

ENDOCRINE & REPRODUCTION MODULE

STUDY GUIDE

Module Code - MED 225

Phase II, Third year

Semester 6

* Module Committee Message

" *Dear students,*

Now you have arrived to Endocrine and Reproduction Module.

In other modules, you studied various body systems regarding their structure, functions and related disorders. Coordination of the functions of these diverse systems is essential. Through secretion of hormones, endocrine system is responsible for control of those functions whose rate is slow as growth and reproduction. It also shares in maintenance of homeostasis.

Healthy reproductive system is key factor of happy life. Having a healthy child is not only one of loftiest aspirations of humans but also essential for preservation of mankind. Infertility was always the factor that worries berth of many people.

Although endocrine glands are small in size, their functions are vital. Endocrine disorders could disturb the complete physical, mental and social well-being of individuals. These disorders usually drain a lot of resources. An example is diabetes mellitus.

This module was designed to supply the basic facts about endocrine and reproduction paving the road for clinical applications. Study of endocrine and reproduction needs much effort. Thus, we hope you wisely use your time during this module get the message we intended to deliver in it.

Best wishes

*Dr. Khaled Khalil
Module Coordinator*

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GENERAL MODULE INFORMATION

Module Title	: Endocrine and Reproduction
Module Code & Number	: MED 225
Credit Hours	: 7 hours
Module Duration	: 8 weeks
Module Starting Date	: 14 Rabi Ul Awal - 1434 H (26 January, 2013 G)
Module Coordinator	: Dr. Khaled Khalil
Module Associate Coordinator	: Dr. Mohammed Vaseem
Module Committee Members	: Prof. Mazen Qato Dr. Abdelmonem Hegazy Dr. Mohammed Ashraf Dr. Salah Abdelrahim Dr. Syed Yousaf Kazmi Dr. Mohammed Almansour
Module Teachers	: All faculty members

Module Description

The endocrine system is a collection of glands that secrete chemical messages called hormones. The reproductive system is a group of organs whose purpose is to allow two living beings to produce a third, separate being that is necessary for the continuation of a species. Much of the function of the reproductive system is mediated by endocrine system.

In this module, the student will explore the endocrine system and how it contributes to the maintenance of homeostasis. Students will identify the cellular and anatomical components of endocrine and reproductive systems. The module will focus on the major organs of the endocrine system, the hormonal secretions they produce, and their physiological effects on the body. Pathology of endocrine and genital organs will be described and correlated with some the clinical cases.

All this basic knowledge will be used to explain the basis of investigations and therapeutic modalities for the major endocrine and reproductive health problems. The module will outline the epidemiology and prevention of these health problems.

Module Objectives

At the end of the course, students are expected to:

- 1) Develop an overview of endocrine system and emphasize the close relationship with nervous and immune systems. (A, B)
- 2) Discuss the structure, synthesis, metabolism and molecular mechanism of action of key hormones and explain mechanisms that control hormones secretion. (A)
- 3) Explain the structure, development and functions of the endocrine and reproductive systems. (A)
- 4) Integrate the pathophysiology of endocrine and reproductive systems into their related disorders (including breast disorders related to reproductive system). (A, B)
- 5) Identify the clinical manifestations of excess or deficiency of key hormones applying the basic knowledge in development of a plan of investigation and management. (A,B,C, E)
- 6) Discuss the structural and functional basis of major reproductive processes and apply the knowledge gained to in the contraception counselling. (A, B, C, D).
- 7) Explain the basis of infertility and related pathological disorders and develop an understanding of plan for investigations & management. (A, B, C, D)
- 8) Describe epidemiology and public health importance of major health problems related to endocrine and reproductive systems (including sexually transmitted diseases) in KSA using updated data. (D, E)

This course will contribute to the achievement of all learning outcomes of College of Medicine, Majmaah University undergraduate curriculum. The overall learning outcomes of the course are:-

- A- Scientific in their approach to practice.
- B- Proficient in clinical care.
- C- Professional.
- D- Community conscious.
- E- Scholars.

Module Content

LECTURES

Theme I: Endocrine system

1. Overview of Endocrine System.
2. Introduction to Hormones.
3. Mechanism of Action of Hormones.
4. Second Messengers.
5. Functional Anatomy of Pituitary gland and Pineal body.
6. Functional Anatomy Thyroid and Parathyroid Glands.
7. Role of Hypothalamus in Control of Endocrine Functions.
8. Functions and Control of Anterior Pituitary Gland.
9. Functions and Control of Posterior Pituitary Gland.
10. Pathology of the Pituitary Glands I.
11. Pathology of the Pituitary Glands II.
12. Developmental Anatomy of Pituitary, Pineal and Adrenal Glands.
13. Biochemistry of Thyroid Hormones.
14. Developmental Anatomy for Thyroid, Parathyroid and Thymus Glands.
15. Physiology of Thyroid Hormones.
16. Pathology of Thyroid Gland I.
17. Therapeutics Modalities for Thyroid Gland Disorders.
18. Pathology of Thyroid Gland II.
19. Pathology of Thyroid Gland III.
20. Hypothyroidism in Pediatrics.
21. Biochemistry of Vitamin D.
22. Endocrine Regulation of Calcium Metabolism.
23. Pathology of Parathyroid Glands.
50. Metabolic Bone Diseases.
24. Biochemistry of Adrenal Steroids.
25. Physiology of Glucocorticoid Hormones.
26. Physiology of Mineralocorticoids & Adrenal Androgens.

27. **Pathology of Adrenal Cortex I.**
28. **Pathology of Adrenal Cortex II.**
29. **Adrenal Corticosteroids.**
31. **Biochemistry and Metabolic Actions of Pancreatic Hormones.**
32. **Neuroendocrine Regulation of Energy Storage and Utilization.**
33. **Insulin Therapy.**
34. **Pathology of Diabetes Mellitus.**
35. **Pathology of Diabetic Complications.**
36. **Clinical Approach to Diabetic Case.**

Theme II: Reproductive System

30. **Functional Anatomy of the Pelvic Wall and Floor.**
37. **Functional Anatomy of the Perineum.**
38. **Functional Anatomy of the Rectum and Anal Canal.**
39. **Functional Anatomy of Male Reproductive System I.**
40. **Spermatogenesis.**
41. **Endocrine Functions of the Testis.**
42. **Functional Anatomy of Male Reproductive System II.**
43. **Pathology of the Prostate.**
44. **Pathology of the Testis.**
45. **Functional Anatomy of Female Reproductive System I.**
46. **Functional Anatomy of Female Reproductive System II.**
47. **The Female Reproductive Cycles.**
48. **Endocrine Functions of the Ovary.**
49. **Hormone Replacement Therapy (HRT).**
51. **Fibroid and Endometriosis.**
52. **Endometrial Polyps, Hyperplasia and Neoplasia.**
53. **Amnion, Yolk Sac and Umbilical Cord.**
54. **Chorion and Placenta.**
55. **Hormonal Changes during Pregnancy & Lactation.**
56. **Cervical Tumours.**
57. **Trophoblastic Diseases.**
58. **Hormonal Contraception.**

59. **Developmental Anatomy of Perineal Structures.**
60. **Inflammatory Lesions of the Breast.**
61. **Overview of Sexually Transmitted Diseases.**
62. **Development of Reproductive System I.**
63. **Development of Reproductive System II.**
64. **Assisted Reproductive Technologies.**

PRACTICAL SESSIONS

1. **Gross Anatomy of Endocrine Glands.**
2. **Microscopic Anatomy of Endocrine Glands.**
3. **Pathology of Pituitary & Thyroid Glands.**
4. **Pathology of Parathyroid & Adrenal Glands.**
5. **Gross Anatomy of Pelvis I.**
6. **Laboratory Diagnosis of Diabetes Mellitus.**
7. **Gross Anatomy of Pelvis II.**
8. **Gross Anatomy of the Perineum.**
9. **Gross Anatomy of the Male Reproductive System.**
10. **Microscopic Anatomy of the Male Reproductive System.**
11. **Endocrine Physiology.**
12. **Pathology of Male Reproductive System.**
13. **Microscopic Anatomy of the Female Reproductive System.**
14. **Gross Anatomy of the Female Reproductive System.**
15. **Pathology of the Female Reproductive System.**
16. **Diagnosis of Ovulation & Early Pregnancy.**
17. **Serology of Syphilis.**

CLINICAL SKILLS

- 1 **Introduction of clinical assessment of endocrine system.**
- 2 **Examination of Thyroid Gland.**
- 3 **Examination of Prostate.**
- 4 **Examination of Breast.**

PROBLEM-BASED LEARNING

- 1 **Pituitary Problem**
- 2 **Thyroid Problem.**

- 3 Adrenal Problem.**
- 4 Male Reproduction Problem.**
- 5 Female Reproduction Problem.**

SEMINARS

- 1 Endocrine Functions of Adrenal Medulla.**
- 2 Hormones of Non-Endocrine Organs.**
- 3 Local Hormones.**
- 4 Ovarian Tumours.**

Module References

- & Clinical Anatomy by Regions: R.S. Snell - 9th ed.
- & Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H - 11th ed.
- & Langman's Medical Embryology: T.W. Sadler - 12th ed.
- & Junqueira's Basic Histology Text & Atlas: Mescher AL - 12th ed.
- & Guyton & Hall Textbook of Physiology - 12th ed.
- & Robbins Basic Pathology - 8th ed.
- & Basic & Clinical Pharmacology - 12th ed.
- & Williams Textbook of Endocrinology - 12th ed.
- & Current Medical Diagnosis & Treatment -50th ed.

Detailed Objectives of Lectures

Lecture 1 Overview of Endocrine System

By the end of this session, the student should:

- § Define and contrast the terms endocrine, paracrine and autocrine.
- § Identify the characteristics of hormone, target cell, and receptor.
- § Describe the relation between endocrine, nervous and immune system.
- § Diagram the mechanism; discuss the significance and enumerate some examples of feedback as mechanism of control of hormone secretion.
- § List the endocrine organs and other organs with endocrine functions and identify the hormones secreted by them.

& Guyton & Hall Textbook of Physiology - 12th ed. P, 880 & 886 – 891.

Lecture 2 Introduction to Hormones

By the end of this session, the student should:

- § Classify the hormones according to their chemical structure.
- § Outline the general mechanisms for synthesis and secretion of hormones.
- § Understand the role of hormone-binding proteins.
- § Discuss clearance of hormones from blood.
- § Brief the methods for measurement of hormone concentration in blood.

& Guyton & Hall Textbook of Physiology - 12th ed. P, 881 – 886 & 891 – 892.

Lecture 3 Mechanism of Action of Hormones

By the end of this session, the student should:

- § Classify hormones on the basis of their mechanism of action.
- § Understand the concept of hormone receptors and second messenger in hormone action.
- § Explain and illustrate the mechanism of action of hormone acting through intracellular receptors.
- § Explain and illustrate mechanism of action of hormones acting through membrane receptors.
- § Identify the types of surface receptors.
- § Discuss the activation and signaling pathway of receptor tyrosine kinase.

& Williams Textbook of Endocrinology – 12th ed. P, 51- 57 & 61- 68.

Lecture 4 Second Messengers

By the end of this session, the student should:

- § Enumerate and discuss various second messenger signaling regarding: formation, actions and termination.
- § Discuss the activation and signaling pathway of G-protein coupled receptors.

- § Discuss the activation and signaling pathway of receptors associated with tyrosine kinase.
- § Discuss the activation and signaling pathway of receptors serine kinases
- § Correlate receptor disorders with the pathogenesis of some endocrinal diseases.

& Williams Textbook of Endocrinology – 12th ed. P, 69 – 77.

Lecture 5 Functional Anatomy of Pituitary Gland and Pineal Body

By the end of this session, the student should:

- § Discuss location of pituitary gland and its relations to the surrounding structures.
- § Identify lobes & structure of pituitary gland.
- § Discuss the blood supply of pituitary gland.
- § Describe the location, structure and clinical anatomy of pineal gland.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed., Ch. 11, p. 652 - 657.

& Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p, 321, 347-348.

Lecture 6 Functional Anatomy Thyroid and Parathyroid Glands

By the end of this session, the student should:

- § Identify thyroid gland location and extension
- § Discuss gross anatomy of thyroid gland with its relationship to the surrounding structures.
- § Identify the applied anatomy of thyroid gland, related to its location and relations.
- § Enumerate blood supply, nerve supply and lymphatic drainage of thyroid gland.
- § Identify location and gross anatomy of parathyroid glands
- § Enumerate blood supply, nerve supply and lymphatic drainage of parathyroid glands.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 11. p. 657-660.

& Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. 264-267.

Lecture 7 Role of Hypothalamus in Control of Endocrine Functions

By the end of this session, the student should:

- § Describe the physiological anatomy and functions of hypothalamo-hypophyseal portal circulation.
- § Discuss the role of hypothalamus in the control of pituitary gland.
- § List the glands not controlled directly by hypothalamic - pituitary axis & outline their control.
- § Correlate some hypothalamic pathologies to endocrine disorders.

& Guyton & Hall Textbook of Physiology - 12th ed. P. 895 – 898.

Lecture 8 Functions and Control of Anterior Pituitary Gland

By the end of this session, the student should:

- § List the hormones secreted by anterior pituitary gland.
- § Discuss physiological actions of growth hormone
- § Outline role of somatomedins as mediators of GH actions.
- § Understand the mechanisms that regulate GH production.
- § Describe the sources, actions of somatostatin and relate it to growth hormone control.
- § Correlate this knowledge to clinical conditions related to hypo- and hypersecretion of growth hormone.

& Guyton & Hall Textbook of Physiology - 12th ed. P. 898 – 902& 1014 – 1015.

Lecture 9 Functions and Control of Posterior Pituitary Gland

By the end of this session, the student should:

- § Describe relation between posterior pituitary gland and hypothalamus.
- § Identify the mechanisms that control the release of oxytocin and arginine vasopressin (AVP).
- § Understand the physiologic target organ responses and the cellular mechanisms of oxytocin and AVP action.
- § Correlate this knowledge to clinical conditions related to hypo- and hypersecretion of vasopressin.

& Guyton & Hall Textbook of Physiology - 12th ed. 904 - 906.

Lecture 10 Pathology of the Pituitary Glands I

By the end of this session, the student should:

- § Classify pituitary adenomas and describe the pathological changes associated with them.
- § Describe the pathogenesis of hyperpituitarism.
- § Discuss the epidemiology and public health importance of hyperpituitarism.

& Robbins Basic Pathology, 8th ed. p.753 – 756.

Lecture 11 Pathology of the Pituitary Glands II

By the end of this session, the student should:

- § Discuss the causes and manifestations of hypopituitarism.
- § Describe the posterior pituitary syndromes.
- § Discuss the epidemiology and public health importance of hypopituitarism and diabetes insipidus.

& Robbins Basic Pathology, 8th ed. p.756 – 757.

Lecture 12 Developmental Anatomy of Pituitary, Pineal and Adrenal Glands

By the end of this session, the student should:

- § Discuss the development and congenital anomalies of pituitary gland.
- § Identify development of pineal gland.
- § Describe briefly development of suprarenal gland and its clinical correlations.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed., Ch. 11. p. 652 - 657.

& Langman's Medical Embryology: T.W. Sadler, 12th ed., Ch. 18. p. 302 - 305.

Lecture 13 Biochemistry of Thyroid Hormones

By the end of this session, the student should:

- § Describe the types and chemical structure of thyroid hormones.
- § List the steps of biosynthesis of thyroid hormones.
- § Enumerate the dietary sources of iodine.
- § Discuss iodine metabolism by thyroid glands and relate this metabolism to thyroid biosynthesis
- § Describe storage and release of thyroid hormones (role of thyroglobulin).
- § Discuss plasma transport of thyroid and contrast bound from free thyroid.
- § Outline methods of thyroid hormone inactivation.

& Williams Textbook of Endocrinology – 12th ed. P. 330 – 337.

Lecture 14 Developmental Anatomy Thyroid, Parathyroid and Thymus Glands

By the end of this session, the student should:

- § Discuss development and congenital anomalies of thyroid gland.
- § Identify clinical anatomy of thyroid gland, related to development.
- § Explain development of parathyroid glands
- § Identify development of thymus gland.
- § Identify its clinical correlations.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 11. p. 657-660.

& Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. 264-267.

& Langman's Medical Embryology: T.W. Sadler, 12th ed. CH. 17. p. 274-275.

Lecture 15 Physiology of Thyroid Hormones

By the end of this session, the student should:

- § Understand the significance of the conversion of tetraiodothyronine (T4) to triiodothyronine (T3) and reverse T3 (rT3) in extrathyroidal tissues.
- § Understand how thyroid hormones produce their cellular effects.
- § Describe the physiological effects of thyroid hormones in the body.
- § Outline the mechanisms for regulation of thyroid hormone.
- § Correlate knowledge to hypo- and hypersecretion of thyroid hormones.

& Guyton & Hall Textbook of Physiology - 12th ed. p. 910 – 915.

Lecture 16 Pathology of Thyroid Gland I

By the end of this session, the student should:

- § List the causes and describe the clinical manifestations of hyperthyroidism.
- § List the causes and describe the clinical manifestations of hypothyroidism.
- § Discuss the epidemiology and public health importance of hyper- and hypothyroidism.

& Robbins Basic Pathology, 8th ed. p.758 – 760.

Lecture 17 Therapeutics Modalities for Thyroid Gland Disorders

By the end of this session, the student should:

- § Describe different modalities for thyroid disorders management
- § List the principal drugs for the treatment of hyperthyroidism (anti-thyroid drugs) and indicate their mechanism of action.
- § Discuss the role of L-thyroxine or its derivatives in treatment of hypothyroidism and compare the onset and duration of their action.
- § Describe the major toxicities of thyroxin and the anti-thyroid drugs.

& Basic & Clinical Pharmacology 12th ed. P. 784 -691

Lecture 18 Pathology of Thyroid Gland II

By the end of this session, the student should:

- § List the types of thyroiditis.
- § Discuss the pathogenesis and describe the pathological changes and clinical features of Hashimoto thyroiditis.
- § Discuss the pathogenesis and describe the pathological changes and clinical features of other common forms of thyroiditis.
- § Discuss the epidemiology and public health importance of thyroiditis.

& Robbins Basic Pathology, 8th ed. p.760 – 763.

Lecture 19 Pathology of Thyroid Gland III

By the end of this session, the student should:

- § List the common neoplasms of thyroid gland.
- § Discuss the pathogenesis and describe the pathological changes and clinical features of thyroid adenomas.
- § List the subtypes of thyroid carcinomas and discuss their pathogenesis, describe their pathological changes and clinical features.
- § Discuss the epidemiology, public health importance, screening and prevention of thyroid cancer.

& Robbins Basic Pathology, 8th ed. p.765 – 771.

Lecture 20 Hypothyroidism in Pediatrics

By the end of this session, the student should:

- § Discuss the causes, pathophysiology & clinical manifestations of hypothyroidism in infants and children.
- § Outline the clinical approach to pediatric thyroid case.
- § Discuss management of hypothyroid child.
- § Describe epidemiology, public health importance, screening and prevention of hypothyroidism in children.

& Nelson Textbook of Pediatrics: Expert Consult Premium 19th ed. P.

Lecture 21 Biochemistry of Vitamin D

By the end of this session, the student should:

- § Describe chemical structure, synthesis, activation and metabolism of vitamin D.
- § Enumerate dietary sources of vitamin D.
- § Discuss the mechanism of action of vitamin D.
- § Discuss the metabolic actions of vitamin D especially those related to calcium homeostasis.
- § Identify the recommended dietary allowance of calcitriol.
- § Correlate this knowledge to clinical conditions related to vitamin D deficiency.

& Williams Textbook of Endocrinology – 12th ed. P. 1252 – 1256.

Lecture 22 Endocrine Regulation of Calcium Metabolism

By the end of this session, the student should:

- § Identify the origin, target organs, and physiologic effects of parathyroid hormone.
- § Describe the regulation of parathyroid hormone secretion and the role of the calcium-sensing receptor.
- § Describe the regulation of calcitonin release and the cell of origin and target organs for calcitonin action.
- § Illustrate and discuss the physiological response to hypocalcemia.
- § Correlate this knowledge to clinical conditions related to hypo- and hypersecretion of parathyroid hormones.

& Guyton & Hall Textbook of Physiology - 12th ed. p. 955 – 969.

Lecture 23 Pathology of Parathyroid Glands

By the end of this session, the student should:

- § Discuss the pathogenesis and describe the pathological changes and clinical features of hyperparathyroidism.
- § Discuss the pathogenesis and describe the pathological changes and clinical features of hypoparathyroidism.

- § Discuss epidemiology, public health importance, prevention and screening of hypo- and hyperparathyroidism.

& Robbins Basic Pathology, 8th ed. P. 772-775.

Lecture 24 Biochemistry of Adrenal Steroids

By the end of this session, the student should:

- § Describe the structure of the glucocorticoids, mineralocorticoids and adrenal androgens.
- § Outline the biosynthesis of adrenal steroids signifying the key enzymes in the biosynthetic pathway.
- § Describe the transport and metabolism of adrenal steroids in tissues.
- § Correlate the enzyme defects in the synthetic pathway to clinical conditions.

& Williams Textbook of Endocrinology – 12th ed. P. 481 – 485.

Lecture 25 Physiology of Glucocorticoid Hormones

By the end of this session, the student should:

- § List the major glucocorticoids secreted by adrenal cortex.
- § Describe the physiological actions of glucocorticoids.
- § Discuss the vital role of glucocorticoids in resistance of stress & inflammation.
- § Discuss and illustrate hypothalamo-hypophyseal-adrenal axis as major control mechanism of glucocorticoid secretion.
- § Understand the circadian rhythm changes in cortisol secretion and describe its mechanism.
- § Correlate this knowledge to clinical conditions related to hypo- and hypersecretion of glucocorticoid hormones.

& Guyton & Hall Textbook of Physiology - 12th ed. p.928 – 934.

Lecture 26 Physiology of Mineralocorticoids & Adrenal Androgens

By the end of this session, the student should:

- § List the major mineralocorticoids and androgens secreted by adrenal cortex.
- § Describe the physiological actions of mineralocorticoids.
- § Discuss the mechanism and sites of action of aldosterone hormone.
- § Discuss the control mechanisms for aldosterone secretion.
- § Describe the physiological significance of adrenal androgens.
- § Correlate this knowledge to clinical conditions related to hypersecretion of aldosterone and adrenal androgens.

& Guyton & Hall Textbook of Physiology - 12th ed. p.924 – 928 & 935 – 936.

Lecture 27 Pathology of Adrenal Cortex I

By the end of this session, the student should:

- § Describe the pathogenesis and morphological changes of adrenocortical insufficiency.
- § List the clinical manifestations of adrenocortical insufficiency.
- § Discuss epidemiology, public health importance of Addison's disease.

& Robbins Basic Pathology, 8th ed. P. 793 – 795.

Lecture 28 Pathology of Adrenal Cortex II

By the end of this session, the student should:

- § Describe the morphological changes and manifestations of hyperaldosteronism.
- § Describe the morphological changes and manifestations of adrenogenital syndrome.
- § Describe the morphological features of adrenocortical neoplasms.
- § Discuss epidemiology, public health importance, prevention and screening of Conn's disease and adrenogenital syndrome.

& Robbins Basic Pathology, 8th ed. P. 789 - 793 & 795 – 796.

Lecture 29 Adrenal Corticosteroids

By the end of this session, the student should:

- § List the various types of naturally occurring and synthetic corticosteroids.
- § Classify the synthetic corticosteroids according to their duration of action and their relative activity.
- § Discuss the use of corticosteroids as a treatment.
- § Discuss the adverse effects and contraindications of corticosteroid therapy.
- § List some antagonists of adrenocortical agents.

& Basic & Clinical Pharmacology 12th ed. P. 703 – 711.

Lecture 30 Functional Anatomy of the Pelvic Wall and Floor

By the end of this session, the student should:

- § Discuss muscles forming the pelvic diaphragm.
- § Identify muscles forming the pelvic wall.
- § Describe ligaments and fascia of the pelvis.
- § Describe blood supply, nerve supply and lymphatic drainage of the pelvis.
- § Identify the clinical correlations of pelvic & sacral (caudal) anaesthesia.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 6, p. 240 -261 & p. 288-301.

& Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. 124-132.

Lecture 31 Biochemistry and Metabolic Actions of Pancreatic Hormones

By the end of this session, the student should:

- § Describe the structure, biosynthesis of pancreatic hormones.
- § Discuss the mechanism of release of insulin in response to stimuli.
- § Brief the mechanism of action of insulin and glucagon.
- § Discuss the effects of insulin and glucagon on carbohydrate, lipid and protein metabolism in different tissues.
- § Identify the sites and actions of glucose transporters.
- § Briefly explain molecular mechanisms of insulin resistance.
- § Correlate this knowledge to pathogenesis of diabetes mellitus and its complications.

& Williams Textbook of Endocrinology – 12th ed. P. 1394 – 1399.

Lecture 32 Neuroendocrine Regulation of Energy Storage and Utilization

By the end of this session, the student should:

- § Describe neuroendocrine regulation of energy metabolism during the fed state
- § Discuss regulation of energy metabolism during the fasted state.
- § List the counter-regulatory hormones and describe their effects.
- § Discuss the Maintenance of Long-Term Energy Balance & Fat Storage
- § Correlate this knowledge to the related clinical conditions.

& Lange Endocrine Physiology– 2nd ed. Online access.

Lecture 33 Insulin Therapy

By the end of this session, the student should:

- § Describe the characteristics of available insulin preparations & combinations
- § List and describe the insulin delivery systems.
- § Discuss the insulin regimens (conventional & intensive insulin therapy) and outline insulin therapy in special situations like diabetic ketoacidosis.
- § List the complications of insulin therapy.

& Basic & Clinical Pharmacology 12th ed. P. 747 – 753.

Lecture 34 Pathology of Diabetes Mellitus

By the end of this session, the student should:

- § Define and classify diabetes mellitus.
- § List the possible causes of diabetes mellitus and correlate them to the classification.
- § Discuss the pathogenesis of different types of DM.
- § Discuss the relation between obesity and insulin resistance.
- § Discuss the pathogenesis of diabetic ketoacidosis.

& Robbins Basic Pathology, 8th ed. P. 775 – 780.

Lecture 35 Pathology of Diabetic Complications

By the end of this session, the student should:

- § Discuss the pathogenesis of diabetic complications.
- § Describe the morphology of diabetic complications.
- § Discuss epidemiology, public health importance, prevention and screening of diabetic complications.

& Robbins Basic Pathology, 8th ed. P. 781- 785.

Lecture 36 Clinical Approach Diabetes Mellitus

By the end of this session, the student should:

- § Identify the main questions asked in history taking.
- § Identify the screening questions of risk factors and complications.
- § Demonstrate the steps of examining diabetic patient.
- § Discuss the management plan of each status (controlled, uncontrolled, complicated, non compliance and resistance).
- § Explain the main international recommendations in DM diagnosis and management.

& CURRENT Medical Diagnosis and Treatment 20th ed. P. 1144 -1148.

Lecture 37 Functional Anatomy of the Perineum

By the end of this session, the student should:

- § Identify perineum, its boundaries and divisions.
- § Identify contents of the urogenital and anal triangle triangles.
- § Describe the location, structure and contents of pudendal canal.
- § Identify the blood supply, nerve supply and lymphatic drainage of perineum.
- § Describe the position, boundaries and contents of the ischiorectal fossa and its applied anatomy.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 8, p. 302 -333.

& Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. 132-136.

Lecture 38 Functional Anatomy of the Rectum and Anal Canal

By the end of this session, the student should:

- § Discuss the functional anatomy of the rectum.
- § Describe the relations, sphincters, and internal structure of the anal canal & differentiate between its upper and lower parts.
- § Identify applied anatomy of the rectum and anal canal.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 8, p. 302 -333.

& Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11thed., 132-136.

& Junqueira's Basic Histology Text & Atlas: Mescher AL, 12th ed. p. 280, 343 - 347.

Lecture 39 Functional Anatomy of Male Reproductive System I

By the end of this session, the student should:

- § Identify major structures of the male reproductive system.
- § Identify the scrotum and its contents.
- § Describe microscopic structure and clinical correlations of the male genital ducts; epididymis, vas deferens and ejaculatory ducts.
- § Identify the spermatic cord and its coverings and structure.
- § Identify the structures palpated per rectal examination (PR) in males.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 7, p. 275-278 & Ch.8, p. 309-320.

& Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. Pp. 84-86 & 116-124.

& Junqueira's Basic Histology Text & Atlas: Mescher AL, 12th ed. Ch. 21, p. 371-387.

Lecture 40 Spermatogenesis

By the end of this session, the student should:

- § List the steps of spermatogenesis and describe the role of different parts of male genital system in spermatogenesis.
- § Discuss the factors affecting spermatogenesis.
- § List the roles of Sertoli cells in male reproductive physiology.
- § Identify the characteristics of normal semen and describe the functional characteristics of mature spermatozoa.
- § Correlate this knowledge to the pathogenesis of male infertility.

& Guyton & Hall Textbook of Physiology - 12th ed. p. 973 – 976.

Lecture 41 Endocrine Functions of the Testis

By the end of this session, the student should:

- § Identify the different sex hormones secreted by testis and contrast their biological activity.
- § Describe the mechanism of action and the physiological actions of testicular androgens relating them to age.
- § Identify the role of testosterone in male puberty.
- § Discuss the role of the hypothalamo-hypophyseal-testicular axis as major control of testicular androgen secretion.
- § Correlate this knowledge to the pathogenesis of male hypogonadism.

& Guyton & Hall Textbook of Physiology - 12th ed. p.979 – 985.

Lecture 42 Functional Anatomy of Male Reproductive System II

By the end of this session, the student should:

- § Describe gross anatomy, blood supply, nerve supply, lymphatic drainage, microanatomy and clinical correlations of testis.
- § Describe the location, gross anatomy, relations and microanatomy of prostate and other glands of the male genital system as well as their clinical correlations.
- § Describe clinical anatomy of penis, blood supply, nerve supply and lymphatic drainage.

& Clinical Anatomy by Regions: R.S. Snell, 9thed. Ch. 7, p. 275-278 & Ch.8, p. 309 - 320.

& Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11thed., p. 116-124.

& Junqueira's Basic Histology Text & Atlas: Mescher AL, 12thed. Ch. 21, p. 371-387.

Lecture 43 Pathology of the Prostate

By the end of this session, the student should:

- § Discuss the aetiology and manifestations of prostatitis.
- § Explain pathogenesis and pathology of benign prostatic hyperplasia.
- § Discuss the pathogenesis and pathology of prostatic carcinoma.

& Robbins Basic Pathology, 8th ed. P. 695 – 700.

Lecture 44 Pathology of the Testis

By the end of this session, the student should:

- § Discuss the pathology of cryptorchidism and testicular atrophy
- § Discuss the inflammatory lesions of the testis and describe their clinical manifestations.
- § Classify and discuss the pathology of testicular neoplasia.
- § Correlate the pathology of the testis to male infertility.
- § Discuss epidemiology, public health importance, prevention and screening of testicular neoplasia.

& Robbins Basic Pathology, 8th ed. P.689 – 695.

Lecture 45 Functional Anatomy of Female Reproductive System I

By the end of this session, the student should:

- § Identify the major components of the female reproductive system and the main function of each part.
- § Describe location, parts, position, structure of wall, relations, ligaments, blood supply, lymphatic drainage and nerve supply of uterus.
- § Identify the applied anatomy of uterus.

& **Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch.7, p. 279-301 & Ch. 8, p. 331-333.**

& **Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. 84-86 & 136-146.**

& **Junqueira's Basic Histology Text & Atlas: Mescher AL, 12th ed. Ch. 22, p. 388-411.**

Lecture 46 Clinical Anatomy of Female Reproductive System II

By the end of this session, the student should:

- § Describe location, structure and relations of ovary and its peritoneal attachment.
- § Identify the gross anatomy and structure of uterine tubes and external genitalia (vulva) & identify their blood supply, nerve supply and lymphatic drainage.
- § Identify the structures palpated per rectal (PR) examination in females.
- § Identify the structures palpated per vaginal (PV) examination.

& **Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch.7, p. 279-301 & Ch. 8, p. 331-333.**

& **Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. 84-86 & 136-146.**

& **Junqueira's Basic Histology Text & Atlas: Mescher AL, 12th ed. Ch. 22, p. 388 - 411.**

Lecture 47 The Female Reproductive Cycles

By the end of this session, the student should:

- § Describe the roles of pituitary hormones in regulation of female reproductive cycles.
- § Define ovulation and discuss its physiological mechanisms and relate this knowledge to its diagnosis.
- § Identify the endocrine functions of corpus luteum and describe its fate.
- § Correlate endometrial changes during the menstrual cycle to the changes in blood levels of pituitary and ovarian hormones.
- § Correlate this knowledge to the pathogenesis female infertility.

& **Guyton & Hall Textbook of Physiology - 12th ed. p. 988 - 991 & 995 - 996.**

Lecture 48 Endocrine Functions of the Ovary

By the end of this session, the student should:

- § Identify different sex hormones secreted by ovary and contrast their biological activity.
- § Describe the target cells and physiological actions of estrogen including puberty.
- § Describe the target organs and physiological actions of progesterone.
- § Summarize the interplay between hypothalamic, pituitary and ovarian hormones and their cyclic changes as the key regulator of female monthly rhythm.
- § Correlate this knowledge to pathogenesis female infertility and menopause.

& Guyton & Hall Textbook of Physiology - 12thed. p. 987 - 988 & 996 – 998.

Lecture 49 Hormone Replacement Therapy (HRT)

By the end of this session, the student should:

- § List the benefits and hazards of postmenopausal (or hormonal replacement therapy) estrogen therapy.
- § Describe the uses of gonadal hormones and their antagonists in the treatment of cancer in women and men.
- § List or describe the toxic effects of anabolic steroids
- § Name 3 selective estrogen receptor modulators (SERMs) and describe their unique properties.

& Basic & Clinical Pharmacology 12th ed. P. 720 - 722, 730 - 733, 734 – 735.

Lecture 50 Metabolic Bone Diseases

By the end of this session, the student should:

- § Define bone demineralization and list its related clinical conditions.
- § Overview the normal bone calcification and metabolism.
- § Discuss the causes, pathogenesis and clinical manifestations of osteomalacia and osteoporosis.
- § Outline a clinical approach for diagnosis of metabolic bone diseases.
- § Briefly describe the management of pathological bone demineralization.

& CURRENT Medical Diagnosis and Treatment 20th ed. P.1098 -1104.

Lecture 51 Fibroid and Endometriosis

By the end of this session, the student should:

- § Define PCOS and explain the possible pathogenesis.
- § Describe fibroid and enlist the anatomical types of fibroid (leiomyomas).
- § Explain clinical features and enlist the complications.
- § Describe endometriosis and differentiate from adenomyosis.
- § Enlist the commonest locations of endometriosis and explain the possible theories of etiopathogenesis.
- § Discuss the epidemiology, public health importance, prevention and screening of female infertility.

& Robbins Basic Pathology, 8th ed. p.722 – 728.

Lecture 52 Endometrial Polyps, Hyperplasia and Neoplasia

By the end of this session, the student should:

- § Discuss the pathology of endometrial polyps.
- § Enlist the types of endometrial hyperplasia.
- § Classify the endometrial neoplasia.

§ Discuss the pathogenesis and morphology of endometrial carcinoma.

& Robbins Basic Pathology, 8th ed. p.722 – 724.

Lecture 53 Amnion, Yolk Sac and Umbilical Cord

By the end of this session, the student should:

- § Discuss development of amnion and identify its function & clinical correlations.
- § Describe briefly development of yolk sac & identify its function.
- § Discuss development of Umbilical Cord & identify its gross anatomy, structure and clinical correlations.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 4. p. 138-144.

& Langman's Medical Embryology: T.W. Sadler, 12th ed. CH. 7. p. 91-111.

& Junqueira's Basic Histology Text & Atlas: Mescher AL, 12th ed. Ch. 5, p. 108 & Ch. 22, p. 403-405.

Lecture 54 Chorion and Placenta

By the end of this session, the student should:

- § Describe development of chorion and placenta.
- § Describe the gross anatomy and structure of placenta.
- § Discuss circulation of placenta & placental barrier.
- § Discuss functions of placenta.
- § Identify clinical correlations.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 4. p. 138-144.

& Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., Pp. 39-40.

& Langman's Medical Embryology: T.W. Sadler, 12th ed. CH. 7. p. 91-111.

& Junqueira's Basic Histology Text & Atlas: Mescher AL, 12th ed. Ch. 5, p. 108 & Ch. 22, p. 403-405.

Lecture 55 Hormonal Changes during Pregnancy & Lactation

By the end of this session, the student should:

- § Identify the role of placenta as an endocrine organ.
- § Describe the hormonal changes during pregnancy and explain the basis of these changes.
- § Discuss the different theories claimed to be involved in initiation of labour.
- § Describe the role of oxytocin in labour.
- § Discuss the hormonal role in development of the breast during different phases.
- § Describe the role of prolactin and oxytocin in lactation.

& Guyton & Hall Textbook of Physiology - 12th ed. p.1008 – 1016.

Lecture 56 Cervical Tumours

By the end of this session, the student should:

- § Discuss the pathology of endocervical polyps.
- § Classify the cervical neoplasia.
- § Discuss the pathogenesis and morphology of cervical neoplasia.
- § Discuss the epidemiology, medicinal importance, prevention and screening of cervical tumours.

& Robbins Basic Pathology, 8th ed. p.717 – 721.

Lecture 57 Trophoblastic Diseases

By the end of this session, the student should:

- § Classify the gestational trophoblastic diseases.
- § Describe the pathological features of hydatiform mole.
- § Describe the pathological features of invasive mole.
- § Describe the pathological features of choriocarcinoma.
- § Discuss the epidemiology, medicinal importance, prevention and screening of trophoblastic diseases.

& Robbins Basic Pathology, 8th ed. p.735 – 737.

Lecture 58 Hormonal Contraception

By the end of this session, the student should:

- § Brief different methods of contraception.
- § Enlist the different modalities of hormonal contraception
- § Describe the mechanism of action, the adverse effects and contraindication of each type.
- § Explain the basis of selection of appropriate hormonal contraception.

& Basic & Clinical Pharmacology 12th ed. P. 726-731

Lecture 59 Developmental Anatomy of Perineal Structures

By the end of this session, the student should:

- § Identify the cloaca and its derivatives.
- § Discuss development of the rectum and anal canal
- § Identify the congenital anomalies of the rectum and anal canal.
- § Discuss development of the urinary bladder and urethra
- § Identify the congenital anomalies of the urinary bladder and urethra.

& Langman's Medical Embryology: T.W. Sadler, 12th ed., Ch. 15 p. 229-232 & Ch.16. p. 240-242.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 7, p. 269-271 & Ch. 8, p. 302 - 333.

Lecture 60 Inflammatory Lesions of the Breast

By the end of this session, the student should:

- § Describe the inflammatory conditions in breast
- § Explain the pathogenesis
- § Explain the pathogenesis of mammary duct ectasia
- § Describe the clinical features and laboratory diagnosis of inflammatory conditions.
- § Discuss the epidemiology, medicinal importance, prevention and screening of inflammatory lesions of the breast.

& Robbins Basic Pathology, 8th ed. p.742.

Lecture 61 Overview of Sexually Transmitted Diseases

By the end of this session, the student should:

- § Describe the pathogenesis of genital infection.
- § Discuss the clinical manifestations of genital infection.
- § Identify the common methods used in the diagnosis of genital infection.
- § Discuss the management plan of genital infection.
- § Summarize appropriate preventive methods of genital infection.
- § Describe the epidemiology, public health importance, prevention and screening of genital infection.

& Robbins Basic Pathology, 8th ed. p. 700 -710.

Lecture 62 Development of Reproductive System I

By the end of this session, the student should:

- § Discuss development of Gonads (Ovary and Testis) & identify the clinical correlates.
- § Discuss development of external genitalia (Vulva and Penis & Scrotum) & identify the clinical correlates.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch.7, p. 279-301 & Ch. 8, p. 331 - 333.

& Langman's Medical Embryology: T.W. Sadler, 12th ed. CH. 16, p. 243 - 259.

Lecture 63 Development of Reproductive System II

By the end of this session, the student should:

- § Identify the embryological origin of the genital ducts (in both sexes).
- § Discuss development and fate of Mullerian (Paramesonephric) ducts in both sexes.
- § Identify the congenital anomalies of uterus & congenital anomalies of other genital ducts and define the clinical correlates.

& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch.7, p. 279-301 & Ch. 8, p. 331-333.

& Langman's Medical Embryology: T.W. Sadler, 12th ed. CH. 16, p. 243 - 259.

Lecture 64 Assisted Reproductive Technologies

By the end of this session, the student should:

- § Identify guidelines for assessment of fertility
- § Identify the basic concept for all techniques of assisted conception.
- § Identify the commonly used conception techniques.
- § Identify the indications of these techniques.
- § Describe briefly the mechanism of in-vitro fertilization (IVF) & embryo transfer technique.
- § Discuss briefly the intrauterine insemination and gamete intra-fallopian transfer (GIFT) techniques.

& Monga A. Gynecology by Ten Teachers, 18th ed., Ch. 7; Infertility, p. 76 - 88. Oxford University Press, 2006.

& Brandon J, et al. The Johns Hopkins Manual of Obstetrics & Gynecology, Ch 31; Infertility and Assisted Reproductive Technologies, Lippincott Williams &Wilkins Publishers 2002.

& Hart DM, Norman J. Gynecology illustrated, 5th ed., Ch. 18, p. 406-409. Churchill Livingstone, 2000.

Practical Sessions

Practical 1 Gross Anatomy of Endocrine Glands

By the end of this session, the student should:

- § Identify the location, relations, blood supply and nerves of the different endocrine glands using the cadavers, models and videos.
- § Identify the endocrine gland imaging, using X-rays, CA scans and MRI.

& **Clinical Anatomy by Regions: R.S. Snell, 9th ed., Ch. 11. p. 211-215, 279, 293-294, 333 & 652-661.**

& **Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. 321, 347-348.**

Practical 2 Microscopic Anatomy of Endocrine Glands

By the end of this session, the student should:

- § Identify the microscopic anatomy of the different endocrine glands.
- § How to differentiate between the normal structure and cells of different glands under the light microscopy.

& **Junqueira's Basic Histology Text & Atlas: Mescher AL, 12th ed. Ch. 20, p. 348 - 354 & 367- 370.**

Practical 3 Pathology of Pituitary and Thyroid Glands

By the end of this session, the student should:

- § Identify the various conditions associated with morphological changes (microscopic and gross).



Practical 4

Pathology of Parathyroid and Adrenal Glands

By the end of this session, the student should:

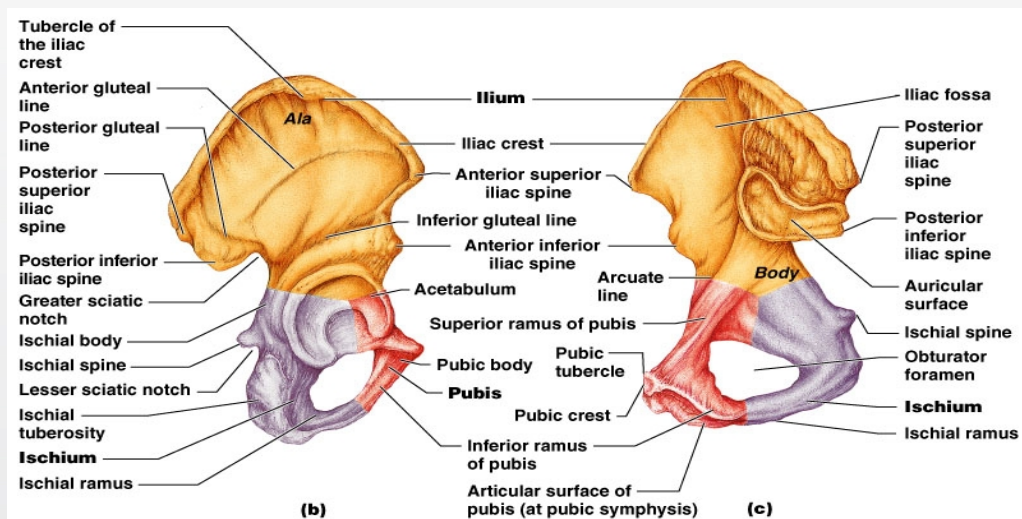
- § Identify the various conditions associated with morphological changes (microscopic and gross).

Practical 5

Gross Anatomy of Pelvis I

By the end of this session, the student should:

- § Identify the parts of the bony pelvis.
- § Identify the features of each bone of pelvis
- § Identify the sexual dimorphism seen in the pelvis (i.e., the differences between the male and female pelvis)
- § Identify radiographic anatomy of the bony pelvis.



& Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 6, p. 240 -261 & p. 288-301.

& Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., Pp. 124-132.

Practical 6

Laboratory Diagnosis of Diabetes Mellitus

By the end of this session, the student should:

- § Discuss the different diagnostic tests for DM.
- § List the indications for the test
- § Describe the procedure to estimate glucose using a glucometer.
- § Highlight the possible errors that happen in the test process and its implications on management of the patient at the three stages;
 - a) Pre analytical stage
 - b) Analytical stage and
 - c) Post analytical stage

& Sacks et al., Guidelines and Recommendations for Laboratory Analysis in the Diagnosis and Management of Diabetes Mellitus. Diabetes Care. vol. 34 no. 6, e61-e99.

Practical 7

Gross Anatomy of Pelvis II

By the end of this session, the student should:

- § Identify the boundaries between the false and true pelvis.
- § Identify the inlet and outlet of the true pelvis.
- § Identify the muscle attachment and blood vessels and nerve relations to the bones of pelvis.

& **Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 6, p. 240 -261& p. 288-301.**

& **Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. 124-132.**

Practical 8

Gross Anatomy of the Perineum

By the end of this session, the student should:

- § Identify perineum, its boundaries and divisions.
- § Identify contents of urogenital triangle and anal triangle.
- § Identify the gross anatomy of rectum and anal canal, using dissected cadavers and models.
- § Identify the position, boundaries and contents of the ischiorectal fossa.
- § Identify blood vessels and nerves of perineum.

& **Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 8, p. 302 -333.**

& **Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. 132-136.**

Practical 9

Gross Anatomy of the Male Reproductive System

By the end of this session, the student should:

- § Identify major structures of the male reproductive system.
- § Identify the scrotum and its contents.
- § Identify the spermatic cord and its structure.
- § Identify the gross anatomy of testis.

& **Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch. 7, p. 275-278 & Ch.8., p.309-320.**

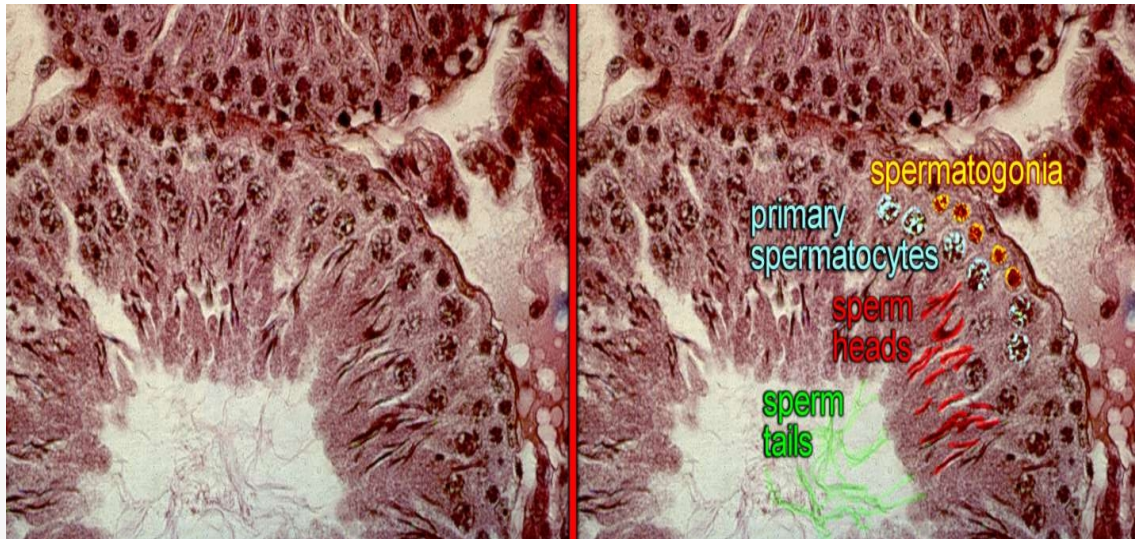
& **Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. 116-124.**

Practical 10

Microscopic Anatomy of the Male Reproductive System

By the end of this session, the student should:

- § Identify microscopic structure of testis, prostate and seminal vesicle.
- § Describe microscopic structure of the male genital ducts; epididymis, vas deferens and ejaculatory ducts.



& **Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch.8., p.309-320.**

& **Junqueira's Basic Histology Text & Atlas: Mescher AL, 12th ed. Ch. 21, p. 371-387.**

Practical 11 Endocrine Physiology (Virtual Lab.)

By the end of this session, the student should:

- § Describe the effect of changes of thyroid, TSH and anti-thyroid drugs on the general body metabolism.
- § Describe the effects of estrogen as hormone replacement therapy.
- § Describe the physiological effects of insulin on carbohydrate metabolism.

& **PhysioEx(TM) 9.0: Laboratory Simulations in Physiology Peter Zao, 2011**

Practical 12 Pathology of Male Reproductive System

By the end of this session, the student should:

- § Identify the various conditions associated with morphological changes (microscopic and gross)

Practical 13 Microscopic Anatomy of the Female Reproductive System

By the end of this session, the student should:

- § Identify the microscopic structure of ovary, uterus and vagina.
- § Identify the structure of ovum, mature Graafian follicle and other ovarian follicles and corpus luteum.

& **Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch.7, p. 279-301 & Ch. 8, p. 331-333.**

& **Junqueira's Basic Histology Text & Atlas: Mescher AL, 12th ed. Ch. 22, p. 388 -411.**

Practical 14 Gross Anatomy of the Female Reproductive System

By the end of this session, the student should:

- § Identify the major components of the female reproductive system.
- § Identify location, parts, position, relations, ligaments, blood supply of uterus.
- § Identify the location, structure and relations of ovary and its peritoneal attachment.
- § Identify the gross anatomy of uterine tubes and external genitalia (vulva).
- § Identify the radiological anatomy of the female genital ducts using hysterosalpingography.

& **Clinical Anatomy by Regions: R.S. Snell, 9th ed. Ch.7, p. 279-301 & Ch. 8, p. 331-333.**

& **Clinical Anatomy, Applied anatomy for students and junior doctors by Ellis H, 11th ed., p. 84-86 & 136-146.**

Practical 15 Pathology of the Female Reproductive System

By the end of this session, the student should:

- § Identify the various conditions associated with morphological changes (microscopic and gross)

Practical 16 Diagnosis of Ovulation & Early Pregnancy

By the end of this session, the student should:

- § Describe tests done to diagnose ovulation
- § Discuss the physiological basis of pregnancy tests.
- § Describe the procedure of pregnancy test
- § Interpret the results of the test.



& **The laboratory Diagnosis of Pregnancy by Herta Shwabacher, online access**

Practical 17 Serology of Syphilis

By the end of this session, the student should:

- § Perform Rapid Plasma Reagin test (screening test) for syphilis
- § Understand the principle of screening test of syphilis

- § Learn different conditions giving rise to false positive serology of screening test of syphilis
- § Interpret results of screening test in different stages of venereal syphilis and non-venereal syphilis (yaws, pinta, bejel).

& Jawetz, Melnick and Adelberg's Medical Microbiology, 25th ed., Section III, Ch. 24 (Spirochetes & Other Spiral Microorganisms), p.301-304.

Detailed objectives of Clinical Skills

Skill 1 Introduction of Clinical Assessment of Endocrine System

By the end of this session, the student should:

- § Demonstrate history taking of standardized patient/volunteer of endocrine diseases.
- § Demonstrate clinical examination of standardized patient/volunteer of endocrine diseases.

Skill 2 Examination of Thyroid Gland

By the end of this session, the student should:

- § Describe the common symptoms of hypo & hyperthyroidism.
- § Identify the correct steps of thyroid examination like inspection, palpation & auscultation.
- § Apply correct technique in performing thyroid examination.
- § Detect common abnormalities of thyroid gland like goiter and nodules.



Skill 3 Examination of Prostate

By the end of this session, the student should:

- § Identify the common indications of digital rectal examination.
- § Explain the procedure to the patient and obtain informed consent.
- § Position the patient correctly for rectal examination.
- § Perform rectal examination by applying correct technique.
- § Detect common abnormalities of prostate.

Skill 4 Examination of Breast

By the end of this session, the student should:

- § Know the common symptoms of breast diseases.
- § Describe significance of regular breast examination.
- § Perform breast examination by applying correct steps and technique.
- § Identify and record common abnormal findings of breast disease.
- § Know the common investigations to diagnose breast lesions.
- § Explain how to perform a breast self examination.

& Macleod's clinical examination 10th ed.

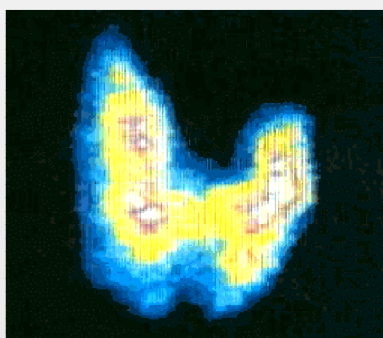
Problem-based Learning

PBL 1

" One night I was sitting at my window and watching rain pour all over the neighbourhood and for some reason I got to thinking about what life was like before I was diagnosed with this disease?!"



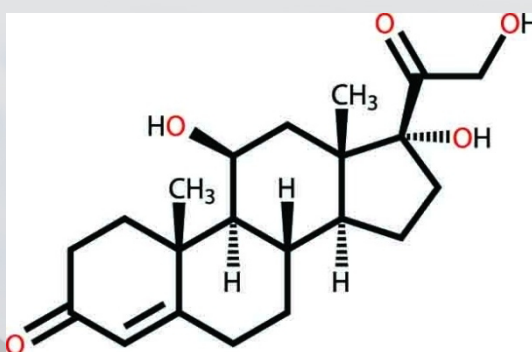
PBL 2



Nabila is 30-year-old housewife mother who was long known among her neighbours by her kindness. Recently, she becomes nervous and raises problems for trivial causes.

PBL 3

Genetics and runaway appetite are not the only causes of obesity. Sometimes, your own body can turn against you in ways you never thought possible.



PBL 4

Some simple lifestyle changes
may be all you need to feel
better



PBL 5



I can still remember the time when 30 seemed over the hill. And when I was 30, 40 seemed *pretty ancient*. But when I was 40, all I could see was a terrible brick wall ahead.

Seminars

I. Guidelines for Seminar Sessions:

1) *Four seminars are scheduled during the module. Duration of each seminar is two hours.*

2) *The whole patch of students of the College of Medicine is divided into four equal groups: **A, B, C & D** (10 students maximum in each group).*

3) *Groups are recommended to assign a **group leader** chosen by students. Each group leader will be in charge for contacting the Module Coordinator, **Dr. Khaled Khalil**.*

4) *A **staff member** will be assigned as a **Seminar Supervisor** for each group. The Seminar Supervisor will take care of his group regarding:*

§ **Assignment of students** for giving presentations in coordination with the group leader.

§ **Assignment of topics** of seminars in coordination with group leader.

§ **Direct help and advice** of students during preparation of presentations.

§ **Lead and supervision** of seminars regarding securing convenient venue, managing timing for each presentation and keeping order during seminar sessions.

§ **Facilitation** of group discussion after each presentation.

§ **Assessment** of students.

5) ***Four students** are assigned for giving presentations in each seminar.*

6) *Each of the assigned students has to prepare a presentation for his assigned topic as follow:*

§ The presentation should be formatted by **Microsoft office PowerPoint program**.

§ Only **five to eight slides** are required for each presentation.

§ Presentation should last for **seven to ten minutes**.

§ **Five minutes** will be allowed for **whole group discussion**.

§ **Five to ten minutes** are devoted for the tutor for giving **feedback and comments**.

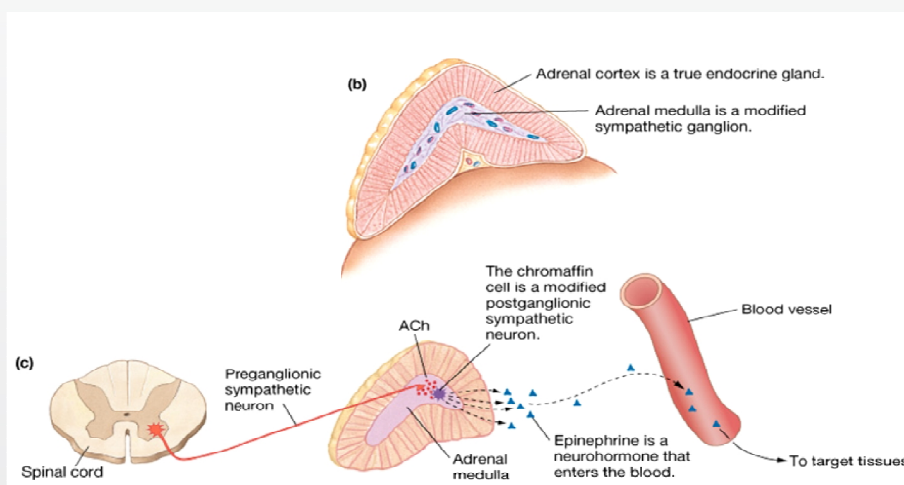
7) *Other students (not giving presentations) have to properly prepare themselves for active collaboration and discussion by reading topics related to seminars prior to attending (not just passive listening).*

II. Scheduled Topics for Seminar Sessions:

Seminar 1 Endocrine Functions of Adrenal Medulla

By the end of this session, the student should:

- 1) Describe the histological features of adrenal medullary cells.
- 2) List the hormones secreted by adrenal medulla and outline the process of their biosynthesis.
- 3) Discuss the physiological actions of adrenal medullary hormones.
- 4) Discuss the control of secretion of adrenal medullary hormones.
- 5) Describe the manifestations of hyper and hyposecretion of adrenal medullary hormones.



Seminar 2 Hormones of Non-Endocrine Organs

By the end of this session, the student should:

- § List hormones secreted by the heart and describe briefly their actions and control.
- § List hormones secreted by the kidney and discuss briefly their physiological actions.
- § List hormones secreted by adipose tissues (fat cells) and describe briefly their physiological actions.
- § Describe the physiological roles of gastrointestinal hormones outside GIT.

Seminar 3 Local Hormones

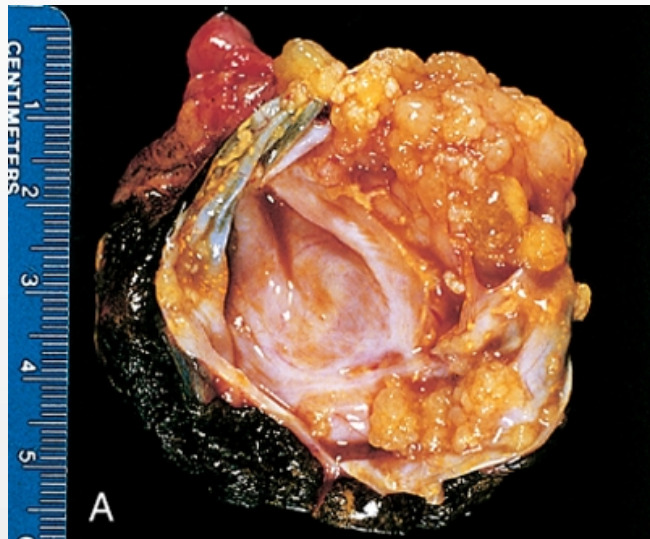
By the end of this session, the student should:

- § Define local hormone and list their types.
- § Differentiate between the neurotransmitter and the hormone then list 3 examples of neurotransmitters describing their sites of release and their mechanism of action.
- § Differentiate between the cytokine and the hormone then list 3 examples of cytokines describing their sites of release and their physiological actions.
- § List 3 examples of growth factors describing their sites of release and their physiological actions.

Seminar 4 Ovarian Tumours

By the end of this session, the student should:

- 1) Classify the ovarian tumours and discuss their pathogenesis.
- 2) Classify and describe surface epithelial cell tumours.
- 3) Classify and describe germ cell tumours.
- 4) Classify and describe sex cord-stroma tumours.



Case Discussion

I. Guidelines of Case Discussion (CD) Sessions:

1) Four scheduled CD sessions will be held during the module.

2) Instructional method: Small group learning

3) Students preparation for the CD sessions:

One week before each scheduled CD session, students will be given the full scenario of the case to be discussed. All students are asked and highly encouraged to read the scenario carefully and prepare themselves for the team-based learning discussion by trying to answer questions provided. Utilizing textbooks in the Medical Library and useful websites are of profound help in achieving convenient preparation in advance.

4) Case Discussion Sessions:

On the day of every CD session, the students will be divided in four groups and for each group a **faculty member** will help them as a **facilitator**. During each session, the case will be presented and discussed by the students of each group in collaboration with the facilitator. They should bring their learning resources to the learning session to actively search and verify information that will be discussed.

The facilitator will be in charge for facilitating discussion and clarifying points issued by students. The facilitator may also pose some critical questions related to the topic during the discussion. Active collaboration of all the students in the discussion is mandatory.

II. Scheduled Topics for Case Discussion (CD) Sessions:

CASE 1

Goitre

Twenty eight years old teacher, during her annual check-up, complained of tiredness and difficulty in concentration in her work over the past months. History taking by physician revealed that the frequency of her bowel motions had decreased and She was having difficulty keeping her weight down. Despite temperate weather, she felt chilled without a light sweater. Family history was positive for her mother that was regularly taking L-thyroxin once daily in the past 12 months.

Physical examination revealed that height is 1.65 m and weight is 56.7 kg. Her facial features appeared slightly puffy with sparse eyebrows in comparison to the photograph on her photo ID card taken 3 years before. The pulse rate was 58 bpm and the blood pressure 138/88 mm Hg. Examination of her neck disclosed a small swelling in the front of the neck (goitre), which was firm to palpate with a bosselated texture and moved on swallowing. Examination of tendon jerks showed delayed relaxation phase. All other systemic examinations were found to be normal. Her blood investigations revealed the following;

	Conventional units	
	Value	Reference interval
FreeT4	0.7ng/dl	0.9 – 1.6ng/dl
TSH	22.0 µIU/ml	0.6 – 4.5µIU/ml
Anti-TPO antibodies	6280.0IU/ml	0 – 70IU/ml
Cholesterol	230mg/dl	< 200mg/dl



Chronic autoimmune thyroiditis associated with hypothyroid functions was diagnosed and L-thyroxine treatment was started.

Questions:

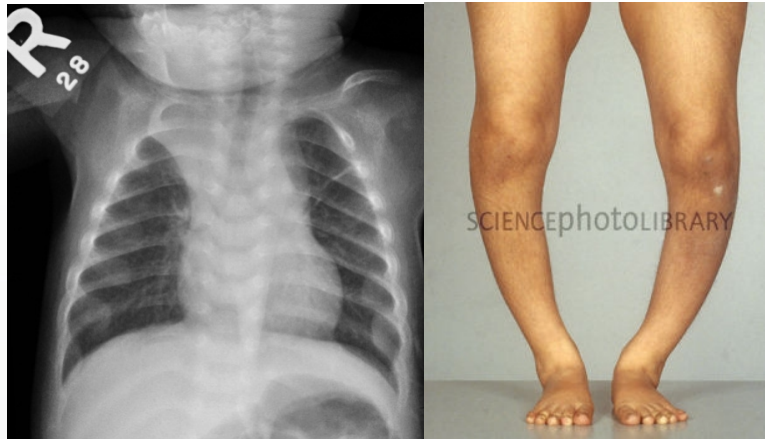
1. *What is goitre? What are the possible causes?*
2. *What is the relation between goitre and the thyroid functions?*
3. *What is hypothyroidism? What are the possible causes? How are these causes involved in the pathogenesis of hypothyroidism?*
4. *What is the effect of the age of the patient on the manifestations of hypothyroidism?*
5. *What are the anti-thyroid auto-antibodies? What is their role in the pathogenesis of thyroid diseases?*
6. *What are the thyroid function tests? How can you interpret them in this case to reach the diagnosis?*
7. *How do non thyroid illnesses interfere with thyroid function tests?*
8. *What are the modalities of management of hypothyroidism?*
9. *Describe the epidemiology, public health importance and prevention of hypothyroidism especially in KSA.*

CASE 2

Rickets

Three-year-old girl who lived with her family in a poor remote village. She was the fifth of eight children. Her parents were farmers. Because of their high cost, dairy products were rarely consumed by the parents or children and vegetable were the main source of food.

During an outpatient clinic visit for throat infection, the paediatrician noted that her legs were severely bowed (genu varum). The mother reported that the child cried when she was required to walk for even a short distance. The physician also noticed that the patient's brother had a pronounced "K-leg" (genu valgum). However, the youngest of the children, who was still being breast-fed, showed no evidence of skeletal problems. The physician referred the girl for examination at a hospital in the nearby city.



Examination of the girl revealed that her weight (14.8 kg) was above the 50th percentile for girls in her age according to WHO. Bowed legs were observed together with the presence of bead-like enlargement of the costochondral junctions. Other parameters were free. X-rays of the long bones of the patient revealed widening of the growth plates and metaphyseal cupping and fraying. There was also reduced calcification of the bones. The results of the laboratory analyses are summarized in the Table.

Parameter	At diagnosis	Reference Range
Total calcium (mg/dl)	8.9	8.8 – 10.8
Phosphorus (mg/dl)	4.0	4.5 – 5.5
PTH (pmol/l)	283	1.05 – 6.84
25- Hydroxy vitamin D (nmol/l)	28	35 – 150
Alkaline Phosphatase (U/l)	1500	160 - 320
Urinary Calcium (mg/24h)	Not detected	50 – 100
Urinary Phosphorus (mg/24h)	2.0	0.4 – 1.3

Questions:

1. List the hormones involved in calcium homeostasis and discuss their physiological role.
2. What are daily requirement, sources and factors affecting the absorption of dietary calcium?
3. What are sources and factors affecting vitamin D metabolism?
4. What are the different types of rickets?
5. Describe the pathogenesis of the different types of rickets.

6. *What are the classical clinical features of rickets?*
7. *What are the investigation plans in such case? How can results interpreted to reach the diagnosis?*
8. *Describe the epidemiology, public health importance and prevention of Rickets.*
9. *In Saudi Arabia, is any population subgroup at risk for deficiency manifestation of Vitamin D? Are there any government policies to prevent this?*

CASE 3

Diabetes Mellitus

Fifty six-year-old male presented to outpatient clinic for follow-up of his diabetes. He has had diabetes since he was twelve. He was diagnosed as Diabetic when one day he was found unconscious at school. He mentioned admission and treatment in the intensive care unit of the city hospital. Then, ever since, he has always on insulin therapy. Of late, when he monitored his blood glucose at home using a glucometer, he found that his blood glucose level was in the range of 150 – 160mg/dl.



He went to a medical college hospital where a junior doctor ordered a glycated haemoglobin test and also increased the dose of insulin by 4 units in the morning and by 8 units at night. He reported feeling very tremulous with palpitations and sweating at 3 AM recently after the new dosing regimen. On using the glucometer, he found his blood sugar in

the range of 40 mg/dL. He, however, noted that his early morning blood sugar is still higher than 140mg/dl. The glycated haemoglobin was later reported to be 7.5%.

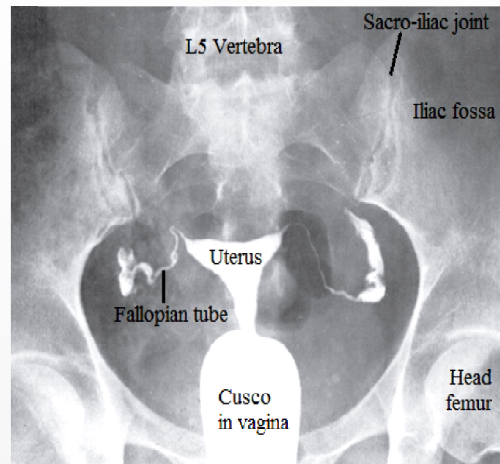
Questions:

1. *What is the type of diabetes mellitus in this case? Describe the mechanism of its pathogenesis.*
2. *What is the most likely cause of the episode of unconsciousness at age 12?*
3. *What are the precipitating factors for diabetic ketoacidosis?*
4. *Why is his blood sugar so low at night and high in the early morning sample?*
5. *Which test reflects the long term control of blood glucose? Why?*
6. *What is glycated haemoglobin? How is it formed?*
7. *What is the implication of the process in Q7 in the pathogenesis of the chronic complications of Diabetes mellitus?*
8. *Discuss the possible management of this case.*
9. *Describe the epidemiology, public health importance and prevention of this type of diabetes especially in KSA.*

CASE 4

Infertility

Mrs. Lyla is 33-year-old teacher. She presents at the gynecology clinic with complaint of inability to conceive. She is married since one year. Her husband is a policeman working in another city. He is well and has no significant past medical or surgical history. Both of them are non-smokers and neither of them drinks alcohol. She has 2 children from her ex husband. The last labour has occurred at the home since 5 years, with history of puerperal fever. Her menstrual periods are regular, occurring every 30 days with menses of about 5 days. There is no history of diabetes, heart or any other systemic disease. Also, there is no history of miscarriage or intrauterine fetal death. She has no past history of regular medications or surgical operations.



Physical examination reveals no pallor, pulse 80/min, blood pressure 110/80, length 165 cm & body weight 70 kg. Inspection of neck shows no clumps or swelling. Chest and abdomen examination is free. No milk or colostrums is shown by examination of her breasts. Vaginal examination shows normal sized uterus, no ovarian masses and free Douglas pouch with no tenderness.

Questions:

1. *What is the advice for the couple in regard the effects of lifestyle, and information concerning spontaneous conception rates?*
2. *What is the relation between the job of the wife and husband to her complaint?*
3. *What are the relations between the past history of medications or surgery and the occurrence of this case?*
4. *What are the factors that predispose to this condition?*
5. *What are the possible causes for such condition? What is the cause in this case?*
6. *What are the required investigations? How can you interpret the results to reach diagnosis?*
7. *Define ovulation and the associated features indicating its occurrence in general and in this case.*
8. *Define the normal parameters for semen analysis?*

Field Visits

I. Guidelines for field visits:

- ◇ Students should follow instructions given to them prior to the visit.
- ◇ A handout is given to students before each and every visit illustrating program, objectives and other details concerning the visit. Students are required to read handouts carefully.
- ◇ Students are encouraged to go to hospital utilizing transportation which is secured by the College Administration. Transportation will be available half an hour prior to visit.
- ◇ Students are expected to behave as future doctors. However, any misconduct by any student will be reported to the College Administration for appropriate measures according to University rules.
- ◇ At the end of each field visit, students are required to give their feedback regarding fulfillment of the objectives of the visit and clarify any comments and suggestions they may have. Feedback will be discussed in a scheduled session in the college that will be held after the visit.



II. Objectives for the scheduled field visits:

Field Visit 1	Visit to diabetes outpatient clinic
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By the end of this session, the student should:

- § Identify the role of medical and paramedical staff in the clinic.
 - § Observe the routine sheets recorded for the new patients.
 - § Discuss the routine history taking, examination.
 - § Discuss the results of routine investigation and its implication in adjustment of therapy.
 - § Adapt to the outpatient environment.
-

By the end of this session, the student should:

- § Observe the procedure of in vitro fertilization (IVF).
- § Observe the routine sheets recorded for the new patients.
- § Discuss the routine history taking, examination.
- § Identify the criteria for patient eligible for IVF
- § Identify routine investigation done for infertility case.



Teaching and Learning Methods

This section provides an elaboration of the teaching and learning methods that will be used to deliver this block. Thus, a detailed description and a step-wise guide to how these methods should be conducted will be given below.

A. Interactive lectures

B. Small group learning sessions (PBL)

C. Large group learning sessions (seminars)

D. Practical sessions

E. Skills lab sessions

F. Clinical teaching and learning sessions

G. Tutorials.

A. Interactive lectures:

Introduction:

Interactive lectures are similar to the lectures used in all other parts of the curriculum, or anywhere else. They are, however, not the didactic lectures used in the past.

Process:

The lecturer will involve the students in active discussion, and may provide brief learning activities during the lecture to achieve the learning objectives stated under each topic.

Occasionally, there will be more than one lecture/lecturer to achieve all the learning objectives given under one topic. As much as possible, where applicable, the lectures will highlight clinical application of the content material. Students could take notes during a lecture, but the lecture slides will be available on Blackboard (i.e., the learning management system of the university).

B. Problem-Bases Learning (PBL):

Introduction:

These are activities where students are divided in a small group of about 10 under the supervision of a tutor/facilitator. One of the important methods of small group learning is PBL, where the students first will be trained how to work in a PBL.

Process:

A detailed guide as to how a PBL is conducted provided separately. Please go through this guide, carefully before taking on PBL learning.

C. Large group learning sessions (seminars):**Introduction:**

In this method students will prepare for a relevant topic on a given 'curriculum facet'. The curriculum facet for discussion will be selected by the tutor. The topics related to a given curriculum facet could be either selected by the tutor or by the student, but pre-agreed with the tutor. The student will prepare for a 30-minute presentation on the topic and deliver it to the whole batch. There will be at approximately one large group learning session every two to three weeks.

Process:

1. Tutor selects a curriculum facet relevant to the module/theme that is being learned at that time.
2. Tutor asks for three student volunteers who are willing to prepare for three, 30-minute presentations.
3. The three volunteer students will discuss with the tutor and agree on three topics under a given curriculum facet. These topics will be either selected by the tutor or selected by the students with the concurrence of the tutor.
4. For a given learning session, 2 hours in duration, three students will deliver three, 30-minute presentations on a particular theme, selected by the tutor. After each 30-minute presentation here will be a 10-minute discussion.
5. Finally, the tutor will summarize the presentations of the session in the last 10 minutes.

D. Practical sessions:**Introduction:**

Practical sessions are designed to practically illustrate the concepts and principles introduced to the student in the lectures. Thus, the practicals will provide an opportunity for the students to acquire hands-on experience on an abstract concept or a principle they learned in the lectures; i.e. the students will experience for

themselves how an abstract concept or a principle practically operates. Every theme that is studied within each module will have several practical sessions.

These practicals will range from demonstration of plastinated models to the dissection of cadavers. The topics of the practical sessions will be determined by the tutor as appropriate. A practical will be held for 2 hours in the newly built 'system-based laboratories' under the guidance of a tutor. Depending on the nature of the subject matter taught within a module, a given module may or may not contain practical sessions.

Process:

1. Tutors who teach in a particular theme, in collaboration with each other will determine an appropriate number of practical for a given theme.
2. Objectives of a given practical session will be developed and given to the students by the tutor before the practical.
3. Students will be pre-informed about a given practical topic. Depending on the type of practical and facilities available, 25 to 50 students will take part in a given practical session.
4. Students will record findings of the practical in a separate Practical Record Book.
5. At the end of the session the tutor will summarize the main learning points illustrated during the practical.

E. Skills lab sessions:

Introduction:

Students will use the newly built, state-of-the-art skills lab to train the students in certain important practical, clinical skills from year 2; i.e., phase 2. An example for a skills lab session would be blood pressure measurement. Depending on the nature of the module, there may or may not be skills lab sessions for a given module.

Process

1. The tutors who teach within a module in collaboration with each other will determine the number of skills lab sessions per module.
2. The tutors will then draw up the objectives for each session and inform the students about the objectives of the session prior to the skills lab session.

3. Depending on the nature of the skills lab session, students will either participate in small groups or as the whole batch. For example, for blood pressure measurement they will measure the blood pressure of each other in small groups.
4. Depending on the skill, the students will perform the skill either on themselves, on each other or on a simulator.
5. The students will record the findings of the skills lab session in a separate Skills Lab Record Book.
6. The tutor will at the end of the session summarize the main learning points.

F. Clinical teaching and learning sessions:

Introduction

Where relevant the students in small groups of 10, will visit a clinical setting (e.g., a ward, a clinic, or a surgical theatre, central sterilization unit) observe (e.g., observing the sterilization process in the central sterilization unit of the hospital) or experience (e.g., speaking with a patient who has a disease related to smoking) how a given concept or principle is clinically applied. Depending on the nature of the subject matter being taught, there may or may not be clinical teaching and learning sessions within a given module.

Process

1. The tutors responsible for teaching and learning for a given module will determine the topics for which there will be clinical teaching and learning sessions.
2. The tutors will then draw up the objectives of a given session and communicate it to the student prior to the session.
3. The students will be divided into groups of 10.
4. A tutor will accompany the students to the clinical setting or a clinician (who is aware of the objectives of the session) from the relevant clinical setting will be assigned to show the students the relevant procedures that they need to observe or do.
5. Students will record their experience or observations in a 'Clinical Teaching and Learning Record Book'.

G. TUTORIALS:

Introduction

We have some tutorial sessions during the Module to help the students in clearing their concepts and solve their queries regarding the content of course and lectures.

Process

In a tutorial session Tutors from all the departments will go and help the students to solve their Problems and queries

The aims of a tutorial

- Tutorials help students to link together what they have heard in lectures and what students have read in textbooks, and to give them an opportunity to discuss these ideas. Discussion is critical; without it, it is not a tutorial.
- Tutorial is highly interactive, promotes opportunity for discussion, debate and critical reflection, and engages students in the subject content by way of analysis of the material being studied.
- Tutorials give students the opportunity to make mistakes (and learn from them) in a collegial and supportive environment.
- In addition tutorials provide the opportunity for contact between students, their peers and with academic staff.
- Help students to review the material they have learned in lectures, develop their ideas and implement their learning through questions and problem-solving.
- Give students a chance to ask questions, develop and voice opinions, argue and clarify their concepts and queries

Assessment of the Module

This module comprises two types of assessment

A. Continuous assessment:

- ◇ These assessments will take place throughout the course.
- ◇ They are mostly based the PBL sessions, skill lab, practical and clinical activities.
- ◇ There will be MCQ as mid module examination.
- ◇ A proportion of marks (40%) from these assessments will contribute to the final summative module assessment.

B. Final assessment:

- ◇ The eligibility criterion for sitting the final examination will be the completion of 75% of attendance.
- ◇ This exam is held the end of the module assessment, and will be held under formal examination conditions, including MCQ, OSPE, OSCE and so forth.
- ◇ A proportion of marks (60%) from this assessment will contribute to the final summative mark of the module assessment.

Quality Assurance and Evaluation Process

◇ Any new course, or for that matter any old course, needs constant reviewing and monitoring to ensure that it meets the demands placed on it by the overall curriculum. This curriculum is no exception. Hence, there will be a number of evaluation strategies employed by the module.

◇ They are as follows:

1. Student feedback at the end of the module, seeking student comments on both teaching and learning, and assessment, along with views on the general course organization and implementation.
2. Student feedback of a sample of teaching and learning activities
3. Tutor feedback
4. Examiner feedback
5. Peer evaluation, where a staff member may visit a particular teaching and learning activity and provide formative feedback about its conduct
6. Analysis of the students' examination results
7. External review.