Brain Stem 1

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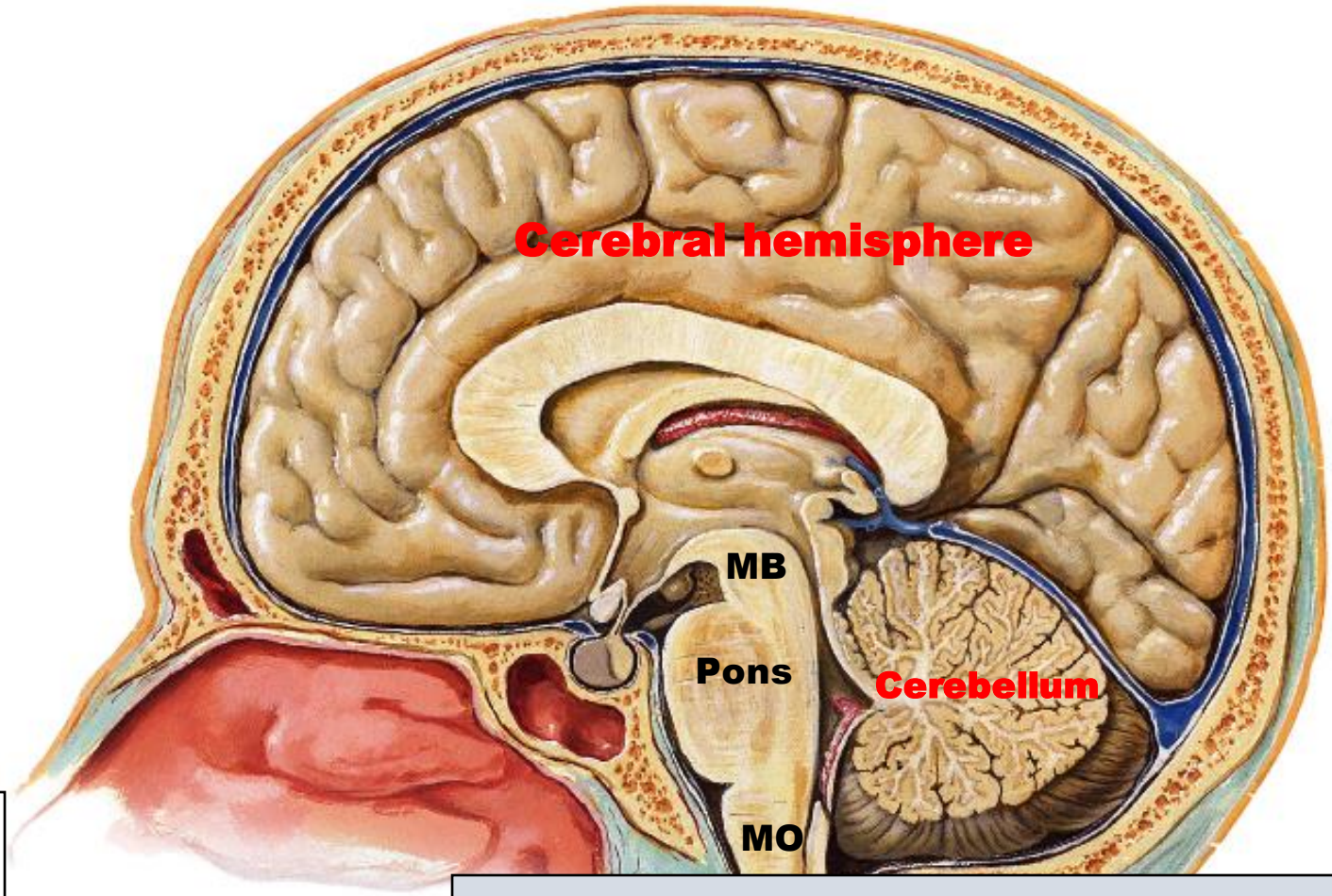
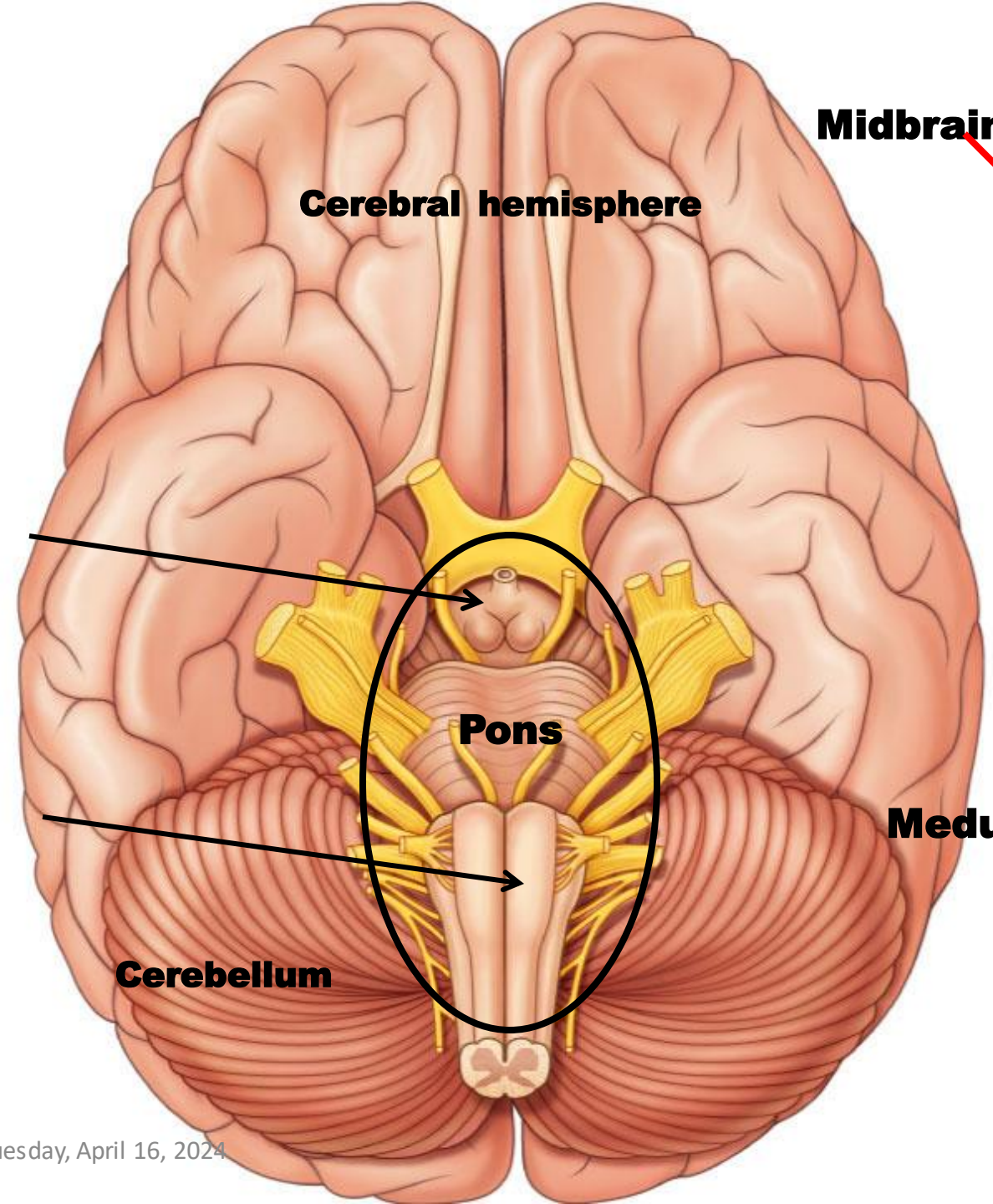
Brain Stem

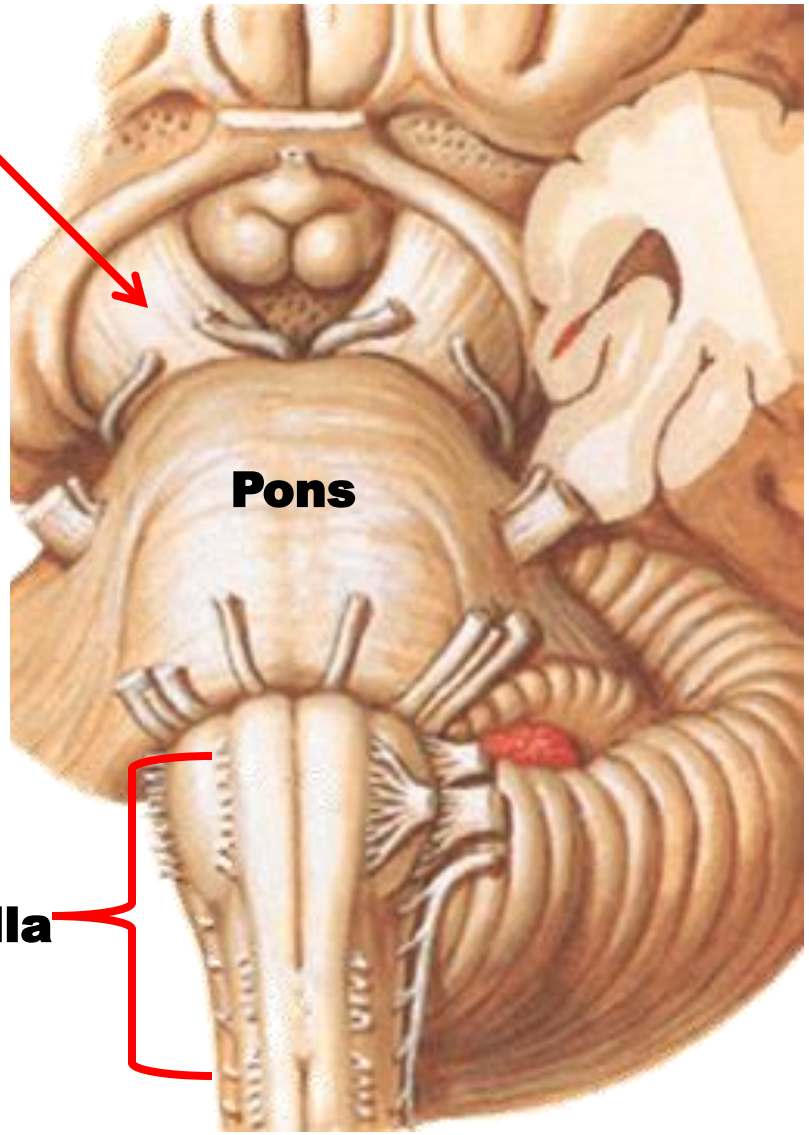
The brain stem is formed of: midbrain, Pons & medulla oblongata.
It connects the Cerebral Hemispheres with the spinal cord.
It is also connected to the cerebellum by 3 peduncles.



Peduncle: thick bundle of nerve fibers.

4th ventricle lies inbetween:
Pons & MO infront and cerebellum behind

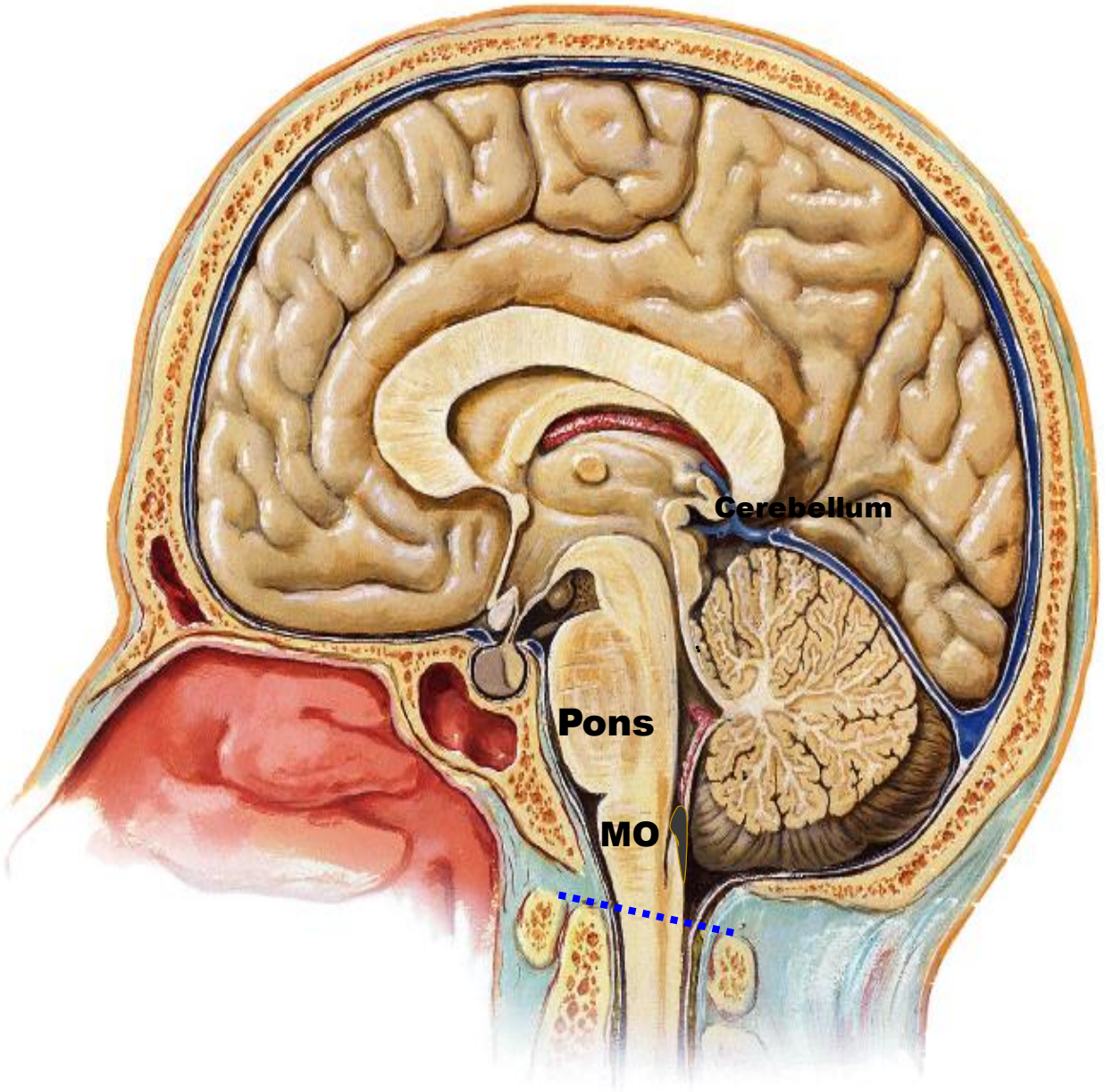

Cerebral hemisphere
Pons
Cerebellum


Midbrain
Pons
Medulla

Medulla oblongata

EXTENSION:

from the lower border of the foramen magnum below to the lower border of the pons above



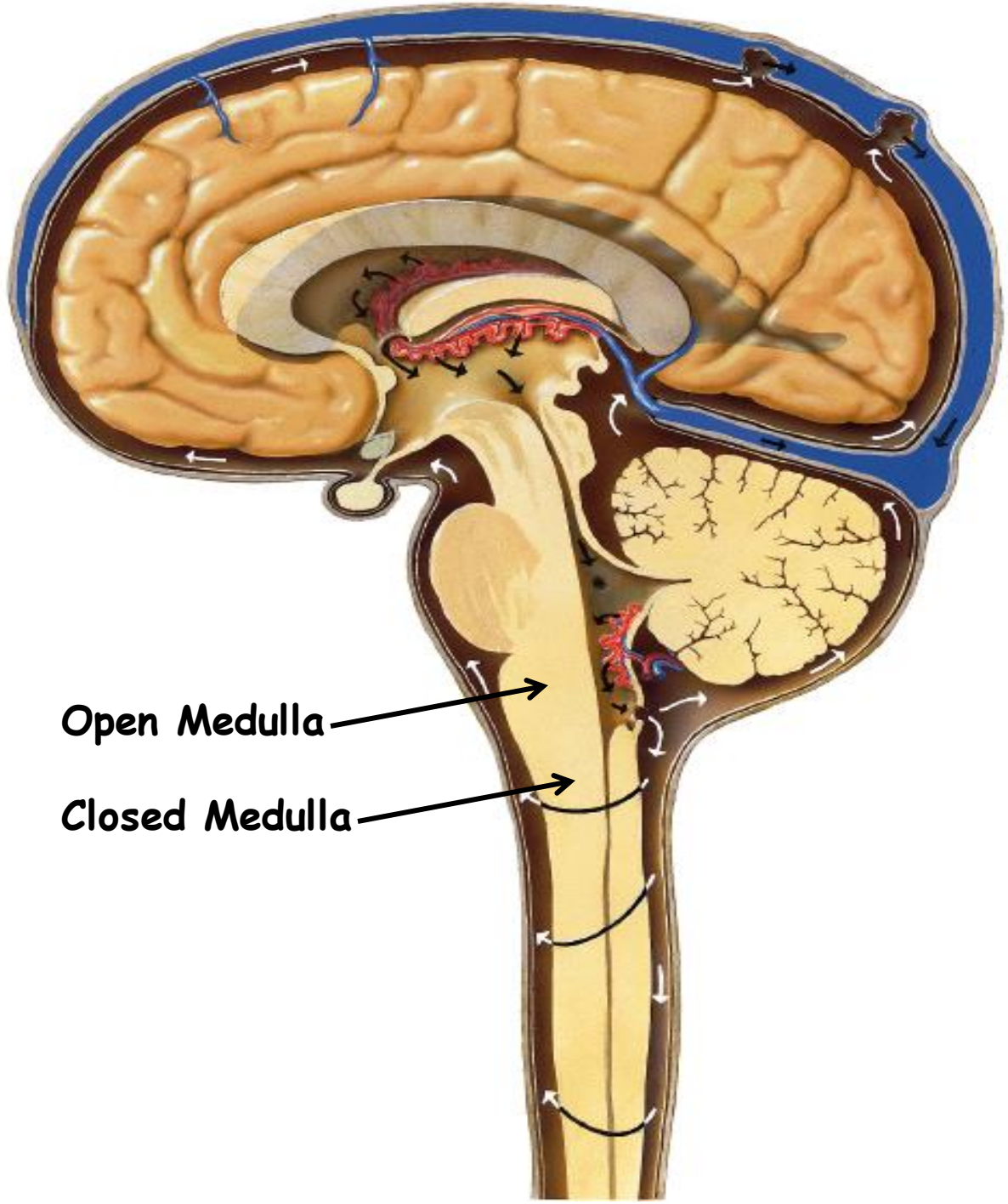
Parts

1) Closed Medulla:

* Is the lower part.
* Encloses the central canal.

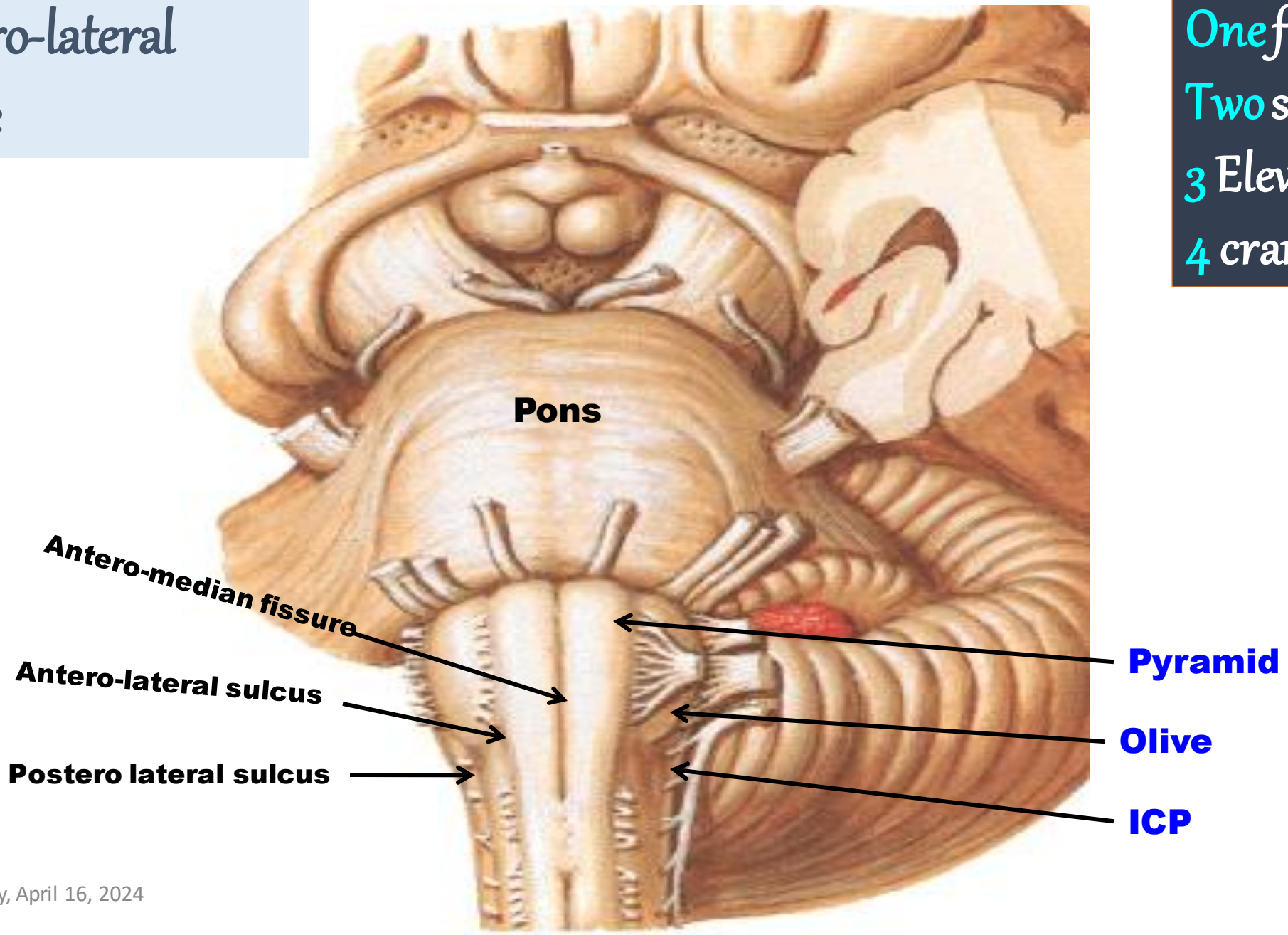
2) Open Medulla:

*Is the upper part.
*Opens into the 4th ventricle & forms the lower part of its floor.



1-Antero-lateral surface

One fissure
Two sulci &
3 Elevations
4 cranial nerves



Pyramid

- Formed by the pyramidal tract.

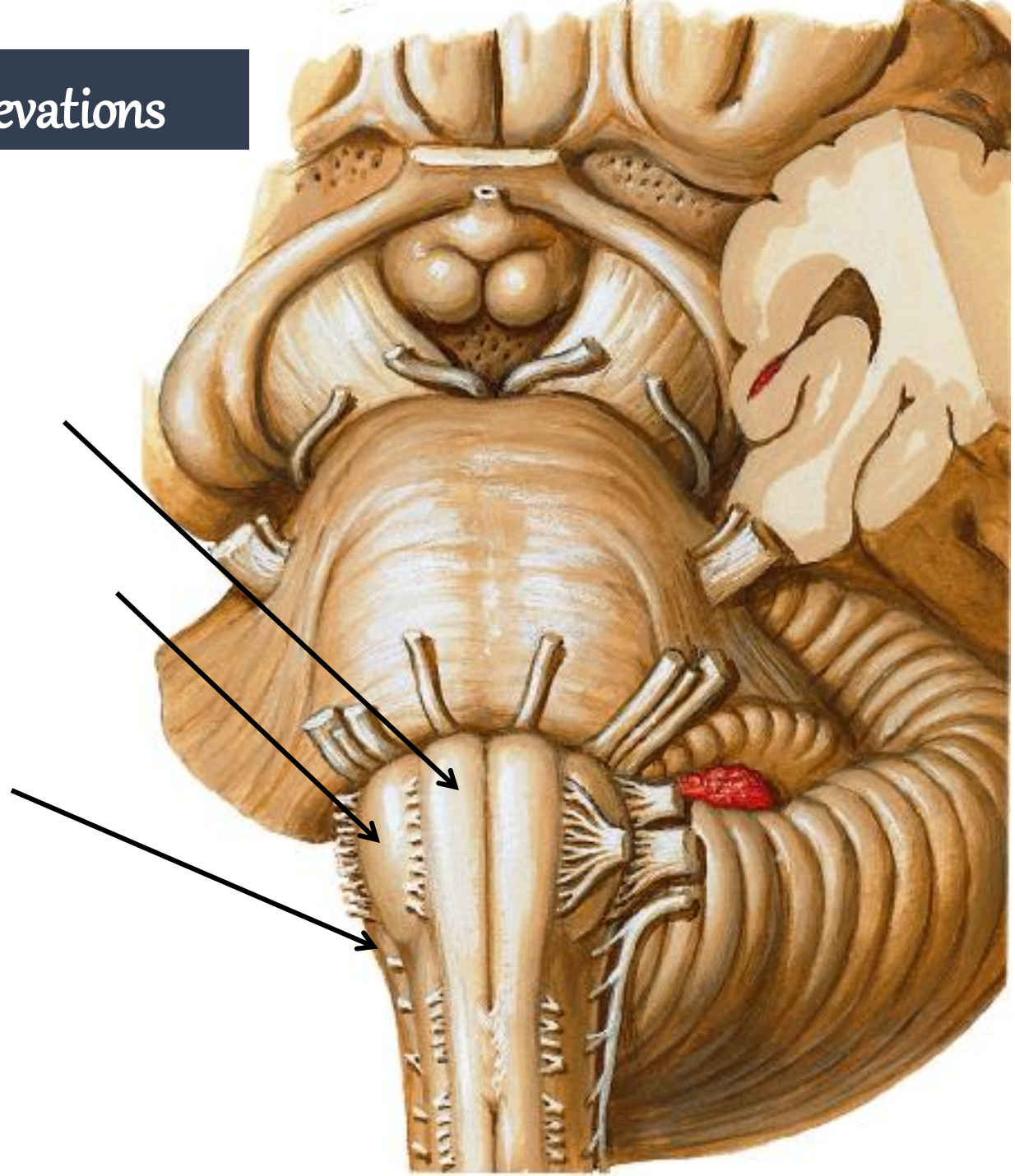
Olive

Is formed by the inferior olivary nucleus.

Inferior Cerebellar Peduncle (ICP)

Lies postero-lateral to olive. It communicates between: Cerebellum & medulla.

3 Elevations



Antero-lateral sulcus:

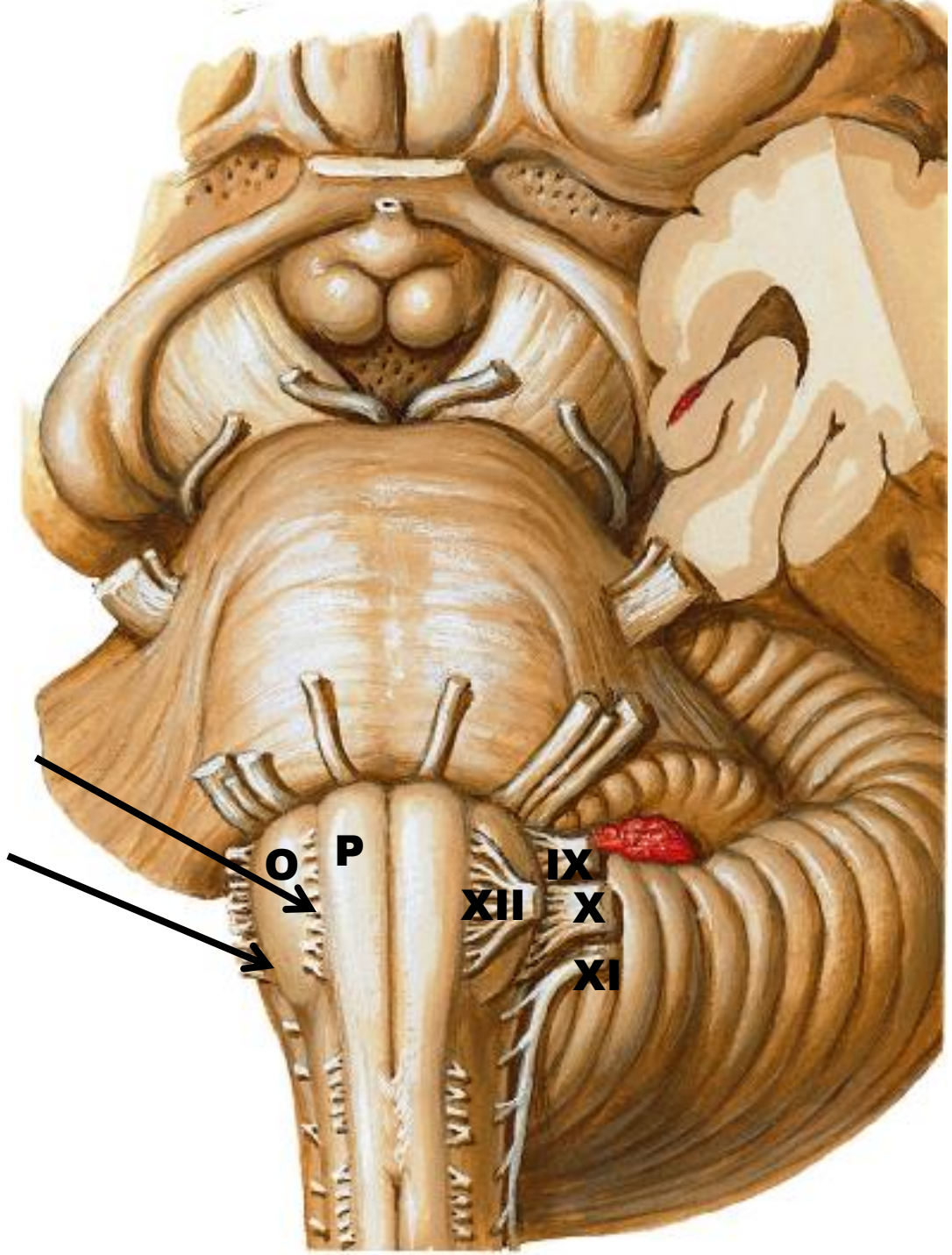
Lies between pyramid & olive.

Gives exit to the rootlets of the hypoglossal nerve.

Postero-lateral sulcus:

Lies between olive & inferior cerebellar peduncle.

Gives exit to the rootlets of 9th, 10th, Cr. accessory (11th).



2-Posterior surface

A-closed medulla:

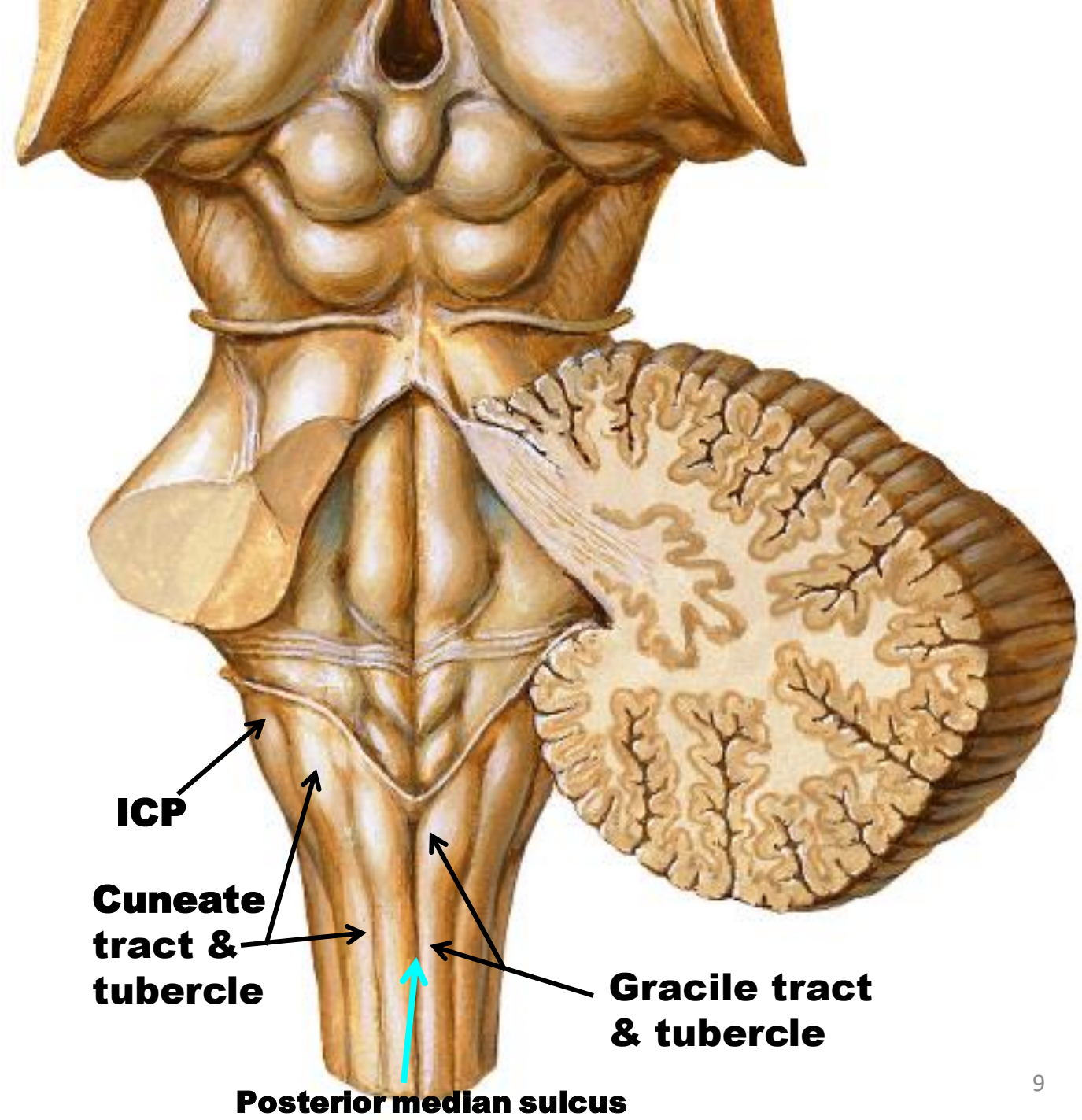
Posterior median sulcus:

3 elevations on each side

Gracile tract: medial & ends in gracile tubercle (nucleus).

Cuneate tract: in the middle & ends in cuneate tubercle (nucleus).

Inferior cerebellar peduncle (ICP).



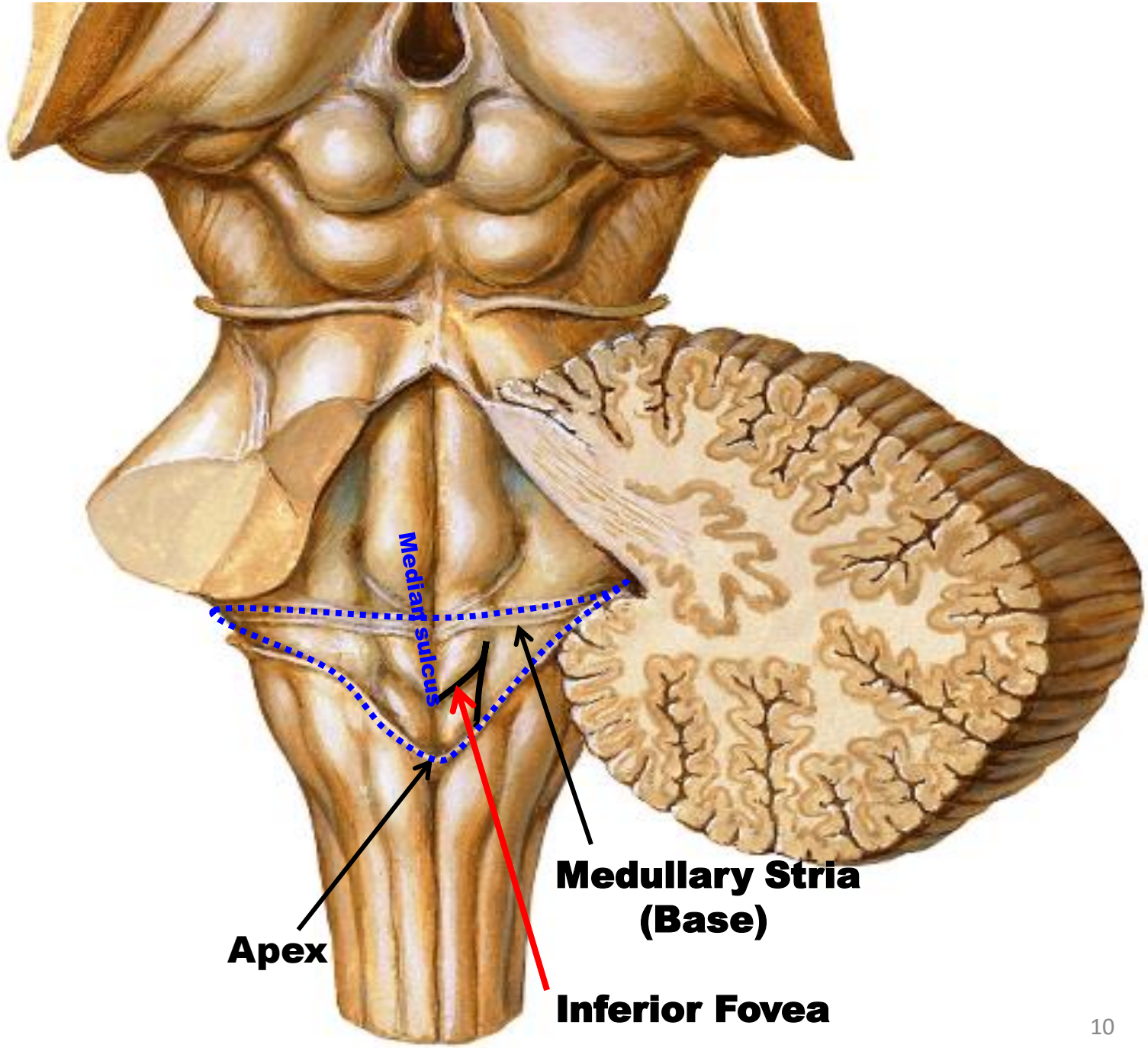
2-Posterior Surface

B-Open meduula:

Forms the lower part of the floor of the 4th ventricle.

it is triangular in shape having :

- Base (above) formed by medullary stria
- Apex (below) continuous with central canal of closed medulla



B-Open medulla:

-Inferior fovea

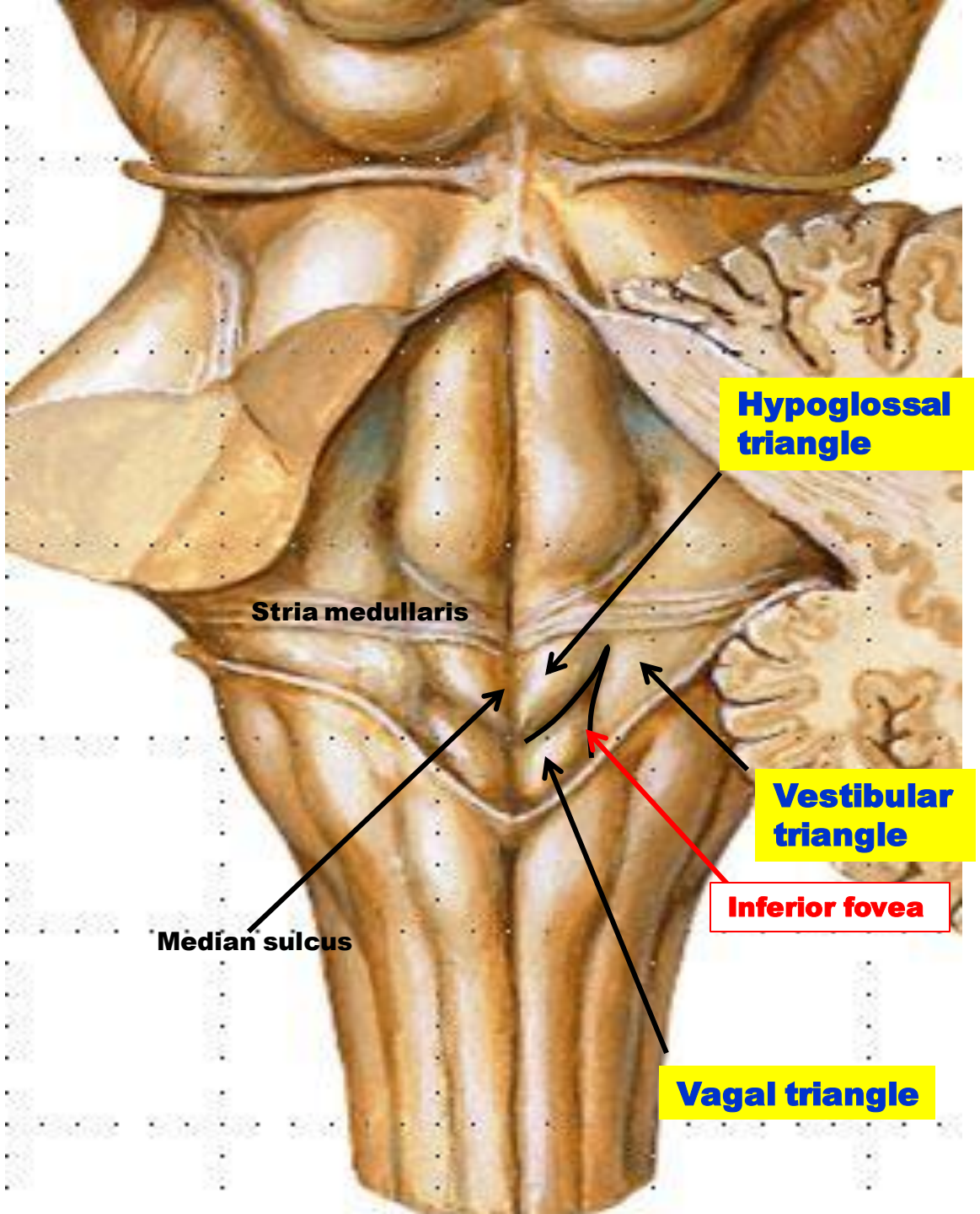
an inverted V-shaped depression.

It divides this area into 3 areas:

-Hypoglossal triangle (Trigone) overlies the hypoglossal nucleus.

-Vagal triangle (Trigone) overlies the dorsal nucleus of vagus.

-Vestibular triangle (Trigone) overlies the vestibular nuclei.

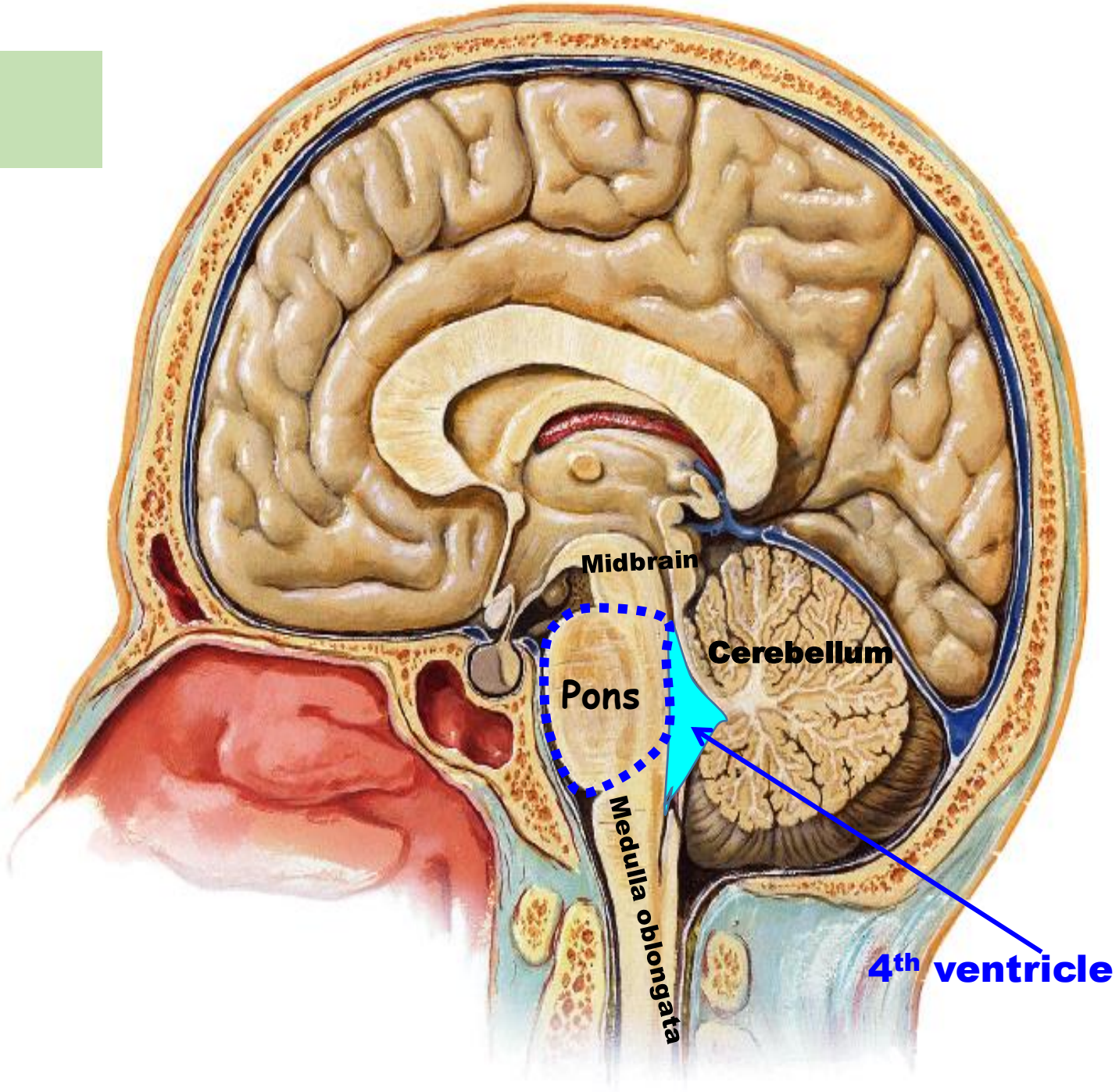


Pons

EXTENSION:

from the upper border of the medulla oblongata (below) to the lower border of the mid brain (above).

It forms the upper part of the floor of the 4th ventricle



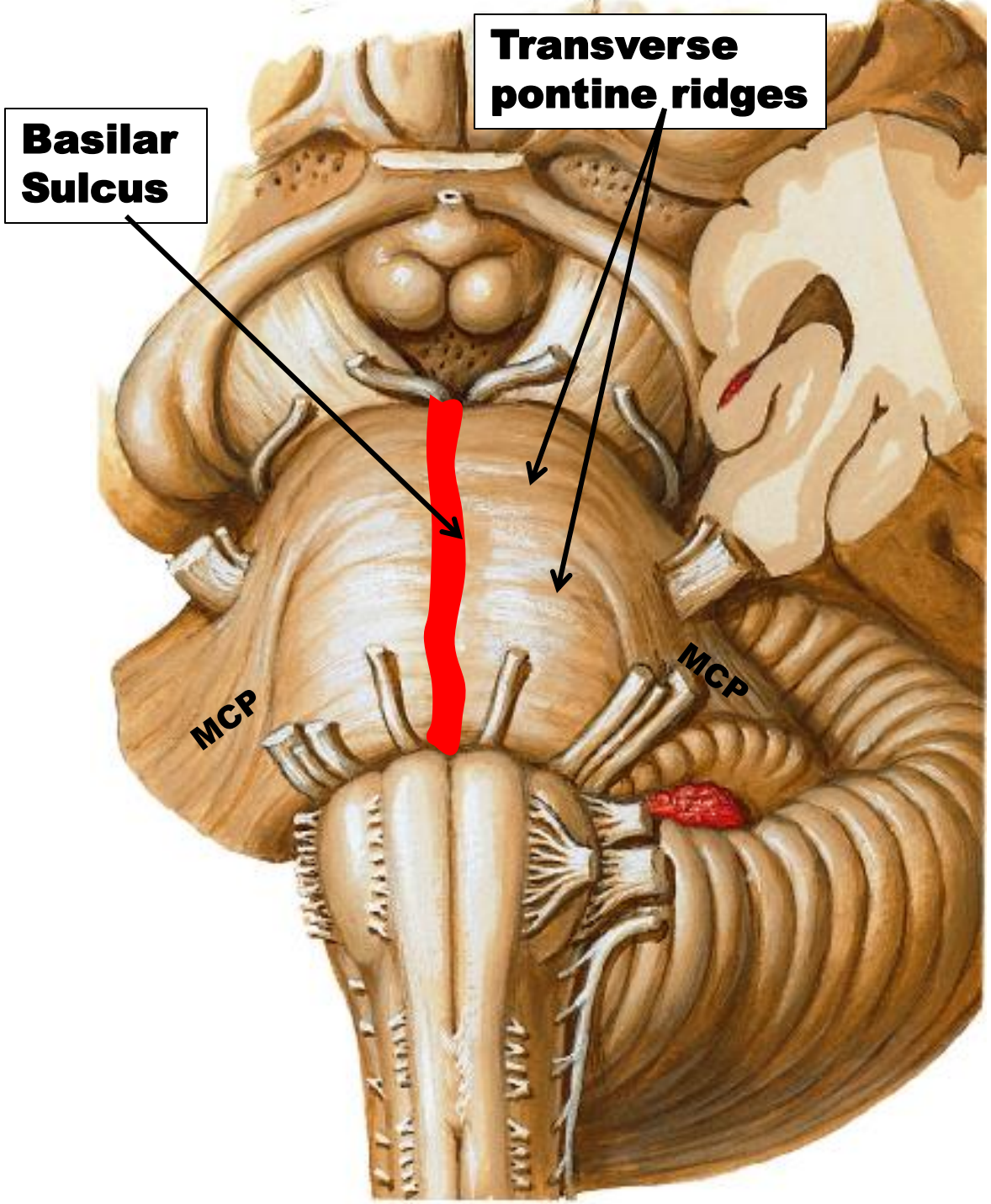
Pons:

A) Ventral aspect:

1) Basilar Sulcus (Sulcus Basilaris):
Lodges the basilar a.

2) Transverse pontine ridges:
by pontocerebellar fibers &
collect to form the MCP.

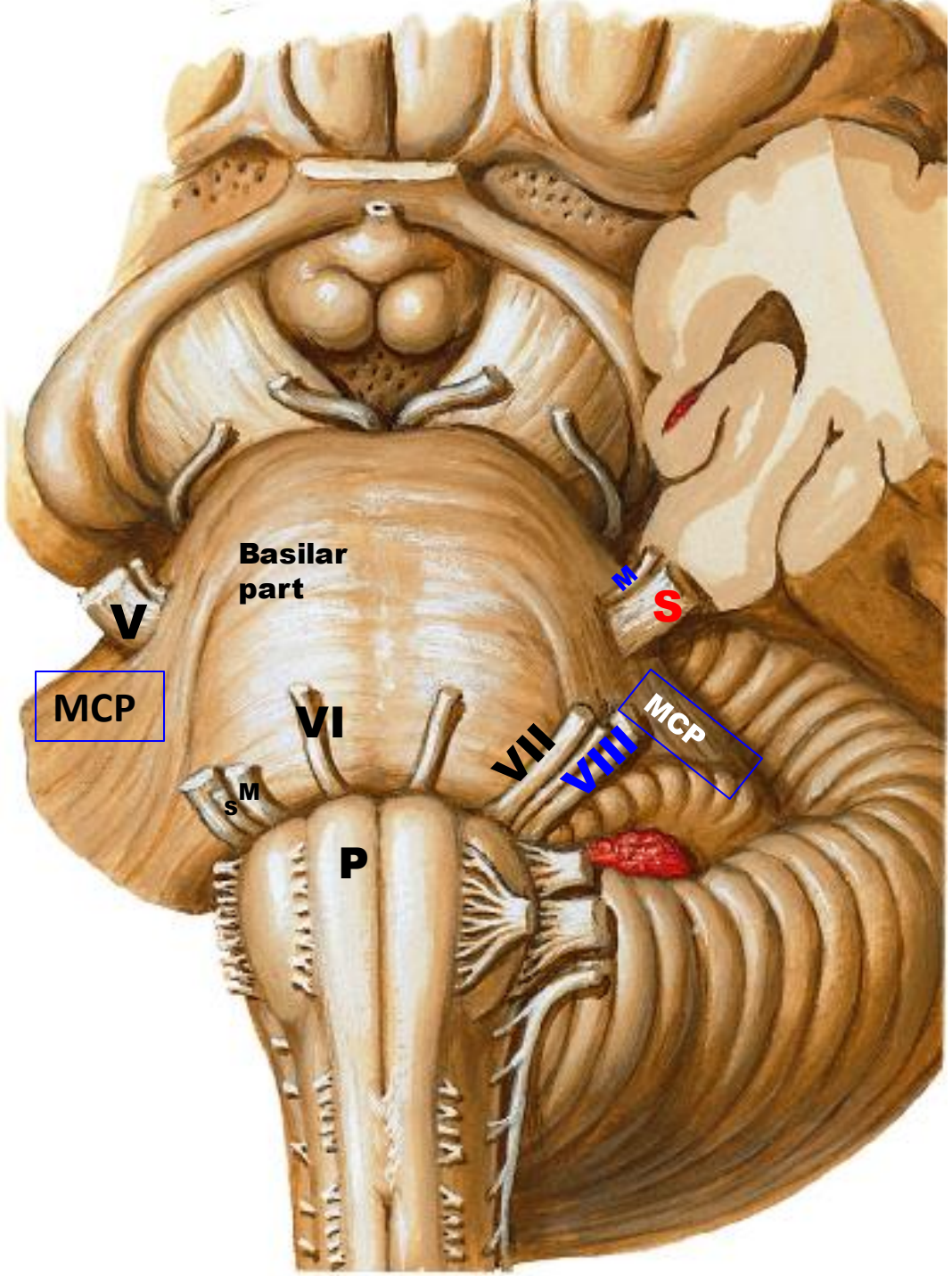
3) Middle cerebellar peduncle
(MCP)



4) Trigeminal (5^{th}) nerve

5) Abducent (6^{th}) nerve:
Is attached to the junction between **pyramid** & **pons**.

6) Facial (7^{th}) & vestibulo-cochlear (8^{th}) **nerves** to cerebello-pontine angle (bet. MCP & ICP)



Clinically, cerebellopontine angle tumor causes lesions of facial paralysis + lesion of VIII deafness & vertigo.

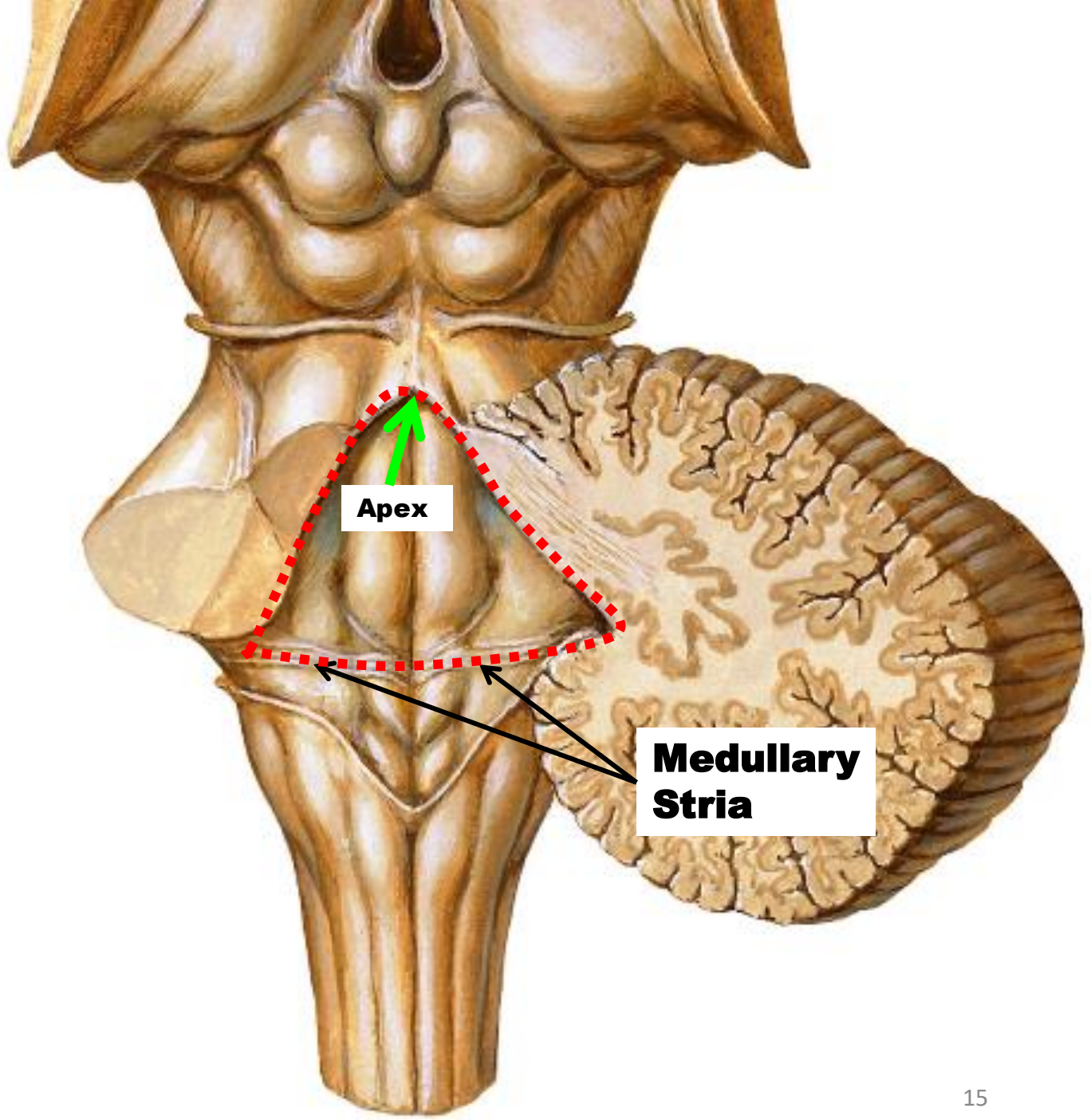
B) Dorsal aspect:

Forms the upper part of floor of 4th ventricle.

It is triangular having:

- Apex (above): continuous with cerebral aqueduct of Sylvius

- Base below formed by Medullary stria



This part SHOWS:

1- Medullary stria

2- Median sulcus

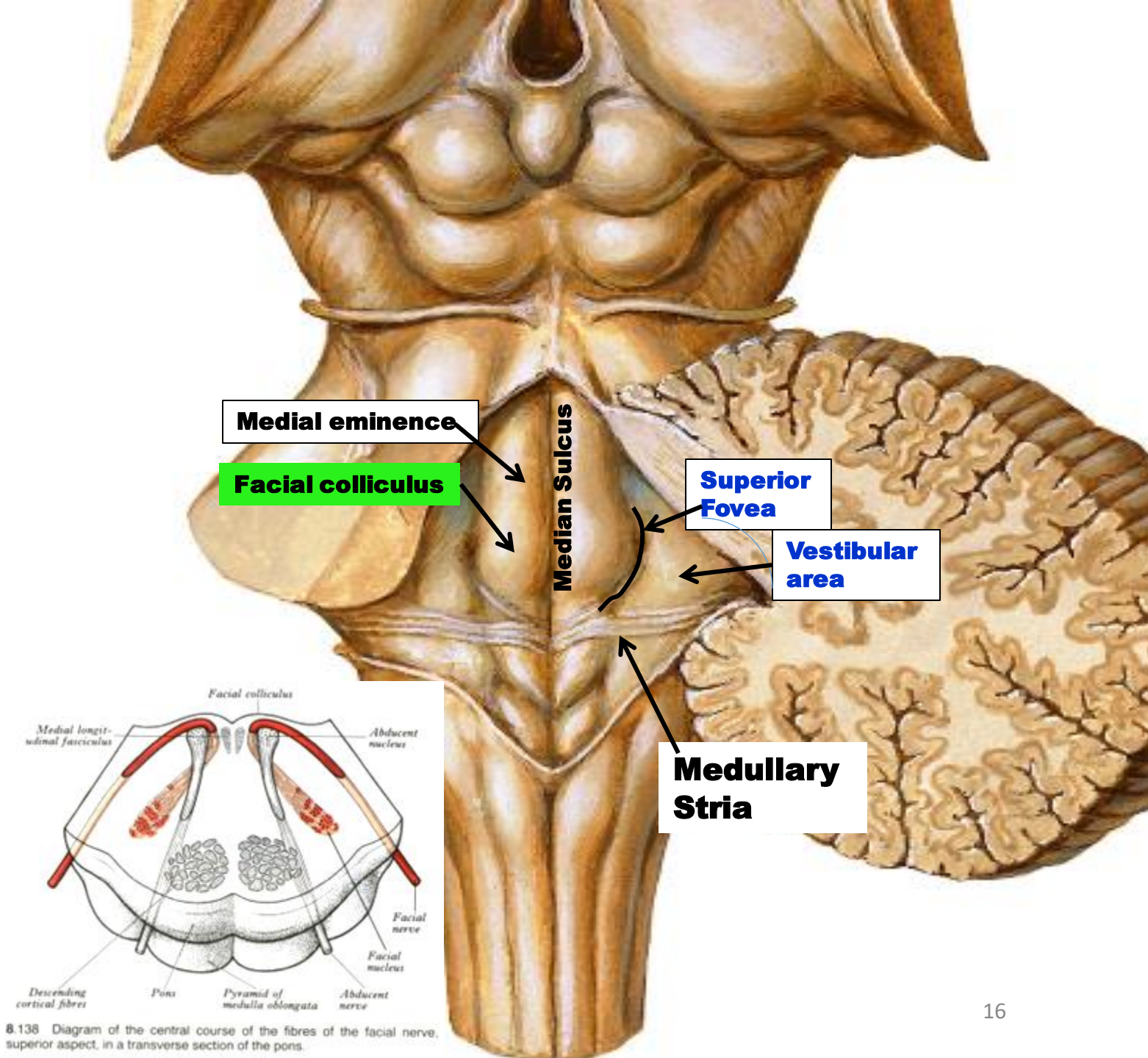
3-Medial eminence overlies the abducent nucleus

4- Facial colliculus: It is formed by the motor fibers of the facial nerve looping over the abducent nucleus.

5-Vestibular area.

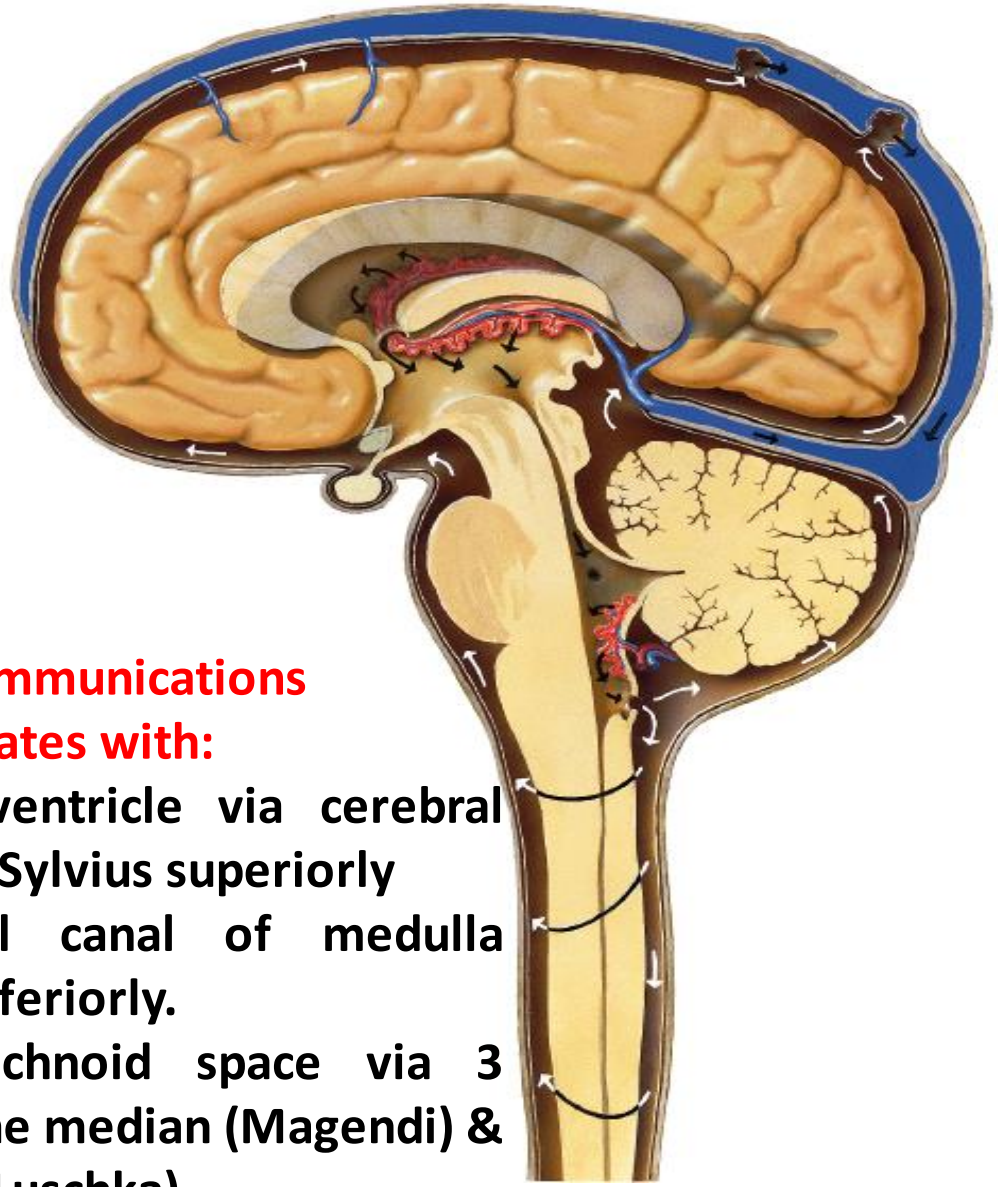
6-Superior fovea

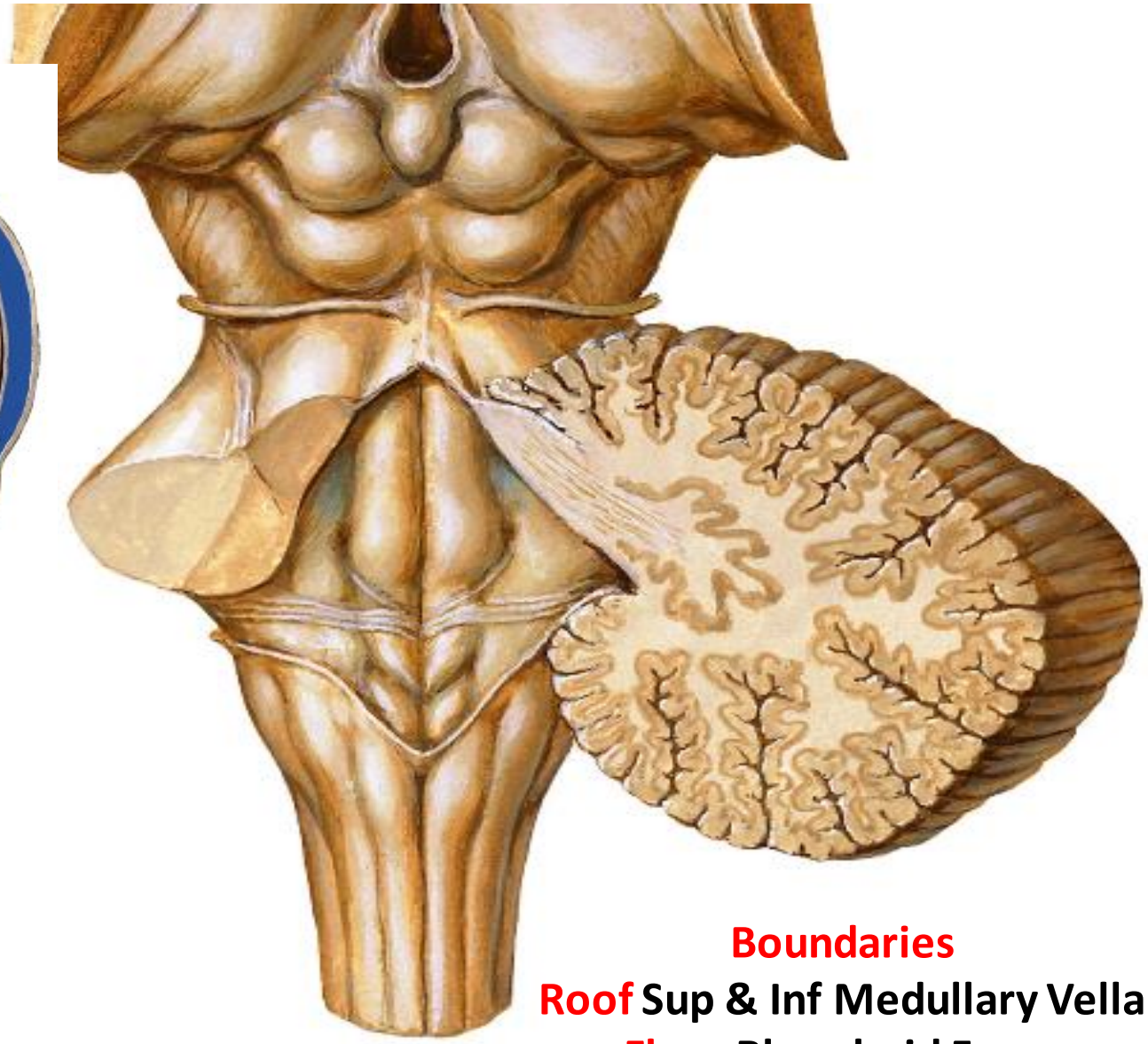
It is a depression between facial colliculus & vestibular area.



8.138 Diagram of the central course of the fibres of the facial nerve, superior aspect, in a transverse section of the pons.

Fourth Ventricle





•Communications

It communicates with:

•the third ventricle via cerebral aqueduct of Sylvius superiorly

•the central canal of medulla oblongata inferiorly.

•the subarachnoid space via 3 foramina: one median (Magendi) & two lateral (Luschka).

Boundaries

Roof Sup & Inf Medullary Vella

Floor Rhomboid Fossa

Midbrain

Extension:

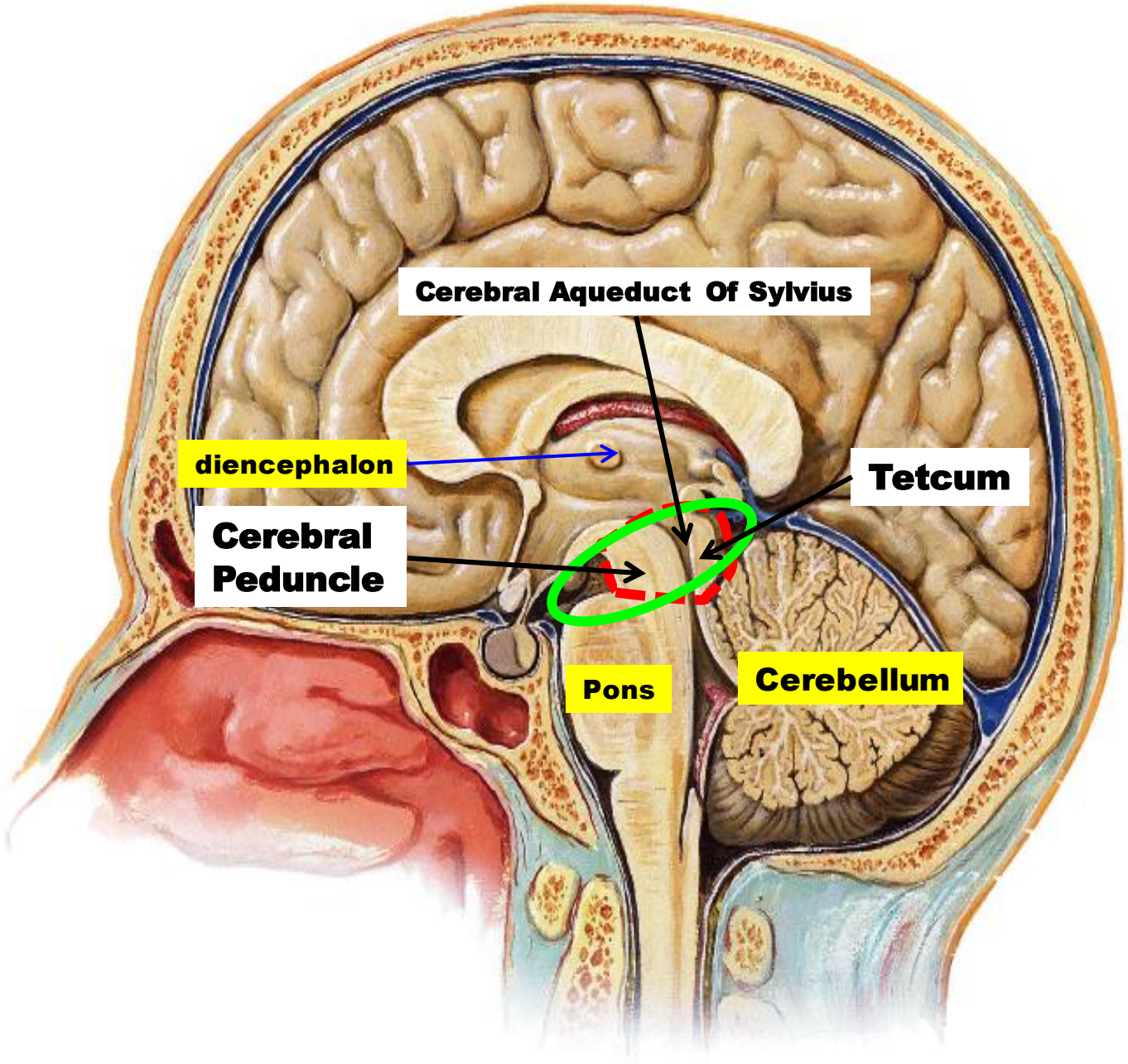
from the upper border of the pons (below) to the diencephalon (above).

Cavity:

cerebral aqueduct of sylvius.

Parts:

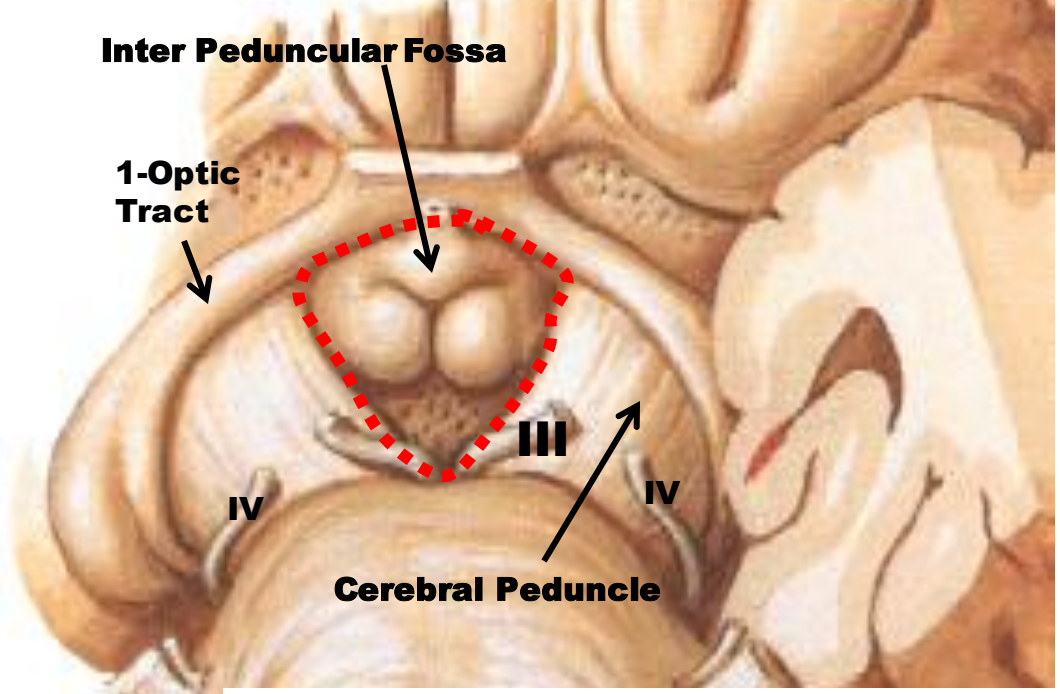
it is divided by its cavity into cerebral peduncle in front & tectum behind.

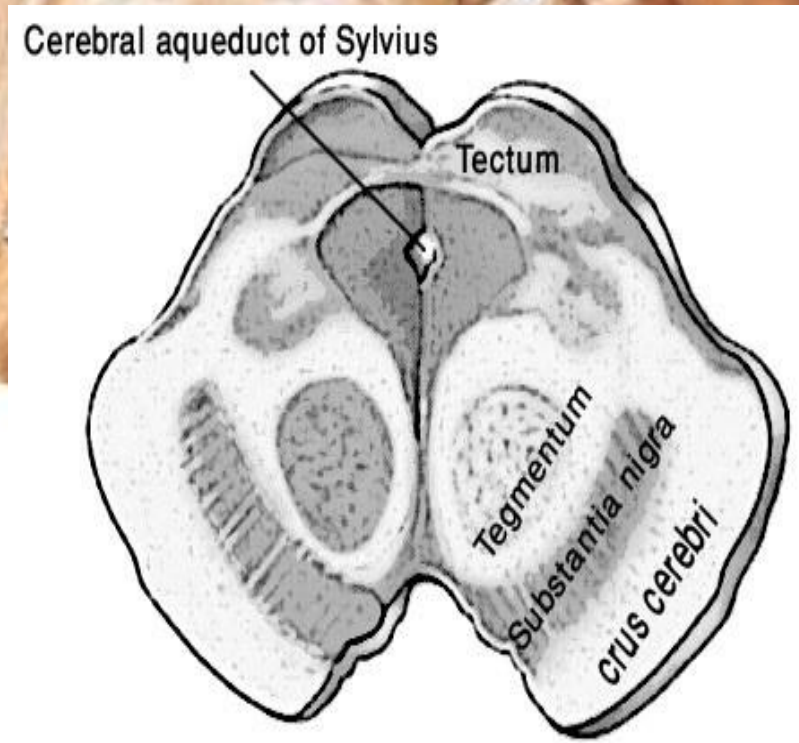


1) Anterior aspect:

i-Two cerebral peduncles enclosing the inter-peduncular fossa. Each consists of: crus cerebri (ant.), substantia nigra, tegmentum (post.)

ii- The oculomotor nerve emerges from the medial side of the cerebral peduncle.



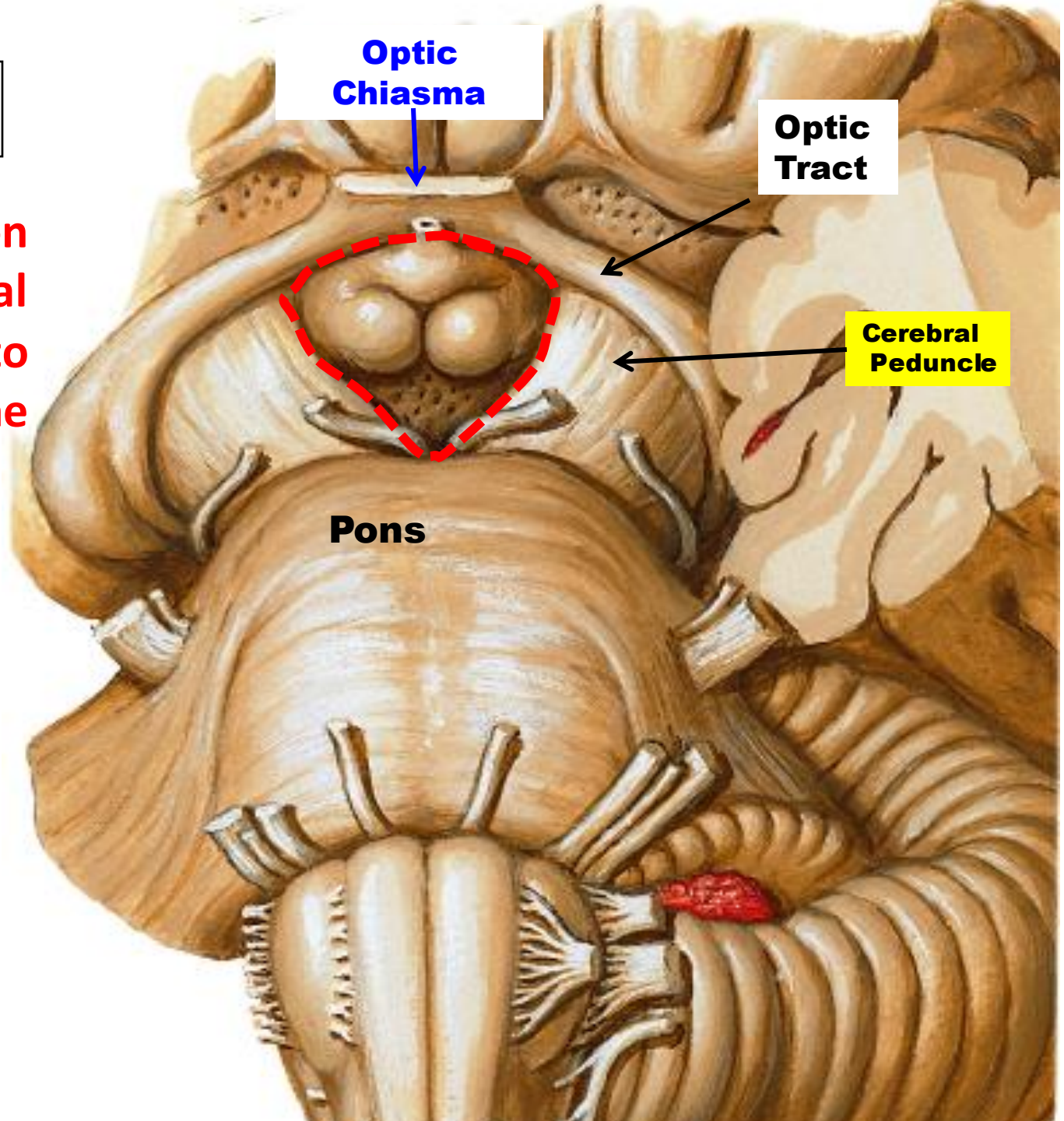


The Interpeduncular Fossa

is a trapezoid depression between the 2 cerebral peduncles. It does not belong to the midbrain but to the hypothalamus.

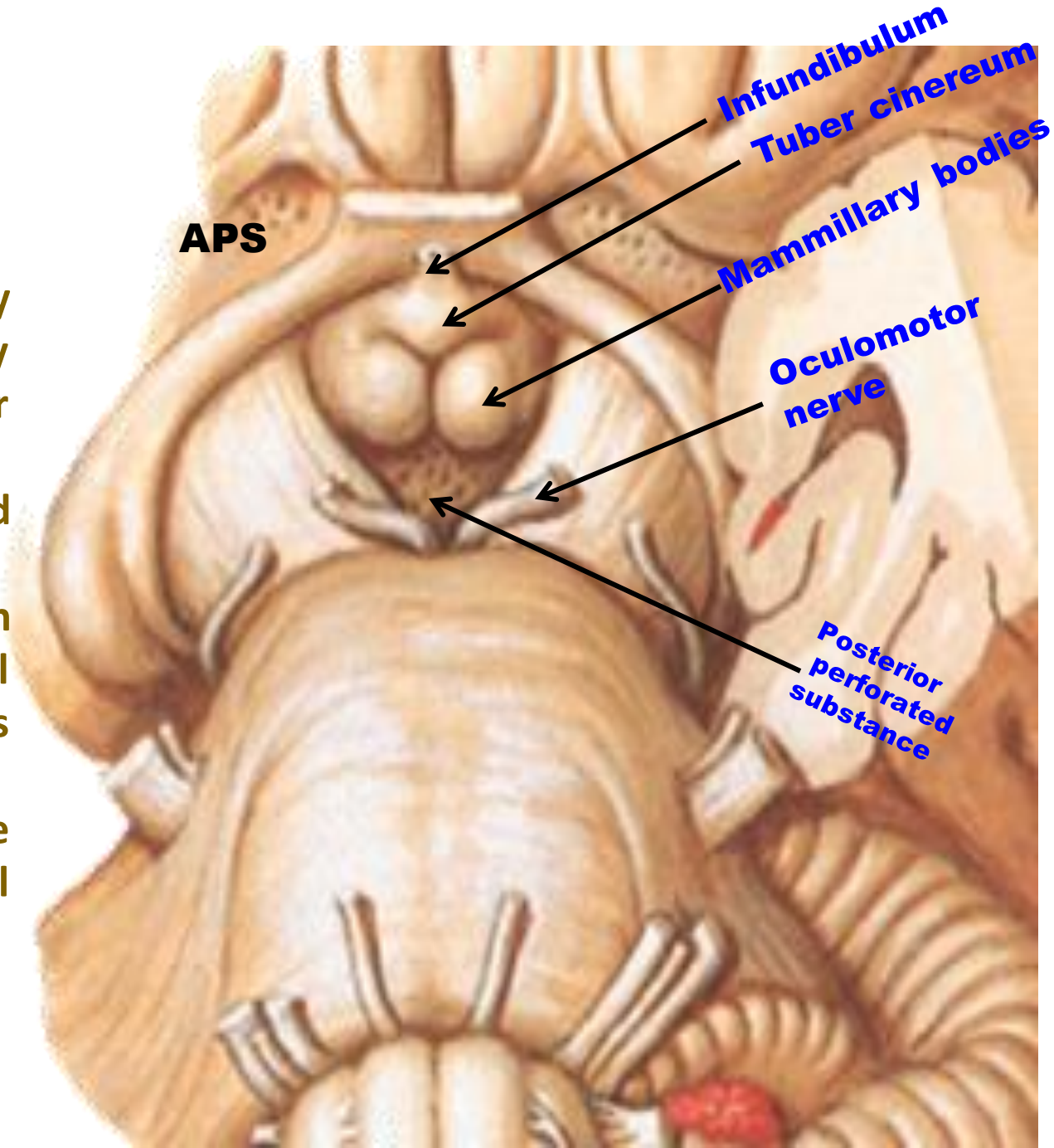
Boundaries

1. Anteriorly: optic chiasma.
2. Anterolaterally: optic tract.
3. Posterolaterally: cerebral peduncle.
4. Posteriorly: upper border of pons.



Contents:

1. Tuber cinereum: convex mass of grey matter. The infundibulum (or pituitary stalk) connects it with the posterior lobe of pituitary gland.
2. Mammillary bodies: two rounded nuclei of hypothalamus.
3. Posterior perforated substance: an area of grey matter showing small holes pierced by the central branches of posterior cerebral artery.
4. Oculomotor nerve emerges from the medial surface of the cerebral peduncle.



2) Posterior aspect (Tectum):

Two Superior colliculli (SC):

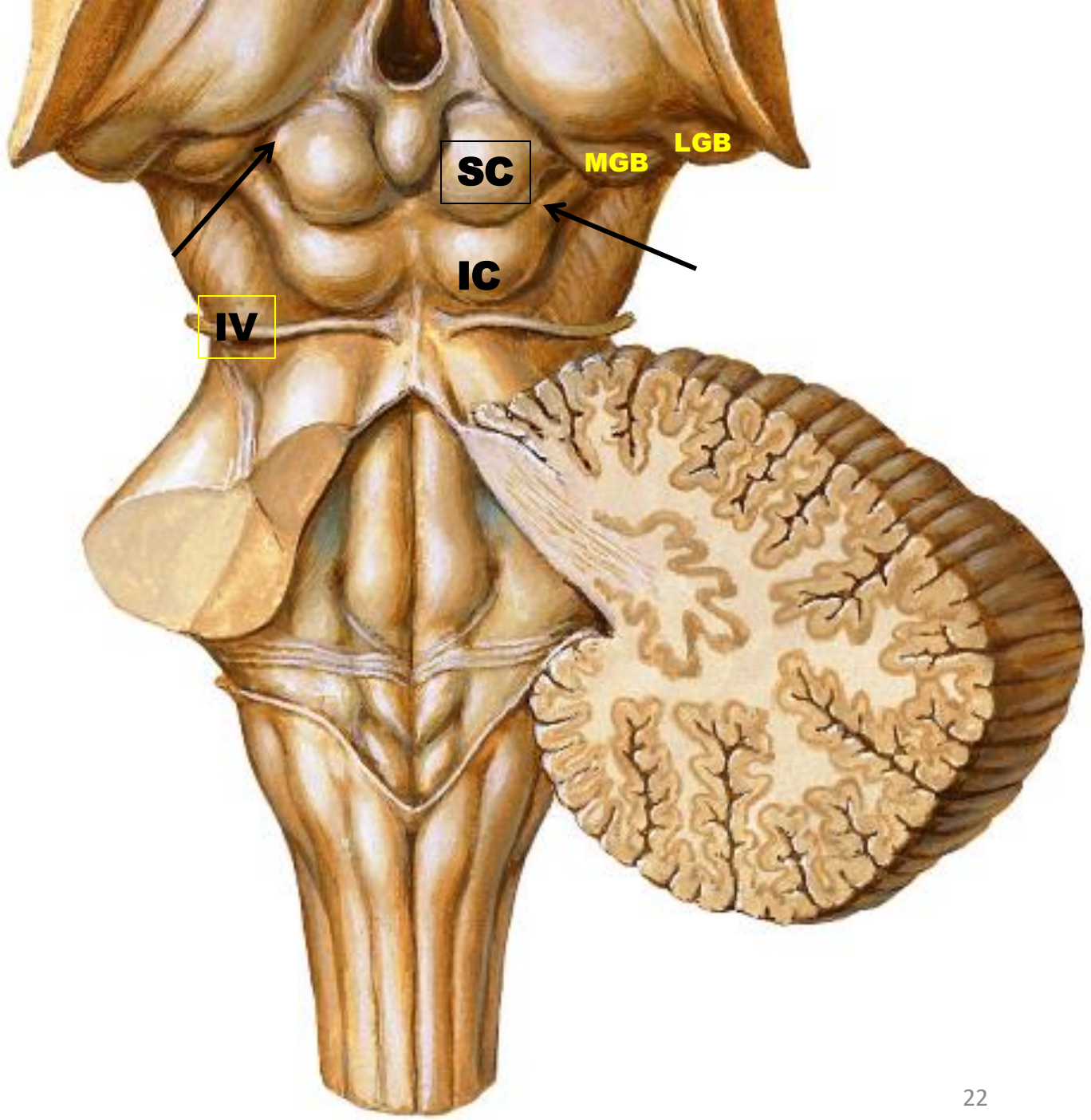
Are visual reflex centers.

Each one is connected to lateral geniculate body (LGB)

Two Inferior colliculli(IC):

Are auditory reflex centers.

Each one is connected to medial geniculate body (MGB)



Thank you