



Anatomy of diencephalon & 3rd ventricle

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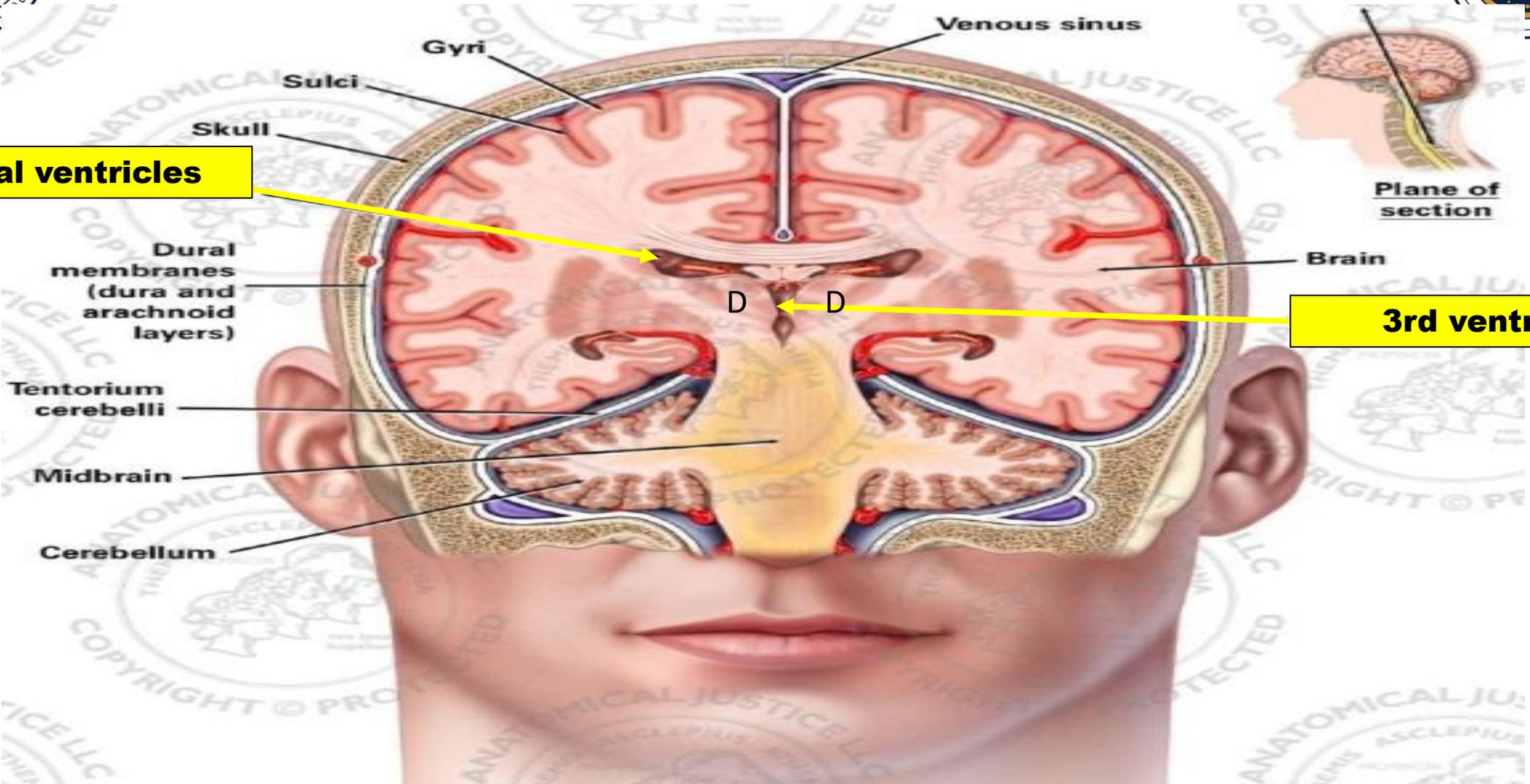
Intended Learning Outcomes (ILOs)

1. Compare between blood supply of thalamus and hypothalamus.
2. Identify parts and features of the diencephalon.
3. Recognize boundaries of 3rd ventricle.
4. Enumerate communications of 3rd ventricle.



Agenda

1. What is the blood supply of the diencephalon?
2. What are divisions of diencephalon?
3. What are the recesses of the 3rd ventricle ?
4. What are the boundaries of the 3rd ventricle?



Lateral ventricles

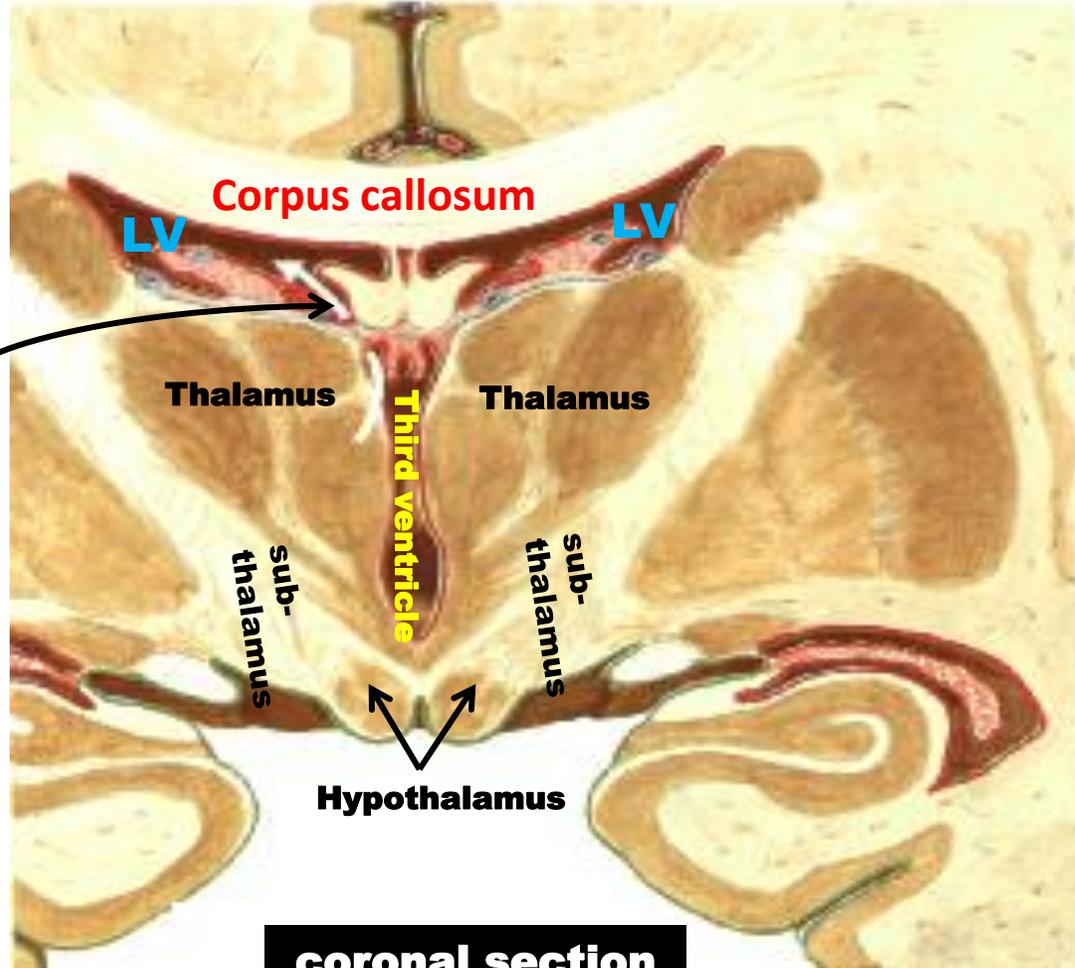
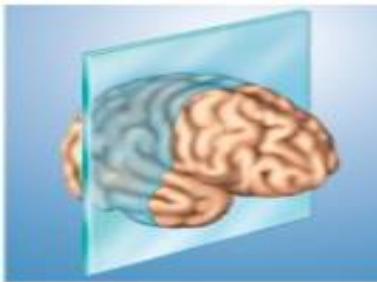
3rd ventricle

diencephalon

divisions :

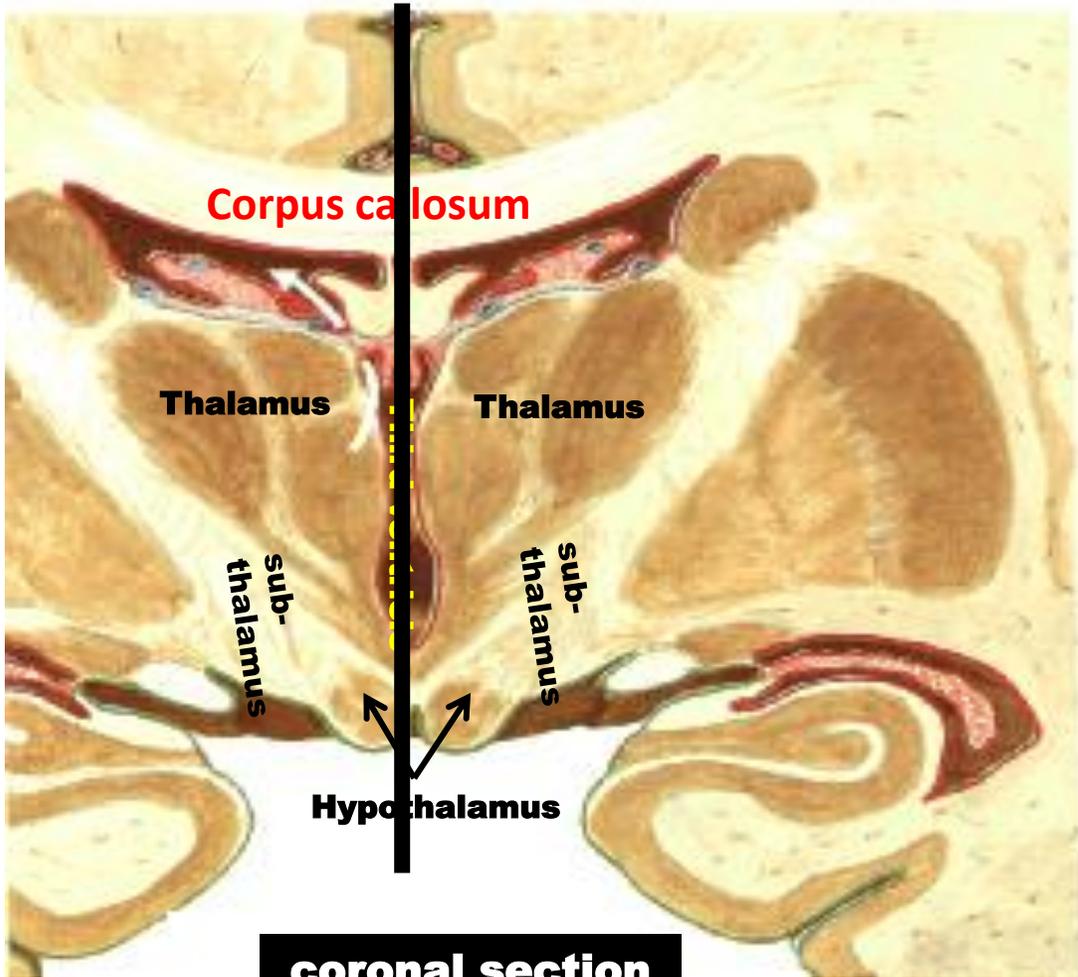
1. Thalamus
2. Hypothalamus
3. Epithalamus
4. Subthalamus

Interventricular F



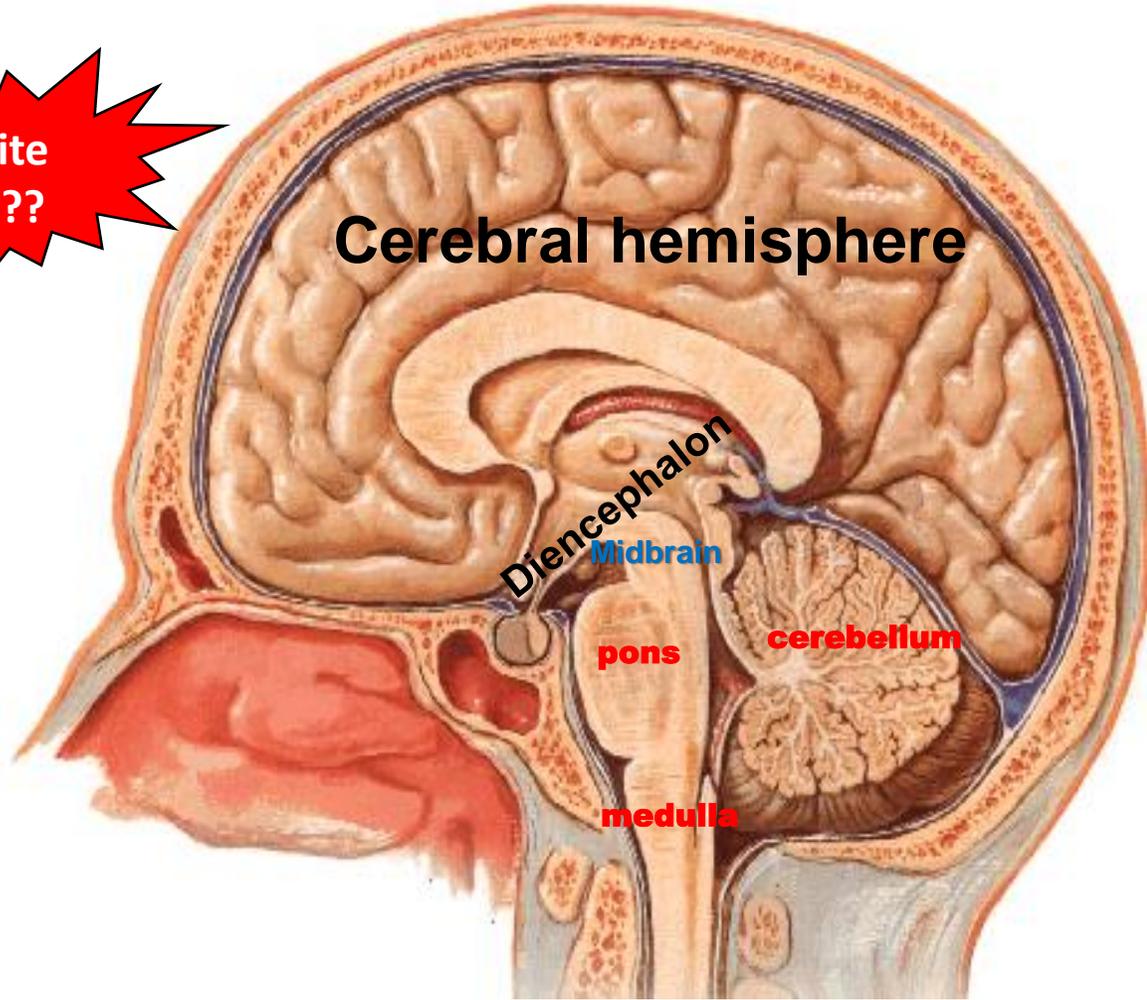
coronal section

diencephalon



coronal section

Site ???



diencephalon

Superiorly:

2) Body of the fornix

1) Tela choroidae of the 3rd ventricle

3) Lateral ventricle

Posteriorly:
called
Epithalamus

Boundaries :

Anteriorly:

2) Anterior commissure

1) Lamina terminalis

Inferiorly:

1) Optic chiasma

2) Tuber cinereum and Infundibulum of pituitary gland

3) Mamillary bodies

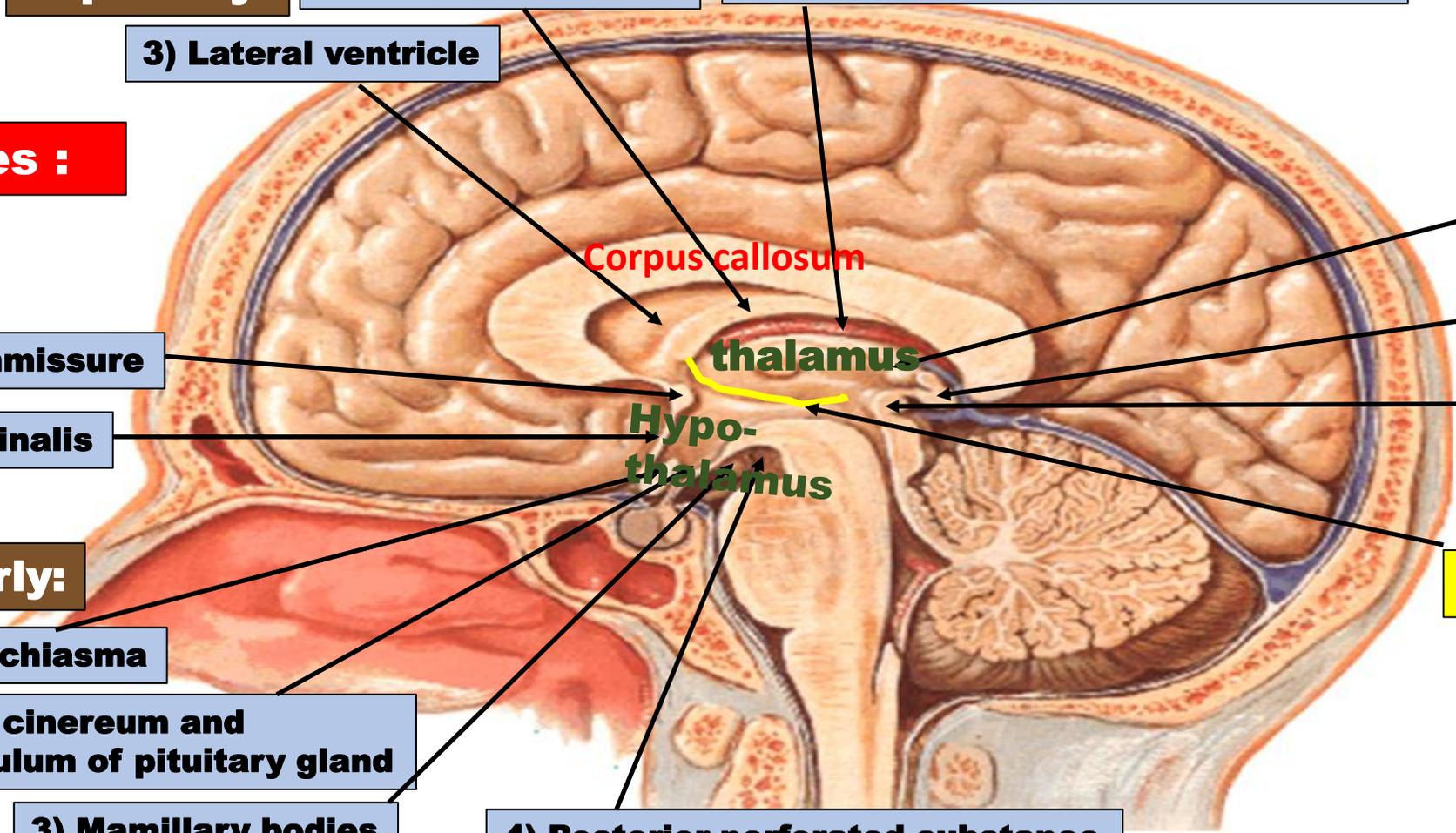
4) Posterior perforated substance

1) Habenular trigone

2) Pineal gland

3) Posterior commissure

hypothalamic sulcus



Sagittal section

diencephalon

Boundaries :

Anteriorly: lamina terminalis and anterior commissure.

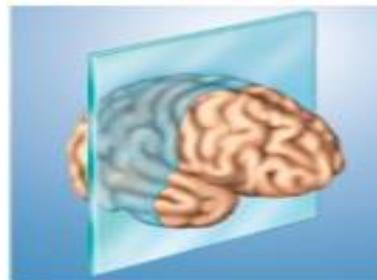
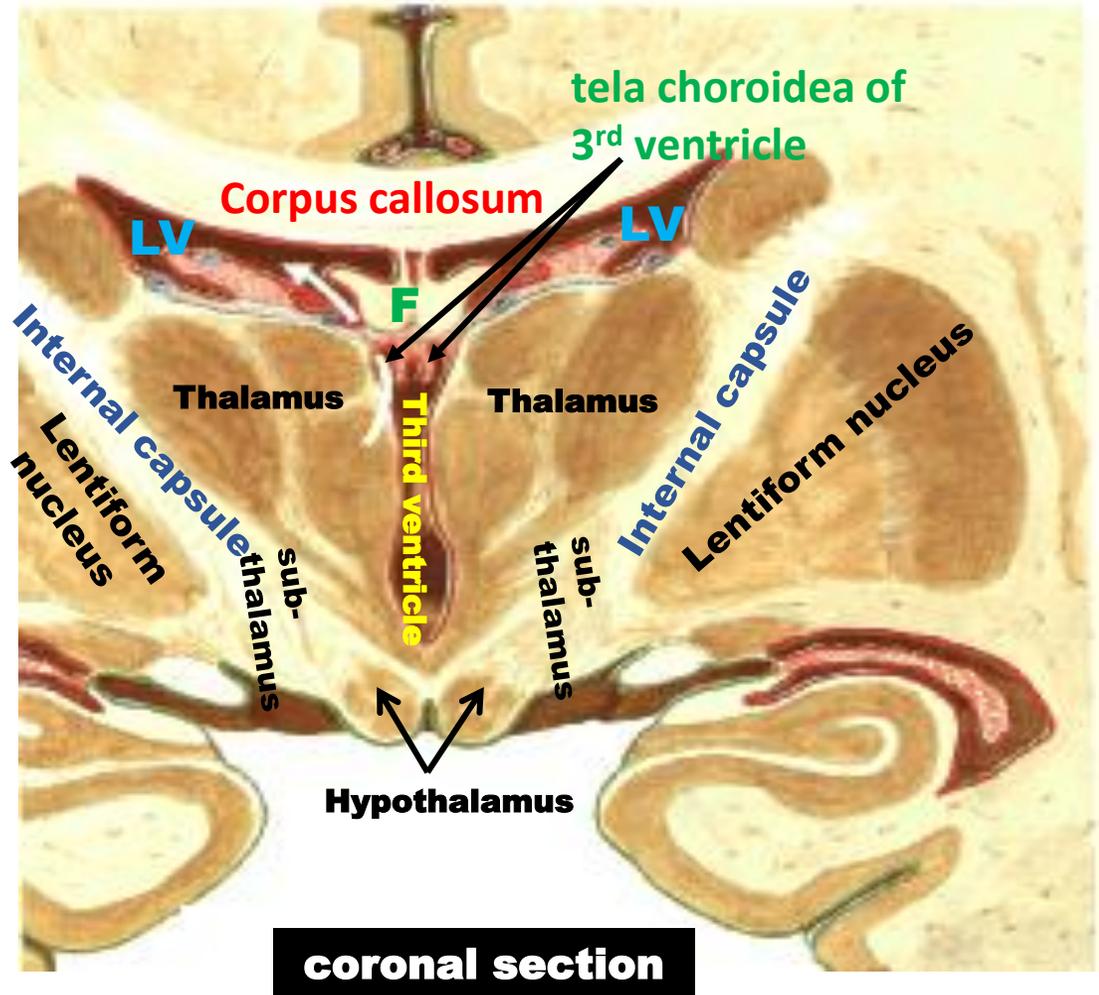
Posteriorly: posterior commissure, pineal gland and habenular trigone.

Superiorly: tela choroidea of the third ventricle, body of the fornix and lateral ventricle.

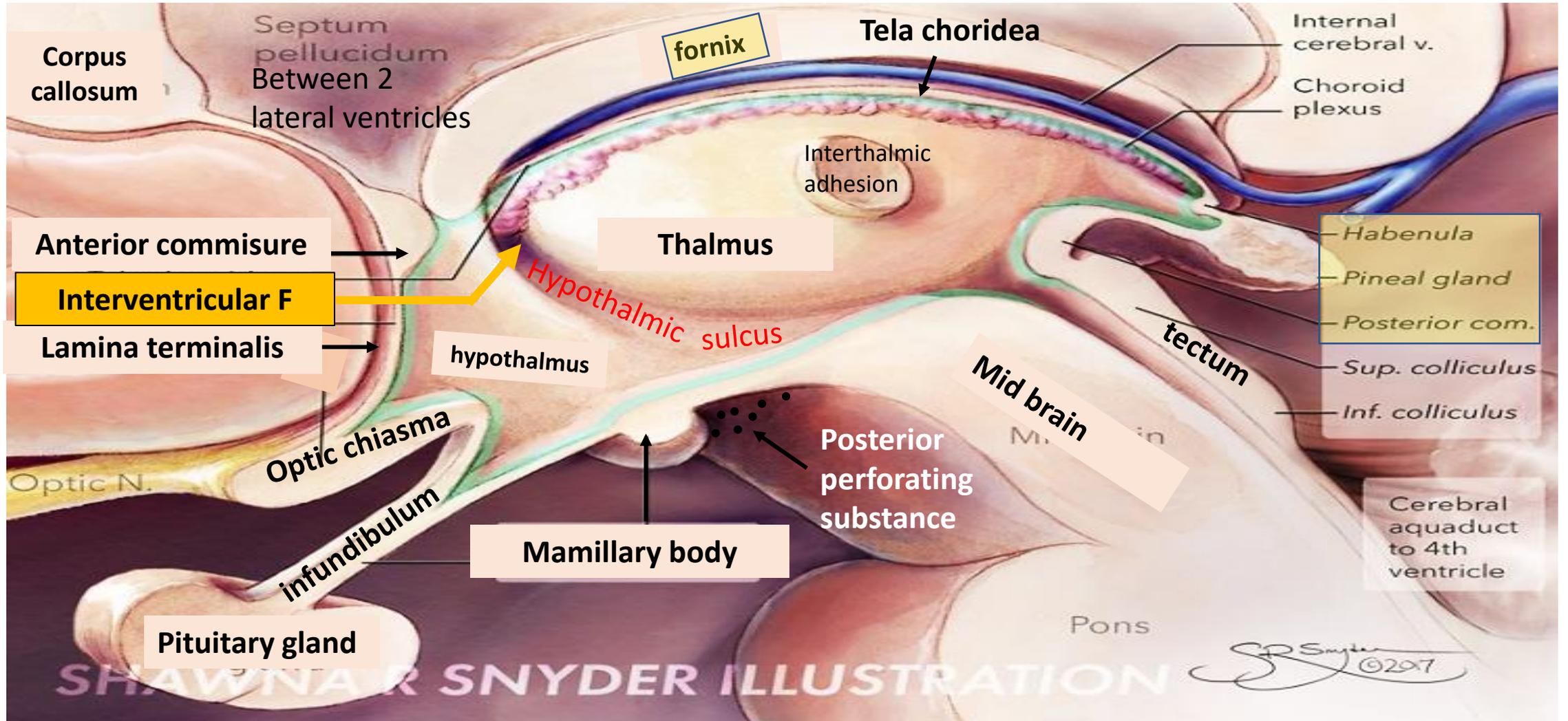
Inferiorly: optic chiasma, tuber cinereum & infundibulum, mamillary bodies and posterior perforated substance.

Medially: the 3rd ventricle.

Laterally: posterior limb of the internal capsule.



diencephalon



diencephalon

A) The thalamus

is the largest part (four-fifth) of the diencephalon.

It receives all sensations except **olfaction** and projects them to sensory areas of the brain.

- The thalamus has **two ends and four surfaces**:

Anterior end: is related to the interventricular foramen.

Posterior end: called **pulvinar** and is related superiorly to the splenium of the corpus callosum and inferiorly to the tectum of the midbrain.

Superior surface: is related to the tela choroidea, fornix and lateral ventricle.

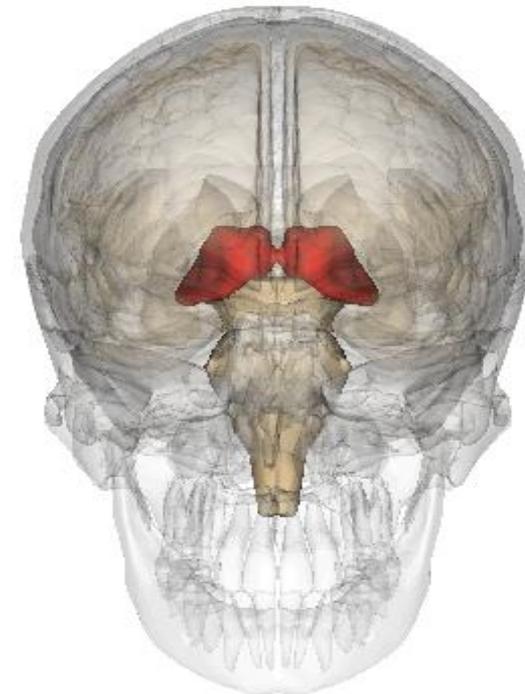
Inferior surface: is related to:

a) The hypothalamus and the subthalamus.

b) The **metathalamus** projects downward from the pulvinar and **It is formed of** the medial geniculate body & lateral geniculate body.

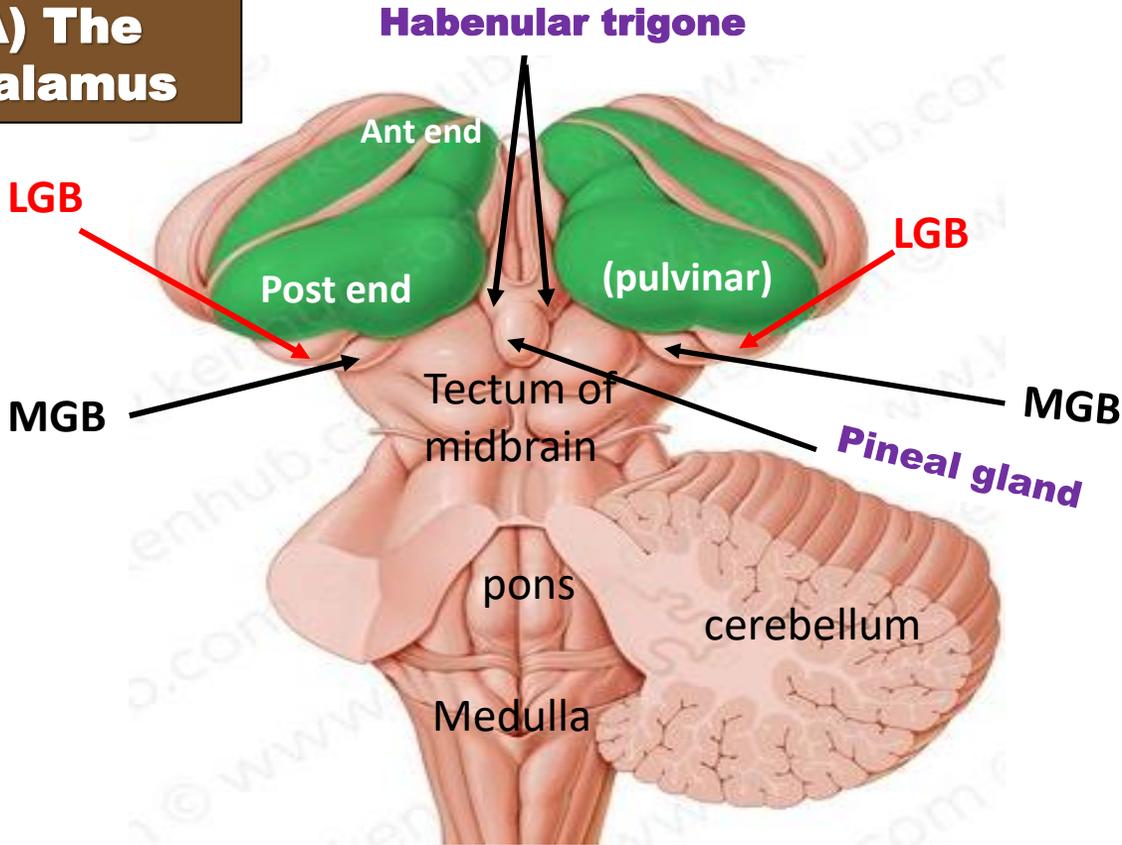
Medial surface: is related to the third ventricle. It is connected with the opposite one in 70% of humans by the interthalamic adhesion (massa intermedia).

Lateral surface: is related to the posterior limb of the internal capsule.

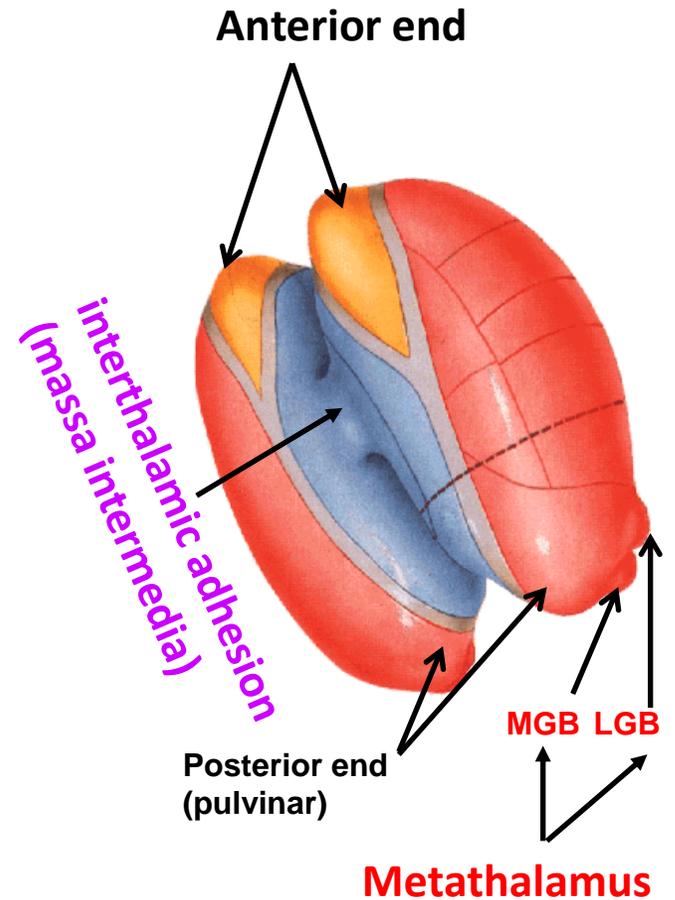


diencephalon

A) The thalamus

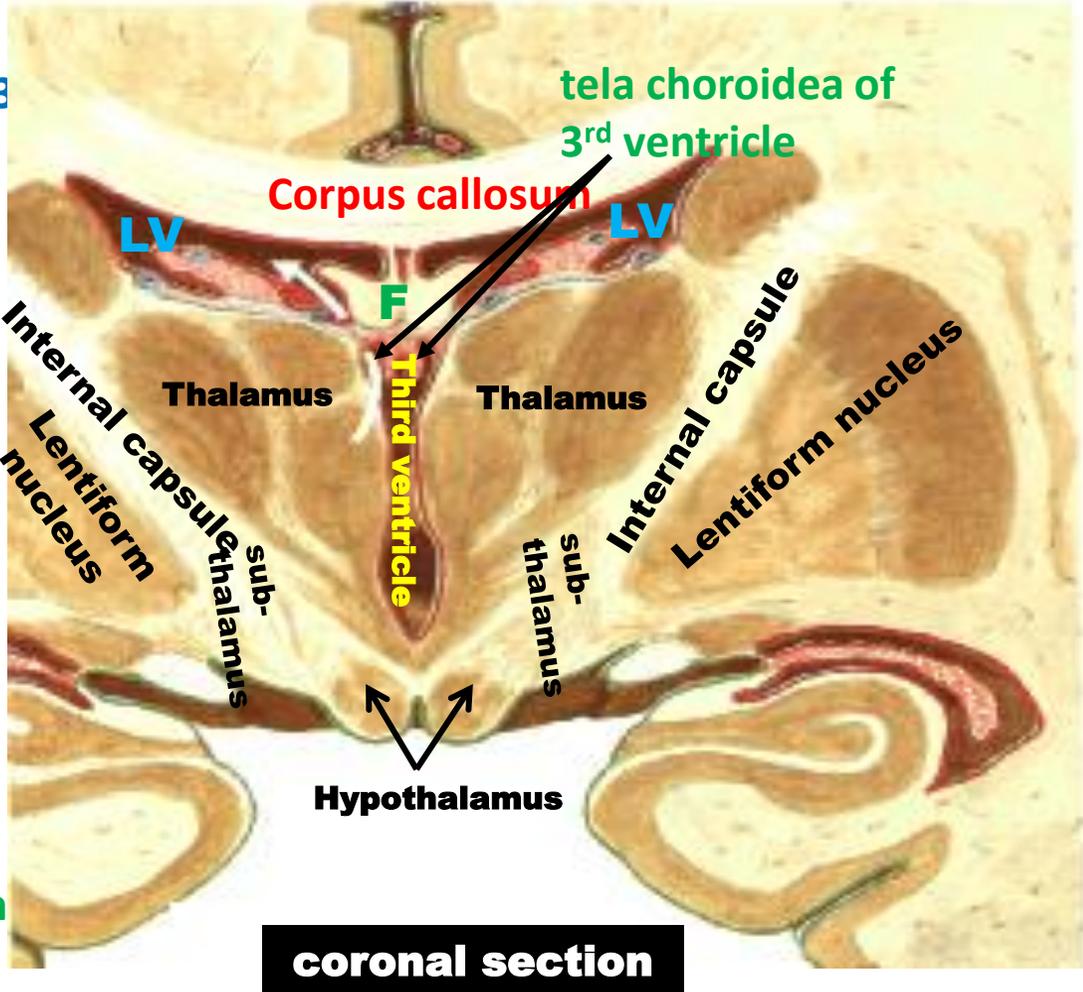
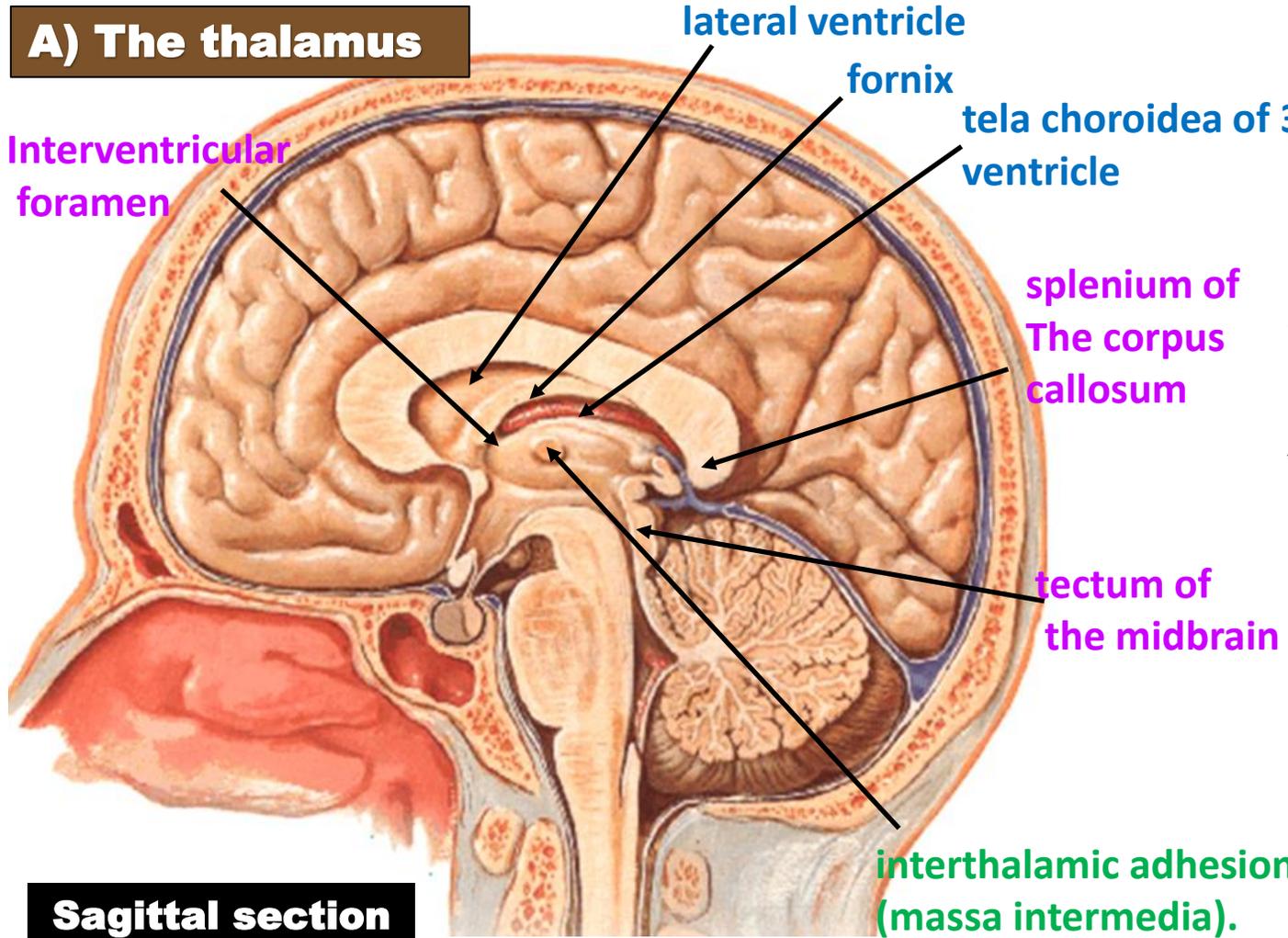


Posterior view



diencephalon

A) The thalamus

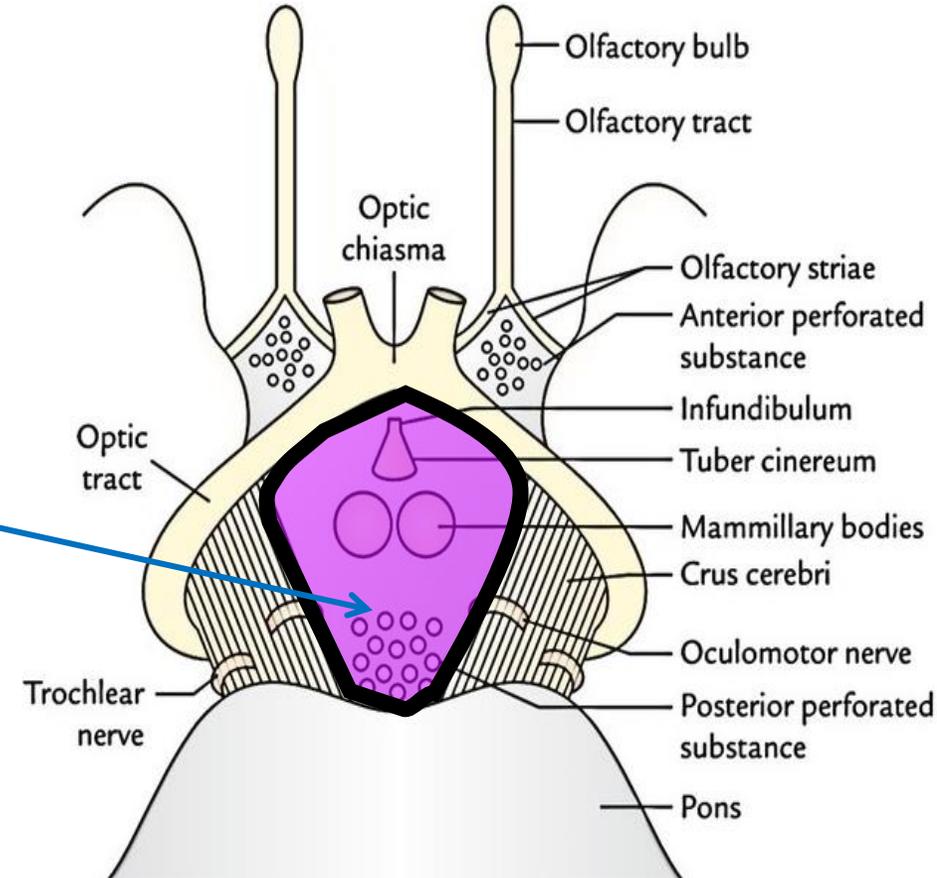
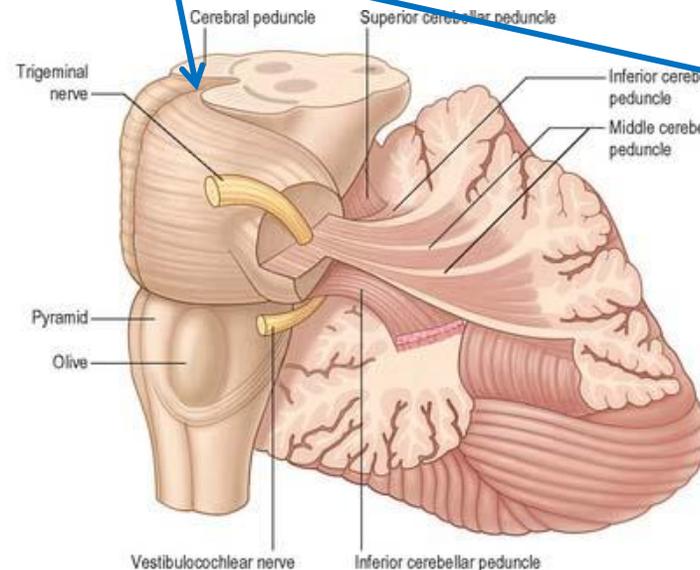
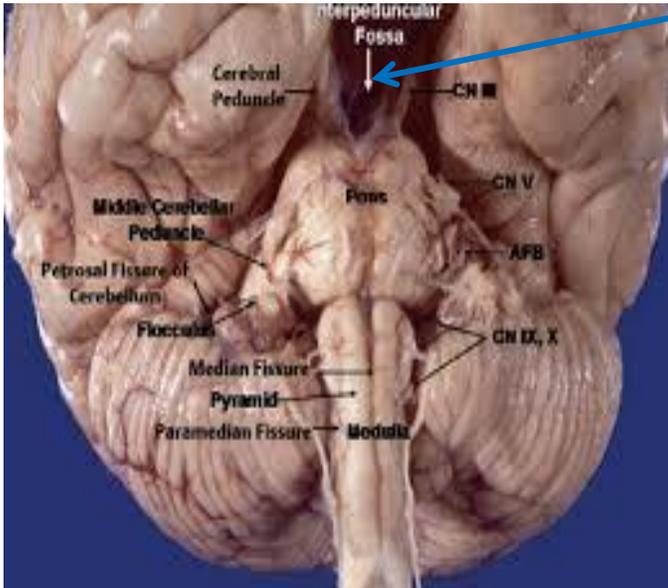


diencephalon

B) The hypo-thalamus

The hypothalamus is the principal autonomic and endocrine center

- **Related Anteriorly** to lamina terminalis and anterior commissure.
- **Related Superiorly** to the hypothalamic sulcus separating it from the thalamus.
- **Related Inferiorly** to the interpeduncular fossa.



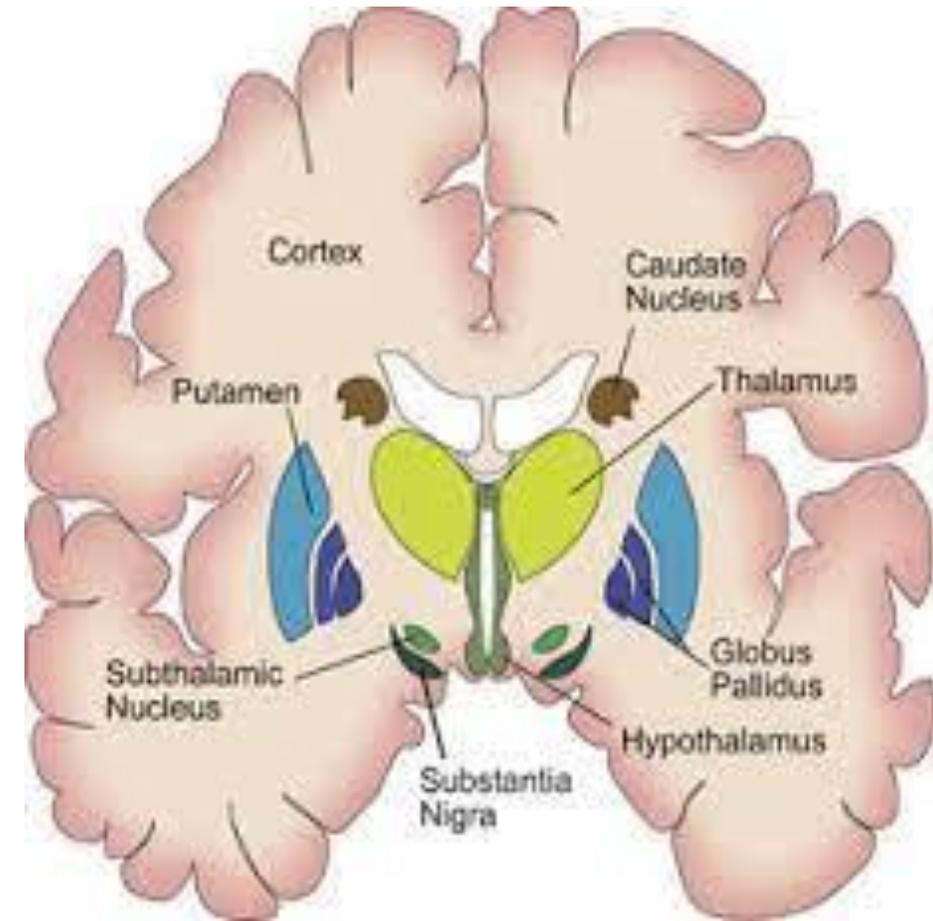
diencephalon

C) The sub-thalamus

It contains **subthalamic nucleus** (motor nucleus) which regulates movement of muscles.

Lesion in the subthalamic nucleus causes **hemiballismus** (involuntary movement).

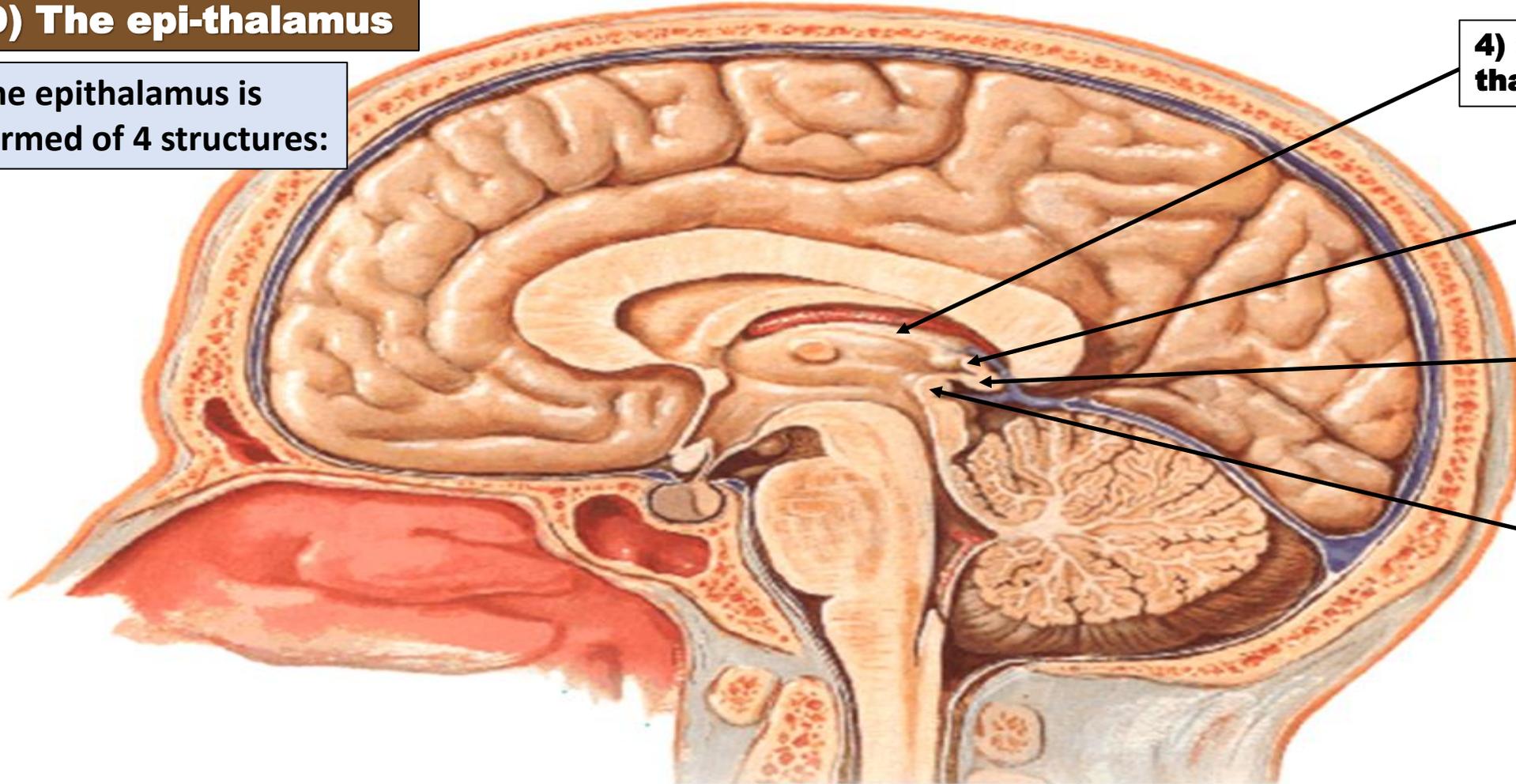
Site: it lies lateral to the hypothalamus between the thalamus and the midbrain.



diencephalon

D) The epi-thalamus

The epithalamus is formed of 4 structures:



4) Stria medullaris thalami:

3) Habenular trigone

2) Pineal gland

1) Posterior commissure

diencephalon

Blood supply :

Thalamus

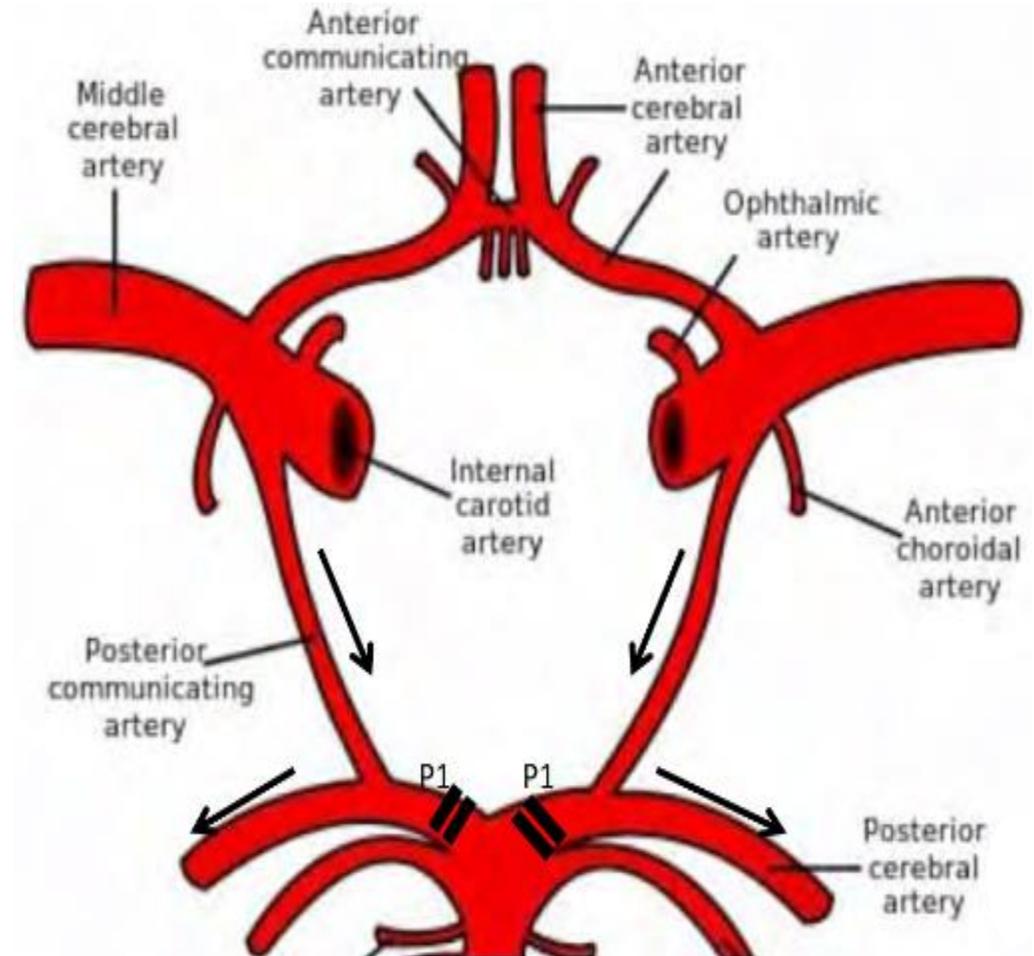
the main arterial supply is the posterior cerebral artery

- **Posterior cerebral artery:** from the basilar artery.
- **Posterior communicating artery:** from the internal carotid artery.
- **Anterior choroidal artery:** from the internal carotid artery to the lateral geniculate body

Hypo-thalamus

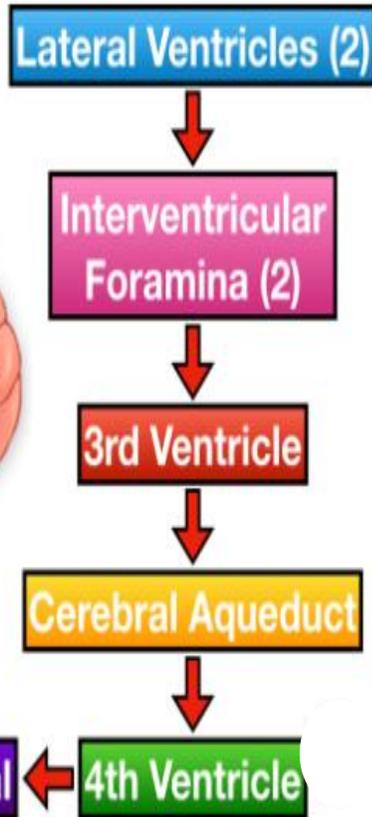
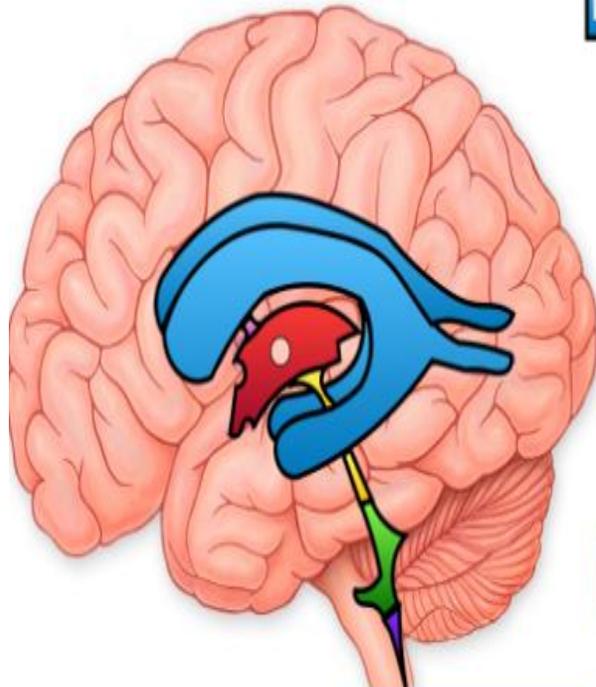
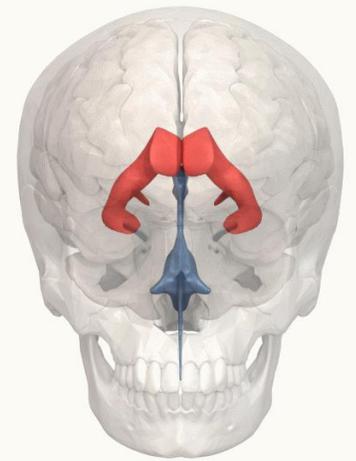
from circulus arteriosus

- **Anterior part:** Anterior cerebral & anterior communicating arteries.
- **Posterior part:** Posterior cerebral & posterior communicating arteries
- **Lateral part:** middle cerebral artery.



3rd ventricle

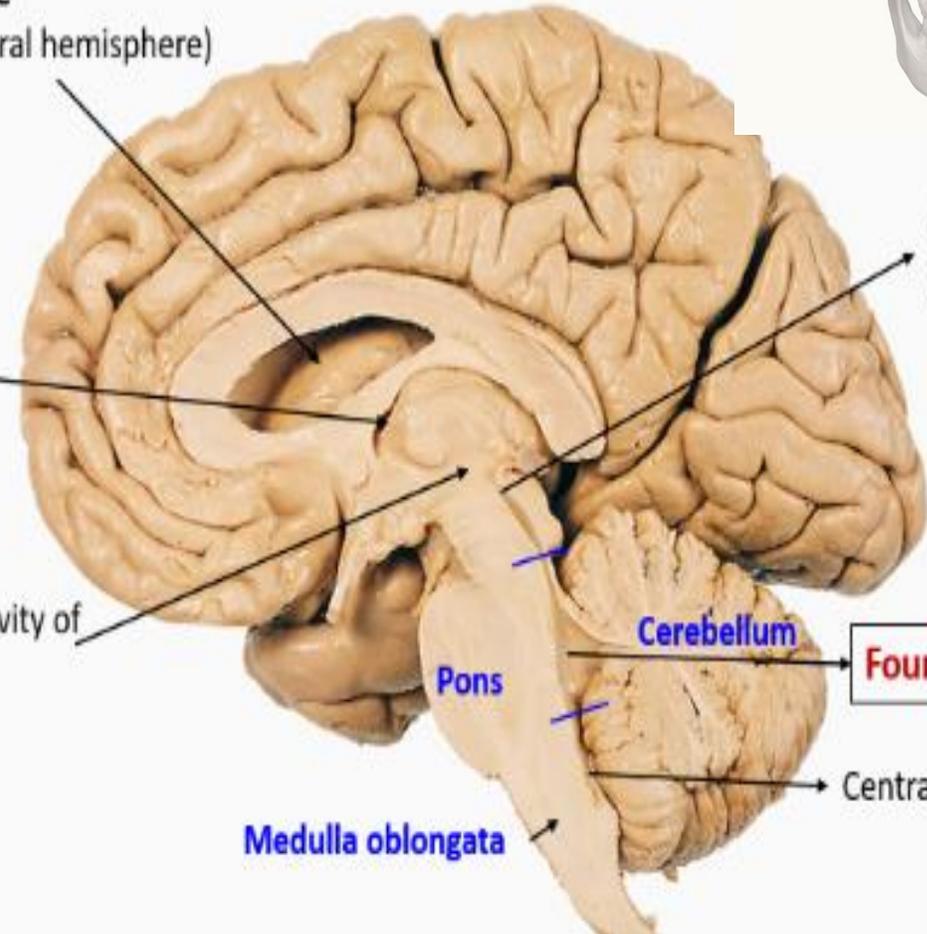
Definition: it is the cavity of the diencephalon



Lateral ventricle
(cavity of cerebral hemisphere)

Interventricular foramina
(connecting lateral and third ventricle)

Third ventricle (cavity of diencephalon)



Cerebral aqueduct
(in midbrain)

Fourth ventricle

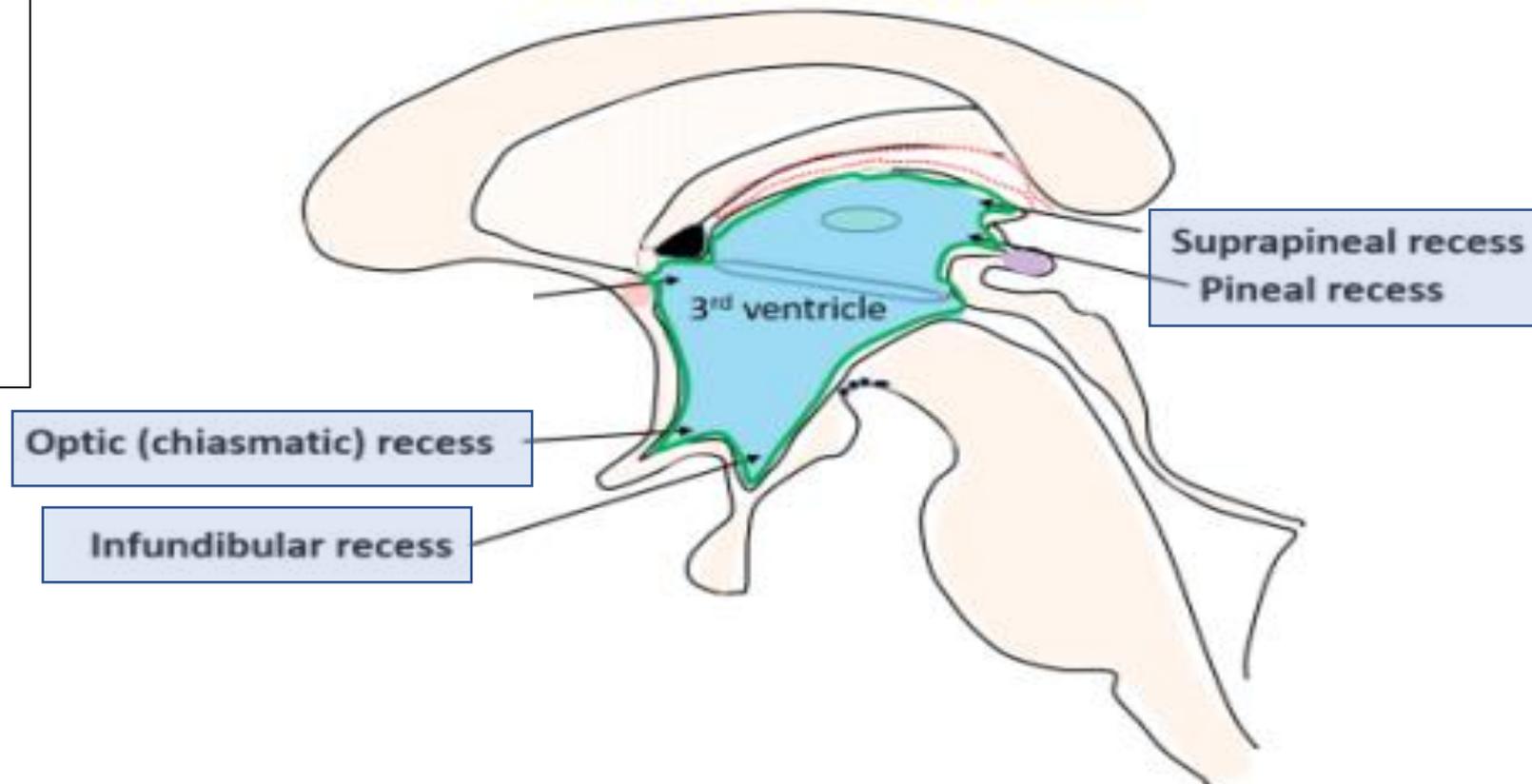
Central canal of medulla

3rd ventricle

Recesses :

1. **Optic recess:** above the optic chiasma.
2. **Infundibular recess:** extends into the infundibulum.
3. **Pineal recess:** extends into the stalk of the pineal gland.
4. **Suprapineal recess:** above the pineal gland.

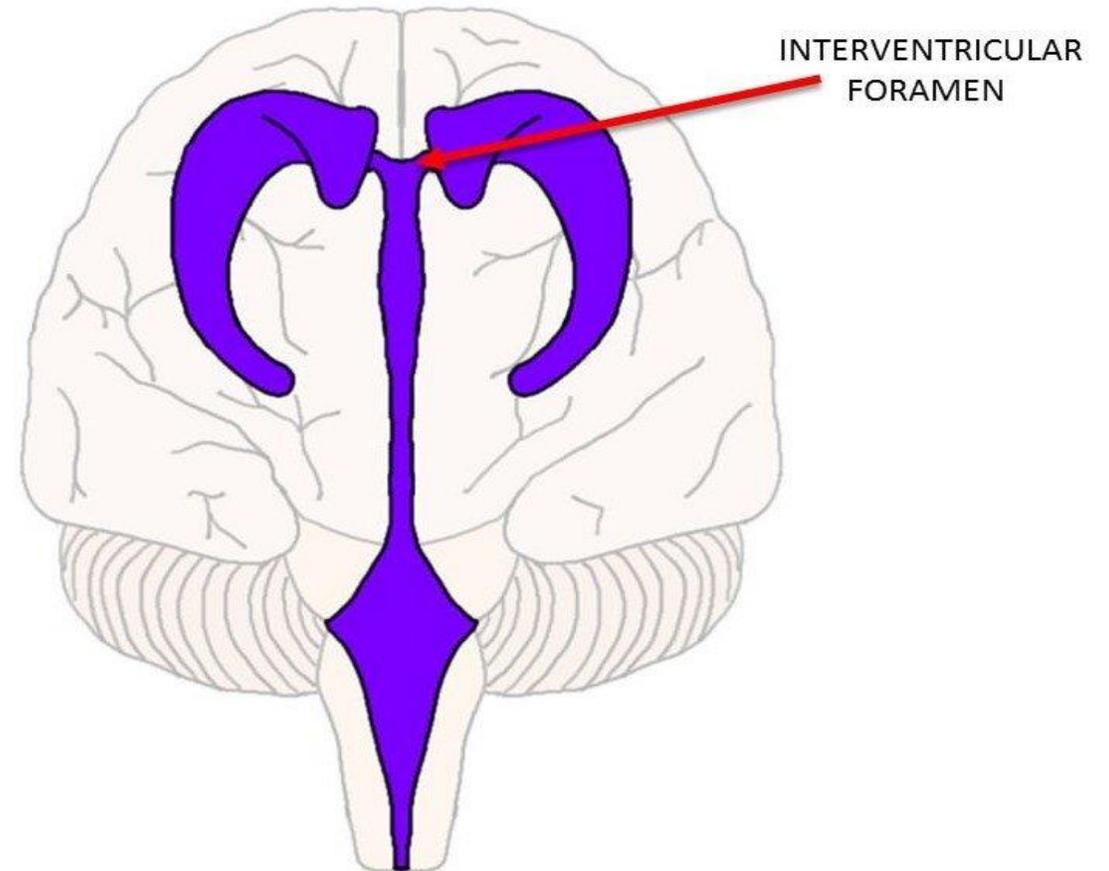
Recesses of Third ventricle



3rd ventricle

Communications :

- **With the lateral ventricles:** through the interventricular foramina of Monro.
- **With the fourth ventricle:** through the cerebral aqueduct of Sylvius.



Thank You!