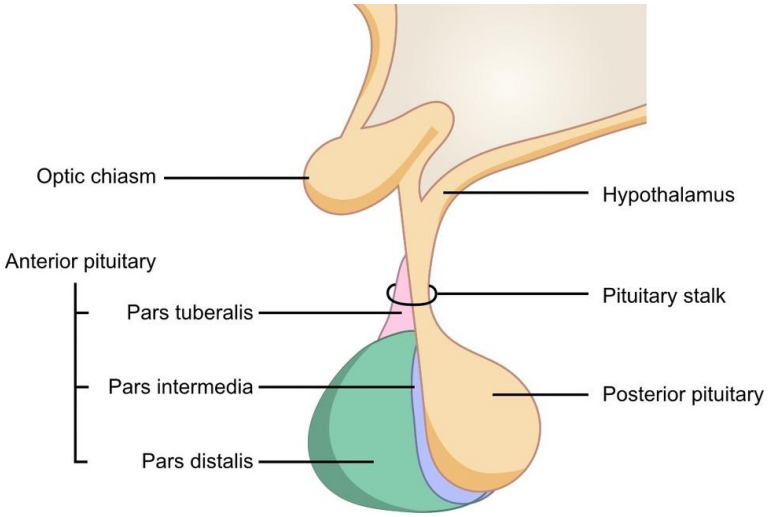
Anatomy & Development of the pituitary gland

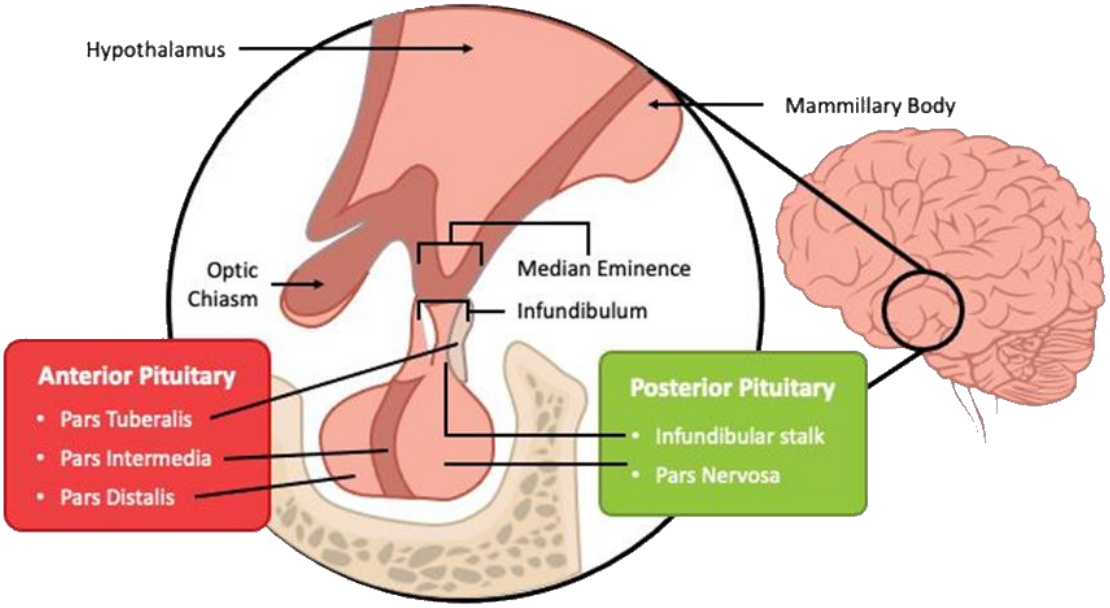
Anatomy of the pituitary gland

- *The pituitary gland is an* **endocrine** *gland that works to maintain cellular* ***homeostasis*** *in the body by the release of different hormones.*
- *The pituitary gland is also called the* ***master gland*** *as it regulates the other endocrine glands.*
- ***Regulated by*** *the secretions of the* ***hypothalamus***.



- *The pituitary gland is* ***attached to the hypothalamus*** *of the forebrain by a single stalk called the* ***infundibulum***.
- *The term 'pituitary' is derived from the Latin term 'pituita', meaning phlegm or slime.*
- *The gland is present* ***posterior and superior to the sphenoidal sinus*** *in the depression called the* ***Sella turcica***.

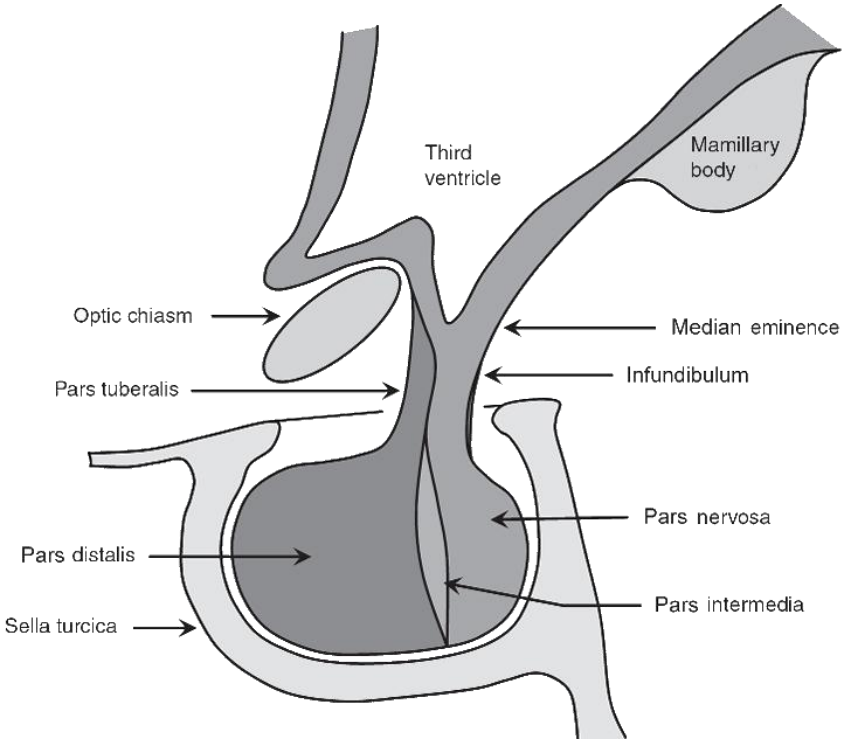
Site	***Hypophyseal fossa (Sella turcica)*** *covered by* ***Diaphragma Sella*** *(Dural fold).*
Shape & Size	*- Oval (12mm x 8mm)* *- Connected to the hypothalamus by* ***infundibulum***

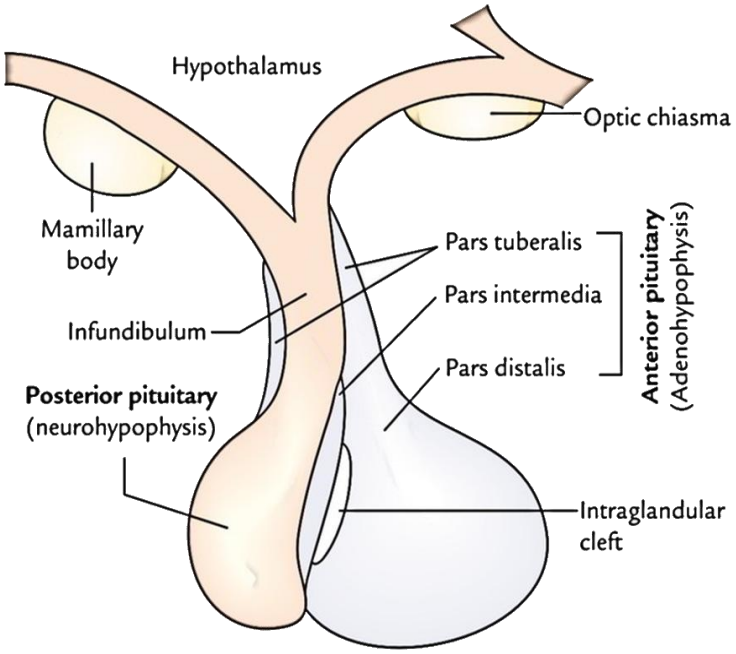


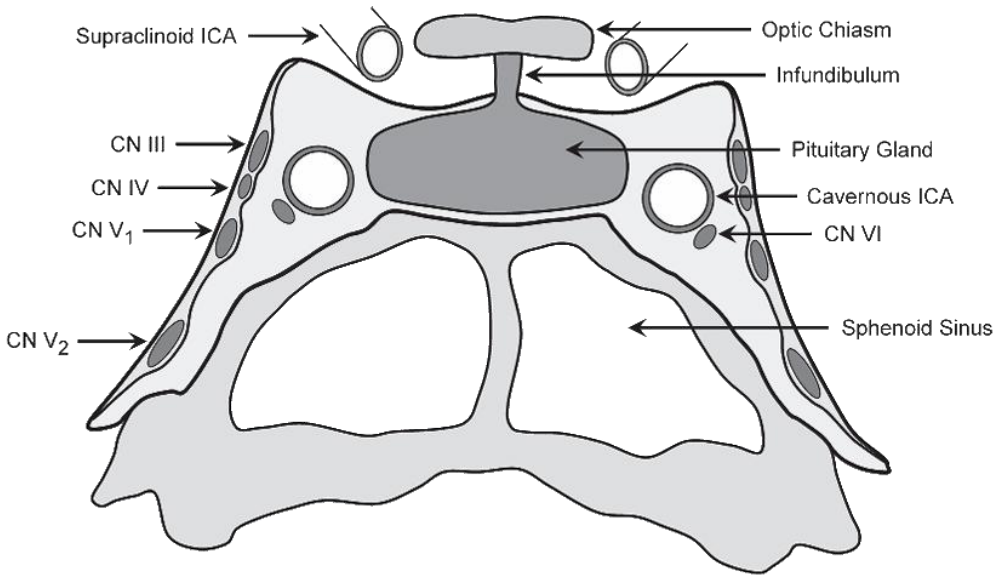
Lobes of pituitary gland

- *It is composed of two lobes.*

Anterior lobe (Adenohypophysis)	**Pars Tuberalis**	Upwards in front of the infundibulum
	Pars Intermedia	At the back of the cleft
	Pars Distalis	In front of the cleft
Posterior Lobe (Neurohypophysis)	- Small and lies at the back of the anterior lobe - Connected with the hypothalamus by the infundibulum (stalk) - The **stalk pierces** the **central part** of Diaphragma Sellae - Its lower end is called pars nervosa	

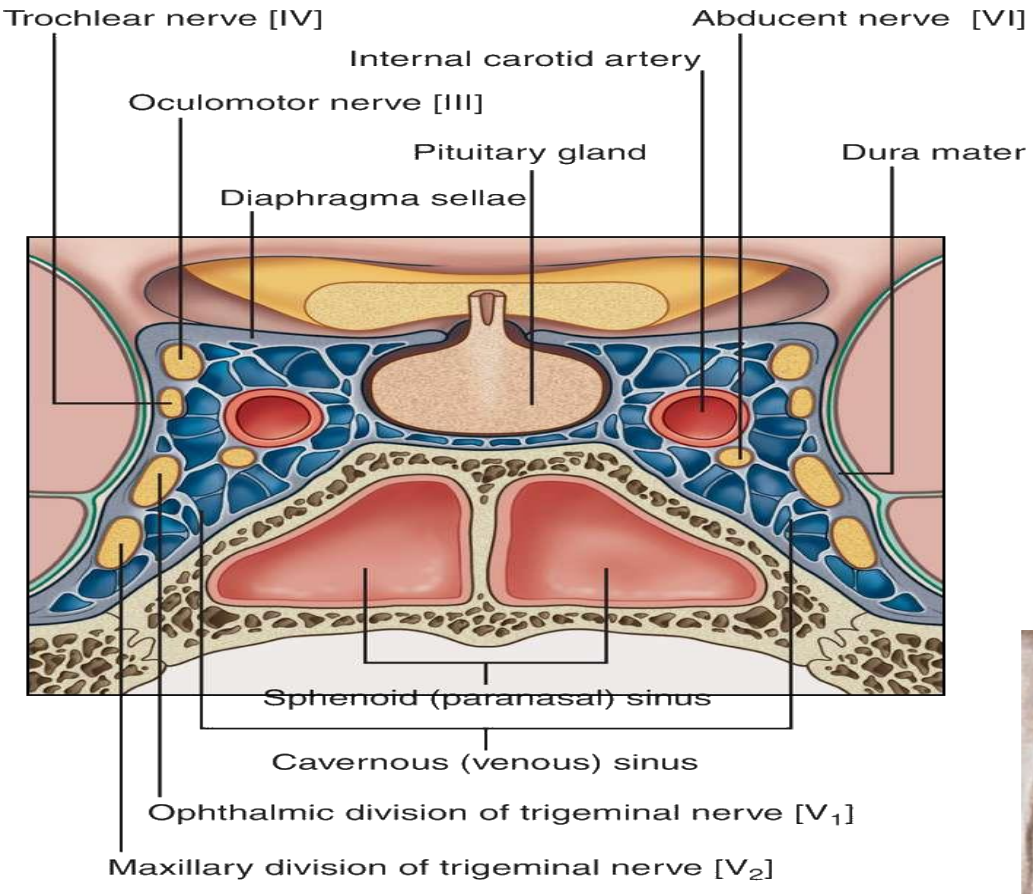


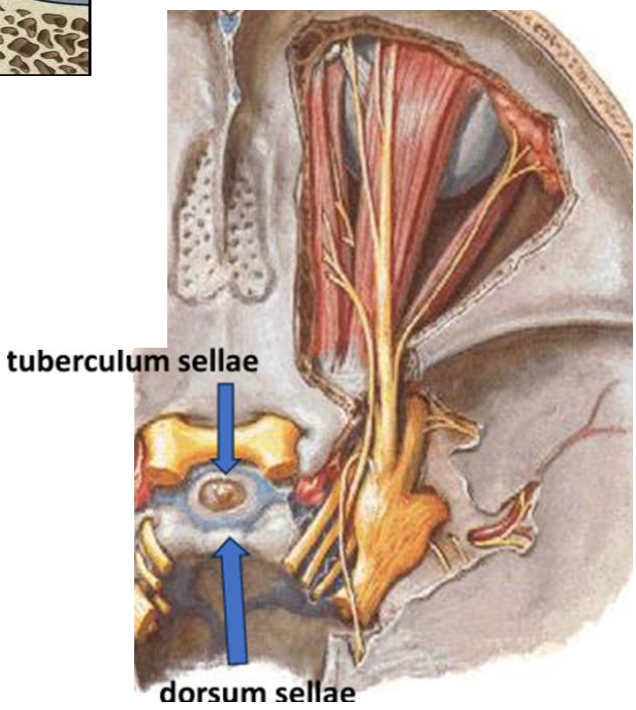




Relations of the pituitary gland

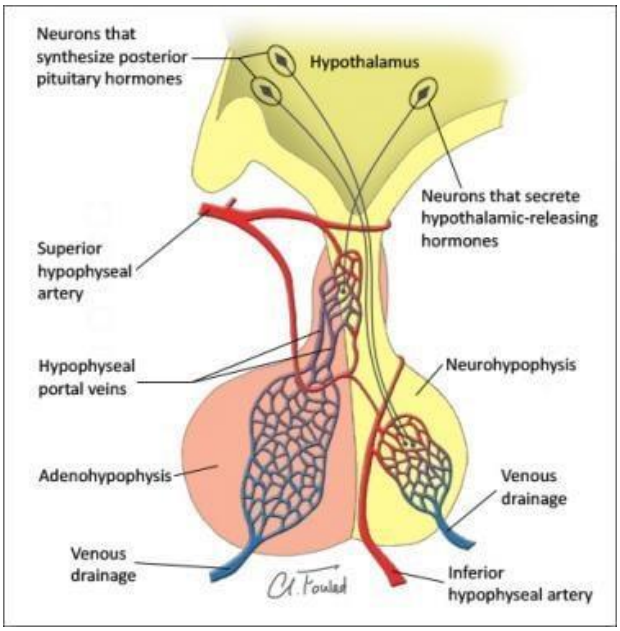
Superiorly	Diaphragma sellae separating it from the Optic chiasma		
Inferiorly	Body of the sphenoid & sphenoidal air sinuses, separating it from the nasopharynx.		
Laterally	Cavernous sinus contents:	Lateral wall	CN III, CN IV, CN V1 & V2
		Floor	Internal carotid artery (ICA) & CN VI
Anteriorly	tuberculum sellae (separating it from the optic chiasma)		
Posteriorly	dorsum sellae (separating it from the pons)		

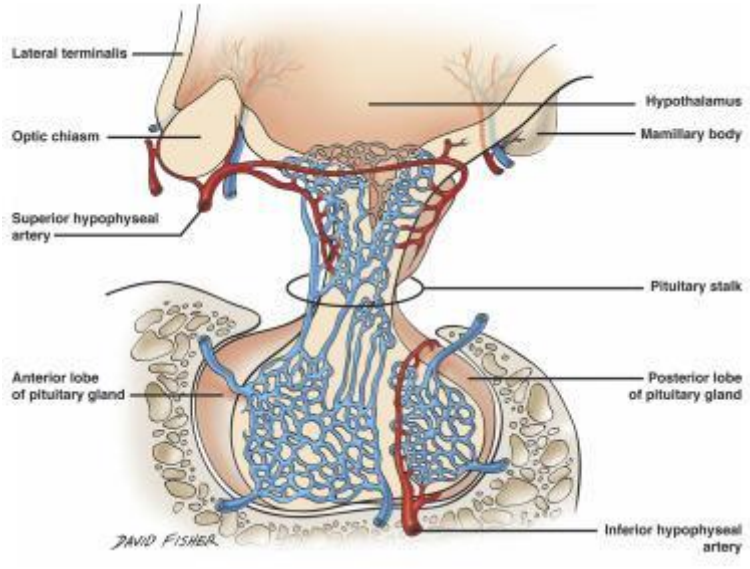




Blood supply of the pituitary gland

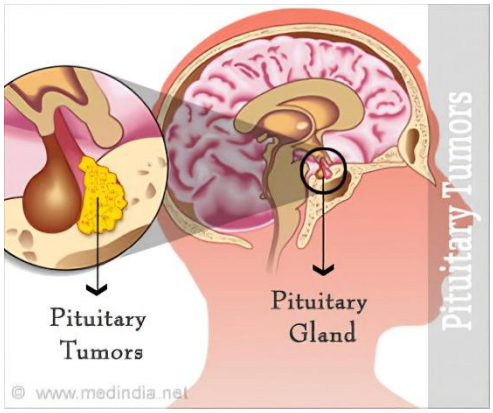
Arterial supply	Superior Hypophyseal artery	Origin	ICA
		Supplies	Anterior Lobe
	Inferior Hypophyseal artery	Origin	ICA
		Supplies	Posterior Lobe
Venous Drainage	Short veins drain in the surrounding venous sinuses (Cavernous & Intercavernous sinuses)		





Clinical note

- *Tumors of the pituitary gland tend to occlude the ICA and press the abducent nerve before affecting the other cranial nerve in the sinus.*
- *Surgical consideration:*
  - *A nonfunctioning adenoma only gets surgically resected when the tumor causes compression or mass effect to the adjacent structures like the optic chiasm causing bitemporal hemianopsia field defect.*
  - *Transsphenoidal surgery is a commonly chosen procedure for resection*



Development of the pituitary gland

Time	at the middle of the 4th week		
Sources	Two ectodermal sources	Adenohypophysis	Rathke`s pouch
		Neurohypophysis	Infundibulum

Adenohypophysis

- It is an ectodermal diverticulum (upgrowth), arises from the roof of the stomodeum.
- It ascends towards the floor of the diencephalon where it swells to form a vesicle.
- The stem connecting this vesicle to the roof of the stomodeum degenerates.
- The vesicle differentiates; forming the anterior lobe of pituitary gland (adenohypophysis), as follows:

Pars anterior (pars distalis)	is derived from the anterior wall of the vesicle
Pars intermedia	is derived from the posterior wall of the vesicle
Pars Tuberalis	an upward extension of the wall of the vesicle to surround the stalk of the infundibulum which descends from the diencephalon.

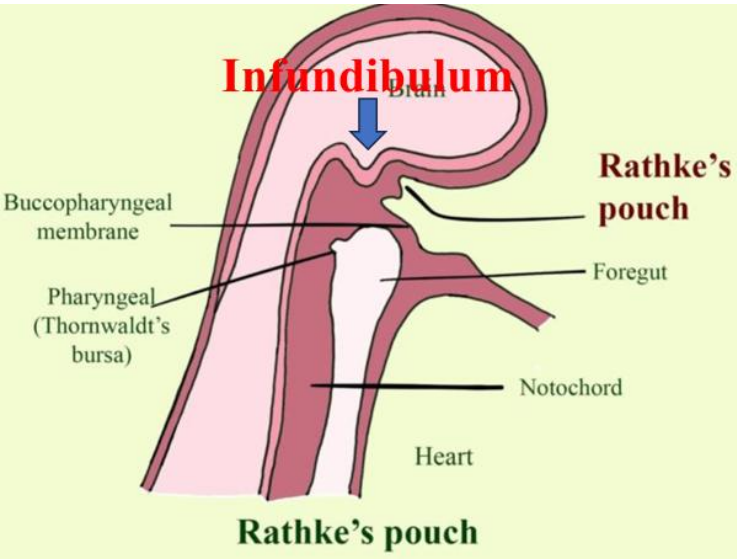
Neurohypophysis

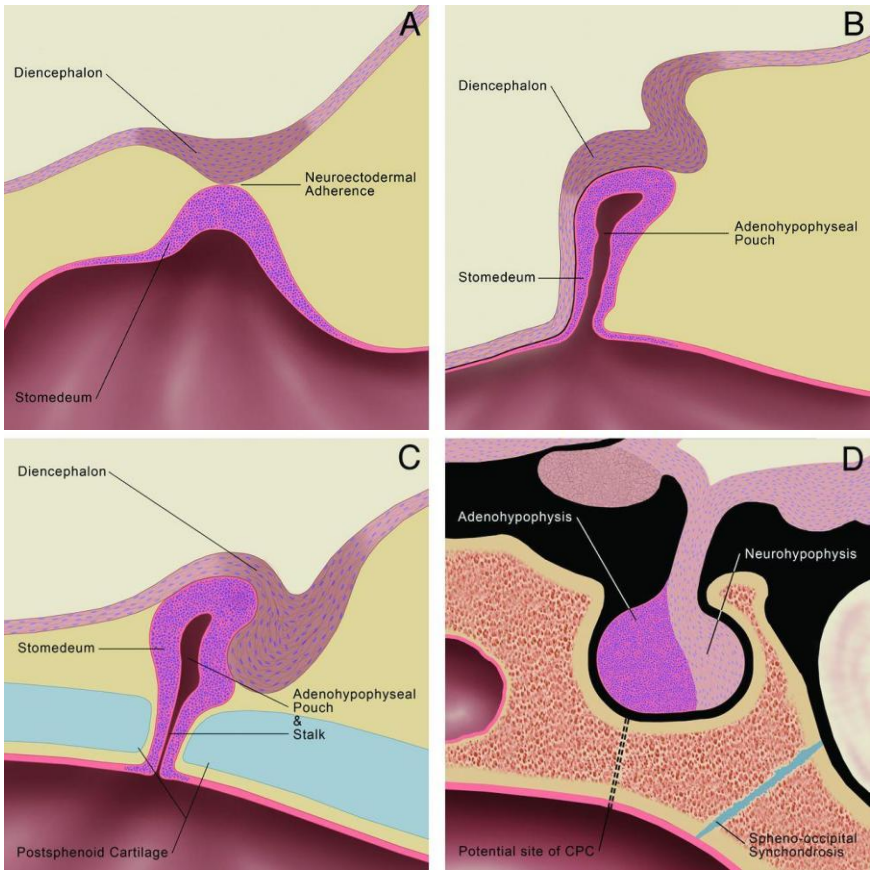
- It is an ectodermal diverticulum (downgrowth) which arises from the floor of the diencephalon (future hypothalamus).
- It descends caudal to the Rathke`s pouch and forms:

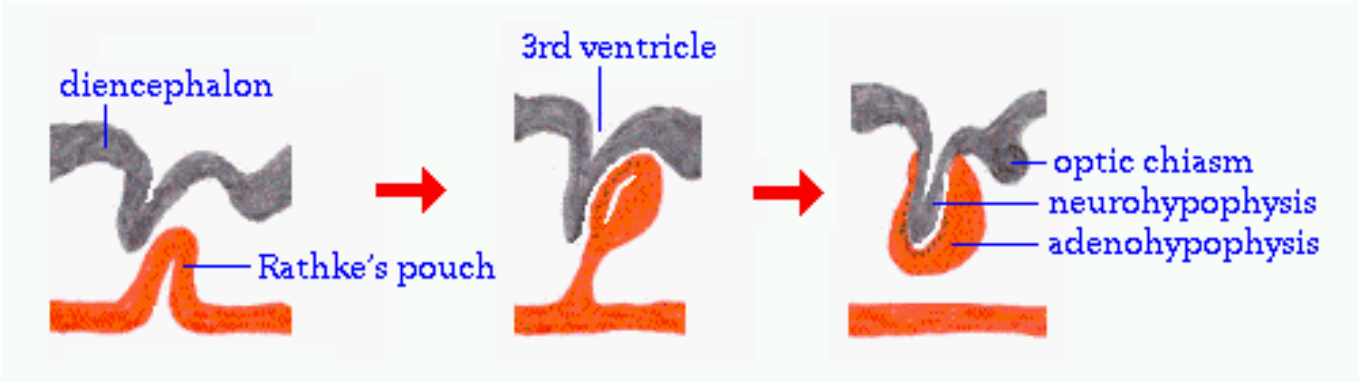
Infundibulum	the infundibular recess of the 3rd ventricle
Posterior lobe (Pars nervosa)	Contains the nerve cells and nerve fibers which belong to the nuclei of the hypothalamus.

Congenital anomalies of pituitary gland

Pharyngeal pituitary gland	Due to	persistence of a remnant of the stalk of Rathke`s pouch.
	Feature	accessory masses of the anterior lobe of the pituitary gland in the roof of oropharynx.
Aplasia & hypoplasia	Due to	Failure or incomplete development of the anterior wall of Rathke`s pouch.
	Feature	Hypofunction of pituitary gland.







- Quiz

1- Which of the following NOT share in the development of pituitary gland

A- Rathke`s pouch

B- Infundibulum

C- Roof of the stomodeum

D- Buccopharyngeal membrane

Answer: D

2- Which of the following NOT part of Rathke's pouch

A- Pars anterior

B- Pars intermedia

C- Pars Tuberalis

D- Infundibulum

Answer: D