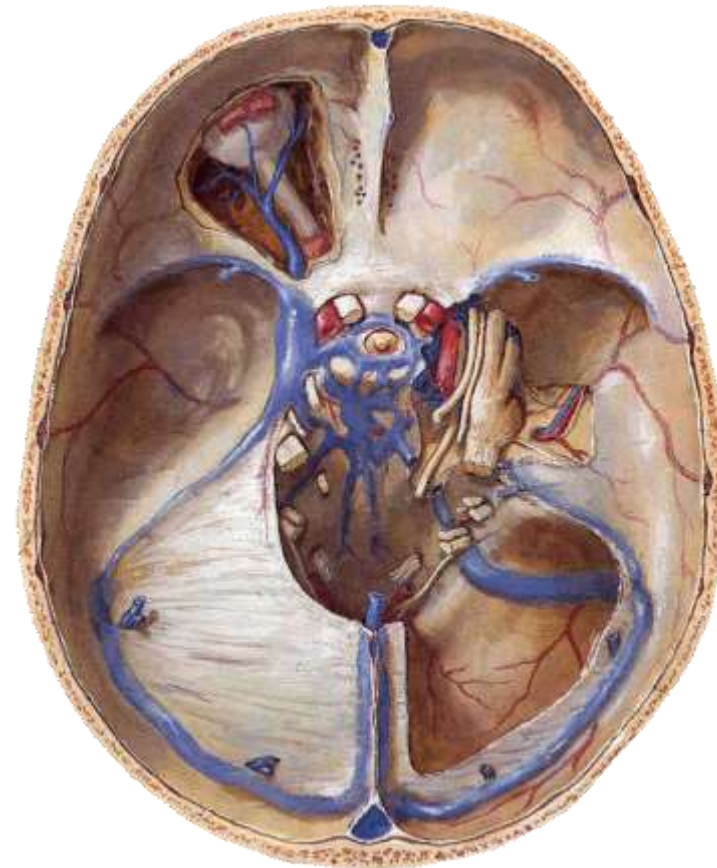
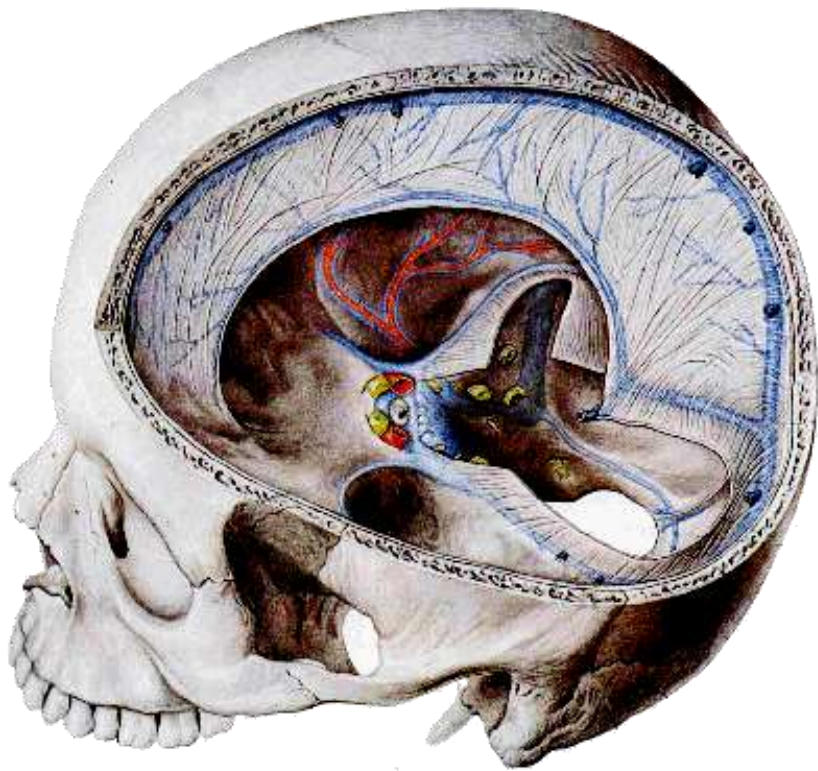


CRANIAL CAVITY-II



Presented by:-
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Associate Professor
Department of Anatomy

Lesson Plan

❖ Intracranial dural venous sinuses:

- Introduction
- Classification

❖ Cavernous Sinus:

- Location
- Extent
- Relations
- Structures within the lateral wall of sinus
- Structures passing through the sinus
- Tributaries
- Communications
- Applied aspects

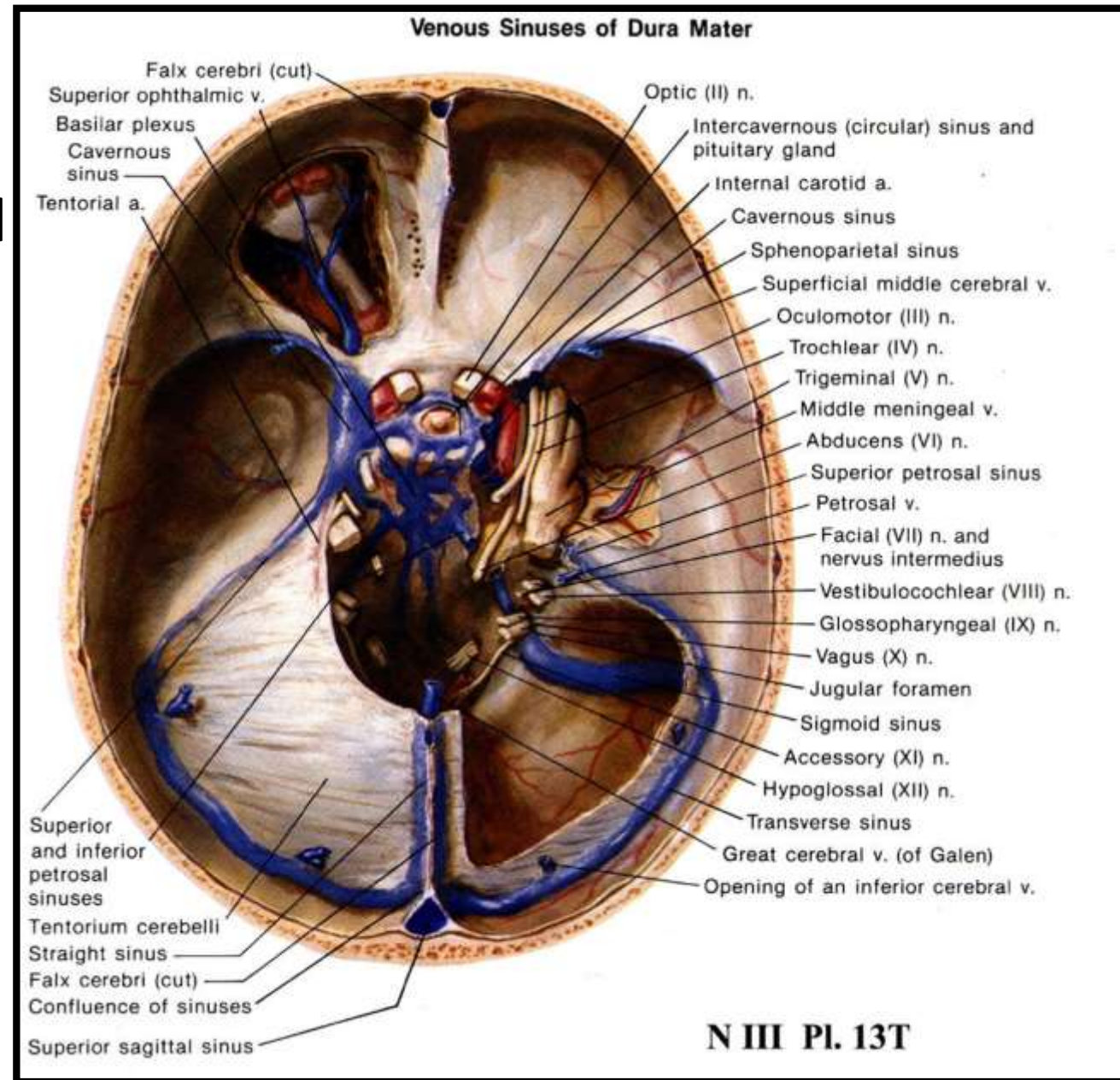
INTRACRANIAL DURAL VENOUS SINUSES

Introduction

- Intracranial venous sinuses are the venous channels present in the cranial dura.

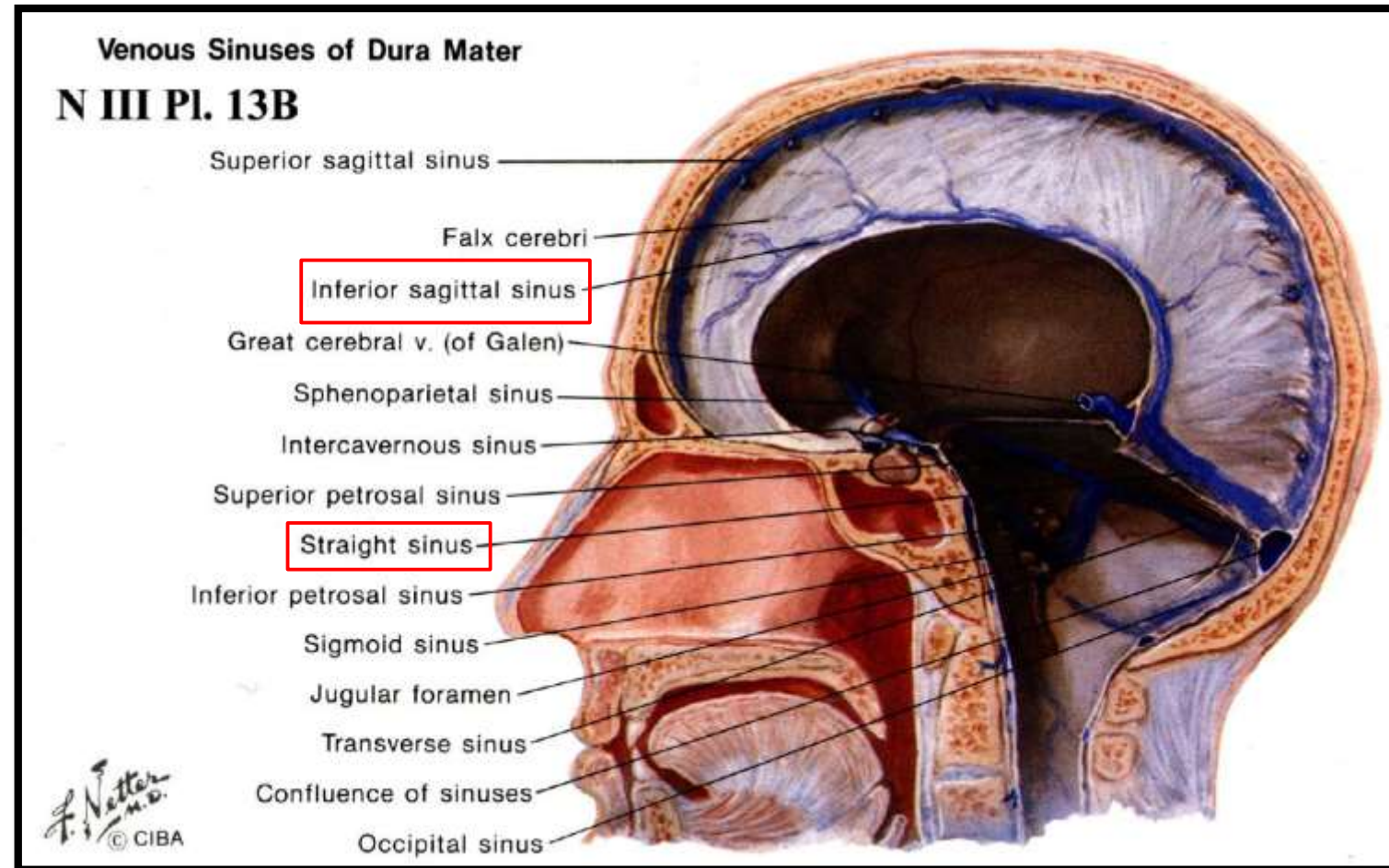
Formation-

- These are formed in **two ways**:
 - By separation of two layers of dura.
 - By reduplication of meningeal layer.



Introduction contd...

- All the venous sinuses, **except** the **Inferior Sagittal** and **Straight sinuses**, lie between the meningeal and endosteal layers of dura mater.
- These venous sinuses are lined by endothelium and this endothelium is continuous with the endothelium of intracranial veins.

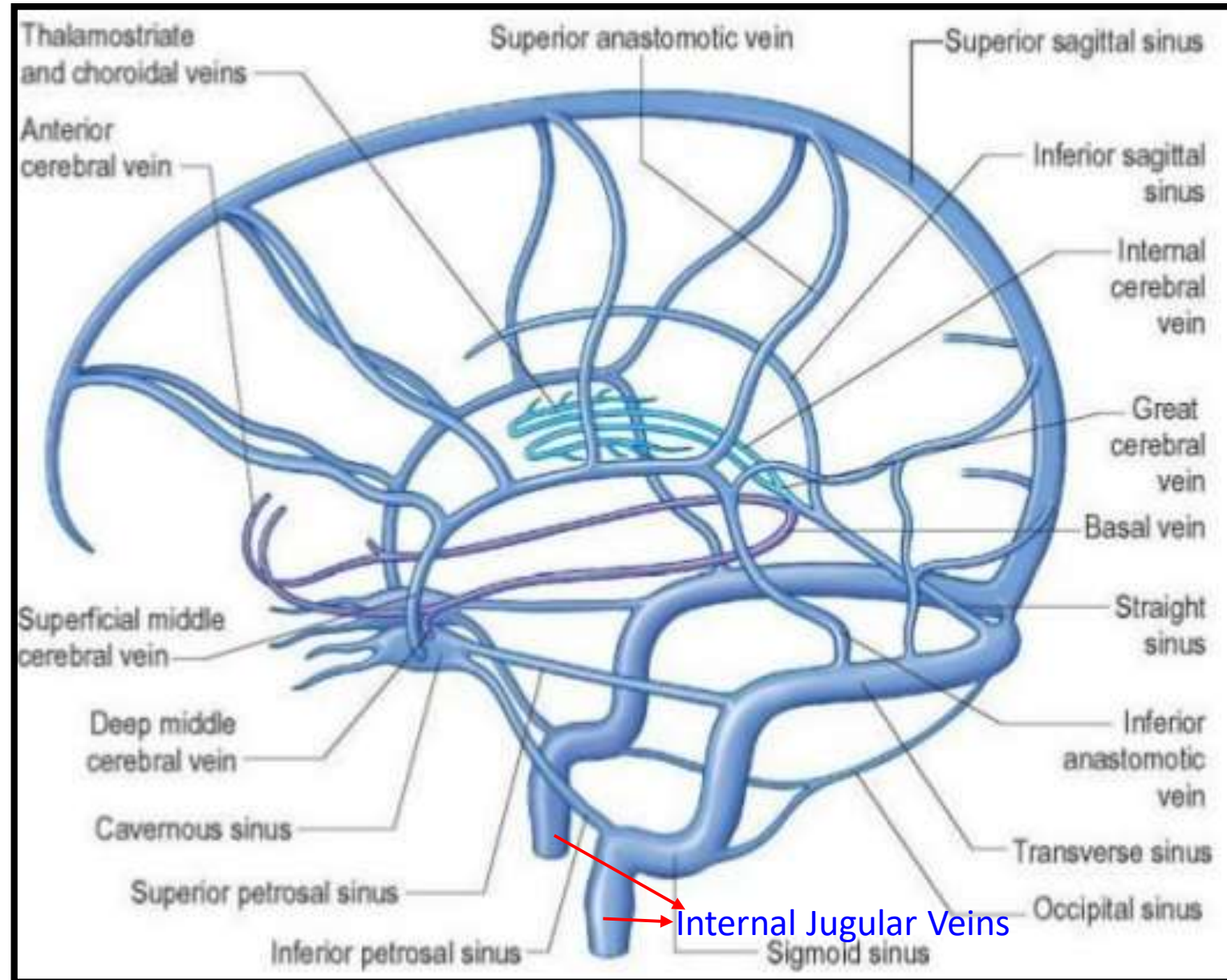


Introduction contd...

○ These venous sinuses drain blood from:

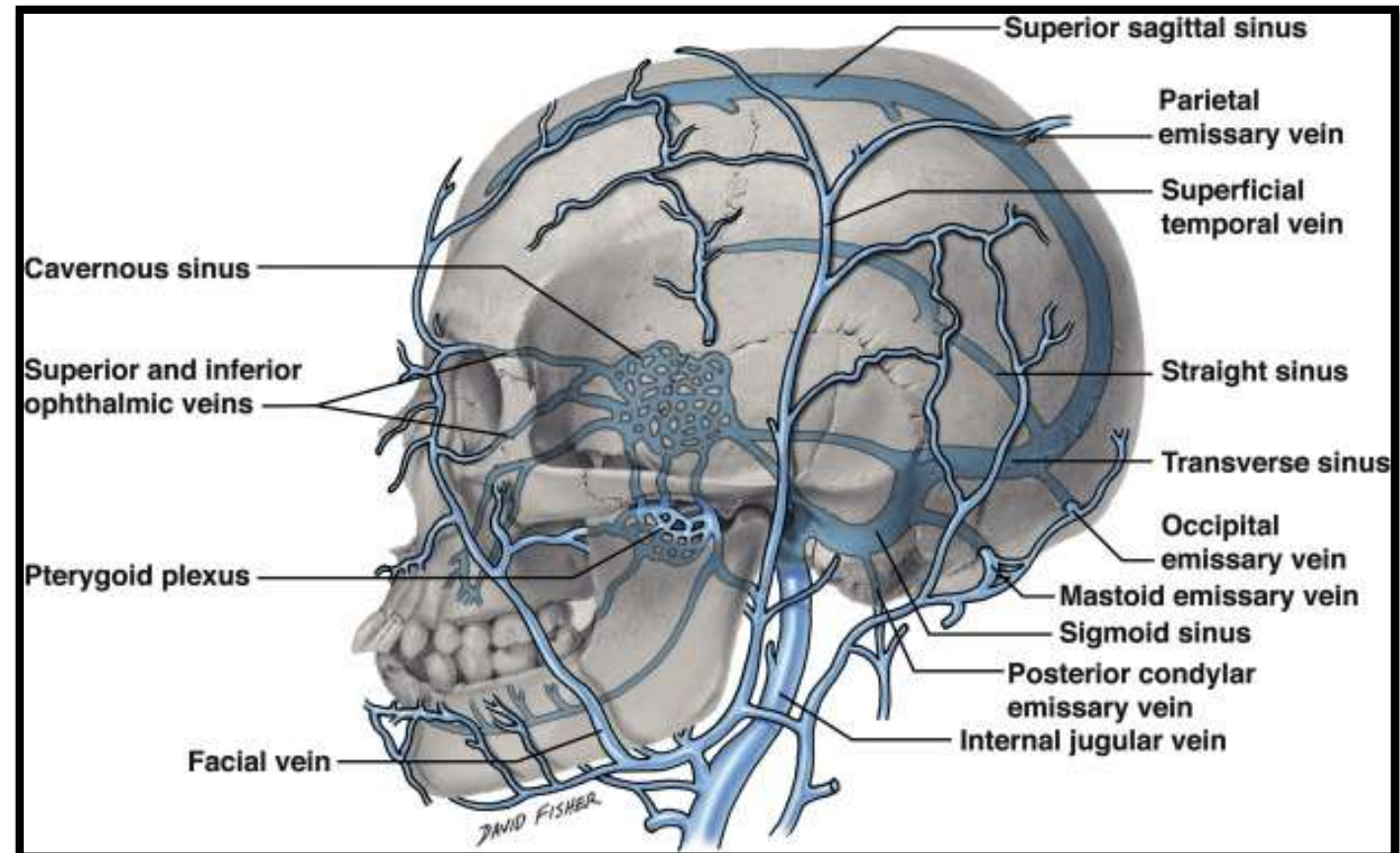
- Brain.
- Skull bones.

○ The blood from these sinuses drained into **Internal Jugular Veins**.



Introduction contd...

- These venous sinuses are **devoid of valves** in their lumen.
- Most of the dural venous sinuses communicate with the extracranial veins through **emissary veins**.
- These emissary veins are also **valveless** and maintain the equilibrium of venous pressure within and outside the skull.
- These venous sinuses receive **venous blood** and **cerebrospinal fluid**.

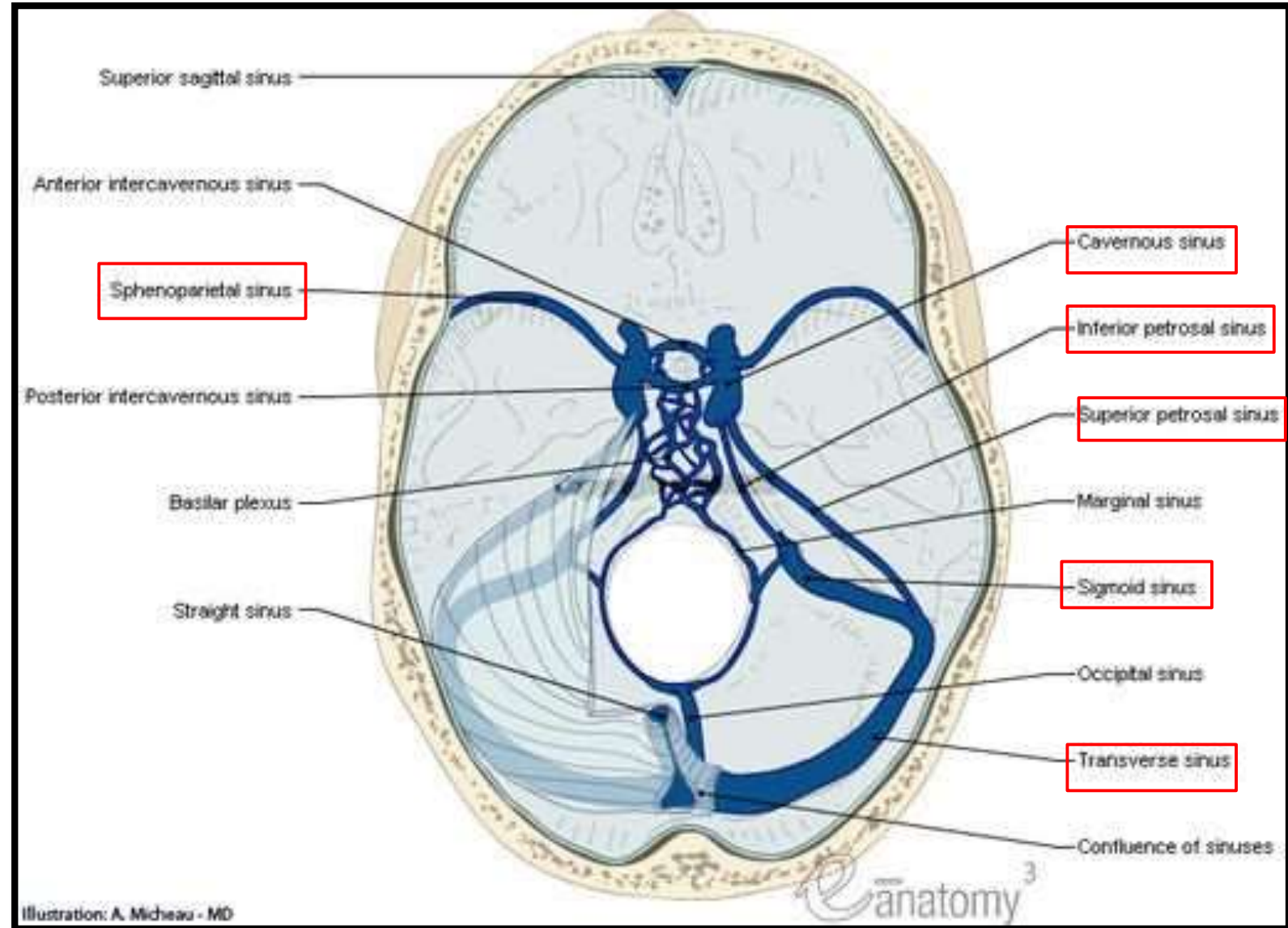


Classification

- Paired (7).
- Unpaired (7).

Paired Dural Venous Sinuses-

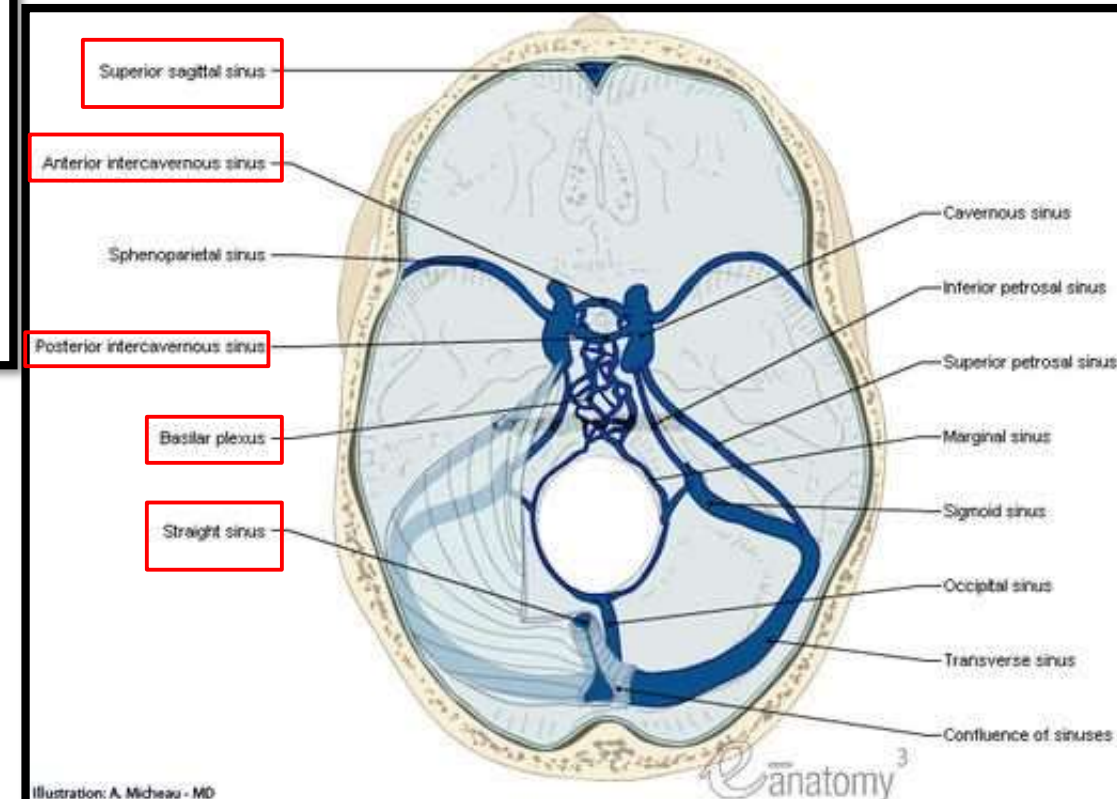
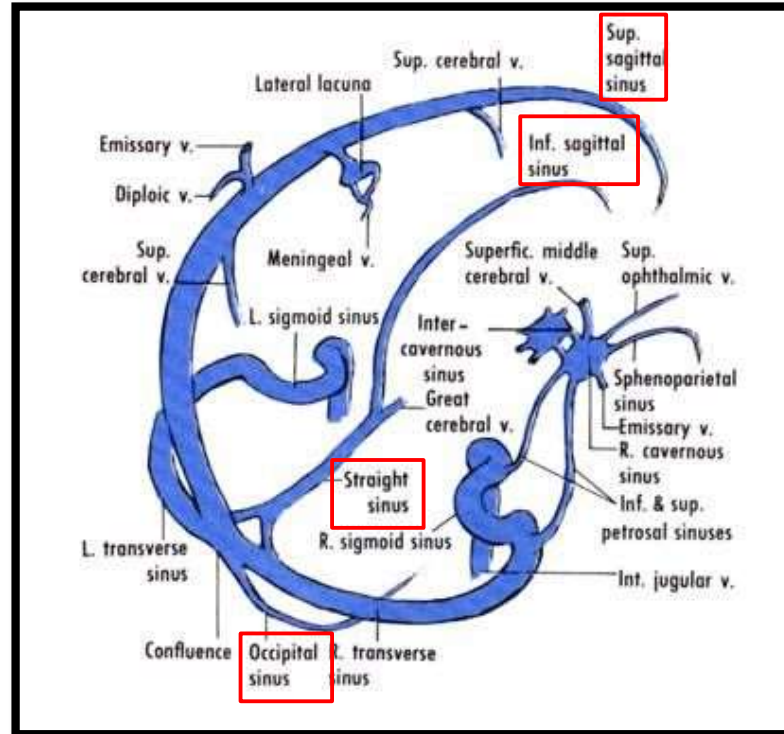
1. Cavernous
2. Superior petrosal
3. Inferior petrosal
4. Transverse
5. Sigmoid
6. Sphenoparietal
7. Petrosquamous



Classification contd...

Unpaired Dural Venous Sinuses-

1. Superior Sagittal
2. Inferior Sagittal
3. Straight
4. Occipital
5. Anterior Intercavernous
6. Posterior Intercavernous
7. Basilar Venous Plexus



Cavernous Sinus

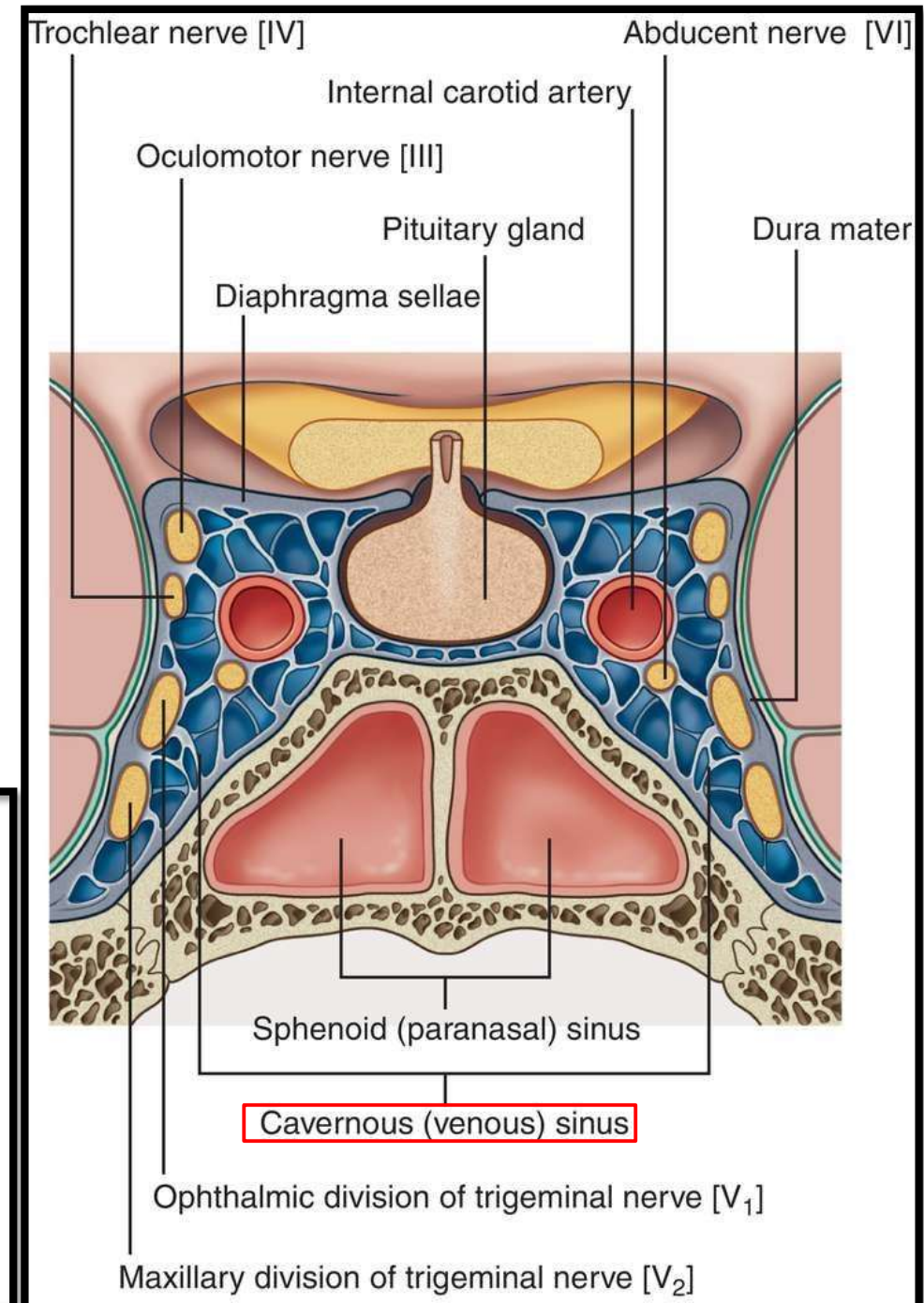
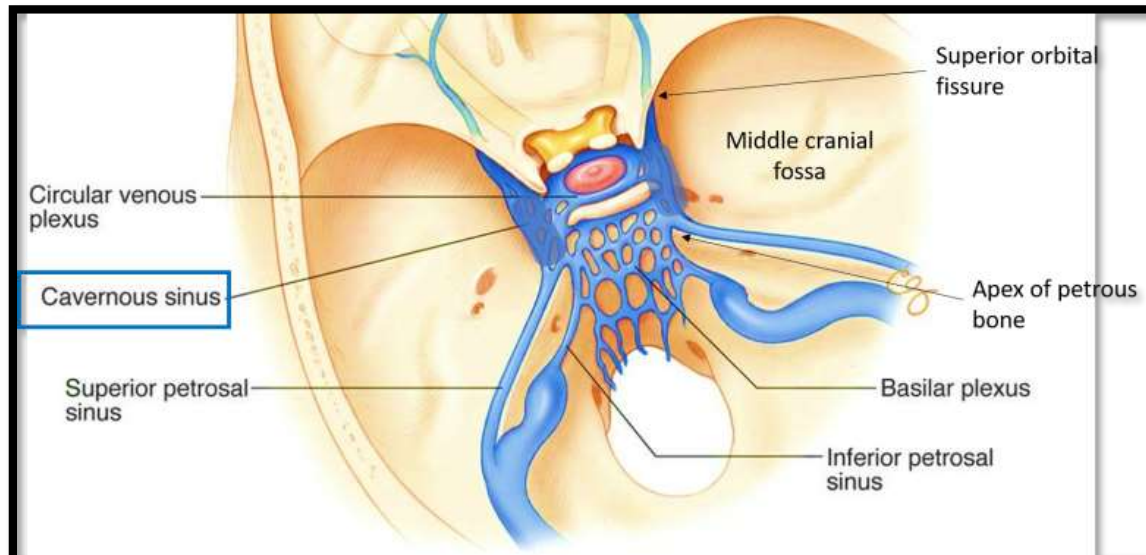
❖ The interior of this sinus is divided into a number of **small spaces** (**caverns**) by trabeculae, hence the name cavernous sinus.

Location-

❖ In the middle cranial fossa, alongside the body of sphenoid bone.

❖ It has:

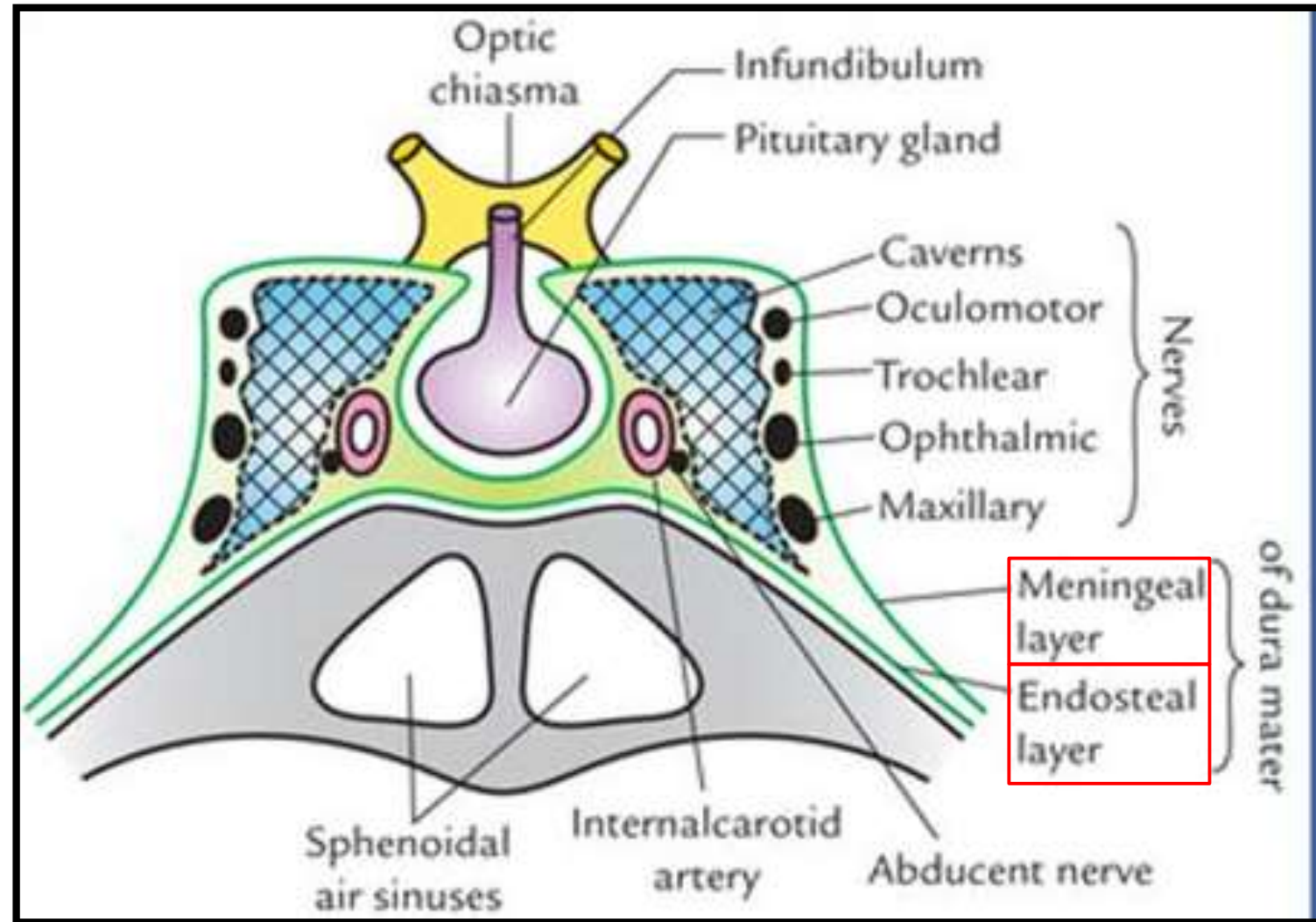
- Floor
- Medial wall
- Roof
- Lateral wall



Cavernous Sinus contd...

❖ Its **Floor** is formed by **endosteal layer**.

❖ **Medial wall, Roof and Lateral wall** are formed by meningeal layer.



Cavernous Sinus contd...

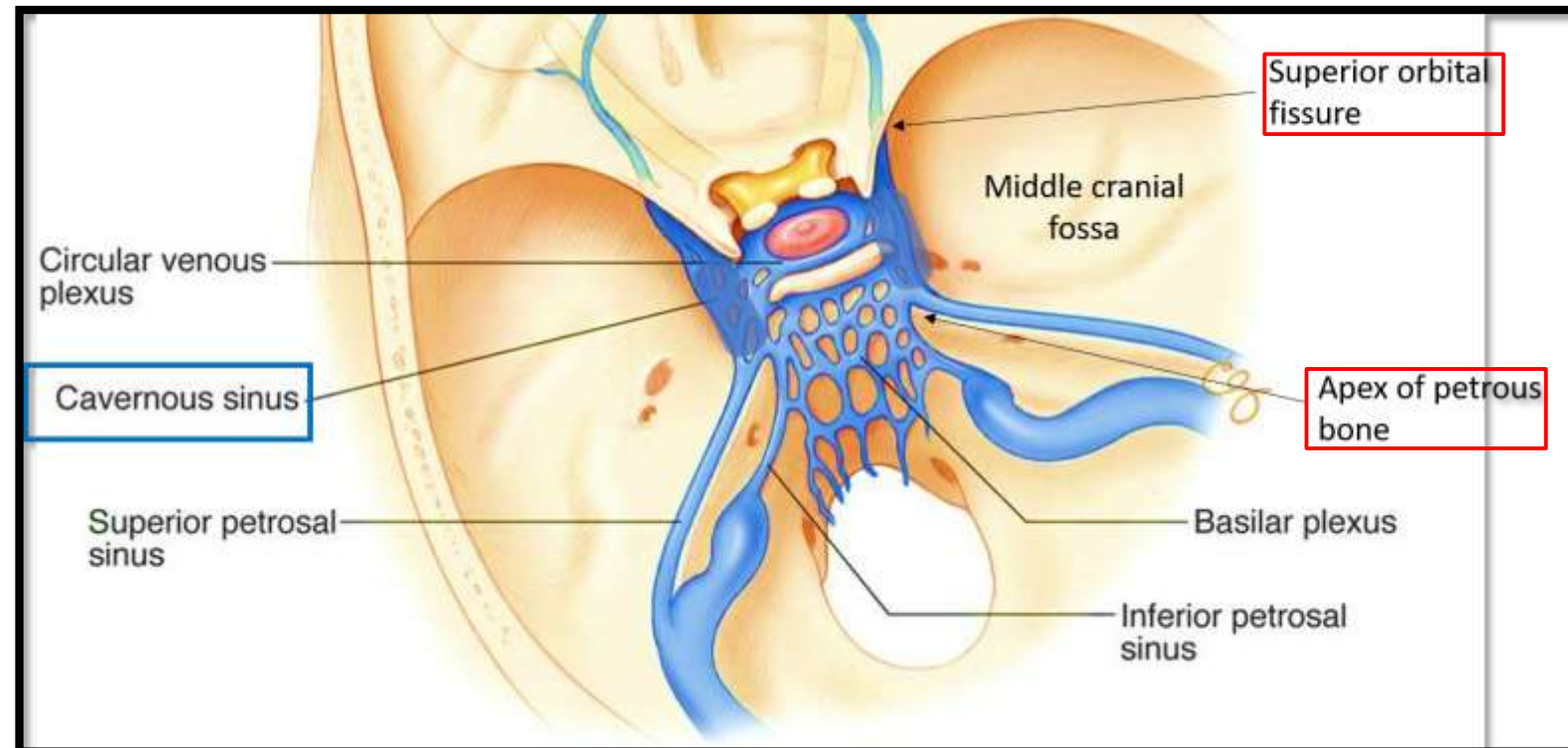
Extent-

Anteriorly-

- Up to medial end of superior orbital fissure.

Posteriorly-

- Up to apex of petrous part of temporal bone.

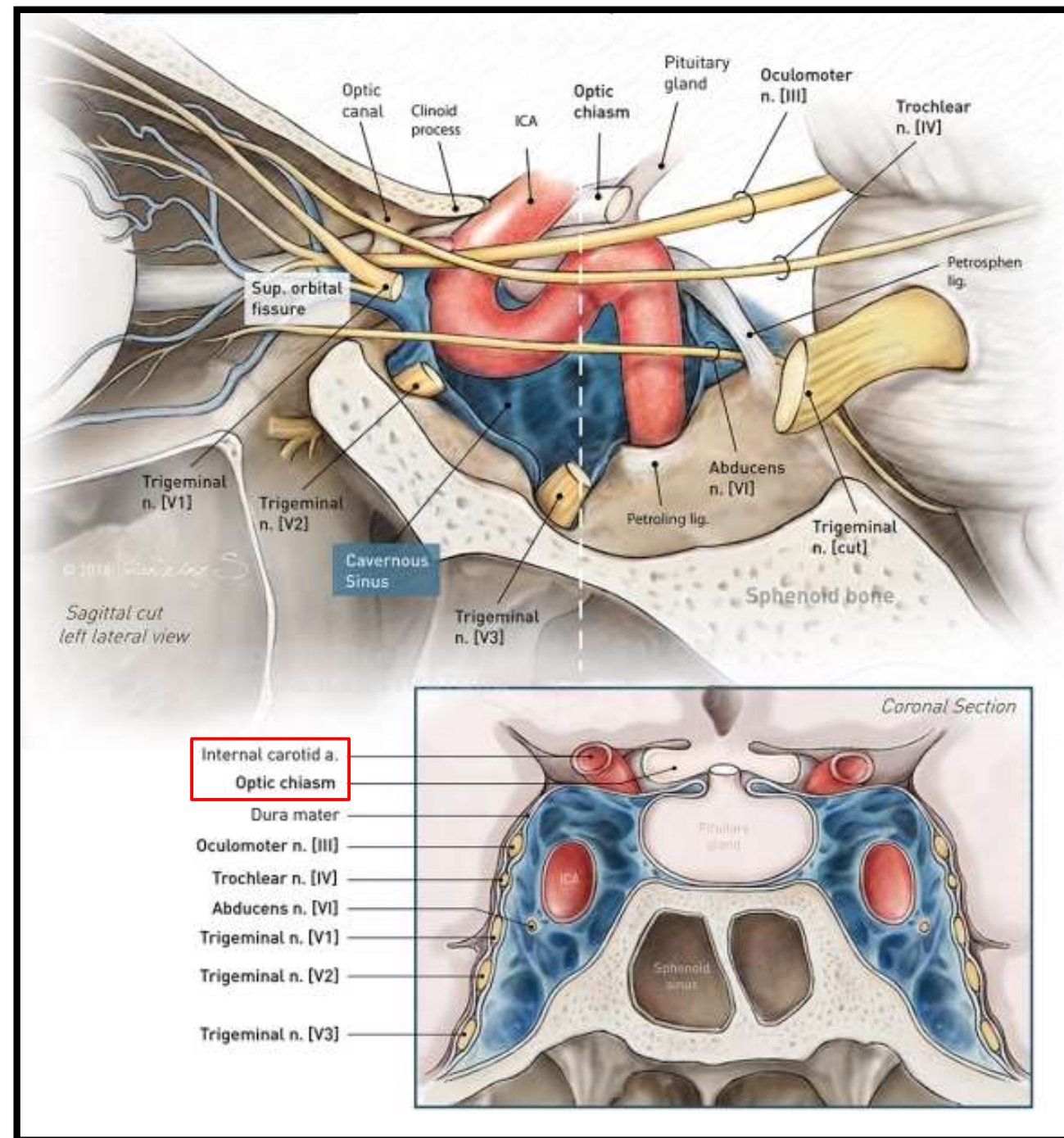
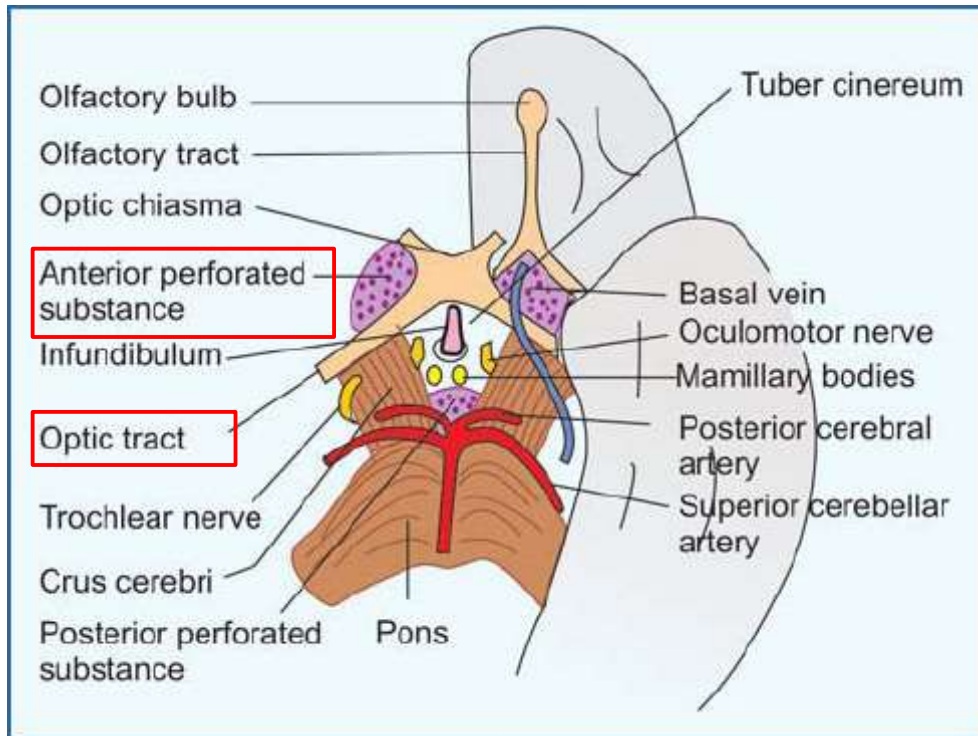


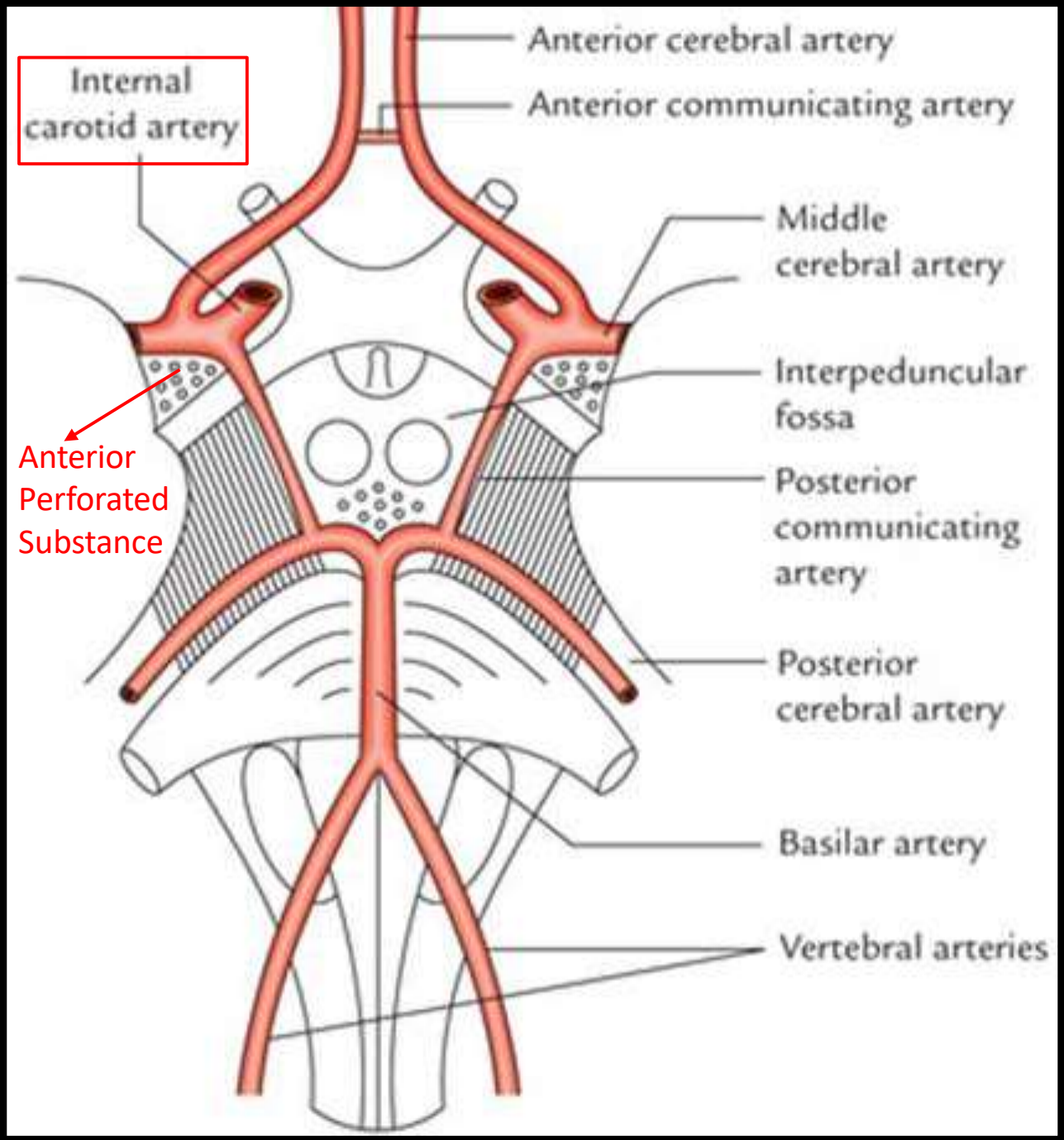
Cavernous Sinus contd...

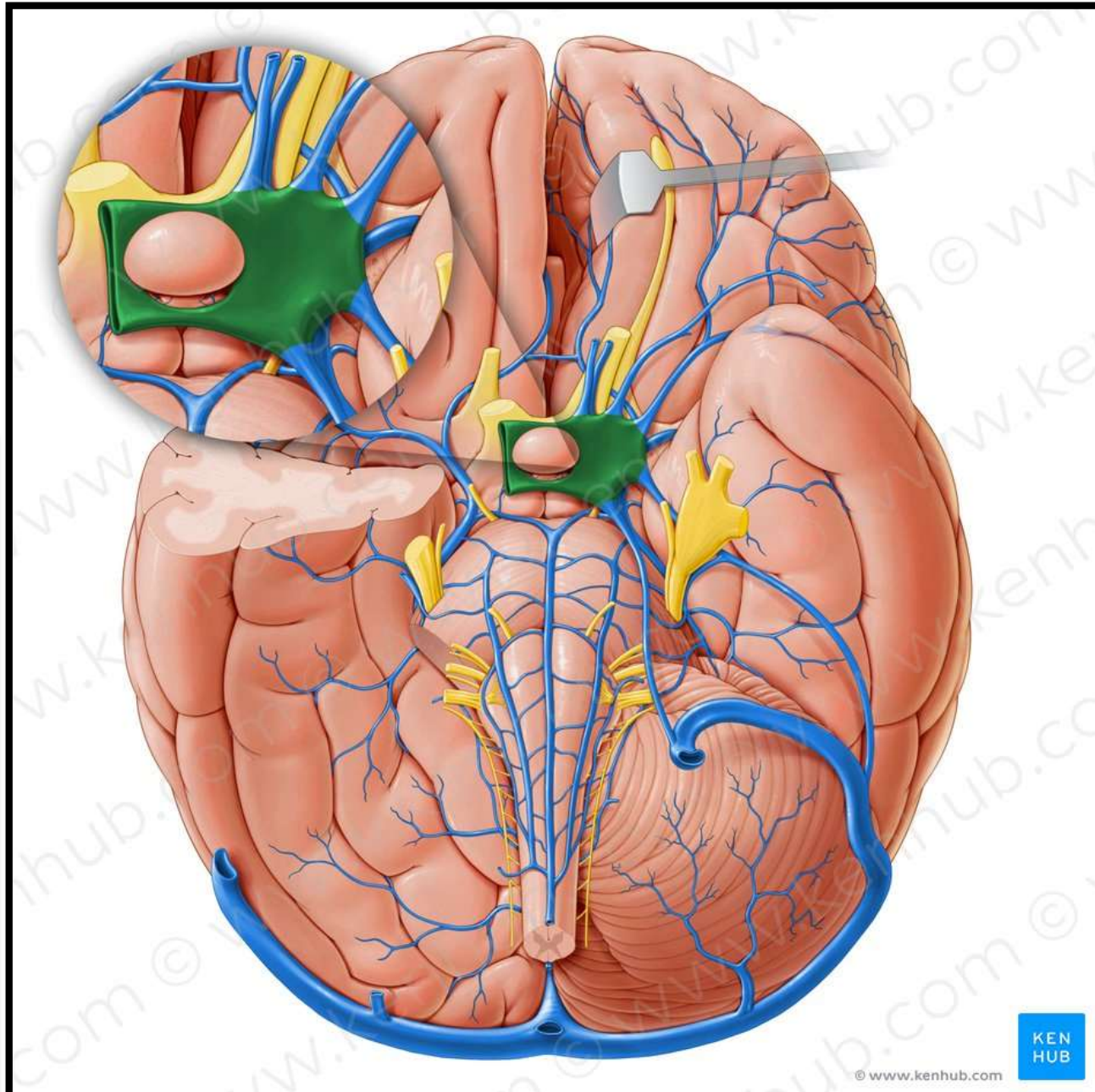
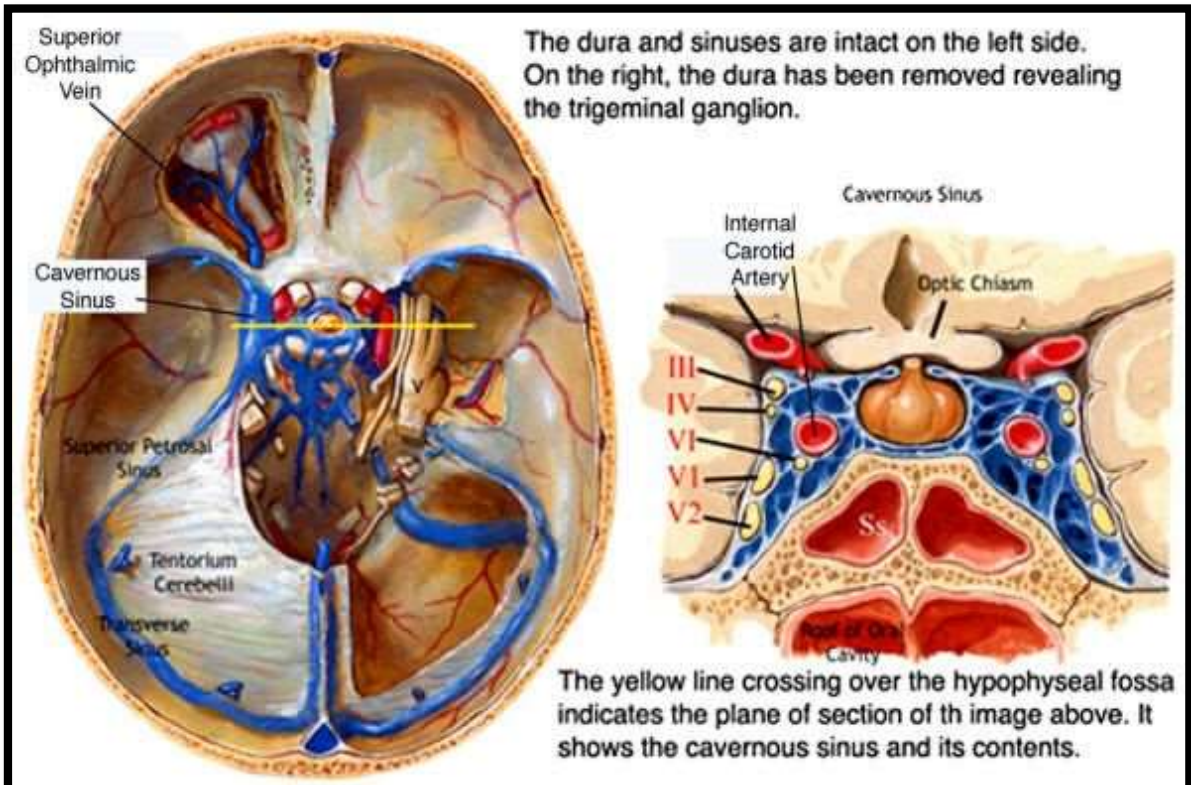
Relations-

Superior-

- Optic chiasma.
- Optic tract.
- Internal carotid artery.
- Anterior perforated substance.



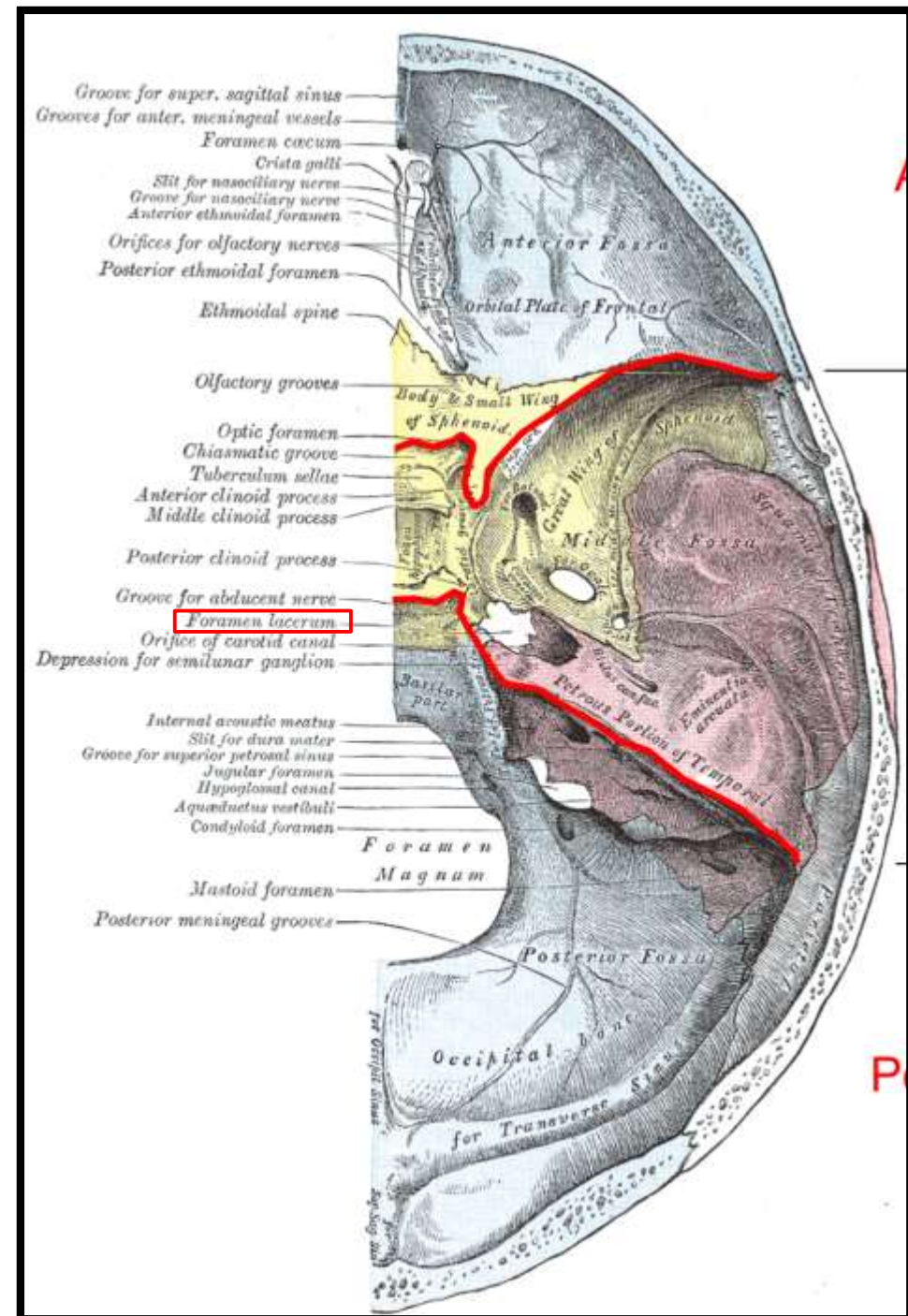




Relations of Cavernous Sinus contd...

Inferior-

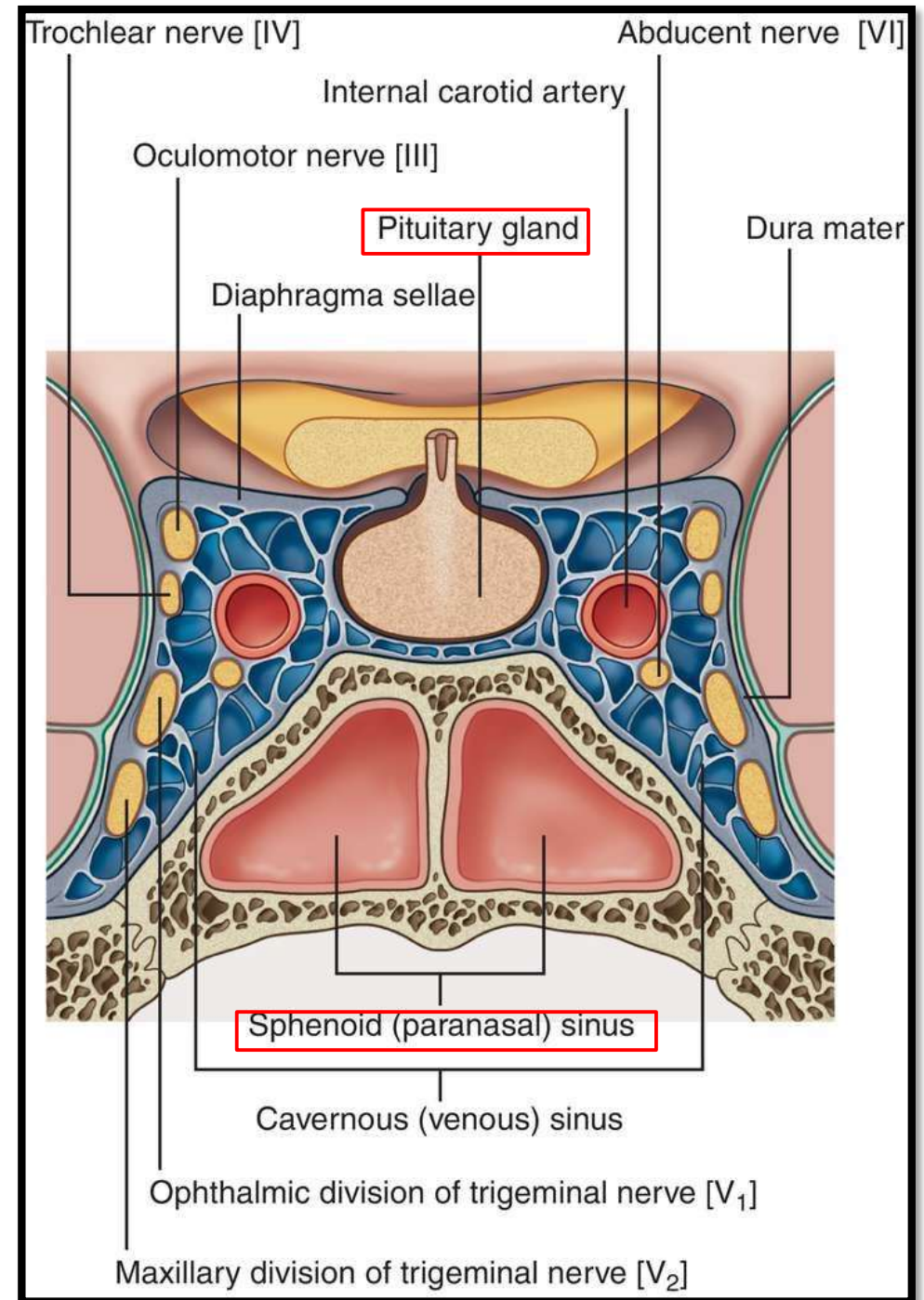
- Foramen lacerum.
- Junction of body and greater wing of sphenoid.



Relations of Cavernous Sinus contd...

Medial-

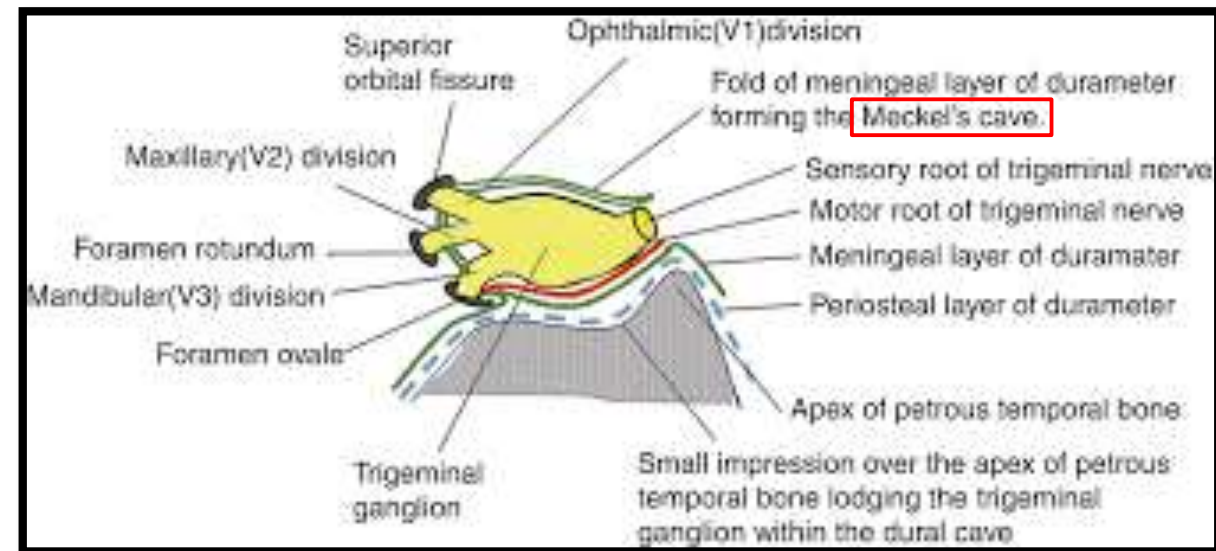
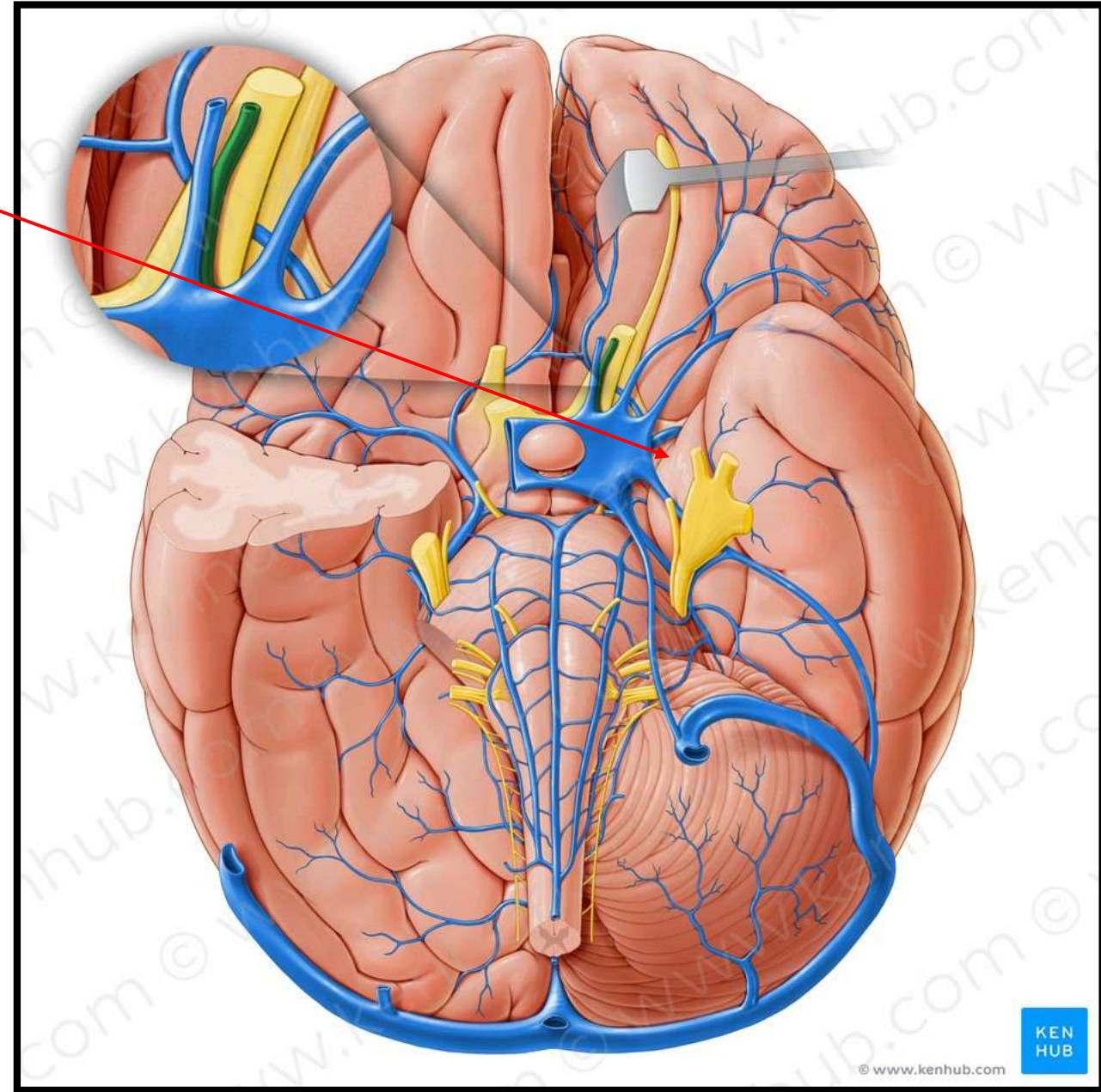
- Pituitary gland (hypophysis cerebri).
- Sphenoid air sinus.



Relations of Cavernous Sinus contd...

Lateral-

- Uncus of temporal lobe of cerebral hemisphere.
- Cavum trigeminale (**Meckel's Cave**) containing trigeminal ganglion.



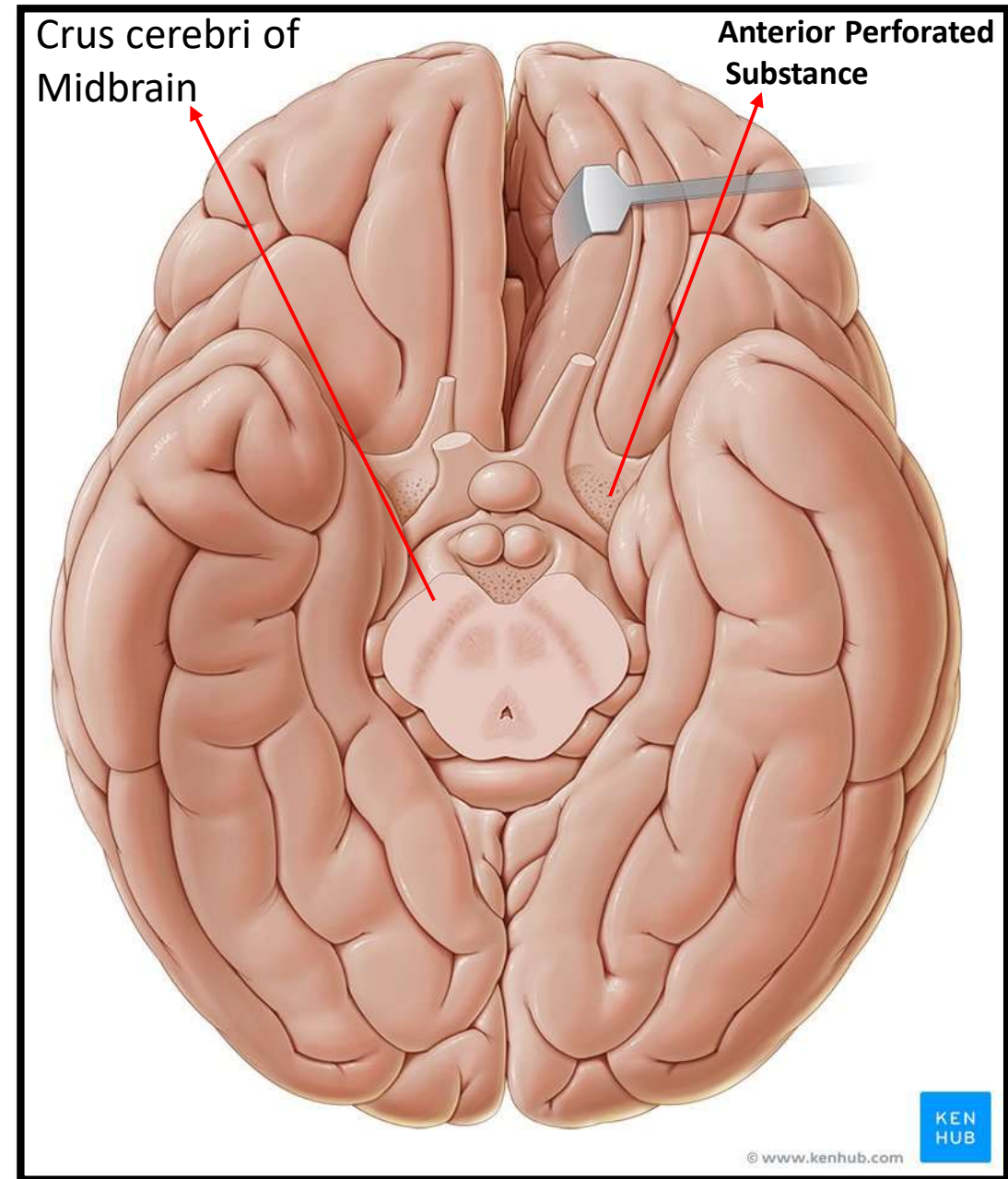
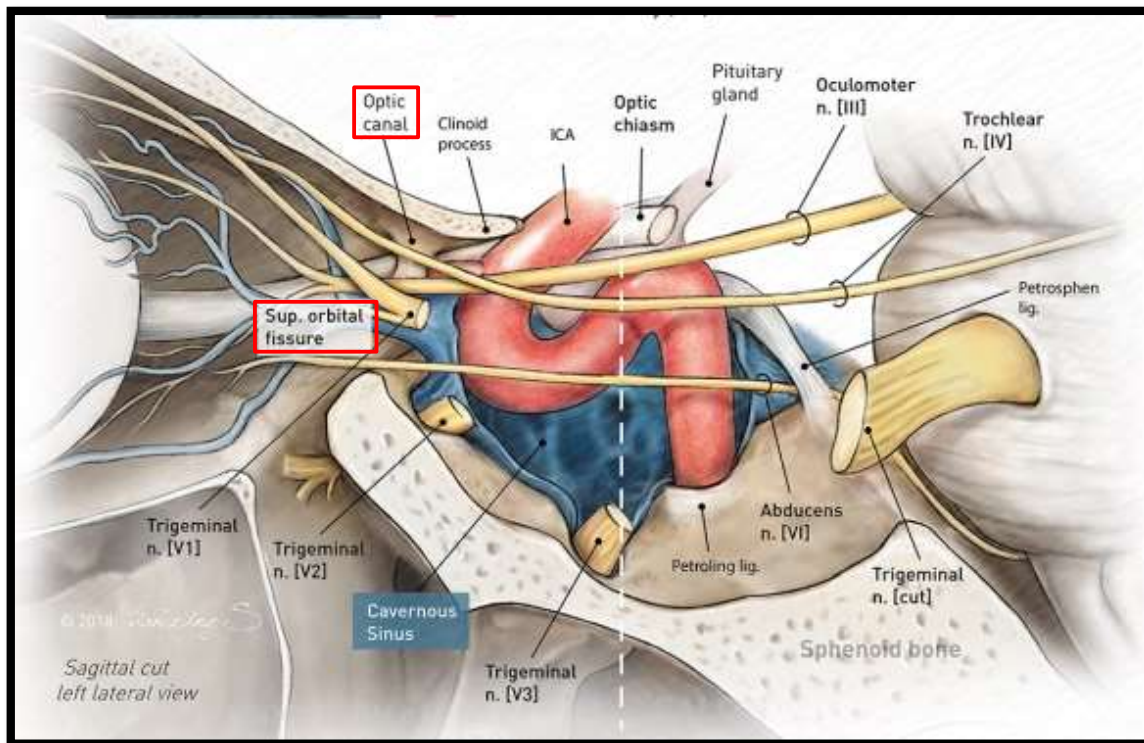
Relations of Cavernous Sinus contd...

Anterior-

- Superior Orbital Fissure.
- Apex of orbit.

Posterior-

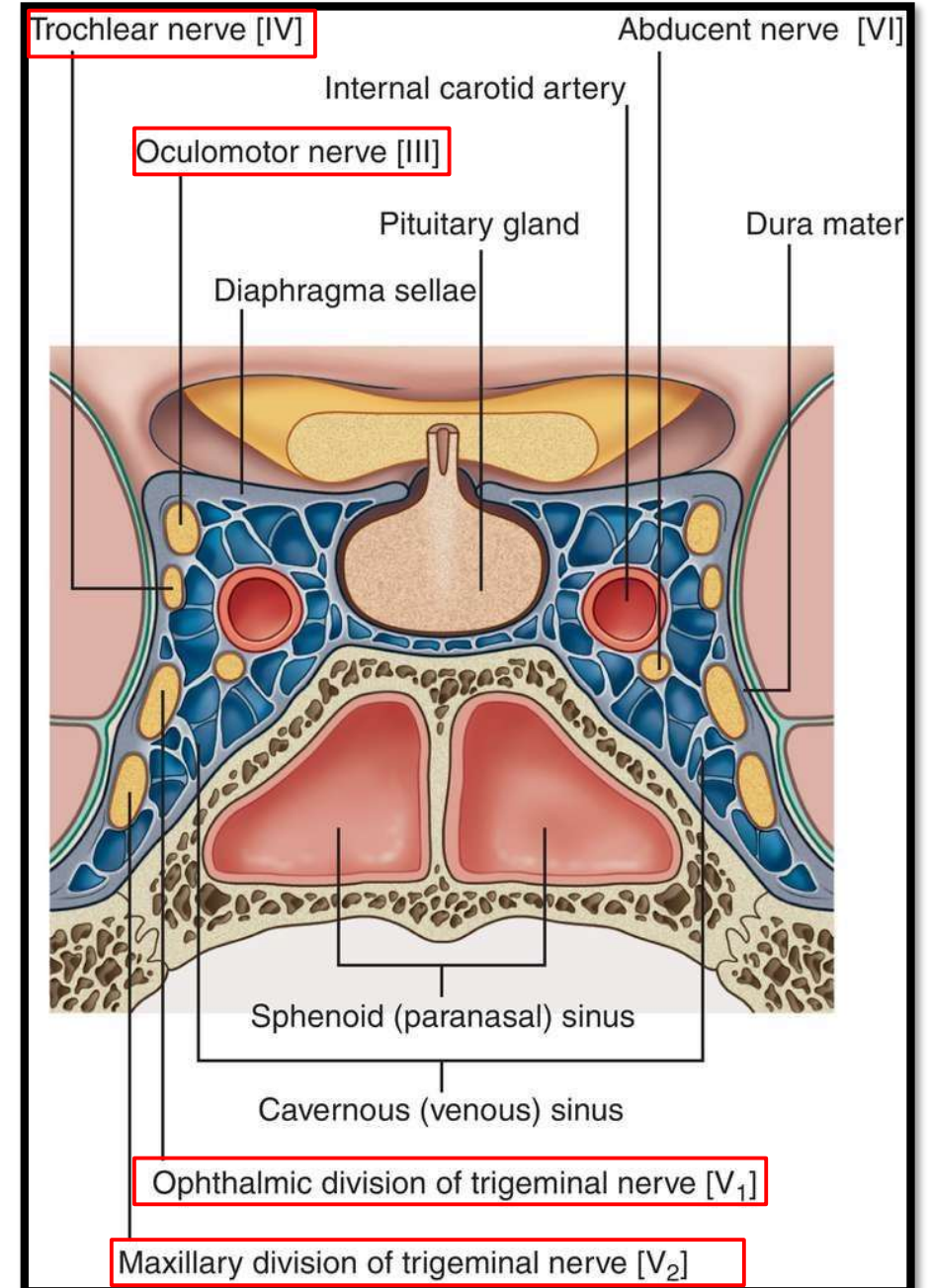
- Crus cerebri of midbrain.
- Apex of petrous part of temporal bone.



Structures present in lateral wall of Cavernous Sinus

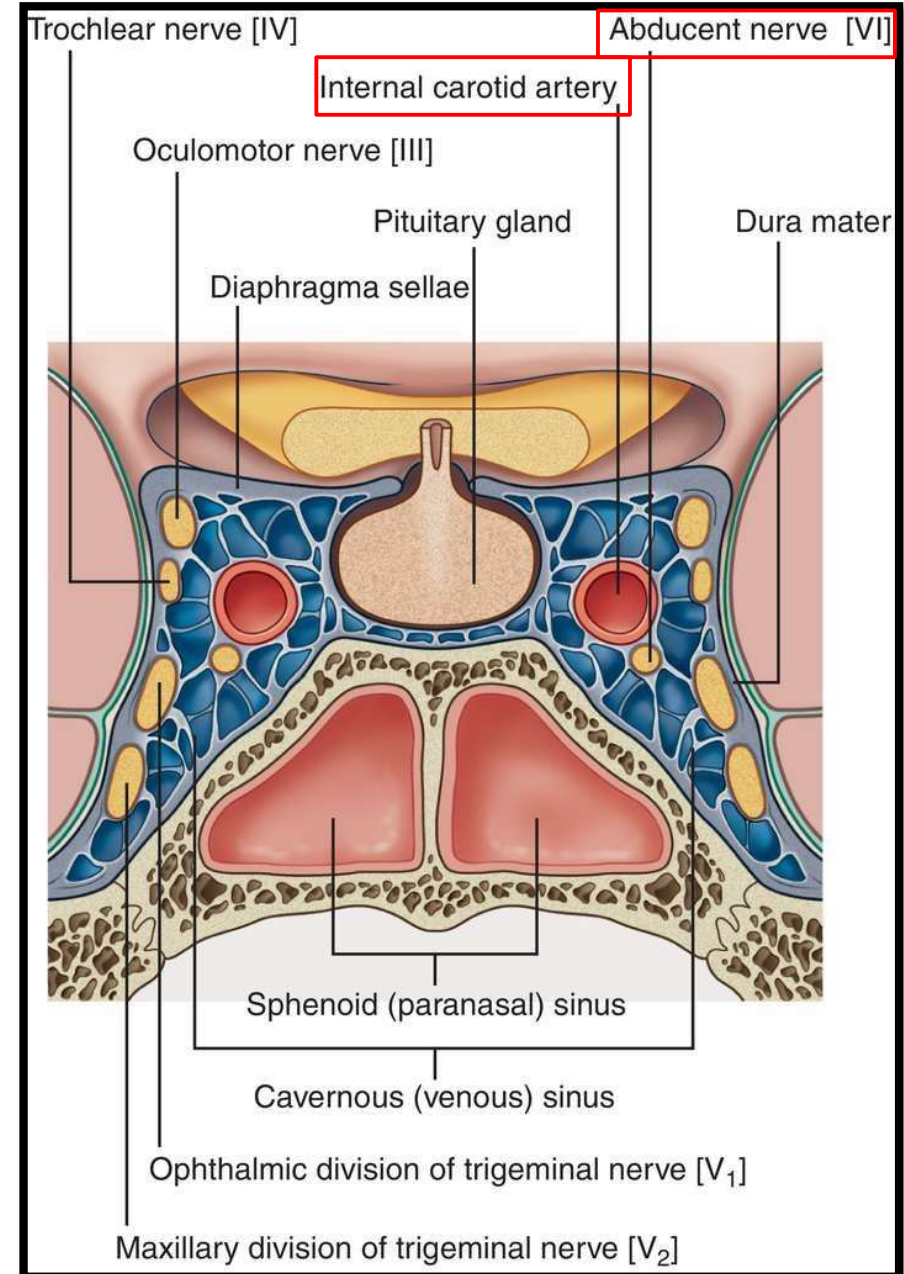
❖ From above downwards:

- Oculomotor nerve.
- Trochlear nerve.
- Ophthalmic nerve.
- Maxillary nerve.



Structures passing through the Cavernous Sinus

- Internal Carotid Artery.
- Abducent Nerve.



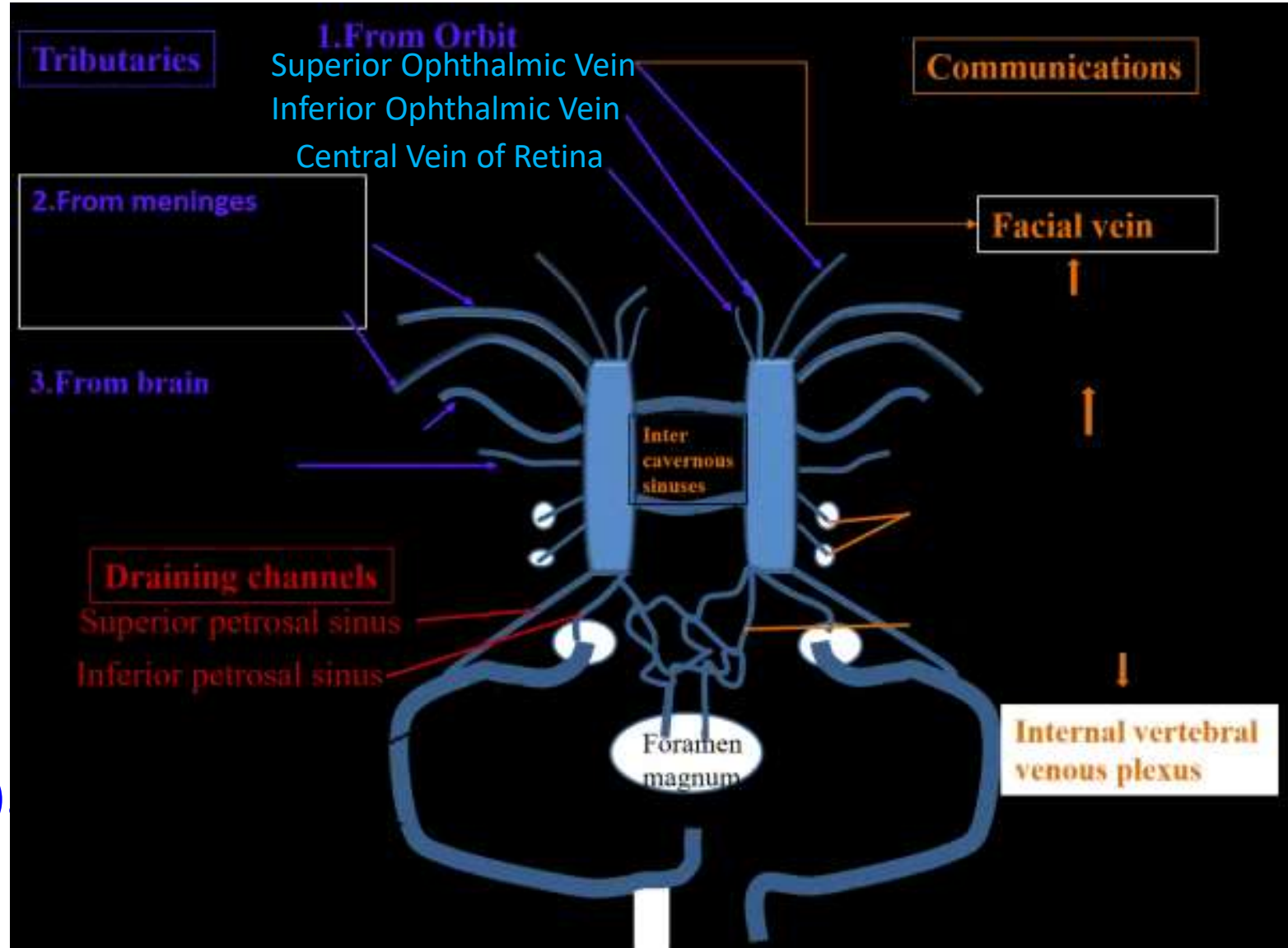
Tributaries of Cavernous Sinus

• Cavernous sinus receives blood from:

- Orbit.
- Meninges.
- Brain.

Tributaries from Orbit-

- Superior Ophthalmic Vein.
- Inferior Ophthalmic Vein.
- Central Vein of Retina (sometimes)



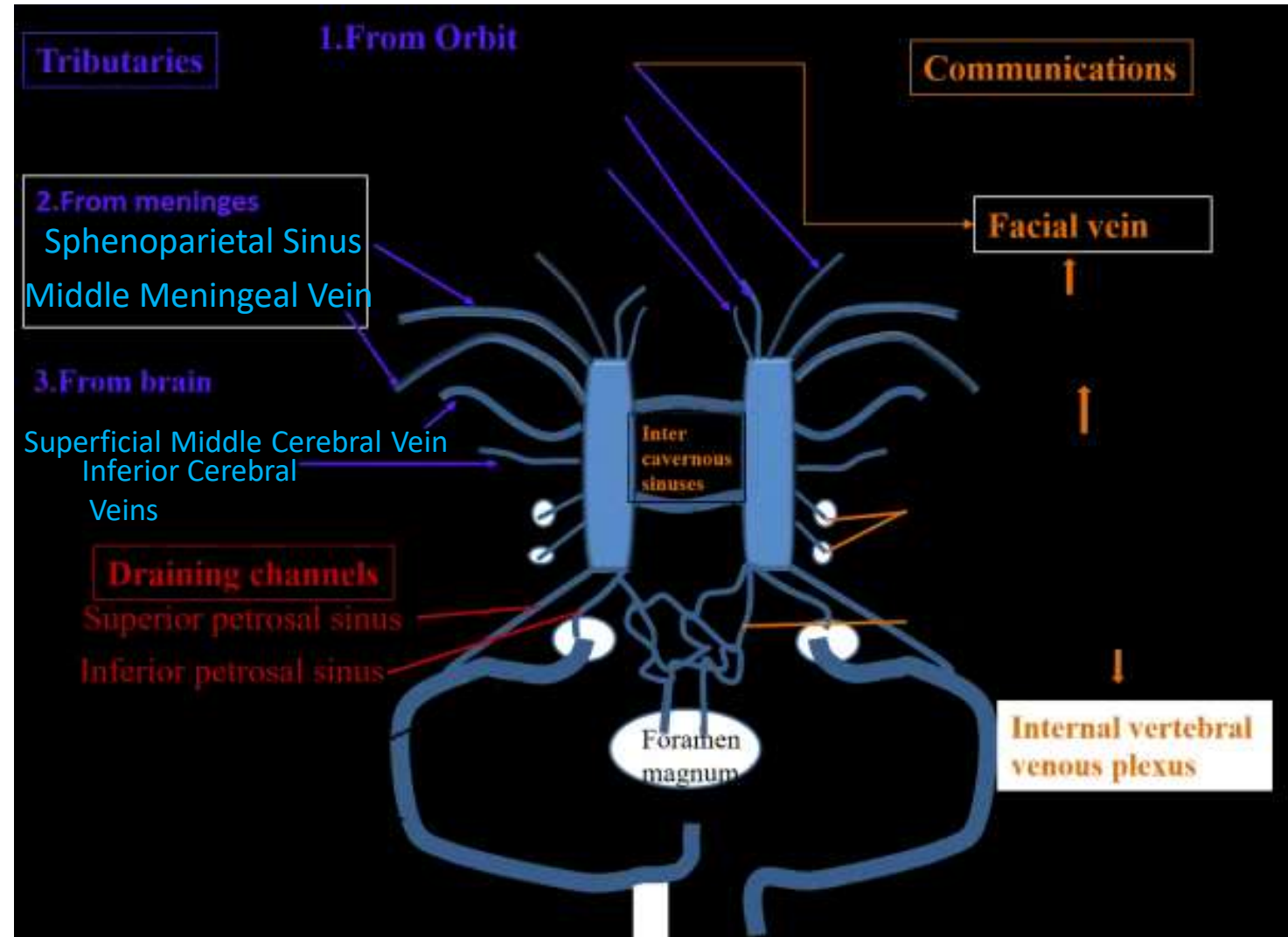
Tributaries of Cavernous Sinus contd...

Tributaries from Meninges-

- Sphenoparietal Sinus.
- Middle Meningeal Vein [anterior (frontal) trunk].

Tributaries from Brain-

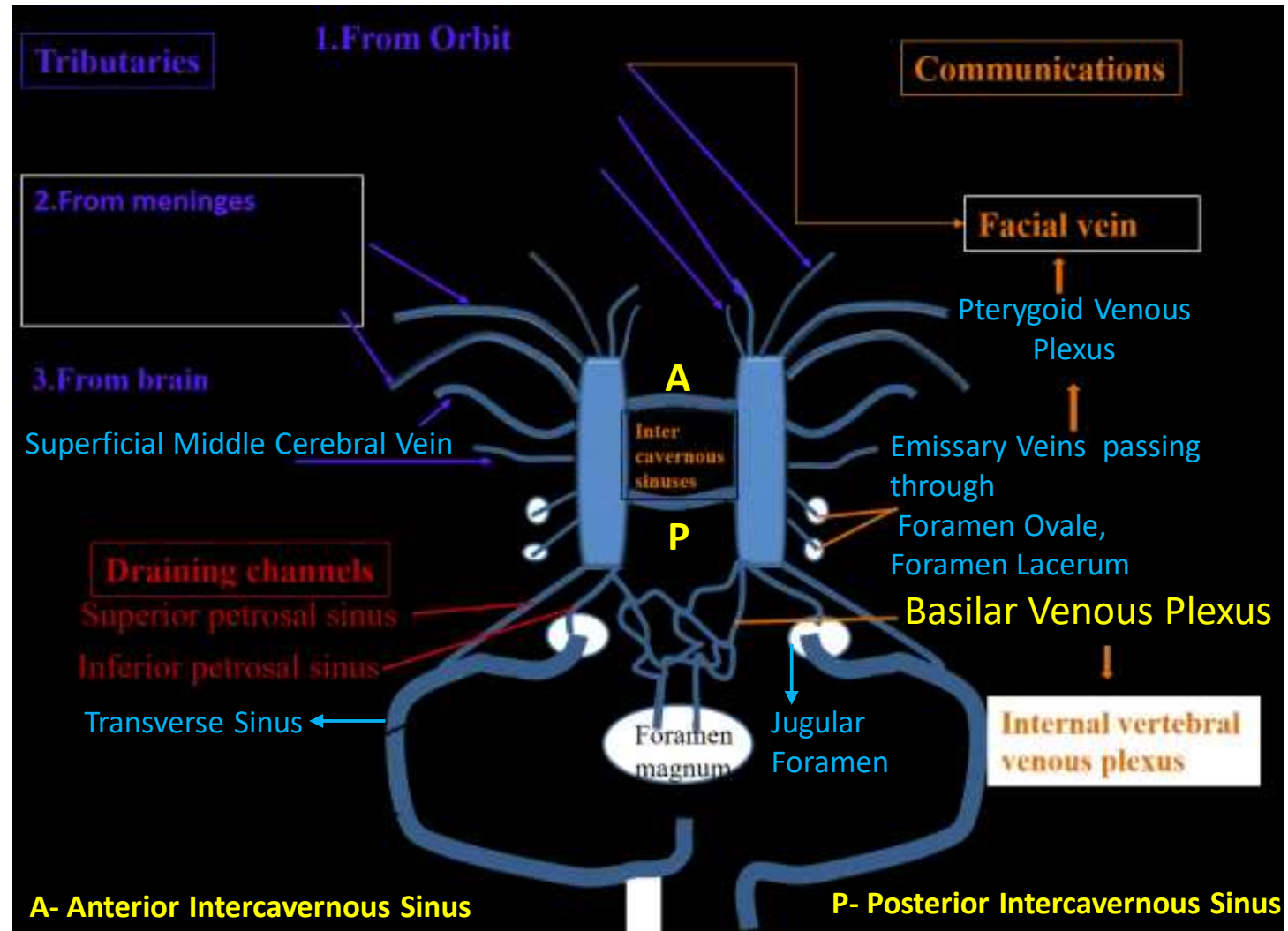
- Superficial Middle Cerebral Vein.
- Inferior Cerebral Veins.

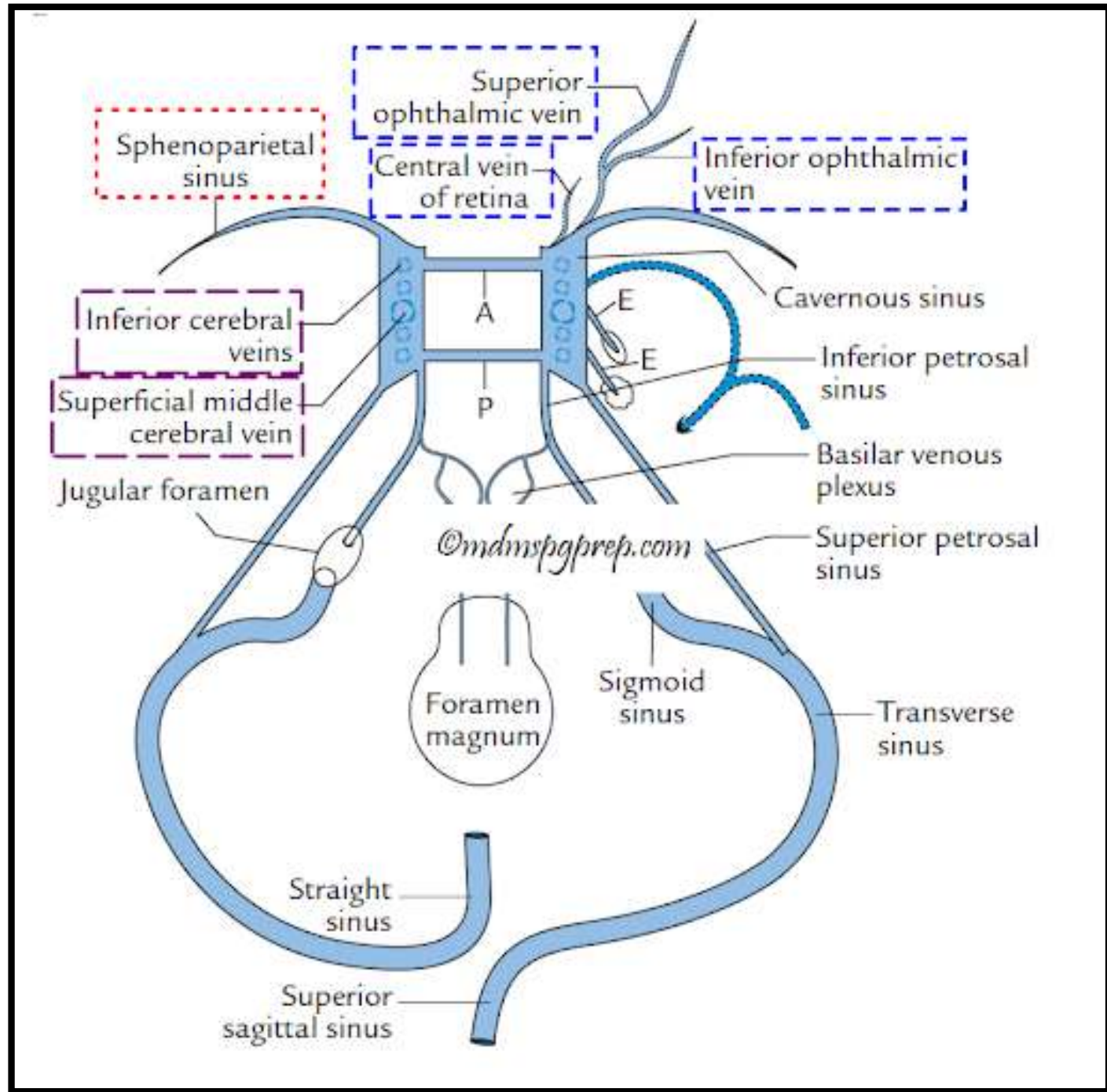


Communications of Cavernous Sinus

❖ Cavernous sinus communicates with:

- Transverse Sinus (via superior petrosal sinus).
- Internal Jugular Vein (via inferior petrosal sinus).
- Pterygoid Venous Plexus (via emissary veins which pass through foramen **ovale**, foramen **lacerum** and **emissary sphenoidal foramen**).
- Facial Vein
- Opposite Cavernous Sinus (via anterior and posterior intercavernous sinuses).
- Superior Sagittal Sinus (via Superficial Middle Cerebral Vein and Superior anastomotic vein).
- Internal Vertebral Venous Plexus (via Basilar Venous Plexus).





Applied Aspects

Cavernous Sinus Thrombosis [CST]-

- It may be caused by passage of septic emboli via its communicating channels.
- Most common cause is passage of septic emboli from face.

Routes for reaching the septic emboli from face to cavernous sinus-

- 2 routes:
- Facial Vein → Angular Vein → Superior Ophthalmic Vein → Cavernous Sinus
- Facial Vein → Deep Facial Vein → Pterygoid Venous Plexus → Emissary veins → Cavernous Sinus.

Cavernous Sinus Thrombosis [CST] contd...

Signs & Symptoms	Anatomical Correlation
Severe pain in the eye and forehead	Involvement of Ophthalmic nerve
Ophthalmoplegia (Paralysis of ocular muscles)	Involvement of 3 rd , 4 th & 6 th cranial nerves
Edema of eyelids with Exophthalmos	Congestion of orbital veins



Applied Aspects contd...

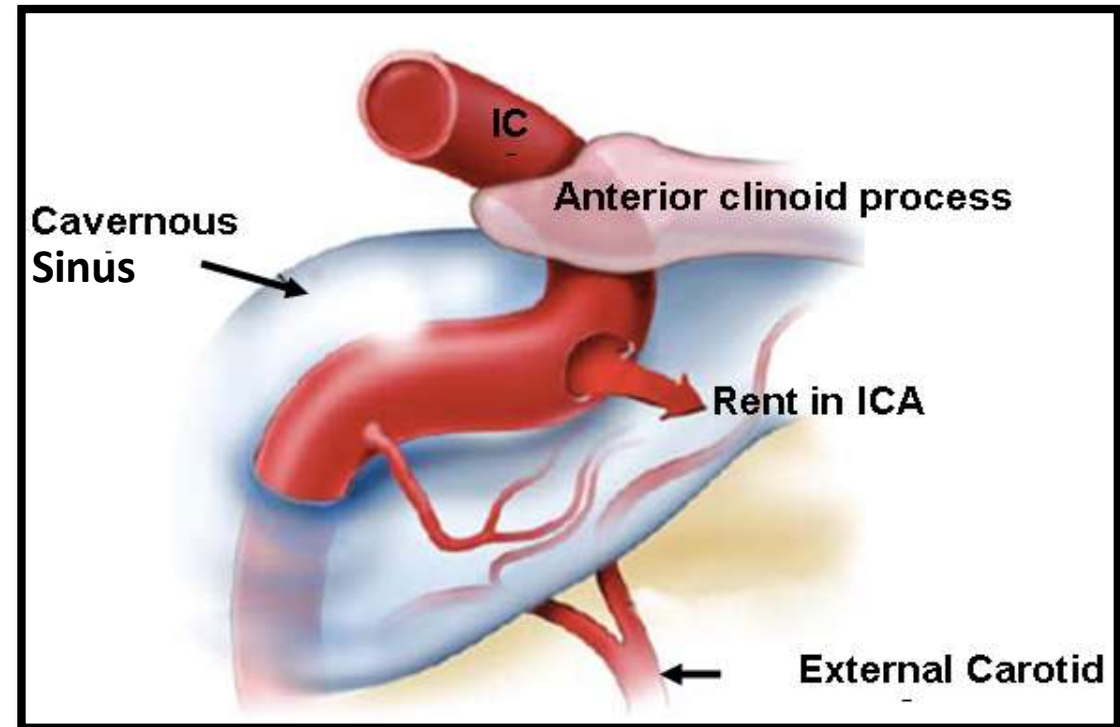
Carotidocavernous Fistula-

- It is an arteriovenous communication between Internal Carotid Artery(ICA) & Cavernous Sinus.
- This communication is established if ICA is ruptured in fracture base of the skull.
- Arterial blood rushes into the cavernous sinus and its communicating channels.

Signs & Symptoms-

❖ Pulsating Exophthalmos-

- Eyeball protrudes and pulsates with each heart beat.
- ❖ A loud systolic murmur over the eye.
- ❖ Ophthalmoplegia.
- ❖ Marked orbital and conjunctival edema.



Thank
You