

**CURRICULUM/STATUTES & REGULATIONS
FOR
2 YEARS DEGREE PROGRAMME
IN
ENDOCRINOLOGY
(MD ENDOCRINOLOGY)**

NISHTAR MEDICAL UNIVERSITY, MULTAN



STATUTES

Nomenclature Of The Proposed Course

The name of degree programme shall be MD Endocrinology. This name is well recognized and established for the last many decades worldwide.

Course Title:

MD Endocrinology

Training Centers:

Departments of Internal Medicine with special interest in Endocrinology (accredited byNMU) in affiliated institutes of Nishtar Medical University, Multan.

Duration of Course:

The duration of MD Endocrinology course shall be two (2) years with structured training in a recognized department under the guidance of an approved supervisor.

After admission in MD Endocrinology Programme the resident will spent 2 years in the Department of Endocrinology in which the candidate will undergo clinical training to achieve the educational objectives of M.D and mandatory workshops. Endocrinology Programme (knowledge & Skills) along with rotations in the relevant fields during last four month of the training programme. The research project will be designed and the **synopsis** will be prepared during initial six months of training. Two articles must be published as first author name in relevant field in HEC approved journal.

The clinical training shall be competency based. There shall be generic and specialty specific competencies and shall be assessed by continuous Internal Assessment.

Admission Criteria

Applications for admission to MD Endocrinology Training Programs of University will be invited through advertisement in print and electronic media mentioning closing date of applications and date of Entry Examination.

Eligibility:

The applicant on the last date of submission of applications for admission must possess the:

- i) Passed MD/FCPS in Medicine

DURATION OF TRAINING IN ENDOCRINOLOGY

Training in Endocrinology is a second fellowship which is to be undertaken after passing MD/FCPS Medicine

- The duration of the training is two years after registration and consists of:
- Outpatient endocrine and diabetes clinics.
- Inpatient endocrine consults service and inpatient endocrine service.
- All training must be completed one month before the theory examination.

ROTATIONS

It will be the responsibility of the concerned supervisor to determine the need and duration of rotations in the following disciplines, liaise with the appropriate centers and send the residents to those centers for acquiring competencies as mentioned in the curriculum. The supervisor will also determine with the institution identified for rotation, the duration and mode of rotation (en-block or staggered).

Allied Clinical Specialties:

- Psychiatry
- Gynecology
- Urology
- Neurosurgery X
- Subfertility & Assisted Reproduction Center

Diagnostic Specialties:

- Chemical pathology
- Histopathology
- Radiology
- Ultrasonography
- Nuclear Medicine

Centre of Excellence:

- Endocrinology rotation at a national center of excellence preferably for a month.

DETAILS ABOUT DURATION AND TOTAL NO OF SPECIALITIES AS IN CPSP

APPROVED TRAINING CENTERS

Training must be undertaken in units, departments and institutions approved by the Nishtar Medical University.

Registration and

Enrollment

- As per policy of Pakistan Medical & Dental Council the number of PG Trainees/ Students per supervisor shall be maximum 05 per annum for all PG programmes including minor programmes (if any)
- Beds to trainee ratio at the approved teaching site shall be at least 5 beds per trainee.
- The University will approve supervisors for MD courses
- Candidates selected for the courses after their enrollment at the relevant institutions shall be registered with NMU as per prescribed Registration Regulations

A). Faculty

Properly qualified teaching staff in accordance with the requirements of Pakistan Medical and Dental Council (PMDC)

B). Adequate Space

Including class-rooms (with audiovisual aids), demonstration rooms, computer lab and clinical pathology lab etc.

C). Library

Departmental library should have latest editions of recommended books, reference books and latest journals (National and International).

- Accreditation of Endocrinology training program can be suspended on temporary or permanent basis by the University, if the program does not comply with requirements for residents training as laid out in this curriculum.
- Program should be presented to the University along with a plan for implementation of curriculum for training of residents.
- Programs should have documentation of residents training activities and evaluation on monthly basis.
- To ensure a uniform and standardized quality of training and availability of the training facilities, the University reserves the right to make surprise visits of the training program for monitoring purposes and may take appropriate action if deemed necessary.

TRAINING PROGRAM

CURRICULUM: AIMS AND OBJECTIVES OF THE COURSE

AIM

The aim of Two years MD programme in Endocrinology is to train residents to acquire the competency of a specialist in the field of endocrinology, diabetes and metabolism so that they can become good teachers, researchers and clinicians in their specialty after completion of their training.

GENERAL OBJECTIVES

MD Endocrinology training should enable a student to:

1. To learn basic and advanced endocrine biochemistry, physiology and pathophysiology, which provide the basis for understanding of endocrine diseases.
2. To accumulate a critical mass of fundamental information and practical approaches for the diagnosis, management and prevention of endocrine disorders.
3. To acquire the technical and practical skills that is required by a consultant in endocrinology, diabetes and metabolism.
4. To acquire clinical skills in a progressive fashion and with increasing responsibility appropriate for a consultant in endocrinology, diabetes and metabolism.
5. To acquire knowledge and skills necessary for providing cost- effective, ethical and humanistic care of patients with disorders of endocrinology, diabetes and metabolism.
6. To acquire knowledge and skills necessary for critical analysis of the laboratory testing and the endocrine literature.
7. To acquire skills in design and performance of hypothesis driven endocrine research, and to participate in such research or equivalent scholarly activity. This may include gaining extensive experience in grant writing and scientific presentation.

8. Overall assessment of patient care that is effective, safe, timely, efficient, equitable and patient-centered.
9. Professionalism, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles and sensitivity to a diverse patient population, providing cost-effective, ethical and humanistic care

10. Practice-based learning and improvement that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence and improvement in patient care.

SYLLABUS

GENERAL

- Endocrine biochemistry and physiology
- Hormone action and interaction
- Perform and interpret endocrine biochemical tests including dynamic testing
- Ordering and interpretation of CT and MRI of pituitary, orbits, adrenals, ovaries and other endocrine organs.
- Ordering and interpretation of ultrasound of thyroid and ovaries.
- Ordering and interpretation of radioisotope scans of thyroid, parathyroid and adrenals.

SPECIFIC

Diabetes

- Diagnosis and general management of diabetes mellitus
- Diabetic emergencies
- Management of diabetes patients during intercurrent illness or surgery
- Conception and pregnancy in diabetes
- Diabetes in young people and elderly.
- Complication of diabetes (screening and management)
 - Macrovascular disease
 - Eye disease in diabetes
 - Renal disease in diabetes.
 - Neuropathies in diabetes.
 - Erectile dysfunction in diabetes
- Knowledge of the details of current technological devices for the management of Diabetes Mellitus.

LIPID DISORDERS

- Screening
- Assessment of cardiovascular risk in relation to lipid profile
- Diagnose and manage patients with primary and secondary lipid disorders

DISORDERS OF THE HYPOTHALAMUS AND PITUITARY

- Diagnose and manage pituitary dysfunction
- Diagnose and manage pituitary adenomas both functional, non functional and craniopharyngiomas.

DISORDERS OF THYROID GLAND

- Diagnose and manage simple goitre, multi-nodular goitre and solitary / dominant thyroid nodules
- Perform and interpret FNAC of thyroid nodules
- Diagnose and manage disorders of thyroid dysfunction
- Diagnose and manage thyroid eye disease
- Diagnose and manage thyroid disease during pregnancy and also those associated with pregnancy
- Diagnose, manage and follow up of thyroid carcinomas

DISORDERS OF ADRENAL GLAND

- Know causes, investigation and treatment of disorders of adrenal gland
- Perform and interpret tests of adrenal function
- Investigate and manage Cushing's syndrome
- Investigate suspected endocrine hypertension and manage pheochromocytoma and adrenocortical hypertension
- Investigate and manage primary and secondary adrenal failure
- Investigate adrenal tumors
- Provide peri-operative care of patients with proven adrenal insufficiency and in acute intercurrent illnesses and emergencies

DISORDERS OF GONADS

- Diagnose and manage patients with gonadal disorders both primary and secondary gonadal failure
- Investigate and manage hirsutism, virilism, polycystic ovarian syndrome and infertility
- Prescribe appropriate sex hormone replacement therapy to men and women with deficiencies
- Investigation and manage men with gynaecomastia
- Investigation and manage delayed and precocious puberty
- Investigate, diagnose and manage gender ambiguity disorders
- Learn the indications, physiology and complications of assisted fertilization.

DISORDERS OF PARATHYROID GLANDS, CALCIUM METABOLISM AND BONES

- Identify causes, investigate and manage cases of hypercalcaemia and hypocalcaemia and their treatments.
- Provide peri-operative care for patients undergoing parathyroid surgery
- Diagnose and manage Vitamin D deficient states
- Know risk factors of osteoporosis, its screening and treatment strategies.

DISORDERS OF APPETITE AND WEIGHT

- Diagnose, manage and provided care of patients with obesity including endocrine and secondary causes of obesity
- Medical and surgical treatment options for obesity
- Diagnose and manage the endocrine consequences of anorexia nervosa and bulimia

MISCELLANEOUS ENDOCRINE AND METABOLIC DISEASES

Diagnose workup and manage patients with rarer endocrine conditions like:

- Spontaneous Hypoglycaemia
- Neuroendocrine and peptide secreting tumours
- Acute and chronic hypo and hypernatraemia
- MEN syndrome including understanding of genetic testing and strategies for long term monitoring
- Late endocrine effects of cancer treatment
- Rare disorders of insulin resistance

CORE COMPETENCIES

The Clinical Competencies a specialist must possess are varied and complex. A complete list of the same necessary for trainees and trainers is given below. The level of competence to be achieved each year is specified according to the key, as follows:

1. Observer status
2. Assistant status
3. Performed under supervision
4. Performed under indirect supervision
5. Performed independently

Note: Levels 4 and 5 for practical purposes are almost
Synonymous

All candidates admitted in MD Endocrinology course shall appear in Final(clinical) examination at the end of structured training programme.

Eligibility Criteria:

To appear in the Final Examination the candidate shall be required:

- i) To have submitted the certificate of completion of training, issued by the Supervisor will be mandatory.
- ii) To have published two article and will then be eligible to appear in Final Examination.
- iii) To have submitted no dues certificate from all relevant departments including library, hostel, cashier etc.
- iv) To have submitted evidence of submission of examination fee.

Final Examination Schedule and Fee

- a) Final examination will be held twice a year.
- b) The candidates shall have to satisfy eligibility criteria before permission is granted to take the examination.
- c) Examination fee will be determined and varied at periodic intervals by the University.
- d) The examination fee once deposited cannot be refunded / carried over to the next examination under any circumstances.
- e) The Controller of Examinations will issue an Admittance Card with a photograph of the candidate on receipt of prescribed application form, documents satisfying eligibility criteria and evidence of payment of examination fee. This card will also show the Roll Number, date / time and venue of examination.

Components of Final Examination

Written Part of Final Examination

Paper part I MCQ 100 marks
Paper part II SEQ 100 marks
Total marks 200

Written Part of Final Examination

- a) There will be two written papers which will cover the whole syllabus of the specialty of training with total marks of 200.
- b) The written examination will consist of 100 single best answer type Multiple Choice Questions (MCQs) and 10 Short Essay Questions (SEQs). Each correct answer in the Multiple Choice Question paper will carry 01 marks, but an incorrect response will result in deduction of 0.5 mark. Each Short Essay Question will carry 10 marks.
- c) The Total Marks of the Written Examination will be 200 and to be divided as follows:
 - Multiple Choice Question paper Total Marks = 100

- Short Essay Question paper

Total Marks = 100

- The candidates securing a score of 75% marks in multiple choice question paper and short essay question paper will pass the written part of the final examination and will become eligible to appear in the clinical and oral examination.
- The written part result will be valid for three consecutive attempts for appearing in the Clinical and Oral Part of the Final Examination. After that the candidate shall have to re-sit the written part of the Final Examination.

Clinical, TOACS/OSCE & ORAL:

- The Clinical and Oral Examination will consist of 04 short cases, 01 long case for a pair of Internal and External Examiner and TOACS with 01 station. Each short case will be of 07 minutes duration, 05 minutes will be for examining the patient and 02 minutes for discussion. The Oral Examination will consist of laboratory data assessment, interpretation of Radiology images, ECG and others.
- The Total Marks of Clinical, TOACS/OSCE & ORAL will be 200 and to be divided as follows:

Short Cases	Total Marks = 200
Long Case	Total Marks = 100
TOACS/OSCE	Total marks = 100
Total Marks = 400	

- A panel of four examiners will be appointed by the Vice Chancellor and of these two will be from university whilst the other two will be the external

examiners. Internal examiner will act as a coordinator. In case of difficulty in finding an Internal examiner in a given subject, the Vice Chancellor would, in consultation with the concerned Deans, appoint any relevant person with appropriate qualification and experience, outside the University as an examiner.

- d) The internal examiners will not examine the candidates for whom they have acted as Supervisor and will be substituted by other internal examiner.
- e) The candidates scoring 50% marks in each component of the Clinical & Oral Examination will pass this part of the Final Examination.
- f) The candidates will have two attempts to pass the final examination with normal fee. A special administration fee of Rs.10,000 in addition to normal fee or the amount determined by the University from time to time shall be charged for further attempts.

Declaration of Result

For the declaration of result

- I. The candidate must publish one article in HEC approved journal.
- II. The candidate must have passed the final written examination with 75% marks and the clinical & oral examination securing 50% marks. The cumulative passing score from the written and clinical/ oral examination shall be 60%. Cumulative score of 60% marks to be calculated by adding up secured marks of each component of the examination i.e written and clinical/ oral and then calculating its percentage.
- III. The MD degree shall be awarded after success in the final examination
- IV. On completion of stipulated training period, irrespective of the result (pass or fail) the training slot of the candidate shall be declared vacant.

Award of MD Endocrinology Degree

After successful completion of the structured courses of MD Endocrinology and qualifying Final examinations (written, Clinical, TOACS/OSCE & ORAL, the degree with title MD Endocrinology shall be awarded.

Specialty training in Endocrinology

SPECIFIC PROGRAM CONTENT

1. Pediatric Endocrinology including Diabetes and Metabolism

Objectives

1. To learn the approach to diagnosis and treatment of disorders affecting children with emphasis on those endocrinologic disorders affecting growth and development, sexual differentiation, and pubertal maturation.
2. To gain experience in dealing with parents of children with diabetes mellitus or endocrine disorders.
3. To gain experience in the evaluation and management of children with diabetes mellitus and in their diabetes education.

Duration

A minimum of one months. Further experience will be arranged depending on the interests and career goals of the resident.

Resources

Pediatric Diabetes and Endocrine Clinic and Inpatient Service

2. Genetics

Objectives

To become familiar with

1. The methods of genetic analysis
2. Genetic counseling of patients and their families
3. Ethical issues associated with genetic analysis and counseling

Duration

A minimum of two weeks. Further experience will be arranged depending on the interests and

career goals of the Fellow.

3. Nuclear medicine/Endocrine Imaging

4. Diabetes Mellitus

Type 1 and Type 2 diabetes mellitus, including;

1. Patient monitoring and treatment objectives in adolescents and adults
2. Acute and chronic complications, including
3. Diabetic ketoacidosis
4. Hyperosmolar non-ketotic syndromes
5. Hypoglycemia
6. Microvascular and macrovascular disease including;
 - i) Diabetic retinopathy
 - ii) Diabetic nephropathy
 - iii) Diabetic neuropathy
 - iv) Dermatologic aspects of diabetes
 - v) Coronary heart disease
 - vi) Peripheral vascular disease
 - vii) Cerebral vascular disease
7. Infections in the diabetic patient
8. Gestational diabetes mellitus
9. Diabetes mellitus in the pregnant patient
10. The surgical patient with diabetes mellitus
11. Patient education
12. Psychosocial issues
13. Genetics and genetic counseling as it relates to patients with endocrine and metabolism disorders
14. Dietary principle

Technical and Other Skills

1. Management of adolescent and adult patients of all ages with diabetes mellitus, including but not limited to the following aspects of the disease:
2. The utilization and interpretation of autoimmune markers of Type 1 diabetes in patient management and counseling
3. Prescription of exercise programs
4. Rationale for and calculation of diabetic diets
5. Oral antidiabetic therapy
6. The use of intravenous insulin in acute decompensated diabetes mellitus

7. Chronic insulin administration, including the use of all varieties of insulin delivery systems
8. Hyperinsulinemic euglycemic hypoglycemic and hyperglycemic clamps
9. Glucose Tolerance Test
10. Glucose monitoring devices
11. Fundoscopic examination, recognition, and appropriate referral of patients with diabetic retinopathy
12. Foot care
13. Psychosocial effects of diabetes mellitus on patients and their families
14. Patient and community education

1. Hypothalamus/ Pituitary
2. Hypothalamic insufficiency
3. Hypothalamic and pituitary tumors, including; pituitary tumors of all types, with particular experience in the diagnosis and management of prolactinoma, acromegaly, Cushing's disease, and clinically non- functioning tumors, craniopharyngioma and other space occupying and infiltrative disorders of the pituitary and hypothalamic region

Anterior pituitary disorders:

- a. Regulation of the pituitary axis
- b. Hypo and Hyperpituitarism
- c. Growth hormone disorders
- d. Prolactin
- e. ACTH axis: Cushing's disease
- f. Gonadotrophins: Hypogonadotropic hypogonadism

Posterior Pituitary disorders:

- a. SIADH
- b. Diabetes insipidus (primary and nephrogenic)
- c. Galactorrhea

Technical and Other Skills

- 1. Waterdeprivation test
- 2. Insulin tolerance test
- 3. Test for GH deficiency
- 4. Dexamethasone suppression test
- 5. Glucose tolerance test for acromegaly
- 6. Visual field testing
- 7. Pituitary imaging

2. Reproductive Endocrinology

Objectives

To gain experience with disorders of reproductive endocrinology and endocrinologic aspects of sexual dysfunction

Reproductive Endocrinology of Female:

- a. Polycystic ovarian syndrome
- b. Hirsutism /virilization
- c. Female infertility
- d. Premature ovarian failure
- e. Menstrual disorders
- f. Dysfunctional uterine bleeding
- g. Menopause
- h. Contraception and hormone replacement therapy
- i. Ovarian tumors

Technical and Other Skills

1. Screening for ovulation
2. Pelvic and trans-vaginal ultrasound
3. Ovulation induction
4. Laparoscopic
5. Treatment of infertility

Reproductive Endocrinology of Male:

- a. Testicular physiology
- b. Male hypogonadism
- c. Male infertility
- d. Gynaecomastia
- e. Erectile dysfunction
- f. Testicular tumors
- g. Autoimmune Polyglandular Failure Syndrome
- h. Androgen replacement therapy

Technical and Other Skills

1. Testicular biopsy
2. Induction of fertility in hypogonadotrophic hypogonadism
3. SMR

Disorder of sexual differentiation

- a. Hormonal evaluation
- b. Androgen insensitivity syndrome
- c. True hermaphroditism
- d. Gender assignment strategies

3. Thyroid

Thyroid disorders, including

- a. Hyperthyroidism and hypothyroidism
- b. Nodular thyroid diseases
- c. Thyroid cancer
- d. Goiter
- e. Thyroiditis, including chronic, silent, subacute, and autoimmune

Technical and Other Skills

1. Performance and cytologic interpretation of fine needle aspiration of the thyroid
2. Thyroid scanning
3. B Scanning for thyroid
4. Assessment of Thyroid Ophthalmopathy

4. Parathyroid Glands/Calcium/Bone/Magnesium/Phosphorus

- a. Disorders of bone and mineral metabolism, including;
Hyperparathyroidism and other causes of hypercalcemia
- b. Hypoparathyroidism and other causes of hypocalcemia
- c. Mineral and bone homeostasis
- d. Hormone regulators of mineral homeostasis
- e. Metabolic bone diseases, with particular emphasis on the diagnosis and management of osteoporosis
- f. Evaluation and prevention of kidney stones
- g. Paget's disease
- h. Osteomalacia, rickets and disorders of vitamin D metabolism
- i. Disorders of magnesium and phosphorus metabolism
- j. Calcitonin and medullary thyroid carcinoma
- k. Bone tumors

Technical and Other Skills

1. Indication and interpretation of quantitative digital radiography and other tests used in the management of osteoporosis and other metabolic bone diseases
2. CT based Calcium scoring
3. MBI scanning
4. Dual Energy X-ray Absorbimetry
5. DEXA scanning

5. Adrenal Gland

1. Benign and malignant adrenal tumors
2. Adrenogenital syndromes

Diseases of Adrenal Cortex

- a. Adrenal hyperfunction
- b. Syndrome of glucocorticoid excess
- c. Cushing's syndrome
- d. Mineralocorticoid excess
- e. Adrenal hypofunction

Diseases of Adrenal Medulla

- a. Catecholamine biosynthesis and metabolism
- b. Pheochromocytomas
- c. Adrenal "incidentaloma"

Technical and Other Skills

- 1. Test of adreno-cortical function
- 2. Short and long synacthen test
- 3. Post operative management of adrenal tumors
- 4. Selective adrenal venous sampling for aldosterone
- 5. MIBG scan
- 6. Management of suspected pheochromocytoma
- 7. Clonidine suppression test

6. Endocrine Emergencies, including

- a. Hypercalcemia and hypocalcemia
- b. Severe hypo- and hyperthyroidism
- c. Adrenal insufficiency
- d. Pituitary apoplexy

Hormone-producing neoplasms, particularly carcinoid syndromes, ectopic hormone production, islet cell tumors and multiple endocrine neoplastic syndromes

1. Endocrinology of the Gastrointestinal System

- a. Gut hormones and incretins
- b. Carcinoid syndrome
- c. Islet cell tumors

Technical and Other Skills

- 1. Localisation of gut tumors
- 2. Secretin test

2. Nutrition/ Water, Electrolyte & Acid-Base Disorders

- 1. Protein energy malnutrition
- 2. The eating disorders
- 3. Obesity; pathophysiology, diagnosis and management
- 4. Anorexia nervosa and bulimia
- 5. Vitamin and mineral deficiency and excess
- 6. Micronutrients
- 7. Disorders of fluid, electrolyte, and acid-base metabolism, including;
 - Hyponatremia and hypernatremia
 - Hypokalemia and hyperkalemia
 - Metabolic acidosis
 - Metabolic alkalosis
 - Parenteral nutritional support nutritional disorders

Technical and Other Skills

- 1. Nutritional assessment
- 2. Enteral and parenteral nutrition designing
- 3. Lipids/ Metabolic Disorders
 - a. Hypoglycemic syndromes, including the spectrum of insulinoma and other causes
 - b. The diagnosis and management of lipid and lipoprotein disorders
 - c. Inborn errors of amino acid metabolism
 - d. The diagnosis and management of primary and secondary hypertension
 - e. Disorders of porphyrins and metals

f. Inherited disorders of connective tissue

Research Experience

Clinical Research

Each resident will participate in at least one clinical research study to become familiar with:

1. Research design
2. Research involving human subjects including informed consent and operations of the Institutional Review Board and ethics of human experimentation
3. Data collection and data analysis
4. Research ethics and honesty
5. Peer review process

This usually is done during the consultation and outpatient clinic rotations.

Case Studies or Literature Reviews

Each resident will write, and submit for publication in a peer-review journal a case study or literature review on a topic of his/her choice.

Laboratory Research

Bench Research

Participation in laboratory research is at the option of the resident and may be arranged through any faculty member of the Division. When appropriate, the research may be done at other institutions.

Hormone assays

Each resident will observe and become familiar with current methods of hormone assays including radioimmuno- and immunoradiometric assays.

Research involving Radioactivity

Each resident participating in research involving radioactive materials is required to

1. Attend a Radiation Review session
2. Work with an Authorized User and receive appropriate instruction from him/her.

METHODS OF INSTRUCTION/COURSE CONDUCTION

As a policy, active participation of students at all levels will be encouraged. Following teaching modalities will be employed:

1. Lectures
2. Seminar Presentation and Journal Club Presentations
3. Group Discussions
4. Grand Rounds
5. Clinico-pathological Conferences
6. SEQ as assignments on the content areas
7. Skill teaching in ICU, emergency and ward settings
8. Attend genetic clinics and rounds for at least one month.
9. Attend sessions of genetic counseling
10. Self-study, assignments and use of internet
11. Bedside teaching rounds in ward
12. OPD & Follow up clinics
13. Long and short case presentations

In addition to the conventional teaching methodologies interactive strategies like conferences will also be introduced to improve both communication and clinical skills in the upcoming consultants. Conferences must be conducted regularly as scheduled and attended by all available faculty and residents. Residents must actively request autopsies and participate in formal review of gross and microscopic pathological material from patients who have been under their care. It is essential that residents participate in planning and in conducting conferences.

1. Clinical Case Conference

Each resident will be responsible for at least one clinical case conference each month. The cases discussed may be those seen on either the consultation or clinic service or during rotations in specialty areas. The resident, with the advice of the Attending Physician on the Consultation Service, will prepare and present the case(s) and review the relevant literature.

2. Monthly Student Meetings

Each affiliated medical college approved to conduct training for MD Endocrinology will provide a room for student meetings/discussions such as:

- a. Journal Club Meeting
- b. Core Curriculum Meetings
- c. Skill Development

a. Journal Club Meeting

A resident will be assigned to present, in depth, a research article or topic of his/her choice of actual or potential broad interest and/or application. Two hours per month should be allocated to discussion of any current articles or topics introduced by any participant. Faculty or outside researchers will be invited to present outlines or results of current research activities. The article should be critically evaluated and its applicable results should be highlighted, which can be incorporated in clinical practice. Record of all such articles should be maintained in the relevant department.

b. Core Curriculum Meetings

All the core topics of Endocrinology should be thoroughly discussed during these sessions. The duration of each session should be at least two hours once a month. It should be chaired by the chief resident (elected by the residents of the relevant discipline). Each resident should be given an opportunity to brainstorm all topics included in the course and to generate new ideas regarding the improvement of the course structure.

c. Skill Development

Two hours twice a month should be assigned for learning and practicing clinical skills.

List of skills to be learnt during these sessions is as follows:

1. Residents must develop a comprehensive understanding of the indications, contraindications, limitations, complications, techniques, and interpretation of results of those technical procedures integral to the discipline (mentioned in the Log Book).
2. Residents must acquire knowledge of and skill in educating patients about the technique, rationale and ramifications of procedures and in obtaining procedure-specific informed consent. Faculty supervision of residents in their performance is required, and each resident's experience in such procedures must be documented by the program director.
3. Residents must have instruction in the evaluation of medical literature, clinical epidemiology, clinical study design, relative and absolute risks of disease, medical statistics and medical decision-making.
4. Training must include cultural, social, family, behavioral and economic issues, such as confidentiality of information, indications for life support systems, and allocation of limited resources.
5. Residents must be taught the social and economic impact of their decisions on patients, the primary care physician and society. This can be achieved by attending the bioethics lectures and becoming familiar with Project Professionalism Manual.

such as that of the American Board of Internal Medicine.

6. Residents should have instruction and experience with patient counseling skills and community education. This training should emphasize effective communication techniques for diverse populations, as well as organizational resources useful for patient and community education.
7. Each resident should attend at least one series of classes given to patients with diabetes mellitus and at least two counseling sessions in the Nutrition Clinic for patients with diabetes mellitus, obesity or lipid disorders.
8. Residents may attend the series of lectures on Nuclear Medicine procedures (radionuclide scanning and localization tests and therapy) presented to the Radiology residents.
9. Each resident will observe and participate in each of the following procedures, preferably done on patients under his/her care including thyroid uptake and scanning; total body scan for thyroid cancer; ultrasound of the thyroid, DEXA scans, central and peripheral and other imaging procedures for endocrine problems.
10. Residents should have experience in the performance of endocrine clinical laboratory and radionuclide studies and basic laboratory techniques, including quality control, quality assurance and proficiency standards.

3. Annual Grand Meeting

Once a year all residents enrolled for MD Endocrinology should be invited to the annual meeting at NMU Multan.

One full day will be allocated to this event. All the chief residents from affiliated institutes will present their annual reports. Issues and concerns related to their relevant courses will be discussed. Feedback should be collected and suggestions should be sought in order to involve residents in decision making.

The research work done by residents and their literary work may be displayed.

In the evening an informal gathering and dinner can be arranged. This will help in creating a sense of belonging and ownership among students and the faculty.

ELOG BOOK

The residents must maintain a log book and get it signed regularly by the supervisor. A complete and duly certified log book should be part of the requirement to sit for MD examination. Log book should include adequate number of diagnostic and therapeutic procedures observed and performed, the indications for the procedure, any complications and the interpretation of the results, routine and emergency management of patients, case presentations in CPCs, journal club meetings and literature review.

Proposed Format of Log Book is as follows:

Candidate's Name: _____ -

Supervisor _____

Roll No. _____

The procedures shall be entered in the log book as per format

Residents should become proficient in performing the related procedures. After observing the technique, they will be observed while performing the procedure and, when deemed competent by the supervising physician, will perform it independently. They will be responsible for obtaining informed consent, performing the procedure, reviewing the results with the pathologist and the attending physician and informing the patient and, where appropriate, the referring physician of the results.

Procedures Performed

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Diagnosis	Procedure Performed	Supervisor's Signature
1					
2					
3					
4					

Endocrine Emergencies Handled

Sr. #	Date	Name of Patient, Age, Sex & Admission No.	Diagnosis	Procedure/ Management	Supervisor's Signature
1					
2					
3					
4					

Case Presented

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Case Presented	Supervisor's Signature
1				
2				
3				
4				

Seminar/Journal Club Presentation

Sr.#	Date	Topic	Supervisor's Signature
1			
2			
3			
4			

Evaluation Record

(Excellent, Good, Adequate, Inadequate, Poor)

At the end of the rotation, each faculty member will provide an evaluation of the clinical performance of the fellow.

Sr.#	Date	Method of Evaluation (Oral, Practical, Theory)	Rating	Supervisor's Signature
1				
2				

EVALUATION & ASSESSMENT STRATEGIES

Assessment

It will consist of action and professional growth oriented ***student-centered integrated assessment*** with an additional component of ***informal internal assessment, formative assessment*** and measurement-based ***summative assessment***.

Student-Centered Integrated Assessment

It views students as decision-makers in need of information about their own performance. Integrated Assessment is meant to give students responsibility

for deciding what to evaluate, as well as how to evaluate it, encourages students to 'own' the evaluation and to use it as a basis for self-improvement. Therefore, it tends to be

growth-oriented, student-controlled, collaborative, dynamic, contextualized, informal, flexible and action- oriented.

In the proposed curriculum, it will be based on:

- Self Assessment by the student
- Peer Assessment
- Informal Internal Assessment by the Faculty

Self-Assessment by the Student

Each student will be provided with a pre-designed self-assessment form to evaluate his/her level of comfort and competency in dealing with different relevant clinical situations. It will be the responsibility of the student to correctly identify his/her areas of weakness and to take appropriate measures to address those weaknesses.

Peer Assessment

The students will also be expected to evaluate their peers after the monthly small group meeting. These should be followed by a constructive feedback according to the prescribed guidelines and should be non-judgmental in nature. This will enable students to become good mentors in future.

Informal Internal Assessment by the Faculty

There will be no formal allocation of marks for the component of Internal Assessment so that students are willing to confront their weaknesses rather than hiding them from their instructors.

It will include:

- a. Punctuality
- b. Ward work
- c. Monthly assessment (written tests to indicate particular areas of weaknesses)
- d. Participation in interactive sessions

Formative Assessment

Will help to improve the existing instructional methods and the curriculum in use

Feedback to the faculty by the students:

After every three months students will be providing a written feedback regarding their course components and teaching methods. This will help to identify strengths and weaknesses of the relevant course, faculty members and to ascertain areas for further improvement.

Summative Assessment

It will be carried out at the end of the programme to empirically evaluate **cognitive, psychomotor** and **affective domains** in order to award degrees for successful completion of courses.

MD ENDOCRINOLOGY EXAMINATIONS

All candidates admitted in MD course shall appear in Final examination at the end of structured training programme (end of 5th calendar year) and after clearing Intermediate examination.

There shall be two written papers of 250 marks each, Clinical TOACS/OSCE & ORAL of 500 marks, Internal assessment of 100 marks and thesis examination of 400 marks.

Topics included in paper 1

1. Pediatric Endocrinology (10 MCQs)
2. Diabetes Mellitus (15 MCQs)
3. Hypothalamus/ Pituitary (10 MCQs)
4. Genetics of endocrinology (05 MCQs)
5. Nuclear medicine/endocrine imaging (05 MCQs)
6. Endocrine aspects of Aging/Psychiatric (05 MCQs)
/Systemic disorders

Topics included in paper 2

1. Reproductive Endocrinology (10 MCQs)
2. Thyroid (12 MCQs)
3. Adrenal (08 MCQs)
4. Calcium/Bone/Magnesium/Phosphorus (06 MCQs)
5. Lipids/ Metabolic Disorders (03 MCQs)

- | | |
|----------------------|-----------|
| 6. GI Endocrinology | (03 MCQs) |
| 7. Nutrition clinic | (03 MCQs) |
| 8. Wound care clinic | (05 MCQs) |

Components of Final Examination ~~Two~~

Paper 11

100 Marks

3 Hours

10 SEQs

50 Marks

Only those candidates, who pass in theory papers, will be eligible to appear in the Clinical, TOACS/OSCE & ORAL.

Clinical, TOACS/OSCE & ORAL

500 Marks

Four short cases

100 Marks

One long case:

50 Marks

TOACS/OSCE & ORAL

65 Marks

RECOMMENDED BOOKS

TEXTBOOKS

1. General Endocrinology by Wilson JD and Foster DW. Williams
2. Textbook of Endocrinology. WB Saunders Felig P, Baxter JD, Broadus AE and Frohman LA.
3. Endocrinology and Metabolism. McGraw-Hill.
4. Syllabus of Endocrine Society Postgraduate Assembly
5. Medical Knowledge Self-Assessment Program. American College of Physicians

Pediatric Endocrinology

1. Kaplan SA. Clinical Pediatric Endocrinology. WB Saunders

APPENDIX "E"

MANDATORY WORKSHOPS

1. Each candidate of MD program would attend the 04 mandatory workshops and any other workshop as required by the university.
2. The four mandatory workshops will include the following
 - a) **Research Methodology and Biostatistics**
 - b) **Synopsis Writing**
 - c) **Communication Skills**
 - d) **Introduction to computer / Information Technology and Software programs**

The workshops will be held on 03 monthly basis.

4. An appropriate fee for each workshop will be charged.
5. Each workshop will be of 02 - 05 days duration.
6. Certificates of attendance will be issued upon satisfactory completion of workshop.

APPENDIX "F"

CONTINUOUS INTERNAL ASSESSMENTS

a) Workplace Based Assessments

Workplace base assessment consist of Generic as well as Especially Specific Competency Assessments and Multisource Feedback Evaluation.

Generic Competency Training & Assessments

The candidates of all MD programs will be trained and assessed in the following five generic competencies

i. Patient Care

- a) Patient care competency will include skills of history taking, examination, diagnosis, plan of investigation, clinical judgement, plan of treatment, consent, counselling, plan of follow up, communication with patient / relative and staff.
- b) The candidate must learn patient care through ward teaching , departmental conferences ,mortality and morbidity meetings, core curriculum lectures and training procedures and operations.
- c) The candidates will be assessed by the supervisor during presentation of cases on clinical ward round, scenario based discussions on patients managements, multisource feedback evaluations, Direct Observation of procedure (DOP) and operating rooms assessments
- d) These method of assessments will have equal weightage

ii. Medical Knowledge and Research

- a) The candidate will learn basic factual knowledge of illnesses relevant through lectures and discussions on topics selected from syllabus, small group tutorials and bed side rounds
- b) The medical knowledge and skill will be assessed by teachers during lectures, clinical rounds and workshops
- c) The candidate will be trained in designing research project, data collection, data analysis and presentation of results by the supervisor.
- d) The acquisition of research skill will be assessed as per regulation governing thesis evaluation and its acceptance

ii. **Practice and System Based Learning**

APPENDIX "F"

CONTINUOUS INTERNAL ASSESSMENTS

b) Workplace Based Assessments

Workplace base assessment consist of Generic as well as Especially Specific Competency Assessments and Multisource Feedback Evaluation.

Generic Competency Training & Assessments

The candidates of all MD programs will be trained and assessed in the following five generic competencies

iii. Patient Care

- e) Patient care competency will be include skills of history taking, examination, diagnosis, plan of investigation, clinical judgement, plan of treatment, consent, counselling, plan of follow up, communication with patient / relative and staff.
- f) The candidate must learn patient care through ward teaching , departmental conferences ,mortality and morbidity meetings, core curriculum lectures and training procedures and operations.
- g) The candidates will be assessed by the supervisor during presentation of cases on clinical ward round, scenario based discussions on patients managements, multisource feedback evaluations, Direct Observation of procedure (DOP) and operating rooms assessments
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- e) The candidate will learn basic factual knowledge of illnesses relevant through lectures and discussions on topics selected from syllabus, small group tutorials and bed side rounds
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- g) The candidate will be trained in designing research project, data collection, data analysis and presentation of results by the supervisor.
- h) The acquisition of research skill will be assessed as per regulation governing thesis evaluation and its acceptance

iii. **Practice and System Based Learning**

- a. This competency will be learnt from journal clubs, review of literature, policies and guidelines, audits projects, medical error investigation, root cause analysis and awareness of healthcare facilities.
- b. The assessment methods will include case studies, presentation in morbidity and mortality review meetings and presentation of audit projects if any.
- c. These methods of assessment shall have equal weight-age.

iv. **Communication Skills**

- a. These will be learnt from role models, supervisor and workshops.
- b. They will be assessed by direct observation of the candidate whilst interacting with the patients, relatives, colleagues and multisource feedback evaluation.

v. **Professionalism as per Hippocratic Oath**

- a. This competency is learnt from supervisor acting as a role model, ethical case conferences and lectures on ethical issues such as confidentiality, informed consent, end of life decisions, **conflict of** interest, harassment use of human subjects in research.
- b. The assessment of residents will be through multisource. feedback evaluation according to proformas of evaluation and its scoring method.

vi. **Specialty Specific Competencies**

- i. The candidates will be trained in operative and procedural skills according to a quarterly based schedule.
- ii. The level of procedural competency will be according to a competency table to be developed by each specialty.

iii. The following key will be used for assessing operative and procedural competencies

a. Level 1 Observer status

The candidate physically presents and observing the supervisor and senior colleagues

b. Level 2 Assistant status

The candidate assisting procedures and operations

c. Level 3 Performed under supervision

The candidate operating or performing procedure under direct supervision

d. Level 4 Performed independently

The candidate operating or performing the procedure without any supervision

iv. Procedure Based Assessments (PBA)

- a. Procedural competency will assess the skill of consent taking, preoperative preparation and planning, intraoperative" general, 'and Specific tasks and postoperative management
- b. Procedure Based assessments **will** be **carried** out during teaching" and training of each procedure.
- c. The assessors may be supervisors, consultant colleagues and senior residents.
- d. The standardized forms will be filled in by the assessor after direct observation.
- e. The resident's evaluation will be graded as satisfactory, deficient, requiring further training and not assessed at all.
- f. Assessment report will be submitted.
- g. A satisfactory score will be required to be eligible for taking final examination.

Multisource Feedback Evaluation

- i. The supervisor would ensure a multisource feedback to collect peer assessments in medical knowledge, clinical skills, communication skills, professionalism, integrity, and responsibility.
- ii. Satisfactory annual reports will be required to become eligible for the final examination

c) Completion Of Candidate's Training Pdrtfolio

- i. The Candidate's Training Portfolio (CTP) will be published (or computer based portfolio downloadable) by the university.
- II. The candidates would either purchase the CTP or download it from the K/MU web site.
- iii. The portfolio will consist of the following components
 - a) Enrollment details.
 - b) Candidate's credentials as submitted on the application for admission form.
 - c) Timeline of scheduled activities e.g. date of commandment and completion of training, submission of synopsis and thesis, assessments and examination dates etc. (Appendix H)
 - d) Log Book of case presentations, operations and procedures recorded in an appropriate format and validated by the Supervisor.
 - e) Record of participation and presentations in academic activities e.g lectures, workshops, journal clubs, clinical audit projects, morbidity & mortality **review meetings, presentation inhouse as well** at national and international meetings.
 - f} Record of Publications if any.
 - g) Record of results of assessments and examinations 'if any
 - h) Synopsis submission proforma and IRB proforma and AS&RB approval Letter
 - i) Copy of Synopsis as approved by AS&RB
- iv. Candidates Training Portfolio shall be assessed as per proforma given in "Appendix-G".

The supervisor annual report

This report will consist of the following components: -

i. Verification and validation of Log Book of operations & procedures according to the expected number of operations and procedures performed (as per levels of competence) determined by relevant board of studies.

- ii. A 90 % attendance in academic activities is expected. The academic activities will include: Lectures, Workshops other than mandatory workshops Journal Clubs, Morbidity & Mortality Review Meetings and Other presentations.
- iii. Assessment report of presentations and lectures
- iv. Compliance Report to meet timeline for completion of research project.
- v. Compliance Report on Personal Development Plan.
- vi. Multisource Feedback Report, on relationship with colleagues, patients.

VII. Supervisor will produce an annual report based on assessment as per proforma in appendix-G and submit it to the Examination Department.

viii. 75 % score will be required to pass the Continuous Internal Assessment on annual review.

APPENDIX "F"

CONTINUOUS INTERNAL ASSESSMENTS

d) Workplace Based Assessments

Workplace base assessment consist of Generic as well as Especially Specific Competency Assessments and Multisource Feedback Evaluation.

Generic Competency Training & Assessments

The candidates of all MD programs will be trained and assessed in the following five generic competencies

- v. Patient Care
 - i) Patient care competency will include skills of history taking, examination, diagnosis, plan of investigation, clinical judgement, plan of treatment, consent, counselling, plan of follow up, communication with patient / relative and staff.

- j) The candidate must learn patient care through ward teaching , departmental conferences ,mortality and morbidity meetings, core curriculum lectures and training procedures and operations.
- k) The candidates will be assessed by the supervisor during presentation of cases on clinical ward round, scenario based discussions on patients managements, multisource feedback evaluations, Direct Observation of procedure (DOP) and operating rooms assessments
- l) These method of assessments will have equal weightage

vi. Medical Knowledge and Research

- i) The candidate will learn basic factual knowledge of illnesses relevant through lectures and discussions on topics selected from syllabus, small group tutorials and bed side rounds
- j) The medical knowledge and skill will be assessed by teachers during lectures, clinical rounds and workshops
- k) The candidate will be trained in designing research project, data collection, data analysis and presentation of results by the supervisor.
- l) The acquisition of research skill will be assessed as per regulation governing thesis evaluation and its acceptance

iv. **Practice and System Based Learning**

- a. This competency will be learnt from journal clubs, review of literature, policies and guidelines, audits projects, medical error investigation, root cause analysis and awareness of healthcare facilities.
- b. The assessment methods will include case studies, presentation in morbidity and mortality review meetings and presentation of audit projects if any.
- c. These methods of assessment shall have equal weight-age.

iv. **Communication Skills**

- c. These will be learnt from role models, supervisor and workshops.
- d. They will be assessed by direct observation of the candidate whilst interacting with the patients, relatives, colleagues and multisource feedback evaluation.

vii. **Professionalism as per Hippocratic Oath**

- a. This competency is learnt from supervisor acting as a role model, ethical case conferences and lectures on ethical issues such as confidentiality, informed consent, end of life decisions, **conflict of interest**, harassment use of human

subjects in research.

- b. The assessment of residents will be through multisource feedback evaluation according to proformas of evaluation and its scoring method.

viii. **Specialty Specific**

Competencies

- v. The candidates will be trained in operative and procedural skills according to a quarterly based schedule.
- vi. The level of procedural competency will be according to a competency table to be developed by each specialty.

The following key will be used for assessing operative and procedural competencies

Level 1
Observer status

the candidate

physically presents and observing the supervisor and senior colleagues

a. Level 2 Assistant status

The candidate assisting procedures and operations

b. Level 3 Performed under supervision

The candidate operating or performing procedure under direct supervision

c. Level 4 Performed independently

The candidate operating or performing the procedure without any supervision

vii. Procedure Based Assessments (PBA)

- a. Procedural competency will assess the skill of consent taking, preoperative preparation and planning, intraoperative" general, 'and Specific tasks and postoperative management
- b. Procedure Based assessments **will** be **carried** out during teaching" and training of each procedure.
- c. The assessors may be supervisors, consultant colleagues and senior residents.
- d. The standardized forms will be filled in by the assessor after direct observation.
- e. The resident's evaluation will be graded as satisfactory, deficient, requiring further training and not assessed at all.
- f. Assessment report will be submitted.
- g. A satisfactory score will be required to be eligible for taking final examination.

Multisource Feedback Evaluation

- i. The supervisor would ensure a multisource feedback to collect peer assessments in medical knowledge, clinical skills, communication skills, professionalism, integrity, and responsibility.
- ii. Satisfactory annual reports will be required to become eligible for the final examination

e) Completion Of Candidate's Training Pdrtfolio

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 - j) Record of results of assessments and examinations 'if any
 - k) Synopsis submission proforma and IRB proforma and AS&RB approval Letter
 - l) Copy of Synopsis as approved by AS&RB
- vi. Candidates Training Portfolio shall be assessed as per proforma given in "Appendix-G".

The supervisor annual report

This report will consist of the following components: -

i. Verification and validation of Log Book of operations & procedures according to the expected number of operations and procedures performed (as per levels of competence) determined by relevant board of studies.

- vii. A 90 % attendance in academic activities is expected. The academic activities will include: Lectures, Workshops other than mandatory **workshops Journal Clubs**, Morbidity & Mortality **Review Meetings** and Other presentations.
- viii. **Assessment** report of presentations and lectures
- ix. **Compliance Report** to meet timeline for completion of research project.

x. Compliance Report on Personal Development Plan.

xi. Multisource Feedback Report, on relationship with colleagues, patients.

VII. Supervisor will produce an annual report **based on assessment** as per proforma in appendix-G and submit it to the Examination **Department**.

viii. 75 % **score** will be required to pass the Continuous Internal Assessment on annual review.

APPENDIX "F"

CONTINUOUS INTERNAL ASSESSMENTS

f) Workplace Based Assessments

Workplace base assessment consist of Generic as well as Especially Specific Competency Assessments and Multisource Feedback Evaluation.

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- o) The candidates will be assessed by the supervisor during presentation of cases on clinical ward round, scenario based discussions on patients managements, multisource feedback evaluations, Direct Observation of procedure (DOP) and operating rooms assessments
- p) These method of assessments will have equal weightage

viii. Medical Knowledge and Research

- m) The candidate will learn basic factual knowledge of illnesses relevant through lectures and discussions on topics selected from syllabus, small group tutorials and bed side rounds
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iv. **Communication Skills**

- e. These will be learnt from role models, supervisor and workshops.
- f. They will be assessed by direct observation of the candidate whilst interacting with the patients, relatives, colleagues and multisource feedback evaluation.

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- a. This competency is learnt from supervisor acting as a role model, ethical case conferences and lectures on ethical issues such as confidentiality, informed consent, end of life decisions, **conflict of** interest, harassment use of human subjects in research.
- b. The assessment of residents will be through multisource. feedback evaluation according to proformas of evaluation and its scoring method.

x. **Specialty Specific Competencies**

- viii. The candidates will be trained in operative and procedural skills according to a quarterly based schedule.
- ix. The level of procedural competency will be according to a competency table to be developed by each specialty.
 - The following key will be used for assessing operative and procedural competencies

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and observing the supervisor and senior

The candidate assisting procedures and operations

colleagues

ii. Level 2 Assistant status

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The candidate operating or performing direct
supervision

procedure
under

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The candidate operating or performing the
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viii. Candidates Training Portfolio shall be assessed as per proforma given in "Appendix-G".

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xiii. **Assessment** report of presentations and lectures

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g. These will be learnt from role models, supervisor and workshops.

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Record of Publications if any.

 - p) Record of results of assessments and examinations 'if any
 - q) Synopsis submission proforma and IRB proforma and AS&RB approval Letter
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i. Verification and validation of Log Book of operations & procedures according to the expected number of operations and procedures performed (as per levels of competence) determined by relevant board of studies.

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xviii. **Assessment** report of presentations and lectures

xix. **Compliance Report** to meet timeline for completion of research project.

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