learning devices and wearables.

B. Affective domain (Attitudes including Communication and Professionalism)

The DM student should:

- Have empathy for patients and their family and should address them as worthy human beings.
- Discuss options, including advantages and disadvantages of each investigation and treatment. She/He should be able to discuss medical issues with them in layperson's language.
- Become confident communicators and should be well accomplished professionals.
- Have developed skills to debate, deliver scientific lecture, participate in panel discussions, and hold group discussions and be ready to deliver the knowledge received by him/her during the course. .
- 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.
- Always adopt ethical principles and maintain proper etiquette in dealing with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- Develop communication skills to write reports and give professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should have acquired following skills:

C.1. The student should be able to perform independently the following procedures and/ or interpret the results of:

A. Should be able to perform:

1. Endocrine stimulation and suppression tests. (Dynamic testing eg., ACTH & LHRH stimulation tests, water deprivation test, Prolonged (72 hr) fast).
2. Hormone and metabolic assays,
3. Autonomic Function Testing,
4. Creation and usage of electronic medical record,

5. Formulation of nutrition plan, counseling and patient education in diabetes,
6. Foot examination of a diabetic patient

B. Should be able to interpret:

1. Radiologic studies for diagnosis and treatment of endocrine and metabolic diseases including:
    i) Plain X-ray/ USG, CT scan/MRI
    ii) radionuclide imaging including PET scan
    iii) DXA for osteoporosis and body composition studies.
    iv) Bone age assessment from radiographs or atlas

2. Ancillary tests: like Perimetry, Visual Evoked Potential (VEP), DFA, Optical Coherence Tomography (OCT), Karyotype and basic molecular genetic techniques

C. 2. The student should be able to observe or perform under supervision the following procedures –desirable skills

a. Fine needle aspiration cytology
b. Thyroid ultrasound
c. *Inferior petrosal sinus sampling (if available)*
d. Offloading techniques for diabetic foot (hands on training)

Syllabus

Course contents:

I. Cognitive domain

A. Basic Sciences as applied to Endocrinology and Metabolism

1. History of Endocrinology
2. General principles of hormone synthesis, action, degradation, receptors, analogues and antagonists
3. Receptors, biorhythms
4. Endocrine Anatomy, Biochemistry and Physiology
5. Endocrine Pharmacology and Pharmacokinetics
6. Metabolism of fat, protein, carbohydrates and other nutrients

7. Endocrine Pathology and Cytology
8. Endocrine functions from foetal to adult life
9. Genetics including cytogenetics and applied genetics including principles of Sanger sequencing and the importance of next generation sequencing and applied inherited basis of disease
10. Principles and performance of biostatistics
11. Basic applied immunology

B. Clinical Endocrinology, Diabetes and Metabolism

1. Diabetes:

Genetics and pathophysiology, classification, epidemiology and pathogenesis and management of type 1 diabetes, type 2 diabetes, gestational diabetes/diabetes in pregnancy, monogenic diabetes, secondary diabetes; specific aspects of diabetes in the sub-continent. Should include principles of life style management and details of various oral & injectable agents as well devices used in the treatment of diabetes mellitus, , screening and management of all acute and chronic complications of diabetes and management of diabetes in special situations.

2. Epidemiology, pathogenesis, clinical features, diagnosis and management of endocrine disorders in pediatric (including neonatal) and adult age groups in the following diseases:

i. Hypothalamus and pituitary:

a) genetic and acquired (including infective, neoplastic, vascular and inflammatory) pituitary dysfunction,
b) functional pituitary tumors (including prolactinomas, GH, ACTH and TSH secreting tumors),
c) nonfunctional pituitary adenomas and other sellar/ suprasellar/ parasellar masses,
d) posterior pituitary dysfunction (including diabetes insipidus, syndrome of inappropriate ADH secretion).

ii. Thyroid:

a) thyrotoxicosis (including Graves disease, Toxic multinodular goiter, Toxic adenoma, transient thyrotoxicosis due to various forms of thyroiditis, drug induced thyrotoxicosis, thyrotoxicosis due to thyrotropin secretion, thyrotoxicosis due to extra-thyroidal tissue and thyrotoxicosis facticia,

b) hypothyroidism and thyroiditis,
c) Thyroid nodules and thyroid malignancies including medullary thyroid carcinoma.

iii. Adrenal cortex and medulla:

a) Cushing syndrome,
b) Adrenal insufficiency,
c) Congenital adrenal hyperplasia,
d) Adrenal adenomas, carcinomas and incidentalomas,
e) Pheochromocytoma and Paraganglioma
f) Primary hyperaldosteronism and other adrenal causes of endocrine hypertension.

iv. Pancreas:

a) Pancreatic endocrine disorders including diabetes, insulinomas, glucagonomas, VIPomas,
b) Pancreatic exocrine insufficiency including fibrocalcific pancreatic disease and chronic pancreatitis,
c) Pancreatic neoplasms and malignancies, particularly neuroendocrine tumours.

v. Gonads:

a) Delayed or early puberty,
b) Chronic anovulatory disorders including polycystic ovary disease,
c) Hirsutism,
d) Premature ovarian failure and menopause,
e) Male hypogonadism -primary and secondary,
f) Disorders of sex development.

vi. Parathyroid:

a) Hyperparathyroidism,
b) Hypoparathyroidism.

3. Reproductive Biomedicine
4. Endocrine Dysfunction in other systemic disorders
5. Endocrinology of aging, transition care (from adolescent to young adult)
6. Oncologic Endocrinology
7. Drug hormone interaction
8. Radiology and Radiation Therapy in Endocrinology
9. Clinical Metabolic disorders
10. Endocrinology of pregnancy and foetus

11. Adolescent and development endocrinology including growth and development, sexual differentiation, and pubertal maturation
12. Clinical epidemiology
13. Ethics, economics and psychosocial aspects of management of endocrine diseases
14. Obesity and lipid disorders including bariatric surgery
15. Endocrine Hypertension
16. Endocrine aspects of cardiovascular disease
17. Any other related areas:- Multiple endocrine neoplasia, polyglandular autoimmunity
18. Surgical aspects of Endocrinology.

C. Laboratory and Experimental Endocrinology

1. Principles of Nuclear medicine as applied to Endocrinology
2. Hormone Measurements, *in vitro* and *in vivo*
3. Principles and practice of immunoassay of hormones
4. Principles of quality control and quality assurance in laboratory estimations
5. Principles of Radioisotope safe handling and disposal
6. Endocrine Biochemistry investigations including semen analysis
7. Animal models in Endocrinology
8. Laboratory evaluation of Endocrine and Metabolic disorders
9. Any other related areas.

D. Recent Advances

1. Molecular Endocrinology
2. Recent advances in Clinical, Comparative, Experimental and Investigative Endocrinology and Metabolism
3. Review of recent literature in the field of Endocrinology, Metabolism and Reproductive Biomedicine
4. Any other related areas.

II. Psychomotor domain

1. Clinical care of the following aspects of diabetes in adults and children including but not limited to:

i. evaluation and management of acute, life threatening complications of hyper- and hypo-glycemia (diabetic ketoacidosis, non-ketotic hyperosmolar coma, severe hypoglycemia).

ii. evaluation and management in critical care and surgical patients with diabetes mellitus including insulin therapy for critical and non-critically ill hospitalized patients.
iii. counseling and education of patients with diabetes mellitus regarding diabetic diet, physical activity, blood glucose monitoring, CGMS and pumps, short term and long term targets of glycemic control and screening for complications. Practical aspects of setting up an integrated diabetes education system
iv. chronic care of diabetes mellitus in the ambulatory setting
v. prevention and surveillance of microvascular and macrovascular complications in diabetes mellitus
vi. diabetes detection and management before, during and after pregnancy including gestational diabetes.
vii. patient-centered care in patients with diabetes mellitus
viii. Integrated foot care and foot wear in patients with diabetes mellitus, aspects of setting up an integrated foot clinic and developing a basic orthotic center.

2. Clinical care including the following aspects of metabolism in adults and children including but not limited to:

i. evaluation and management of patients with disorders of fluid, electrolyte, and acid-base metabolism;
ii. patients with disorders of bone and mineral metabolism including all metabolic bone disorders
iii. patients with calcium, phosphorus, and magnesium imbalance.

Besides the above, post graduate students in DM (Endocrinology) should be involved in patient care and management of Endocrine Emergencies apart from bedside and didactic teaching of undergraduate and postgraduates, as assigned to them.

TEACHING AND LEARNING METHODS

Post graduate teaching programme

General principles

Acquisition of practical competencies being the keystone of post graduate medical education, PG training should be skills oriented. Learning in PG program should be essentially self-directed and primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.

Teaching Methodology

The post graduate student should be given the responsibility of managing and caring for patients in a gradual manner under supervision.

Formal teaching sessions

This should include regular bedside case presentations and demonstrations, didactic lectures, seminars, journal clubs, clinical meetings, and combined conferences with allied departments.

This will comprise of the following:

	Minimum sessions
• Bedside rounds	- Three days per week
• Seminar	- once in 4 weeks
• Journal club	- once in two weeks
• Endocrine -histology conference	- once in 4 weeks (if feasible)
• Endocrine - Surgery conference	- once in 8 weeks (if feasible)
• Endocrine-radiology conference	- once in 4 weeks
• Endocrine –Nuclear Medicine conference	-once in 4 weeks (if feasible)
• Endocrine – Neurosurgery conference	-once in 4 weeks (if feasible)
• Clinical case discussion	- once a week
• Outpatient Endocrine & Metabolic /Diabetic clinic *	- thrice a week
• Integrated diabetes foot clinic	- once a week
• GDM/diabetes in pregnancy clinic	- twice a month (if available)
• Pediatric endocrinology clinic	- once a week
• Reproductive endocrinology clinic	- twice a month (if available)
• Mortality meeting	- once a month
• Combined Grand rounds/ Clinical meetings/CPCs (at Institution level)	- once a month
• Student project presentation	- once in 6 months

All above may refer to sessions conducted in given Department and not for each trainee.

*should include a dietician and diabetes educator

Didactic Lectures

In addition, 10 lectures per year covering recent advances in all aspects of endocrine diseases would be taken by faculty. All post graduate students will be required to attend these lectures as well and short term basic and clinical courses on:

- Bio-statistics
- Research methodology and experimental lab medicine relevant to endocrinology
- Use of computers in medicine
- Bioethics, ethical issues in endocrine practice including Diabetes care

- In addition, student should attend accredited scientific meetings (CME, symposia, and conferences) once or twice a year.
- Additional sessions on Research methodology, experimental Laboratory Medicine relevant to Endocrinology, use of computers in Medicine, Biostatistics, ethical and legal issues in endocrine practice including diabetes care, teaching methodology, hospital waste management, health economics, are suggested.
- The post graduate students shall be required to participate in the teaching and training programme of undergraduate and post graduate students and interns (if available).
- A post graduate student of a post graduate degree course in super specialties would be required to present one poster presentation or read one paper at a national/state conference; should write a research paper from his/her work which should be published/accepted for publication/sent for publication during the period of his postgraduate studies
- **Log Book:** During the training period, the post graduate student should maintain a Log Book indicating the duration of the postings/work done in Endocrinology Wards, OPDs and Casualty. This should indicate the procedures assisted and performed, and the teaching sessions attended. The purpose of the Log Book is to:
  a) Help maintain a record of the work done during training,
  b) Enable Consultants to have direct information about the work; intervene if necessary,
  c) Use it to assess the experience gained periodically.

  The Log Book should be used to aid the internal evaluation of the student. The Log book shall be checked and assessed periodically by the faculty members imparting the training. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be necessary before he/she would be allowed to appear in the examination.

- The **Department should encourage e-learning activities.**
- **Clinical postings: Recommended schedule for three years training**

Each post graduate student will undergo the following rotations in various areas of endocrinology during the three years of training in DM Endcrinology:

i. **Ward/Indoor service/Out patient clinics/Consultations** : 30 months
(Should include rotation for 2 weeks each in cardiology and nephrology departments/units; where available a rotation in a reproductive endocrine clinic is desirable)

ii. **Interventional and investigative Endocrinology** : 3 months*

- ultrasonography, CT scan, MRI, Doppler study, IPSS (optional), AVS (optional)
- Nuclear Medicine: Isotope scans* including Thyroid scans and radioactive iodine/technetium uptake.
- Pathology and Cytology
- Ophthalmoscopy, DFA, OCT, Laser photocoagulation

***All institutions having DM Endocrinology course should have a Nuclear Medicine Department or one within a radius of 10 km which could serve for peripheral postings Or go for electives for the same.*

iii. **Endocrine laboratory techniques :** Endocrine and Metabolic Lab: 2.5 months*
Genetic Lab** : 2 weeks

** This period can be 3-4 hours per day and can be concurrent with clinical care*
**Hands -on training in endocrine laboratory is essential*
***A suitable laboratory within a radius of 20 km, or a designated peripheral posting in another institution should be available for training. The content should include hands-on training for DNA extraction and PCR.*

Provision for elective posting (maximum of 2 months) to reputed departments should be available to gain experience in new areas.

Research

Each post graduate student will be required to undertake research under the guidance of the faculty. He/she will be required to submit a research plan within 6 months after joining the

course. In addition, the post graduate student will participate in various departmental research activities. Should prepare at least 1 original paper accepted for publication/ready for sending to a journal for publication, to be eligible for the exam.

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.

ASSESSMENT

FORMATIVE ASSESSMENT, during the training programme

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and practical/clinical examination.

Six monthly assessment during the DM training should be based on:

1. Improvement in theory knowledge
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching

Annual formal assessment to be submitted to Dean / Principal, with recommendation from all faculty, as to promotion to second year.

The student to be assessed periodically as per categories listed in post graduate student appraisal form (Annexure I).

SUMMATIVE ASSESSMENT, namely, assessment at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The post graduate examination shall be in two parts and will be as per the details given in Postgraduate Regulations, 2000.

1. Theory:

The examinations shall be organised on the basis of 'Grading'or 'Marking system' to evaluate and to certify postgraduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole.

There will be four theory papers, as below:

Paper I: Basic sciences relevant to the discipline of endocrinology and metabolism

Paper II: Clinical aspects and diagnosis of endocrinology and metabolism disorders

Paper III: Therapeutic aspects of endocrinology and Metabolism and Laboratory technology

Paper lV: Recent Advances in Endocrinology & Metabolism

2. Clinical / Practical and Oral/viva voce Examination:

Oral examination shall be comprehensive enough to test the student's overall knowledge of the subject. The clinical/practical examination shall be held as per norms and as per the prevailing rules of the training institute/ University rules. A broader outline is suggested below:

There would be four examiners for clinical examination. These would comprise of two internal and two external examiners. There should be long/ semi-long/ short/ spot cases covering different aspects of Endocrinology, of which at least one long case must be on Diabetes. The post graduate students may also be assessed on endocrinological histopathology/ cytopathology slides, radiological investigations, ability to evaluate laboratory data in clinical endocrinology and viva-voce. The logbook of procedures and

interventions shall also be assessed in the practical examination. The research paper shall be presented.

Recommended Reading:

Books (latest edition)

- Williams Text Book of Endocrinology
- Endocrinology - Leslie J De Groot& J Larry Jameson
- Joslin's Diabetes Mellitus
- Text Book Of Diabetes Mellitus - Richard I & G Holt
- RSSDI Text Book Of Diabetes Mellitus
- Paediatric Endocrinology - Sperling
- Pediatric Endocrinology - edited by FimaLifshitz,
- Thyroid - Werner &Ingbar
- Pituitary Disorders - Shlomo Melmed
- Reproductive Endocrinology - Speroff
- Endocrine & Metabolic Disorders - Robert E Dons & Frank H Wians
  Clinical Lab Testing Manual
- Manual of Endocrinology & Metabolism - edited by Norman Lavin

Journals:

3-5 international and two national journals (all indexed).

Dr. RAJEEV KASLIWAL
Associate Professor
Department of Endocrinology
Jalma Gandhi Hospital, Sitapura, Jaipur-302022
RMC No. 23829

Annexure I

Postgraduate Students Appraisal Form

Clinical Disciplines

Pre / Para /Clinical Disciplines
Name of the Department/Unit :
Name of the PG Student :
Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Clinical competence				
2.	Academic Presentations				
3.	Laboratory Skills				
4.	Thesis / Research work				
5.	Log Book Maintenance				

Publications **Yes/ No**

Remarks* _____

_____

_____

***REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 04 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGNATURE OF ASSESSEE SIGNATURE OF CONSULTANT SIGNATURE OF HOD