

# **PEOPLES UNIVERSITY OF MEDICAL & HEALTH SCIENCES FOR WOMEN.(SBA)**



## **ENDOCRINOLOGY STUDY GUIDE**

### **Second Year MBBS**

### **Module -III**

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# INTRODUCTION

## WHAT IS A STUDY GUIDE?

A study guide provides a focus for different educational activities in which the students are engaged. It equips students with information on the topic of study and assists in management of student learning. Furthermore, it imparts relevant information about the organization of the module and thus helps students organize their educational activities accordingly. Another important purpose of a study guide is the dissemination of information about rules and policies and teaching and assessment methods.

## HOW DOES A STUDY GUIDE HELP LEARNERS?

- Includes information on organization and management of the module.
- Advises the learners about representatives who can be contacted in case of need.
- Defines the outcomes and objectives which are expected to be achieved at the end of the module.
- Elaborates the teaching and learning strategies which will be implemented during the module.
- Inform learners about the learning resources in order to maximize their learning.
- Provides information about the assessment methods that will be held to determine every student's achievement of objectives.

## CURRICULUM MODEL:

Integrated modular curriculum is followed at **Peoples University of Medical & Health Sciences for Women (SBA)** for MBBS program. This implies that instead of studying basic and clinical sciences separate and apart, students will experience a balanced and integrated combination of basic and clinical sciences in the form of a system –based modules.

The modular curriculum followed by **Peoples University of Medical & Health Sciences for Women (SBA)** is integrated both in the vertical and the horizontal directions. However, in order to prepare the students for clinical teaching with a sound background knowledge of the basic sciences, the curriculum has been divided in three spirals.

The three spirals are:

- 1. Spiral -1 Basic Sciences**
- 2. Spiral -2 Clinical Sciences**
- 3. Spiral -3 Integrated Supervised Practical Training**

The Basic Sciences Spiral is spread over the first two years and Clinical Sciences Spiral is distributed over the next two years. In the final year students are given practical hands-on training in the role similar to that of a shadow house officer. The whole curriculum is divided into modules, each module being related to a particular system. For example, Cardiovascular 1 module is in the Basic Sciences Spiral-1 and Cardiovascular 2 module is in the Clinical Sciences Spiral-2 and the relevant practical and clinical teaching/learning will be accomplished in Final year Spiral-3.

### **TEACHING & LEARNING METHODOLOGIES:**

The following teaching/ learning methods may be used to facilitate the learning process:

1. **Interactive Lectures:** Lectures are considered as an efficient means of transferring knowledge to large audiences.
2. **Small Group Discussion:** Small group discussion such as Demonstrations, tutorials and case- based learning (CBL) sessions facilitate interactive learning which helps students develop discussion skills and critical thinking.
3. **Practical:** Practical related to Basic Sciences are held to facilitate student learning.
4. **Skills:** Skills sessions are scheduled parallel with various modules at fully equipped Skills Lab and Simulation Lab in which students observe and learn skills relevant to the respective modules under guidance of Clinical Faculty.
5. **Self-Directed Learning (Self- Study):** Students have a measure of control over their own learning. They diagnose their needs, set objectives in accordance to their specific needs, identify resources and adjust their pace of learning

## 5 YEAR CURRICULAR ORGANIZATION

Spiral	Year	Modules				
	I	<b>FND1- Foundation</b> Cell, Genetics & Cell Death (Basics of Anatomy, Physiology, Biochemistry, Gen. Pathology, Gen. Pharmacology, Community Medicine & Behavioral Sciences,		<b>HEM1- Blood Module</b> Immunity, Inflammation, Tissue repair, Antimicrobials & Neoplasia <b>9 Week</b>		
First Spiral		9 Weeks				
		<b>LCM1- Locomotion</b> Bones, Joints, Nerves & Muscles, 9weeks		<b>RSP1- Respiratory System 6 weeks</b>	<b>CVS1- Cardiovascular System 4 weeks</b>	
	II	<b>NEU1- Nervous System 8 weeks</b>		<b>HNN1- Head &amp; Neck &amp; Special 6 weeks</b>	<b>END1- Endocrinology 5weeks</b>	
		<b>GIL 1- GIT and Liver 8 weeks</b>		<b>EXC1- Renal and Excretory System 5 weeks</b>	<b>REP1- Reproductive System 5 weeks</b>	
Second Spiral	III	<b>IDD 1- Infectious diseases 5 weeks</b>	<b>HEM2- Hematology 5 weeks</b>	<b>RSP2- Respiratory System 5 weeks</b>	<b>CVS2- Cardiovascular System 5 weeks</b>	
		<b>GIL 2-GIT and Liver (including Nutritional Disorders) 8weeks</b>		<b>EXC2- Renal &amp; Excretory System 5 weeks</b>	<b>END2- Endocrinology 5 weeks</b>	
	IV	<b>ORT2- Orthopedics, Rheumatology, Trauma 7 weeks</b>	<b>PMR-Physical Medicine &amp; Rehabilitation DPS-Dermatology Plastic Surgery / Burns GEN-Genetics 6 weeks</b>	<b>REP2- Reproductive System 8 Weeks</b>		
		<b>NEU2- Neurosciences and Psychiatry 8 weeks</b>		<b>ENT* 4 weeks</b>	<b>OPHTHALMOLOGY/ EYE 4 weeks</b>	
	Third Spiral	V	Clinical Rotation 9:30 to 3:00 (with Ambulatory, Emergency, Intensive care) In Medicine, Pediatrics, Cardiology and Neurology units		Clinical Rotation 9:30 to 3:00 (Inpatient, Ambulatory, Emergency, Intensive care and Operation Theatres) In Surgery, Gynecology & Obstetrics, Orthopedics and Neurosurgery.	
			<ul style="list-style-type: none"> <li>▪ Lecture on problem based approach, twice a week</li> <li>▪ Ward tutorial twice a week</li> <li>▪ Student research presentation once a week</li> </ul>		<ul style="list-style-type: none"> <li>▪ Lecture on problem based approach, twice a week</li> <li>▪ Ward tutorial twice a week</li> <li>▪ Student research presentation once a week</li> </ul>	

## **OVERVIEW**

<b>Program</b>	<b>MBBS</b>	
Year	Second Year	
Module Title	<b>Endocrinology</b>	
Module Code	<b>END-1</b>	
Credit Hours	4.5	
Duration	5 weeks	
	Anatomy	19.5
	Biochemistry	19.5
	Physiology	36.5
	Pathology	15.5
	Pharmacology	16.5
	Community medicine	7
	Medicine	3
	Behavioral Science	4
	Skill Lab	1.5
<b>Total Hours</b>	<b>Endocrine-I Module</b>	<b>123</b>

## **MODULE DESCRIPTION:**

This module has been designed for students to introduce them to the basic concepts of Endocrinology. This module includes Anatomy, Physiology, Biochemistry, Pathology, Pharmacology, Community Medicine, Medicine and Behavioral sciences.

The basic concepts of the endocrine system and its related diseases will be thoroughly covered in this module.

You will be able to apply your medical knowledge to practical situations by means of group and individual tasks.

This study guide has been developed to assist you and keep you focused to achieve your goals.

## **RATIONALE:**

Endocrine system has a vital role in maintaining Homeostasis which is the body's ability to regulate its internal environment and keep it stable despite external changes. It acts under the regulation of certain hormone that coordinate communication between different organs and tissues. By learning about the endocrine system, medical students can understand how hormones control bodily processes, such as metabolism, growth and development, reproduction, and stress responses. Many medical conditions are directly related to dysfunction within the endocrine system. By studying the endocrine system, medical students can comprehend the pathophysiology of these conditions, enabling them to make accurate diagnoses and develop appropriate treatment plans. A significant portion of medications used in medicine, including hormone replacement therapies and drugs to manage endocrine disorders, target the endocrine system. A comprehensive understanding of the endocrine system is crucial for medical students to learn how these drugs work and their potential side effects.

In conclusion, studying the endocrine system during the second year of medical school is crucial for providing medical students with a fundamental understanding of hormone regulation, homeostasis, and various endocrinerelated diseases.

## **LEARNING OUTCOMES**

**At the end of Five years MBBS program, student shall be able to:**

- identify the common endocrinological problems
- to show improved confidence, attitudes and skills in treating common problems of endocrinology
- manage appropriate referrals regarding problems of endocrinology

## **MODULE OBJECTIVES**

**The 2<sup>nd</sup> year MBBS student at the end of module shall be able to:**

- List the endocrine glands in the body with their respective hormones
- Describe the anatomy and physiology of the endocrine system, including the gross and microscopic structure, development and function of major endocrine glands.
- Explain the biochemical nature of various hormones, their structure, mechanism of action and its receptors.
- Describe the synthesis, regulation, and secretion of hormones produced by the endocrine glands and their target organs.
- Identify the role of hormones in maintaining homeostasis, metabolism, growth, and development.
- Explain the feedback mechanisms involved in hormone regulation and the concept of negative and positive feedback loops.
- Recognize the pathophysiology of common endocrine disorders, such as diabetes mellitus, thyroid disorders (hypothyroidism, hyperthyroidism), adrenal disorders (Cushing's syndrome, Addison's disease), and disorders of the pituitary gland.
- Develop skills in interpreting endocrine function tests and laboratory investigations used in diagnosing endocrine disorders.
- Discuss the principles of pharmacological management for various endocrine disorders and the use of hormone replacement therapies
- Discuss the association between endocrine disorders and other medical conditions.
- Apply the principles of endocrinology to clinical scenarios, making appropriate diagnoses and suggesting management plans.
- Discuss the Public health issues associated with the more common endocrine disease in Pakistan



# **DISCIPLINE-WISE LEARNING OBJECTIVES AND CONTENTS**

## **ANATOMY**

### **Learning Objectives:**

- List the endocrine glands in the body with their respective hormones.
- Describe the development, biochemical structure, secretions, and mode of action, functions, anomalies and common related disorders Hypothalamus.
- Discuss the location and gross anatomical features of endocrine glands.
- Describe the microscopic features of endocrine glands.
- Describe the development and related developmental anomalies of endocrine glands.

### **Topics/ Contents:**

#### **Lectures: (50 Minutes each)**

- Anatomical overview of all endocrine glands in the body.
- Gross structure of hypothalamus.
- Gross Anatomy and development of Pituitary Gland.
- Microscopic Features of Pituitary Gland.
- Gross anatomy of Thyroid and Parathyroid Gland.
- Development of Thyroid and Parathyroid gland and related anomalies.
- Microscopic structure of Thyroid and Parathyroid gland.
- Gross structure of pancreas.
- Development of pancreas.
- Microscopic structure of pancreas.
- Gross structure & development of adrenal gland and developmental anomalies.
- Microscopic structure of adrenal gland.

#### **Practicals: (1.5 Hour each)**

- Microscopic Features of Pituitary Gland
- Microscopic structure of Thyroid and Parathyroid gland □ Gross anatomy of thyroid and parathyroid gland (Simulation) □ Microscopic structure of pancreas.
- Microscopic structure of adrenal gland

## **PHYSIOLOGY**

### **Learning Objectives:**

- Give the classification of hormones based on their chemical structure & solubility and give example of hormones present in each type of classification
- Describe how hormones interact with target-cell receptors □ Differentiate between down-regulation and up-regulation □ Describe the general mechanisms of hormone action.
- List the factors determine the responsiveness of a target cell to a hormone
- Differentiate among permissive effects, synergistic effects, and antagonistic effects of hormones.
- Describe the synthesis of each hormone present in structural classification. For example: steroid hormones are made from cholesterol
- Identify the site of synthesis of hormone in the cell.
- Depending upon the water and lipid solubility describe how hormones are transported in the blood and how they act on target cells
- Describe the locations of and relationships between the hypothalamus and pituitary gland.
- Discuss the hypothalamic releasing and inhibiting hormones influencing secretions of the anterior pituitary hormones
- Describe the structure and importance of the hypothalamo-hypophyseal system
- Differentiate between hypothalamo-hypophyseal portal system and hypothalamo-hypophyseal tract □ Describe the location, histology, hormones, and functions of the anterior pituitary.
- Describe how the pituitary gland is a combination of actually two glands
- Know that cutting the pituitary stalk that carries hypothalamic hormones to the pituitary will prevent release of all anterior pituitary hormones except one
- Know that any tumor compressing the anterior pituitary gland will affect secretion of hormones one by one
- Describe the hormone which is the last to go
- Describe the causes of Panhypopituitarism
- Discuss the types of dwarfs and their hormonal causes
- Discuss the signs and symptoms of growth hormone over and under production before and after puberty
- Understand what is Sheehan's syndrome
- Describe the location, histology, hormones, and functions of the posterior pituitary
- Discuss the two stimuli that cause release of anti-diuretic hormone
- Describe the role of oxytocin in male reproductive system
- Define diabetes insipidus
- Discuss types of diabetes insipidus  
Discuss the conditions in which diabetes insipidus occurs  
Define syndrome of inappropriate ADH secretion (SIADH)
- Discuss the condition that lead to SIADH

Describe the location, histology, and hormones of the thyroid gland.

- Explain how blood levels of T3/T4, TSH, and TRH would change in a laboratory animal that has undergone a thyroidectomy (complete removal of its thyroid gland).
- Describe the synthesis, storage and secretion of thyroid hormones
- Discuss the regulation of T3 and T4 hormone secretion
- Understand the physiological effects of the thyroid hormones
- Describe the etiology, history, physical examination and management of a patient with myxedema.
- Describe the signs and symptoms of cretinism
- Differentiate between a dwarf due to cretinism and a dwarf due to growth hormone deficiency
- Describe the causes and clinical manifestations of thyrotoxicosis
- Describe the most common causes of thyrotoxicosis
- Give the diagnostic tests for thyrotoxicosis
- Describe the location, histology, hormone, and functions of the parathyroid glands.
- Describe the regulation of parathyroid hormone secretion
- Explain the reason why is it important to regulate blood calcium concentration within such a narrow range □ Describe the actions of calcitonin
- Discuss the similarities and differences between the actions of PTH and calcitriol
- Discuss the synthesis of vitamin D
- Describe its effects on blood calcium concentration □ Define tetany. Differentiate it from tetanus □ Give reasoning as to the cause of tetany.
- Discuss how it is treated.
- Discuss the causes of hypercalcemia
- Describe the effects of hypercalcemia on different body organ systems
- Describe the structure of the pancreatic islets and name the hormones secreted by each of the cell types in the islets.
- Describe the structure of insulin and outline the steps involved in its biosynthesis and release into the bloodstream.
- Describe insulin receptors, the way they mediate the effects of insulin, and the way they are regulated.
- List the major factors that affect the secretion of insulin.
- List the hormones that affect the plasma glucose concentration and briefly describe the action of each.
- Describe the types of glucose transporters found in the body and the function of each.
- Describe the structure of glucagon and other physiologically active peptides produced from its precursor.
- List the physiologically significant effects of glucagon and the factors that regulate glucagon secretion.
- Describe the physiologic effects of somatostatin in the pancreas.
- Understand the major differences between type 1 and type 2 diabetes.

Review the risk factors for diabetes and describe why the diagnosis is often delayed in adults.

Explain the diagnosis and treatment goals of diabetes and identify factors that may compromise glycemic control.

Describe the management of diabetes including special considerations for choosing pharmacologic therapies □

Describe the difference between basal and prandial insulin and list the currently available products.

- Describe other benefits associated with the GLP-1 agonists besides glucose reduction and identify patients who may benefit from therapy.
- Review the potential complications of diabetes in and describe the role of diabetes self-management education in minimizing complications.
- Understand the clinical features and management of any patient that comes with hypoglycemia
- Identify the clinical presentation of Zollinger Ellison's syndrome
- Describe the location, histology, hormones, and functions of the adrenal glands.
- Differentiate between C18, C19, and C21 steroids and give examples of each.
- Outline the steps involved in steroid biosynthesis in the adrenal cortex.
- Name the plasma proteins that bind adrenocortical steroids and discuss their physiologic role
- Name the major site of adrenocortical hormone metabolism and the principal metabolites produced from glucocorticoids
- Describe the mechanisms by which glucocorticoids produce changes in cellular function
- Define the physiological and pharmacological effects of glucocorticoids
- Name the major site of adrenocortical hormone metabolism and the principal metabolites produced from adrenal androgens
- Contrast the physiological and pathological effects of adrenal androgens.
- Describe the mechanisms that regulate secretion of adrenal sex hormones.
- Describe the location, histology, hormones, and functions of the adrenal glands.
- Differentiate between C18, C19, and C21 steroids and give examples of each.
- Outline the steps involved in the synthesis of mineralocorticoids
- Differentiate between the mineralocorticoids in terms of potency
- Discuss the stimuli that regulate aldosterone secretion
- Discuss the mode of action of aldosterone on the Principal and Intercalated cells in the kidney
- List other organ systems where aldosterone works also
- Describe the etiology, clinical manifestation, and treatment of Cushing syndrome.
- Describe the etiology, clinical manifestation, and treatment of Conn syndrome.
- Describe the etiology of Addison disease and list the presenting features.
- Distinguish primary adrenal insufficiency from secondary adrenal insufficiency.
- Understand what system regulates mineralocorticoid levels.
- Understand lab abnormalities related to Addison disease.
- Have an understanding of adrenogenital syndrome
- Name the three catecholamines secreted by the adrenal medulla and summarize their biosynthesis, metabolism, and function.
- List the stimuli that increase adrenal medullary secretion.

Outline the clinicopathologic features of Pheochromocytoma Define the location of pineal gland

- Describe its secretion

Understand that melatonin is referred to as the sleep hormone

□ Identify the mechanism of action of prostaglandins.

- Describe the adverse effects of prostaglandins.
- Review the appropriate monitoring of prostaglandins.
- Understand the primary function of thymus in the development of adaptive immunity
- Describe the role of thymus in maturation of T-lymphocytes
- Know that Natural Killer Cells which provide innate immunity also develop in the thymus
- Understand the role of kidney as an endocrine organ
- Discuss the hormones that are formed by the kidney
- Describe the hormones which act upon the kidney and their mode and site of action.
- Define obesity.
- Describe its prevalence in different age groups and in different races
- Discuss the adverse effects of obesity on the body
- Describe the influence of obesity on cardiovascular morbidity and mortality □ Describe the ways by which obesity is measured, along with their normal values □ Discuss the ELISA test.
- Describe the conditions for which ELISA is used for diagnosis
- Understand the basic principles of ELISA
- Discuss the 4 types of ELISA
- Describe the meaning of the ELISA results

### **Topics/Contents:**

#### **Lectures: (50 Minutes each)**

- Classification of hormones
- Mechanism of action of hormones
- Biosynthesis, transport, metabolism, action
- Hypothalamic hormones
- Anterior pituitary hormones, Panhypopituitarism, Dwarfism, Acromegaly, Gigantism, Sheehan's syndrome
- Posterior Pituitary hormones, Diabetes insipidus, Syndrome of inappropriate ADH secretion
- Thyroid hormones, Myxedema, Cretinism, Thyrotoxicosis
- Parathyroid hormone
- Calcitonin, Vitamin D, Tetany, Hypercalcemia
- Obesity - Video
- Insulin
- Hormonal regulation of glucose

- Diabetes mellitus & Hypoglycemia, Zollinger Ellison's syndrome
- Cortisol and other Glucocorticoids
- Androgens
- Mineralocorticoids
- Cushing's syndrome, Conn's syndrome, Addison's disease, Adrenogenital syndrome
- Adrenal Medullary hormones
- Pineal gland & Local hormones (Prostaglandins)
- Thymus
- Renal hormones
- Hormonal Essay – ELISA - Video

**Practicals: (1.5 hour each)**

□ Measurement of Obesity

□

## **BIOCHEMISTRY**

### **Learning Objectives:**

- Discuss the basic functions of endocrine system
- Classify the hormones chemically
- Recall the mechanism of action according to the chemical nature
- Recognize the chemical properties and structure of each group of hormones
- List important peptide hormones
- Discuss examples of peptide hormones and their function, and mechanism of action.
- Describe the process of packaging, synthesis and release of peptide hormones.
- List the metabolism-based role of peptide hormones.
- Describe the dietary sources and absorption of Iodine.
- Explain its transportation and storage.
- Discuss the role of iodine in thyroid hormone synthesis.
- Describe the manifestation of deficiency of vitamin A.
- Identify the steps involved in Thyroid Hormone Synthesis
- Describe the chemical nature of Thyroid Hormones
- Discuss the Thyroid Hormone Transport and Protein Binding
- Elaborate the mode of action of Thyroid Hormones and metabolic effects of Thyroid Hormones
- Discuss the clinical disorders of Thyroid Function
- Enumerate hormones released from the pancreas
- Describe Molecular structure of these hormones
- Explain regulation of their secretion and mechanism of action
- Discuss biochemical effects and role in intermediary metabolism □ Describe the Structure and Chemical Composition of Insulin.
- Discuss the Synthesis of insulin.

- List the Functions of insulin.
- Describe the principle of blood glucose estimation
- Explain/demonstrate the procedure for blood glucose estimation
- Identify normal values of blood glucose
- Interpret blood glucose values for hypoglycemia and hyperglycemia □ Recognize the clinical significance of hyperglycemia □ List types of steroid hormones.
- Explain cholesterol is the common precursor molecule for the synthesis of steroid hormones.
- Describe the common metabolic pathway for synthesis of all steroid hormones.
- Explain the synthesis of female sex hormones.
- Describe synthesis of male sex hormones.
- List the enzyme of adrenal cortex
- Describe the Mode of action
- Discuss the biochemical and clinical concept of adrenocortical hormones.
- Discuss the abnormalities of adrenocortical hormones with treatment option
- Identify the parts of the adrenal gland
- Identify hormones secreted by adrenal medulla and their main actions □ Discuss the diseases caused by imbalance of adrenal medulla.
- Discuss the common clinical presentation of pheochromocytoma.
- Define normal blood glucose level
- Describe its regulation
- Enlist the different causes of T1DM & T2DM.
- Identify blood glucose values for diagnosing Diabetes Mellitus Type I, Type II.
- Describe the principle of OGTT.
- Explain/demonstrate the procedure of OGTT.
- Interpret fasting and random glucose with normal values □ Use OGTT curve for the diagnosis of Diabetes Mellitus.
- Explain the physical and chemical properties of urine
- Describe the filtration process by kidneys
- List the normal composition of urine
- Describe the principle of urine analysis
- Demonstrate the procedures of glucose & ketone bodies detection by dipstick method.
- Define Electrolytes
- Describe the different sources of electrolytes
- Justify their role in maintaining of osmolality of plasma
- Interpret the normal values of electrolytes in serum
- Correlate the clinical significance of electrolyte with associated hormones
- Estimate serum Na<sup>+</sup> & K<sup>+</sup> in a given sample by flame-photometer.



## **Topics/Contents:**

### **Lectures: (50 Minutes each)**

- Classification of Hormones according to structure and mechanism of Action
- Metabolism of Peptide Hormones: Hypothalamic and pituitary hormones
- Sources & biochemical importance of Iodine
- Metabolism of Thyroid Hormones
- Metabolism of pancreatic hormones: Insulin, Glucagon, Somatostatin
- Diabetes Mellitus: an endocrine disorder
- Structure, Metabolism and Mechanism of Action of Steroid Hormones
- Metabolism of adrenocortical hormones
- Metabolism of adrenal medullary hormones

### **Practicals: (1.5 hour each)**

- Blood Glucose monitoring (OGTT & its interpretation)
- Qualitative analysis of Glucose & ketone bodies in Urine (Dipstick method)
- Serum Electrolyte estimation and Interpretation in relation to Hormones

### **Tutorials: (1.5 hour each)**

- Thyroid Profile & its Interpretation
- Hormonal Regulation of blood Glucose levels
- Diagnosis and interpretation of T1DM and T2DM
- Abnormalities related to Adrenal gland

## **PATHOLOGY**

### **Learning Objectives:**

- Describe normal function and regulation of pituitary gland.
- Enumerate Function and regulation of different pituitary hormones.
- Enlist the diseases affecting the pituitary along with their pathogenesis and effects.
- Discuss the pathogenesis and features of hyperparathyroidism and hypoparathyroidism
- Describe normal function and regulation of thyroid and parathyroid glands
- Enlist the hormones produced by thyroid and parathyroid glands
- Explain causes and effects of hyperthyroidism and hypothyroidism
- Describe the causes and pathogenesis of Grave's disease
- Discuss the pathogenesis of goiter
- Enlist the laboratory tests for hyper and hypothyroidism hypoparathyroidism
- Differentiate primary hyperparathyroidism from secondary hyperparathyroidism
- Discuss the pathogenesis of diabetes in detail
- Enlist different complications of diabetes with their signs and symptoms.
- Describe the main investigations related to diagnosis and assessment of diabetes
- Describe the features of major disorders related to adrenocortical hyperfunctioning and hypo-functioning.
- Enlist various laboratory tests performed for adrenal function assessment.

### **Topics/Contents:**

#### **Lectures: (50 Minutes each)**

- Overview of Pituitary Functions and Pathology
- Overview of Thyroid Functions and Pathology
- Grave's disease and Goiter
- Disorders of Parathyroid Gland
- Diabetes Pathogenesis
- Diabetes Complications
- Adrenocortical Hyperfunction
- Adrenal Insufficiency

#### **Practicals: (1.5 hour each)**

- Lab Investigations for Thyroid Function
- Pathology Museum: Gross Pathology of Thyroid
- Morphological Changes in Diabetes
- Overview of Lab Investigations in Diabetes
- Lab Investigations for Adrenal Function

## **COMMUNITY MEDICINE**

### **Learning Objectives:**

- Define Non-communicable diseases (NCDs)
- State the vision, goal, overarching principles, objectives and voluntary global targets of the Global Action Plan for non-communicable diseases 2013-2020
- Define integrated approach to NCDs and common action areas in the Integrated Framework of Action (IFA) for NCDs
- Summarize agenda of the National action plan (NAP) for control of non-communicable diseases like Diabetes mellitus and Cancer
- Take appropriate action for non-communicable disease in protecting, maintaining and promoting the health of individuals, families and communities
- Identify the risk factors and preventative measures for malnutrition and obesity
- Define obesity
- Analyze the Obesity situation in Pakistan and the world
- Identify the epidemiological determinants of obesity
- Classify reference standards for assessment of obesity i.e. Body weight, Skinfold thickness, Waist Circumference and Waist Hip Ratio
- Calculate Brocca Index, BMI and Waist Hip Ratio
- Use BMI to classify Obesity
- Define central (abdominal) obesity and its hazards
- Evaluate the impact of obesity on individual and population health
- Formulate strategies for prevention and control of Obesity for individuals and communities
- Analyze the epidemiology, risk factors and prevention of metabolic syndrome in South Asian population □ Advise measures for assessment and prevention of Obesity at all levels of prevention.
- Define the Epidemiology of diabetes in Pakistan
- Apply Prevention & control of diabetes Mellitus at primary care level
- Advise measures to support and rehabilitate patients and families with diabetes mellitus □ Define Iodine deficiency disorders
- Identify strategies for prevention and control of iodine deficiency in the community
- Recognize the importance of Iodine Control Program of Pakistan in prevention and control of iodine deficiency disorders.

### **Topics/Contents:**

#### **Lectures: (50 Minutes each)**

- Non communicable diseases; global & national action plan
- Obesity risk factors and prevention
- Epidemiology of diabetes in Pakistan, Prevention & control at primary care level
- Iodine Control Program of Pakistan
- Cancer epidemiology, risk factors and prevention
- Metabolic syndrome in South Asia
- Iodine deficiency disorders

## **PHARMACOLOGY**

### **Learning Objectives:**

- Understand the mechanism of action, clinical uses and side effects of drugs used in hypo and hyperthyroidism.
- List and understand the mechanism of action ,clinical uses and side effects of drugs used in hyperglycemia
  
- List and understand the mechanism of action, clinical uses and side effects of Steroids.

### **Topics/Contents:**

#### **Lectures: (50 Minutes each)**

- Pharmacology of pituitary gland secretions and its clinical application
- Drugs used in thyroid gland disorders
- Drugs used to treat parathyroid gland disorders
- Over view of drugs used in diabetes-I(Insulin preparation classification)
- Over view of drugs used in diabetes-II(Oral hypoglycemic drugs classification) □ Over view of adrenal gland secretions and its pharmacology

#### **Tutorials: (1.5 hour each)**

- Drugs used to treat pituitary gland related disorders
- Treatment of hypo&hyper thyroidism
- Drugs used to treat hypo&hyper parathyroidism
- Corticosteroids
- Classification of Insulin & oral hypoglycemic drugs

## **MEDICINE**

### **Learning Objectives:**

- Identify the anatomical relation of pituitary gland disorders.
- Describe the physiology of pituitary hormones secretion, regulation and function.  
Identify the clinical presentation of hypo and hyper functioning of different pituitary hormones
- Define metabolic syndrome
- Describe the pathophysiology of metabolic syndrome.
- Identify the risk factors of metabolic syndrome.
- Identify the clinical features of metabolic syndrome.
- Define Cushing syndrome / disease
- List the causes of Cushing syndrome
- Outline the clinical features of the disease
- Discuss the laboratory tests for screening and confirmation and localization of the cause of Cushing syndrome
- Discuss the pathophysiology of Addison's disease. □ Enlist the causes of Addison's disease.
- Discuss the clinical presentation (symptoms and sign's) of Addison's Disease □ Plan investigations and interpret the results.
- Discuss the pathophysiology of pheochromocytoma.
- Discuss the clinical presentation (symptoms and signs)
- Plan investigations to confirm pheochromocytoma

### **Topics/ Contents:**

#### **Lectures (50 Minutes each)**

- Clinical Disorders of Pituitary
- Metabolic syndrome
- Interpretation & Diagnosis of Hyper and Hypo Secretion of adrenal hormones

## **BEHAVIORAL SCIENCES**

### **Learning Objectives:**

- Describe the neurobehavioral basis of memory formation
- Compare the functions of different types of memory
- Identify the occurrence of various kinds of memory related disorders
- Describe different theories of perceptual organization
- Define perception
- Describe the Importance of Perception
- Identify the Factors Affecting Perception
- Define the Perceptual Process
- Identify and Describe the Errors in Perception □ Discuss the functions of perception.
- Differentiate between illusion and hallucination
- Learn about different types of Hallucinations
- Define Meta-cognition and its significance
- Discuss the Components of meta-cognition
- Describe the Characteristics to deep and surface approaches to t
- List the Steps in meta-cognitive skills
- Elaborate the Ways to improve meta-cognitive skills
- Define Empowerment, marginalization and Marginalized groups
- List the Qualities of empowerment
- Discuss the Empowerment and community psychology
- Identify the elements of psychological empowerment
- Describe the qualities of empowering community settings
- List the ways to empower employees
- Discuss the Empowerment and health care
- Discuss the factors influencing empowerment and its association with community psychology

### **Topics/ Contents:**

#### **Lectures (50 Minutes each)**

- Memory and related Disorders
- Perception and Related disorder
- Metacognition
- Empowerment

## **SKILL LAB**

### **Clinical Breast Examination** Introduction/Rationale:

The clinical breast examination (CBE) can be used either for screening (to detect breast cancer in asymptomatic women) or diagnosis (to evaluate women who present with breast complaints). Students often avoid examination of the breast during routine physical exam because of shyness. It should be an essential part of routine physical examination for early diagnosis of breast disease. Learning objectives:

1. Demonstrate the proper technique of clinical breast examination.
2. Demonstrate the examination of axillary and supraclavicular lymph nodes.

## **LEARNING RESOURCES**

### **ANATOMY**

- Clinically Oriented Anatomy Textbook by Anne MR Agur, Arthur F Dalley, and Keith L. Moore
- Gray's Anatomy for Students by Richard L. Drake, A. Wayne Vogl, Adam W. M. Mitchell 4th Edition
- B. Young J. W. Health Wheater's Functional Histology
- Langman's Medical Embryology

### **BIOCHEMISTRY**

- Harper's Illustrated Biochemistry
- Lippincott's Illustrated reviews of Biochemistry
- Biochemistry by Devlin
- Textbook of Medical BIOCHEMISTRY Author: MN Chatterjee and Rana Shinde. 11<sup>th</sup> Edition.

### **PHYSIOLOGY**

- Textbook Of Medical Physiology by Guyton And Hall
- Ganong's Review of Medical Physiology
- Human Physiology by Lauralee Sherwood

### **PATHOLOGY**

- Robbins Basic Pathology Kumar & Abbas 10th Edition□
- Robbins & Cotran Pathologic Basis Of Disease Kumar & Abbas & Aster 10th Edition

### **COMMUNITY MEDICINE**

- Public Health And Community Medicine Shah, Ilyas, Ansari 7th Edition

### **PHARMACOLOGY**

- Lippincott's Illustrated Review Pharmacology Karen Whalen 6th Or Latest Edition□
- Basic And Clinical Pharmacology Bertram G. Katzung 11th Edition

### **MEDICINE**

- Principles & Practice Of Medicine Davidson's 22nd Or Latest Edition
- Essentials Of Kumar And Clark's Clinical Medicine Kumar & Clark 9th Or Latest Edition
- Macleod's Clinical Examination Douglas & Nicol & Robertson 13th Or Latest Edition
- Hutchison's Clinical Methods William M Drake & Michael Glynn 23rd Or Latest Edition



## **ASSESSMENT.**

Assessment will be done in two parts:

### **At the end of module**

- Module Exam (Theory) -20%
- Module Exam Practical Internal Evaluation- 20%

### **At the end of Year**

- Annual Exam (Theory) -80%
- Annual Exam (ospe, Viva)-80%

MCQs (Multiple choice questions), OSPE (Objective Structured Practical Exam) and structured viva will be the assessment tool.