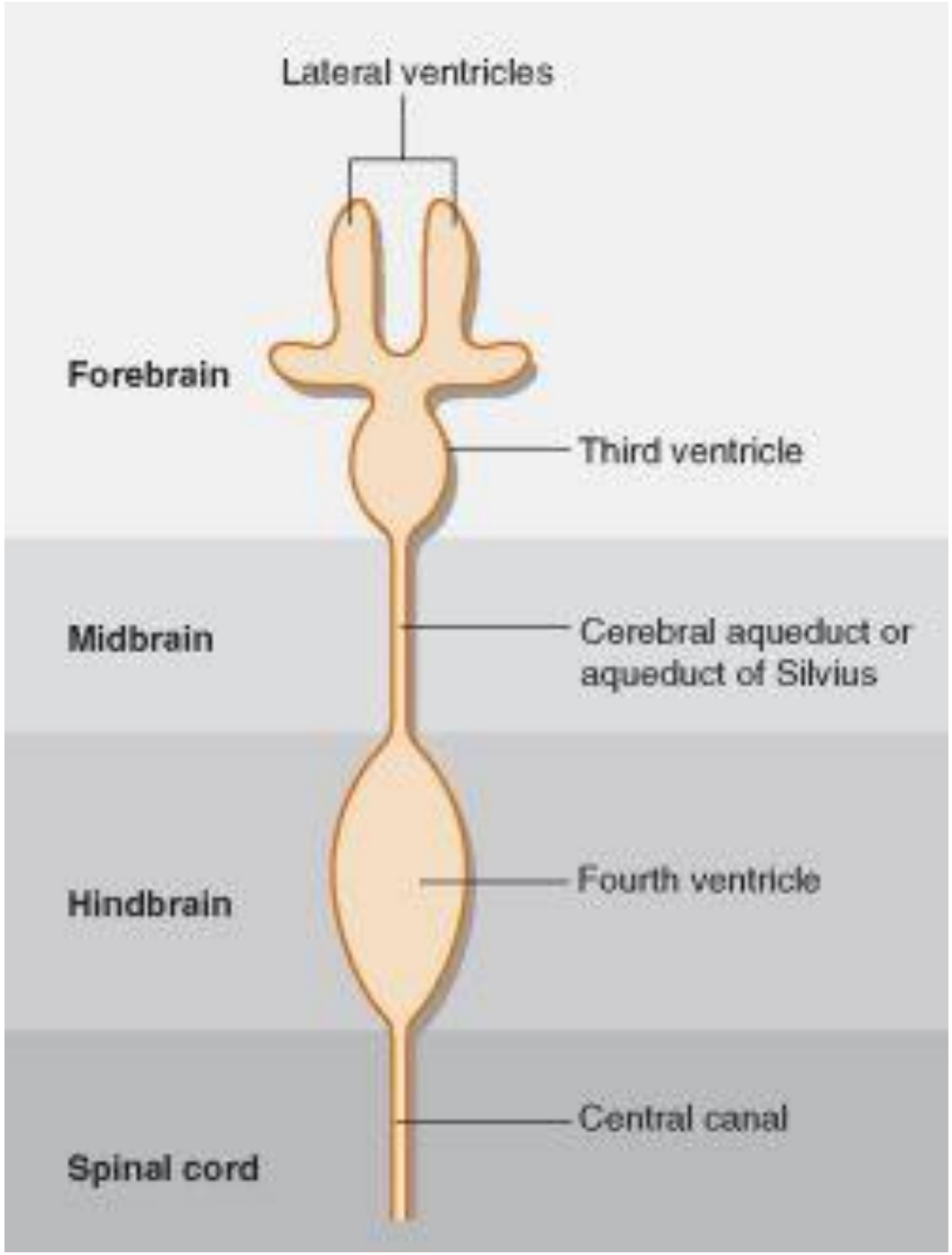
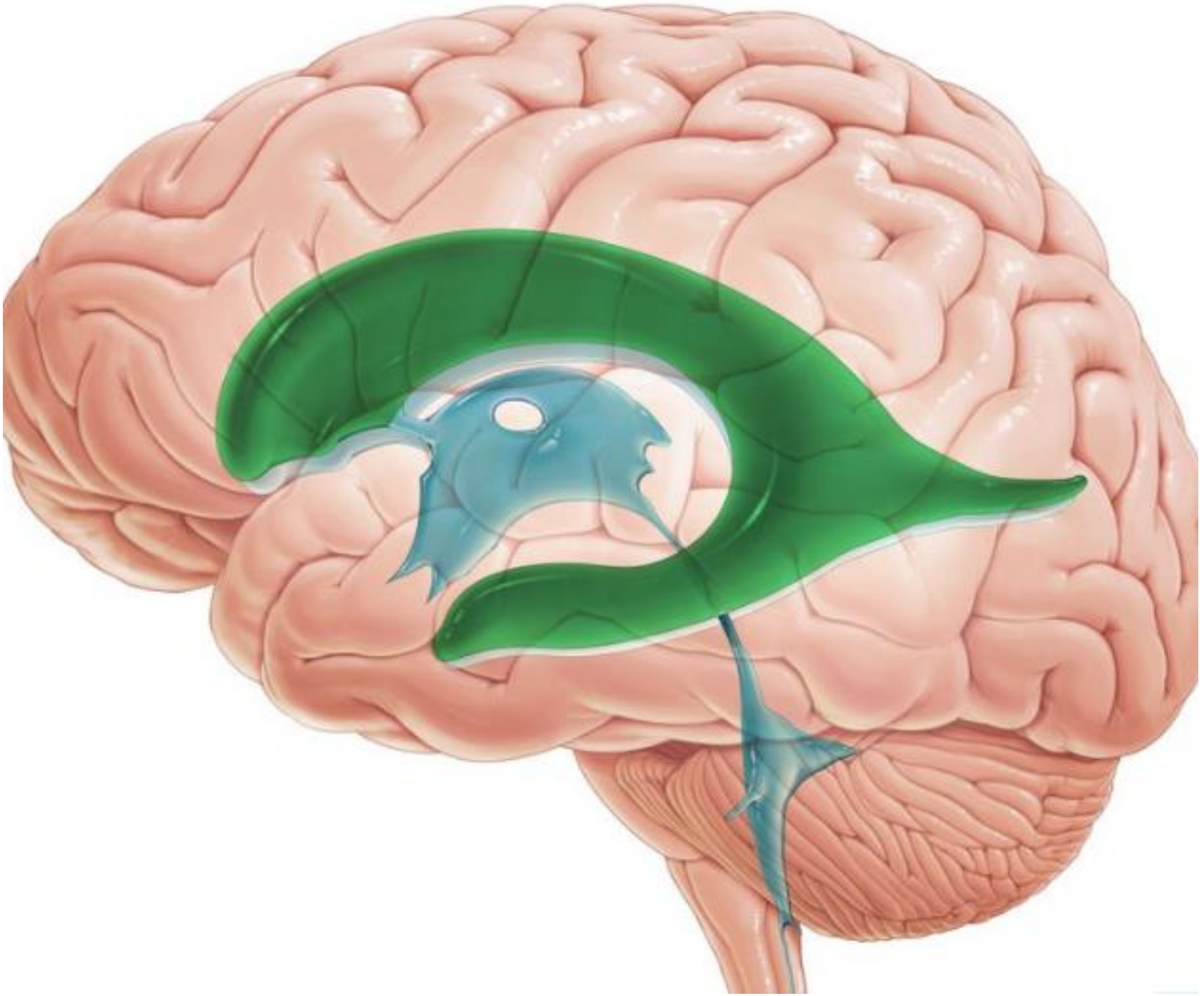
Ventricles of brain

- **The ventricles of the brain are a communicating network of cavities filled with CSF and located within the brain parenchyma.**
- **The ventricular system is composed of 2 lateral ventricles, the third ventricle, the cerebral aqueduct, and the fourth ventricle.**
- **Lateral ventricles- interventricular foramen= third ventricle**


Lateral ventricles
Forebrain
Third ventricle
Midbrain
Cerebral aqueduct or
aqueduct of Silvius
Hindbrain
Fourth ventricle
Central canal
Spinal cord



Lateral ventricles

- **No. – 2 (each CH)**
- **CONSIST- central part, 3 horns or extensions (anterior, posterior and inferior horn)**

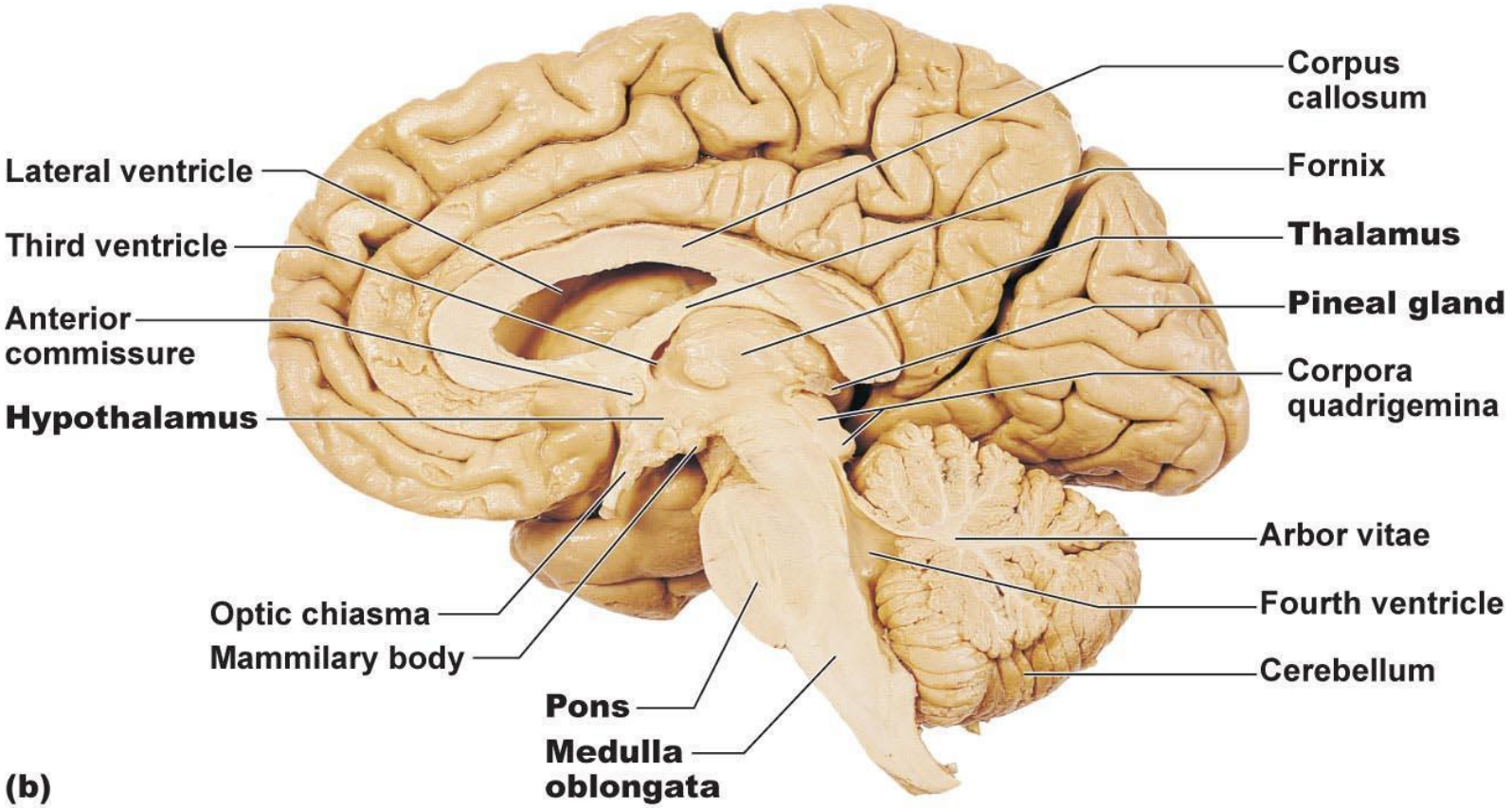
Central part-

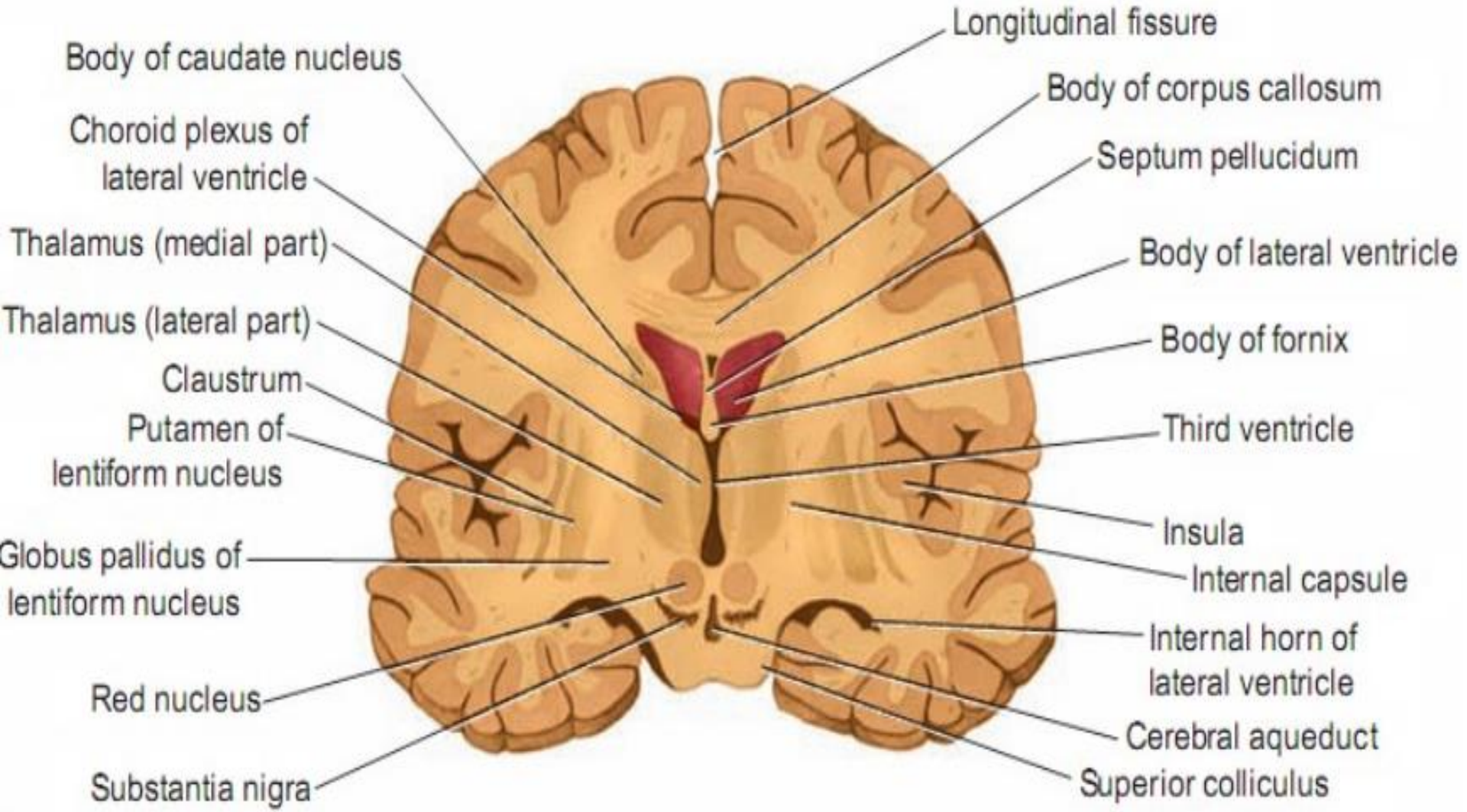
The central part of the lateral ventricle is elongated anteroposteriorly.

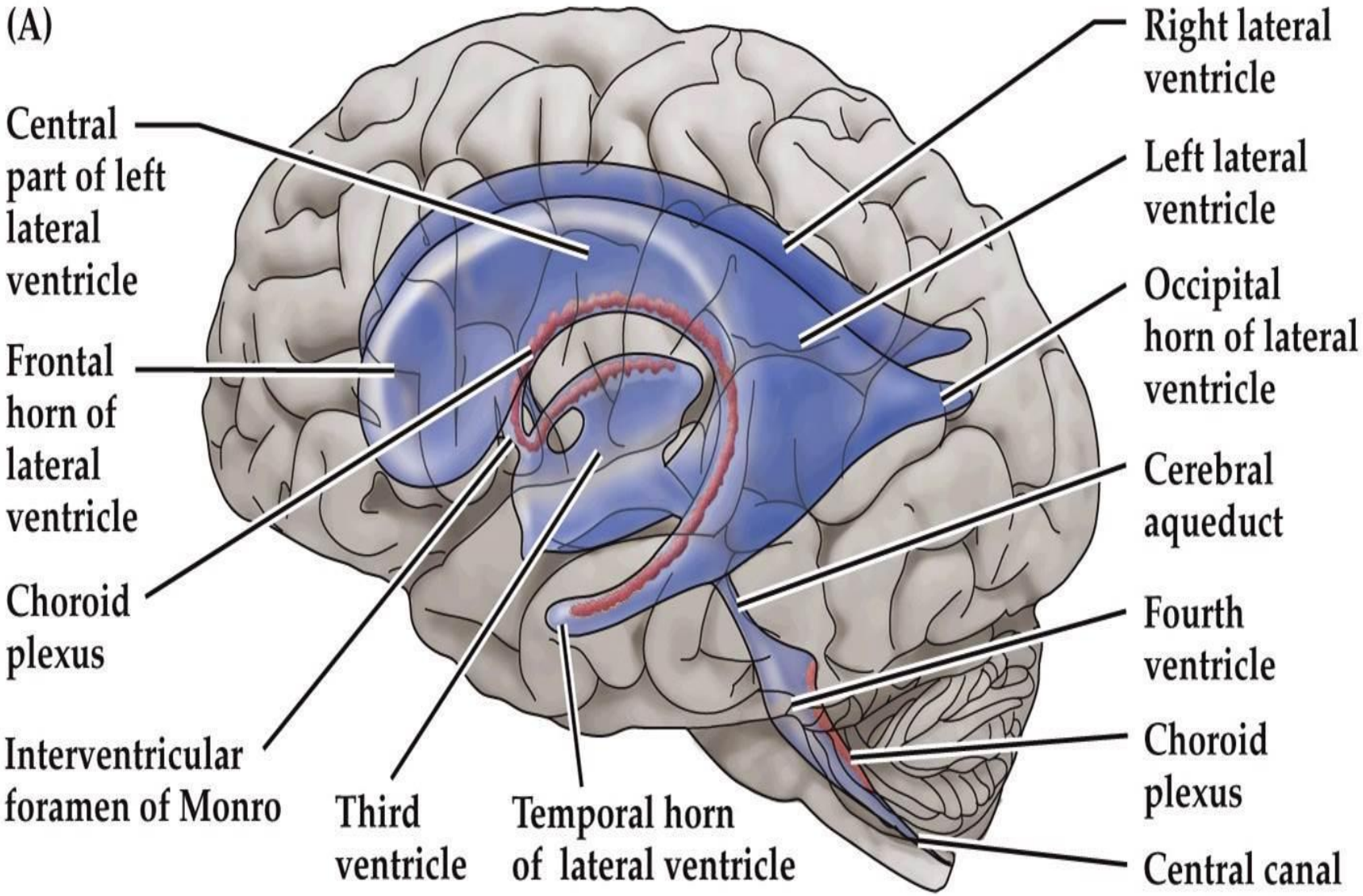
Anteriorly, it becomes continuous with the anterior horn at the level of the interventricular foramen.

Posteriorly, the body reaches the splenium of the corpus callosum.

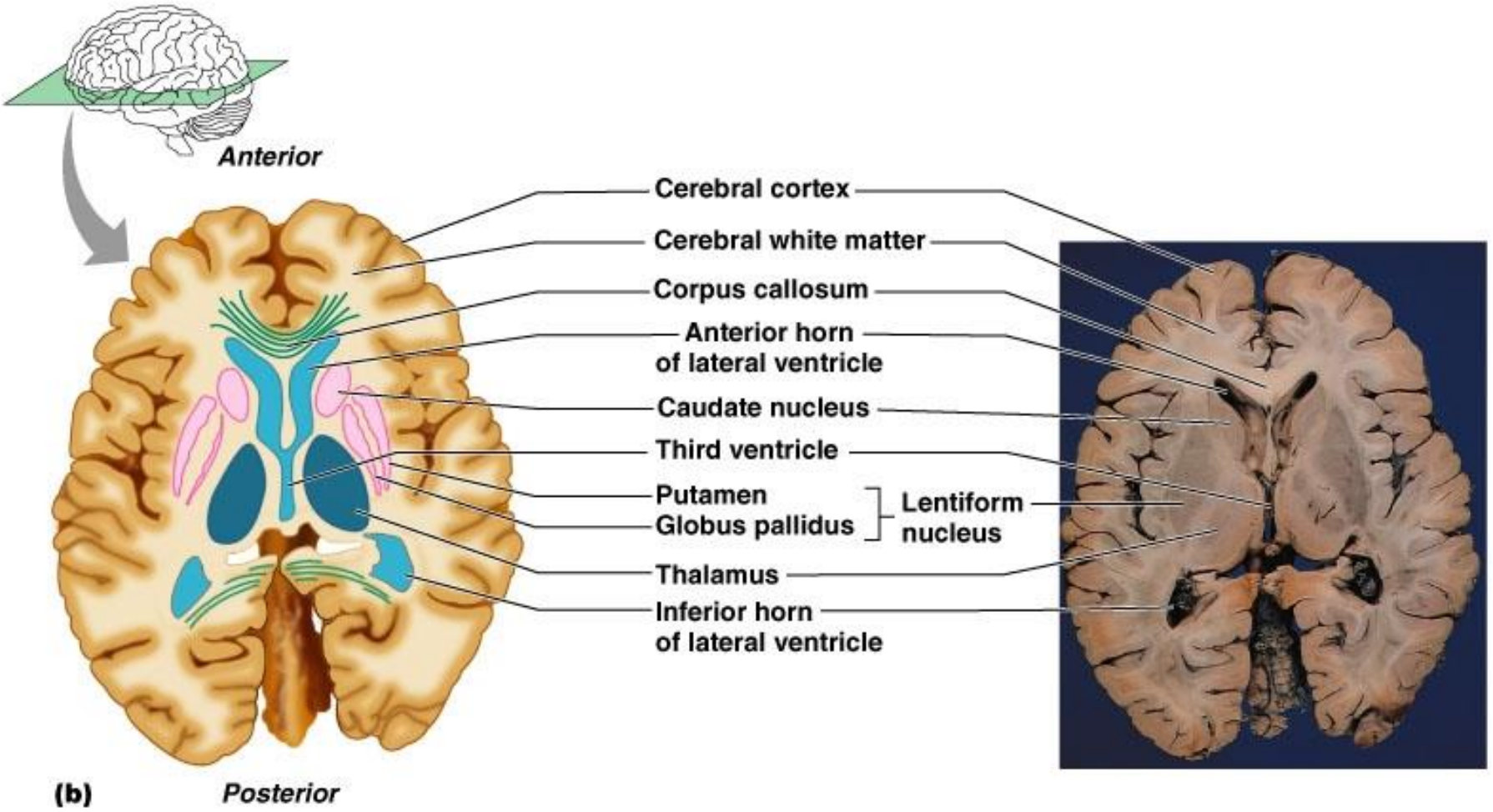
- **It is triangular in cross section and has a roof, floor, and a medial wall.**
- **Roof is formed by- the trunk of the corpus callosum**
- **Medial wall- septum pellucidum**
- **Floor- superior surface of the thalamus, medially, and by the caudate nucleus laterally.**




Longitudinal fissure
Body of caudate nucleus
Body of corpus callosum
Choroid plexus of lateral ventricle
Septum pellucidum
Thalamus (medial part)
Body of lateral ventricle
Thalamus (lateral part)
Body of fornix
Claustrum
Putamen of lentiform nucleus
Third ventricle
Insula
Globus pallidus of lentiform nucleus
Internal capsule
Internal horn of lateral ventricle
Red nucleus
Cerebral aqueduct
Substantia nigra
Superior colliculus



***NEUROSCIENCE 5e*, Figure A23 (Part 1)**



Inferior horn-

largest component of the lateral ventricle. It begins at the posterior end of the central region, and runs anteroinferiorly into the temporal lobe.

In cross section, the inferior horn has a narrow cavity which is bounded above, and laterally, by the roof, and below, and medially by the floor.

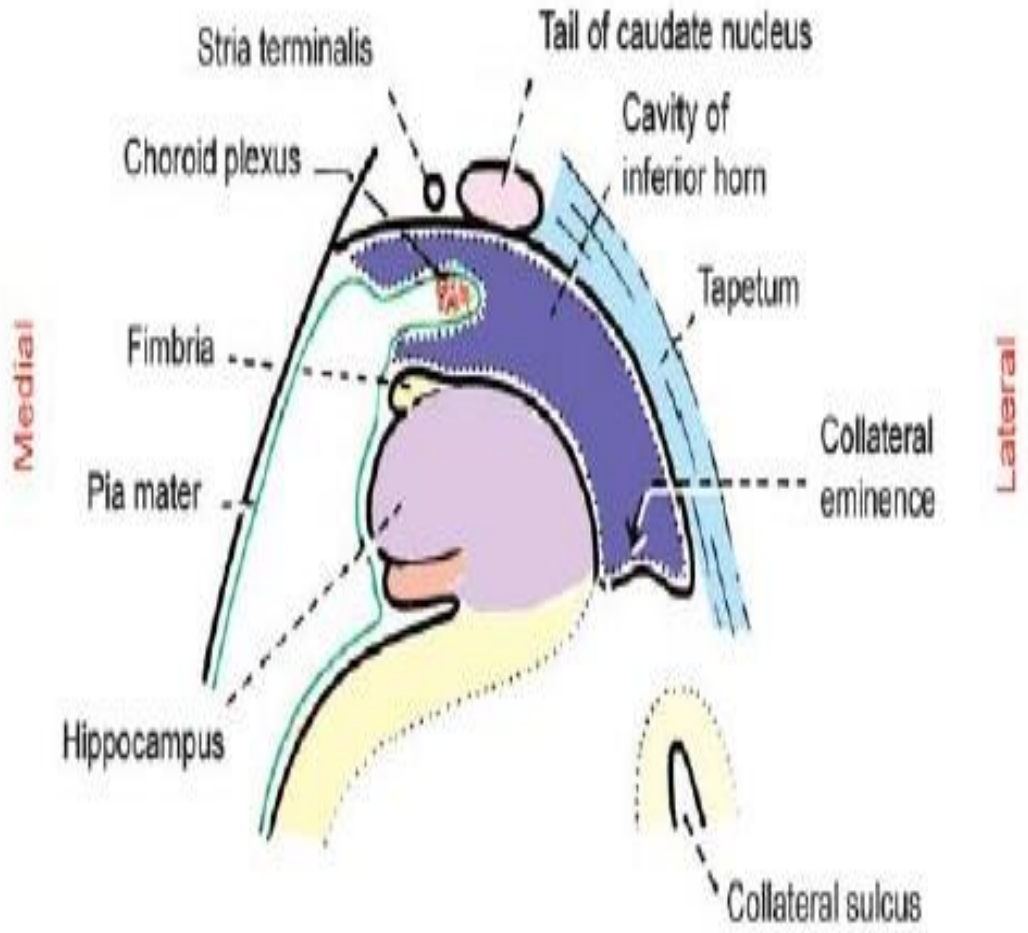
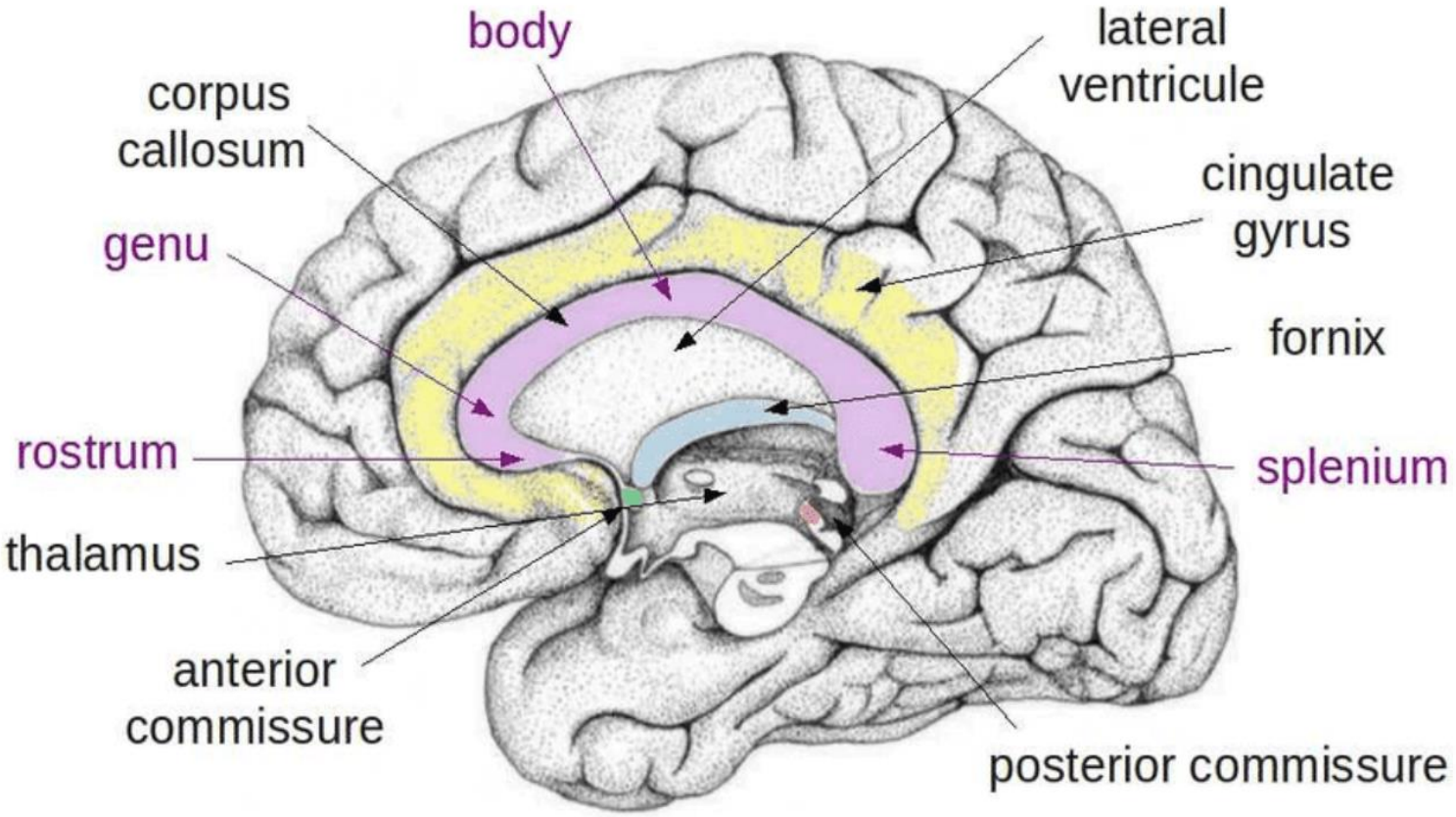
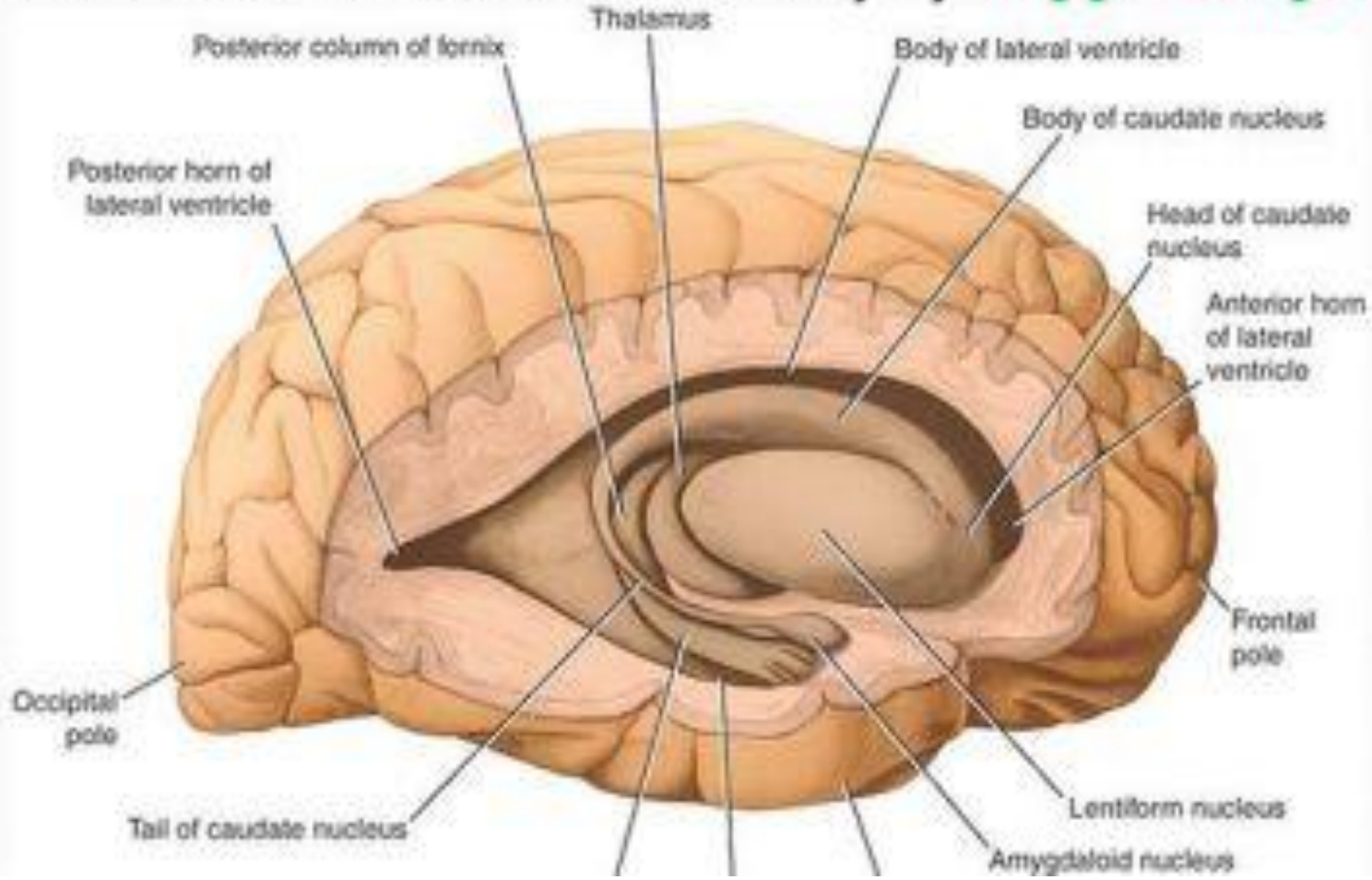


Fig. 20.5. Boundaries of the inferior horn of the lateral ventricle.


body
lateral ventricule
corpus callosum
cingulate gyrus
genu
fornix
rostrum
splenium
thalamus
anterior commissure
posterior commissure

- **Roof** formed by fibers of tapetum of corpus callosum & tail of caudate nucleus .
- **Floor** formed laterally by collateral eminence, produced by collateral fissure, and medially by hippocampus.



Anterior horn-

lies anterior to the central part, from which it is separated by an imaginary vertical line that runs at the level of the interventricular foramen.

This extension is triangular in cross section and has a roof, floor and medial wall. It is closed anteriorly by the genu and rostrum of the corpus callosum.

- **Roof- trunk of the corpus callosum**
- **Floor- head of the caudate nucleus.**
- **Medial wall- septum pellucidum.**

Anterior horn (frontal horn)

- Ant.extension of central part

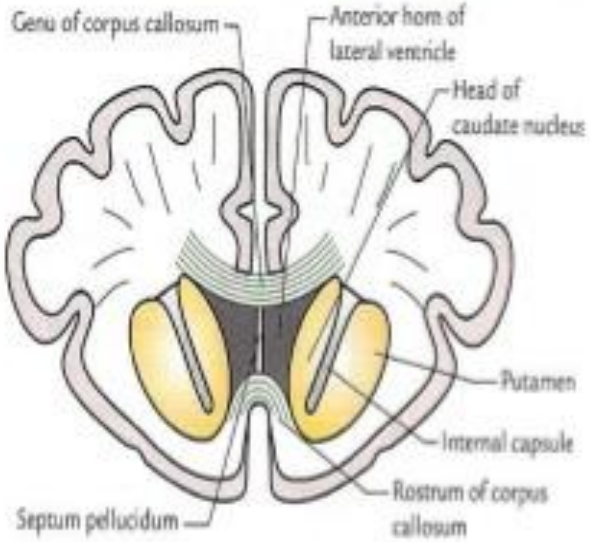
Situation: frontal lobe

Extent: from interventricular foramen to post.surface of genu

Presenting parts :

(coronal section – roughly triangular in shape)

- Roof
- Floor
- Anterior wall
- Medial wall
- Lateral wall



Posterior horn

- **extends backwards into the occipital lobe**
- **It has a roof, lateral wall and a medial wall.**
- **Roof and lateral wall- tapetum**
- **Medial wall- shows two elevations, one superior and the other inferior and referred to as the calcar avis.**

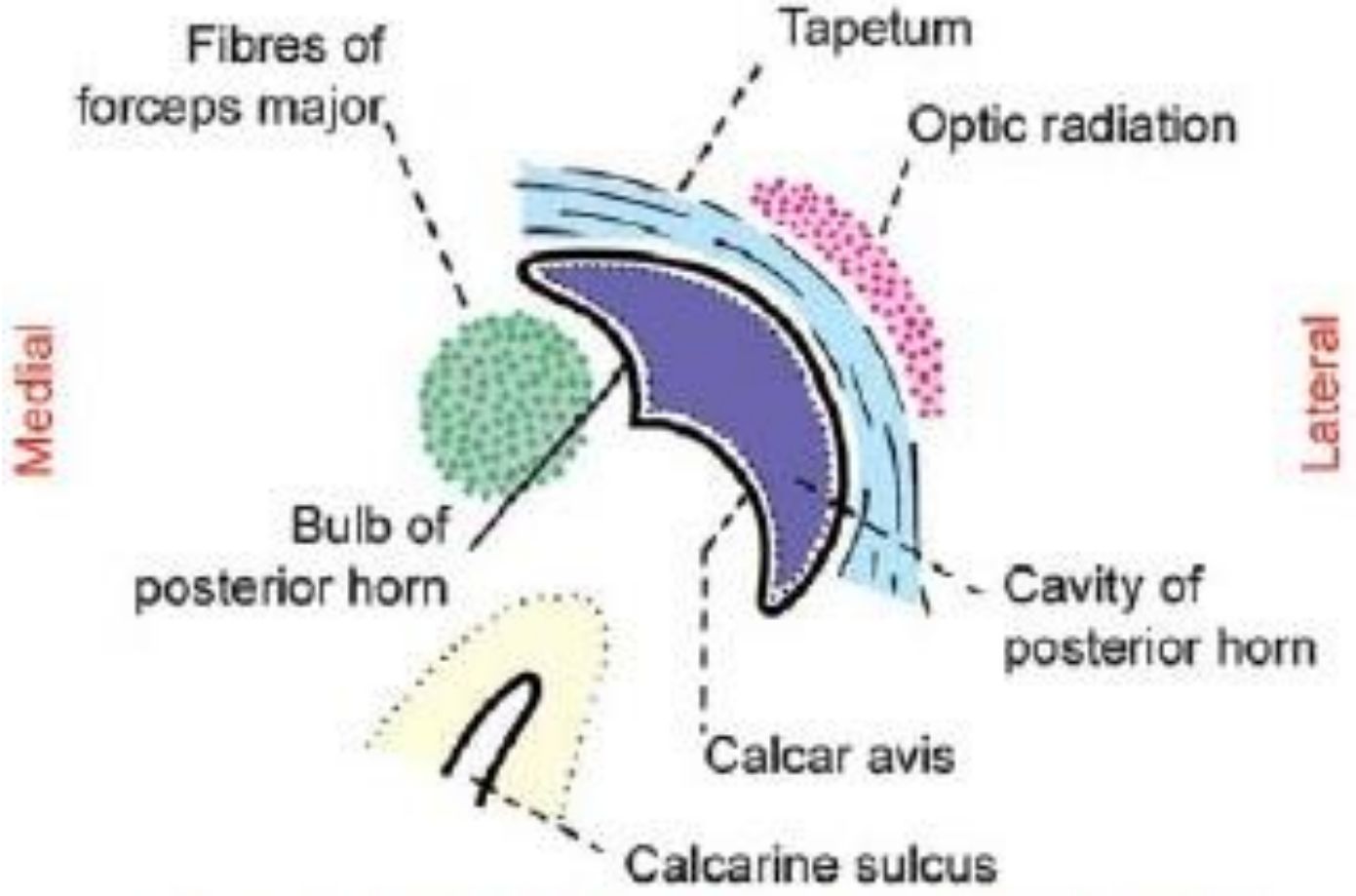
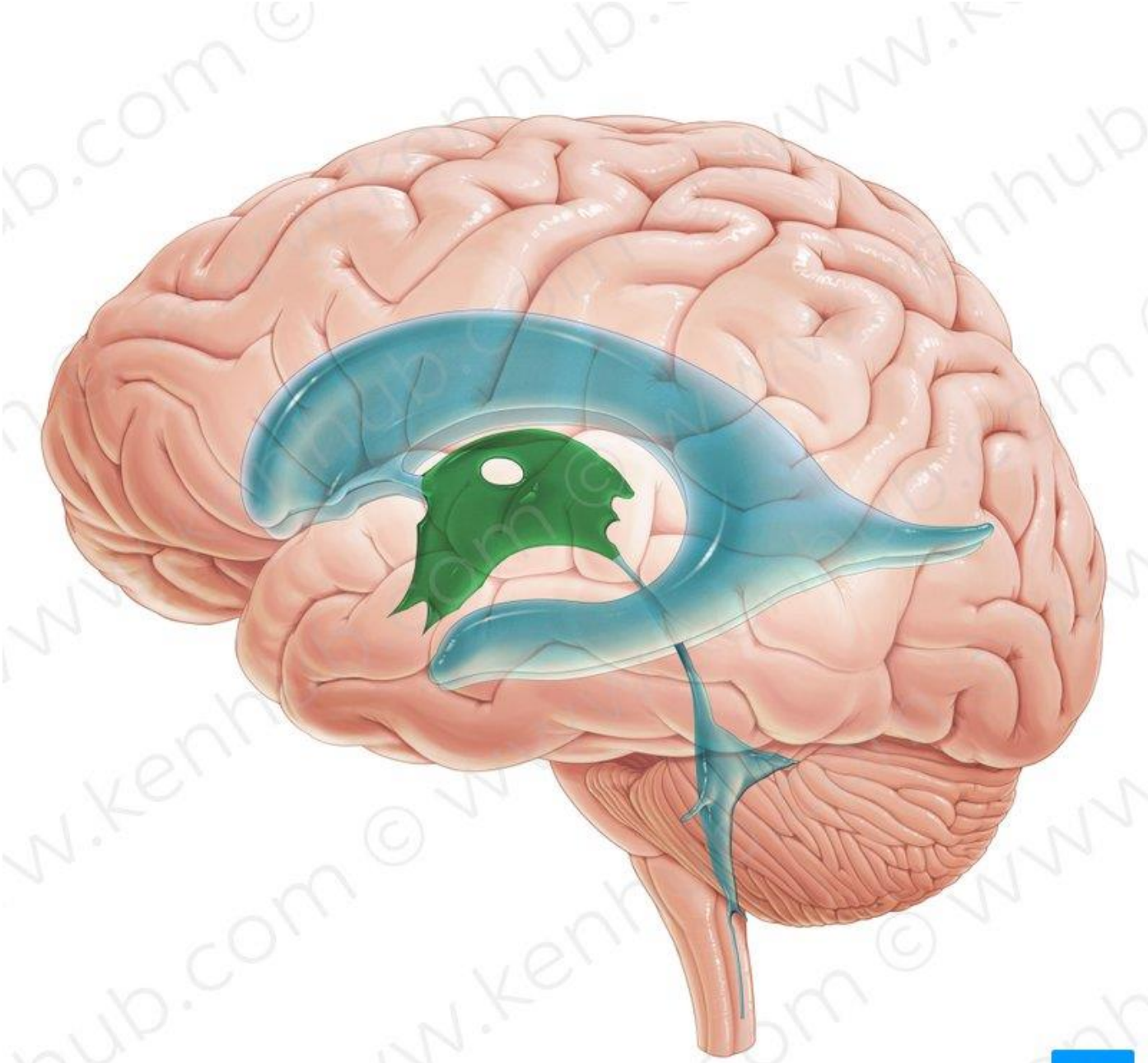


Fig. 20.4. Boundaries of the posterior horn of the lateral ventricle.

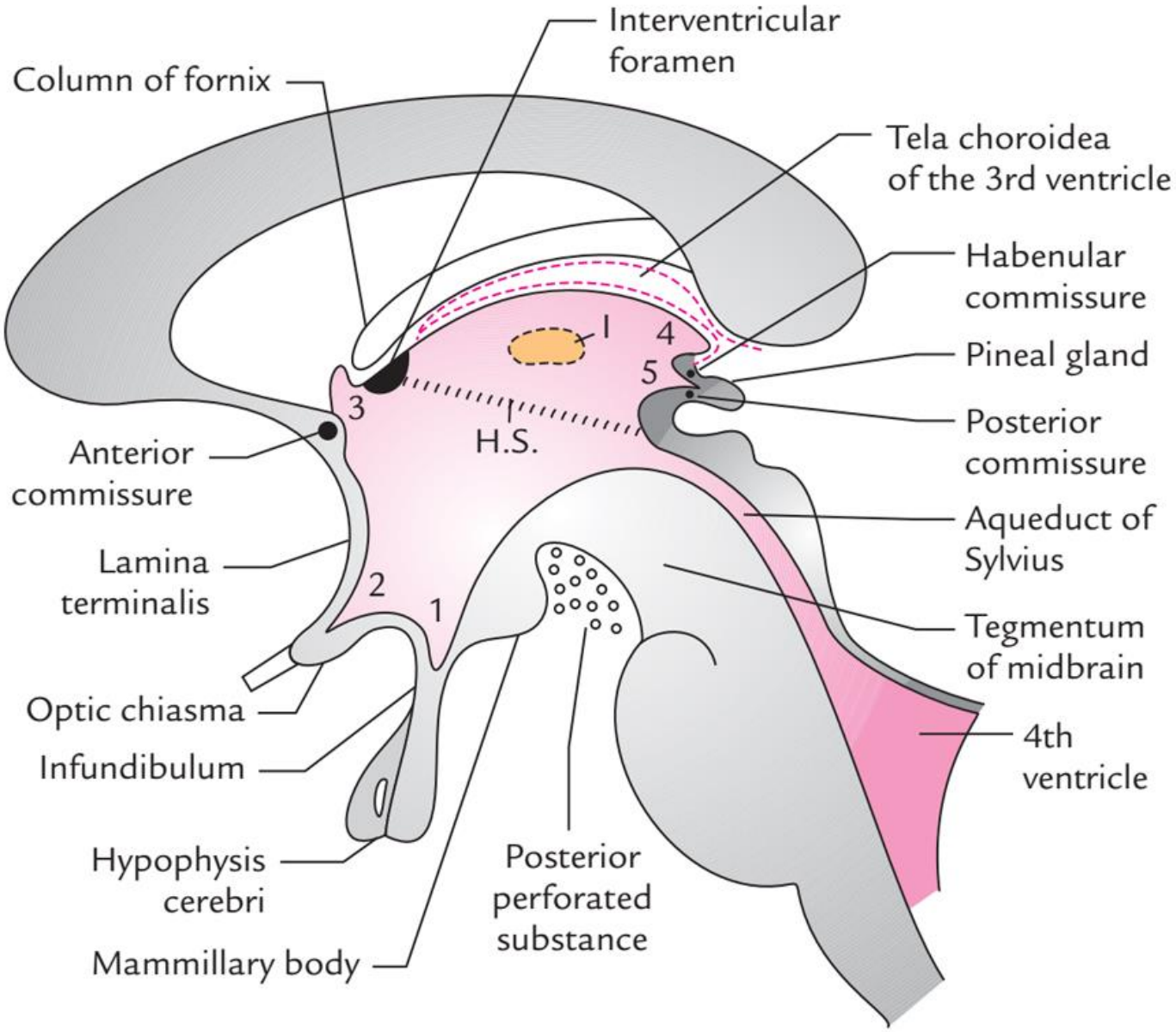
THIRD VENTRICLE

cavity of diencephalon.

It's a midline slit-like cavity situated between 2 thalami and part of hypothalamus. It goes from the lamina terminalis anteriorly to the superior end of the cerebral aqueduct of the midbrain posteriorly.



- **It communicates superolaterally with lateral ventricles through the interventricular foramen (of Monro). Posteroinferiorly, it connects with the fourth ventricle through the cerebral aqueduct (of Sylvius).**
- **It has a cavity, an anterior wall, a posterior wall, a floor, a roof and two lateral walls.**


Interventricular foramen
Column of fornix
Tela choroidea of the 3rd ventricle
Habenular commissure
Pineal gland
Posterior commissure
Aqueduct of Sylvius
Tegmentum of midbrain
4th ventricle
Anterior commissure
Lamina terminalis
Optic chiasma
Infundibulum
Hypophysis cerebri
Mammillary body
Posterior perforated substance
H.S.
1
2
3
4
5

- **Floor- optic chiasma, the tuber cinereum and the infundibulum, the mamillary bodies, the posterior perforated substance and the tegmentum of the midbrain.**
- **Roof- is constituted by ependyma that stretches across the two thalami.**

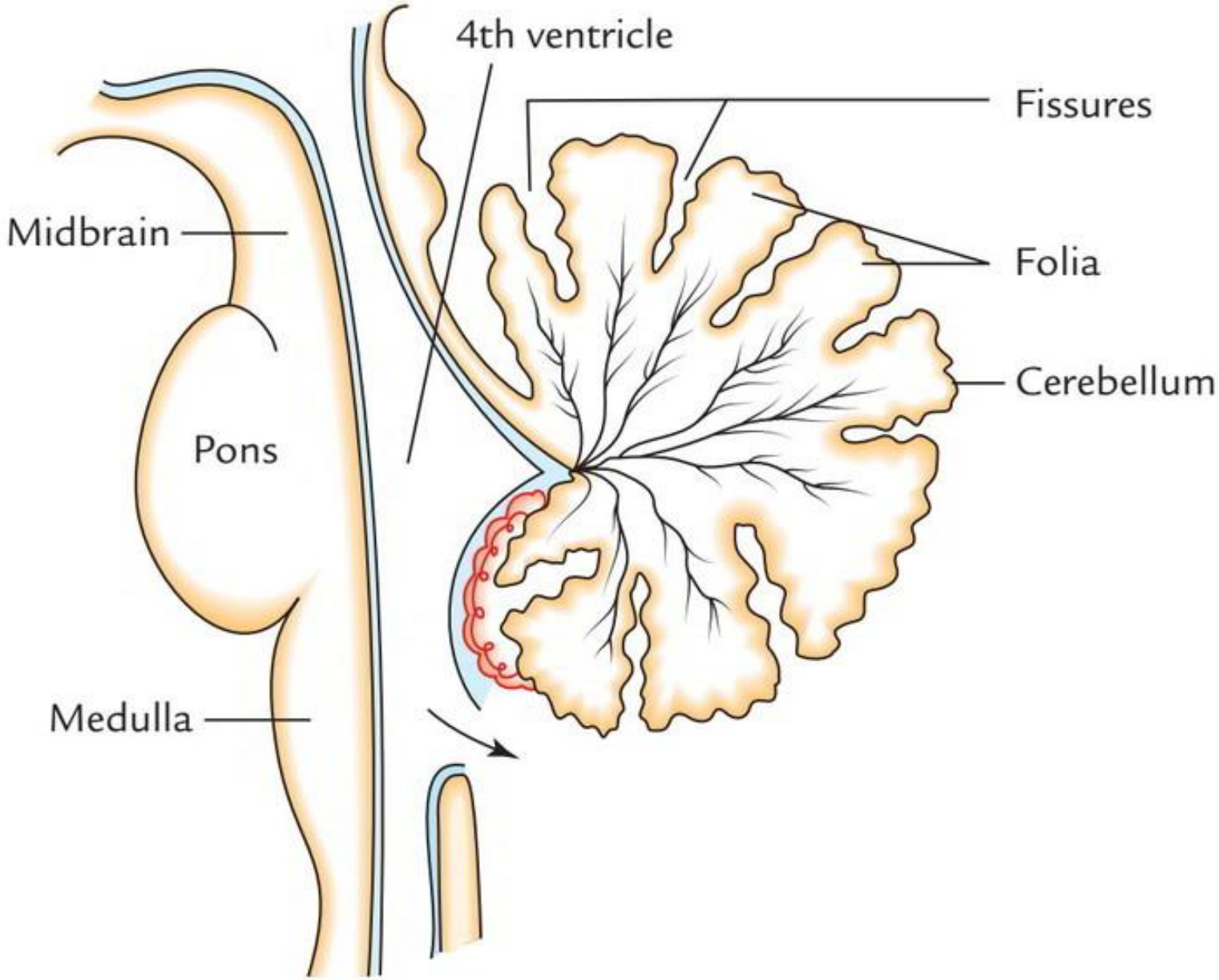
- **Cavity of the third ventricle is marked by a number of elongations and recesses (extensions). All of its recesses are named according to their related structures**
  - **Optic recess- is located above the optic chiasma**
  - **Infundibular recess- extends into the infundibulum.**
  - **Suprapineal recess- lies above the pineal body,**
  - **pineal recess- which lies between the superior and inferior laminae of the stalk of the pineal body.**

- **Anterior wall is formed by the lamina terminalis, which bridges between the optic chiasm and the rostrum of the corpus callosum.**
- **Posterior wall- pineal body and the posterior commissure**

- **Each of the two lateral walls of the third ventricle is marked by the hypothalamic sulcus, which follows the curved course from the interventricular foramen to the aqueduct. The left and right thalami are also major structures forming the lateral walls of the third ventricle.**

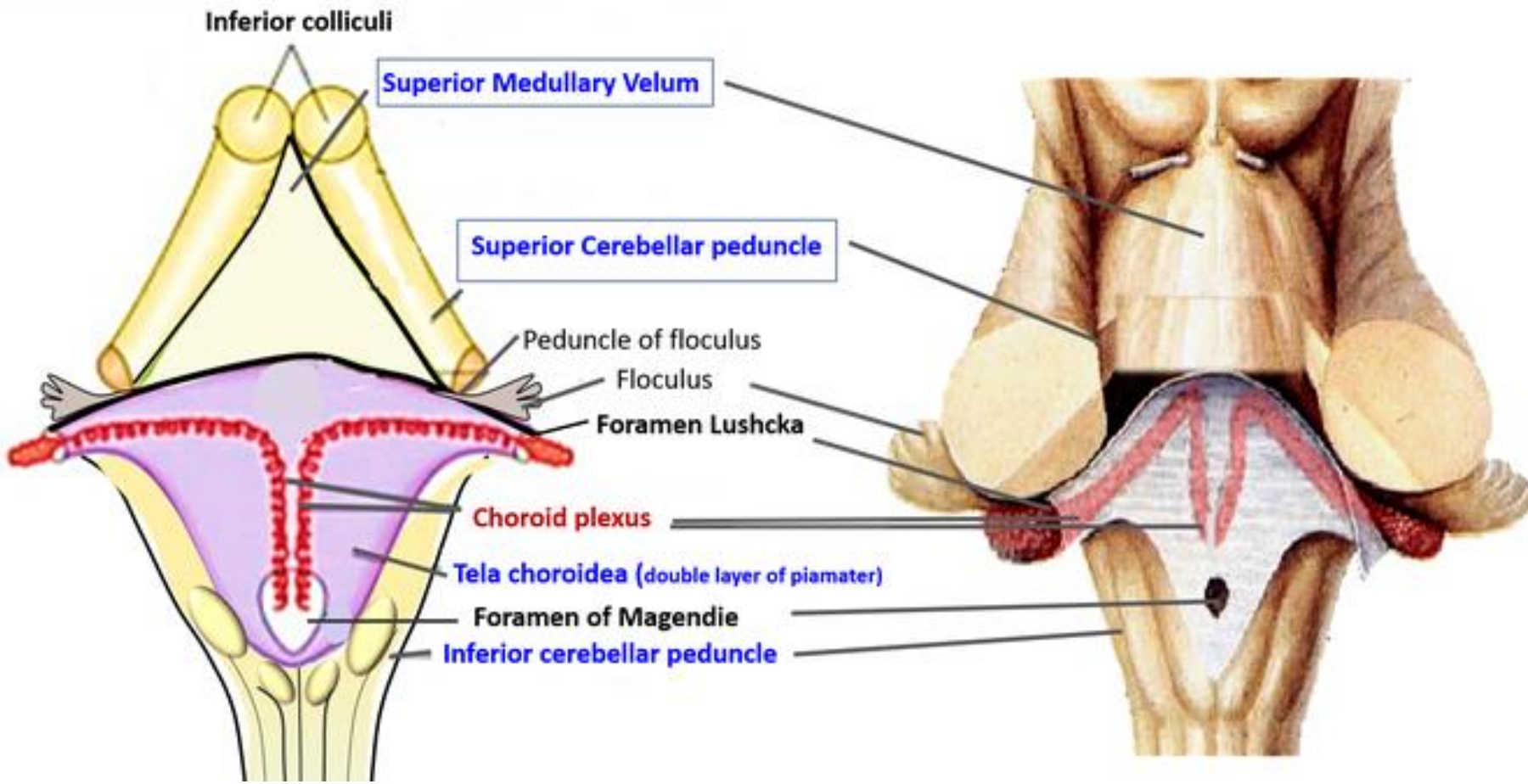
FOURTH VENTRICLE

- **The fourth ventricle lies dorsal to the pons and medulla and ventral to the cerebellum. It extends from the cerebral aqueduct superiorly, extending inferiorly into the central canal.**
- **It has cavity, roof, floor and lateral walls.**


4th ventricle
Fissures
Midbrain
Folia
Cerebellum
Pons
Medulla

Cavity

- **The cavity communicates with the subarachnoid space through the three apertures (1) median aperture and 2 lateral aperture.**


Inferior colliculi
Superior Medullary Velum
Superior Cerebellar peduncle
Peduncle of floculus
Floculus
Foramen Lushcka
Choroid plexus
Tela choroidea (double layer of piamater)
Foramen of Magendie
Inferior cerebellar peduncle

- **It has two major extensions, known as the lateral recesses, one on either side of the midline. These recesses extend laterally between the inferior cerebellar peduncle and the peduncle of the flocculus of the cerebellum, to open into the subarachnoid space as the lateral apertures of the fourth ventricle (foramina of Luschka).**

Floor

- **The floor of the fourth ventricle is also referred to as the rhomboid fossa because of its shape. It is divisible into a right and left half by the median sulcus and a superior and inferior triangle by the striae medullares.**
- **The upper triangular part is formed by the posterior surface of the pons.**
- **lower triangular part- upper part of the posterior surface of the medulla .**

- **On either side of median sulcus lies a longitudinal elevation called the medial eminence. This eminence is limited laterally by the sulcus limitans. The area lateral to sulcus limitans is called the vestibular area and houses the vestibular nuclei.**
- **The uppermost part of the sulcus limitans overlies an area called the locus coeruleus.**
- **Lower down the sulcus limitans is a depression referred to as the superior fovea. At the level of this depression, the median eminence shows a swelling called the facial colliculus.**

- **Within the medullary part of the floor, the sulcus limitans is marked by a depression, the inferior fovea. Inferior to this inferior fovea is an oblique sulcus running towards the midline and dividing the medial eminence into two triangles called the hypoglossal and vagal triangles .**
- **The hypoglossal triangle lies medial and the vagal, lateral. These triangles house the hypoglossal and vagal nuclei respectively.**

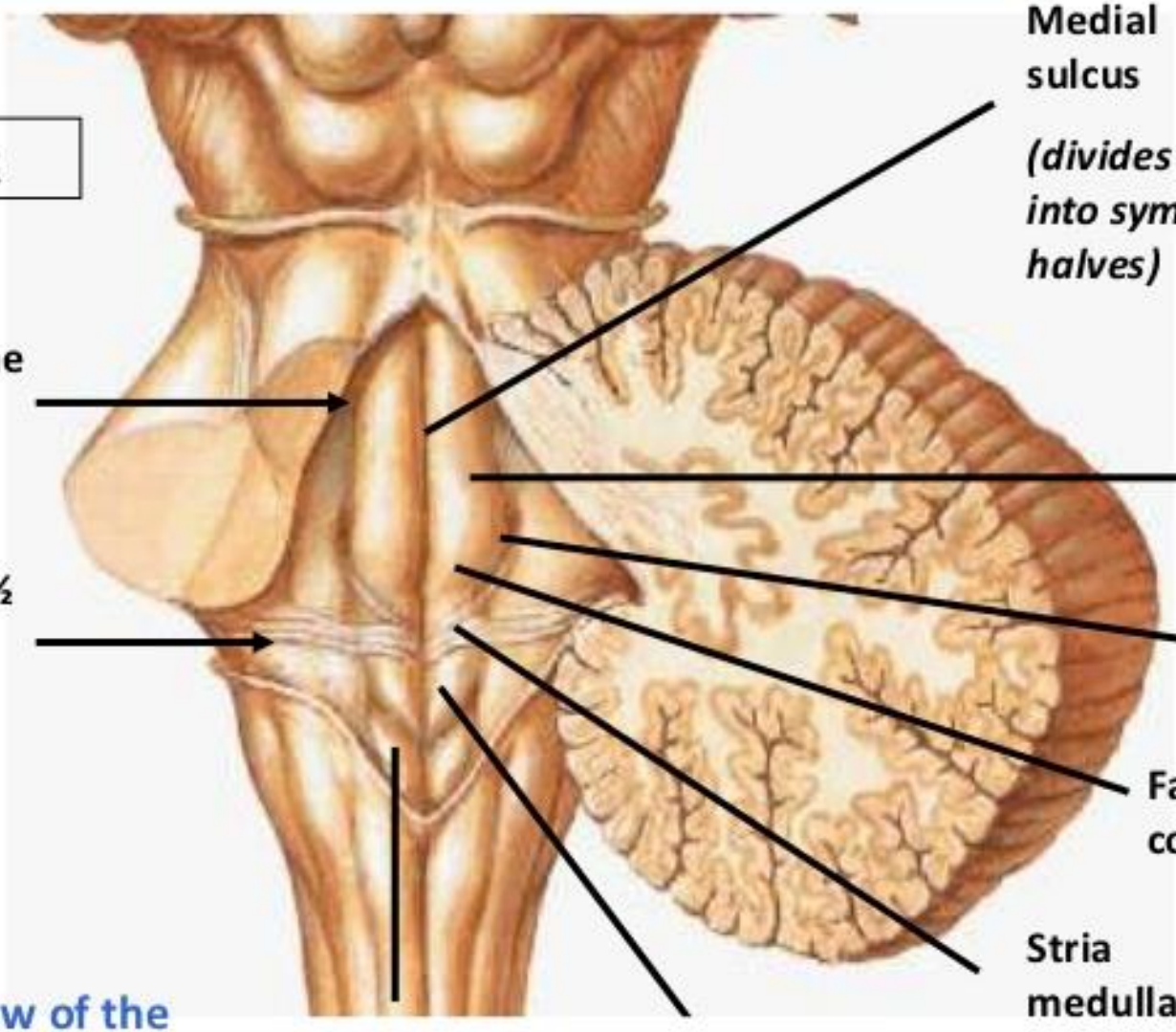
- **The lowest part of the floor of the fourth ventricle is referred to as the calamus scriptorius. Each inferolateral margin of the floor is marked by a narrow white ridge called taenia. The right and left taeniae meet at the inferior apex of the floor to form a small fold called the obex.**

Floor or rhomboid fossa of fourth ventricle :

Formed by ;

1. Posterior surface of the pons

2. Cranial ½ of the medulla oblongata



Medial sulcus

(divides the floor into symmetrical halves)

Medial eminence

Sulcus limitans

Facial colliculus

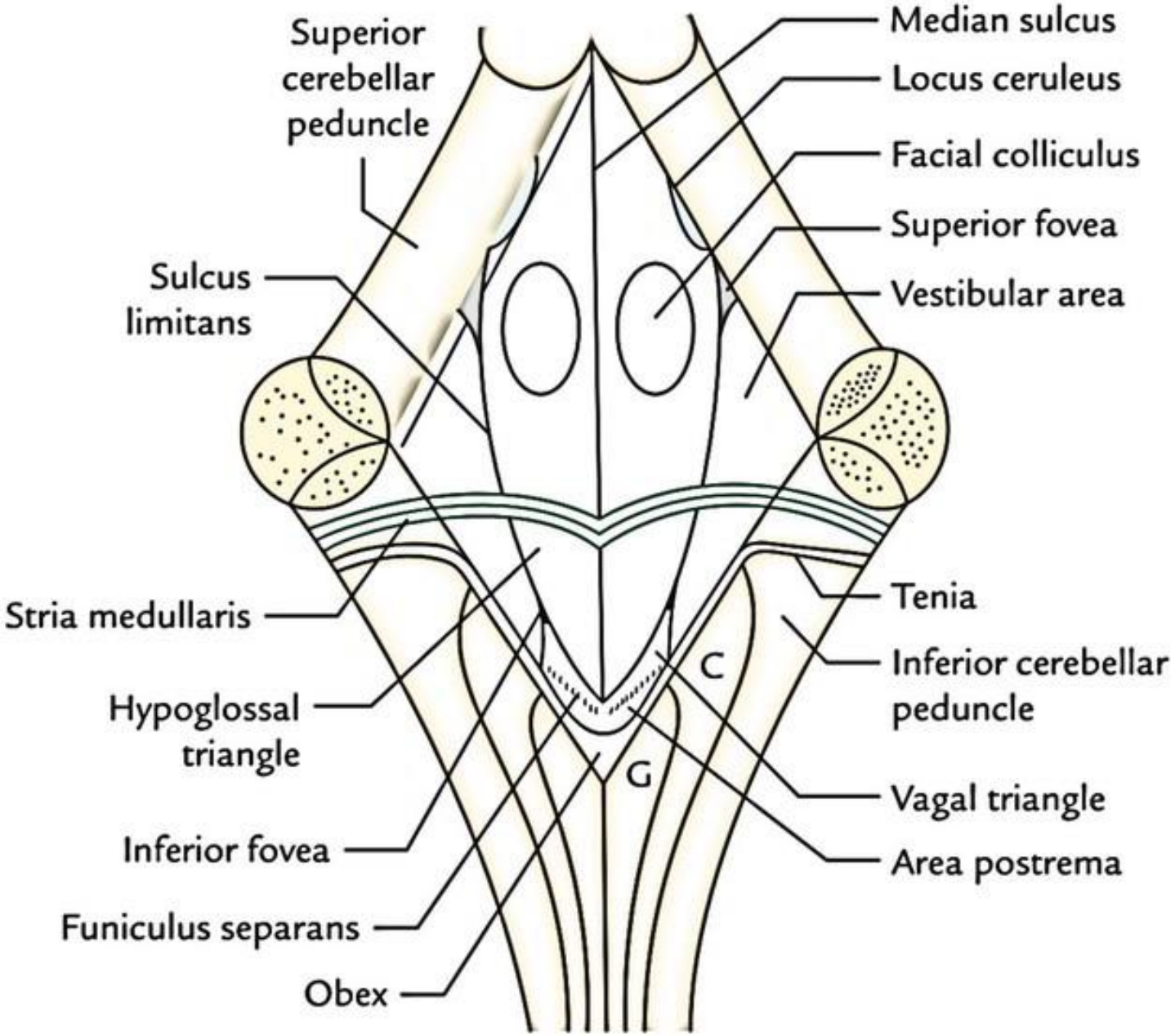
Stria medullaris

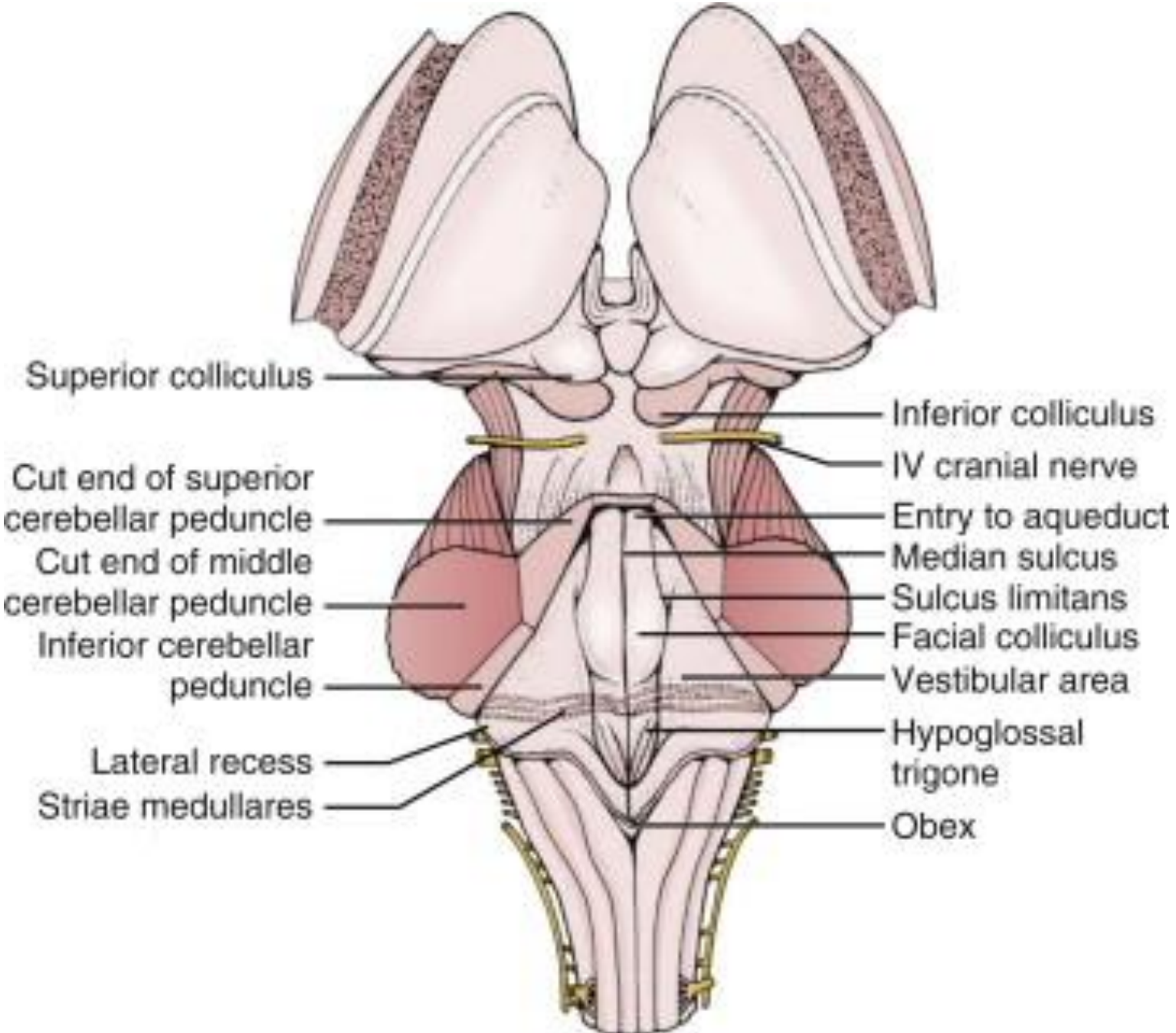
(strands of nerve fibers)

Vagal triangle

Hypoglossal triangle

Posterior view of the 4th ventricle


Superior cerebellar peduncle
Median sulcus
Locus ceruleus
Facial colliculus
Superior fovea
Vestibular area
Sulcus limitans
Stria medullaris
Tenia
Inferior cerebellar peduncle
Hypoglossal triangle
C
G
Vagal triangle
Area postrema
Inferior fovea
Funiculus separans
Obex

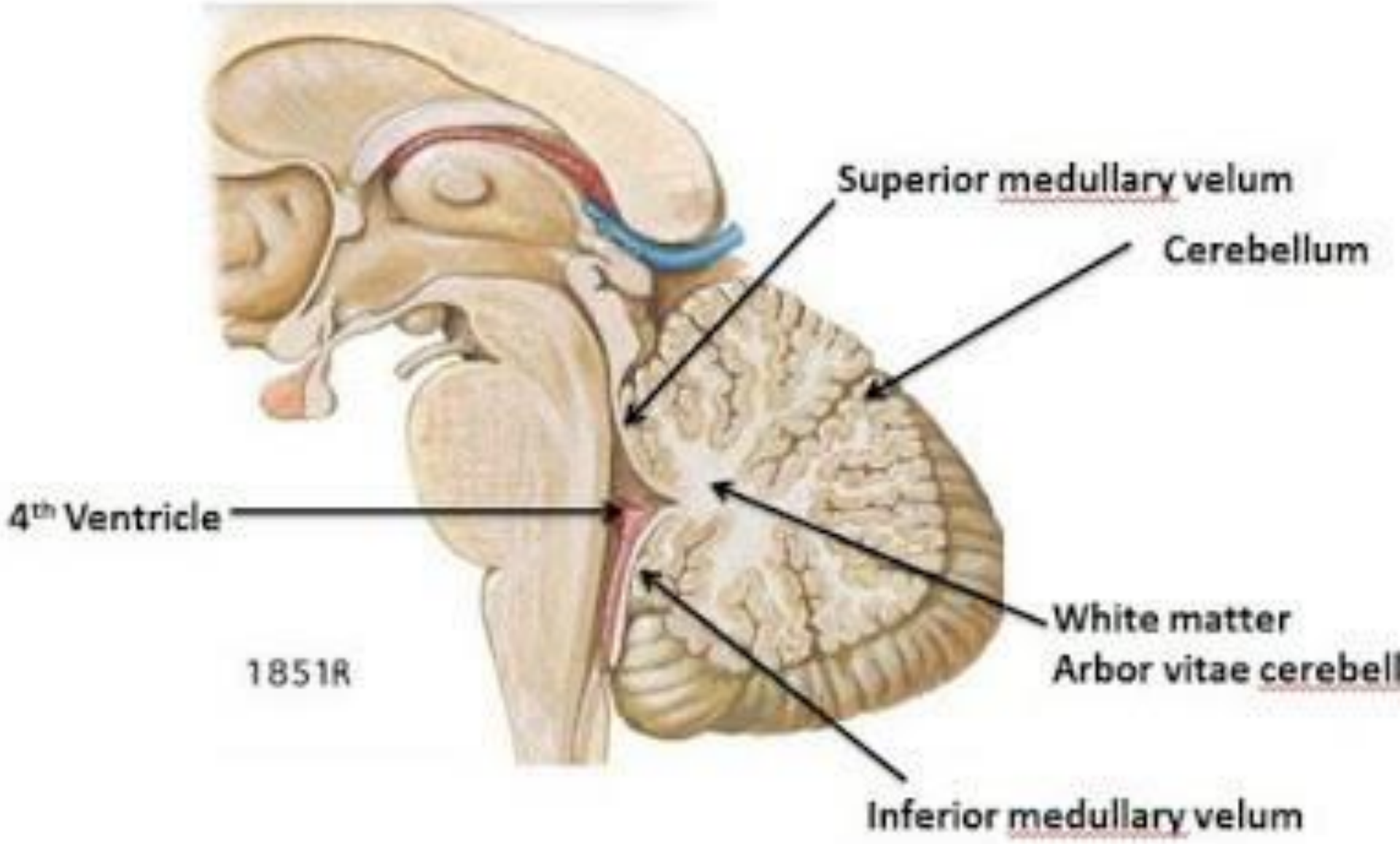

Superior colliculus
Cut end of superior cerebellar peduncle
Cut end of middle cerebellar peduncle
Inferior cerebellar peduncle
Lateral recess
Striae medullares
Inferior colliculus
IV cranial nerve
Entry to aqueduct
Median sulcus
Sulcus limitans
Facial colliculus
Vestibular area
Hypoglossal trigone
Obex

Lateral Walls

- **The lateral walls of the fourth ventricle are formed by the cerebellar peduncles.**

Roof

- **The roof of the fourth ventricle is 'tent-like' and can be divided into upper and lower parts which meet an apex. The apex extends into the white core of the cerebellum.**
- **The superior part of the roof is formed by the superior cerebellar peduncles and the superior medullary velum (thin sheet of white matter). The inferior part of the roof is made of non-nervous tissue, the inferior medullary velum.**


Superior medullary velum
Cerebellum
4th Ventricle
White matter
Arbor vitae cerebell
1851R
Inferior medullary velum