

# Diabetes



## STUDY GUIDE

### ENDOCRINE-II MODULE

### THIRD YEAR MBBS

9<sup>th</sup> July – 1<sup>st</sup> Aug 2019

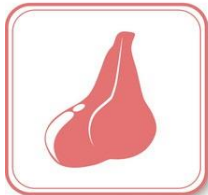
## ENDOCRINE SYSTEM



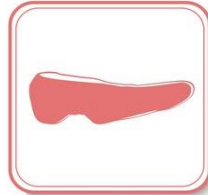
*Adrenal gland*



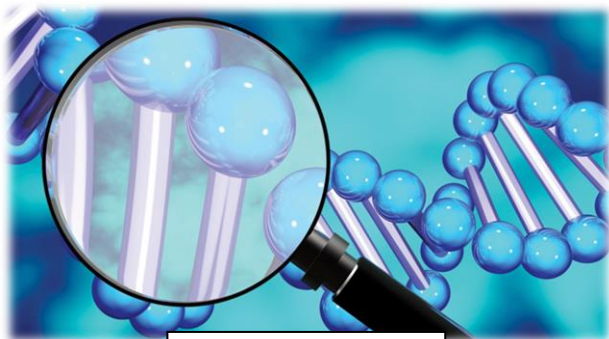
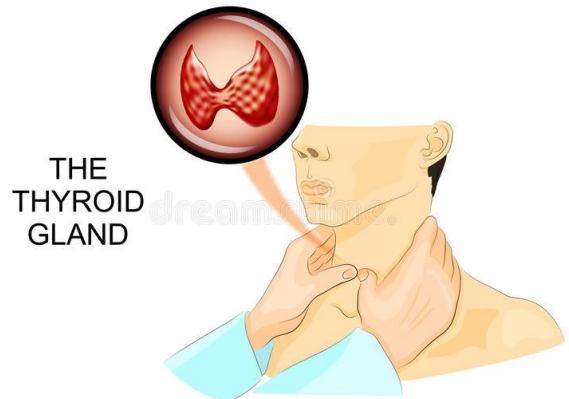
*Thyroid*



*Pituitary gland*

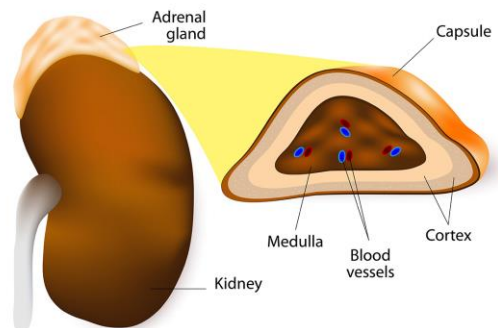


*Pancreas*



Forensic Genetics

## ADRENAL GLAND



**LIAQUAT NATIONAL HOSPITAL  
& MEDICAL COLLEGE**



**STUDY GUIDE FOR ENDOCRINE-II MODULE**

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Module name: **Endocrine-II**

Year: **Three**

Duration: **4 weeks (July 2019)**

Timetable hours: **Lectures, Case-Based Integrated Learning (CBIL), Clinical Rotations, learning experience in LNH outreach centers, Laboratory, Practical, Demonstrations, Skills, Self-Study**

### MODULE INTEGRATED COMMITTEE

<b>MODULE COORDINATOR:</b>	<ul style="list-style-type: none"> <li>• Dr. Aqiba Sarfraz (Endocrinology)</li> </ul>
<b>CO-COORDINATORS:</b>	<ul style="list-style-type: none"> <li>• Dr. Sobia Ali (DHCE)</li> </ul>

### DEPARTMENTS' & RESOURCE PERSONS' FACILITATING LEARNING

BASIC HEALTH SCIENCES	CLINICAL AND ANCILLARY DEPARTMENTS
<b>ANATOMY</b> <ul style="list-style-type: none"> <li>• Professor Zia-ul-Islam</li> </ul>	<b>ENDOCRINOLOGY</b> <ul style="list-style-type: none"> <li>• Dr. Aqiba Sarfraz</li> <li>• Dr. Muhammad Naeem Durrani</li> </ul>
<b>COMMUNITY MEDICINE</b> <ul style="list-style-type: none"> <li>• Dr. Saima Zainab</li> </ul>	<b>ENT</b> <ul style="list-style-type: none"> <li>• Prof. Shakil Aqil</li> <li>• Dr. Ahmad Nawaz</li> </ul>
<b>FORENSIC MEDICINE</b> <ul style="list-style-type: none"> <li>• Professor Murad Zafar Marri</li> </ul>	<b>RESEARCH &amp; SKILLS DEVELOPMENT CENTER</b> <ul style="list-style-type: none"> <li>• Dr. Kahkashan Tahir</li> </ul>
<b>PATHOLOGY</b> <ul style="list-style-type: none"> <li>• Professor Naveen Faridi</li> <li>• Dr. Humaira Howrah Ali</li> </ul>	<b>PEDIATRICS</b> <ul style="list-style-type: none"> <li>• Prof. Samina Shamim</li> <li>• Dr. Raman Kumar</li> </ul>
<b>PHARMACOLOGY</b> <ul style="list-style-type: none"> <li>• Professor Nazir Ahmad Solangi</li> <li>• Professor Tabassum Zehra</li> </ul>	
<b>PHYSIOLOGY</b> <ul style="list-style-type: none"> <li>• Professor Syed Hafeez-ul-Hassan</li> </ul>	
<b>DEPARTMENT OF HEALTHCARE EDUCATION</b>	
<ul style="list-style-type: none"> <li>• Professor Nighat Huda</li> <li>• Dr. Mehnaz Umair</li> </ul>	<ul style="list-style-type: none"> <li>• Dr. Sobia Ali</li> <li>• Dr. M. Suleman Sadiq</li> <li>• Dr. Afifa Tabassum</li> </ul>
<b>LNH&amp;MC MANAGEMENT</b>	
<ul style="list-style-type: none"> <li>• Professor Karimullah Makki, Principal, LNH&amp;MC</li> <li>• Dr. Shaheena Akbani, Director A.A &amp; R.T LNH&amp;MC</li> </ul>	
<b>STUDY GUIDE COMPILED BY:</b>	
<ul style="list-style-type: none"> <li>• Dr. Sobia Ali, Associate Professor, Department of Health Care Education</li> <li>• Dr. Muhammad Suleman Sadiq, Lecturer III, Department of Health Care Education</li> </ul>	

## **INTRODUCTION**

### **WHAT IS A STUDY GUIDE?**

It is an aid to:

- Inform students how student learning program of the module has been organized
- Help students organize and manage their studies throughout the module
- Guide students on assessment methods, rules and regulations

### **THE STUDY GUIDE:**

- Communicates information on organization and management of the module.  
This will help the student to contact the right person in case of any difficulty.
- Defines the objectives which are expected to be achieved at the end of the module.
- Identifies the learning strategies such as lectures, small group teachings, clinical skills, demonstration, tutorial and case based learning that will be implemented to achieve the module objectives.
- Provides a list of learning resources such as books, computer assisted learning programs, web- links, journals, for students to consult in order to maximize their learning.
- Highlights information on the contribution of continuous on the student's overall performance.
- Includes information on the assessment methods that will be held to determine every student's achievement of objectives.
- Focuses on information pertaining to examination policy, rules and regulations.

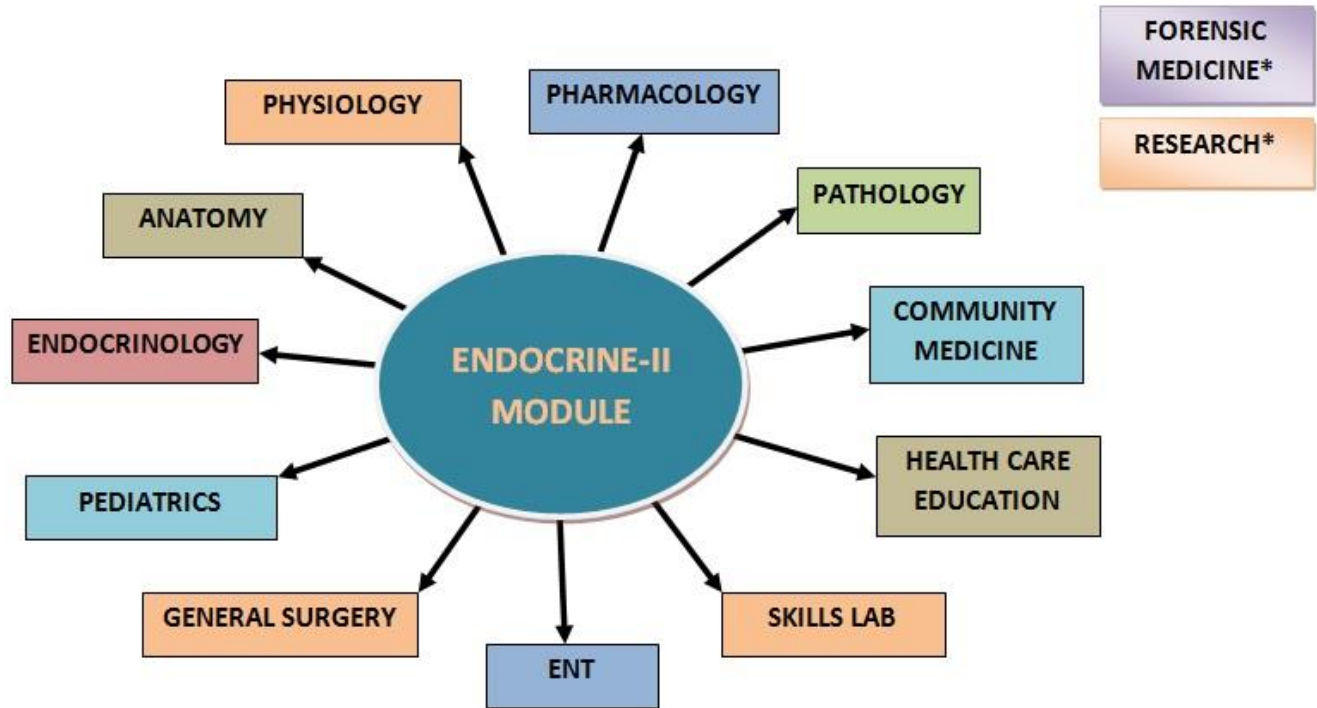
### **CURRICULUM FRAMEWORK**

Students will experience *integrated curriculum* similar to previous modules.

**INTEGRATED CURRICULUM** comprises of system-based modules such as GIT & Liver II, Renal & Excretory System II and Endocrinology II which links basic science knowledge to clinical problems. Integrated teaching means that subjects are presented as a meaningful whole. Students will be able to have better understanding of basic sciences when they repeatedly learn in relation to clinical examples.

**LEARNING EXPERIENCES:** Case based integrated discussions, skills acquisition in skills lab. computer-based assignments, learning experiences in clinics, wards, and outreach centers.

## INTEGRATING DISCIPLINES OF ENDOCRINE MODULE-II



Note: \*Forensic Medicine & Research Curriculum will run parallel in 5<sup>th</sup> and 6<sup>th</sup> Semester

## LEARNING METHODOLOGIES

The following teaching / learning methods are used to promote better understanding:

- Interactive Lectures
- Small Group Discussion
- Case- Based Integrated Learning (CBIL)
- Clinical Experiences
  - Clinical Rotations
  - Experience in LNH outreach centers
- Practicals
- Skills session
- Self-Directed Study

**INTERACTIVE LECTURES:** In large group, the lecturer introduces a topic or common clinical conditions and explains the underlying phenomena through questions, pictures, videos of patients' interviews, exercises, etc. Students are actively involved in the learning process.

**SMALL GROUP SESSION:** This format helps students to clarify concepts, acquire skills or desired attitudes. Sessions are structured with the help of specific exercises such as patient case, interviews or discussion topics. Students exchange opinions and apply knowledge gained from lectures, tutorials and self study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

**CASE- BASED INTEGRATED LEARNING (CBIL):** A small group discussion format where learning is focused around a series of questions based on a clinical scenario. Students' discuss and answer the questions applying relevant knowledge gained previously in clinical and basic health sciences during the module and construct new knowledge. The CBIL will be provided by the concern department.

**CLINICAL LEARNING EXPERIENCES:** In small groups, students observe patients with signs and symptoms in hospital wards, clinics and outreach centers. This helps students to relate knowledge of basic and clinical sciences of the module and prepare for future practice.

- **CLINICAL ROTATIONS:** In small groups, students rotate in different wards like Medicine, Pediatrics, Surgery, Obs & Gyne, ENT, Eye, Family Medicine clinics, outreach centers & Community Medicine experiences. Here students observe patients, take histories and perform supervised clinical examinations in outpatient and inpatient settings. They also get an opportunity to observe medical personnel working as a team. These rotations help students relate basic medical and clinical knowledge in diverse clinical areas.
- **EXPERIENCE IN LNH OUTREACH CENTERS:** Learning at outreach centers of LNH have been organized and incorporated as part of training of third year medicinal students. The objective is to provide clinical training experiences for students in primary care settings.

**PRACTICAL:** Basic science practicals related to pharmacology, microbiology, pathology, forensic medicine, and community medicine have been schedule for student learning.

**SKILLS SESSION:** Skills relevant to respective module are observed and practiced where applicable in skills laboratory.

**SELF-DIRECTED STUDY:** Students' assume responsibilities of their own learning through individual study, sharing and discussing with peers, seeking information from Learning Resource Center, teachers and resource persons within and outside the college. Students can utilize the time within the college scheduled hours of self-study.

### MODULE 3: ENDOCRINOLOGY-II

#### INTRODUCTION

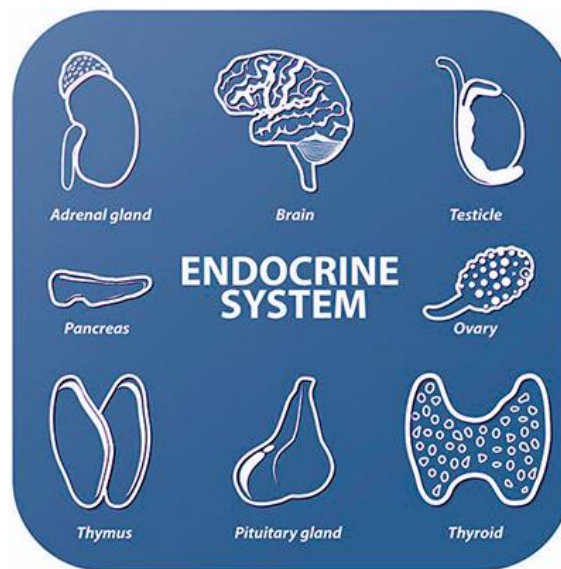
The endocrine system is responsible for monitoring changes occurring in human's internal and external environment. It works in conjunction with nervous system for adaptation in response to these changes. It plays a key role in maintenance of whole body homeostasis and thus balancing wellbeing and ailment throughout the life.

As part of the spiral II of our integrated module, the emphasis of this three weeks module will be to correlate already built concepts of underlying principles of endocrinology with their clinical presentations, their pathologies and treatment options.

Our major emphasis will be on Hypothalamic - pituitary axis, thyroid gland, parathyroid gland, adrenal gland, and pancreatic hormones.

Our instructional strategies will prominently focus on methods available for the diagnosis of specific endocrine diseases. This includes physical examination findings, measurement of electrolyte and hormone levels and surgical and pharmacological treatment options.

This study guide will help you prioritize the important topics for learning in relation to the module objectives through lectures, demonstrations, tutorials, practicals and skill lab sessions.



**COURSE OBJECTIVES AND STRATEGIES**

At the end of the module the students will be able to:

<b>TOPICS &amp; OBJECTIVES</b>	<b>FACULTY</b>	<b>LEARNING STRATEGY</b>
<b>OVERVIEW</b>		
<ul style="list-style-type: none"> <li>Discuss the anatomical features of endocrine glands</li> </ul>	Anatomy	Interactive Lecture
<ul style="list-style-type: none"> <li>Describe the synthesis and modes of secretion of hormones</li> <li>Explain the roles of the endocrine system in maintaining homeostasis</li> </ul>	Physiology	Small Group Discussion
<ul style="list-style-type: none"> <li>Describe the different classes and chemical structures of hormones</li> </ul>		Interactive Lectures
<ul style="list-style-type: none"> <li>Explain how the secretion of hormones is regulated, including the principles of negative and positive feedback mechanisms</li> </ul>		
<b>PITUITARY GLAND</b>		
<b>Overview of pituitary pathology</b>	Anatomy	Practical
<ul style="list-style-type: none"> <li>Identify the microscopic features of Pituitary gland in detail</li> </ul>		
<ul style="list-style-type: none"> <li>List the hormones produced by the hypothalamus and the pituitary gland along with their functions</li> <li>Describe hyperpituitarism and clinical manifestations of different adenomas</li> <li>Define hypopituitarism and discuss its causes</li> <li>Describe posterior pituitary syndromes</li> </ul>	Pathology	Interactive Lecture
<ul style="list-style-type: none"> <li>Interpret pituitary function tests</li> <li>Explain the mechanism and clinical significance of pituitary functions tests including Prolactin, LH and FSH, TSH, Thyroxine, ACTH, Cortisol, GH and IGF</li> </ul>	Pathology	Interactive Lecture
<b>Growth hormone and pharmacological applications</b>		
<ul style="list-style-type: none"> <li>Explain the physiological actions and role of hormones in different disorders</li> <li>Discuss anterior pituitary hormones</li> <li>Discuss posterior pituitary hormones</li> <li>Discuss pharmacology and therapeutic uses of growth hormones</li> <li>Describe adverse effects and contraindication of growth hormone</li> </ul>	Pharmacology	Interactive Lecture
<b>Anterior &amp; posterior pituitary hormone deficiencies:</b>		
<ul style="list-style-type: none"> <li>Discuss the signs and symptoms along with the other clinical manifestation related to anterior &amp; posterior pituitary hormone deficiencies</li> </ul>	Endocrinology /Pediatrics	Interactive Lectures
<b>Hypopituitarism in children:</b>		
<ul style="list-style-type: none"> <li>Describe hypopituitarism in children</li> <li>List the Causes of hypopituitarism in children</li> <li>Describe the clinical presentations of hypopituitarism</li> </ul>		



<ul style="list-style-type: none"> <li>Discuss the Laboratory findings of hypopituitarism</li> <li>Describe the causes of growth hormone deficiencies</li> <li>List indications of growth hormone replacement in children</li> </ul>		
<p><b><u>Tumors of Pituitary</u></b></p> <ul style="list-style-type: none"> <li>Classify anterior pituitary tumors</li> <li>Discuss genetic alterations, morphology and clinical manifestations of each adenoma</li> <li>Explain Hypothalamic suprasellar tumors</li> </ul>	Pathology	Interactive Lecture
<b>THYROID AND PARATHYROID HORMONES</b>		
<p><b><u>Hypo/Hyper secretion of Thyroid gland</u></b></p> <ul style="list-style-type: none"> <li>Elaborate causes of Hypothyroidism</li> <li>Discuss Cretinism, Myxedema and different types of Thyroiditis</li> <li>Explain Grave's disease, diffuse and multinodular goiters</li> </ul>	Pathology	Interactive Lectures
<p><b><u>Tumors of Thyroid gland</u></b></p> <ul style="list-style-type: none"> <li>Explain follicular adenoma, its morphology and clinical features</li> <li>Discuss follicular, papillary, anaplastic and medullary thyroid carcinomas, their morphology and clinical courses</li> </ul>	Pathology	
<p><b><u>Lab evaluation of Endocrine Diseases</u></b></p> <ul style="list-style-type: none"> <li>Elaborate the pathophysiology of lab tests associated with diseases of Hypothalamus, Thyroid, Parathyroid and adrenal glands</li> </ul>		
<p><b><u>Histopathology of Thyroid</u></b></p> <ul style="list-style-type: none"> <li>Describe the histopathology of Hashimotos and granulomatous Thyroiditis, Graves' disease, multinodular goiter, follicular adenoma, follicular carcinoma, papillary carcinoma and medullary carcinoma of thyroid gland</li> </ul>		Small Group Discussion
<p><b><u>Hypothyroidism in children:</u></b></p> <ul style="list-style-type: none"> <li>Describe the functions of thyroid hormones</li> <li>List the causes of hypothyroidism in children</li> <li>Identify common signs and symptoms of hypothyroidism</li> <li>Discuss the importance of neonatal thyroid screening</li> <li>Develop a management plan for Hypothyroidism in children</li> </ul>	Pediatrics	Interactive Lecture
<p><b><u>Thyroid Examination:</u></b></p> <ul style="list-style-type: none"> <li>Examine the thyroid gland in simulated patient/normal human subject</li> </ul>	ENT	Small Group Discussion
<p><b><u>Thyroid Disorders:</u></b></p> <ul style="list-style-type: none"> <li>Identify the signs and symptoms of thyroid disorders</li> <li>Describe various causes of thyroid disorders</li> <li>List the relevant investigations of thyroid disorders</li> <li>Discuss the management plan of thyroid disorders</li> <li>Describe the complications of thyroid disorders</li> </ul>	Endocrinology	Interactive Lecture/Case-Based Integrated Learning
<p><b><u>Drugs used in Thyroid Diseases</u></b></p> <ul style="list-style-type: none"> <li>Describe the clinical presentation and classification, pharmacokinetics and pharmacodynamics of drugs used in hyperthyroidism</li> <li>Describe the treatment of thyroid storm and myxedema coma</li> </ul>	Pharmacology	Case-Based Integrated Learning

<p><b><u>Drugs Used to treat Hypothyroidism</u></b></p> <ul style="list-style-type: none"> <li>Describe the clinical presentation and classification, pharmacokinetics and pharmacodynamics of drugs used in hypothyroidism</li> </ul>		
<p><b><u>Pathophysiology of Parathyroid gland</u></b></p> <ul style="list-style-type: none"> <li>Describe the causes, pathophysiology and histopathology of hyper and hypo parathyroidism</li> </ul>	Pathology	Interactive Lecture
<p><b><u>Parathyroid Disorders:</u></b></p> <ul style="list-style-type: none"> <li>Identify the signs and symptoms of parathyroid disorders</li> <li>Describe various causes of parathyroid disorders</li> <li>List the relevant investigations of parathyroid disorders</li> <li>Discuss the management plan of parathyroid disorders</li> <li>Describe the complications of parathyroid disorders</li> </ul>	Endocrinology	Interactive Lecture
<b>DIABETES MELLITUS</b>		
<p><b><u>Diabetes Mellitus Type 1 &amp; 2:</u></b></p> <ul style="list-style-type: none"> <li>Enlist the diagnostic criteria of diabetes mellitus</li> <li>Describe the pathogenesis and clinical presentation of Type 1 and Type 2 diabetes mellitus</li> </ul>	Pathology	Interactive Lectures
<p><b><u>Clinical Manifestation of Diabetes Mellitus:</u></b></p> <ul style="list-style-type: none"> <li>Define the diagnostic criteria for Diabetes</li> <li>Differentiate between Type 1 and Type 2 diabetes</li> <li>Identify sign and symptoms of diabetes mellitus</li> <li>Interpret the investigation related to Diabetes Mellitus</li> <li>Formulate the management plan of Diabetes Mellitus</li> <li>Describe the complications of diabetes mellitus</li> </ul>	Endocrinology	Interactive Lecture
<p><b><u>Diabetes in children:</u></b></p> <ul style="list-style-type: none"> <li>Discuss the role of glucose and insulin in the body</li> <li>Explain the role of glucose in the body of a type 1 diabetes patient</li> <li>Distinguish between various forms of diabetes in children (type-I, type-II)</li> <li>Identify the sign and symptoms of diabetes in children</li> <li>Interpret the laboratory findings in a case of diabetes in children</li> <li>Develop a treatment plan in a case of diabetes in children</li> <li>List the complications of diabetes in children</li> </ul>		
<p><b><u>Complication of Diabetes Mellitus:</u></b></p> <ul style="list-style-type: none"> <li>Describe the pathogenesis, morphology and clinical features of the chronic complications of Diabetes</li> </ul> <p><b><u>Diabetic Ketoacidosis:</u></b></p> <ul style="list-style-type: none"> <li>Describe the pathogenesis and lab findings of diabetic ketoacidosis and non ketotic hyperosmolar coma</li> </ul>	Pathology	Interactive Lectures
<p><b><u>Oral hypoglycemic agents 1:</u></b></p> <ul style="list-style-type: none"> <li>Explain glucose metabolism</li> <li>Discuss the types and symptoms of diabetes mellitus</li> <li>Classify oral hypoglycemic drugs</li> <li>Describe the pharmacology of oral hypoglycemic agents, adverse effects and important drug interactions</li> </ul>	Pharmacology	Interactive Lecture

<p><b><u>Oral hypoglycemic agents 2:</u></b></p> <ul style="list-style-type: none"> <li>• Explain detailed pharmacology of the others oral antidiabetic drugs and their clinical application</li> </ul> <p><b><u>Insulin Therapy:</u></b></p> <ul style="list-style-type: none"> <li>• Discuss basic and clinical pharmacology and kinetics and dynamics of different Insulin preparations</li> <li>• List the different insulin preparations: Classification, onset, peak and duration of action</li> <li>• Describe conventional and intensive insulin therapy and explain their advantages and disadvantages</li> </ul>	Pharmacology	Interactive Lecture
<b>ADRENAL GLAND</b>		
<p><b><u>Adrenal gland part I</u></b></p> <ul style="list-style-type: none"> <li>• Discuss causes, pathophysiology and histopathology of hypercorticostroidism, hyperaldosteronism and adreno-genital syndrome</li> </ul> <p><b><u>Adrenal gland part II</u></b></p> <ul style="list-style-type: none"> <li>• Discuss causes, pathophysiology and histopathology of primary and secondary adrenocortical insufficiency</li> <li>• Describe tumors of adrenal cortex and adrenal medulla</li> <li>• Define MEN syndrome</li> </ul>	Pathology	Interactive Lecture
<p><b><u>Dynamics of Adreno-Corticosteroid</u></b></p> <ul style="list-style-type: none"> <li>• Discuss the classification and pharmacology of glucocorticoids and mineralocorticoids in detail</li> <li>• Explain indications and adverse effects</li> <li>• Differentiate between an adrenocortical agonist and antagonist</li> </ul>	Pharmacology	Case-Based Discussion
<p><b><u>Cushing syndrome:</u></b></p> <ul style="list-style-type: none"> <li>• Define Cushing Syndrome</li> <li>• Identify the signs and symptoms of Cushing Syndrome</li> <li>• Discuss its types</li> <li>• Interpret investigations related to the Cushing Syndrome</li> <li>• Discuss the management plan of Cushing Syndrome</li> <li>• Describe the complications of Cushing Syndrome</li> </ul>	Endocrinology	Case-Based Discussion
<p><b><u>Addison's Disease</u></b></p> <ul style="list-style-type: none"> <li>• Define Addison's disease</li> <li>• List causes of Addison's disease</li> <li>• Interpret investigations related to the Addison's disease</li> <li>• Describe the complications of Addison's disease</li> <li>• Discuss the management plan of Addison's disease</li> </ul>		Interactive Lectures

<b>COMMUNITY MEDICINE</b>		
<b>Introduction of Biostatistics</b> <ul style="list-style-type: none"> <li>Describe the techniques and procedures to deal with data collection</li> <li>Classify types of data</li> <li>Describe the concept of frequency and cumulative frequency</li> </ul>	Community Medicine	Interactive Lectures/Small Group Discussion
<b>Data and its type</b> <ul style="list-style-type: none"> <li>Classify data</li> <li>Differentiate between qualitative and quantitative data</li> <li>Practice Measurement of Types Of Data</li> </ul>		
<b>Method of data presentation</b> <ul style="list-style-type: none"> <li>Describe different Types of data presentation</li> <li>List the Advantages of tabular &amp; graphic presentation</li> </ul>		
<b>Interpretation of data</b> <ul style="list-style-type: none"> <li>Evaluate criteria of interpretation of data</li> <li>Discuss steps of data interpretation</li> <li>Interpret data</li> </ul>		
<b>Vital Statistics</b> <ul style="list-style-type: none"> <li>Discuss the role of vital statistics in health status of country</li> <li>Describe vital statistics registration in developing countries</li> <li>Explain the situation of vital statistics in Pakistan</li> </ul>		
<b>Measure of Central tendency, mean, median and Mode</b> <ul style="list-style-type: none"> <li>List the advantages and disadvantages of Measures of central tendency</li> <li>Demonstrate how to calculate Measure of Central tendency</li> </ul>		
<b>Measure of dispersion, range, standard deviation</b> <ul style="list-style-type: none"> <li>List the Advantages and disadvantages of Measures of measures of dispersion</li> <li>Demonstrate how to calculate Measure of dispersion</li> </ul>		
<b>FORENSIC MEDICINE</b>		
<u><b>Body Fluids Examinations Tests</b></u> <ul style="list-style-type: none"> <li>Discuss the protocol for examination of blood and blood stains on the basis of physical characters, microscopic and spectroscopic findings</li> <li>Discuss the protocol for examination of seminal stain on the basis on physical characters, chemical tests and microscopic findings</li> </ul>	Forensic Medicine	Small Group Discussion
<u><b>Toxicology:</b></u> <u><b>Food Poisoning:</b></u> <ul style="list-style-type: none"> <li>List the types of food poisoning</li> <li>Differentiate toxin and infectious type of bacterial food poisoning</li> <li>Discuss the symptoms, diagnosis and treatment of food poisoning</li> <li>Describe the role of forensic experts in cases of food poisoning</li> </ul> <u><b>Vegetable Poisoning:</b></u> <ul style="list-style-type: none"> <li>Discuss the sources, mode of action, signs, symptoms, treatment, postmortem findings and medico legal importance of the following poisons:</li> </ul>		Small Group Discussion

<ul style="list-style-type: none"> <li>○ Castor</li> <li>○ Croton</li> <li>○ Abrus Precatorius</li> <li>○ Semicarpus Anacardium</li> </ul> <p><b><u>CO2 Poising-Coal Gas &amp; Sewer Gas:</u></b></p> <ul style="list-style-type: none"> <li>● Discuss the sources, mode of action, signs, symptoms, treatment, postmortem findings and medico legal importance of CO2, Coal gas and Sewer gas poisoning</li> <li>● Discuss Blood grouping and its medico legal importance</li> </ul> <p><b><u>Aluminums Phosphide &amp; Insecticide:</u></b></p> <ul style="list-style-type: none"> <li>● Discuss the sources, mode of action, signs, symptoms, treatment, postmortem findings and medico legal importance of poisoning by Aluminums Phosphide and insecticide</li> </ul>		
<p><b><u>Forensic Serology:</u></b></p> <ul style="list-style-type: none"> <li>● Describe the following analytic techniques: <ul style="list-style-type: none"> <li>○ Thin Layer Chromatography(TLC)</li> <li>○ Gas Chromatography(GC)</li> <li>○ High Pressure Liquid Chromatography(HPLC)</li> <li>○ Spectro-photometry</li> <li>○ Stas-Otto process</li> </ul> </li> </ul>		Small Group Discussion
<p><b><u>Forensic Genetics:</u></b></p> <ul style="list-style-type: none"> <li>● Define the DNA molecular basis</li> <li>● Describe the role of DNA in Forensic Sciences</li> <li>● Describe the DNA Typing techniques (RFLP,PCR, STR, mt DNA, Y-Chromosome Analysis) in context of forensic DNA Analysis</li> <li>● Define mitochondrial DNA and its use in forensic identification</li> <li>● Describe the method of DNA Evidence collection</li> <li>● List the uses of DNA in forensic Sciences</li> </ul>		
<p><b><u>Forensic Pathology</u></b></p> <ul style="list-style-type: none"> <li>● Define Custodial deaths and torture according to World Medical Association(Declaration of Tokyo)</li> <li>● List the types of Deaths in custody</li> <li>● List the various torture techniques</li> <li>● Discuss the sequelae of torture</li> <li>● Discuss the role of medical practitioner in cases of torture</li> <li>● Describe relevant Ethical issues</li> </ul>	Forensic Medicine	Interactive Lectures
<p><b><u>Medicolegal aspects of Biological Stains (Blood):</u></b></p> <ul style="list-style-type: none"> <li>● List the tests used to identify whether the stain is blood or not</li> <li>● Discuss the various methods of determination of origin (species), age, source (Arterial or venous), blood groups and sexing of blood stain</li> <li>● Discuss whether the stain is Ante-mortem or Postmortem</li> <li>● Discuss the distribution pattern of blood</li> <li>● Describe the tests for blood stains (Physical, Microscopic, Chemical, Biological, Spectroscopic)</li> </ul>		
<p><b><u>Medicolegal aspects of Biological Stains (Seminal Stains):</u></b></p>		

<ul style="list-style-type: none"> <li>• Describe the composition of semen</li> <li>• Describe the Normal sperm count as per WHO</li> <li>• Discuss the medico legal importance of seminal stains</li> <li>• Discuss the various methods of collection of seminal material and determination of motility of sperms</li> <li>• Discuss the examination of seminal stains including physical, chemical (Florence Test, Barberio's Test, Acid Phosphatase test, Creatine Phosphokinase test), microscopic, electrophoretic tests (Acid phosphatase isoenzyme, LDH isoenzyme), Immunological [Human seminal plasma (HSP) P30] tests</li> <li>• Differentiate the Blood grouping from seminal stains</li> </ul>		
<p><b><u>Chloro group of Insecticides:</u></b></p> <ul style="list-style-type: none"> <li>• Discuss the sources, mode of action, signs, symptoms, treatment, postmortem findings and medico legal importance of DDT Poisoning</li> <li>• Discuss the sources, mode of action, signs, symptoms, treatment, postmortem findings and medico legal importance of Paraquat poisoning</li> </ul>	Forensic Medicine	Interactive Lecture

**Apart from attending daily scheduled sessions, students too should engage in self-study to ensure that all the objectives are covered.**



**LEARNING RESOURCES**

<b>SUBJECT</b>	<b>RESOURCES</b>
<b>ANATOMY</b>	<p><b>A. <u>GROSS ANATOMY</u></b></p> <ol style="list-style-type: none"> <li>1. K.L. Moore, Clinically Oriented Anatomy</li> </ol> <p><b>B. <u>EMBRYOLOGY</u></b></p> <ol style="list-style-type: none"> <li>1. Keith L. Moore. The Developing Human</li> <li>2. Langman's Medical Embryology</li> </ol>
<b>COMMUNITY MEDICINE</b>	<p><b><u>TEXT BOOKS</u></b></p> <ol style="list-style-type: none"> <li>1. Community Medicine by Parikh</li> <li>2. Community Medicine by M Illyas</li> <li>3. Basic <i>Statistics</i> for the Health Sciences by Jan W Kuzma</li> </ol>
<b>FORENSIC MEDICINE</b>	<p><b><u>TEXT BOOKS</u></b></p> <ol style="list-style-type: none"> <li>1. Nasib R. Awan. Principles and practice of Forensic Medicine 1st ed. 2002.</li> <li>2. Parikh, C.K. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology. 7th ed.2005.</li> </ol> <p><b><u>REFERENCE BOOKS</u></b></p> <ol style="list-style-type: none"> <li>3. Knight B. Simpson's Forensic Medicine. 11th ed.1993.</li> <li>4. Knight and Pekka. Principles of forensic medicine. 3rd ed. 2004</li> <li>5. Krishan VIJ. Text book of forensic medicine and toxicology (principles and practice). 4th ed. 2007</li> <li>6. Dikshit P.C. Text book of forensic medicine and toxicology. 1st ed. 2010</li> <li>7. Polson. Polson's Essential of Forensic Medicine. 4th edition. 2010.</li> <li>8. Rao. Atlas of Forensic Medicine (latest edition).</li> <li>9. Rao. Practical Forensic Medicine 3rd ed ,2007.</li> <li>10. Knight: Jimpson's Forensic Medicine 10th 1991,11th ed.1993</li> <li>11. Taylor's Principles and Practice of Medical Jurisprudence. 15th ed.1999</li> </ol> <p><b><u>CDs:</u></b></p> <ol style="list-style-type: none"> <li>1. Lectures on Forensic Medicine.</li> <li>2. Atlas of Forensic Medicine.</li> </ol> <p><b><u>WEBSITES:</u></b></p> <p><a href="http://www.forensicmedicine.co.uk">www.forensicmedicine.co.uk</a></p>
<b>GENERAL MEDICINE</b>	<p><b><u>REFERENCE BOOKS:</u></b></p> <ol style="list-style-type: none"> <li>1. Hutchison's Clinical Methods, 23<sup>rd</sup> Edition</li> <li>2. MacLeod's clinical examination 13th edition</li> <li>3. Davidson's Principles and Practice of Medicine</li> <li>4. Kumar and Clark's Clinical Medicine</li> <li>5. HCAI guidelines CDC</li> <li>6. WHO TB guidelines</li> </ol>

PATHOLOGY/MICROBIOLOGY	<b><u>TEXT BOOKS</u></b> 1. Robbins & Cotran, Pathologic Basis of Disease, 9th edition. 2. Rapid Review Pathology, 4th edition by Edward F. Goljan MD
	<b><u>WEBSITES:</u></b> 1. <a href="http://library.med.utah.edu/WebPath/webpath.html">http://library.med.utah.edu/WebPath/webpath.html</a> 2. <a href="http://www.pathologyatlas.ro/">http://www.pathologyatlas.ro/</a>
PEDIATRICS	<b><u>TEXT BOOK:</u></b> 1. Nelson Textbook of Pediatrics, 19 <sup>th</sup> Edition 2. Textbook of Pediatrics by PPA, preface written by S. M. Haneef 3. Clinical Pediatrics by Lakshmanaswamy Aruchamy, 3 <sup>rd</sup> Edition
PHARMACOLOGY	<b>A. <u>TEXT BOOKS</u></b> 1. Lippincot Illustrated Pharmacology 2. Basic and Clinical Pharmacology by Katzung
PHYSIOLOGY	<b>A. <u>TEXTBOOKS</u></b> 1. Textbook Of Medical Physiology by Guyton And Hall 2. Ganong ' S Review of Medical Physiology 3. Human Physiology by Lauralee Sherwood 4. Berne & Levy Physiology 5. Best & Taylor Physiological Basis of Medical Practice



**ADDITIONAL LEARNING RESOURCES**

<b><u>Hands-on Activities/ Practical</u></b>	Students will be involved in Practical sessions and hands-on activities that link with the Endocrine-II module to enhance learning.
<b><u>Labs</u></b>	Utilize the lab to relate the knowledge to the specimens and models available.
<b><u>Skills Lab</u></b>	Provides the simulators to learn the basic skills and procedures. This helps build confidence when approaching patients in real settings.
<b><u>Videos</u></b>	Familiarize the student with the procedures and protocols to assist patients. videos on performing digital rectal examination on mannequin : for skills lab session <a href="https://www.youtube.com/watch?v=fUwLRtJN4Aw">https://www.youtube.com/watch?v=fUwLRtJN4Aw</a> <a href="https://www.youtube.com/watch?v=bK1GTLpL_F8">https://www.youtube.com/watch?v=bK1GTLpL_F8</a>
<b><u>Computer Lab/CDs/DVDs/Internet Resources:</u></b>	To increase knowledge and motivation of students through the available internet resources and CDs/DVDs. This will be an additional advantage to meaningful learning.
<b><u>Self Learning</u></b>	Self Learning is when students seek information to solve cases, read through different resources and discuss among peers, and with the faculty to clarify the concepts.

**ASSESSMENT METHODS:****Theory:**

- **Best Choice Questions (BCQs)** also known as MCQs (Multiple Choice Questions) are used to assess objectives covered in each module.
  - A BCQ has a statement or clinical scenario followed by four options (likely answer).
  - Students after reading the statement/scenario select ONE, the most appropriate response from the given list of options.
  - **Correct answer carries one mark, and incorrect 'zero mark'. There is no negative marking.**
  - Students mark their responses on specified computer-based/OMR sheet designed for LNHMC.

**OSPE/OSCE: Objective Structured Practical/Clinical Examination:**

- Each student will be assessed on the same content and have same time to complete the task.
- Comprise of 12-25 stations.
- Each station may assess a variety of clinical tasks, these tasks may include history taking, physical examination, skills and application of skills and knowledge
- Stations are observed, unobserved, interactive and rest stations.
- Observed and interactive stations will be assessed by internal or external examiners.
- Unobserved will be static stations in which there may be an X-ray, Labs reports, pictures, clinical scenarios with related questions for students to answer.
- Rest station is a station where there is no task given and in this time student can organize his/her thoughts.

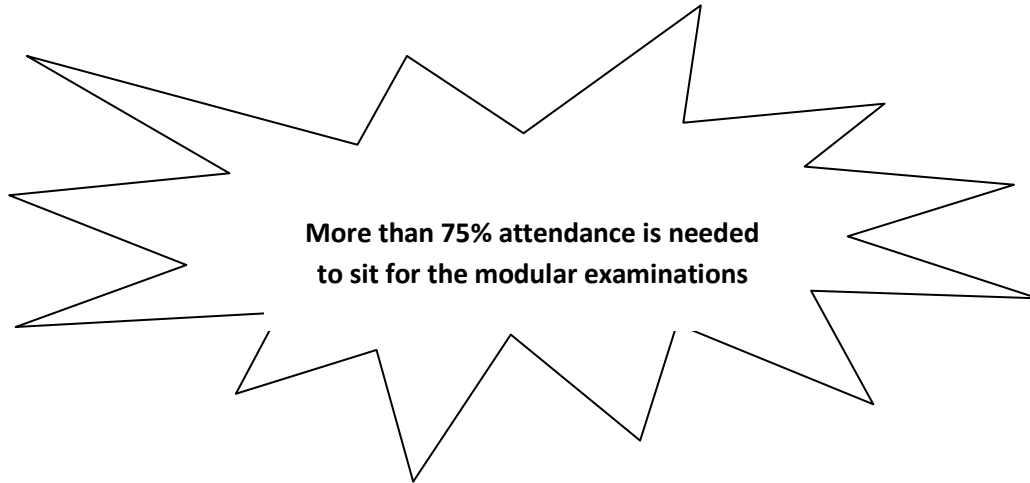
**Internal Evaluation**

- Students will be assessed to determine achievement of module objectives through the following:
  - **Module Examination:** will be scheduled on completion of each module. The method of examination comprises theory exam which includes BCQs and OSPE (Objective Structured Practical Examination).
  - **Graded Assessment of students by Individual Department:** Quiz, viva, practical, assignment, small group activities such as CBL, TBL, TOL, online assessment, ward activities, examination, and log book.
- Marks of both modular examination and graded assessment will constitute 20% weightage.
- As per JSMU policy, this 20% will be added by JSMU to Final Theory Examination.

Example : Number of Marks allocated for Final Theory and Internal Evaluation			
	Final Examination Theory Marks	Internal Evaluation (Class test + Assignments + Modular Exam)	Total (Theory)
	80%	20%	100%

### Formative Assessment

- Individual department may hold quiz or short answer questions to help students assess their own learning. The marks obtained are not included in the internal evaluation



**MODULAR EXAMINATION RULES & REGULATIONS (LNH&MC)**

- Student must report to examination hall/venue, 30 minutes before the exam.
- **Exam will begin sharp at the given time.**
- No student will be allowed to enter the examination hall after 15 minutes of scheduled examination time.
- Students must sit according to their roll numbers mentioned on the seats.
- **Cell phones are strictly not allowed in examination hall.**
- If any student is found with cell phone in any mode (silent, switched off or on) he/she will be not be allowed to continue their exam.
- No students will be allowed to sit in exam without University Admit Card, LNMC College ID Card and Lab Coat
- Student must bring the following stationary items for the exam: Pen, Pencil, Eraser, and Sharpener.
- Indiscipline in the exam hall/venue is not acceptable. Students must not possess any written material or communicate with their fellow students.

**JSMU Grading System**

- It will be based on GPA – 4 system

Marks obtained in Percentage range	Numerical Grade	Alphabetical Grade
80-100	4.0	A+
75-79	4.0	A
70-74	3.7	A-
67-69	3.3	B+
63-66	3.0	B
60-62	2.7	B-
56-59	2.3	C+
50-55	2.0	C
<50 Un-grade-able	0	U

- A candidate obtaining GPA less than 2.00 (50%) is declared un-graded (fail).
- Cumulative transcript is issued at the end of clearance of **all** modules.

**CBL 1: HYPERTHYROIDISM****Learning objectives**

1. Discuss the structure and functions of thyroid gland.
2. Recognize the mechanism of action of thyroid hormones and regulation.
3. Relate the clinical picture with the presentation of such clinical condition.
4. Identify the anatomical structures of the endocrine gland in front of the neck.
5. Discuss the synthesis of T3 T4.
6. Interpret thyroid function tests.
7. Formulate the management plan for thyroid dysfunctions.

**Case**

30 year old female presented with weight loss, diarrhea, and heat intolerance for five weeks along with palpitations, and excessive sweating. On examination she had swelling in front of neck, fine tremors at both out stretched hands. Palms are sweaty and warm. Her facial features and eyes are like below:

**Vitals:**

- **Blood Pressure:** 140/60mm Hg
- **Pulse:** 140 bpm Irregularly irregular

**Lab Investigations:**

<b>WBCs:</b> 11000/mm <sup>3</sup>	<b>ESR:</b> 40mm/hr	<b>Hb:</b> 11 gm/lit	<b>Thyroid function Test TSH:</b> 0.002 (low)
<b>Free T3</b>	<b>Raised Free T4</b>	<b>Raised Thyroid Antibodies</b> Positive (+)	

**QUESTIONS**

1. Which endocrine gland is involved in this case?
2. How would you interpret the thyroid function test of the above case?
3. What has happened to her eyes? And what is this condition called?
4. Why pulse is irregular and what is this condition called?
5. How thyroid hormone is playing role for normal functions of the body?
6. How iodine is incorporated in thyroid gland and hormone and what other macromolecules are involved for its synthesis?
7. What further investigations would you consider?
8. How would you manage this patient and monitor the treatment? 9. What is the role of surgery in hyperthyroidism with goiter?

## CBL 2: CUSHING SYNDROME

### Learning objectives

The student should be able to

1. Describe the role cortisol and its production.
2. Differentiate between Cushing syndrome and disease.
3. Diagnose Cushing syndrome
4. Formulate the management plan of patients with Cushing syndrome
5. Identify and manage complication of cushing syndrome.

### Case

42- year-old woman presented in medical OPD with three month history of headache and narrowing of her visual field. This has badly effecting her driving. She revealed further that she has gained 11 kg for past eight months and noticed growth of coarse facial hairs on her face. On examination she has round flushing face with collection of fat on base of her neck and upper back. She can't stand without support from sitting position. Abdomen has broad 1.5 cm purplish striae. Bitemporal hemianopia was found on confrontation perimetry.

### **Investigations:**

<b>CBC</b> shows mild lymphocytopenia	<b>Fasting blood sugar:</b> 150 mg/dl	<b>Random sugars:</b> 234 mg/dl
<b>Urine DR:</b> +2 Glucose	<b>ACTH level:</b> 68 pmol/L	

Low dose dexametasone failed to suppress cortisol below 1.8 mg/dl and on high dose dexametasone suppression test, the cortisol was suppressed more than 50 % from baseline.

MRI pituitary showed macroadenoma with suprasellar and cavernous sinus extension was noted.

### **QUESTIONS:**

1. Which endocrine glands are involved in this case?
2. How would you interpret tests in this case?
3. How cortisol is regulated in the body?
4. What is the gold standard test for differentiating cushing syndrome from cushing disease?
5. What is the patho-physiology of Stria and muscle weakness?
6. How would you manage this patient?
7. What is the mechanism of diabetes in this patient?

**SCHEDULE:**

WEEKS	3 <sup>rd</sup> Year	MONTH
WEEK 1	<b><u>GIT &amp; LIVER II</u></b> <b><u>MODULE</u></b>	8 <sup>th</sup> April 2019
WEEK 2		
WEEK 3		
WEEK 4		
WEEK 5		
WEEK 6		
WEEK 7		
WEEK 8		
	<b>MODULAR EXAM</b>	30 <sup>th</sup> & 31 <sup>st</sup> May 2019
WEEK 1	<b><u>RENAL &amp; EXCRETORY SYSTEM II</u></b> <b><u>MODULE</u></b>	10 <sup>th</sup> June 2019
WEEK 2		
WEEK 3		
WEEK 4		3 <sup>rd</sup> July 2019
	<b>MODULAR EXAM</b>	6 <sup>th</sup> & 8 <sup>th</sup> July 2019
WEEK 1	<b><u>ENDOCRINOLOGY II</u></b> <b><u>MODULE</u></b>	9 <sup>th</sup> July 2019
WEEK 2		
WEEK 3		
WEEK 4		1 <sup>st</sup> Aug 2019
	<b>MODULAR EXAM</b>	5 <sup>th</sup> & 6 <sup>th</sup> Aug 2019