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| **Ilam University of Medical Sciences** | | |
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| **Faculty:** | Medicine | |
| **Course Name:** | Endocrine physiology | |
| **Students:** | Medical students | |
| **Teacher:** | Dr. Sajjad Salari |  |
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|  |  | ***Course plan*** |
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| **Date** | **Topics** | **Resources** |
|  | Introduction to Endocrinology | Guyton and Hall Textbook of Medical Physiology 14th Edition |
|  | Pituitary hormones | Guyton and Hall Textbook of Medical Physiology 14th Edition |
|  | Thyroid hormones | Guyton and Hall Textbook of Medical Physiology 14th Edition |
|  | Adrenocortical hormones | Guyton and Hall Textbook of Medical Physiology 14th Edition |
|  | Parathyroid hormone | Guyton and Hall Textbook of Medical Physiology 14th Edition |
|  | Insulin, Glucagon, and Diabetes Mellitus | Guyton and Hall Textbook of Medical Physiology 14th Edition |
|  | Male reproductive hormones | Guyton and Hall Textbook of Medical Physiology 14th Edition |
|  | Female reproductive hormones | Guyton and Hall Textbook of Medical Physiology 14th Edition |
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| **Qualification:** | Active participation in the classroom: | 2 |
|  | Final exam: | 18 |
|  | Total score: | 20 |
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| **Lesson plan** | |
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| **Lesson** | **Objectives** |
| Introduction to Endocrinology | By the end of this lesson, the students should be able to:   * Define hormone and endocrine system. * Understand the chemical nature of different classes of hormones and how this determines their mechanism of action on target cells. * Define how hormones are synthesized and secreted by cells of endocrine * glands, including how peptide hormones are cleaved from longer precursors. * Explain the relevance of protein carriers in the blood for hydrophobic * hormones, and the mechanisms that determine the level of free circulating * hormones. * Understand the principles of feedback control for hormone release and its * relevance for homeostasis. * Describe hormones and their contribution to whole body homeostatic mechanisms. |
| Pituitary hormones | By the end of this lesson, the students should be able to:   * Describe the anatomic connections between the hypothalamus and the pituitary gland. * Describe the functional connection between hypothalamus and the pituitary gland * Describe the structure of the pituitary hormones. * Describe the physiological effects of growth hormone. * Describe the regulation of growth hormone secretion * Define the effects of the growth hormone in growth and metabolic function, and how insulin-like growth factor I (IGF-I) may mediate some of its actions in the periphery. * List the stimuli that regulate growth hormone secretion and define their underlying mechanisms. * Describe the synthesis, processing, storage, and secretion of the hormones of the posterior pituitary. * Discuss the effects of vasopressin, the receptors on which it acts, and how its secretion is regulated. * Discuss the effects of oxytocin, the receptors on which it acts, and how its * secretion is regulated. |
| Thyroid hormones | By the end of this lesson, the students should be able to:   * Describe the structure of the thyroid gland and how it relates to its function. * Define the chemical nature of the thyroid hormones and how they are synthesized. * Understand the critical role of iodine in the thyroid gland and how its transport is controlled. * Describe the role of protein binding in the transport of thyroid hormones and peripheral metabolism. * Identify the role of the hypothalamus and pituitary in regulating thyroid function. * Define the effects of the thyroid hormones in homeostasis and development. * Understand the basis of conditions where thyroid function is abnormal and how they can be treated. |
| Adrenocortical hormones | By the end of this lesson, the students should be able to:   * Describe the general histology of the adrenal gland. * Outline the steps involved in steroid biosynthesis in the adrenal cortex. * Name the plasma proteins that bind adrenocortical steroids and discuss their physiologic role. * Name the major site of adrenocortical hormone metabolism and the principal metabolites produced from glucocorticoids, adrenal androgens, and aldosterone. * Describe the mechanisms by which glucocorticoids and aldosterone produce changes in cellular function. * List and briefly describe the physiologic and pharmacologic effects of glucocorticoids. * Contrast the physiologic and pathologic effects of adrenal androgens. * Describe the mechanisms that regulate secretion of glucocorticoids and adrenal sex hormones. * List the actions of aldosterone and describe the mechanisms that regulate aldosterone secretion. * Describe the main features of the diseases caused by excess or deficiency of each of the hormones of the adrenal gland. |
| Parathyroid hormone | By the end of this lesson, the students should be able to:   * Understand the importance of maintaining homeostasis of body calcium and phosphate concentrations, and how this is accomplished. * Describe the body pools of calcium, their rates of turnover, and the organs that play central roles in regulating movement of calcium between stores. * Delineate the mechanisms of calcium and phosphate absorption and excretion. * Identify the major hormones and other factors that regulate calcium and phosphate homeostasis and their sites of synthesis as well as targets of their action. * Define the basic anatomy of bone. * Delineate cells and their functions in bone formation and resorption. |
| Insulin, Glucagon, and Diabetes Mellitus | By the end of this lesson, the students should be able to:   * Classify the pancreatic secretions. * Identify the principal hormones secreted from the endocrine pancreas, their cells of origin, and their chemical nature. * Understand the nutrient, neural, and hormonal mechanisms that regulate pancreatic hormone release. * List the principal target organs for insulin and glucagon action and their major physiologic effects. * Identify the time course for the onset and duration of the biologic actions of insulin and glucagon. * Identify the disease states caused by oversecretion, undersecretion, or decreased sensitivity to insulin, and describe the principal manifestations of each. * Describe the physiologic effects of somatostatin in the pancreas. * Understand the major differences between type 1 and type 2 diabetes |
| Male reproductive hormones | By the end of this lesson, the students should be able to:   * Describe the anatomy of the male sex organ. * Describe the general histology of testis * Describe the H.P.G axis (hypothalamus, pituitary, gonad) in reproduction. * Describe the spermatogenesis and their important steps. * Describe the effective factors in sperm differentiation and development. * Describe the synthesis and mechanism of action of androgens. * Describe the physiological effects of testosterone. |
| Female reproductive hormones | By the end of this lesson, the students should be able to:   * Describe the anatomy of the female sexual organ. * Describe the follicular development in ovaries. * Describe puberty process and its stages in females. * Describe the ovarian-uterine cycle in females. * Describe of physiological roles of female sex hormones. * Describe menopause and mention its symptoms. * Describe the fertilization, implantation and supportive function of placenta during pregnancy. * Describe endocrine roles of placenta during pregnancy * Define the phenomenon of and state the stages and factors involved in its regulation. * Describe the hormonal function during childbirth and lactation |