ENDOCRINE GLAND

- **The body contains two kinds of glands: exocrine glands and endocrine glands.**
- **Exocrine glands-** ***secrete their products into ducts that carry the*** **secretions into body cavities, into the lumen of an organ, or to the outer surface of the body. Exocrine glands include sudoriferous (sweat), sebaceous (oil), mucous, and digestive glands.**
- **Endocrine glands** ***-secrete their products*** **(hormones) into the interstitial fluid rather than into ducts. From the interstitial fluid, hormones diffuse into blood capillaries and blood carries them to target cells throughout the body. Because most hormones are required in very small amounts, circulating levels typically are low.**
- **The endocrine glands include the pituitary, thyroid, parathyroid, adrenal, and pineal glands.**

- **In addition, several organs and tissues are not exclusively classified as endocrine glands but contain cells that secrete hormones. These include the hypothalamus, thymus, pancreas, ovaries, testes, kidneys, stomach, liver, small intestine, skin, heart, adipose tissue, and placenta.**
- **Taken together, all endocrine glands and hormone-secreting cells constitute the endocrine system.**
- **The science of the structure and function of the endocrine glands and the diagnosis and treatment of disorders of the endocrine system is endocrinology**

HYPOTHALAMUS AND PITUITARY GLAND

- **For many years, the pituitary gland or hypophysis was called the "master" endocrine gland because it secretes several hormones that control other endocrine glands.**
- **We now know that the pituitary gland itself has a master—the hypothalamus. This small region of the brain below the thalamus is the major link between the nervous and endocrine systems.**
- **Together, these hormones play important roles in the regulation of virtually all aspects of growth, development, metabolism, and homeostasis.**

Pituitary gland

- **The pituitary gland is a pea-shaped structure that measures 1–1.5 cm (0.5 in.) in diameter and lies in the hypophyseal fossa of the sella turcica of the sphenoid bone. It attaches to the hypothalamus by a stalk, the infundibulum , and has two anatomically and functionally separate portions: the anterior pituitary and the posterior pituitary.**

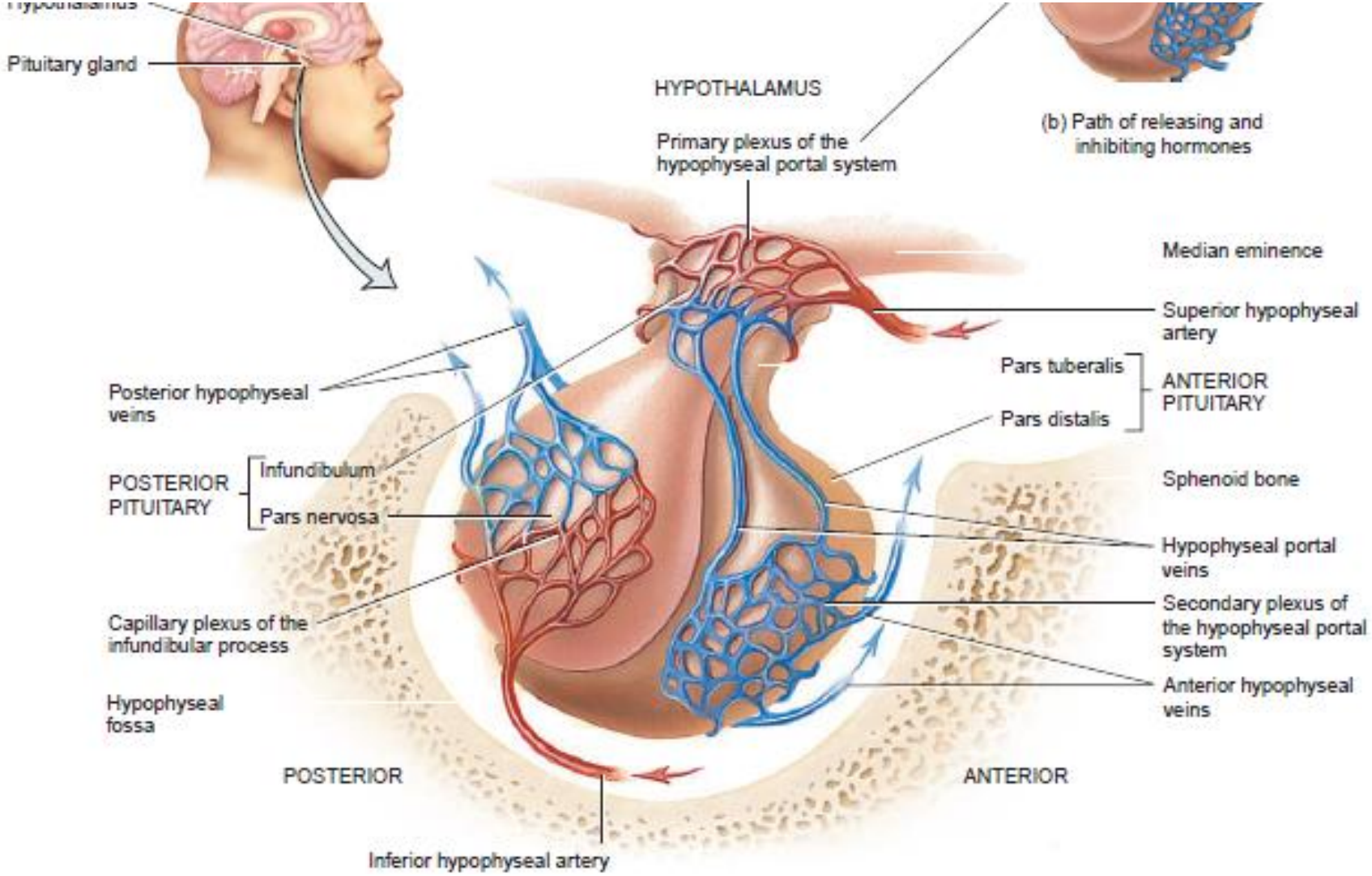
Anterior pituitary-(anterior lobe)-

- **also called the adenohypophysis, accounts for about 75% of the total weight of the gland.**
- **The anterior pituitary consists of two parts in an adult: The pars distalis is the larger portion, and the pars tuberalis forms a sheath around the infundibulum.**

Posterior pituitary (posterior lobe),

- **also called the neurohypophysis, also consists of two parts: the pars nervosa, the larger bulbar portion, and the infundibulum.**

A third region of the pituitary gland called the *pars intermedia atrophies during human fetal development*.


Pituitary gland
HYPOTHALAMUS
Primary plexus of the hypophyseal portal system
(b) Path of releasing and inhibiting hormones
Median eminence
Superior hypophyseal artery
Pars tuberalis
ANTERIOR PITUITARY
Pars distalis
Posterior hypophyseal veins
POSTERIOR PITUITARY
Infundibulum
Pars nervosa
Sphenoid bone
Hypophyseal portal veins
Secondary plexus of the hypophyseal portal system
Capillary plexus of the infundibular process
Anterior hypophyseal veins
Hypophyseal fossa
POSTERIOR
ANTERIOR
Inferior hypophyseal artery

Anterior Pituitary

- **The anterior pituitary or adenohypophysis *secretes hormones* that regulate a wide range of bodily activities, from growth to reproduction.**
- **Release of anterior pituitary hormones is stimulated by releasing hormones and suppressed by inhibiting hormones from the hypothalamus.**

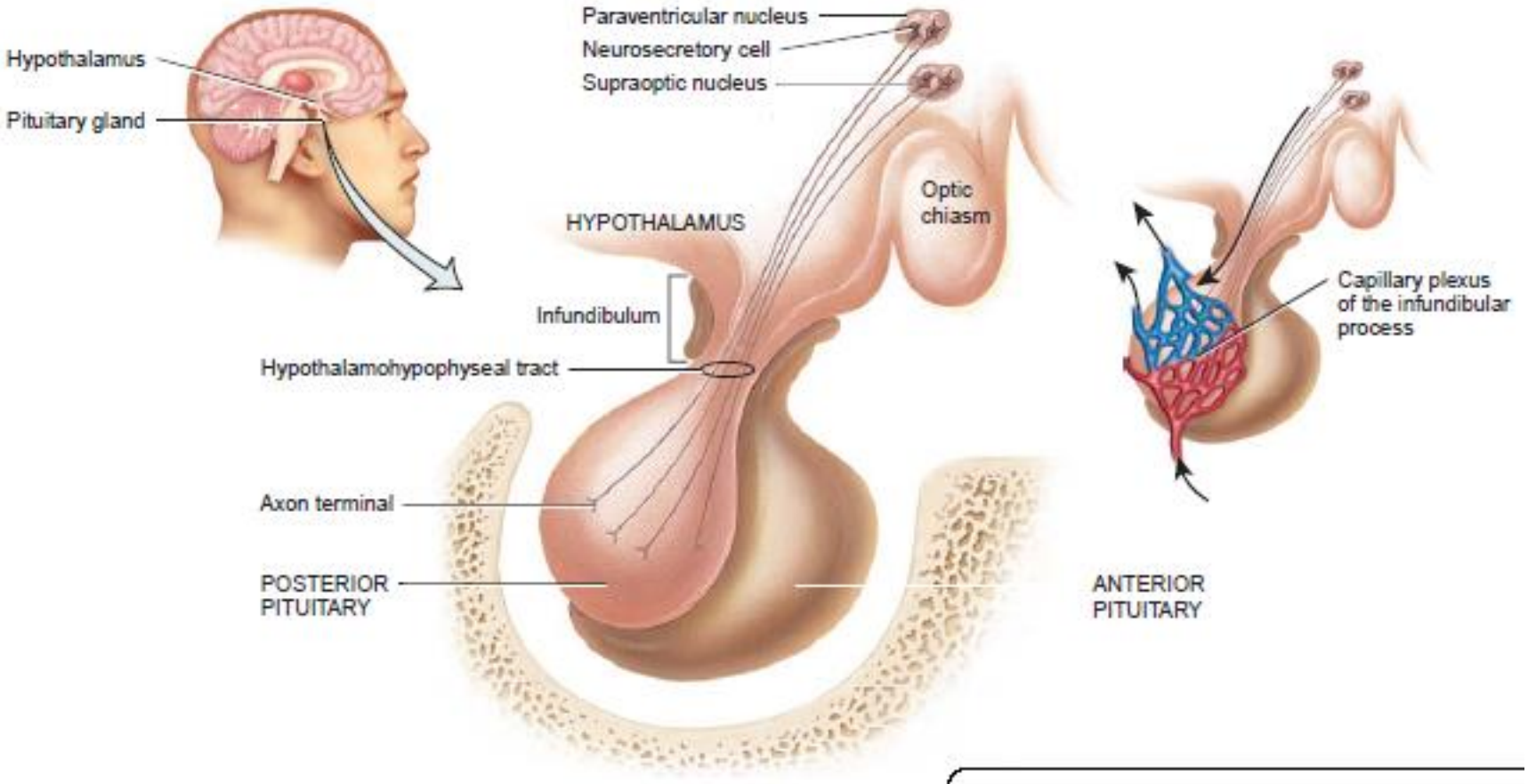
***Types of Anterior Pituitary Cells*-Five types of anterior pituitary cells—somatotrophs, thyrotrophs, gonadotrophs, lactotrophs, and corticotrophs—secrete seven hormones :**

1. **Somatotrophs- secrete human growth hormone (hGH) or somatotropin. Human growth hormone in turn stimulates several tissues to secrete insulinlike growth factors, hormones that stimulate general body growth and regulate aspects of metabolism.**
2. **Thyrotrophs- secrete thyroid-stimulating hormone (TSH) or thyrotropin . TSH controls the secretions and other activities of the thyroid gland.**

3. **Gonadotrophs-** ***secrete two gonadotropins:*** **follicle-stimulating hormone (FSH) and luteinizing hormone (LH) . FSH and LH both act on the gonads. They stimulate secretion of estrogens and progesterone and the maturation of oocytes in the ovaries, and they stimulate sperm production and secretion of testosterone in the testes.**
4. **Lactotrophs-** ***secrete prolactin (PRL), which*** initiates milk production in the mammary glands.
5. **Corticotrophs- secrete adrenocorticotropic hormone (ACTH) or corticotropin**, which stimulates the adrenal cortex to secrete glucocorticoids such as cortisol. Some corticotrophs, remnants of the pars intermedia, also secrete **melanocyte-stimulating hormone (MSH).**

Posterior Pituitary

- **Although the posterior pituitary or neurohypophysis does not *synthesize hormones, it does store and release two hormones. It* consists of axons and axon terminals of more than 10,000 hypothalamic neurosecretory cells. The cell bodies of the neurosecretory cells are in the paraventricular and supraoptic nuclei of the hypothalamus; their axons form the hypothalamohypophyseal tract. This tract begins in the hypothalamus and ends near blood capillaries in the posterior pituitary .**
- **The paraventricular nucleus synthesizes the hormone oxytocin and the supraoptic nucleus produces antidiuretic hormone (ADH) increased urine production, also called vasopressin.**

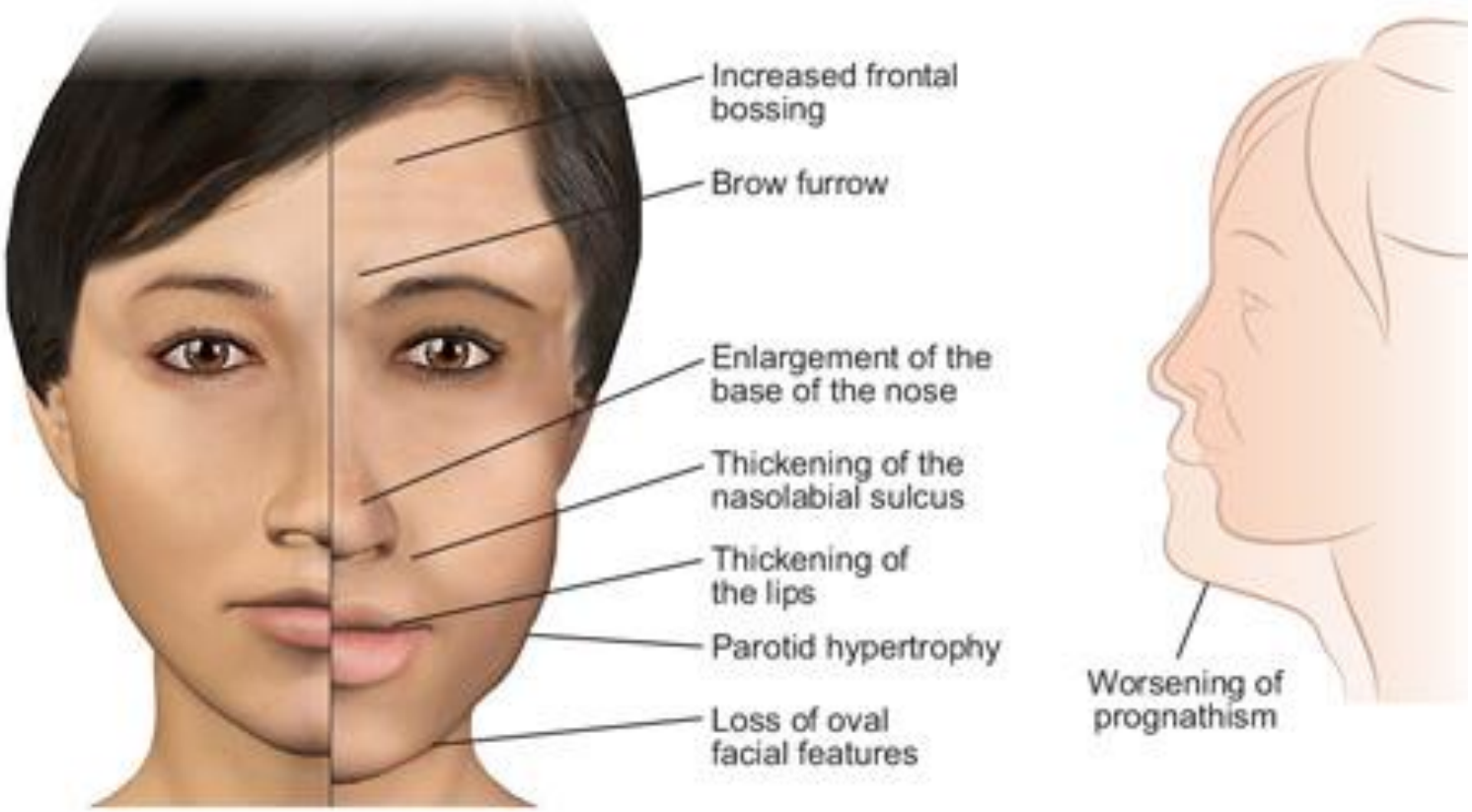

Hypothalamus
Pituitary gland
Paraventricular nucleus
Neurosecretory cell
Supraoptic nucleus
Optic chiasm
HYPOTHALAMUS
Infundibulum
Hypothalamohypophyseal tract
Axon terminal
POSTERIOR PITUITARY
ANTERIOR PITUITARY
Capillary plexus of the infundibular process

- **During and after delivery of a baby, oxytocin affects two target tissues: the mother's uterus and breasts. During delivery, oxytocin enhances contraction of smooth muscle cells in the wall of the uterus; after delivery, it stimulates milk ejection from the mammary glands in response to the mechanical stimulus provided by a suckling infant.**

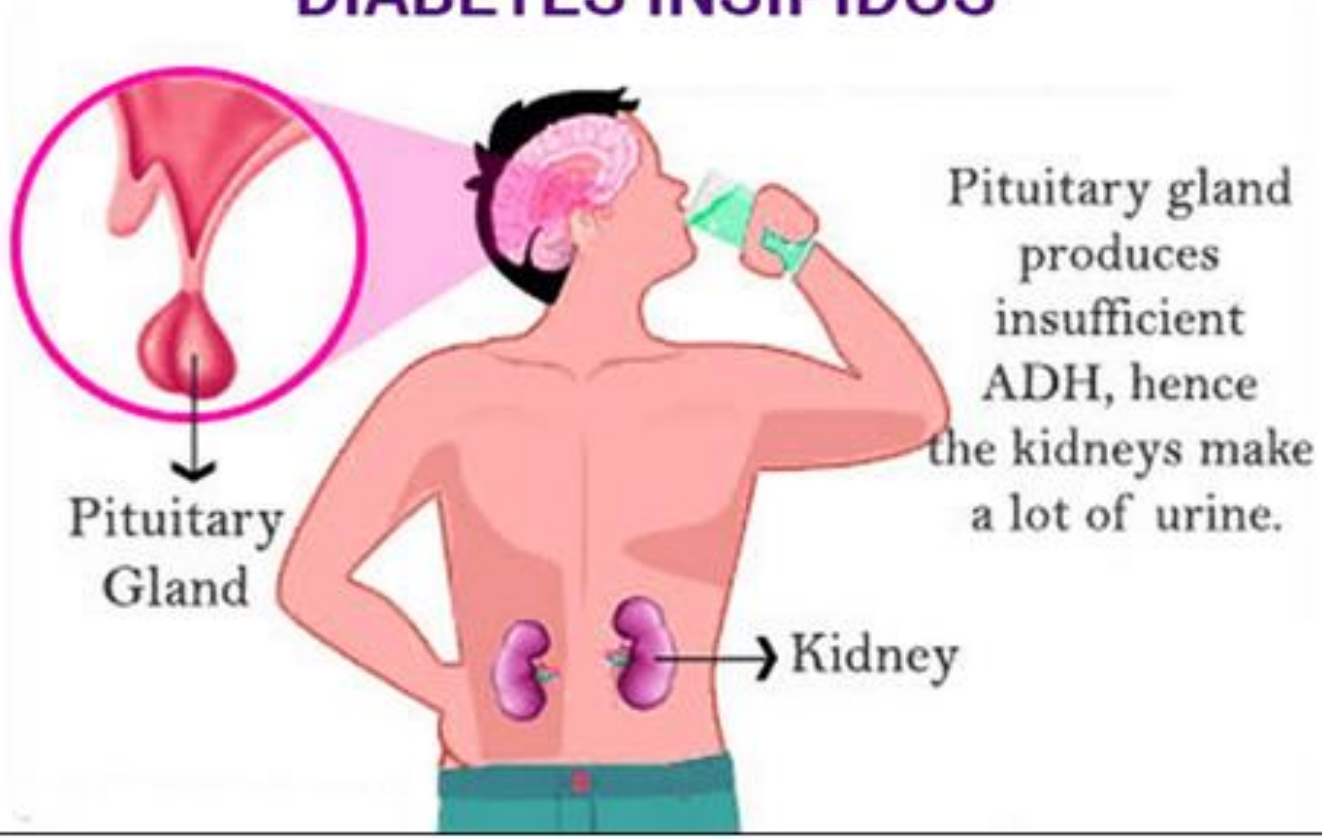
Clinical aspect

1. **Pituitary** tumors- **Pituitary** tumors are usually noncancerous.
2. Hypopituitarism-
3. Acromegaly. ...
4. Diabetes insipidus. ...
5. Cushing's disease. ...

Acromegaly

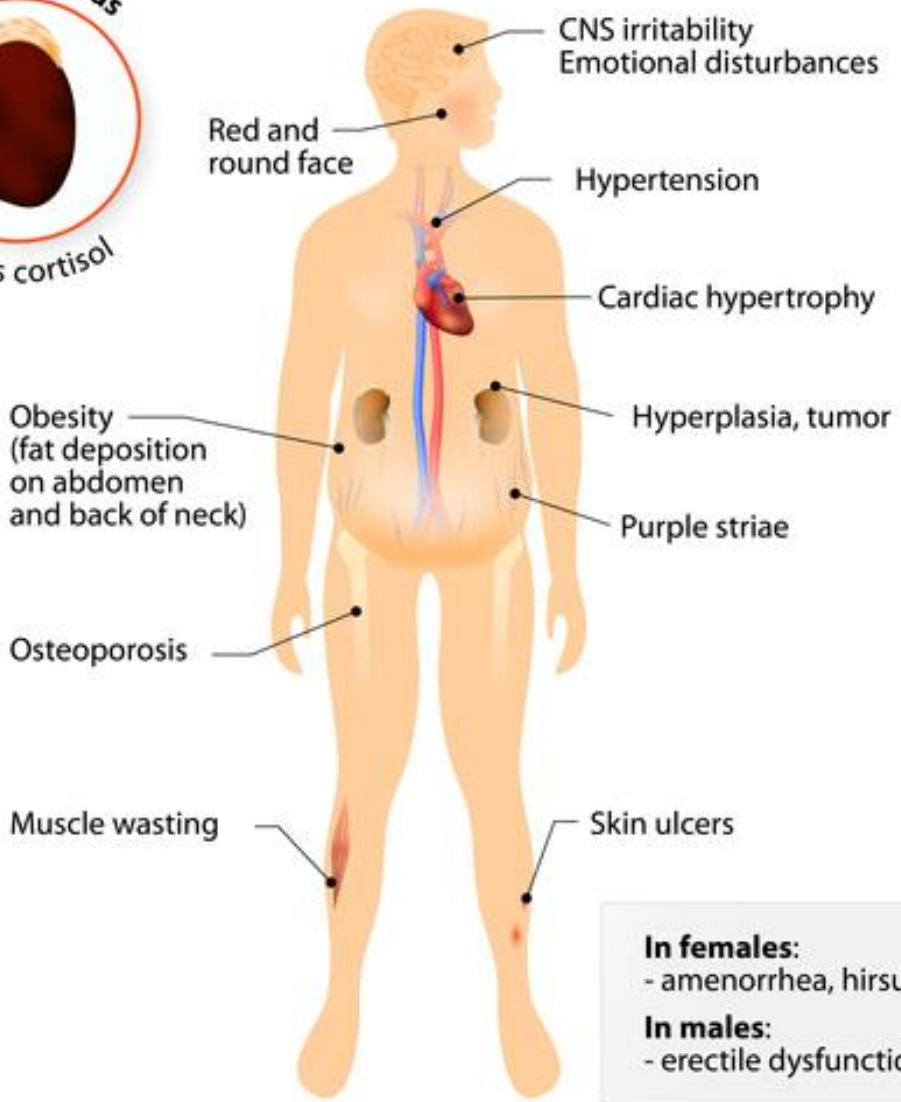

Increased frontal bossing
Brow furrow
Enlargement of the base of the nose
Thickening of the nasolabial sulcus
Thickening of the lips
Parotid hypertrophy
Loss of oval facial features
Worsening of prognathism

DIABETES INSIPIDUS



SYMPTOMS

of Cushing's syndrome



In females:
- amenorrhea, hirsutism

In males:
- erectile dysfunction