

VISWASS SCHOOL & COLLEGE OF NURSING

GNM 1ST YEAR

ANATOMY AND PHYSIOLOGY

UNIT-9

ENDOCRINE SYSTEM

LONG QUESTIONS AND ANSWERS

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1)A)What do you mean by endocrine gland? (2+5+8)

B)List out the endocrine gland present in our body.

C)Describe about structure and function of pituitary gland.

A)Endocrine gland:

- The endocrine system is made up of a network of glands.
- These glands secrete hormones to regulate many bodily functions, including growth and metabolism.
- The endocrine system is a network of glands in your body that make the hormones that help cells talk to each other. They're responsible for almost every cell, organ, and function in your body.
- Endocrine diseases are common and usually occur when glands produce an incorrect amount of hormones.

- The endocrine system is a network of glands that secrete chemicals called hormones to help body function properly.

- Hormones are chemical signals that coordinate a range of bodily functions.

- The endocrine system works to regulate certain *internal* processes. Endocrine glands secrete hormones internally, using the bloodstream.

- The endocrine system helps control the following processes and systems:
 - Growth and development
 - Homeostasis (the internal balance of body systems)
 - Metabolism (body energy levels)
 - Reproduction
 - Response to stimuli (stress and/or injury)

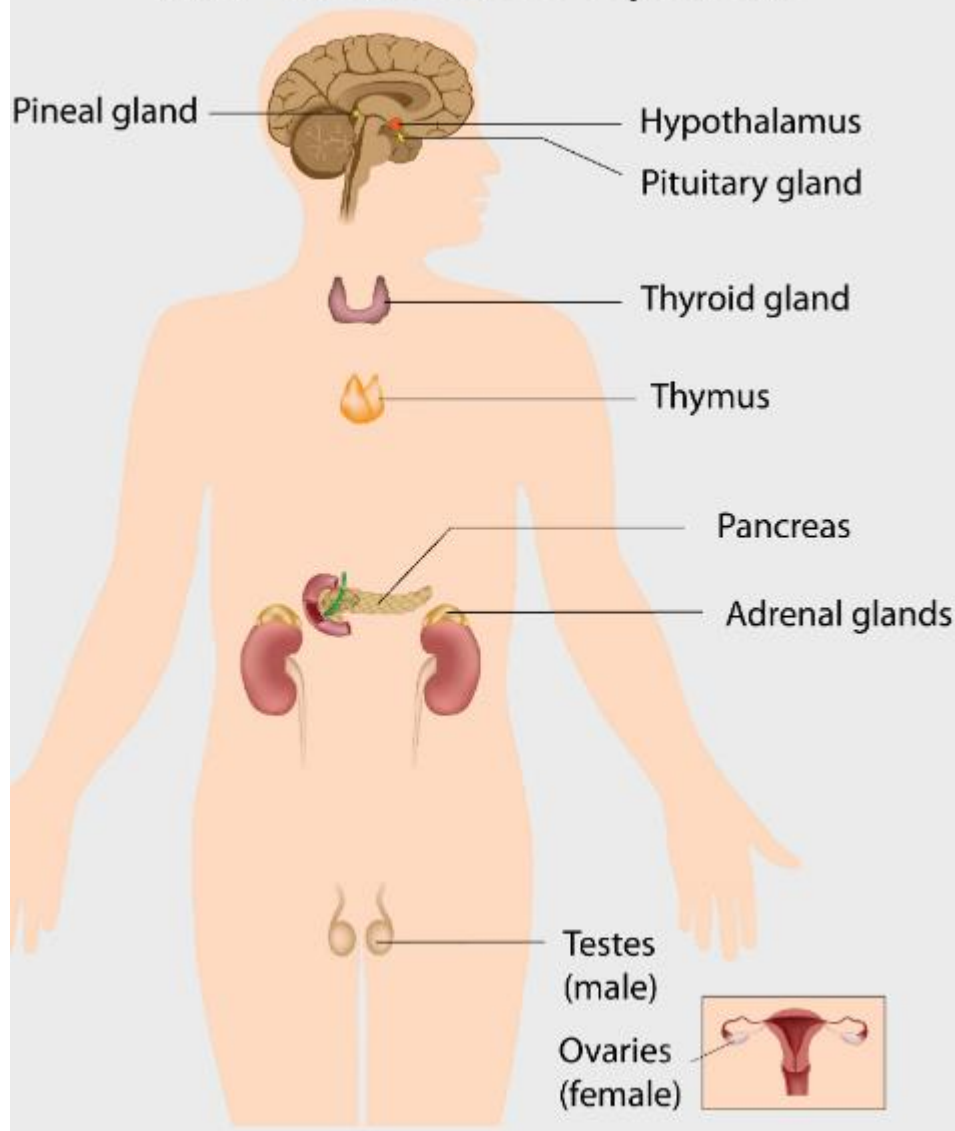
Endocrine System Functions

- Makes hormones that control moods, growth and development, metabolism, organs, and reproduction
- Controls how hormones are released
- Sends those hormones into bloodstream so they can travel to other body parts.

B)List out the endocrine gland present in our body:

- The endocrine system completes these tasks through its network of glands, which are small but highly important organs that produce, store, and secrete hormones.
- Many glands make up the endocrine system.
 - ❖ The hypothalamus
 - ❖ Pituitary gland
 - ❖ Pineal gland
 - ❖ Thyroid gland
 - ❖ Parathyroid gland
 - ❖ Thymus gland
 - ❖ Adrenal gland
 - ❖ Pancreas
 - ❖ Ovaries (in woman)
 - ❖ Testes (in man)

The endocrine system



- Hypothalamus.
 - ✓ This organ connects endocrine system with nervous system.
 - ✓ Its main job is to tell your pituitary gland to start or stop making hormones.
- Pituitary gland.
 - ✓ This is endocrine system's master gland.
 - ✓ It uses information it gets from brain to tell other glands in body what to do.
 - ✓ It makes many important hormones, including growth hormone; prolactin, which helps breastfeeding moms make milk; and luteinizing hormone, which manages estrogen in women and testosterone in men.

- Pineal gland.
 - ✓ It makes a chemical called melatonin that helps the body get ready to go to sleep.

- Thyroid gland.
 - ✓ This gland makes thyroid hormone, which controls the metabolism.
 - ✓ If this gland doesn't make enough (a condition called hypothyroidism), everything happens more slowly.
 - ✓ The heart rate might slow down. May could get constipated. And might gain weight.
 - ✓ If it makes too much (hyperthyroidism), everything speeds up.
 - ✓ The heart might race. and could have diarrhea. And might lose weight without trying.

- Parathyroid.
 - ✓ This is a set of four small glands behind thyroid.
 - ✓ They play a role in bone health.
 - ✓ The glands control the levels of calcium and phosphorus.

- Thymus.
 - ✓ This gland makes white blood cells called T-lymphocytes that fight infection and are crucial as a child's immune system develops.
 - ✓ The thymus starts to shrink after puberty.

- Adrenals.
 - ✓ Best known for making the "fight or flight" hormone adrenaline (also called epinephrine), these two glands also make hormones called corticosteroids.
 - ✓ They affect the metabolism and sexual function, among other things.

- Pancreas.
 - ✓ This organ is part of both the digestive and endocrine systems.
 - ✓ It makes digestive enzymes that break down food.
 - ✓ It also makes the hormones insulin and glucagon.
 - ✓ These ensure that have the right amount of sugar in the bloodstream and cells.

- ✓ If don't make insulin, which is the case for people with type 1 diabetes, the blood sugar levels can get dangerously high.
- ✓ In type 2 diabetes, the pancreas usually makes some insulin but not enough.
- Ovaries.
 - ✓ In women, these organs make estrogen and progesterone.
 - ✓ These hormones help develop breasts at puberty, regulate the menstrual cycle, and support a pregnancy.
- Testes.
 - ✓ In men, the testes make testosterone.
 - ✓ It helps them grow facial and body hair at puberty.
 - ✓ It also tells the penis to grow larger and plays a role in making sperm.

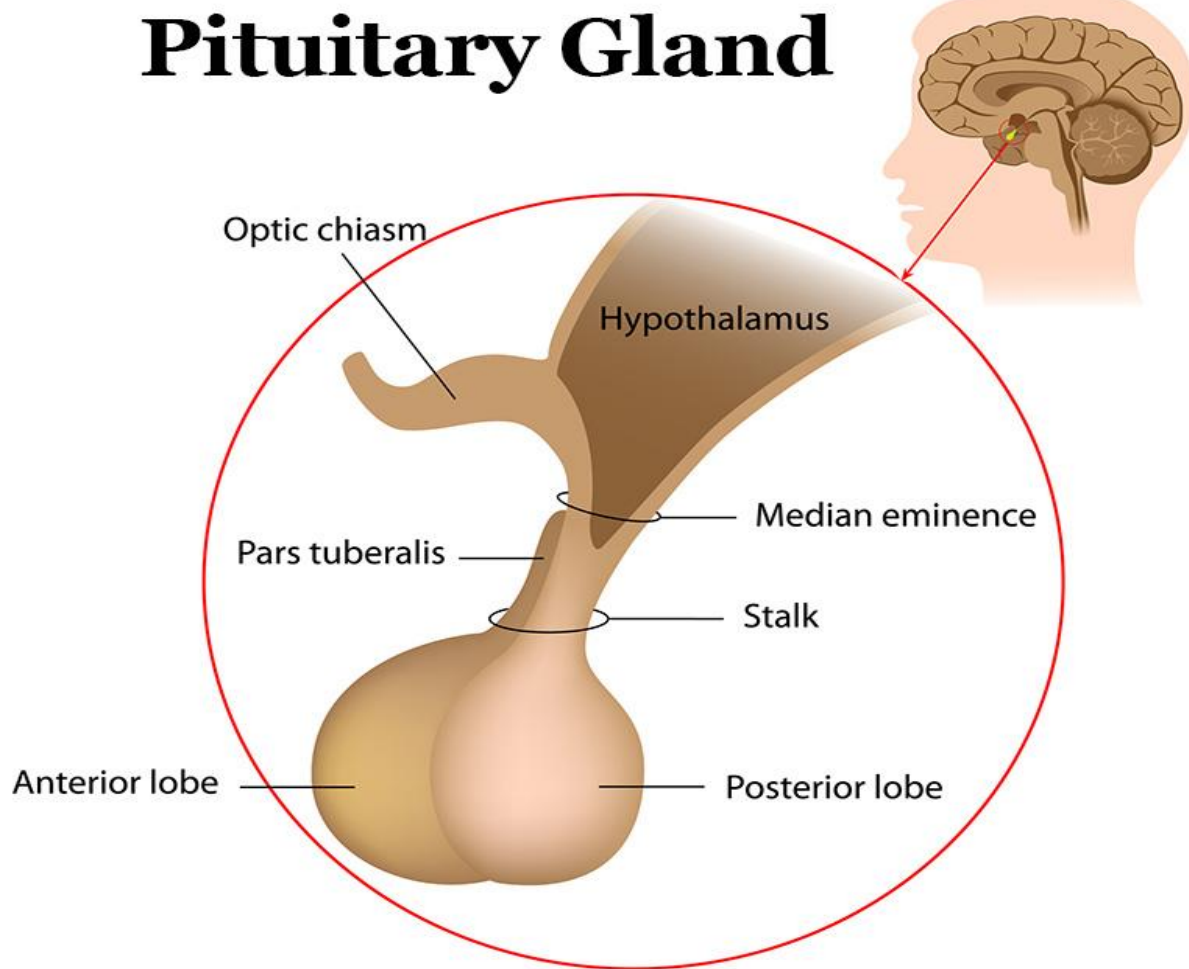
C) **structure and function of pituitary gland:**

- The pituitary gland is a part of your endocrine system. Its main function is to secrete hormones into your bloodstream.
- These hormones can affect other organs and glands, especially your:
 - thyroid
 - reproductive organs
 - adrenal glands
- The pituitary gland is sometimes called the master gland because it's involved in so many processes.

Structure:

- The pituitary gland is small and oval-shaped.
- It's located behind your nose, near the underside of your brain.
- It's attached to the hypothalamus by a stalk like structure.

- The hypothalamus is a small area of your brain.
- It's very important in controlling the balance of your bodily functions.
- It controls the release of hormones from the pituitary gland.
- The pituitary gland can be divided into two different parts: the anterior and posterior lobes.



Anterior lobe

The anterior lobe of your pituitary gland is made up of several different types of cells that produce and release different types of hormones, including:

- Growth hormone. Growth hormone regulates growth and physical development. It can stimulate growth in almost all of your tissues. Its primary targets are bones and muscles.

- Thyroid-stimulating hormone. This hormone activates your thyroid to release thyroid hormones. Your thyroid gland and the hormones it produces are crucial for metabolism.
- Adrenocorticotrophic hormone. This hormone stimulates your adrenal glands to produce cortisol and other hormones.
- Follicle-stimulating hormone. Follicle-stimulating hormone is involved with estrogen secretion and the growth of egg cells in women. It's also important for sperm cell production in men.
- Luteinizing hormone. Luteinizing hormone is involved in the production of estrogen in women and testosterone in men.
- Prolactin. Prolactin helps women who are breastfeeding produce milk.
- Endorphins. Endorphins have pain-relieving properties and are thought to be connected to the “pleasure centers” of the brain.
- Enkephalins. Enkephalins are closely related to endorphins and have similar pain-relieving effects.
- Beta-melanocyte-stimulating hormone. This hormone helps to stimulate increased pigmentation of your skin in response to exposure to ultraviolet radiation.

Posterior lobe

The posterior lobe of the pituitary gland also secretes hormones. These hormones are usually produced in your hypothalamus and stored in the posterior lobe until they're released.

Hormones stored in the posterior lobe include:

- Vasopressin. This is also called antidiuretic hormone. It helps your body conserve water and prevent dehydration.
- Oxytocin. This hormone stimulates the release of breast milk. It also stimulates contractions of the uterus during labor.

Functions

Anterior

- The anterior pituitary synthesizes and secretes hormones. All releasing hormones (-RH) referred to, can also be referred to as releasing factors (-RF).

❖ Somatotropes:

- Human growth hormone (HGH), also referred to as 'growth hormone' (GH), and also as somatotropin, is released under the influence of hypothalamic growth hormone-releasing hormone (GHRH), and is inhibited by hypothalamic somatostatin.

❖ Corticotropes:

- Cleaved from the precursor proopiomelanocortin protein, and include adrenocorticotrophic hormone (ACTH), and beta-endorphin, and melanocyte-stimulating hormone are released under the influence of hypothalamic corticotropin-releasing hormone (CRH).

❖ Thyrotropes:

- Thyroid-stimulating hormone (TSH), is released under the influence of hypothalamic thyrotropin-releasing hormone (TRH) and is inhibited by somatostatin.

❖ Gonadotropes:

- Luteinizing hormone (LH).
- Follicle-stimulating hormone (FSH), both released under influence of Gonadotropin-releasing Hormone (GnRH)

❖ Lactotropes:

- Prolactin (PRL), whose release is inconsistently stimulated by hypothalamic TRH, oxytocin, vasopressin, vasoactive intestinal peptide, angiotensin II, neuropeptide Y, galanin, substance

P, bombesin-like peptides (gastrin-releasing peptide, neuromedin B and C), and neurotensin, and inhibited by hypothalamic dopamine.

- These hormones are released from the anterior pituitary under the influence of the hypothalamus.
- Hypothalamic hormones are secreted to the anterior lobe by way of a special capillary system, called the hypothalamic-hypophysial portal system.
- There is also a non-endocrine cell population called folliculostellate cells.

Intermediate

- The intermediate lobe synthesizes and secretes the following important endocrine hormone:
 - Melanocyte-stimulating hormone (MSH). This is also produced in the anterior lobe. When produced in the intermediate lobe, MSHs are sometimes called "intermedins".

Posterior

- The posterior pituitary stores and secretes (but does not synthesize) the following important endocrine hormones:
 - ❖ Magnocellular neurons:
 - Antidiuretic hormone (ADH, also known as vasopressin and arginine vasopressin AVP), the majority of which is released from the supraoptic nucleus in the hypothalamus.
 - Oxytocin, most of which is released from the paraventricular nucleus in the hypothalamus. Oxytocin is one of the few hormones to create a positive feedback loop.

Hormones

- Hormones secreted from the pituitary gland help control the following body processes:
 - Growth (GH)
 - Blood pressure

- Some aspects of pregnancy and childbirth including stimulation of uterine contractions
- Breast milk production
- Sex organ functions in both sexes
- Thyroid gland function
- Metabolic conversion of food into energy
- Water and osmolarity regulation in the body
- Water balance via the control of reabsorption of water by the kidneys
- Temperature regulation
- Pain relief