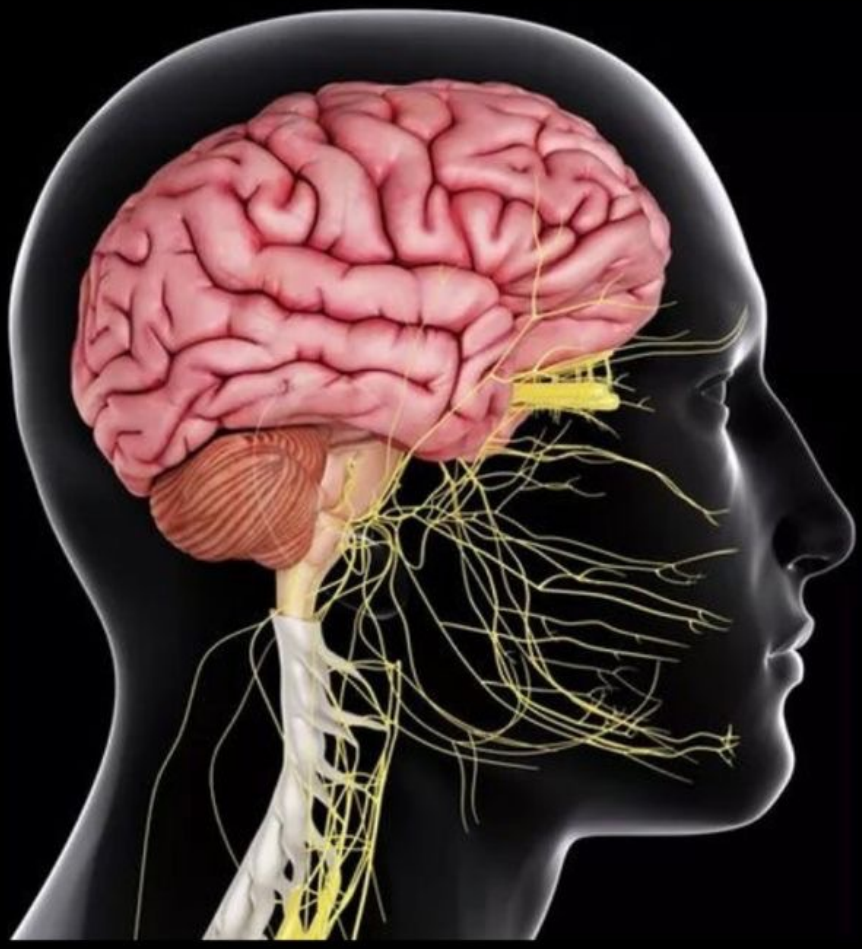
CENTRAL NERVOUS SYSTEM



SUBJECT : Anatomy

LEC NO. : 4 +5

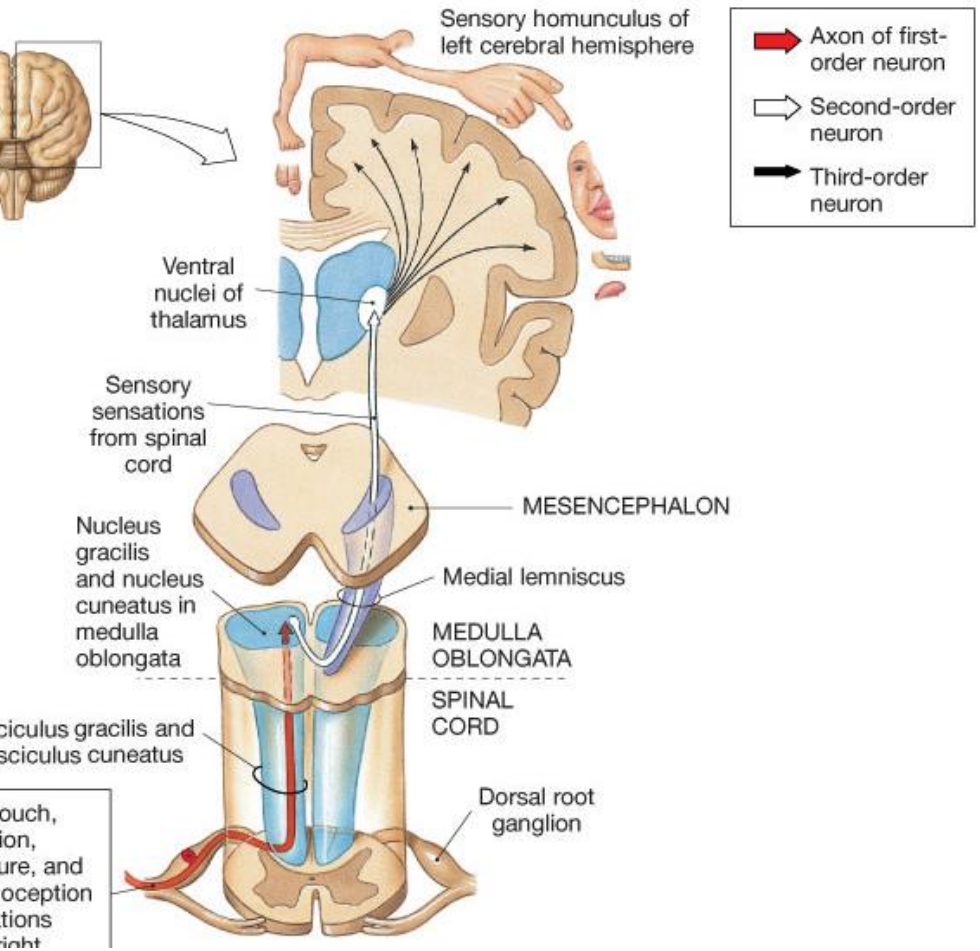
DONE BY : Batool ALzubaidi & Hashem Ata

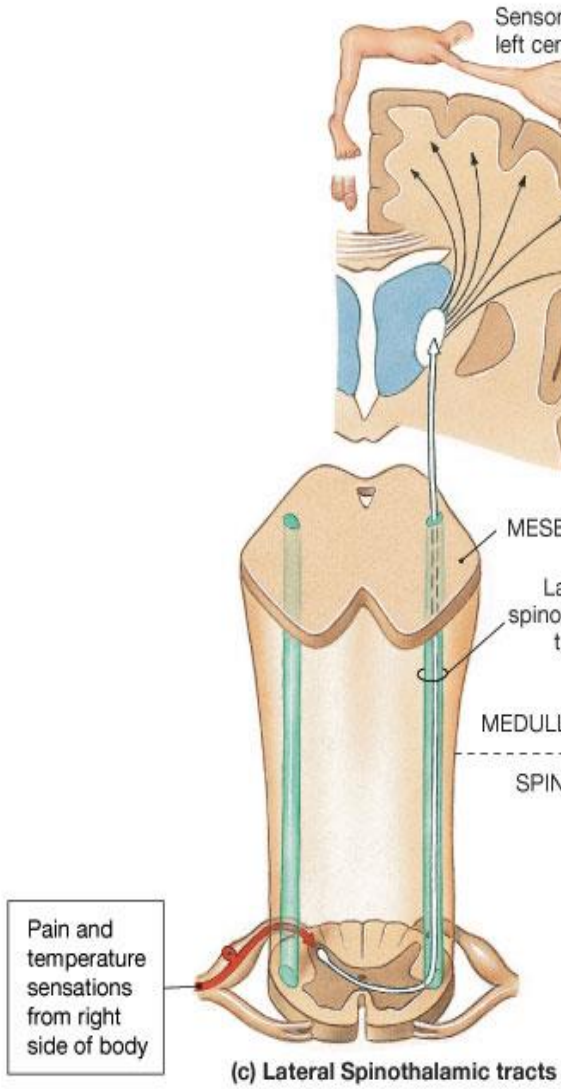
وَقُل رَّبِّ زِدْنِي عِلْمًا

Spinal cord lesions

Before the study the lesions, lets remember the pathways for the sensations.

من المحاضرة الماضية





Spinal Cord lesions

Complete transverse section

- Above C5 → Death due to paralysis of diaphragm & intercostal muscles
  - مكان ال brachial plexus
- Between C5 & T1 → Quadriplegia
  - شلل رباعي
- Below T1 → Paraplegia
  - شلل نصفي

هاد ال common زي trauma من الجنب

لو صار compression عند اا من جهة وحدة راح ينقطع ال dorsal horn و اخسر كل ال sensation مع lower motor lesion لانه انقطع ال ventral

Hemi-section of Spinal Cord

بالنسبة لشغلة ال segments و ال vertebrae هلا هي مش دقيقة بالملي ممكن نلاقي اختلافات يعني اجا سؤال للدكتور مثلا cl segment من اي vertebrae و هيك

في حالة ال ipsilateral لو القطع كان لتحت ال anterior horn cells راح تكون شغالة و راح يكون upper motor lesion اما لو كان في مكان ال lesion راح يكون lower

Brown sequard syndrome

At level of lesion;

1-Ipsilateral loss of all sensations(damage of dorsal root)

2-Ipsilateral LMNL(damage of anterior horn)

Below level of lesion ipsilateral:

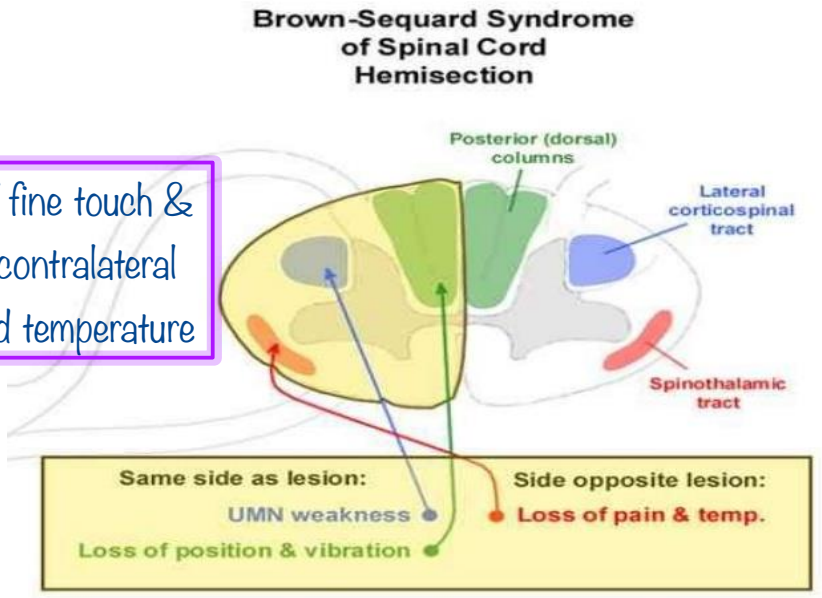
1- loss of proprioceptive sensations due to destruction of post white column

2- UMNL: due to affection of lateral corticospinal

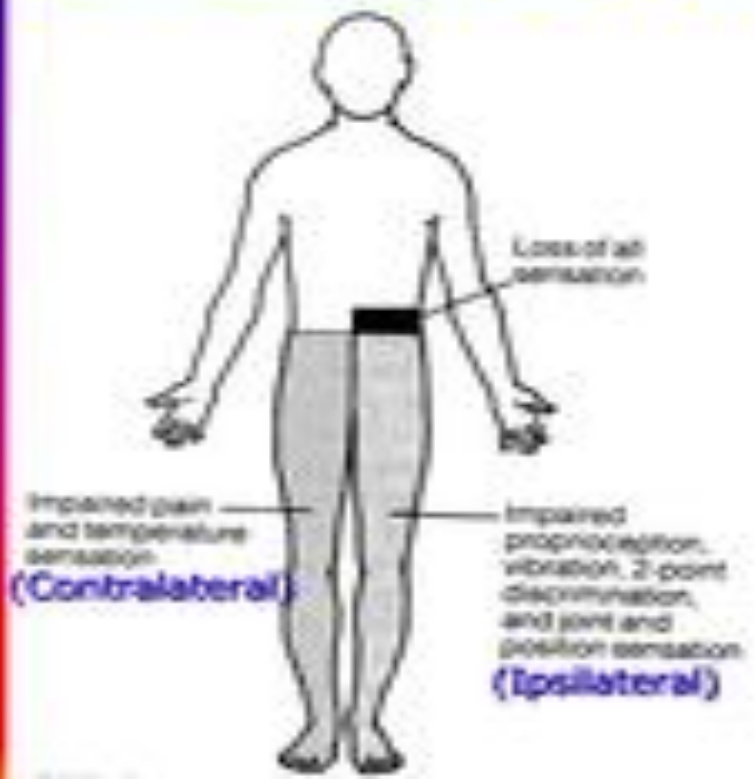
Below level of lesion contra lateral

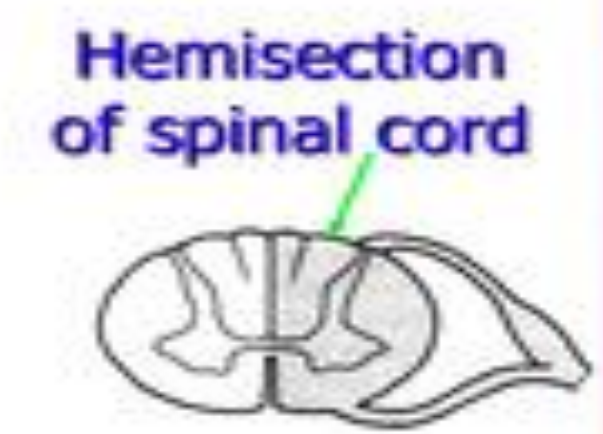
1- loss of pain and temperature due to affection of lateral spinothalamic

Loss of fine touch & loss of contralateral pain and temperature



Brown-Séquard Syndrome





يعني ال artery مسكر و هو الي بغذي التلتين الامامين من ال spinal cord

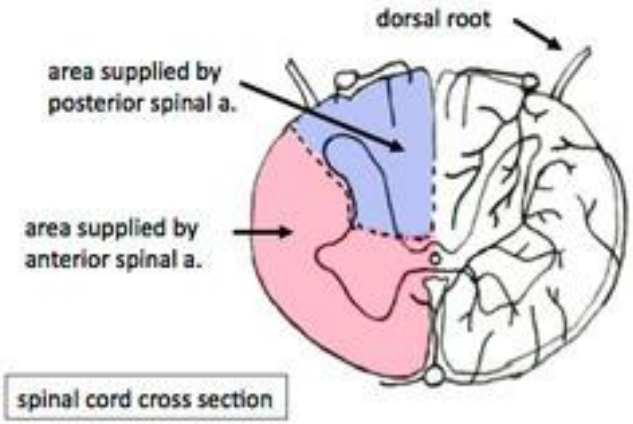
Anterior spinal artery occlusion

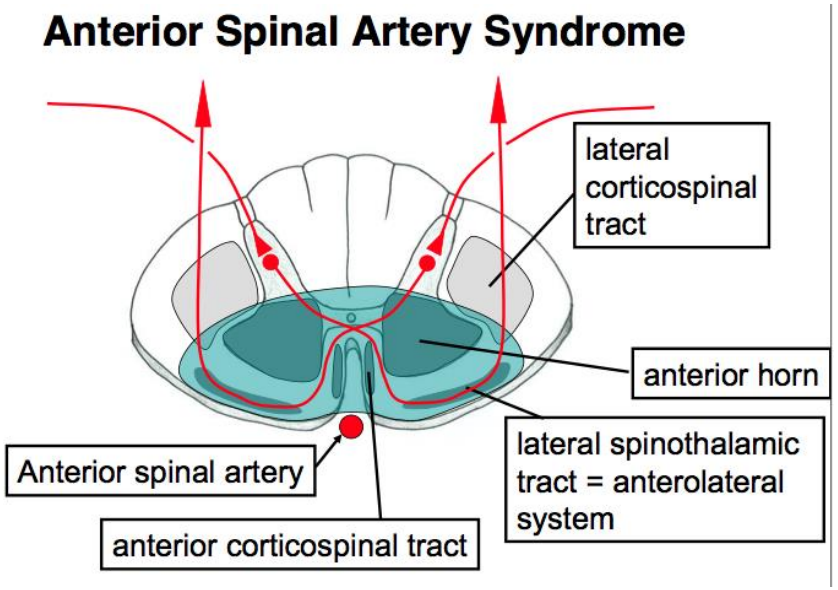
below lesion

Bilateral UMNL paralysis

Bilateral loss of pain and temperature

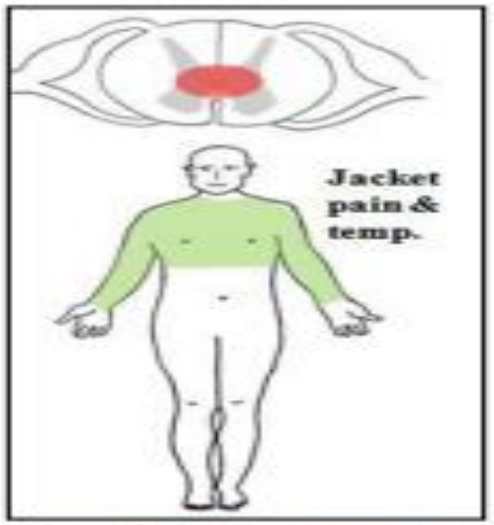
Preservation of proprioception and touch





Syringomyelia

- Cavitation around the central canal in the cervical and upper thoracic segments of the spinal cord
- degeneration of the crossing fibers carrying pain & temperature sensations. Around central canal
- There is bilateral loss of pain & temperature sensations in dermatomes corresponding to the levels of crossing affected (jacket distribution of anesthesia).



Brain Stem 1

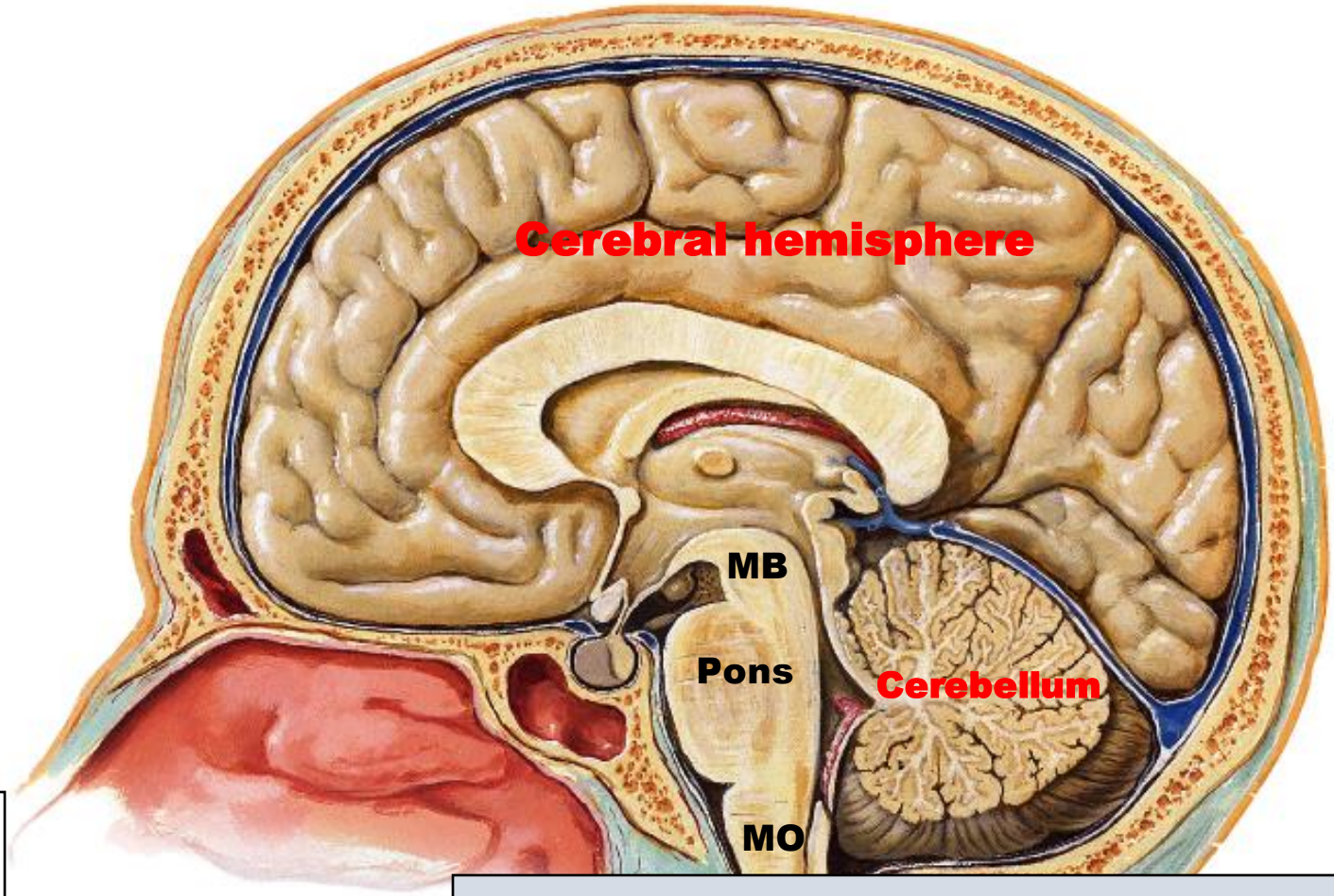
Dr Ashraf Sadek *PhD, MD, MRCPCH*

Assistant Professor of anatomy and embryology

Brain Stem

Lower/ inferior peduncle → connects medulla with cerebellum
Middle peduncle → connects pones with cerebellum
Superior peduncle → connects midbrain with cerebellum

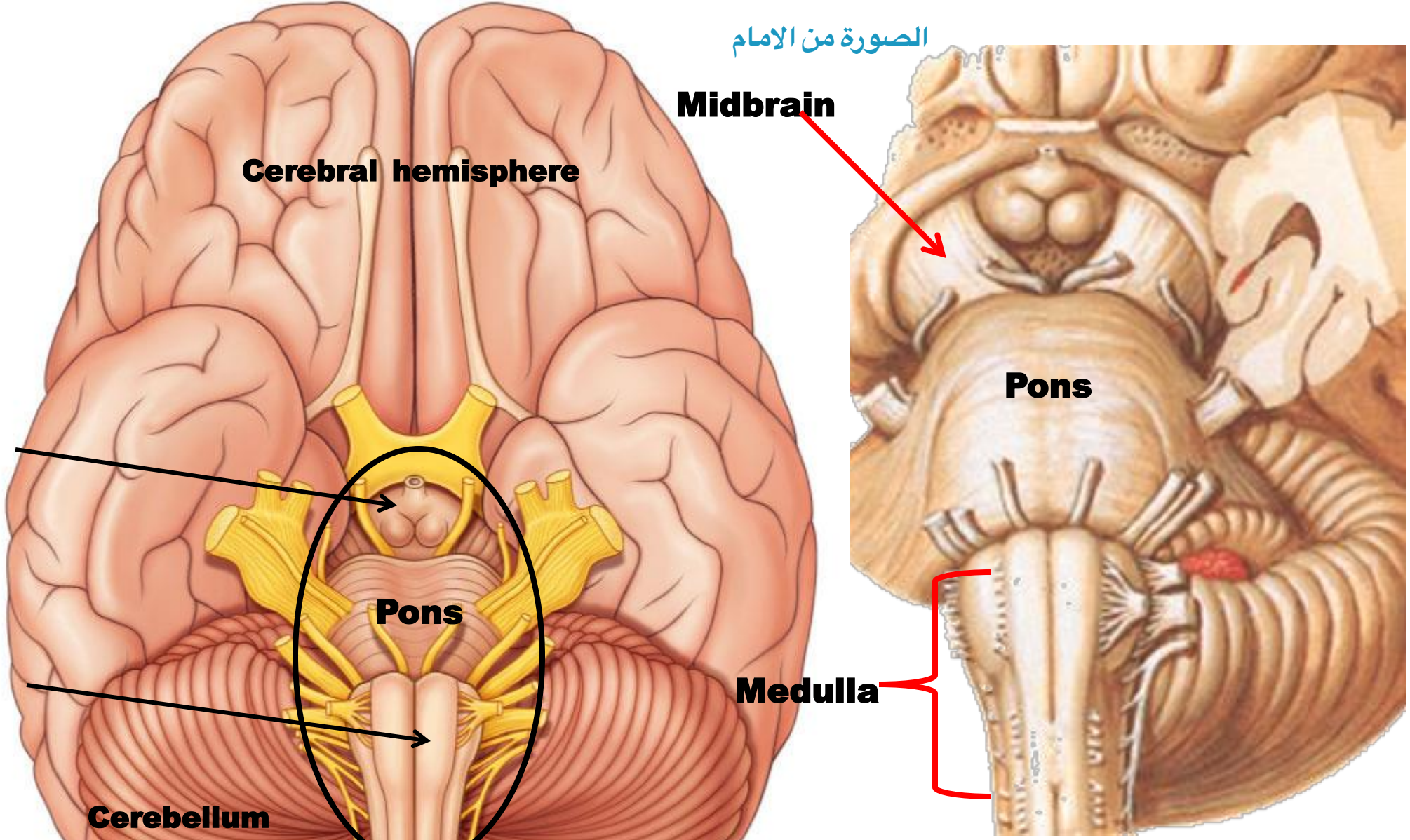
The brain stem is formed of: midbrain, Pons & medulla oblongata.
It connects the Cerebral Hemispheres with the spinal cord.
It is also connected to the cerebellum by 3 peduncles.



Peduncle: thick bundle of nerve fibers.

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

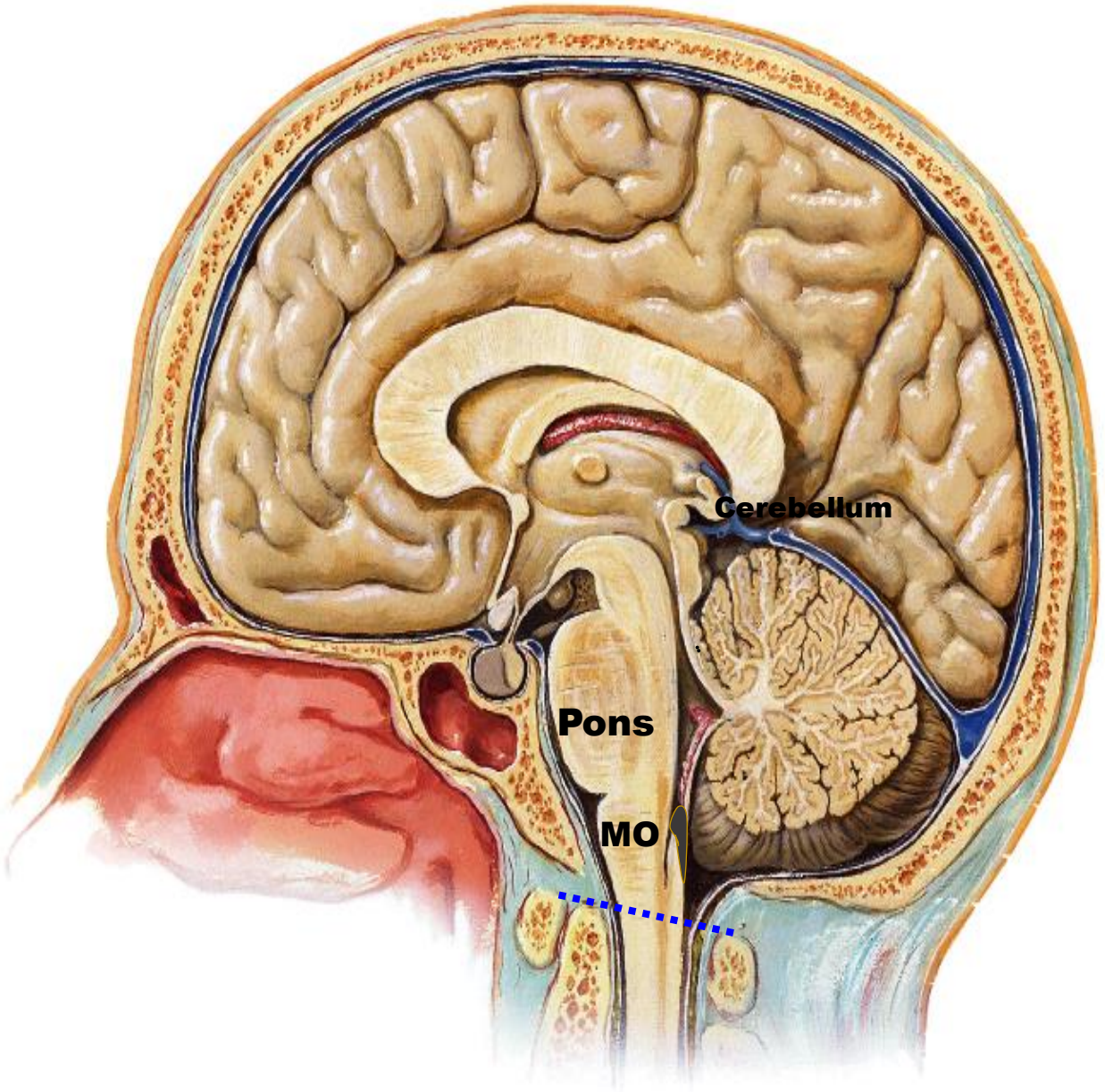
الصورة من الامام



Medulla oblongata

EXTENSION:

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



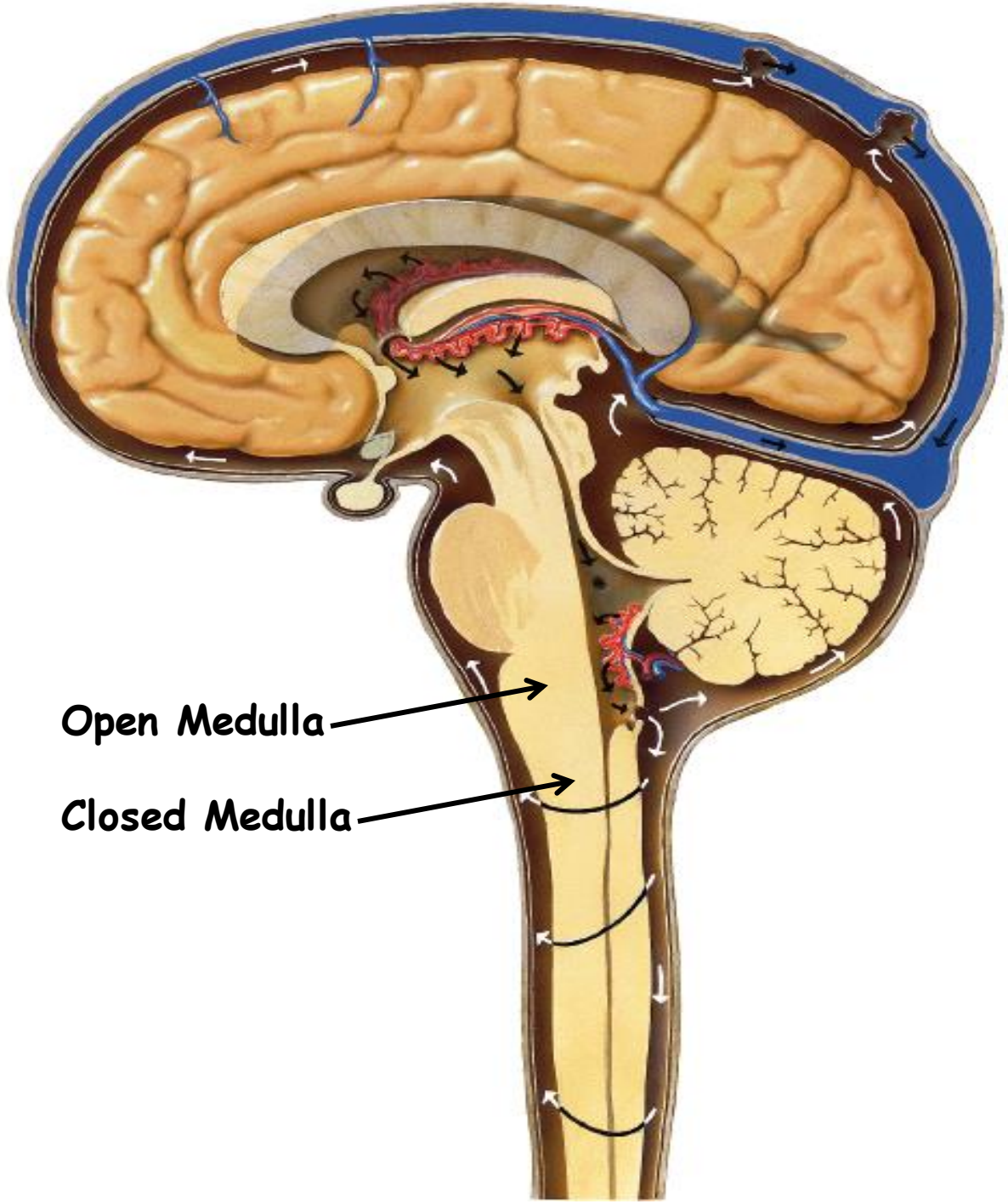
Parts

1) Closed Medulla:

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

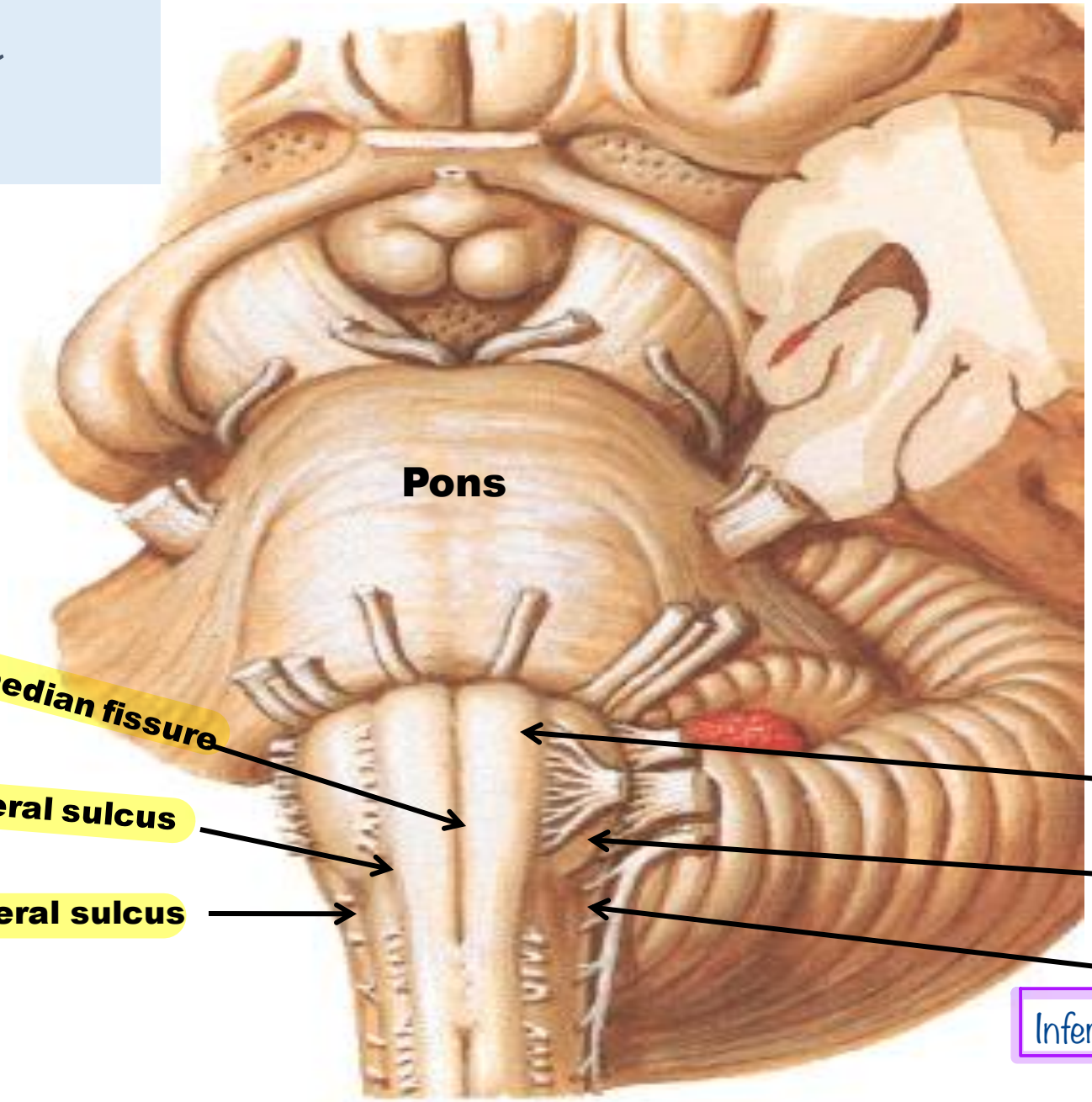
2) Open Medulla:

*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



spinal cord بكمل بال

Antero-median fissure

Antero-lateral sulcus

Postero lateral sulcus

Elevations :

Pyramid

Olive

Inferior olivary nucleus

ICP

Inferior cerebellum peduncle

Pyramid

- Formed by the pyramidal tract.

Olive

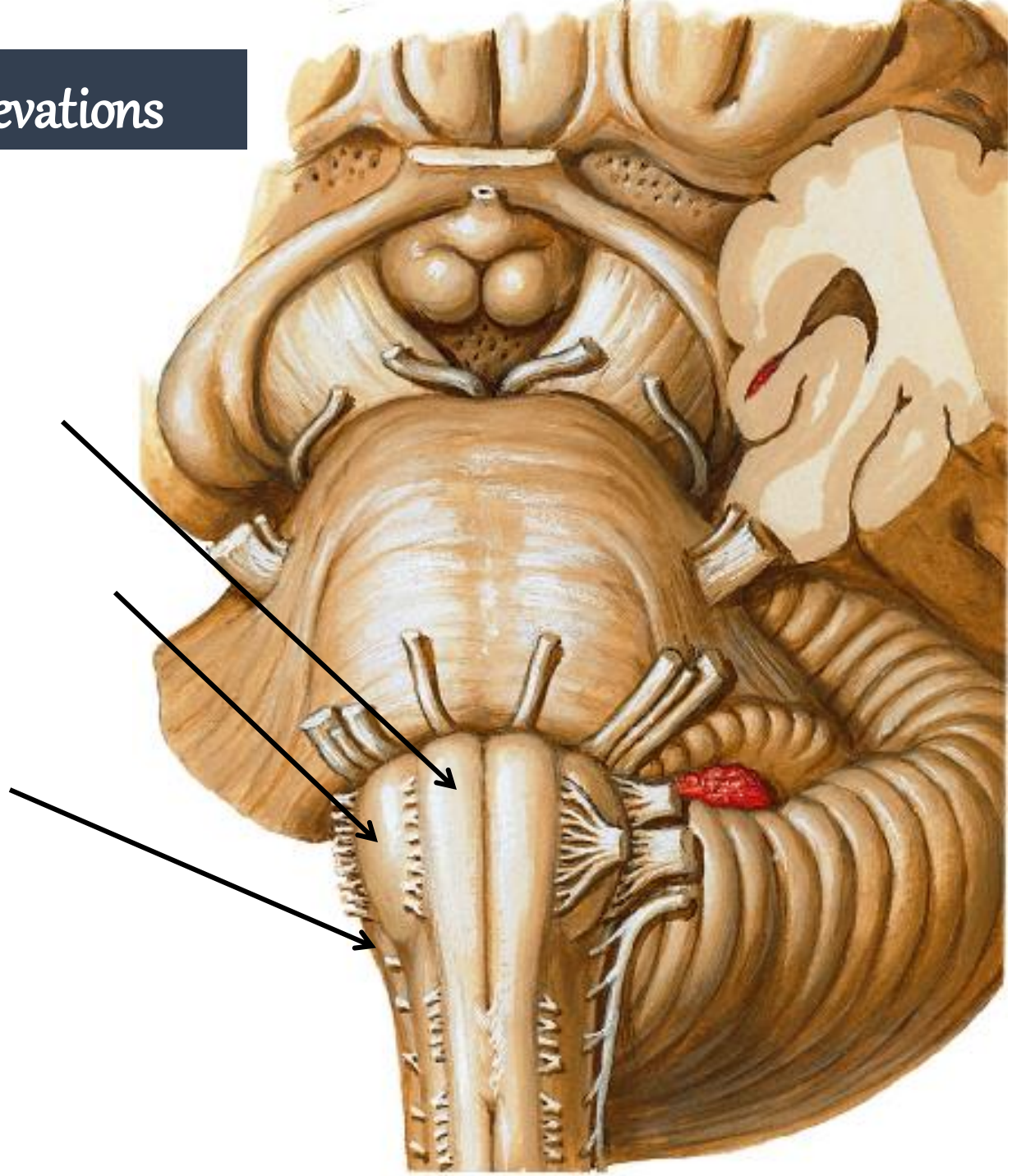
Lateral

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:

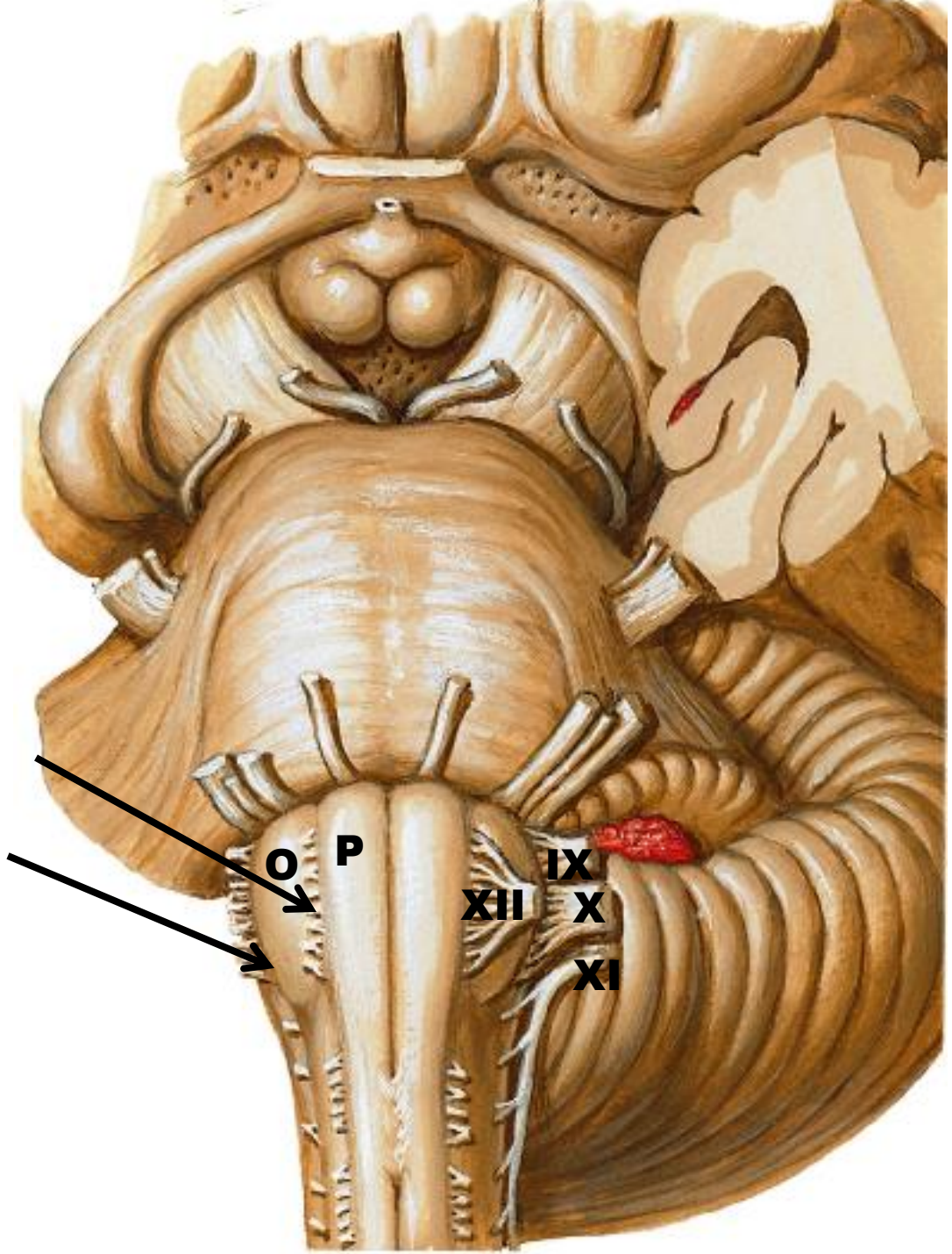
Lies between pyramid & olive.

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:

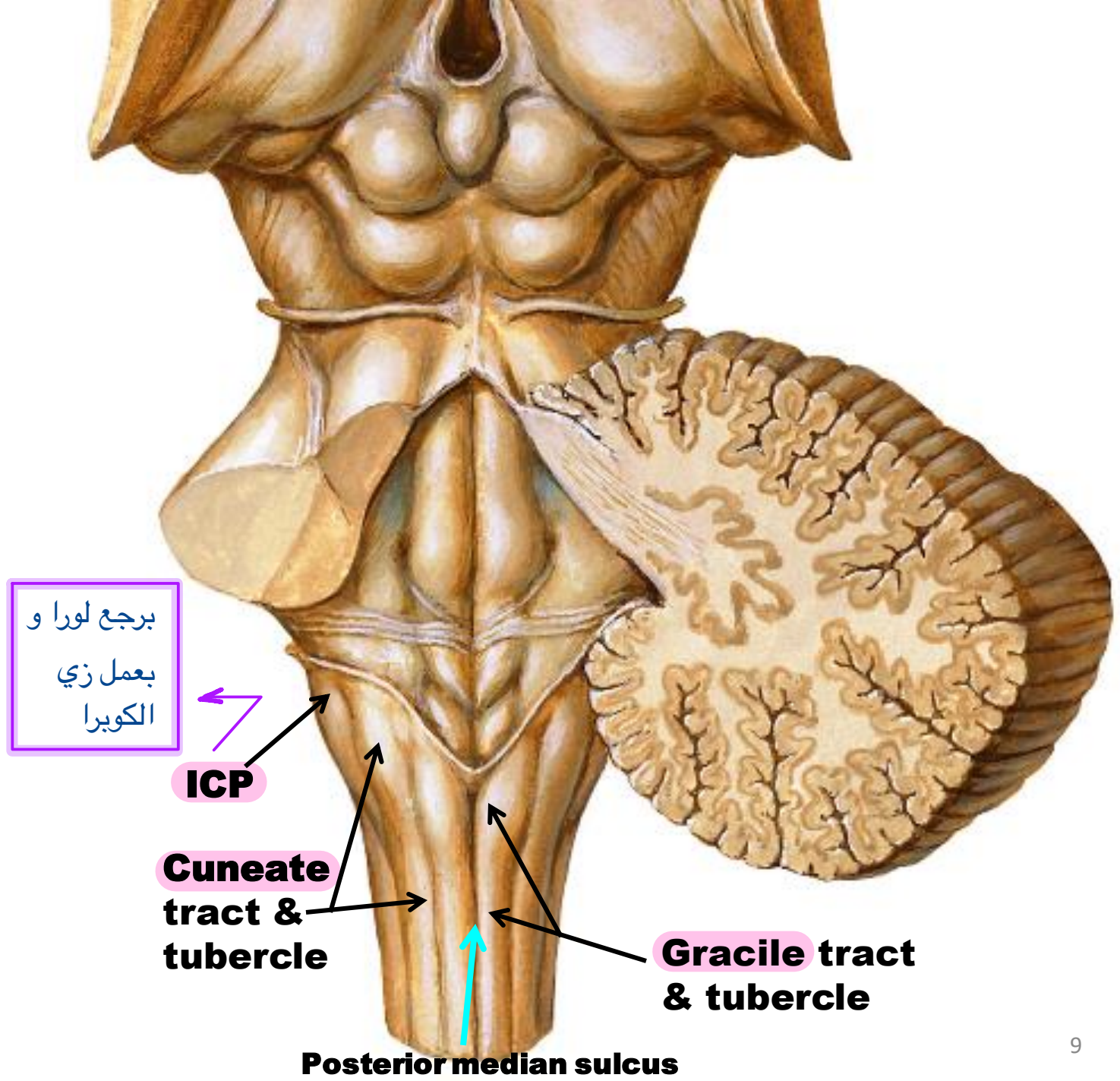
Posterior median sulcus:

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).



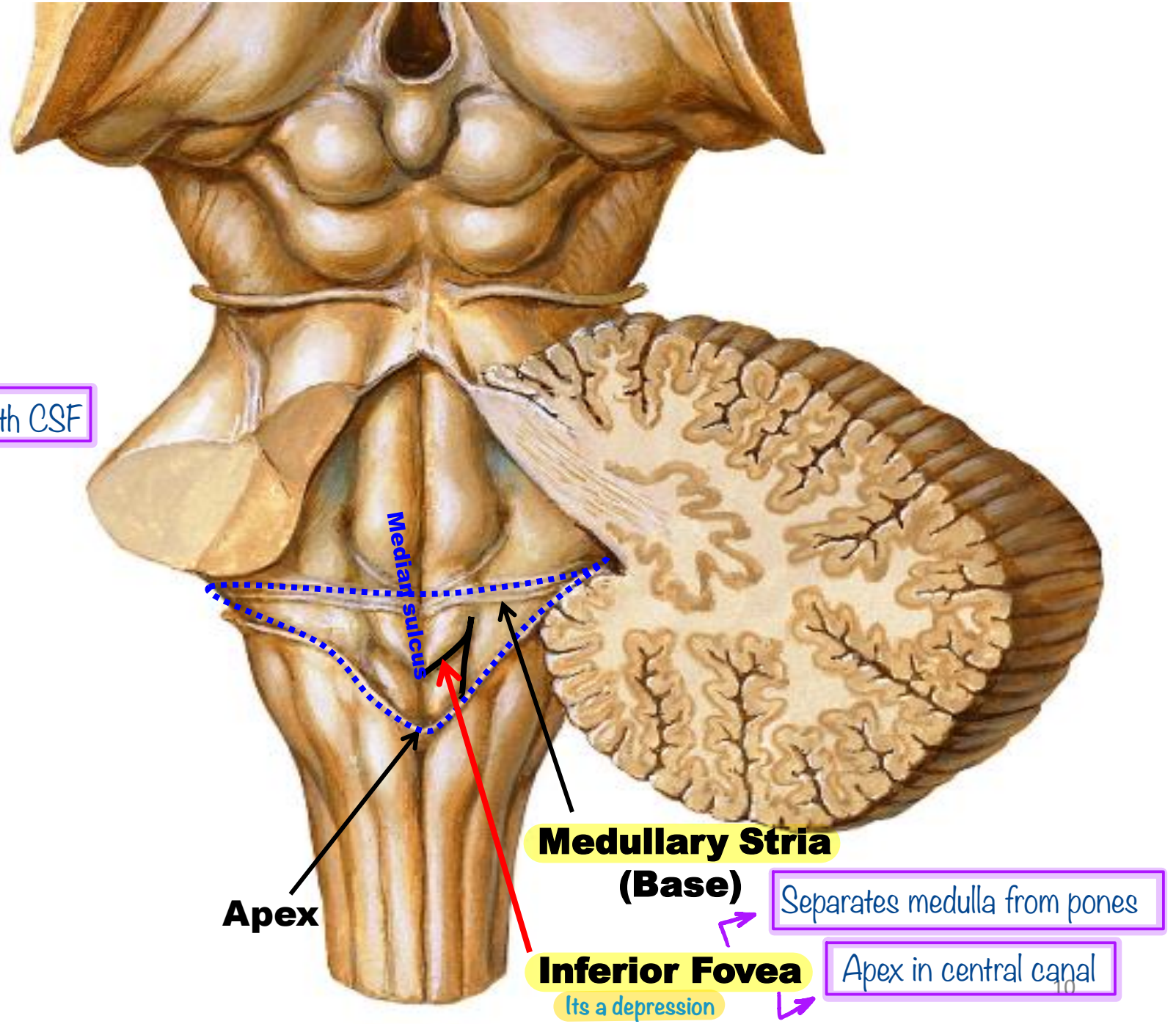
2-Posterior Surface

B-Open meduula:

Forms the lower part of the floor of the 4th ventricle. Filled with CSF

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 — Filled with CSF

an inverted V-shaped depression.

It divides this area into 3 areas:

-Hypoglossal triangle (Trigone) — Superior

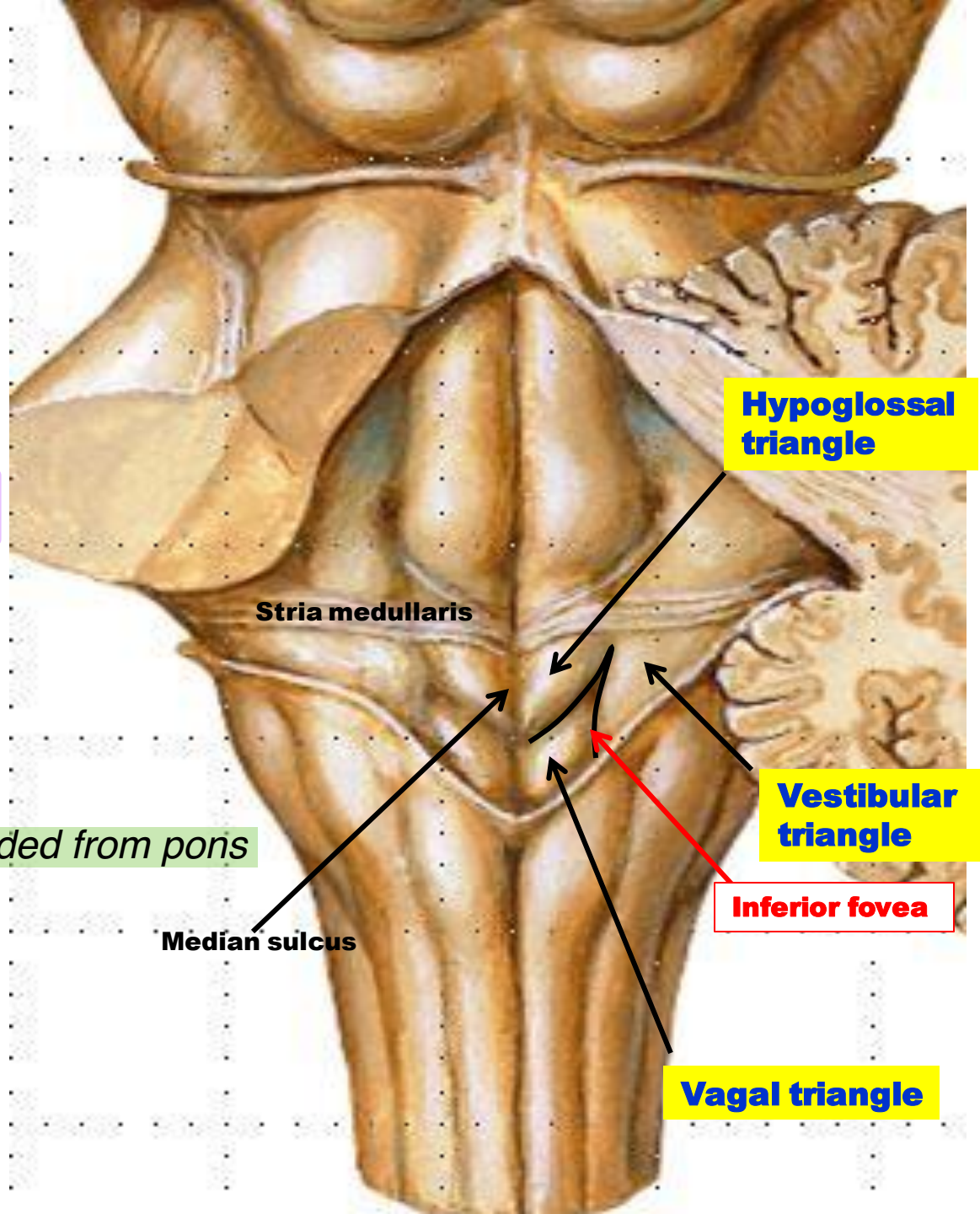
overlies the hypoglossal nucleus.

-Vagal triangle (Trigone) overlies — Inferior

the dorsal nucleus of vagus.

-Vestibular triangle (Trigone) — Extended from pons

overlies the vestibular nuclei. — Lateral

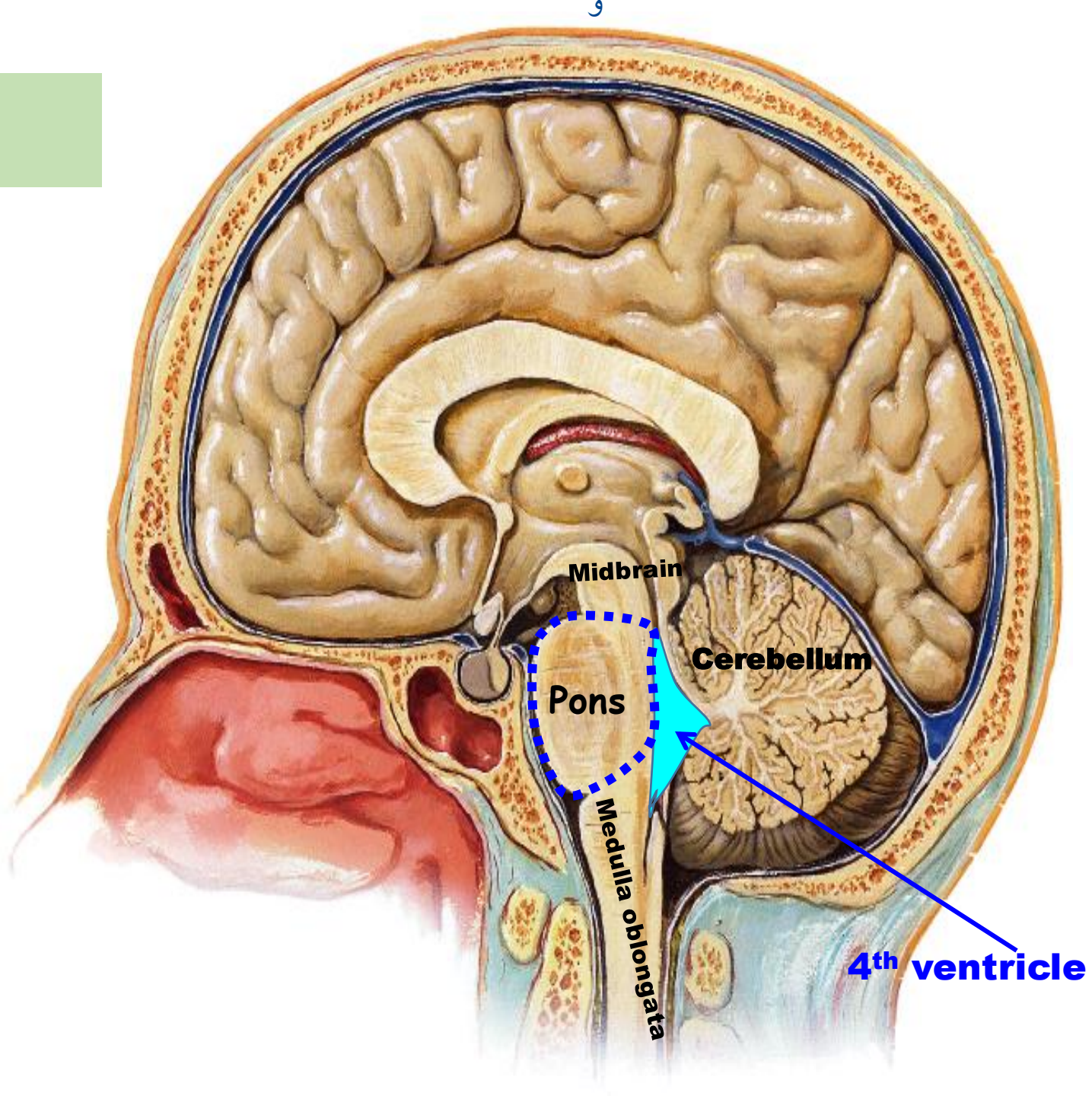


Pons

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:

وظيفتها الاساسية انها تمسك بال cerebellum

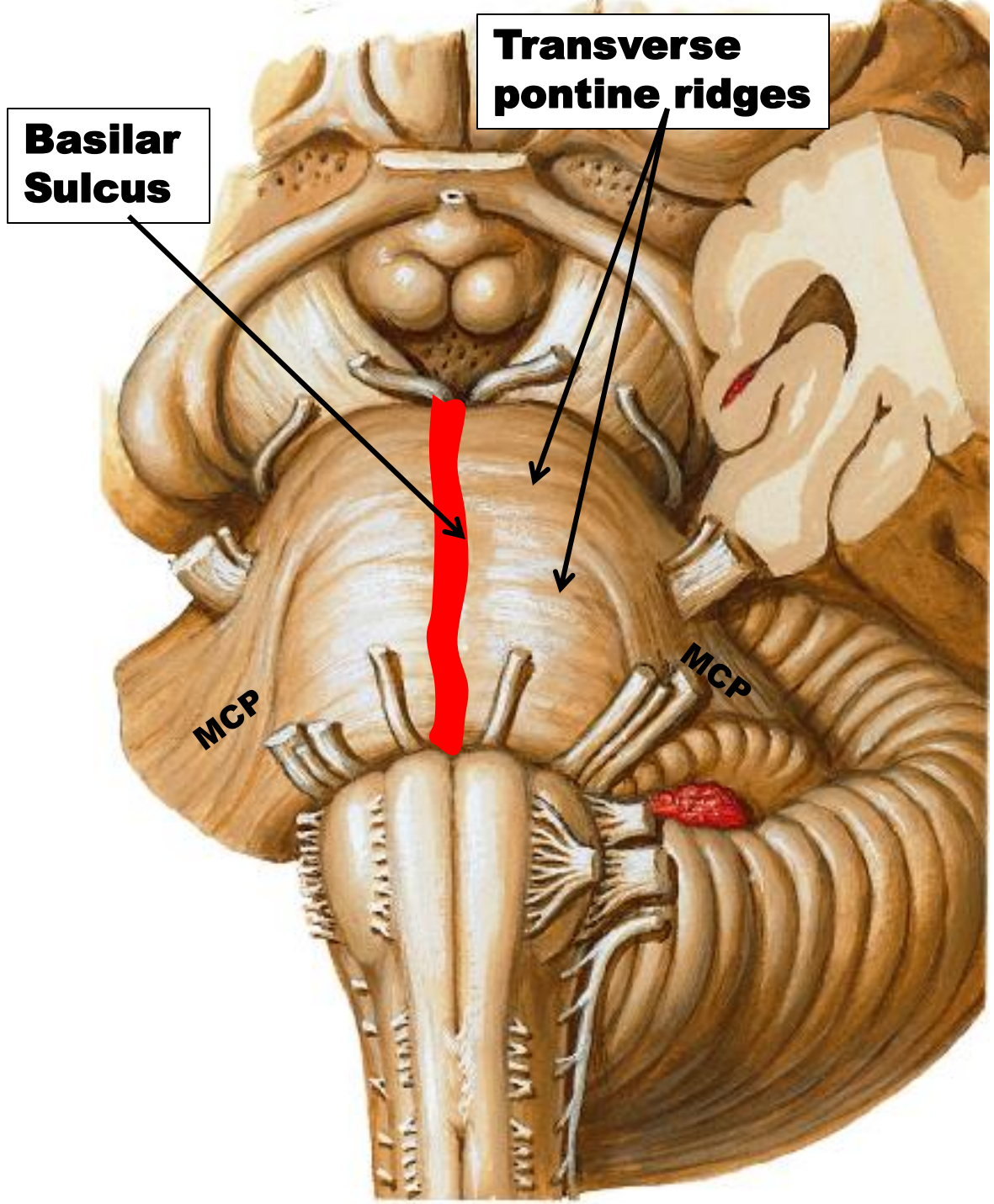
A) Ventral aspect:

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

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

Largest pedunde

3) Middle cerebellar peduncle
(MCP)



4) Trigeminal (5th) nerve

Has sensory and motor but sensory is larger

5) Abducent (6th) nerve:

Is attached to the junction between **pyramid** & **pons**.

هاد ال abducent nerve
حكى احفظوه انه بشبه
شنب الصرصور

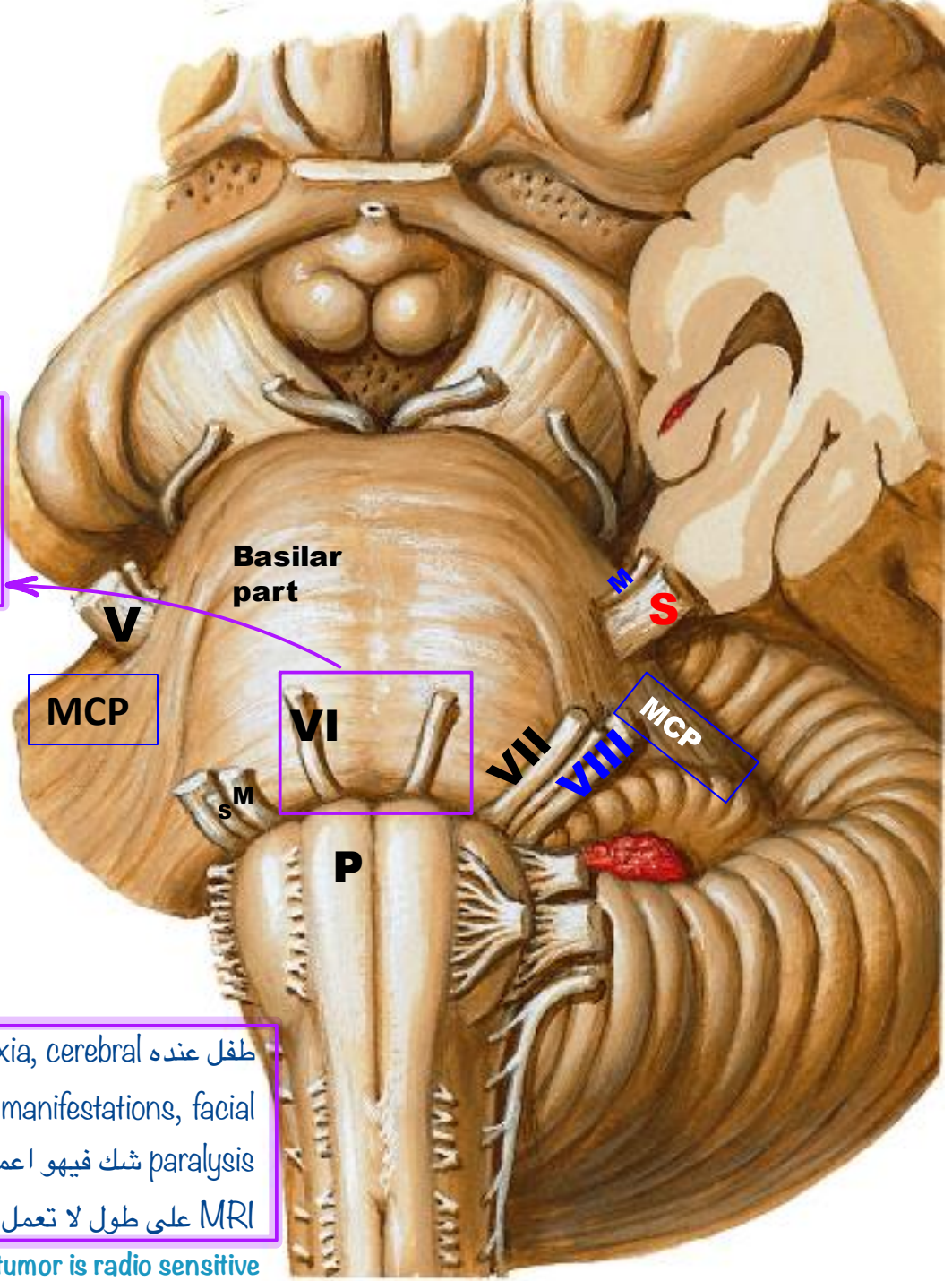
Has sensory and motor but motor is larger

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

Between cerebellum and pones
Most common solid tumor in pediatrics
→ medullo-blastoma, retino-blastoma

ataxia, cerebral طفل عنده
manifestations, facial
شك فيهو اعمله paralysis
CT على طول لا تعمل MRI

This tumor is radio sensitive



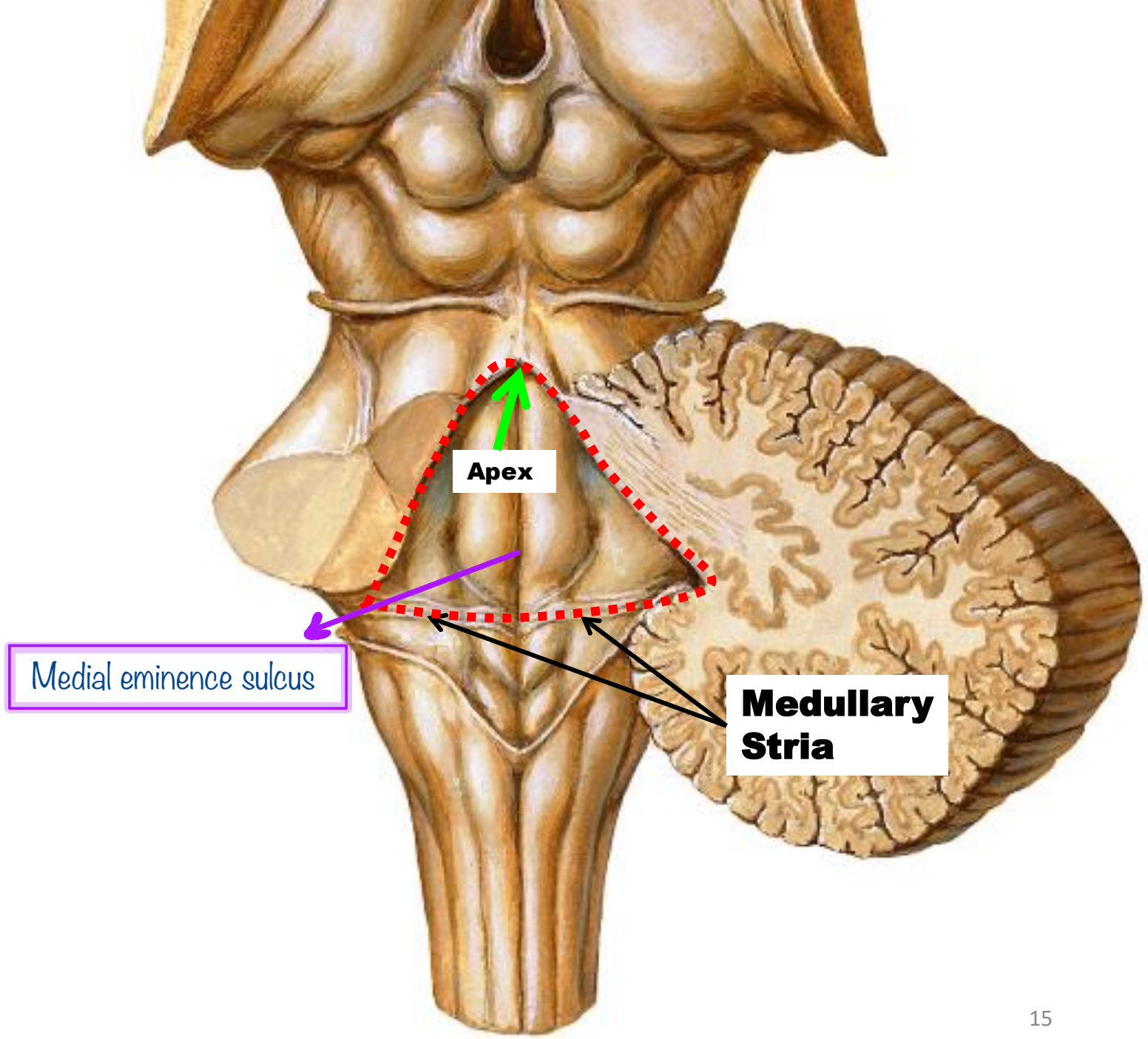
Clinically, cerebellopontine angle tumor causes lesions of facial paralysis + lesion of VIII deafness & vertigo.

B) Dorsal aspect:

Forms the upper part of floor of 4th ventricle.

It is triangular having:

- Apex (above): continuous with cerebral aqueduct of Sylvius
  - third ventricle قناة ل
- Base below formed by Medullary stria



This part SHOWS:

1- Medullary stria

2- Median sulcus

3-Medial eminence overlies the abducent nucleus

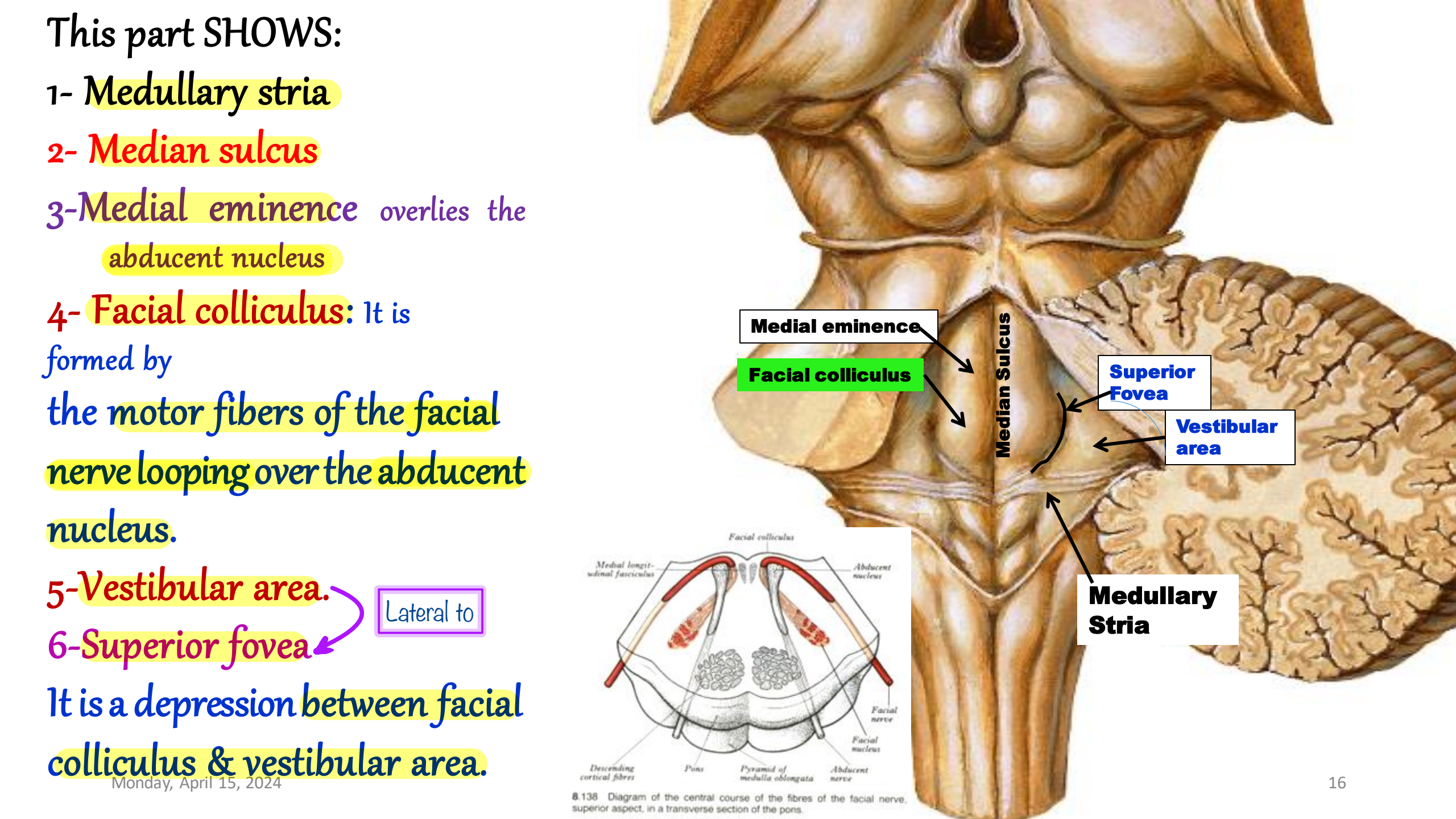
4- Facial colliculus: It is formed by the motor fibers of the facial nerve looping over the abducent nucleus.

5-Vestibular area.

6-Superior fovea

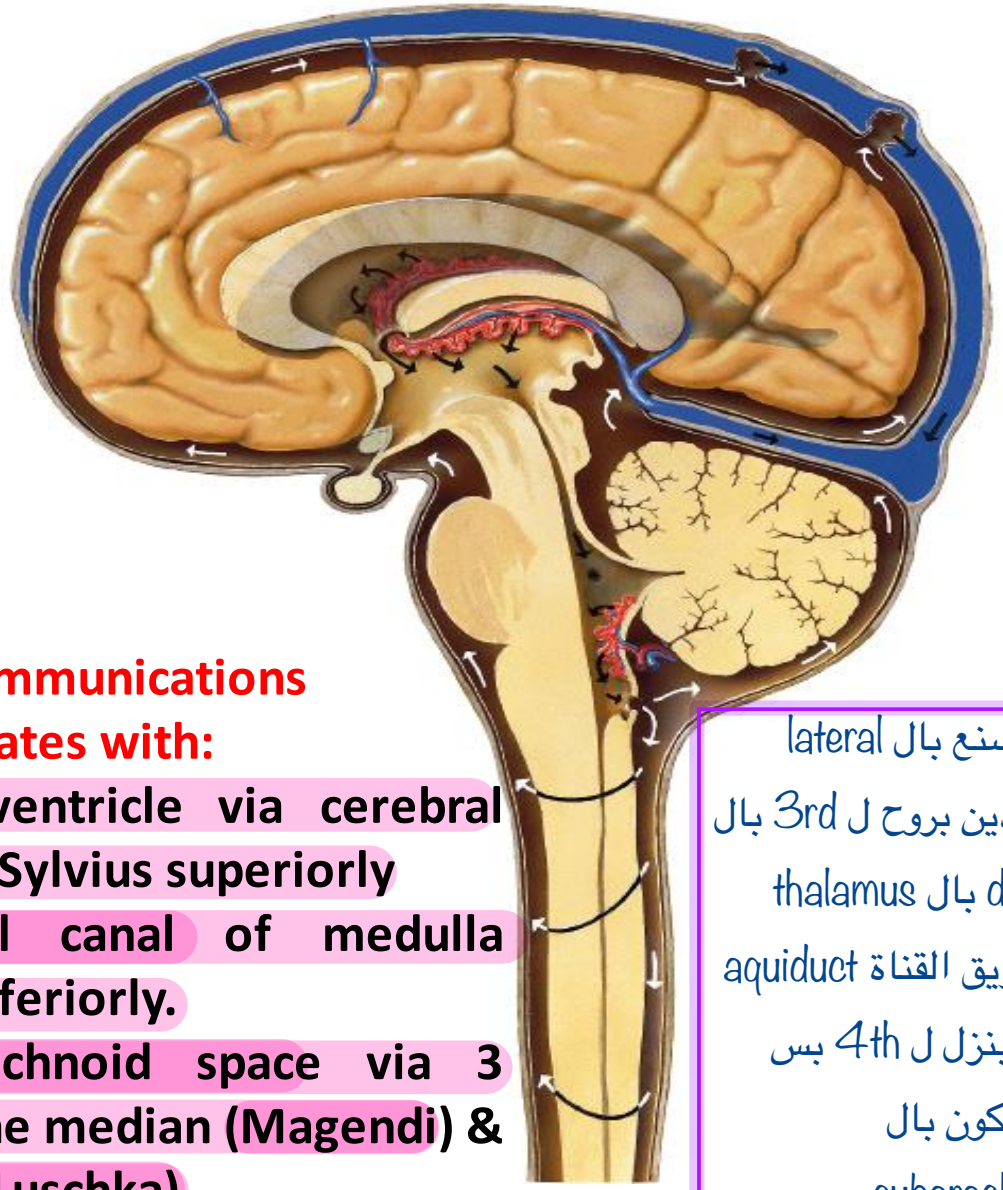
Lateral to

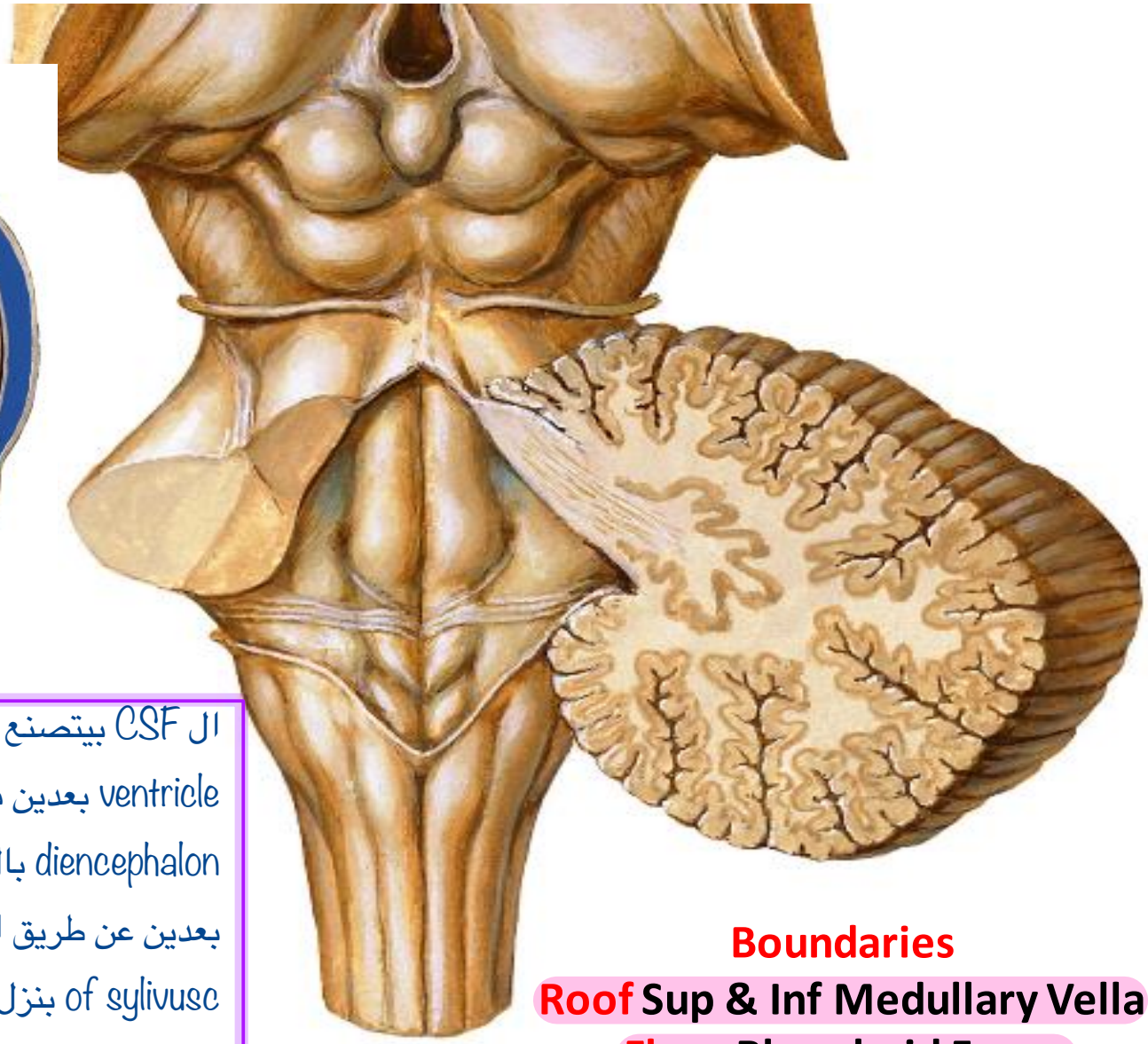
It is a depression between facial colliculus & vestibular area.



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).**

ال CSF بيتصنع بال lateral ventricle بعدين بروح ل 3rd بال thalamus بال diencephalon بعدين عن طريق القناة aquiduct of sylivusc بنزل ل 4th بس معظمه لازم يكون بال subarachnoid space

Boundaries

Roof Sup & Inf Medullary Vella

Floor Rhomboid Fossa

Midbrain

Extension:

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

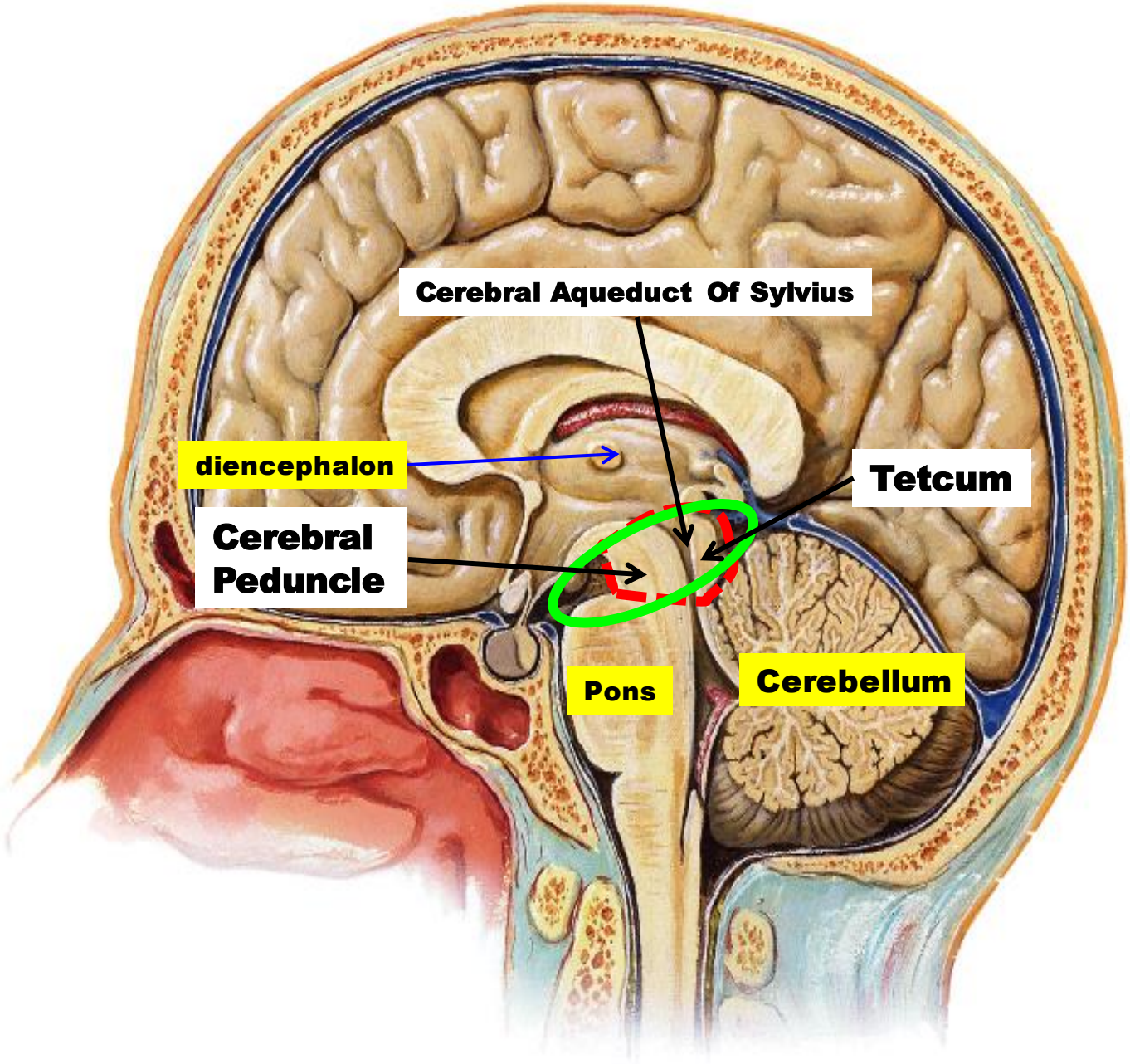
Cavity:

cerebral aqueduct of sylvius.

Parts:

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

Crus cerebri



1) Anterior aspect:

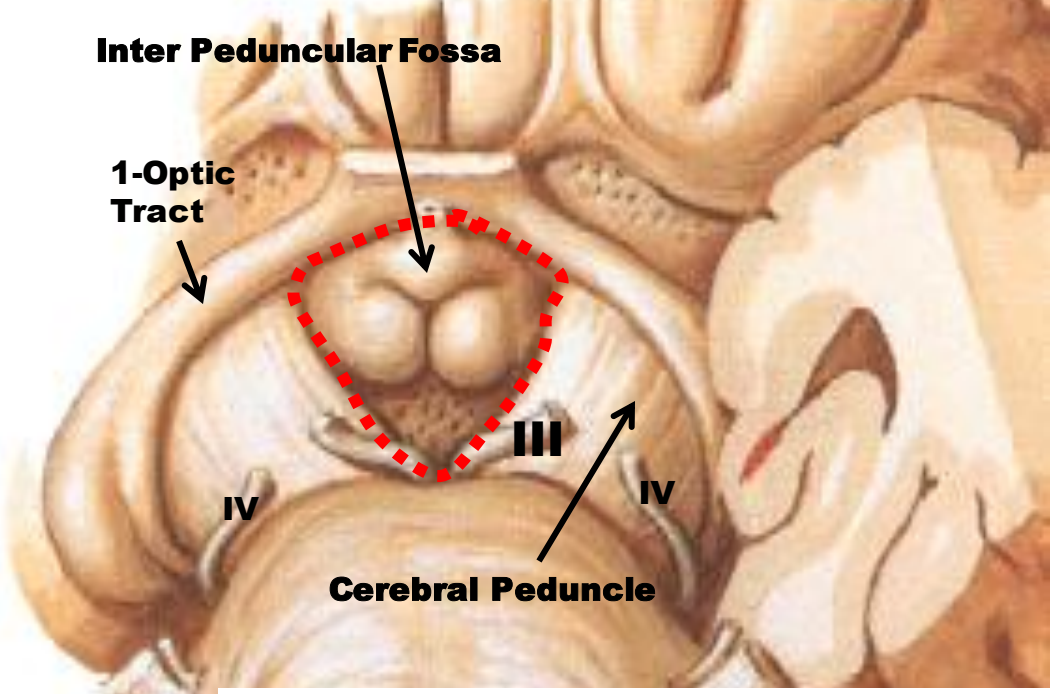
فرق بين cerebral وبين cerebullum peduncle

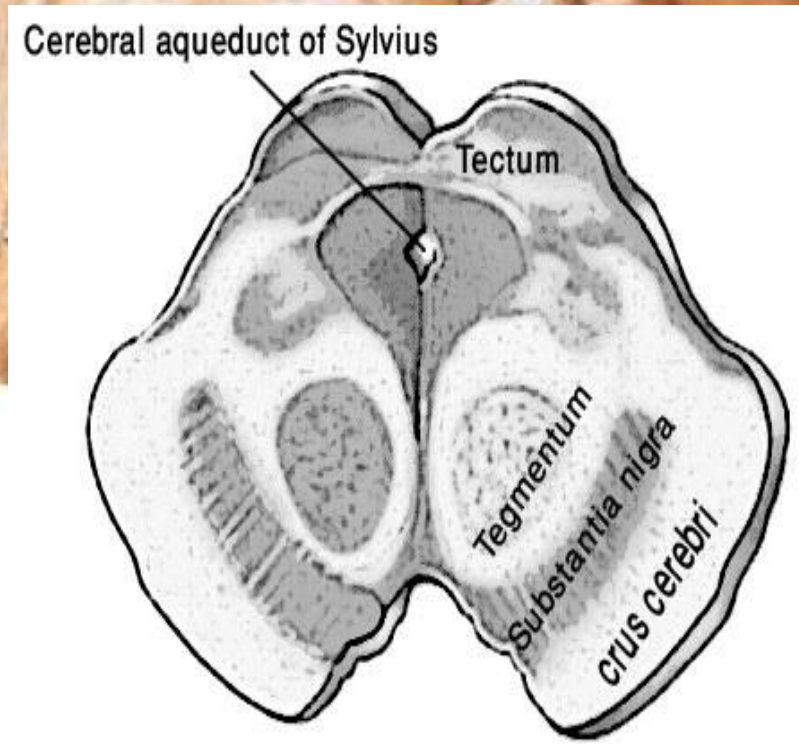
i-Two cerebral peduncles enclosing the inter-peduncular fossa. Each consists of: crus cerebri (ant.), substantia nigra, tegmentum (post.)

Responsible of dopamine

تعني حشوة

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





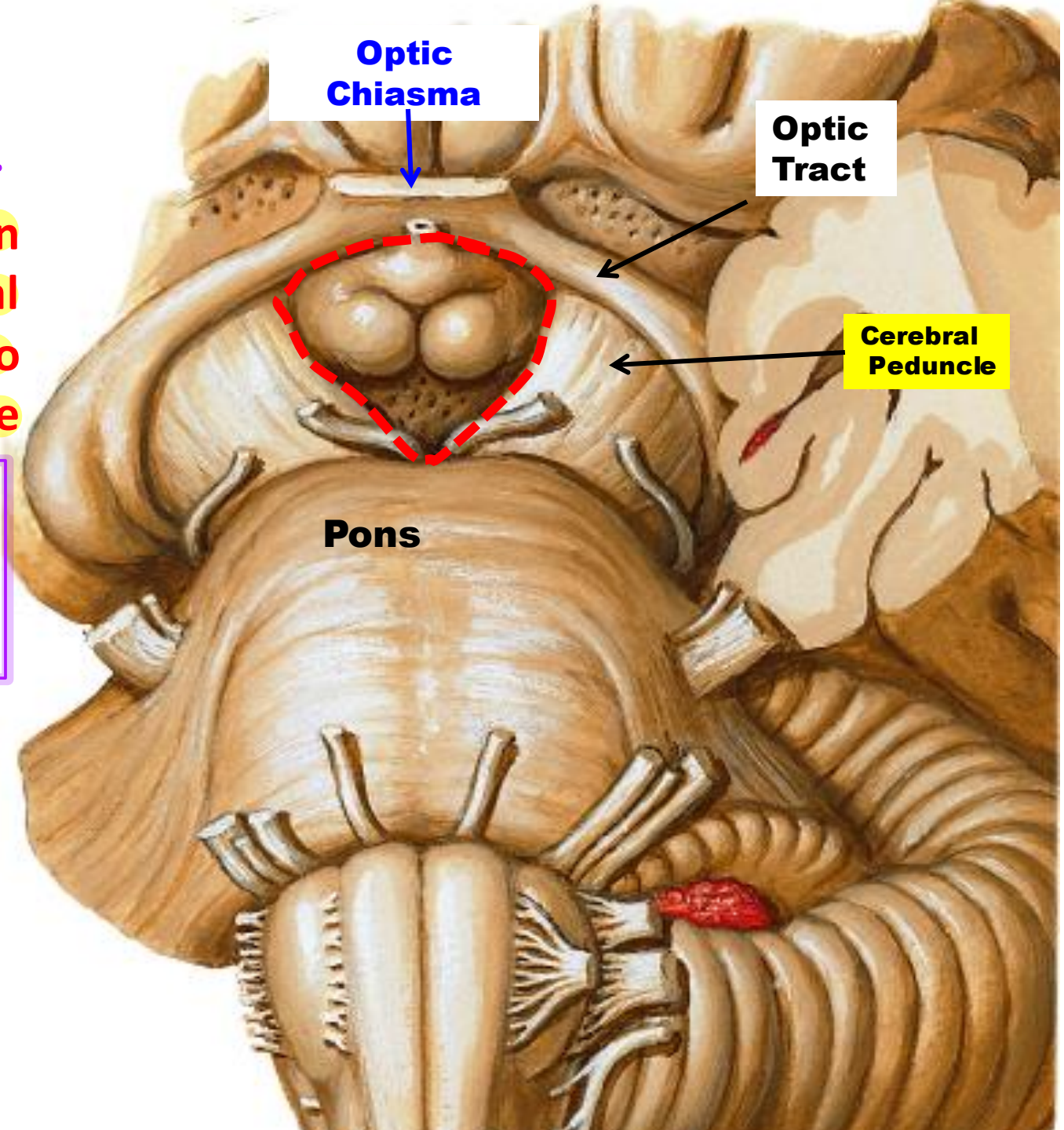
The Interpeduncular Fossa

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

pituitary gland بال tumor اي
راح يضغط على ال optic
chiasma و تعمل اشي اسمه
bitemporal hemianopia

Boundaries

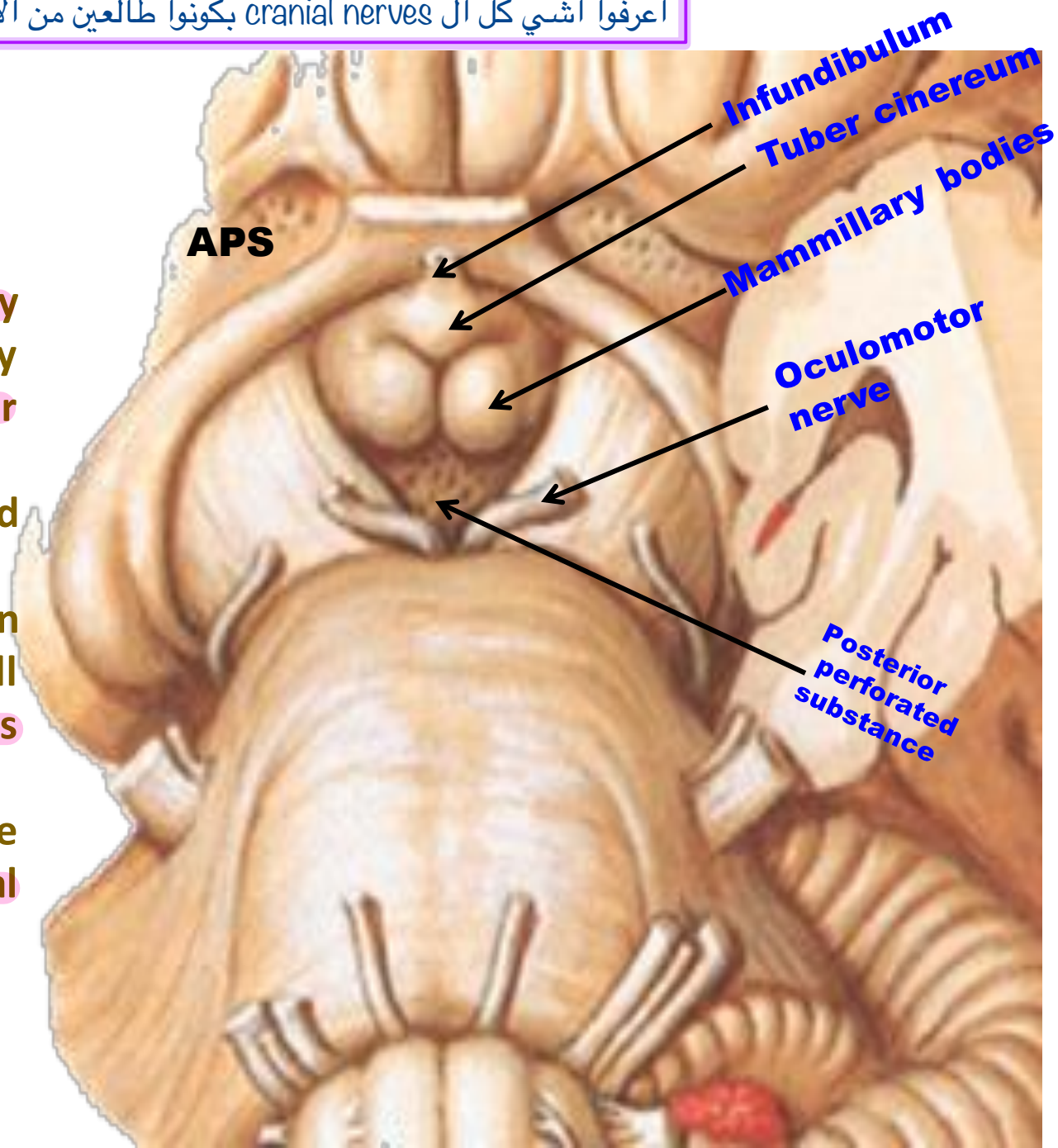
1. Anteriorly: optic chiasma.
2. Anterolaterally: optic tract.
3. Posterolaterally: cerebral peduncle.
4. Posteriorly: upper border of pons.



اعرفوا اشي كل ال cranial nerves بكونوا طالعين من الامام من ال brain stem ما عدا ال trochlear nerve بلف من ورا

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.

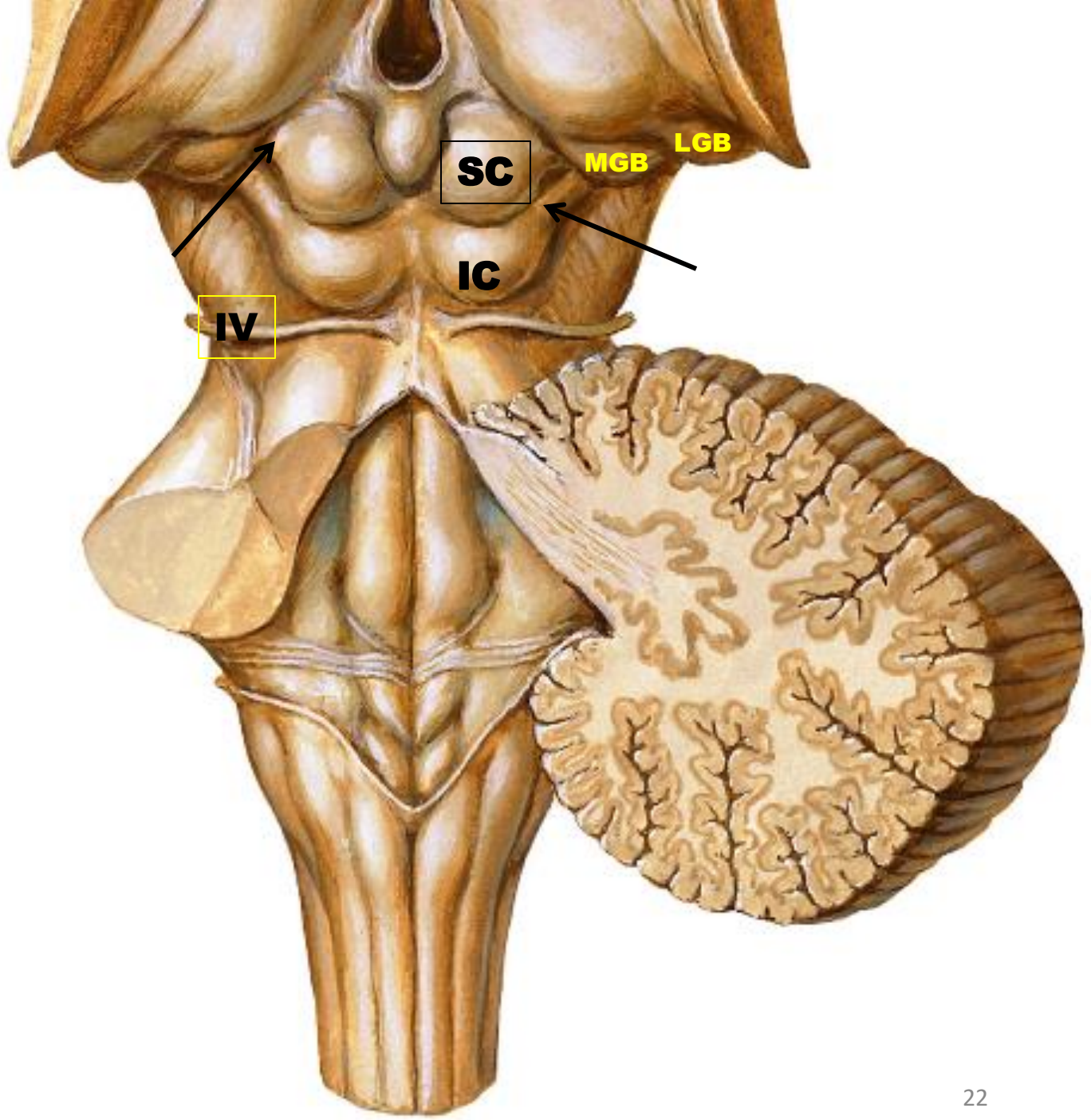
Each one is connected to lateral geniculate body (LGB)

Two Inferior colliculli(IC):

Are auditory reflex centers.

Each one is connected to medial geniculate body (MGB)

Part of thalamus



Thank you

اذا وصلت لهون ادعيلنا ❤️🤍
* الدعاء اجباري 👻