

Endocrine System

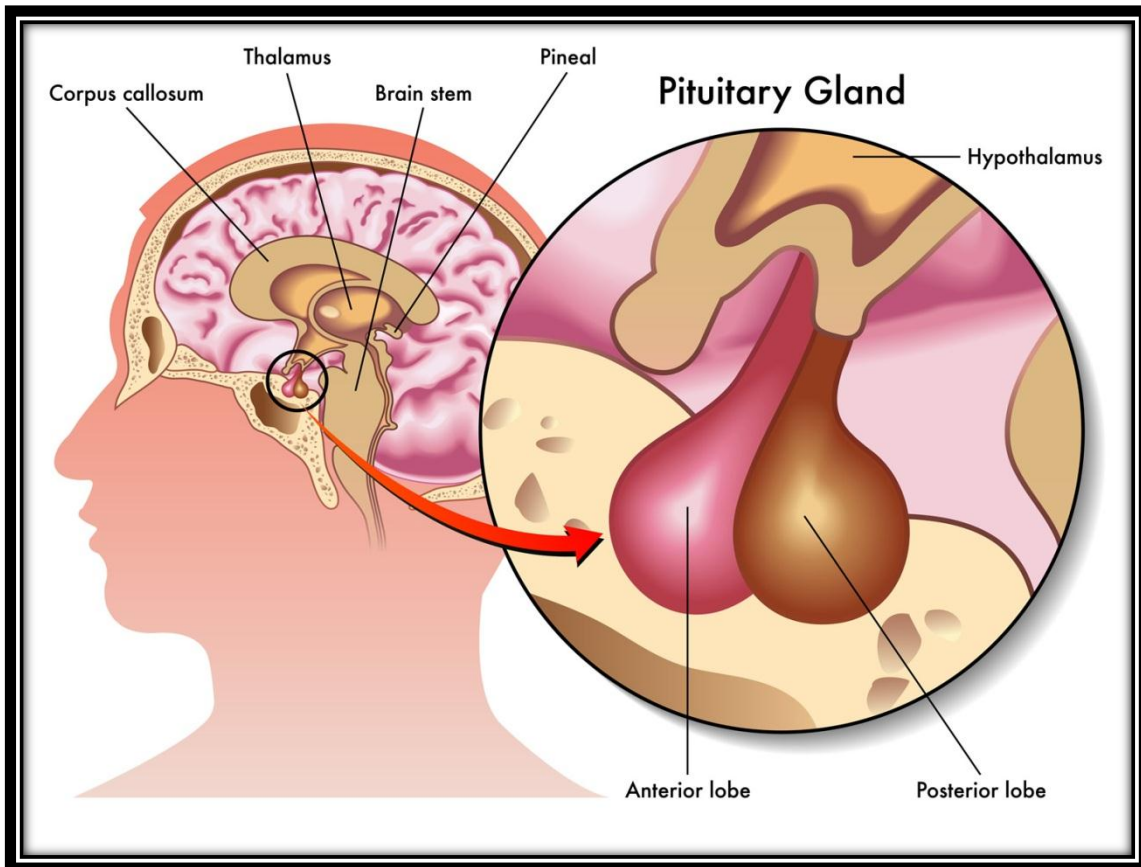
Endocrine Glands

1-Pituitary gland:

The hypothalamus lies just above the brain stem. The pituitary gland (hypophysis) is attached to the bottom of the hypothalamus by a slender stalk called the infundibulum. The pituitary gland consists of two major regions, the anterior pituitary gland (anterior lobe or adenohypophysis) and the posterior pituitary gland (posterior neurohypophysis).

The hypothalamus also controls the glandular secretion of the pituitary gland.

It is divided into two sections: the **anterior lobe** (adenohypophysis) and the **posterior lobe** (neurohypophysis). The Anterior pituitary is involved in sending hormones that control all other hormones of the body.



- **Anterior pituitary**

The anterior lobe is derived from oral ectoderm and is composed of glandular epithelium. Communication between the hypothalamus and the anterior pituitary occurs through hormones (releasing hormones and inhibiting hormones) produced by the hypothalamus and delivered to the anterior pituitary via a portal network of capillaries. The releasing and inhibiting hormones are produced by specialized neurons of the hypothalamus called neurosecretory cells. The hormones are released into a capillary network or primary plexus, and transported through veins or hypophyseal portal veins, to a second capillary network or secondary plexus that supplies the anterior pituitary. The hormones then diffuse from the secondary plexus into the anterior pituitary, where they initiate the production of specific hormones by the anterior pituitary. Many of the hormones produced by the anterior pituitary are tropic hormones or tropins, which are hormones that stimulate other endocrine glands to secrete their hormones.

The anterior pituitary secretes:

- thyroid-stimulating hormone (TSH)
- adrenocorticotrophic hormone (ACH)
- prolactin
- follicle-stimulating hormone (FSH)
- luteinizing hormone (LH)
- growth hormone (GH)
- endorphins

- **Posterior pituitary**

Communication between the hypothalamus and the posterior pituitary occurs through neurosecretory cells that span the short distance between hypothalamus and the posterior pituitary. Hormones produced by the cell bodies of the neurosecretory cells are packaged in vesicles and transported through the axon and stored in the axon terminals that lie in the posterior pituitary. When the neurosecretory cells are stimulated, the action potential generated triggers the release of the stored hormones from the axon terminals to a capillary network within the posterior pituitary.

Two hormones, oxytocin and antidiuretic hormone (ADH), are produced and released this way. Decreased ADH release or decreased renal sensitivity to ADH produces a condition known as diabetes insipidus. Diabetes insipidus characterized by polyuria (excess urine production), hypernatremia (increased blood sodium content) and polydipsia(thirst).

The posterior lobe is composed of neural tissue [neural ectoderm] and is derived from hypothalamus. Its function is to store oxytocin and antidiuretic hormone. When the hypothalamic neurons fire these hormones are release into the capillaries of the posterior lobe.