بسم الله الرحمـٰن الرحيم

(وَفَوْقَ كُلِّ ذِي عِلْمٍ عَلِيمٌ)

Endocrine Anatomy, Histology, Embryology | MID 1

Hypothalamus & Pituitary

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Introduction

- The human body relies on two main systems to regulate its functions:

1) **The nervous system** is quick-acting and communicates by sending nerve impulses.
2) **The endocrine system** is slow-acting, consists of multiple glands, and communicates by releasing hormones.

- Even though they act differently, **the nervous system controls the endocrine system.** The command chain flows in this specific order:

1) **The Hypothalamus sits at the very top. As a part of the diencephalon in the brain, it is the master controller that links the nervous system to the endocrine system.**
2) **The Pituitary Gland takes direct orders from the hypothalamus. It is the most crucial endocrine gland because it acts as the manager for the rest of the body.**
3) **Other Endocrine Glands take all their instructions directly from the pituitary gland.**

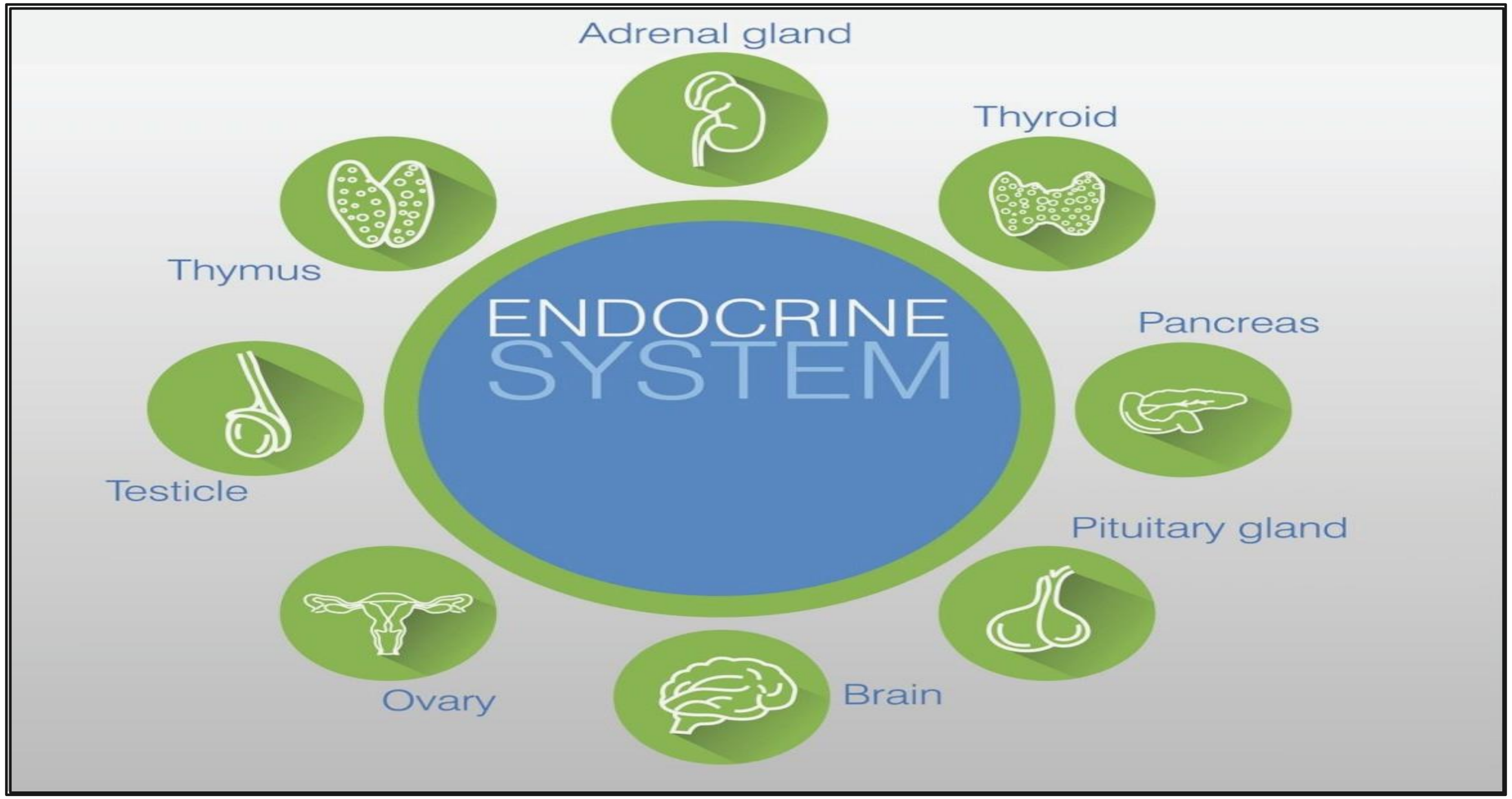
- **Pathway to remember: Hypothalamus ➔ Pituitary Gland ➔ Other Endocrine Glands**

Introduction

- In the brain, there are a few key structures that participate in the endocrine system:

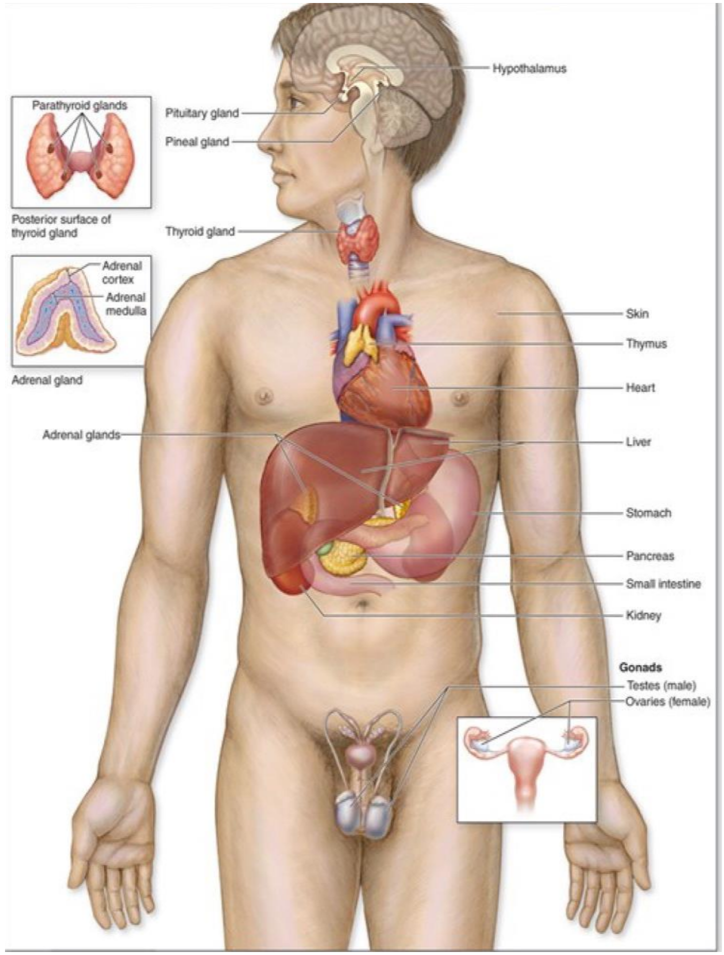
  1) **The pineal gland** is responsible for producing **melatonin**, the hormone that controls your **sleep-wake cycle (day cycle)**.

  2) **the hypothalamus**, which is physically connected directly to the pituitary gland to direct its functions.



- **The pancreas** Even though it is a large organ, **only 1%** of its tissue actually belongs to the endocrine system (producing hormones). **The other 99%** of the organ is **dedicated to other functions, primarily digestion.**

Endocrine Glands:



- Pituitary
- Pineal
- Thyroid
- Parathyroid
- Adrenal (suprarenal)

Purely endocrine glands

Hypothalamus

Thymus

Pancreas

Gonads etc………!!!

Organs with secondary endocrine function.

See next slide for Explanation:

Explication of the previous slide :

- **Purely Endocrine Glands:**

  Many structures in the body belong strictly to the endocrine system. **The Pituitary Gland, Pineal, Thyroid, Parathyroid, Adrenal (supra renal) glands** are completely and purely endocrine. This means their sole purpose is to produce and secrete hormones, and they have no other functions in the body.

- **Organs with Secondary Endocrine Functions:**

  In contrast to the purely endocrine glands, several structures have a primary job in another system, but take on hormone production as a "**vital side job**", such as:

  - **The Hypothalamus** is primarily composed of nervous tissue, yet it holds the crucial ability to produce and release hormones to control the rest of the body.

  - **The Thymus** (الغدّة الزعتريّة) is fundamentally a part of the lymphoid and immune system, but it also functions as an endocrine organ by producing specific hormones.

Explication of the previous slide :

- **Organs with Secondary Endocrine Functions (continued):**

  In contrast to the purely endocrine glands, several structures have a primary job in another system, but take on hormone production as a "**vital side job**", such as:

  - **The Pancreas** acts mainly as an exocrine gland, dedicating 99% of its work to the gastrointestinal (GI) tract for digestion. However, that remaining 1% endocrine function is incredibly important, as it handles insulin production and plays a central role in both Type 1 and Type 2 diabetes.

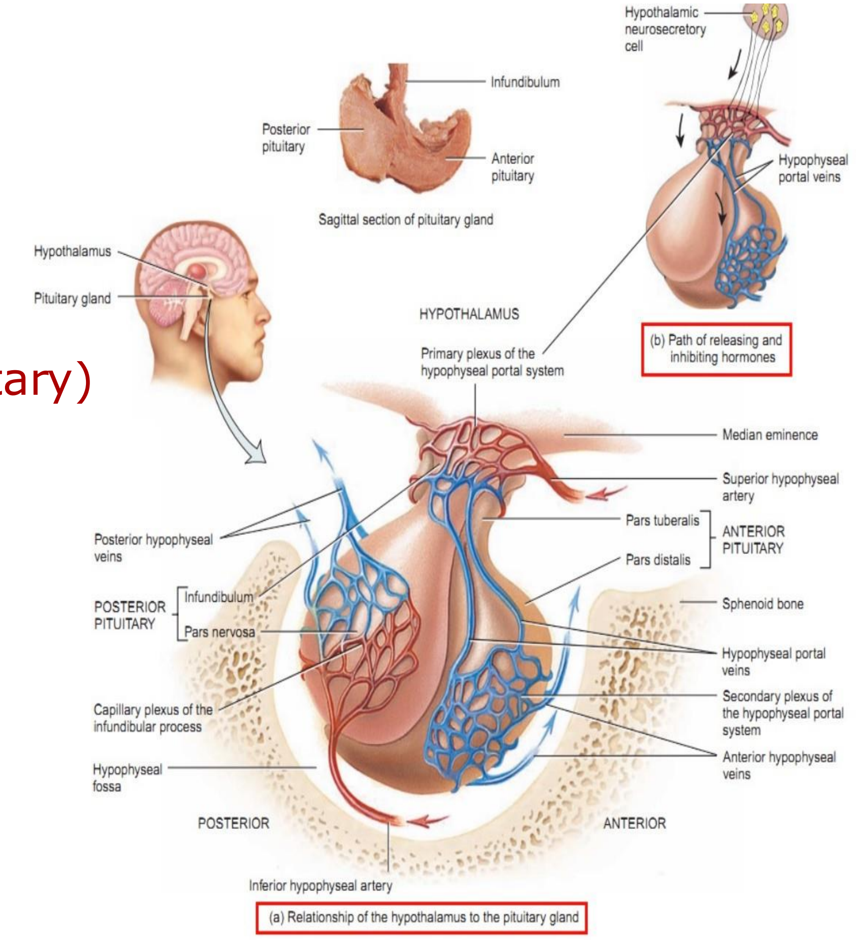
  - **The Gonads** are primarily responsible for producing reproductive cells (oocytes in females and sperm in males). Alongside this main job, they also act as endocrine glands by producing essential reproductive hormones.

The endocrine system -Hypothalamus

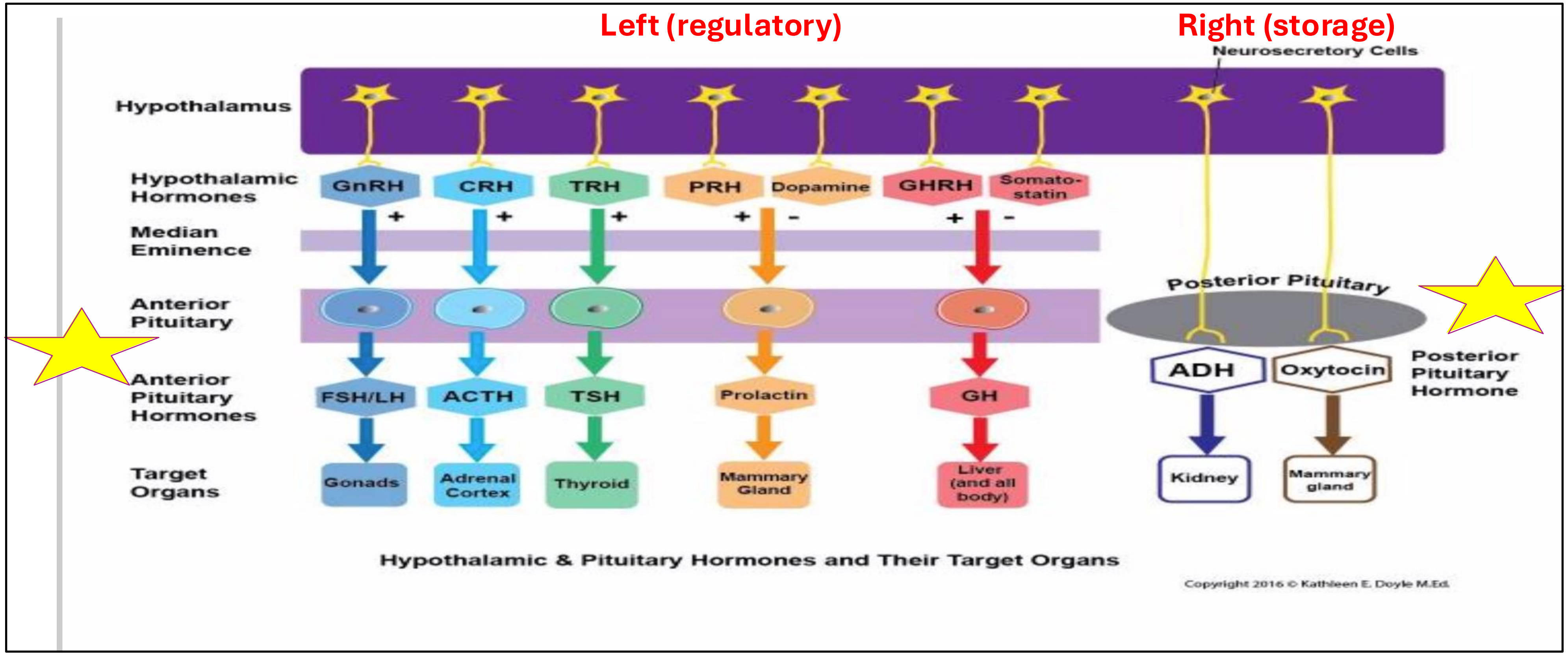
- Participates in the endocrine system by two mechanisms:

1. **Secretions of two hormones**. (Stored in the Posterior Pituitary)
2. **Controlling the secretion** of the pituitary hormones by: **Inhibitory and releasing hormones**. (Anterior Pituitary)

- The hypothalamus is **anatomically connected** to the pituitary gland, allowing the nervous system to directly control the endocrine system. The pituitary gland itself is divided into two distinct parts: **the posterior lobe and the anterior lobe, and each interacts with the hypothalamus differently.**



See the next 2 slides for more explanation.



See next slide for more explanation:

Note: The endocrine system is never fully separated from the nervous system. The hypothalamus uses the pituitary gland for two distinct functions: storing ready-made hormones in the posterior lobe, and sending regulatory signals to the anterior lobe, which in turn commands the rest of the body's endocrine glands.

Explication of the previous slide :

- ***Right: The Posterior Pituitary (Storage):***

  The posterior lobe is essentially an **extension of the hypothalamus.** Neurons in the hypothalamus act as endocrine cells, producing hormones that travel down their long axons directly into the posterior pituitary. The posterior pituitary does not actually produce its own hormones; it only stores two specific hormones made by the hypothalamus: **antidiuretic hormone (ADH) and oxytocin**.

- ***Left: The Anterior Pituitary (Regulatory Response):***

  Unlike the posterior lobe, the anterior pituitary is entirely controlled by **regulatory hormones** it receives from the hypothalamus (GnRH, CRH, TRH...). Neurons release these regulatory signals, which travel to the anterior pituitary and command its specific cells to release their own hormones into the bloodstream. Because the anterior pituitary has different types of cells, each cell type produces a specific hormone that travels to a **final target organ** (like the adrenal cortex, thyroid, or testes/ovaries).

How Glands Develop?

✓ All glands begin their development in the exact same way: through an **invagination** (an inward growth or folding) of the surface epithelium down into the underlying connective tissue. What happens to this invagination next determines the type of gland...

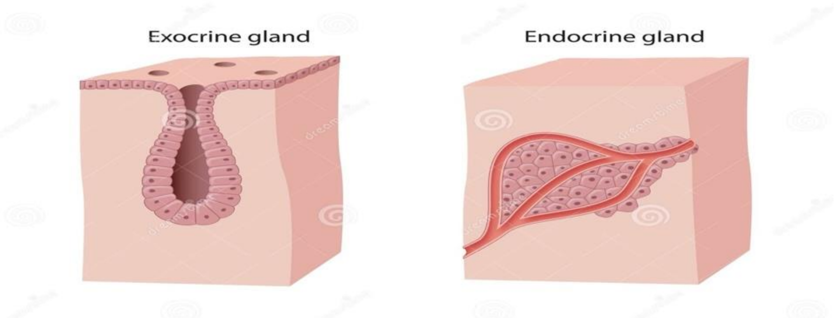
- **Exocrine Glands:** The gland successfully retains its connection to the surface epithelium. This connection acts as a **duct**, which the gland uses to release its secretions to the outside (or into a cavity).

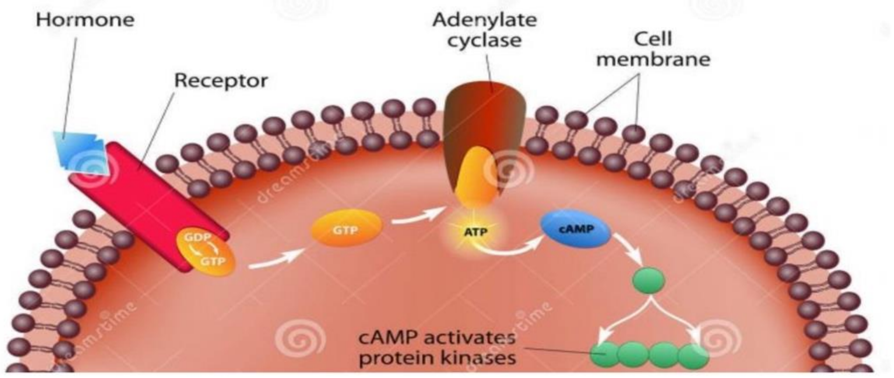
- **Endocrine Glands:** The connection to the surface epithelium is completely eliminated, making the gland **ductless**.

Endocrine system:

- Is made up of ductless glands that secrete chemical messengers called hormones into the bloodstream or in the extracellular fluid.

- A hormone is a chemical substance made and secreted by one cell that travels through the circulatory system or the extracellular fluid to affect the activities of cells in another part of the body or another nearby cell.



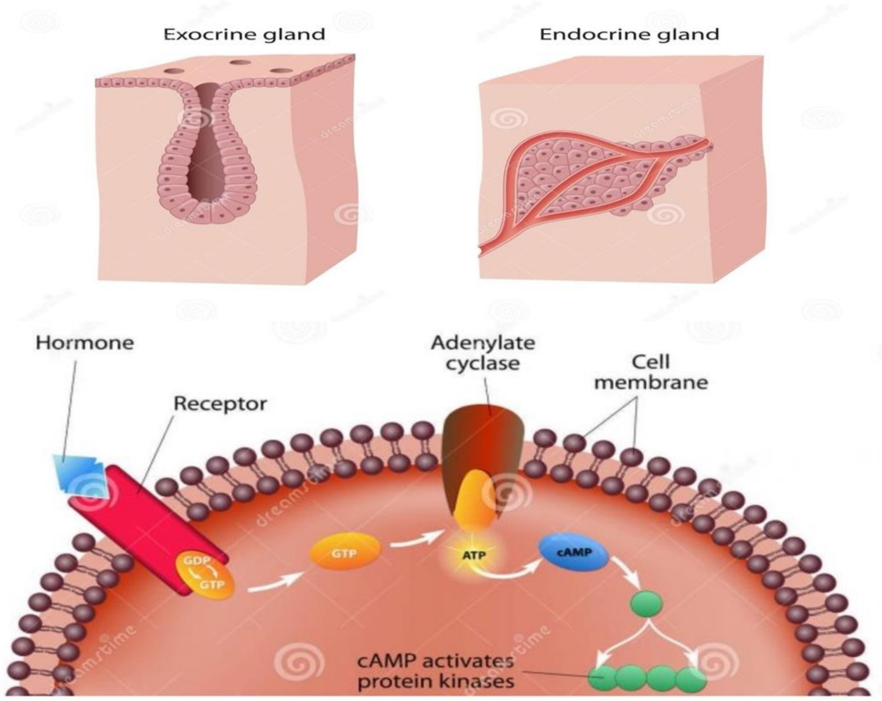


See next slide for more explanation:

Notes Regarding the Previous Slides:

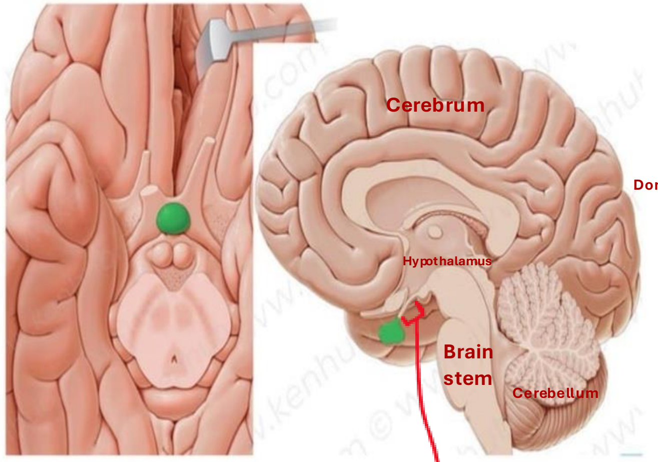
- Because endocrine glands lose their ducts during development, they must rely entirely on the **bloodstream** to transport their products.

- To make this possible, extensive vascularization occurs as the gland separates from the surface. Blood vessels grow directly into the tissue to form **highly permeable, leaky capillaries known as sinusoids.** This unique leaky structure allows the newly produced hormones to easily diffuse right out of the gland tissue and directly into the blood.

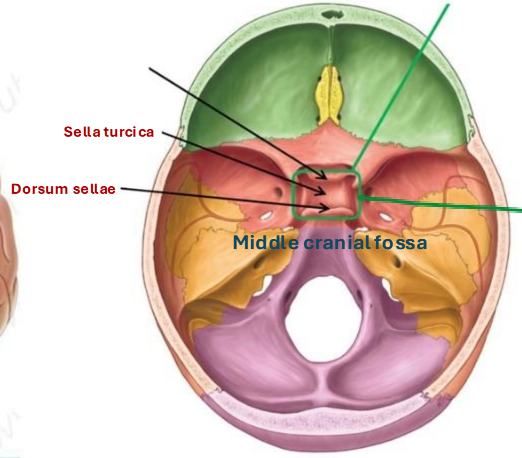


- Once in the bloodstream, the blood acts as a highway, carrying the hormones throughout the body until they find **specific receptors on their target organs** (such as Growth Hormone finding receptors on muscles or bones). Once the hormone binds to its target, it translates that chemical signal into **specific actions** and events inside the cell.

Pituitary Gland (master endocrine gland):

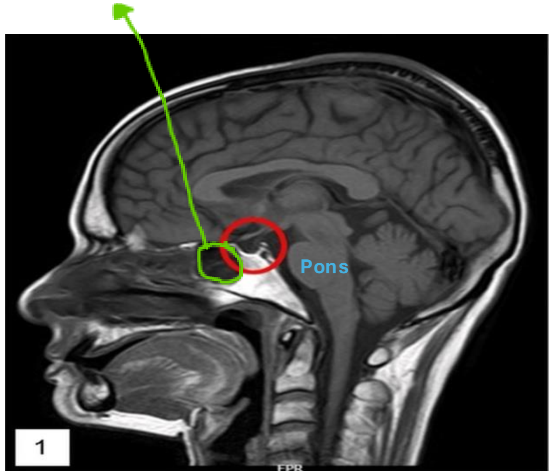


Inferior view



- Also called hypophysis cerebri. Relatively small- 0.5 gm. Centrally located at the base of the brain.
- **The pituitary gland** rests in a saddle-like bony depression (sphenoid bone) called **hypophyseal fossa of the Sella turcica.**

Sphenoid sinus: anterior to the pituitary gland.



MRI; we can observe the soft tissue.
Important for the relations in the next slide.

- Connected to the brain (hypothalamus) by a **stalk** called the **infundibulum**.
- Has two lobes: adenohypophysis and neurohypophysis.

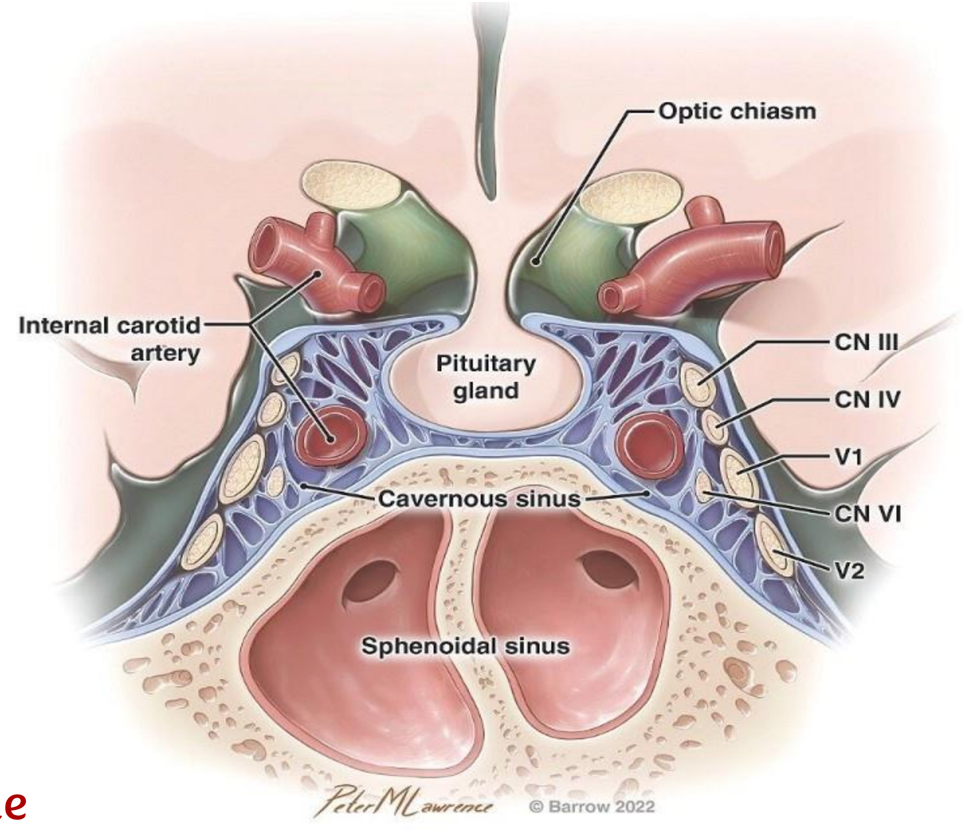
Adenohypophysis: The Anterior lobe.

Neurohypophysis: The Posterior lobe.

Relations of the Pituitary Gland

- **Anterior:** sphenoid sinus.
- **Posterior**: dorsum sellae, basilar artery, pons.
- **Inferior**: body of the sphenoid (sinus).
- **Superior**: Diaphragma sellae (dura), optic chiasm (next slide).
- **Lateral**: cavernous sinus cushioning (contents) including the **internal carotid artery and cranial nerves (III, IV, V1, V2, VI).**

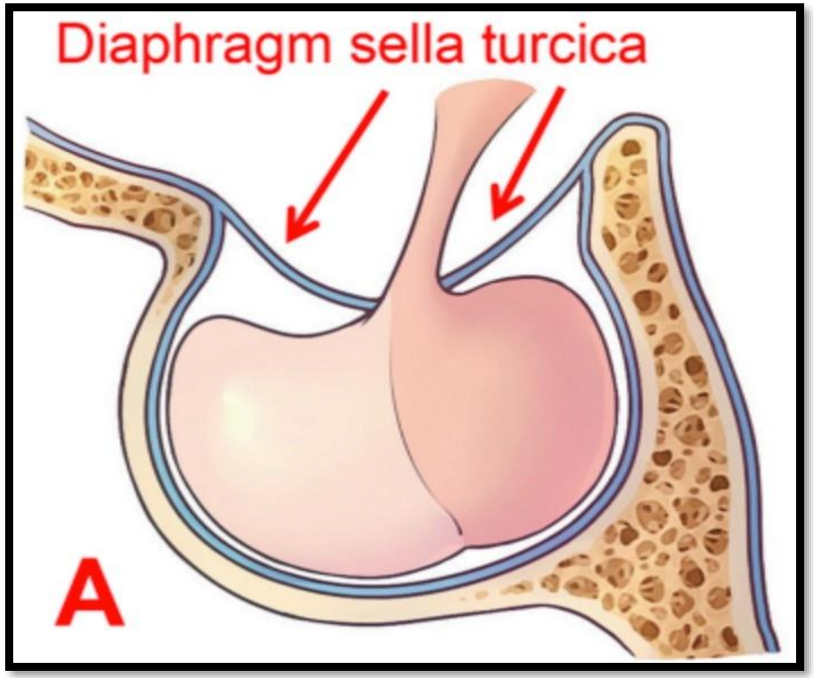
Coronal section (important):



- **Diaphragma sellae:** a fold of dura (the blue line) that acts as a roof with a central aperture that allows the passage of the infundibulum (stalk), and seprate the PG from overlying optic chiasma.

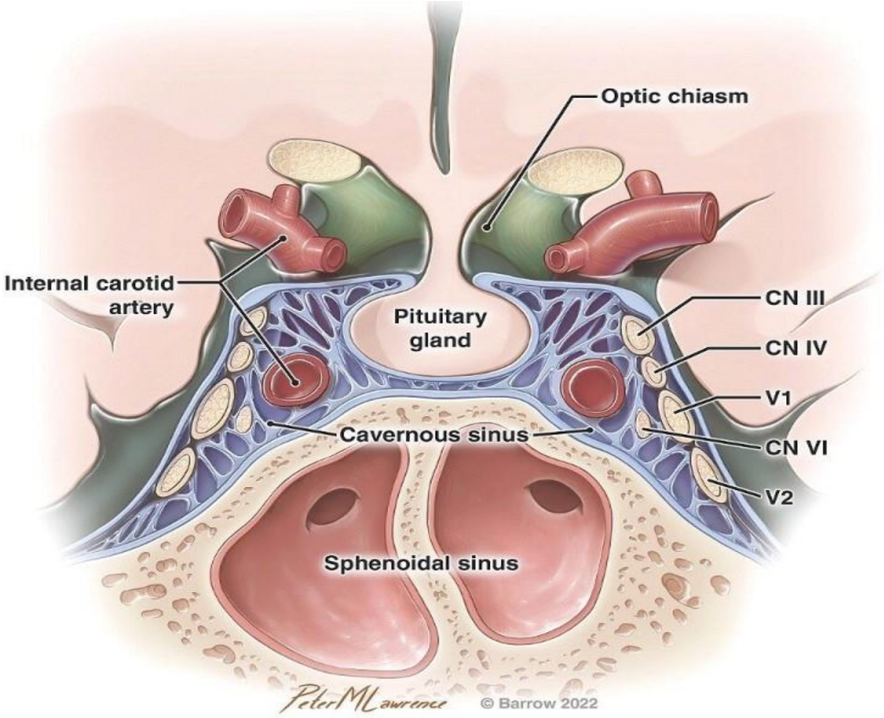
✓ **Note:** The central nervous system is protected by three distinct layers of connective tissue known collectively as the **meninges**. Arranged from the outside in, the **dura mater** serves as the tough, outermost layer closest to the skull. Moving deeper, you find the middle layer called the **arachnoid mater**, and finally, the delicate **pia mater** rests as the innermost layer directly around the tissue of the brain and spinal cord.

- The protective dura layer (blue) is not completely sealed. It has a specific opening that allows the **infundibulum (also known as the pituitary stalk) to pass right through it.**
- The infundibulum serves as the vital physical bridge that connects the pituitary gland (sitting below the dura) directly to the hypothalamus (sitting above it in the brain).



Notes:

- **The Optic Chiasm** is an **X-shaped structure** located immediately **superior to the pituitary gland** where the **right and left optic nerves cross over each other** to process visual information. Because it sits directly above the pituitary gland, this anatomical relationship is highly important in clinical settings; if the pituitary gland becomes enlarged (such as from a tumor or adenoma), it pushes upward and compresses the optic chiasm. This compression damages the crossing visual nerves, resulting in a specific type of vision loss.



- ***Note:*** The brain receives its main blood supply from two major sources: the Internal Carotid Arteries (ICA) and the Vertebral Arteries. As the right and left vertebral arteries travel upward along the brainstem, they merge together to form a single vessel called the Basilar Artery, which is located posterior to the pituitary gland. At the base of the brain, branches from the Internal Carotid Arteries and the Basilar Artery connect together. This connection creates a vital vascular ring known as the Circle of Willis, which ensures continuous blood flow to the brain. Only the Internal Carotid Artery (ICA) passes directly through the cavernous sinus. The vertebral and basilar arteries are located elsewhere and do not pass through the cavernous sinus at all.

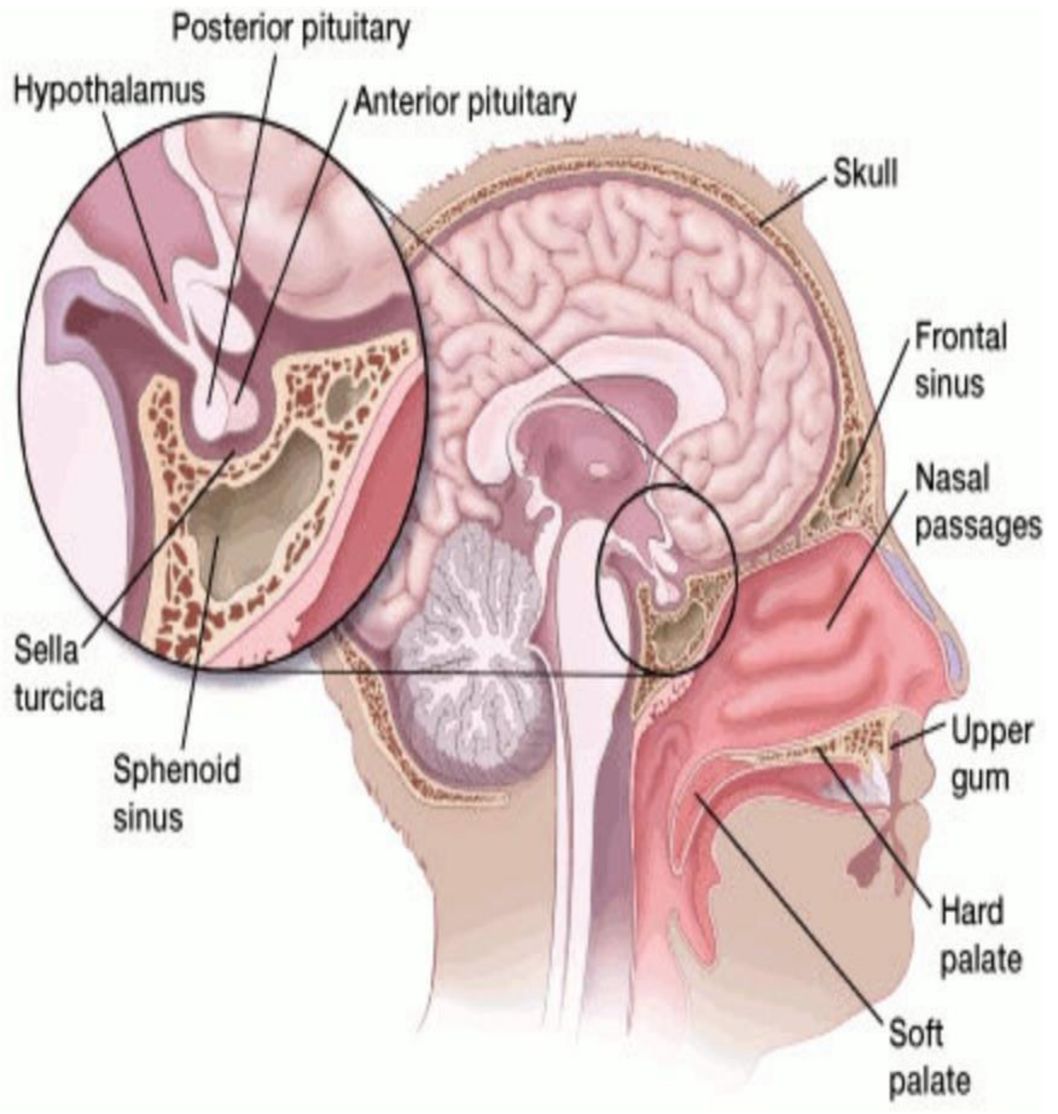
The Pituitary Tumor

- The problem with pituitary gland tumors is that as cell numbers increase, the amount of hormone released also increases – disrupting the body's hormonal balance.

- Pituitary tumors can't invade surrounding tissue because their lateral boundary is the sphenoidal bone.

✓ So a pituitary tumor is considered an emergency case that requires surgical removal.

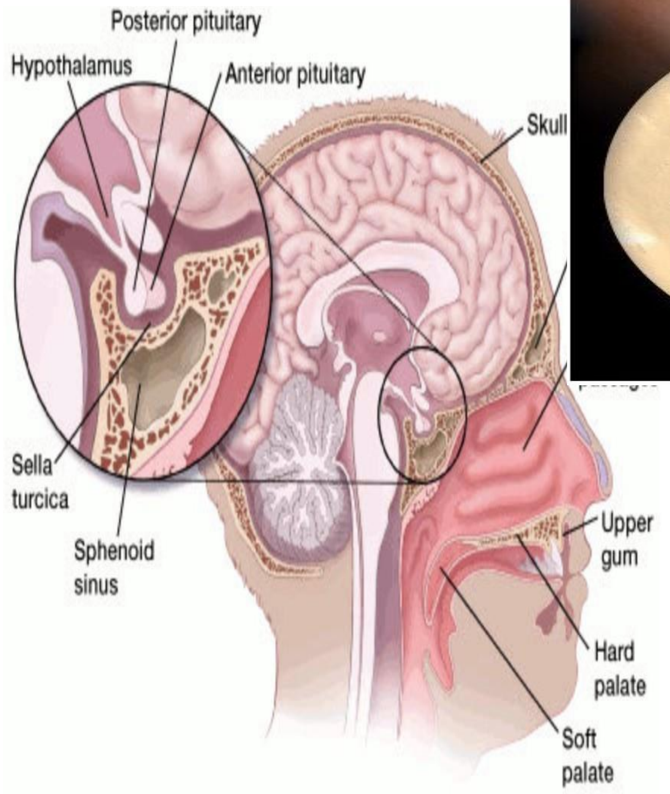
✓ **But, How we can reach the pituitary gland at the base of the brain ?! See next slide for answer ☺**

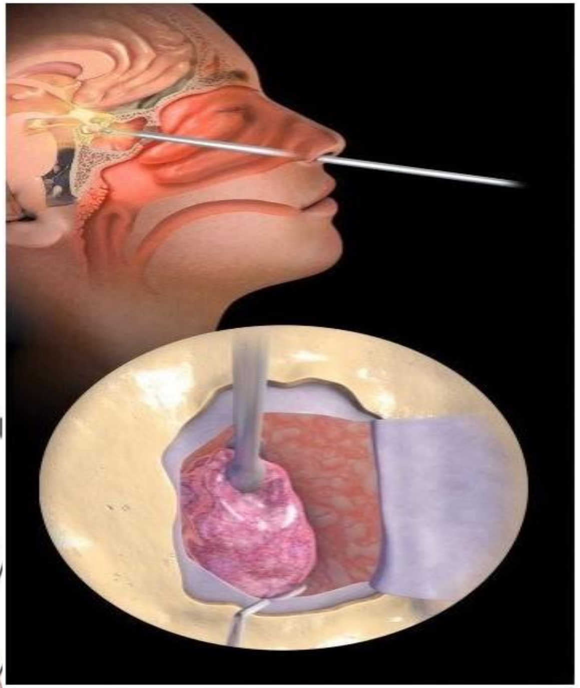


Endoscopic Transnasal/Transsphenoidal

- Is the **most common** procedure for removing pituitary tumors.
- The neurosurgeon reaches the tumor through the **nasal passages and the sphenoid sinus.**
- **Less-invasive approach**--avoid important brain structures by accessing the pituitary gland from underneath the brain.
- **Transsphenoidal surgery leaves no visible scar, minimizes the risk of complications, and enables faster recovery.**

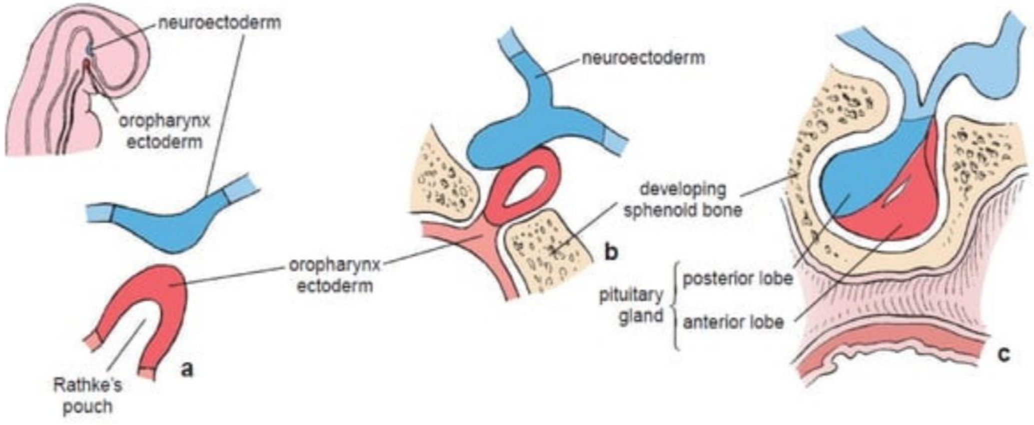
Craniotomy!!!!



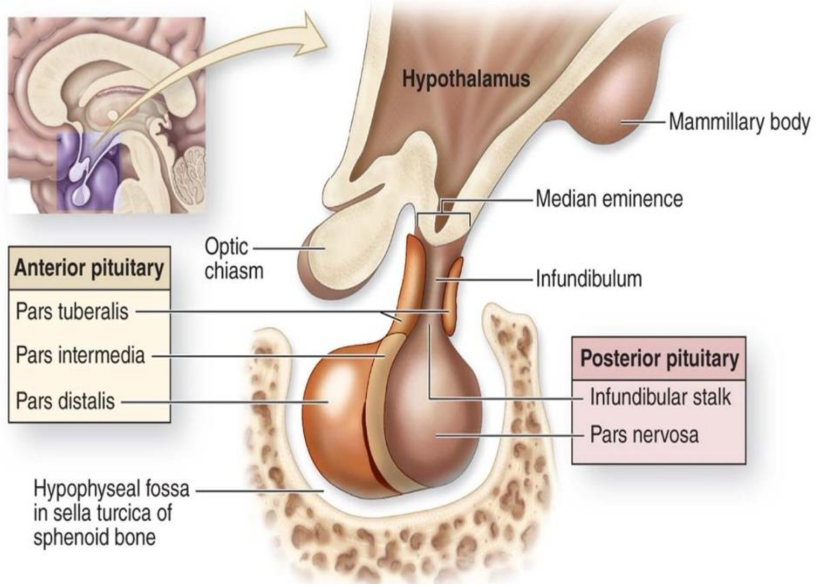


Structure and Origin

- Two tissue types -- two origins.
- Adenohypophysis (anterior lobe).
- Neurohypophysis (posterior lobe).



Development of pituitary gland



Adenohypophysis (anterior lobe):

- Pars tuberalis.
- Pars intermedia.
- Pars distalis.

Neurohypophysis (posterior lobe):

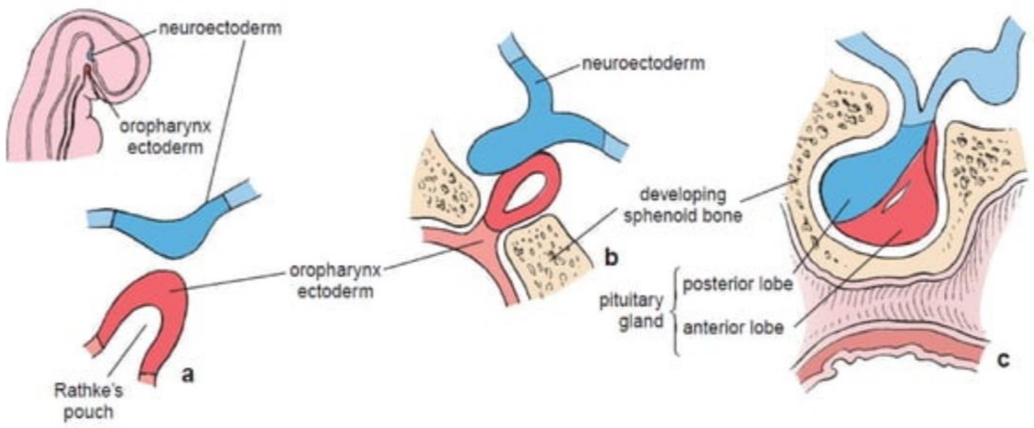
- Pars infundibularis.
- Pars nervosa.

See next slide for more explanation:

Structure and Origin

- The connection between Rathke's pouch and the oral cavity degenerates, so the pouch becomes a fully separate structure.

- The **posterior lobe** (blue) is the **continuation of neural tissue** – technically an **extension of the hypothalamus**/brain, made of neural tissue and glial-like cells (pituicytes), and **connected via the infundibular stalk.**



Development of pituitary gland

- The **anterior lobe** (red) is derived from oral ectoderm, made of true endocrine epithelial cells.

- Both lobes now sit encased within the sella turcica of the sphenoid bone.

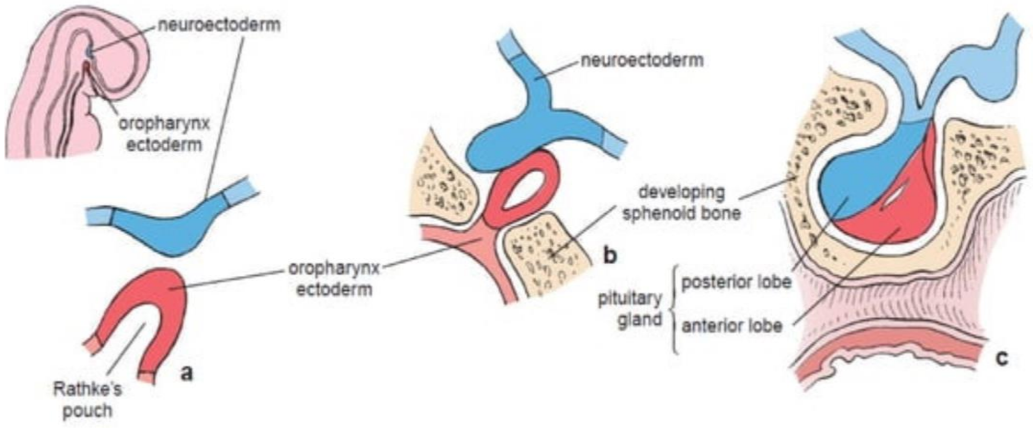
❑ **Why this matters clinically?**

- The **anterior pituitary** produces hormones directly (GH, TSH, ACTH, FSH/LH, prolactin) because it's true secretory glandular epithelium.
- The **posterior pituitary** doesn't synthesize its own hormones – it only *stores and releases* ADH and oxytocin, which are made by hypothalamic neurons and transported down axons through the infundibular stalk, because it's neural tissue, not glandular tissue.
- Remnants of Rathke's pouch can persist and give rise to **craniopharyngiomas**, a tumor typically found in this exact region.

Structure and Origin

- **The Pituitary Gland** starts its development at the **4th week & ends at the 8th week**, which is relatively **early**, why?!
  ✓The pituitary gland function is required for the development of other organs.

- Is there a connection between the pharynx and sella turcica? Anatomically No, they are separated by sphenoid bone, but before the two ridges of the developing sphenoid bone bridge the oropharyngeal seal extension upward and separate them from the rest of the ectoderm (which is going to form the anterior pituitary) as the sphenoid ridges bridges.



Development of pituitary gland

- There are two functions of the pituitary:

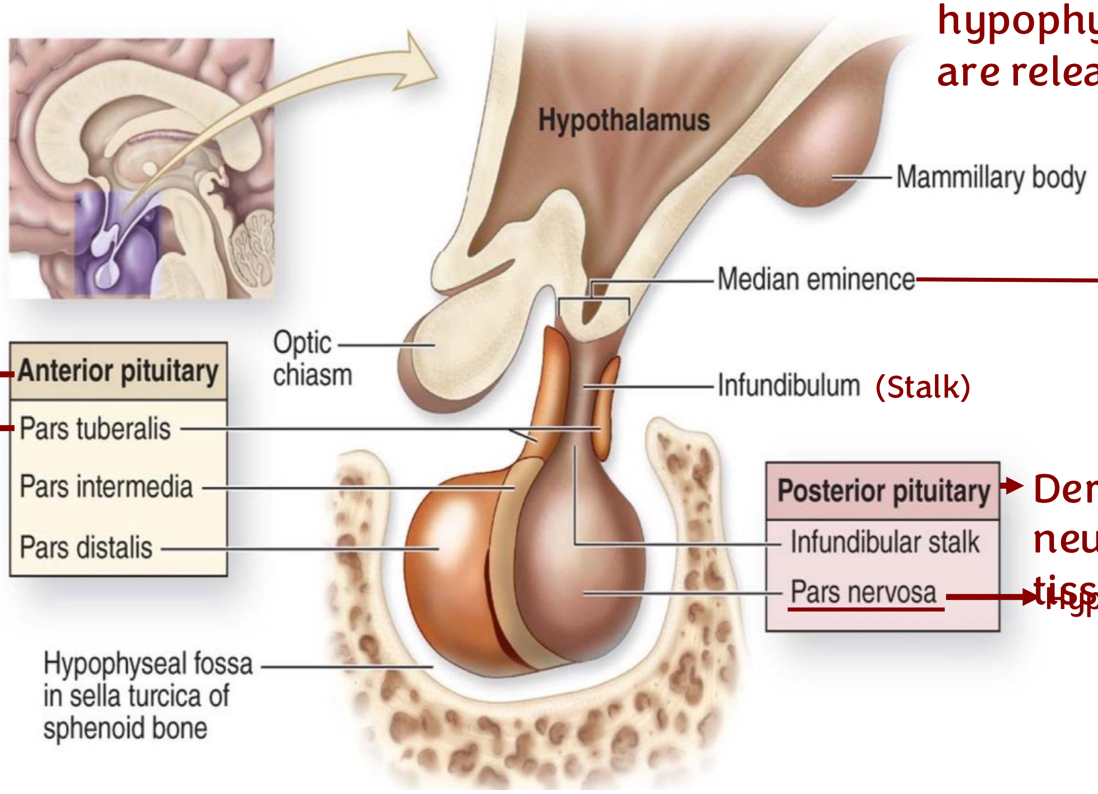
1) Storage of Hypothalamic hormones.
2) Production and responding to hypothalamic hormones → So we have 2 different parts with 2 different tissues.

Structure and Origin

The part of the hypothalamus in which the hypophyseal hormones (oxytocin & ADH are released.

Derived from Oral Ectoderm

Hugging (Coating) the infundibulum and the posterior lobe



Derived from neuroectoderm (Nervous tissue)

Hypophyseal Hormones are stored here

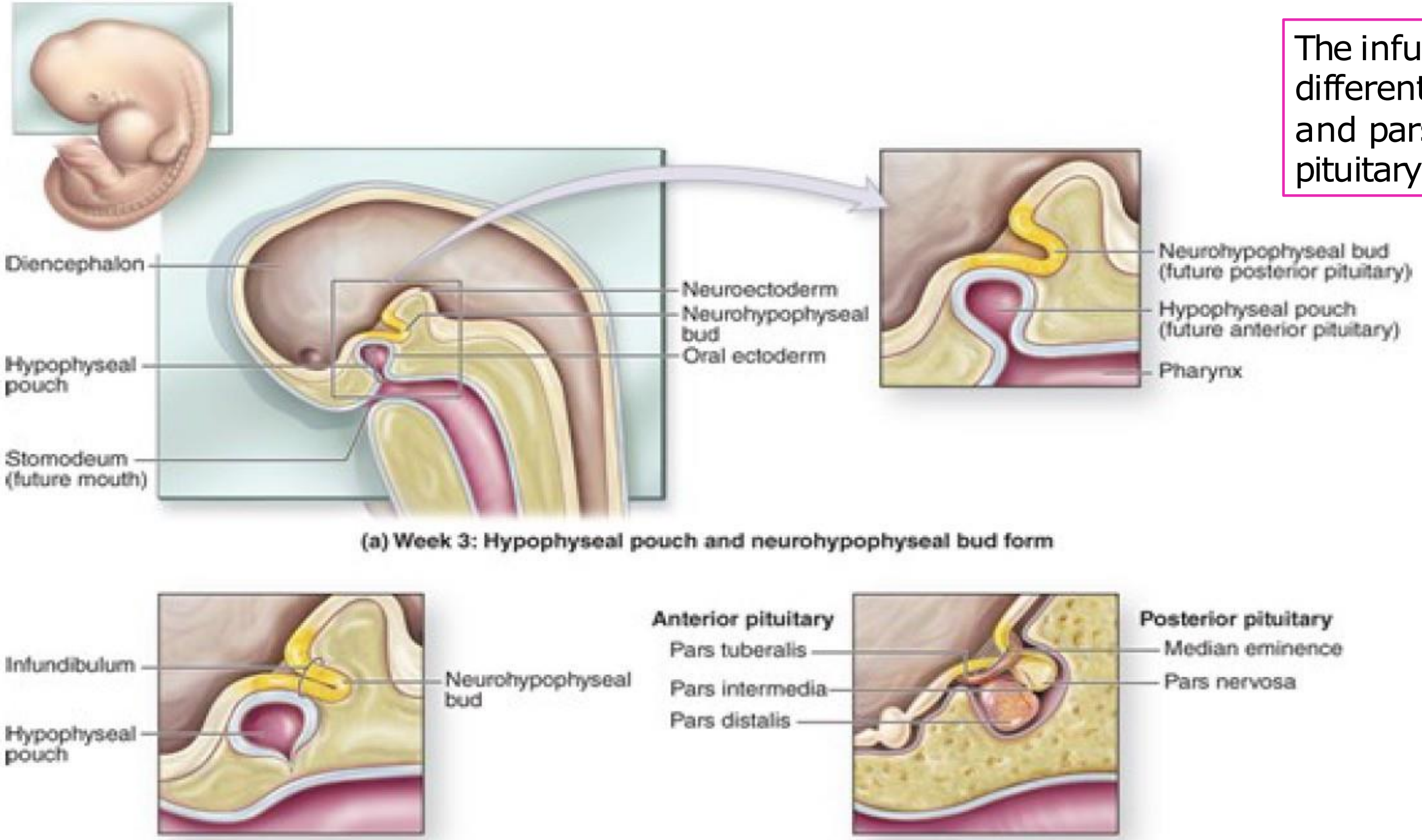
Pituitary organogenesis

- Begins during week 4 of fetal development.
- A thickening of cells in the oral ectoderm form the hypophyseal placode, which gives rise to Rathke’s pouch, an upward evagination that extends towards the neural ectoderm.
- A downward extension of the ventral diencephalon forms the posterior lobe (at the same time).
- The two nascent lobes connect to form the composite structure of the adult pituitary.
- Rathke’s pouch constricts at its base and eventually separates altogether from the oral epithelium during week 6-8.

The cavity of the vesicle is reduced to a narrow cleft, which may disappear completely.

Cells of the pouch later differentiate to form different pars of the adenohypophysis.

The infundibulum differentiates into the stalk and pars nervosa of the pituitary gland.



(a) Week 3: Hypophyseal pouch and neurohypophyseal bud form

(b) Late second month: Hypophyseal pouch loses contact with roof of pharynx

(c) Fetal period: Anterior and posterior parts of pituitary have formed

Blood supply (1)

In embryology, a general rule is that **an organ takes its blood supply with it as it develops and migrates**. However, the **posterior lobe (neurohypophysis)** of the pituitary gland is an exception. Although it grows downward from the diencephalon toward the **sella turcica**, it **does not bring its own embryonic blood supply with it**. Instead, it receives a new blood supply after reaching its final location.

The pituitary gland is supplied by two main arteries:

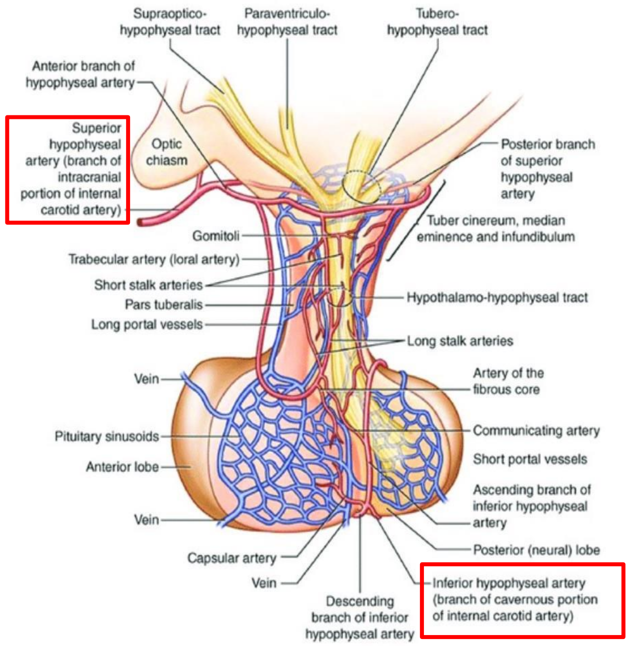
- **Superior hypophyseal artery**
- **Inferior hypophyseal artery**

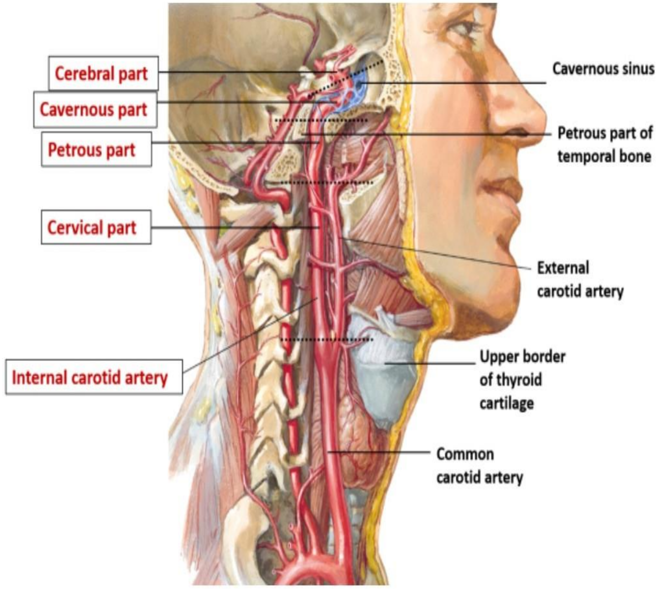
➢ **Inferior Hypophyseal Artery**

- Directly supplies the **posterior pituitary (neurohypophysis)**.

➢ **Superior Hypophyseal Artery**

- Primarily supplies the **median eminence** and the upper part of the pituitary stalk.
- It does **not** directly supply the anterior pituitary.





Blood supply (2)

❖ **Hypophyseal Portal System**

The **superior hypophyseal artery** is unique because it does **not** follow the usual pattern of blood flow:

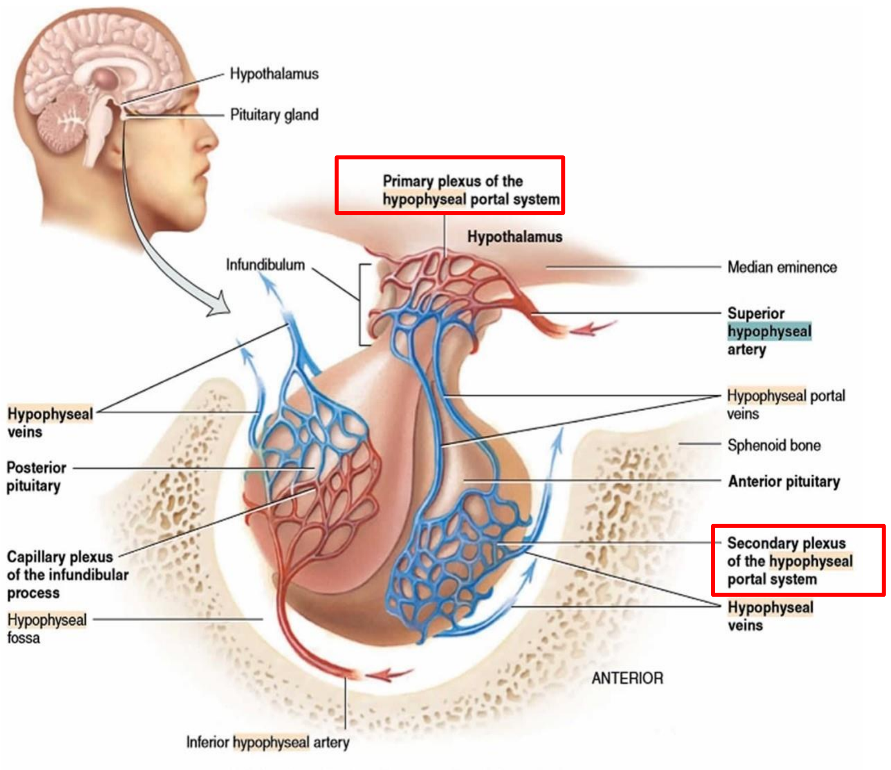
Typical circulation:

Artery → Capillary bed → Vein

Instead, it forms a **portal circulation**:

Artery → Primary capillary plexus (median eminence) → Portal veins (carrying hypothalamic regulatory hormones) → Secondary capillary plexus (anterior pituitary) → Veins → Systemic circulation

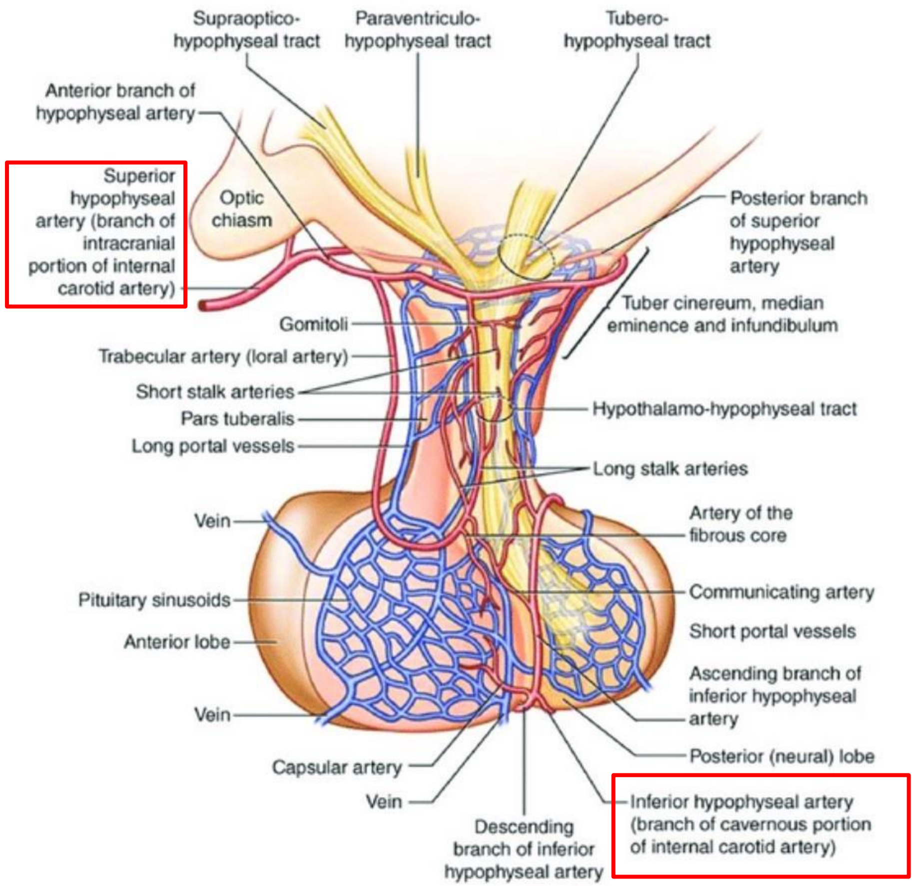
The portal veins transport **hypothalamic releasing and inhibiting hormones** directly to the **anterior pituitary (adenohypophysis)**.

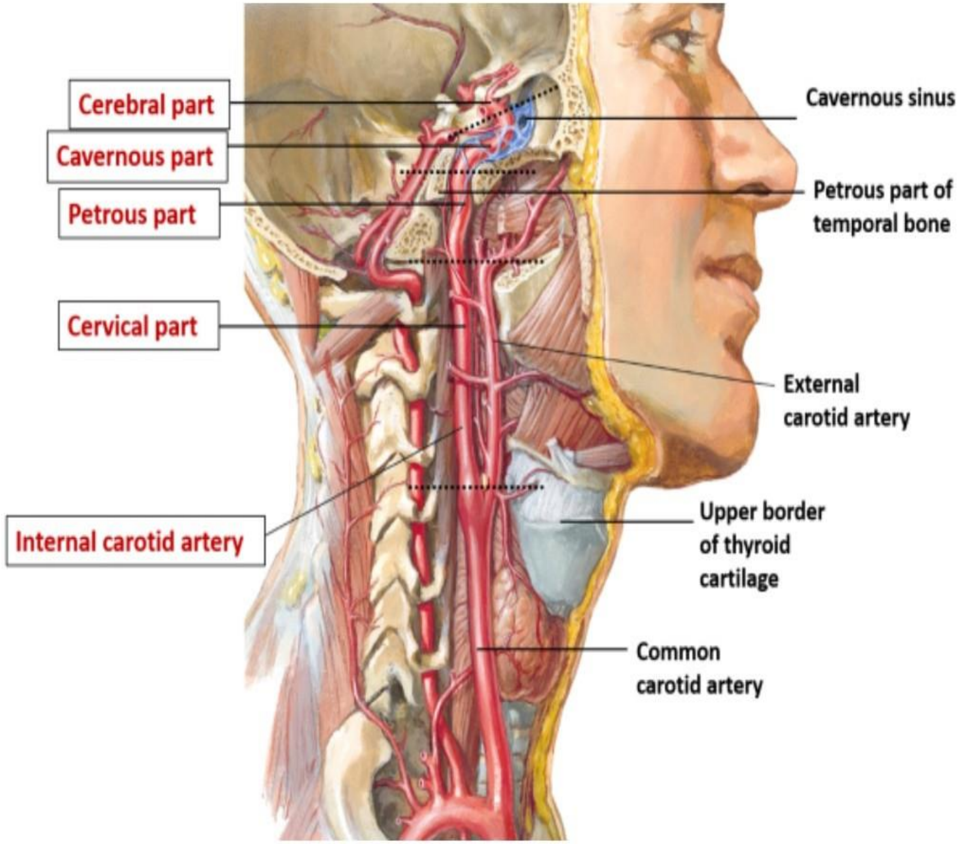


Clinical Point

The **anterior pituitary has no direct arterial blood supply**. Instead, it depends almost entirely on the **hypophyseal portal system**, receiving blood that has already passed through the primary capillary plexus in the median eminence. This arrangement allows hypothalamic hormones to reach the anterior pituitary rapidly and at high concentrations before entering the systemic circulation.

Blood supply





The hypothalamic-hypophyseal portal system

Superior hypophyseal artery

↓

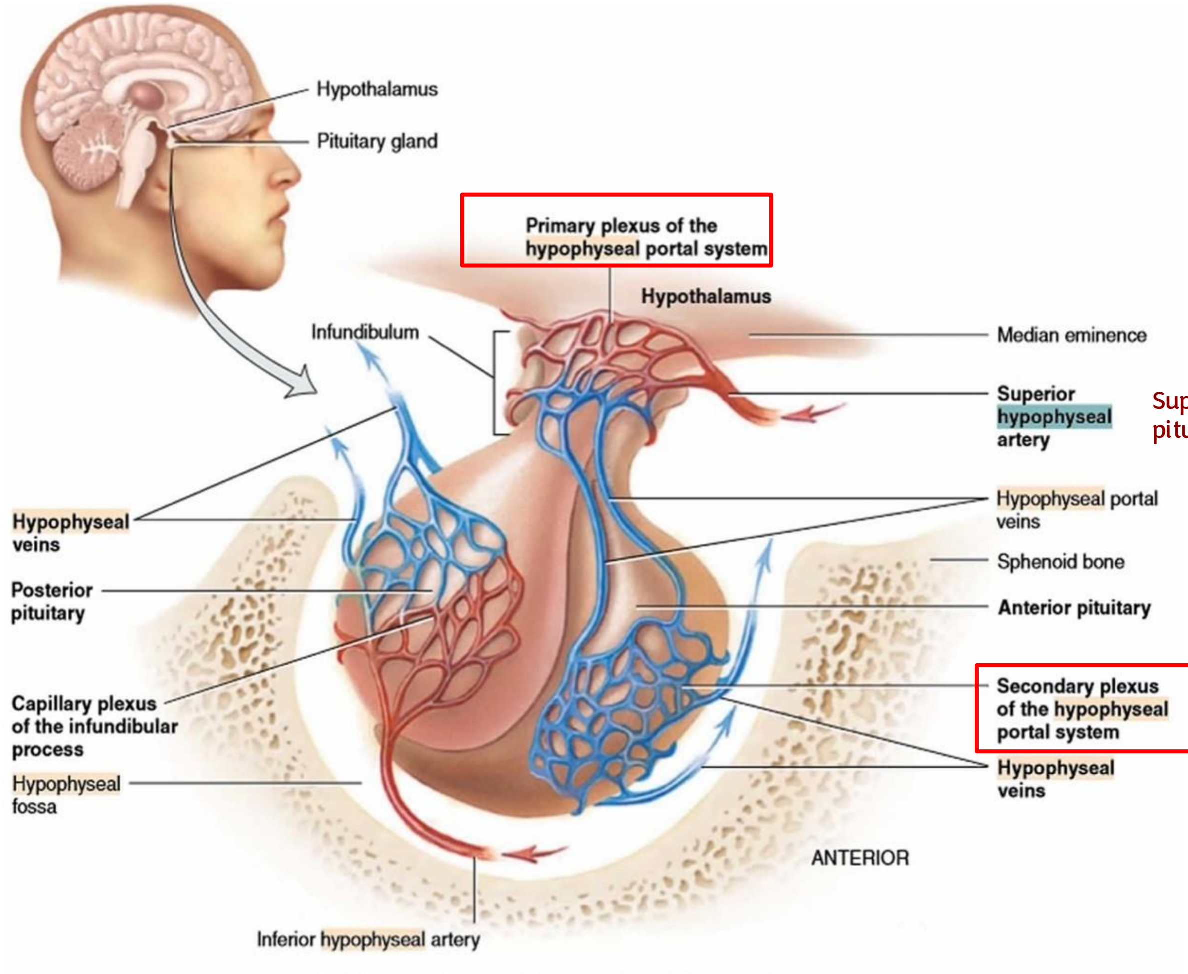
Primary plexus (capillaries)

↓

Hypophyseal portal veins

↓

Secondary plexus (capillaries)



Supplies the anterior pituitary indirectly

Secrections of the hypothalamus

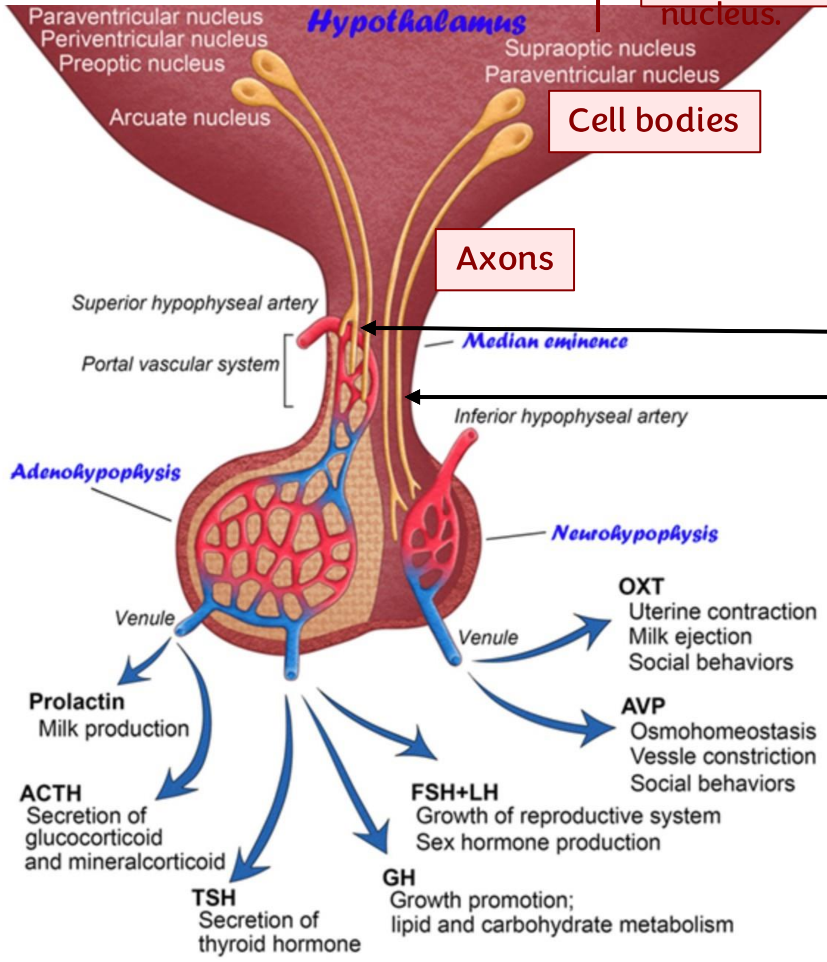
- **To Neurohypophysis.**
  1. Hypothalamic-hypophyseal tract
  2. Supraoptic and the paraventricular Ns.
  3. Axonal transport— pars nervousa.
  4. ADH, Oxytocin.

- **To Adenohypophysis**

Rreleasing and inhibitory hormones:

TRH, GnRH, GHRH, PIH, GHIH, and CRH).

Oxytocin and ADH are produced at the Supraoptic nucleus & Paraventricular nucleus.



The hypothalamic-hypophyseal tract----axons extending from the hypothalamic supraoptic and paraventricular nuclei, through the infundibulum and into the pars nervosa.

The hypophyseal hormones are released from the neuronal axons here and then they are transported to the anterior pituitary through the hypophyseal portal system.

The axons transfer the oxytocin and ADH to the posterior pituitary to be stored in the para nervosa.

Neurohypophysis

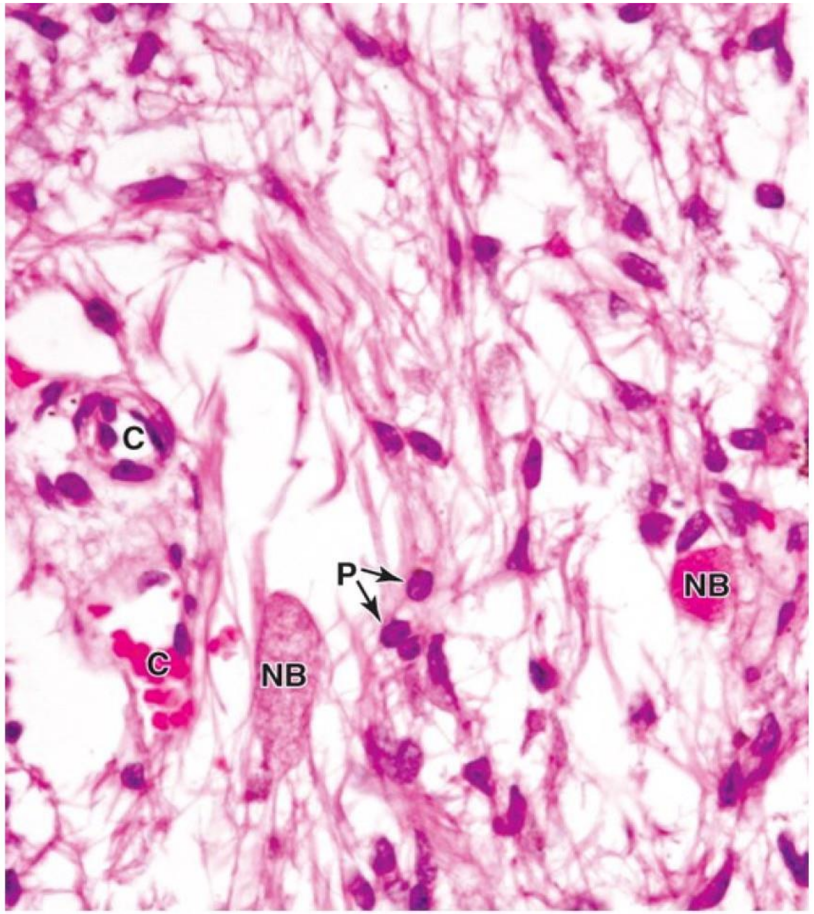
- Contains around 100,000 unmyelinated axons of large secretory neurons with cell bodies in the supraoptic and paraventricular nuclei.

- Highly branched glial cells called pituicytes (most abundant).
- Neurosecretory (Herring) bodies contain either: antidiuretic hormone (ADH, arginine vasopressin) or oxytocin.

- Carrier proteins: neurophysin I and II.

- Nerve impulse is required to release these two hormones

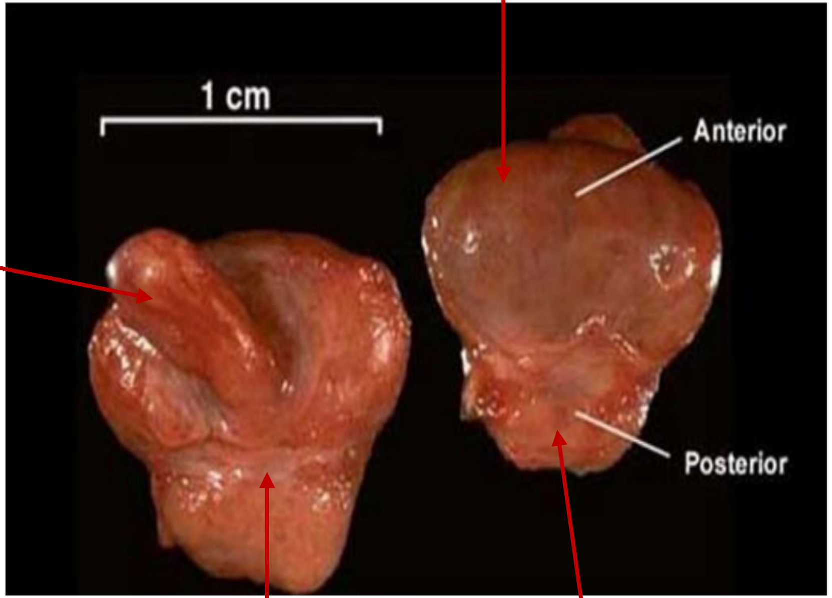
NB: neurosecretory (Herring) bodies



Adenohypophysis

Pars distalis

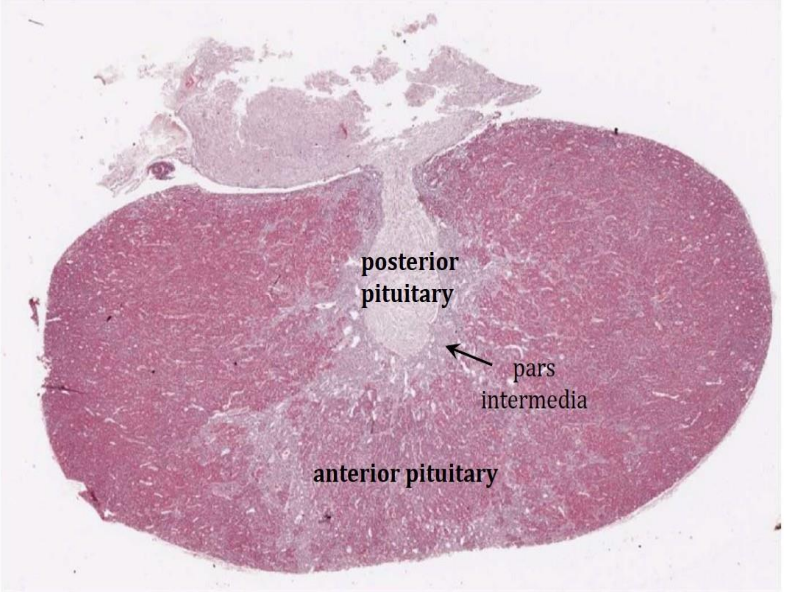
Infundibulum



Pars Intermedia

Pars nervousa

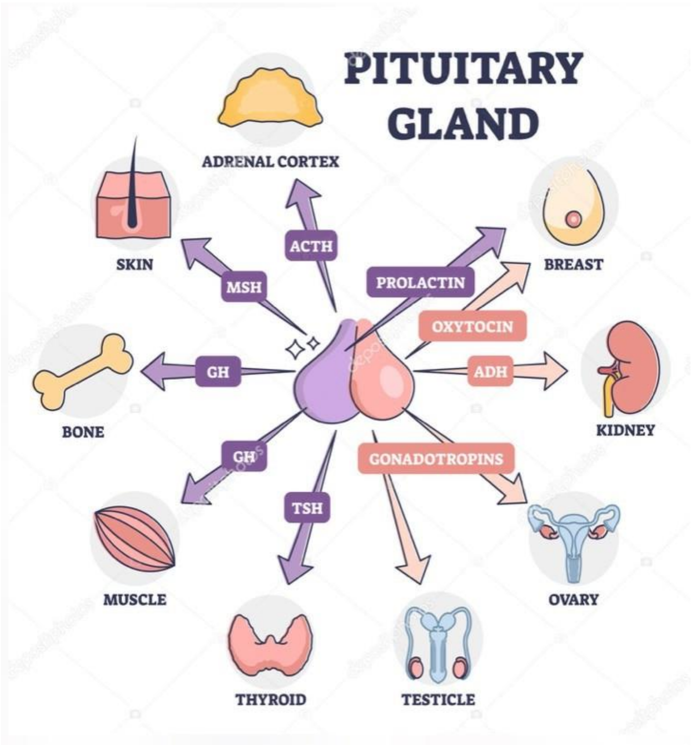
The pars Nervosa is being coated by the pars distalis in a sandwich-like appearance. “Dr.said this in 2nd Lec and she mentioned this image”.



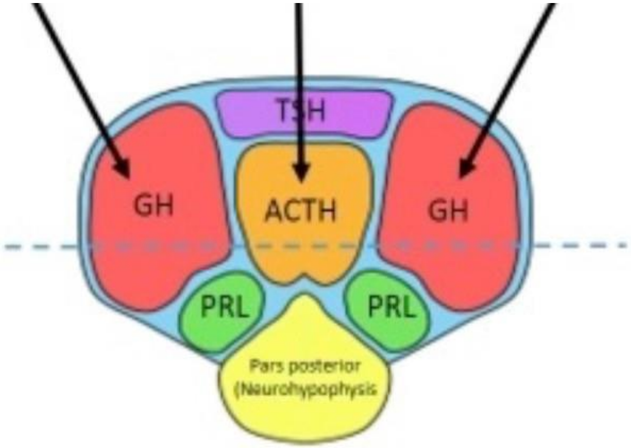
NB: neurosecretory (Herring) bodies

Adenohypophysis--Pars ditalis

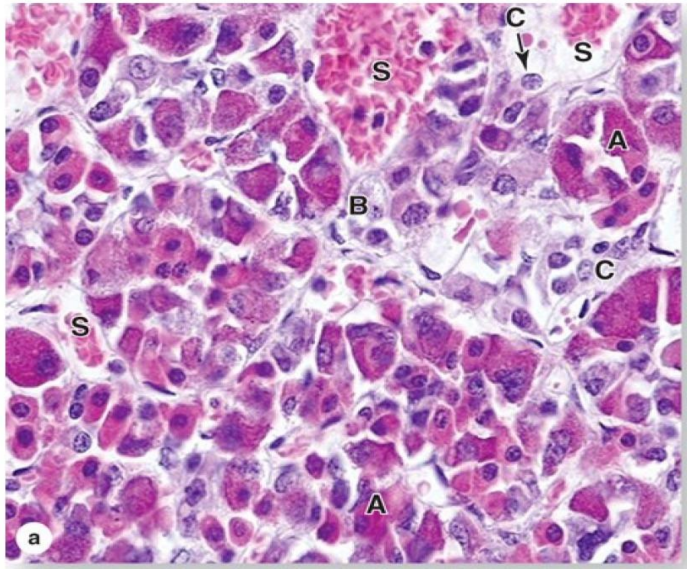
- Biggest part--75%
- Thin fibrous capsule.
- Cords of well-stained endocrine cells interspersed with fenestrated capillaries and supporting reticular connective tissue.
- <u>Chromophils</u> and <u>chromophobes</u>.
- Chromophils are secretory cells.
- Chromophils: hormone is stored in cytoplasmic granules….basophils and acidophils.
- <u>Acidophils</u>: somatotrophs (50% of cells) and lactotrophs.
- <u>Basophils</u>: corticotrophs, gonadotrophs, and thyrotrophs (least numerous)



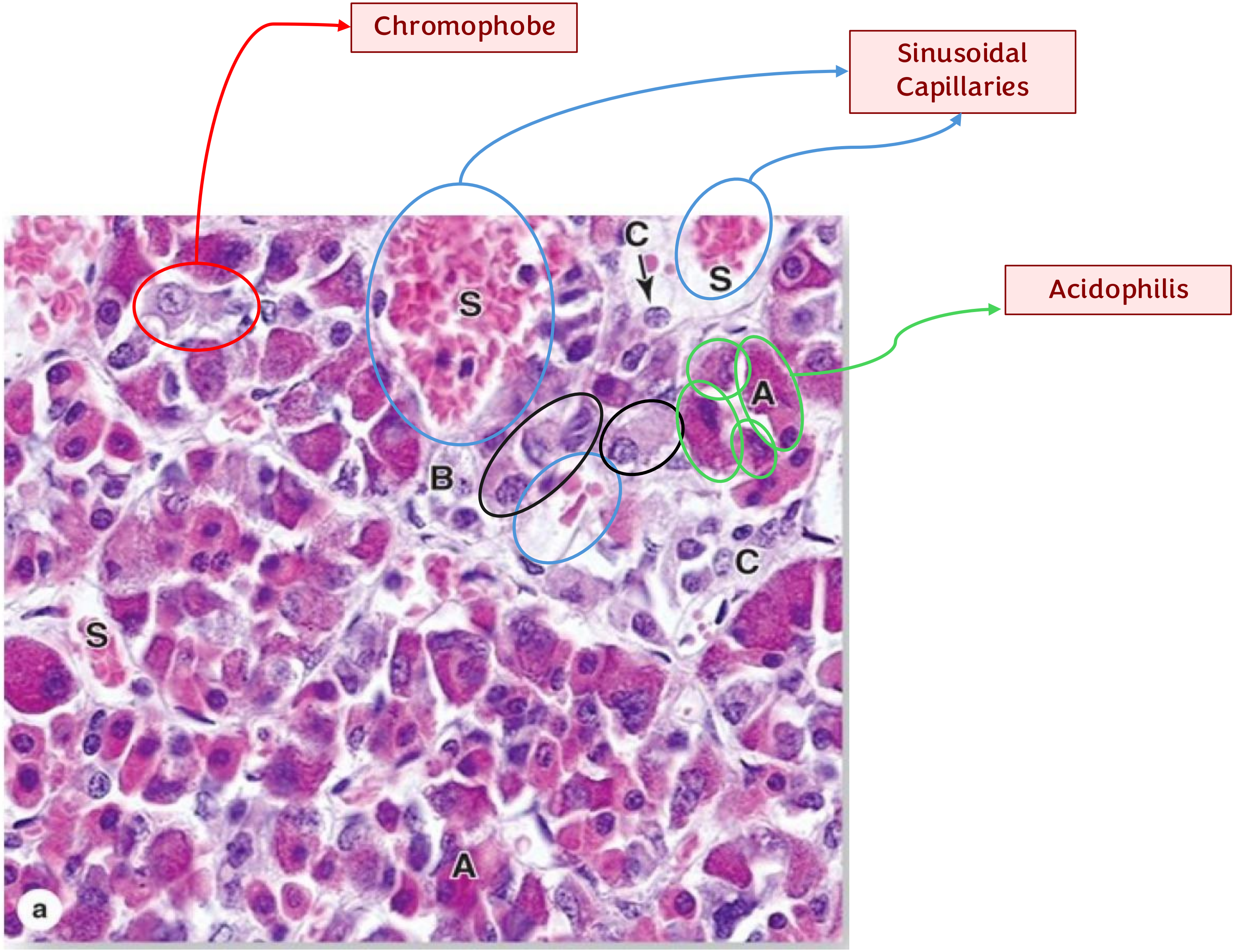
a mixture of different hormone producing cells in most pituitary acini, but the distribution of cells is not random.



acidophil cells (A), basophils (B), and Chromophobes(C).



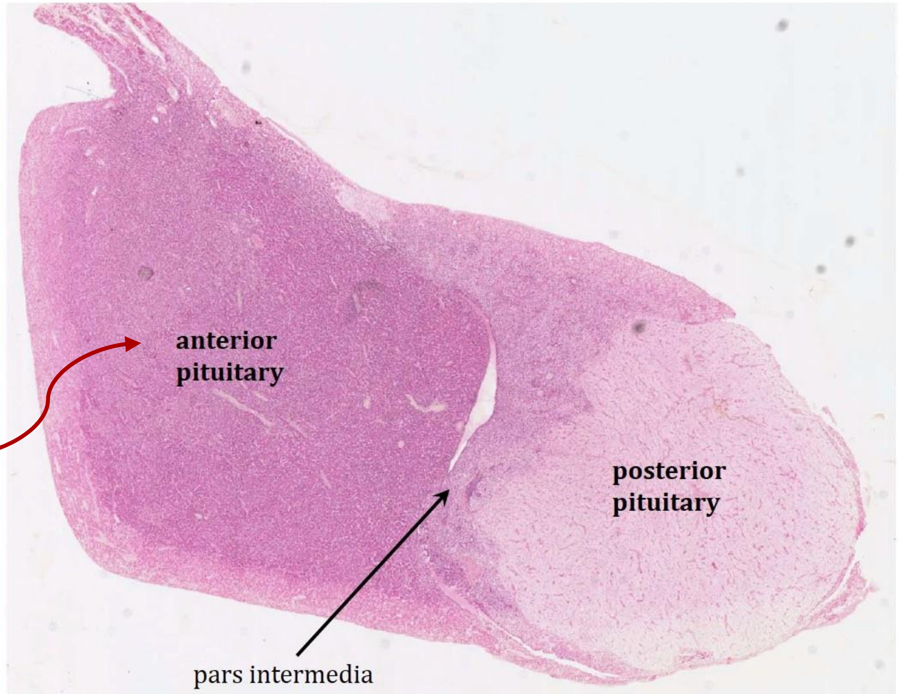
- Immunohistochemstry is needed to differentiate different types of basophilic cells, because they look very similar with routine H & E Staining.



Pars tuberalis

- Small funnel-shaped region surrounding the infundibulum.
- Most of the cells of the are gonadotrophs.

It contains large number of cells

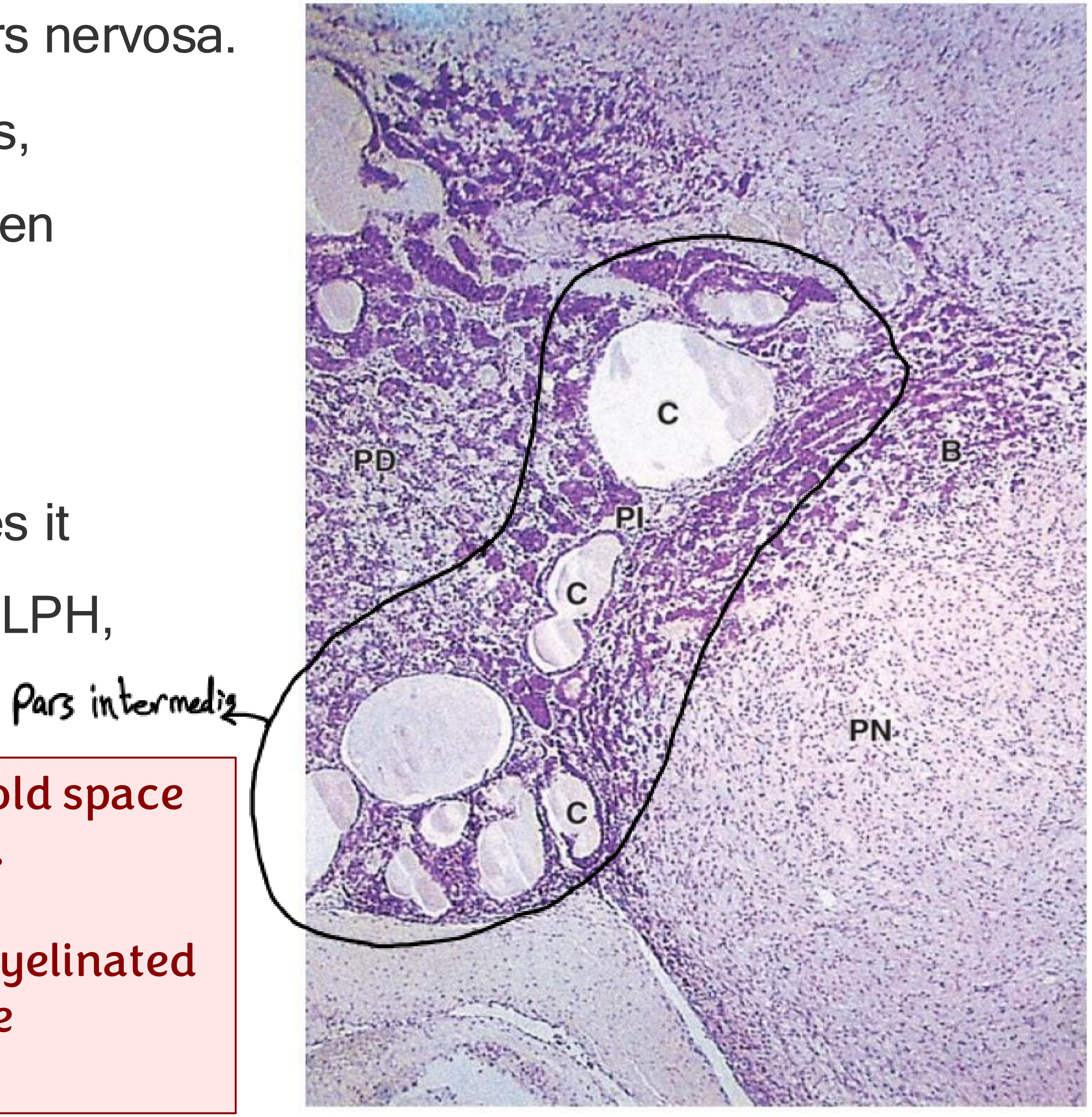


pars intermedia
w/ remnants of Rathke's pouch

Pars Intermedia

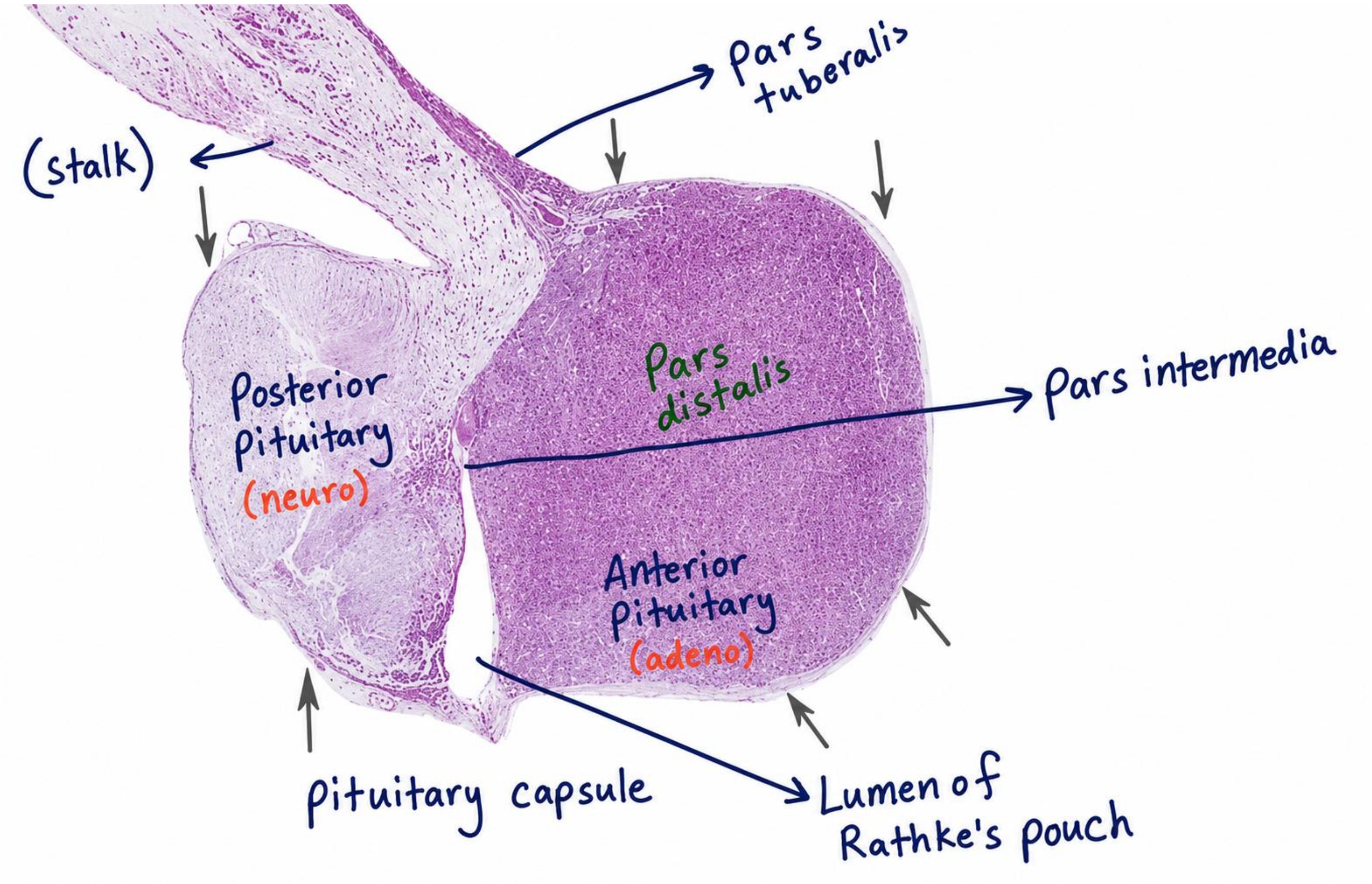
- A narrow zone lying between pars distalis and pars nervosa.
- Contains basophils (corticotrophs), chromophobes, and small, colloid-filled cysts derived from the lumen of the embryonic hypophyseal pouch.
- Best-developed and active during fetal life
- Express POMC (pro-opiomelanocortin) but cleaves it differently from cells in the pars distalis ((MSH), γ-LPH, and β-endorphin).

PN = Pars Nervosa
PD = Pars Destalis
PI = Pars Intermedia
C = Colloid filled cyst



- Colloid-filled cysts (they represent remnants of the old space that existed in Rathke's pouch and didn't disappear).
- Pars nervosa of the posterior pituitary contains unmyelinated axons of hypothalamic neurons. Also, it doesn't have secretory cells so it appears lighter.

Pituitary Gland



Adenohypophysis—major cell types.

POMC: adrenocortical trophic hormone (ACTH) and β-lipotropin(β-LPH).

Cell Type	% of Total Cells	Hormone Produced	Major Function
Somatotrophs	50	Somatotropin (growth hormone, GH), a 22-kDa protein	Stimulates growth in epiphyseal plates of long bones via insulin-like growth factors (IGFs) produced in liver
Lactotrophs (or mammotrophs)	15-20	Prolactin (PRL), a 22.5-kDa protein	Promotes milk secretion
Gonadotrophs	10	Follicle-stimulating hormone (FSH) and luteinizing hormone (LH; interstitial cell-stimulating hormone [ICSH] in men), both 28-kDa glycoprotein dimers, secreted from the same cell type	FSH promotes ovarian follicle development and estrogen secretion in women and spermatogenesis in men; LH promotes ovarian follicle maturation and progesterone secretion in women and interstitial cell androgen secretion in men
Thyrotrophs	5	Thyrotropin (TSH), a 28-kDa glycoprotein dimer	Stimulates thyroid hormone synthesis, storage, and liberation
Corticotrophs	15-20	Adrenal corticotropin (ACTH), a 4-kDa polypeptide Lipotropin (LPH)	Stimulates secretion of adrenal cortex hormones Helps regulate lipid metabolism

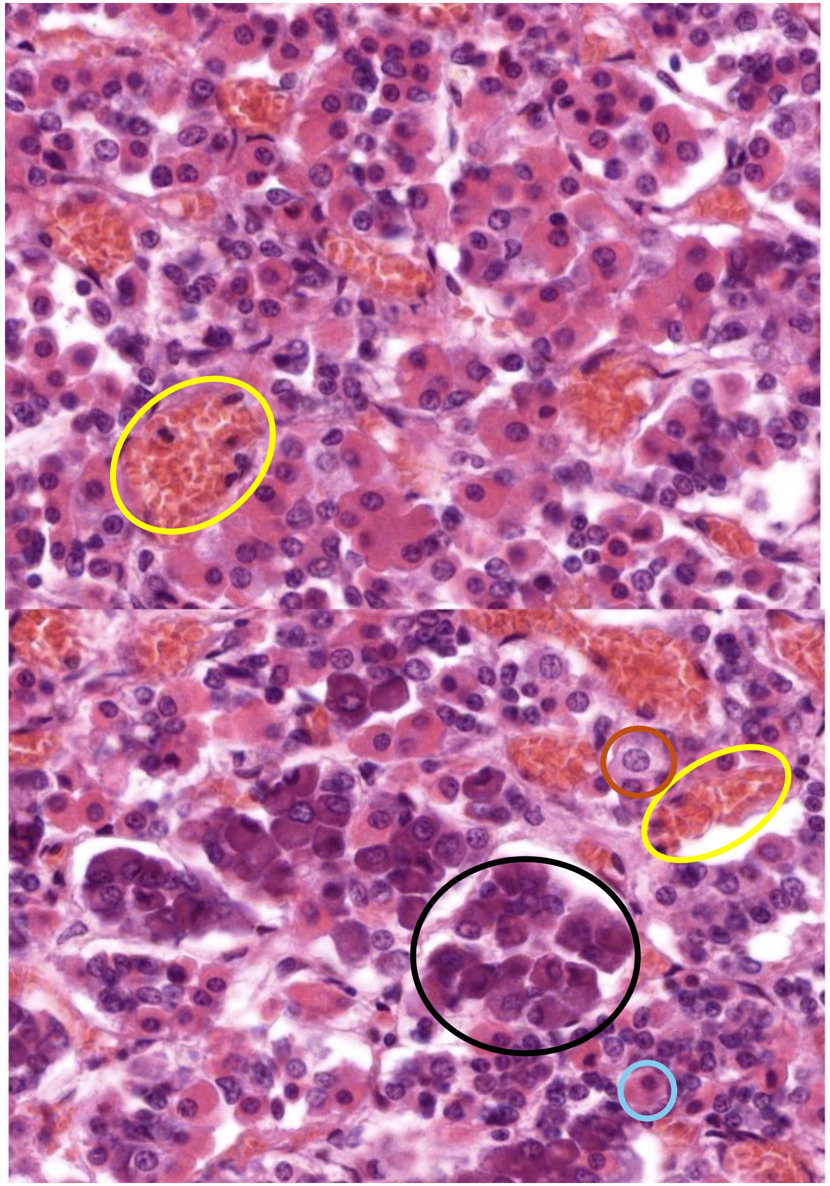
Hypothalamic hormones/Adenohypophysis

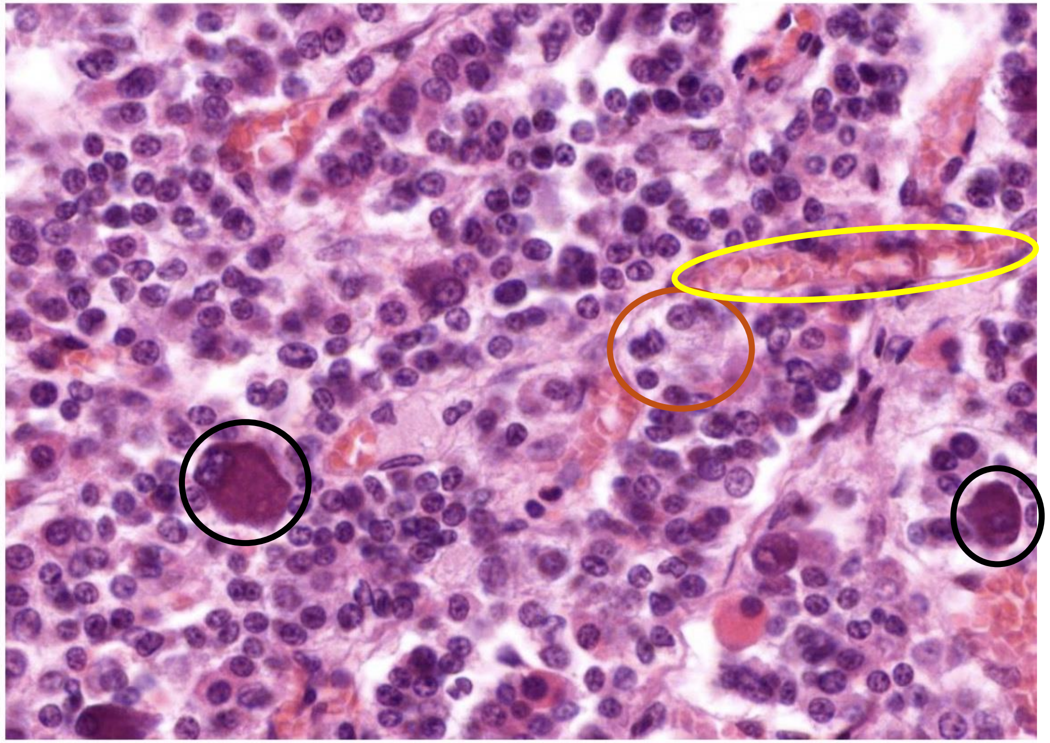
Hormone	Chemical Form	Functions
Thyrotropin-releasing hormone (TRH)	3-amino acid peptide	Stimulates release of thyrotropin (TSH)
Gonadotropin-releasing hormone (GnRH)	10-amino acid peptide	Stimulates the release of both follicle-stimulating hormone (FSH) and luteinizing hormone (LH)
Somatostatin	14-amino acid peptide	Inhibits release of both somatotropin (GH) and TSH
Growth hormone-releasing hormone (GHRH)	40- or 44-amino acid polypeptides (2 forms)	Stimulates release of GH
Dopamine	Modified amino acid	Inhibits release of prolactin (PRL)
Corticotropin-releasing	41-amino acid polypeptide	Stimulates synthesis of pro-opiomelanocortin (POMC) and release of both β-lipotropic

Hypothalamic hormones/ Neurohypophysis

Hormone	Function
Vasopressin/antidiuretic hormone (ADH)	Increases water permeability of renal collecting ducts
Oxytocin	Stimulates contraction of mammary gland myoepithelial cells and uterine smooth muscle

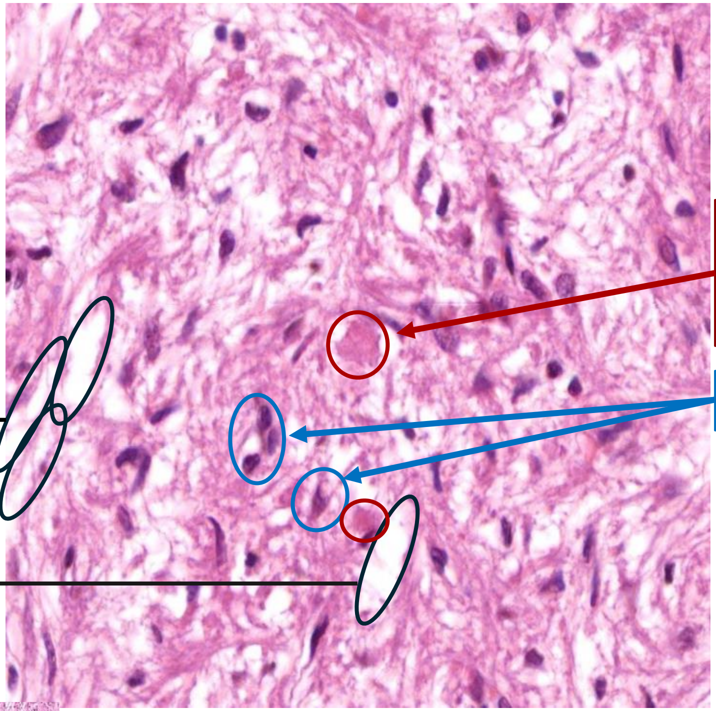
Chromophils and chromophobes

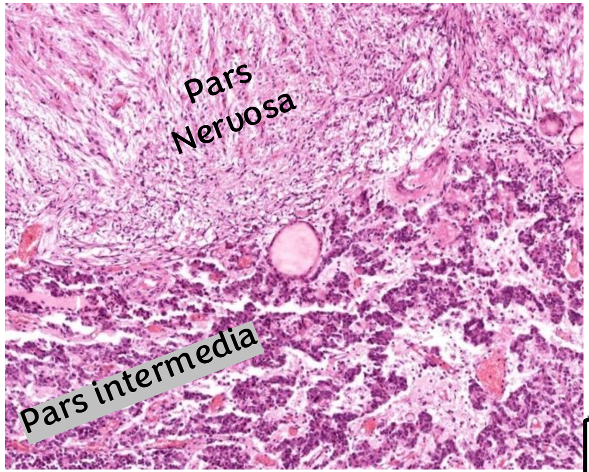


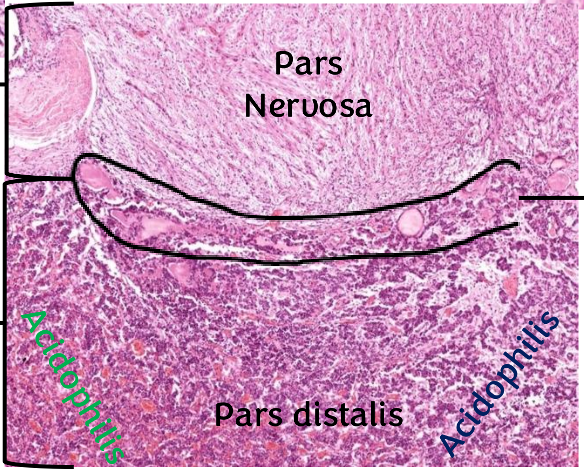


Yellow = Capillaries
Black = basophils
Blue = Acidophilis
Orange = Chromophobes

Prs intermedia pars nervousa







Neurohypophysis (Posterior)

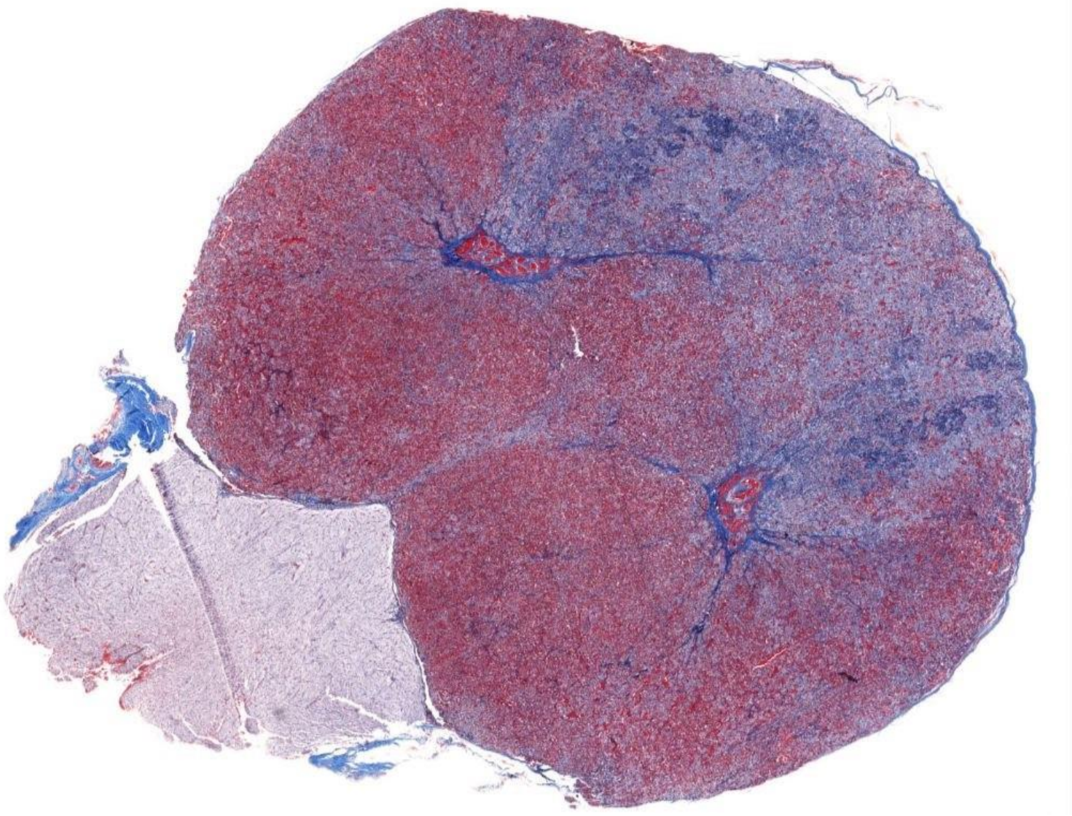
Distal is + Intermedia = Adenohypophysis (Anterior)

Pars intermedia
Most of the cells are basophils (corticotrophs).

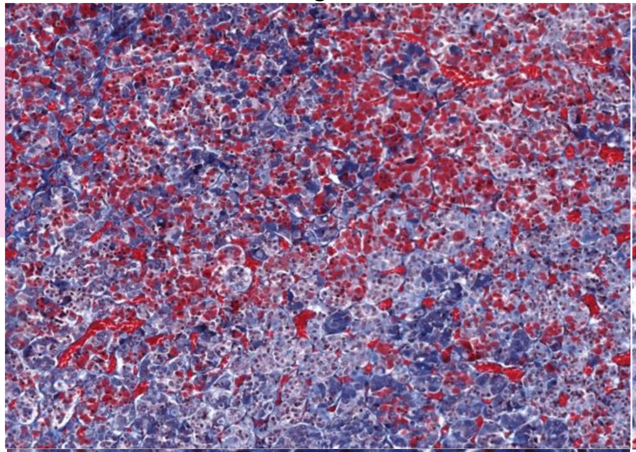
Not Required :)

AZAN staining

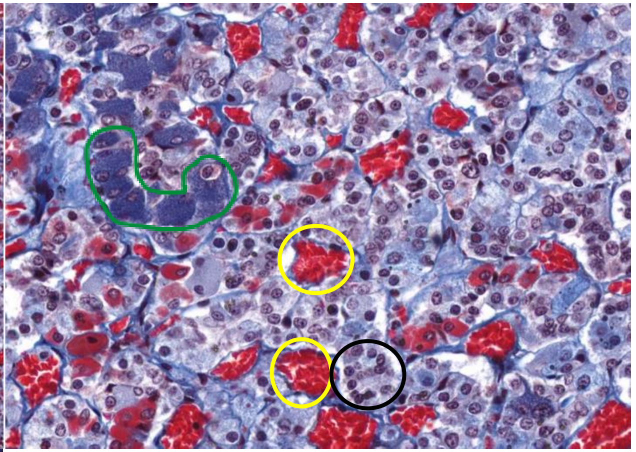
- Azocarmine: colors the nuclei red
- Aniline blue: stain collagen or mucin.
- Orange g: colors the cytoplasm

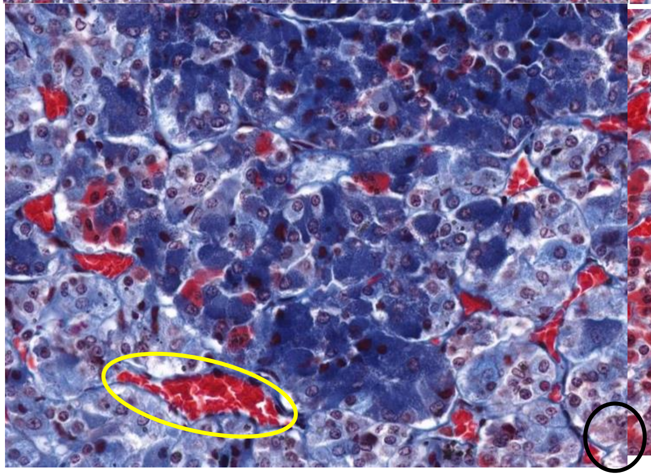


Lower magnification

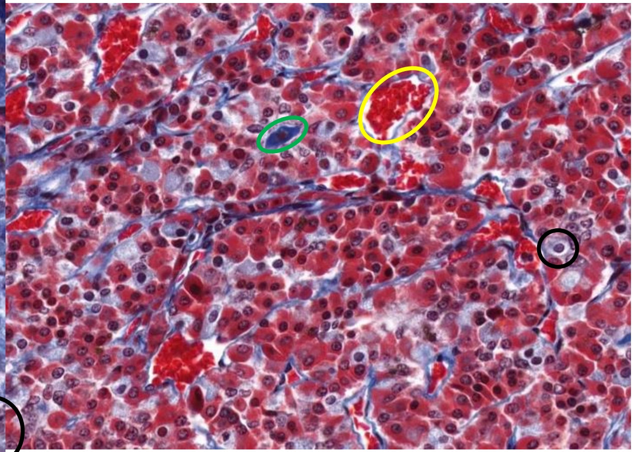


Higher magnification





Higher magnification



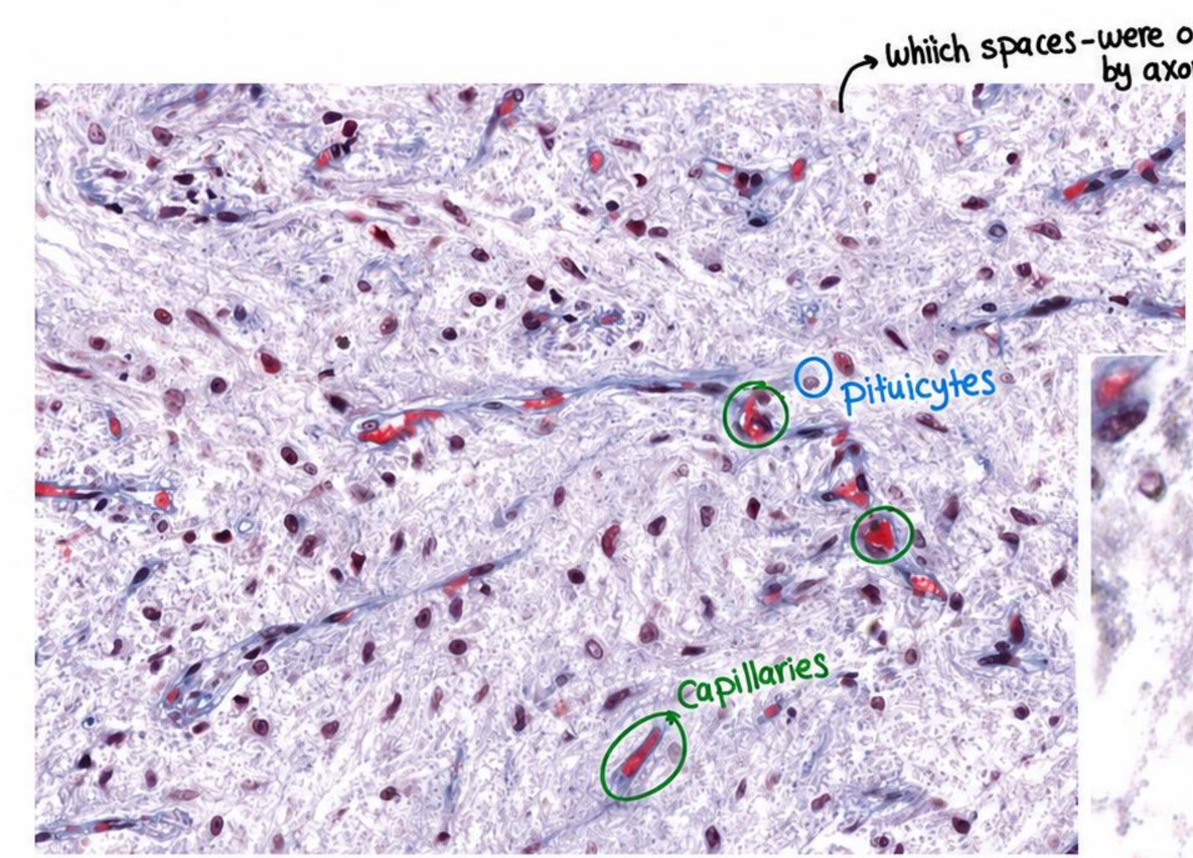
Higher magnification

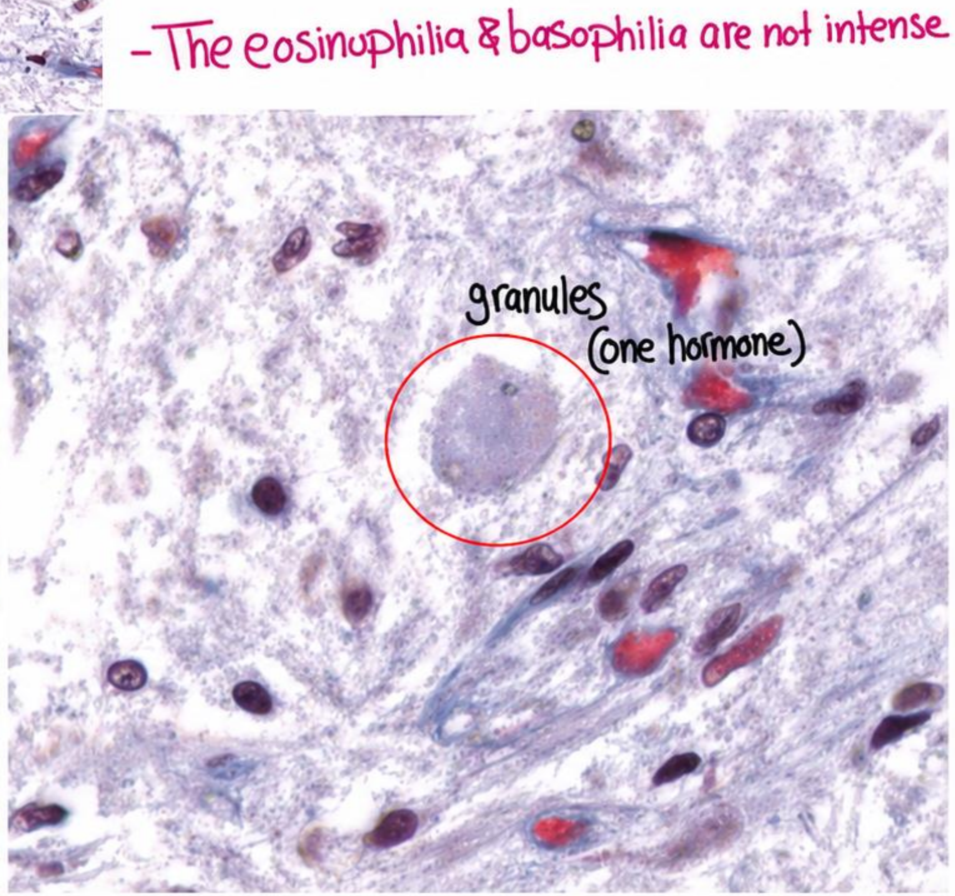
Azan satin

- Dark red=acidophils.
- Dark blue: basophils.
- Light blue: chromophobes.

Yellow = Capillaries
Black = chromophopes
Green = Basophili
Red = Either RBC (if inside capillary or Acidophilis

Pars nervousa
Azan





رسالة من الفريق العلمي:

قال الشيخ ابن عثيمين رحمه الله:
"بين النبي عليه الصلاة والسلام في هذه الجملة أن الأمة لو اجتمعت كلها علي أن ينفعوك بشيء، لم ينفعوك إلا بشيء قد كتبه الله لك، فإذا وقع منهم نفع لك، فاعلم أنه من الله، لأنه هو الذي كتبه، فلم يقل النبي صلي الله عليه وسلم :لو اجتمعت على أن ينفعوك بشيء لم ينفعوك ؛ بل قال :لم ينفعوك إلا بشيء قد كتبه الله لك.
فالناس بلا شك ينفع بعضهم بعضا، ويعين بعضهم بعضا، ويساعد بعضهم بعضا، لكن كل هذا مما كتبه الله للإنسان، فالفضل فيه أولا لله عز وجل، هو الذي سخر لك من ينفعك ويحسن إليك ويزيل كربتك .
وكذلك بالعكس، لو اجتمعوا علي أن يضروك بشيء، لم يضروك إلا بشيء قد كتبه الله عليك.
والإيمان بهذا يستلزم أن يكون الإنسان متعلقا بربه، ومتكلا عليه، لا يهتم بأحد، لأنه يعلم أنه لو اجتمع كل الخلق علي أن يضروه بشيء، لم يضروه إلا بشيء قد كتبه الله عليه؛ وحينئذ يعلق رجاءه بالله ويعتصم به، ولا يهمه الخلق ولو اجتمعوا عليه .
ولهذا نجد الناس في سلف هذه الأمة لما اعتمدوا علي الله وتوكلوا عليه، لم يضرهم كيد الكائدين، ولا حسد الحاسدين :وَإِنْ تَصْبِرُوا وَتَتَّقُوا لا يَضُرُّكُمْ كَيْدُهُمْ شَيْئاً إِنَّ اللَّهَ بِمَا يَعْمَلُونَ مُحِيطٌ آل عمران " .120/انتهى من "شرح رياض الصالحين".

الفصل الصيفي جريمة بحق الإنسانية!

For any feedback, scan the code or click on it.

Corrections from previous versions:

Versions	Slide # and Place of Error	Before Correction	After Correction
V0 → V1	31	Pars distalis (down) and nervousa (up)	Pars distalis (up) and nervousa (down)
	35 (black circle)	Pars nervousa	Pars intermedia
V1 → V2			