HPEX 250: Module 16: The Endocrine System

Section 1: Anatomy and Physiology

- Lesson 1: Endocrine System Overview
  - Endocrinology
    - Endocrine
      - Secreting substances internally
    - Endocrinology
      - The study of the endocrine glands
    - Endo-
      - Within
    - -Crine and crin/o
      - To secrete
    - Glands
      - Aden/o
  - Endocrine System Organs
    - Pituitary Glands
      - (pituitar/o)
    - Pineal Gland
    - Thyroid Gland
      - (thyroid/o & thyr/o)
    - Parathyroid
      - (parathyroid/o)
    - Thymus
    - Adrenal Glands
    - Pancreas
      - Pancreat/o
  - Endocrine vs. Exocrine
    - Endocrine
      - Ductless
      - Secrete hormones into the bloodstream through a glandular membrane
    - Exocrine
      - Deliver their secretions through a duct
      - Exo- means out and away
      - Sweat glands are exocrine glands
      - Produce a transparent watery liquid that travels through a duct to the surface of the skin
  - Categories of hormones
    - Protein
      - Hormone formed from amino acids
    - Steroid
      - Hormone formed from the lipid cholesterol
  - Target Tissue

        - Specific tissues that hormones work by affecting
    - Hormone Function
        - Hormones interact with target tissues by binding to receptors on or within the surface of the tissues cells
        - Receptors
            - Enable the tissue to recognize and respond to specific hormones
    - Erythropoietin
        - Substance that stimulates the production of red blood cells
- Lesson 3: Anterior Pituitary Gland
    - Pituitary Gland
        - Pituitar/o
        - Supplies hormones that effect almost every bodily function
        - AKA = master gland and hypophysis cerebri
        - Small, pea-shaped gland attached to the undersurface of the hypothalamus in a depression of the skull called sella turcica
        - Consists of two major lobes
            - Anterior Lobe
                - Adenohypophysis
                - Upward extension of the pharynx composed of glandular tissue
            - Posterior Lobe
                - Neurohypophysis
                - Downward projection of the brain composed of nervous tissue
    - Hypothalamus in the Pituitary Gland
        - Hypothalamus
            - Activates, integrates and controls the endocrine processes, somatic functions and peripheral autonomic nervous system
            - Exerts an important function on the pituitary gland
                - It targets the organ
                - It controls the secretion of the anterior pituitary lobe by secreting release-inhibiting hormones
            - Produces hormones that transported to the posterior pituitary lobe
                - Where they can be stored until needed
    - Growth Hormone
        - Somatotropin
        - Affects the growth of the skeletal muscles and the long bones of the body
        - Promotes the synthesis of proteins, preforms cell repairs, and helps maintain blood glucose levels
    - Prolactin-Releasing (Lactogenic) Hormone
        - Another hormone secreted by the anterior pituitary lobe
        - Stimulates the growth and development of the mammary glands
        - Causes each mammary gland in the breast to produce milk after childbirth

    - Thyroid-Stimulating Hormone
        - Thyrotropin

        - Substance secreted by the anterior pituitary lobe
        - Controls the release of the thyroid hormone
        - Stimulates that growth and function of the thyroid gland
    - ACTH
        - Adrenocorticotropic Hormone
        - Target Tissue
        - Outer portion of the adrenal gland
            - Adrenal cortex
        - -tropic = turning toward or changing
        - Stimulates the growth of the adrenal cortex and causes it to secrete 3 steroid hormones, including cortisol
    - FSH, LH, MSH
        - Gonadotropic Hormones
            - Anterior Pituitary Lobe has 2 to target the gonads or the sex glands
            - Follicle-stimulating hormone
                - Stimulates the growth of the ova
                    - Eggs in females
                    - Sperm in males
            - Luteinizing Hormone
                - Causes the secretion of sex hormone in men and women
                    - Estrogen
                    - Progesterone
                    - Testosterone
                - Stimulates the process of ovulation
        - Melanocyte-Stimulating Hormone
            - Affects the skin's pigment-producing cells
- Posterior Pituitary Glands and Pineal Glands
    - ADH, Oxytocin
        - Antidiuretic Hormone
            - Decreases the production of urine by increasing the reabsorption of water by the renal tubules
            - Vasopressin
                - Synthetic ADH
                - Used in the treatment of diabetes insipidus
        - Oxytocin
            - Serves an important function in women during the process of labor and delivery
            - Stimulates the smooth muscle of the uterus to contract
            - Responsible for the release (letdown) of milk from the mammary glands in response to an infant's suckling

    - Pineal Gland
        - Housed in the cranial cavity