



# *ENDOCRINE MODULE*

MBBS Year-2 (Academic Year 2019-2020)

*KMU Central Curriculum Committee  
Khyber Medical University, Phase V, Hayatabad | Peshawar*

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## List of Themes

TOTAL WEEKS-4

Themes	Duration in weeks
Tall stature	1 week
Neck swelling with bulging eyes / tetany	1 week
Increased thirst and urination	1 week
Moon face	3 days

### Learning objectives

At the end of this module, the 2<sup>nd</sup> year students will be able to:

- 1) Development, structure, hormones and regulation of pituitary gland, thyroid gland, parathyroid gland, endocrine pancreas, and adrenal glands
- 2) Describe the etiology, pathophysiology, relevant clinical features and common investigations of disorders of these glands
- 3) Describe the basic concepts and components of medical professionalism
- 4) Describe the steps of writing a research proposal

### Theme-1 (Tall stature)

Subject	Topic		Learning objectives
Embryology	Pituitary gland	1	Describe the development of Anterior and posterior pituitary gland
Histology	Pituitary gland	2	Enlist the histological differences between anterior and posterior pituitary glands
Physiology	Introduction to endocrinology	3	Describe the chemical messengers in the body
		4	Describe the classification of hormones
		5	Describe mechanisms of synthesis of hormones
		6	Describe mechanisms of hormone Secretion, Transport and Clearance from the Blood
	Mechanisms of Action of Hormones	7	Explain mechanisms of Action of Hormones
		8	Describe second messenger mechanisms for mediating intracellular hormonal functions

		9	Describe measurement of Hormone Concentrations in the Blood
	Pituitary gland Physiological anatomy and its control	10	Describe physiological anatomy of pituitary gland
		11	Describe hypothalamus Control of Pituitary Secretion
	Physiological Functions of Growth Hormone	12	Describe Growth hormone's effect on growth and metabolism
		13	Explain the structure, mechanism of action and physiological effects of Insulin-Like Growth Factors
		14	Describe regulation of Growth Hormone
	Physiological Functions of Posterior Pituitary hormones	15	Describe formation and physiological functions of Oxytocin
		16	Describe formation and physiological functions of ADH
<b>Biochemistry</b>	Hormones Introduction	17	Define hormones and differentiate between the terms- endocrine, paracrine & autocrine
		18	Classify hormones on various basis
		19	Discuss the mechanisms of action of hormones
		20	Define 2nd messengers and their roles
	Anterior Pituitary hormones	21	Enumerate the hormones of anterior pituitary gland
		22	Describe the chemistry, secretion, mechanism of action, regulation and metabolic effects of Growth hormone with its related clinical disorders
	Posterior Pituitary hormones	23	Enumerate the hormones of the posterior pituitary gland

		24	Describe the chemistry, secretion, mechanism of action, regulation and metabolic effects of the hormones of the posterior pituitary gland with its related clinical disorders
<b>Medicine</b>	Acromegaly	25	Describe the pathophysiology, clinical features and investigations of patient with Acromegaly and Gigantism
		26	Describe the etiology, clinical features and investigations of a patient with diabetes insipidus
<b>Neurosurgery</b>	Tumors of pituitary gland	27	Explain the types, clinical features, CT and MRI findings and management of pituitary tumors
<b>Pediatrics</b>	Growth charts	28	Describe the fundamentals of growth charts in pediatric practices
<b>Theme-2 (Neck swelling with bulging eyes and Tetany)</b>			
<b>Gross anatomy</b>	Thyroid gland	29	Describe the gross structure, lobes, relations, blood supply, venous drainage, nerve supply and lymphatic drainage of thyroid gland
<b>Embryology</b>	Thyroid gland	30	Describe the developmental events and anomalies of thyroid gland
	Parathyroid gland	31	Describe the developmental events of parathyroid gland and its anomalies
<b>Histology</b>	Thyroid gland	32	Describe the microscopic structure of thyroid gland
<b>Physiology</b>	Introduction of thyroid hormones	33	Describe formation, Secretion and transport of thyroid hormones
		34	Explain mechanism of action of thyroid hormones
		35	Explain the actions of thyroid hormones on cellular metabolism
	Physiological functions & regulation of thyroid hormone	36	Describe Physiological effects of Thyroid Hormone on Growth, metabolism and body systems
		37	Describe Regulation of Thyroid Hormone Secretion

	Physiological functions and Control of the Parathyroid hormone	38	Explain Mechanism of action PTH
		39	Describe Effect of Parathyroid Hormone on Calcium and Phosphate concentrations
		40	Describe Control of Parathyroid Secretion
	Physiological role of VIT D and Calcitonin in Calcium metabolism	41	Explain Role of Vit. D in Calcium and phosphorus metabolism
		42	Explain physiological functions of calcitonin
<b>Biochemistry</b>	Thyroid gland	43	Enumerate the hormones secreted from thyroid gland
		44	Describe the chemistry, biosynthesis, secretion, mechanism of action, regulation and metabolic effects of thyroid hormone and calcitonin with its related clinical disorders
	Parathyroid gland	45	Enumerate the hormones secreted from parathyroid gland
		46	Describe the chemistry, biosynthesis, secretion, mechanism of action, regulation and metabolic effects of parathyroid hormone with its related clinical disorders
<b>Medicine</b>	Thyroid disorders	47	Explain the clinical features of hyperthyroidism
		48	Explain the clinical features of hypothyroidism

<b>Pharmacology</b>	Antithyroid drugs	49	Describe the types and mechanism of action of Antithyroid drugs
<b>Community medicine</b>	Diabetes mellitus	50	Describe the epidemiology, risk factors and prevention of Diabetes Mellitus
<b>Theme-3 (Increased thirst and urination)</b>			
<b>Histology</b>	Pancreas	51	Describe the histological features of pancreas and differentiate between exocrine and endocrine parts of pancreas
<b>Physiology</b>	Mechanism of action of insulin & its control	52	Explain Mechanism of action of insulin
		53	Describe the Control of Insulin Secretion
	Physiological Effects of insulin on carbohydrates, protein, and Fats	54	Describe the effects of insulin on carbohydrates, proteins and Fats metabolism
	Physiology of Glucagon	55	Describe regulation of glucagon and its effects
		56	Describe the physiological actions of Somatostatins
	Physiological effects of Diabetes Mellitus	57	Describe Effects of hyperglycaemia /hypoglycaemia on body functions
		58	Explain Insulin resistance
<b>Biochemistry</b>	Pancreas	59	Enumerate the hormones secreted by pancreas
		60	Describe the chemistry, biosynthesis, secretion, mechanism of action, regulation and metabolic effects of Insulin & Glucagon with its related clinical disorders
<b>Pharmacology</b>	Antidiabetic drugs	61	Explain the mechanism of action of oral antidiabetic drugs
		62	Explain the mechanism of action and complications of Insulin therapy

<b>Medicine</b>	Diabetes Mellitus	63	Explain the short-term and long-term complications of Diabetes Mellitus
		64	Describe the pathophysiology, clinical features and treatment of Diabetes Mellitus
<b>Theme-4 (Moon face)</b>			
<b>Gross anatomy</b>		65	Describe the gross anatomy and relations of adrenal glands on both sides
<b>Embryology</b>	Adrenal gland	66	Describe the development of adrenal gland
<b>Histology</b>		67	Describe the microscopic picture of adrenal gland and differentiate between the various histological zones of adrenal gland
<b>Physiology</b>	Physiological functions of Aldosterone	68	Describe Types, Mechanisms and regulation of mineralocorticoids
		69	Describe the physiological Effects of Aldosterone (Renal, Circulatory and others)
	Physiological Functions of the Glucocorticoids	70	Describe Types and Mechanisms of Glucocorticoids actions
		71	Describe Effects of Cortisol on Carbohydrate, Proteins and Fat Metabolism
		72	Describe role of Cortisol in Stress, Inflammation and Allergy
	Physiological functions Adrenocorticotrophic Hormone ACTH	73	Describe ACTH Secretion & mechanism of Action
<b>Biochemistry</b>	Adrenal cortical hormones	74	Enumerate the hormones secreted from adrenal cortex
		75	Describe biosynthesis, secretion, mechanism of action, regulation and metabolic effects of Adrenal cortical hormones with its related clinical disorders



	Adrenal medullary hormones	76	Enumerate the hormones secreted from adrenal medulla
		77	Describe biosynthesis, secretion, mechanism of action, regulation and metabolic effects of Adrenal medullary hormones with its related clinical disorders
		78	Describe the structure and functions of Melanocyte-Stimulating Hormone, Lipotropin, and Endorphins
<b>Medicine</b>	Cushing`s syndrome	79	Describe the clinical features and complications of Cushing`s syndrome
	Addison`s disease	80	Describe the clinical features and complications of Addison`s disease

### Practical work

<b>Biochemistry</b>	Urinary glucose	81	Detect glucose in urine
	Blood glucose	82	Detect glucose in blood
	Glucose tolerance test	83	Perform and interpret Glucose tolerance test
<b>Histology</b>	Pituitary glands	84	Identify the structure of pituitary gland under microscope
	Thyroid gland	85	Identify the structure of thyroid gland under microscope
	Adrenal gland	86	Identify the structure of adrenal gland under microscope