

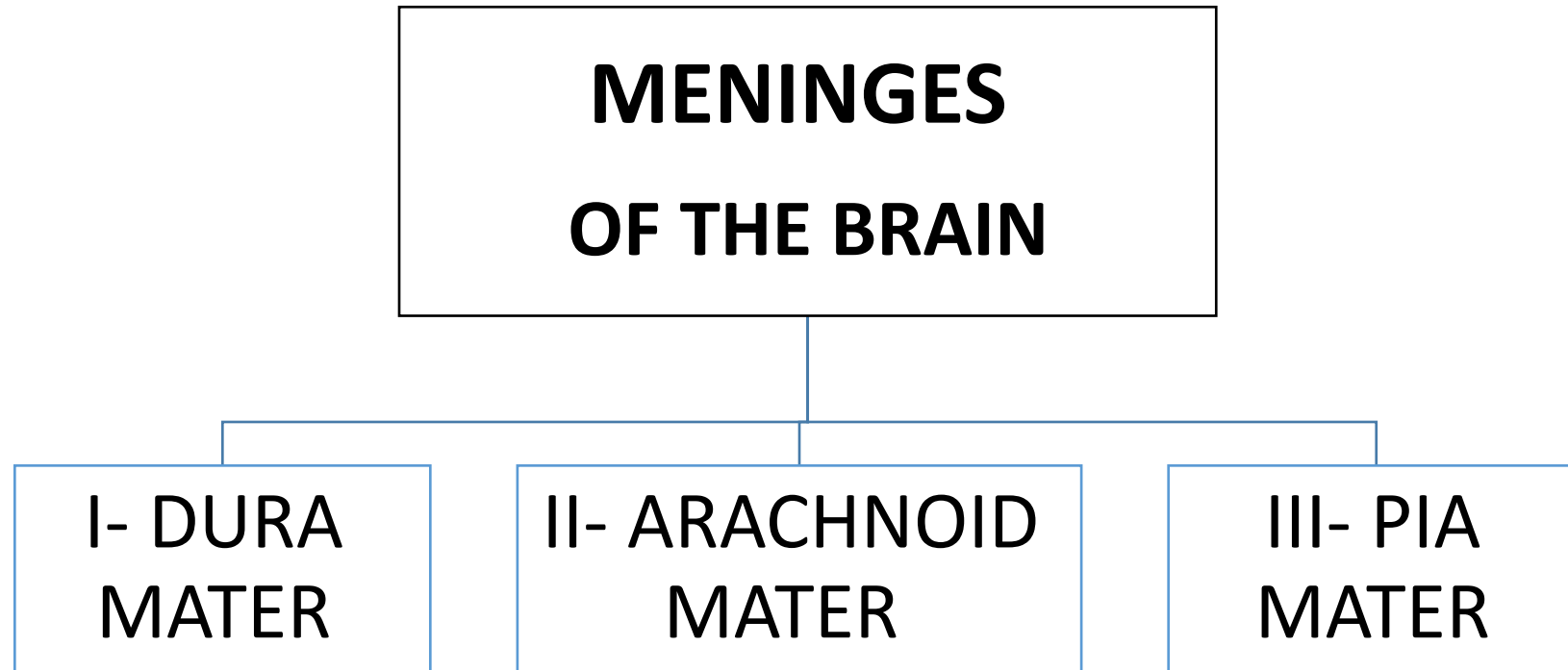


Dural folds and sinuses

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MENINGES OF THE BRAIN



MENINGES OF THE BRAIN

1- Dura Mater

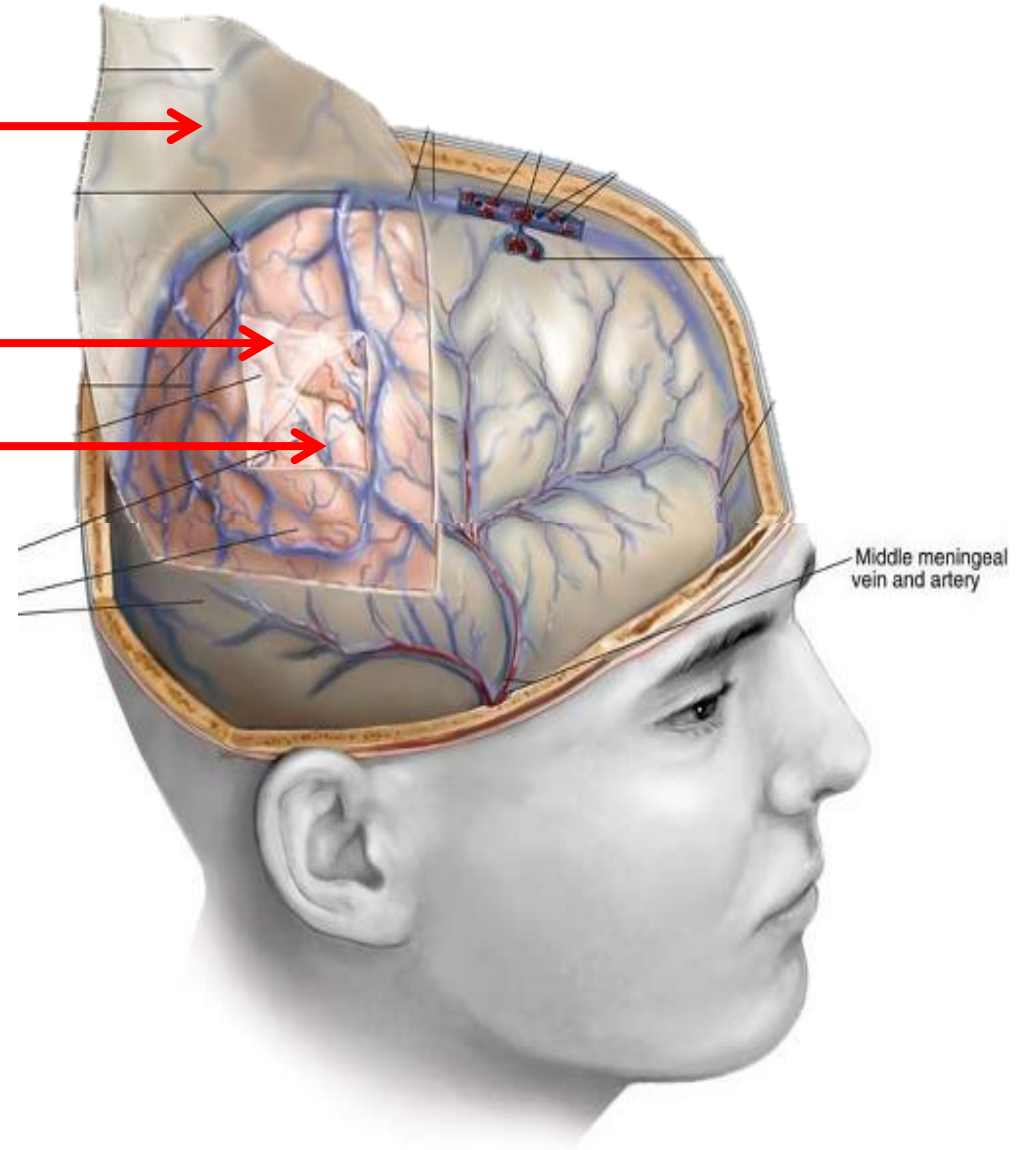
(outer layer)

2- Arachnoid Mater

(middle layer)

3- Pia Mater

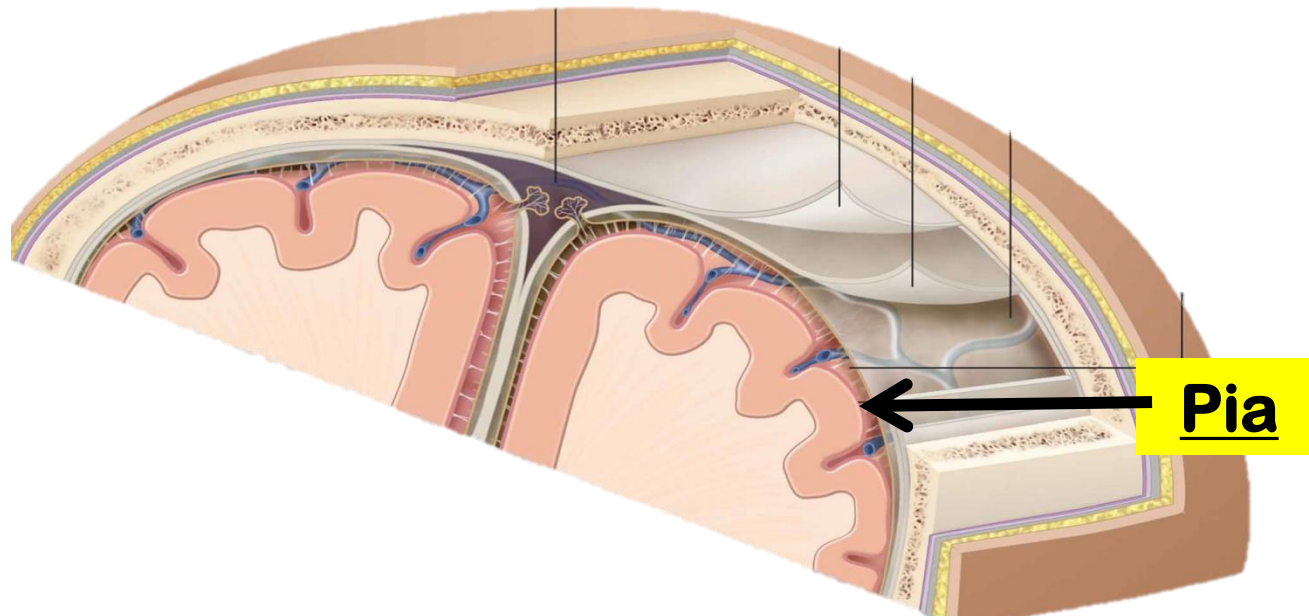
(inner layer)



MENINGES OF THE BRAIN

Pia mater

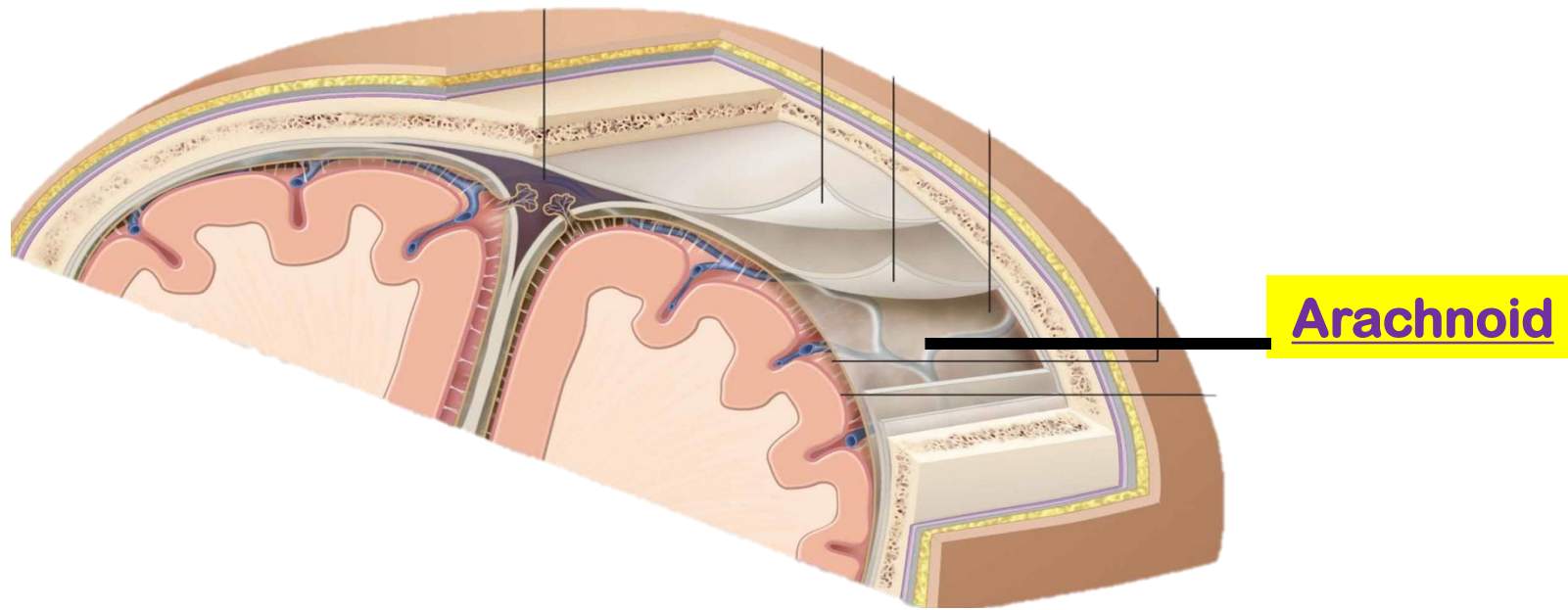
- It is a thin, delicate membrane that closely invests the surface of the brain.
- It follows the contours of the brain, entering the grooves and fissures on its surface,



MENINGES OF THE BRAIN

Arachnoid mater

- It is a thin, avascular membrane.
- From its inner surface thin trabeculae extend downward, cross the subarachnoid space, and become continuous with the pia mater



MENINGES OF THE BRAIN

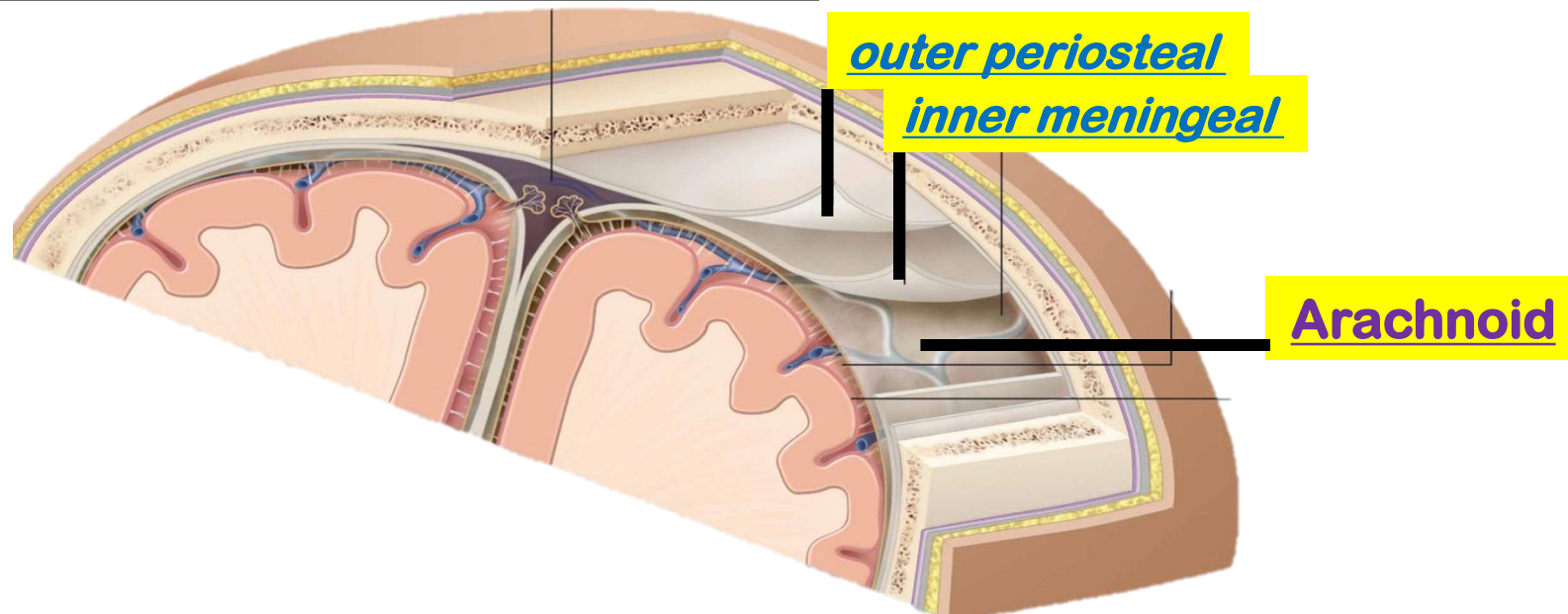
Dura Mater

1- the outer periosteal layer

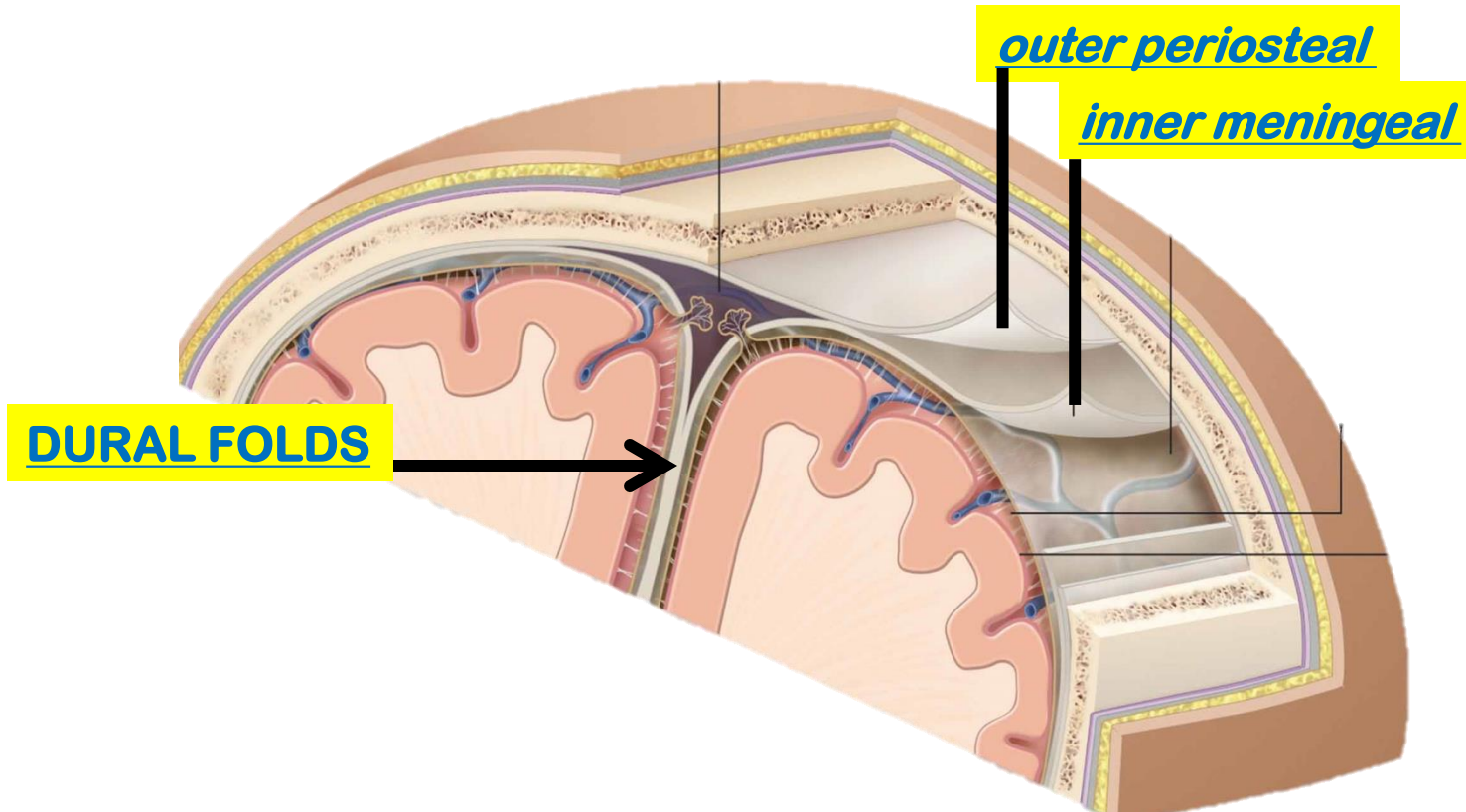
- It is the periosteum of the cranial cavity.
- It is firmly attached to the skull.

2- the inner meningeal layer

- It is in close contact with the arachnoid mater
- It is continuous with the dura mater of spinal cord .

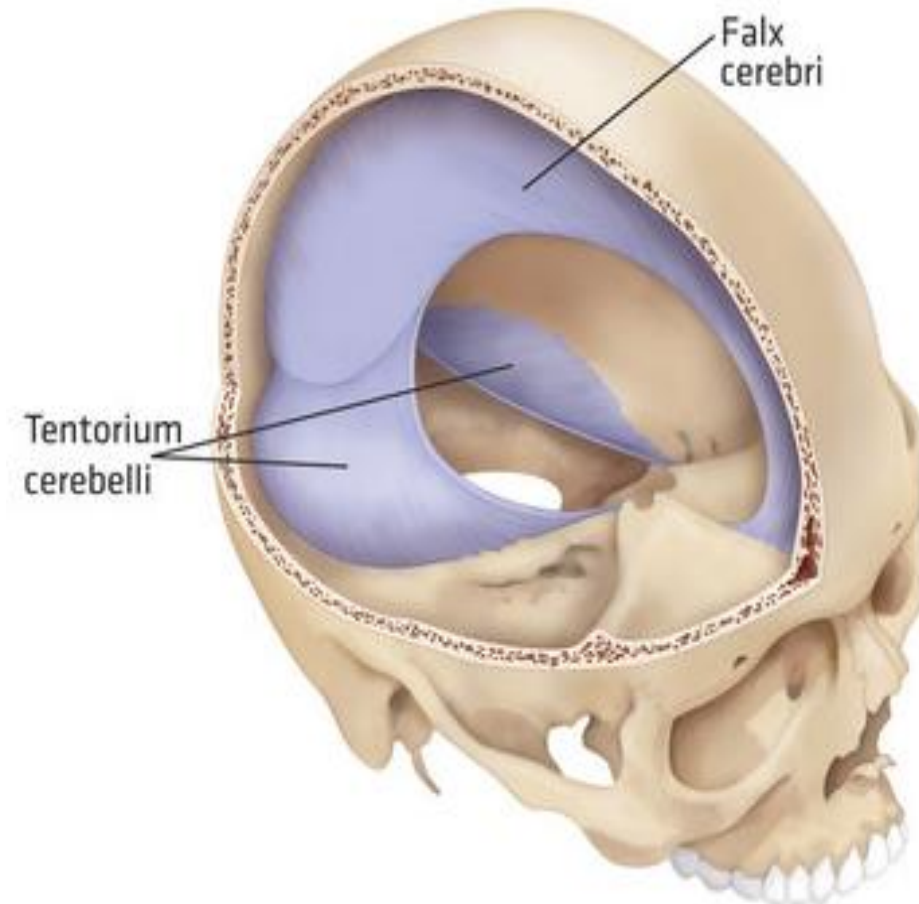


□ The two layers of dura separate from each other to form → → **DURAL FOLDS**



Dural Folds

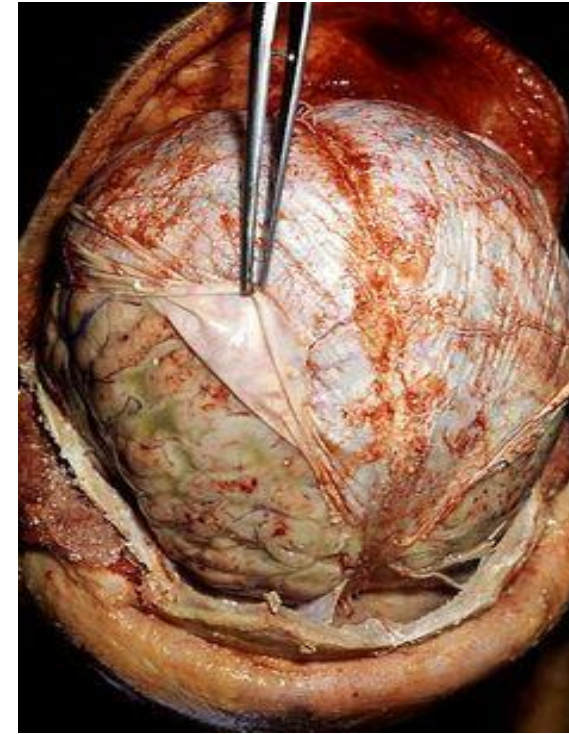
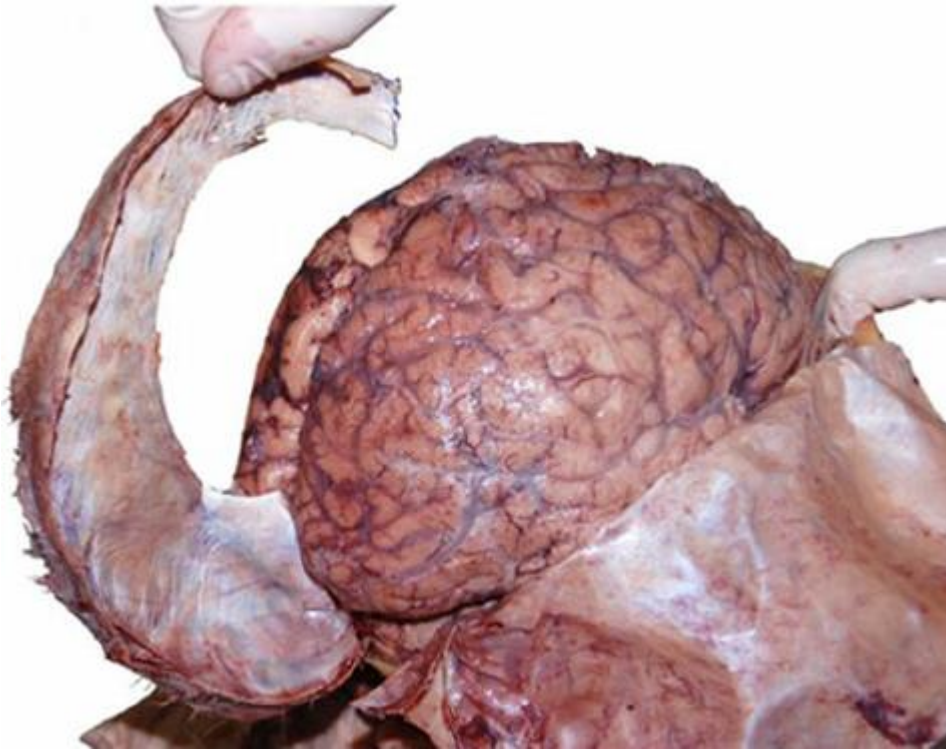
- 1) Falx Cerebri
- 2) Tentorium Cerebelli
- 3) Falx Cerebelli
- 4) Diaphragma Sellae



□ Function: form **partition-like processes**, between different parts of the brain. They help to **stabilize the brain within the cranial cavity** during movements of head.

Dural Folds

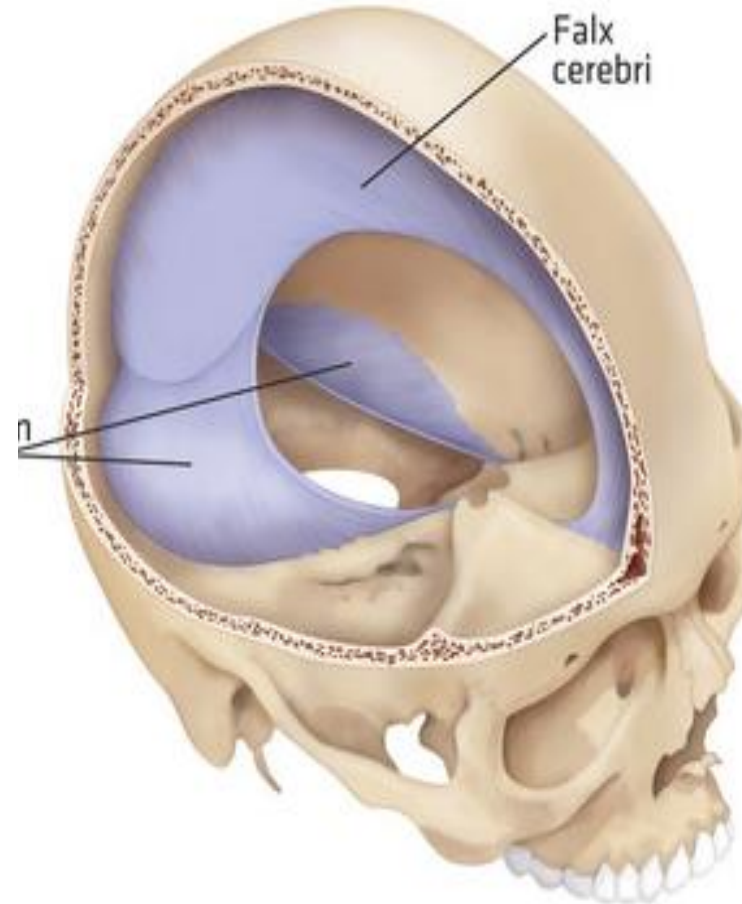
I- Falx Cerebri



Dural Folds

I- Falx Cerebri

- is a *large crescent-shaped*
- projects vertically downward between the *two cerebral hemispheres*
- **Apex** : It is attached **anteriorly** :
 - **frontal crest** of the frontal b.
 - **crista galli** of the ethmoid b.
- **Base** : it is attached **Posteriorly** to upper surface of **tentorium cerebelli**



Dural Folds

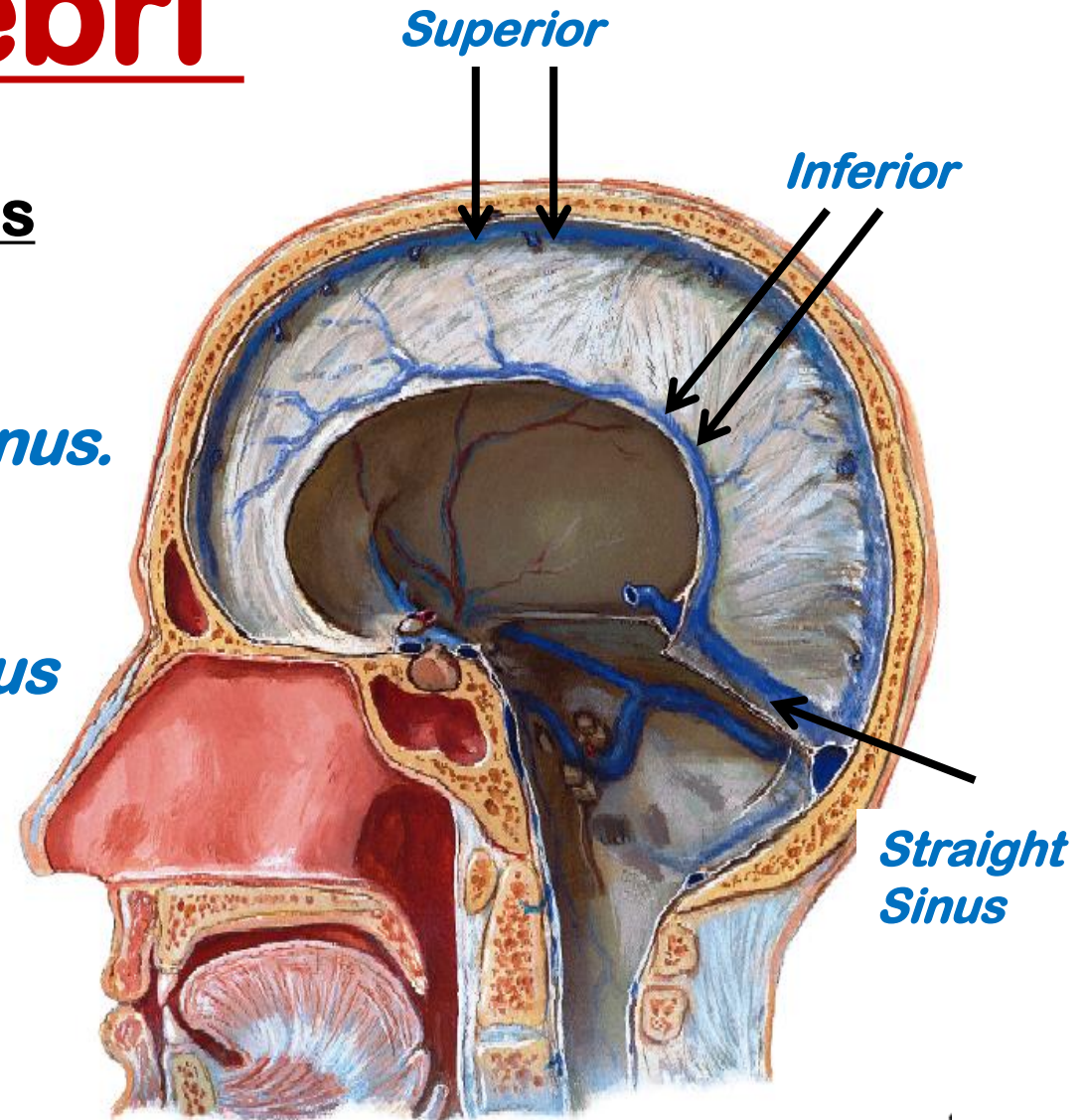
I- Falx Cerebri

- The margin of falix enclosing venous sinosis

Upper border →
Superior Sagittal Sinus.

Lower free border →
Inferior Sagittal Sinus

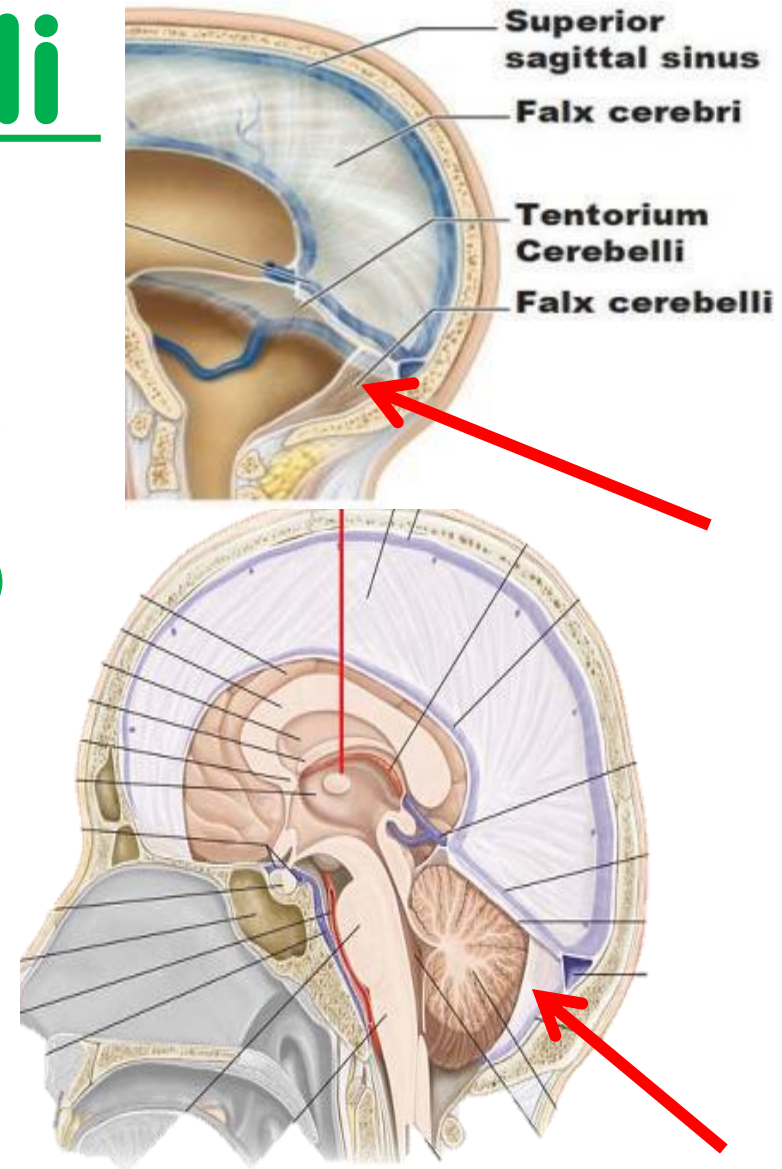
Base → *Straight Sinus.*



Dural Folds

II- Falx Cerebelli

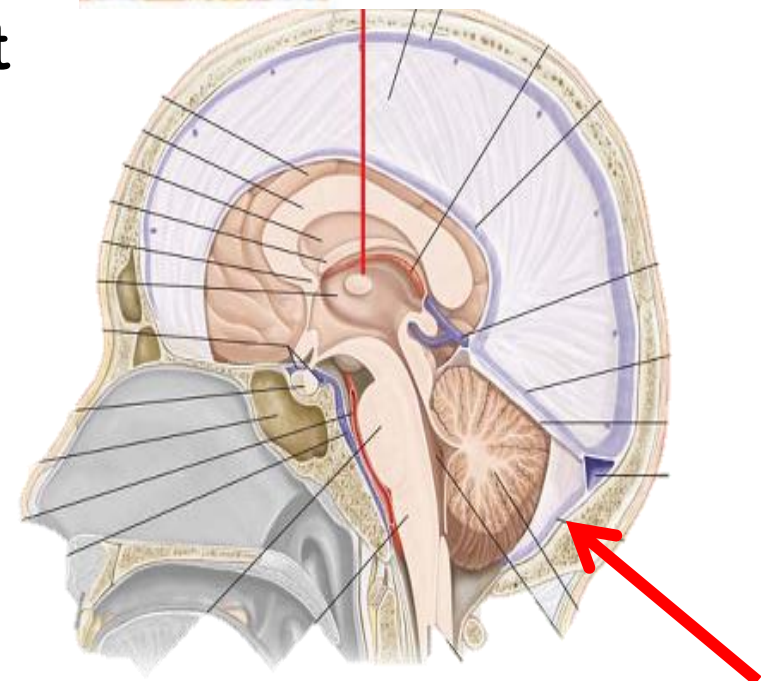
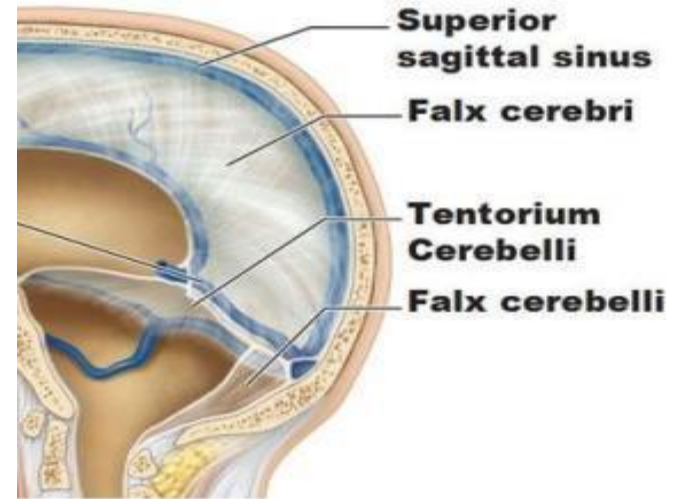
- is a *small crescent-shaped*
- projects vertically downward in *posterior cranial fossa* between the *two cerebellar hemispheres*
- **Base** : it is attached (*superiorly*) *lower surface* of **tentorium cerebelli**
- **Apex** : It is attached (*inferiorly*) **the margins of the foramen magnum**



Dural Folds

II- Falx Cerebelli

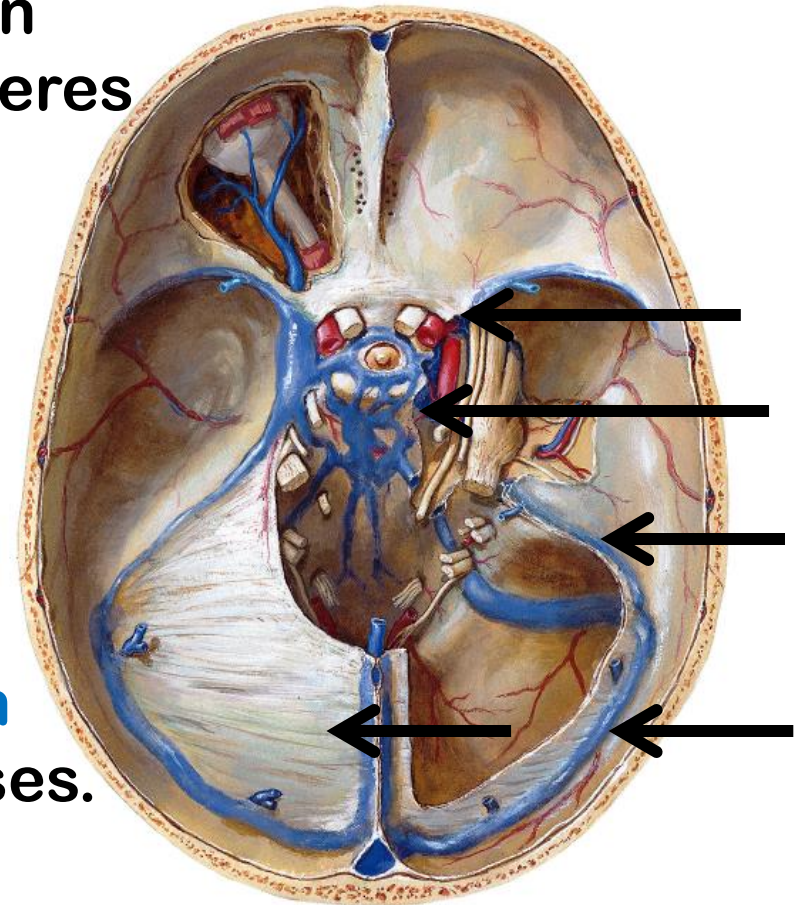
- *Rt & Lt surfaces*
is related to the cerebellar vermis
- *Posterior border :*
 - attached to internal occipital crest
 - encloses the *occipital sinus*
- *Anterior border :* free



Dural Folds

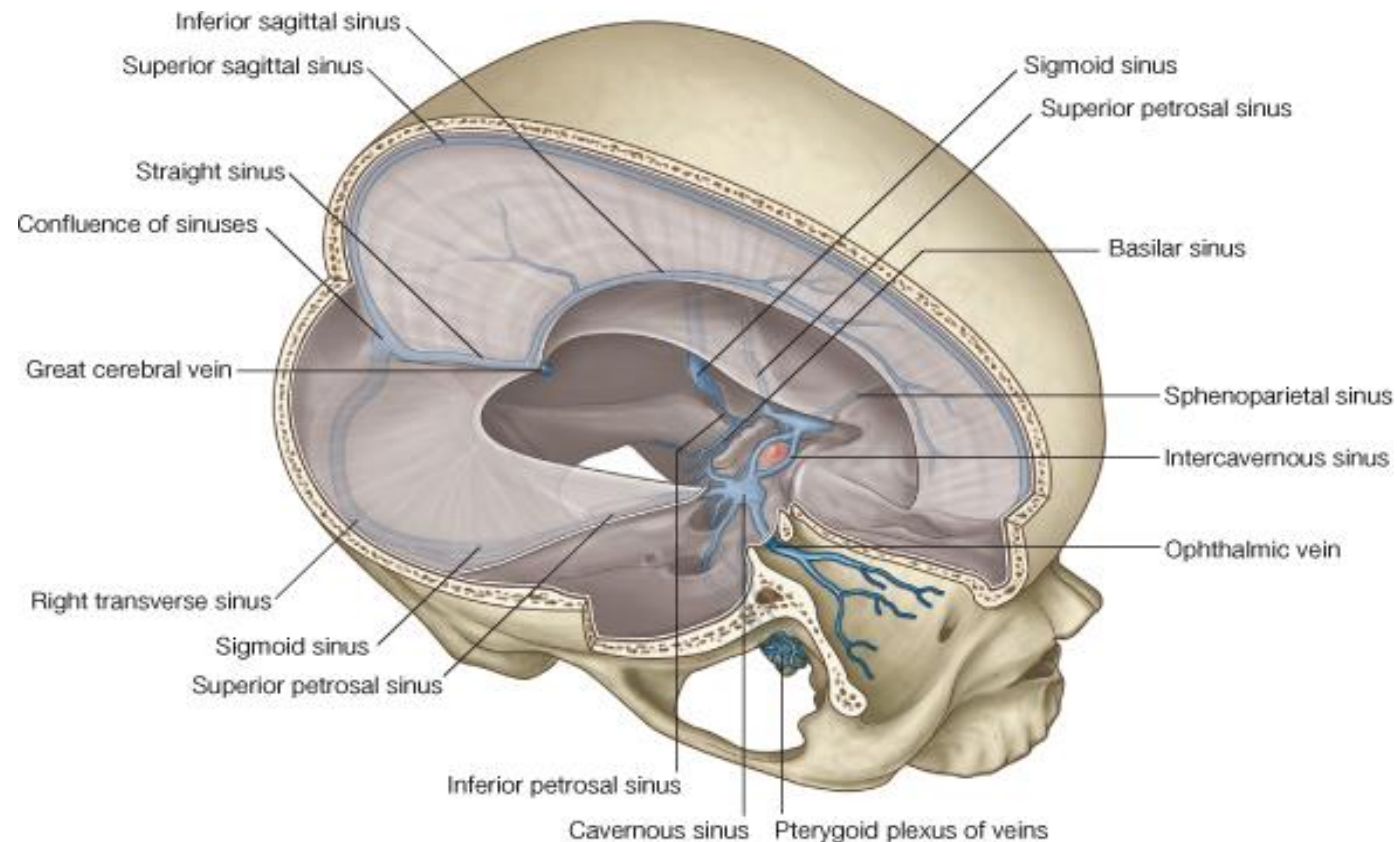
III- Tentorium Cerebelli

- It forms a **horizontal roof** between cerebral and cerebellar hemispheres
- **Attached border:**
 - transverse sulcus
 - upper border of petrous bone
 - posterior clinoid processes.
- **Free border:**
 - forming **U-shaped tentorial notch** between anterior clinoid processes.



DURAL VENOUS SINUSES

Definition: are venous channels lying between the 2 dural layers



DURAL VENOUS SINUSES

6 Paired Sinuses

- 1- Sphenoparietal
- 2- Cavernous
- 3- Superior petrosal
- 4- Inferior petrosal
- 5- Sigmoid
- 6- Transvers

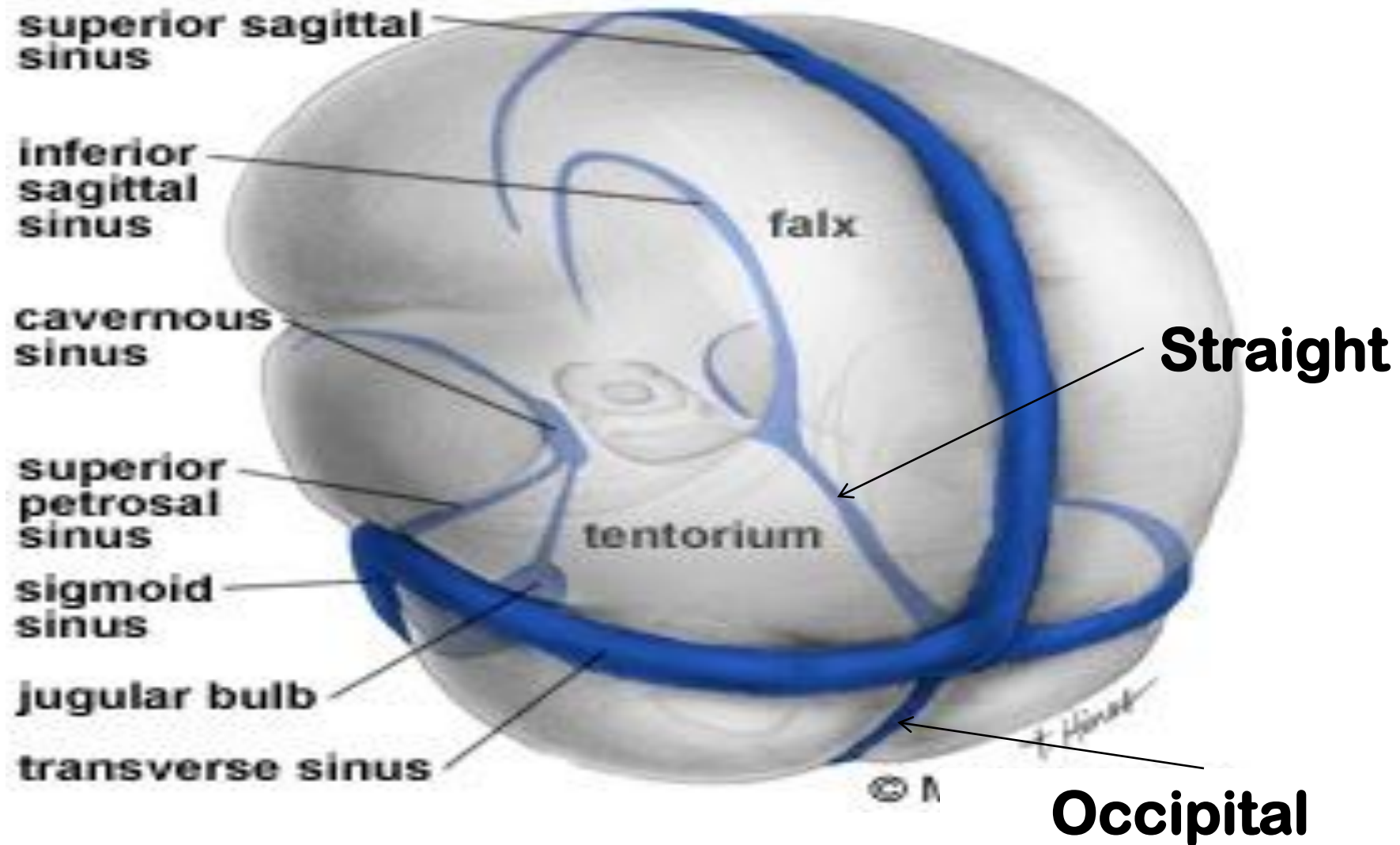
4 Single Sinuses:

- 1-Superior sagittal
- 2- Inferior sagittal
- 3- Straight
- 4- Occipital

2 Multiple Sinuses :

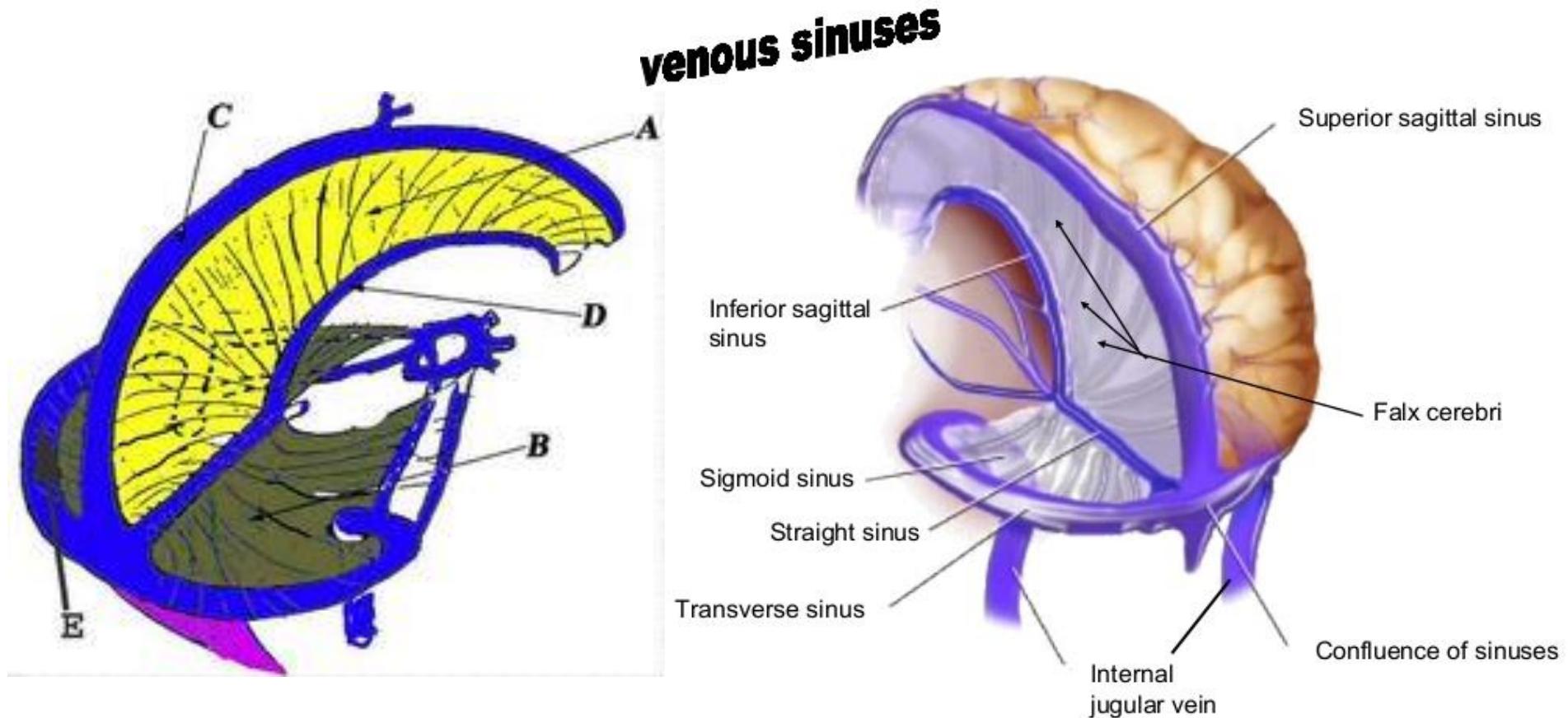
- 1- Intercavernous
- 2- Basillar plexus

DURAL VENOUS SINUSES



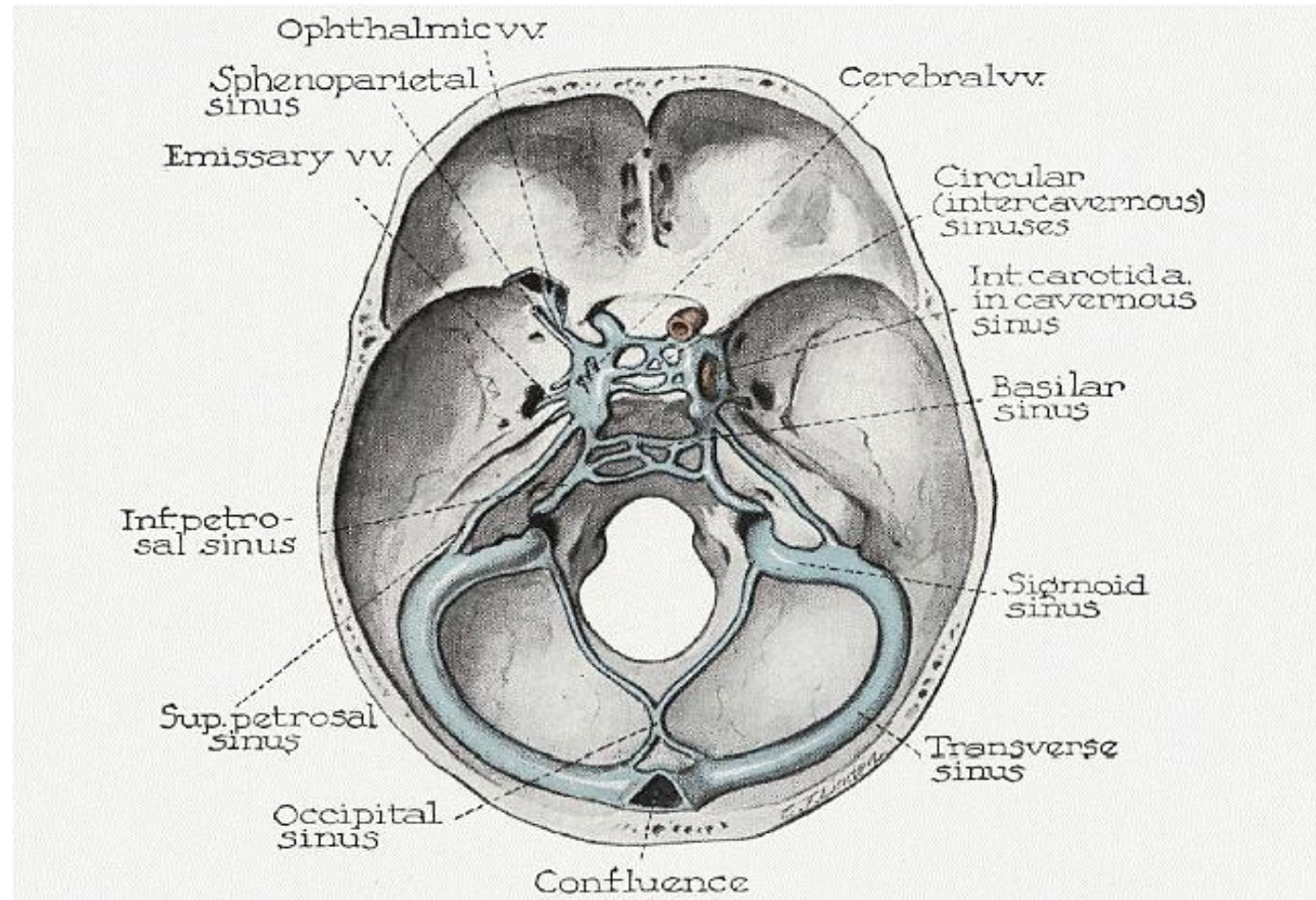
DURAL VENOUS SINUSES

Flow of Blood in Venous Sinuses



DURAL VENOUS SINUSES

Flow of Blood in Venous Sinuses



DURAL VENOUS SINUSES

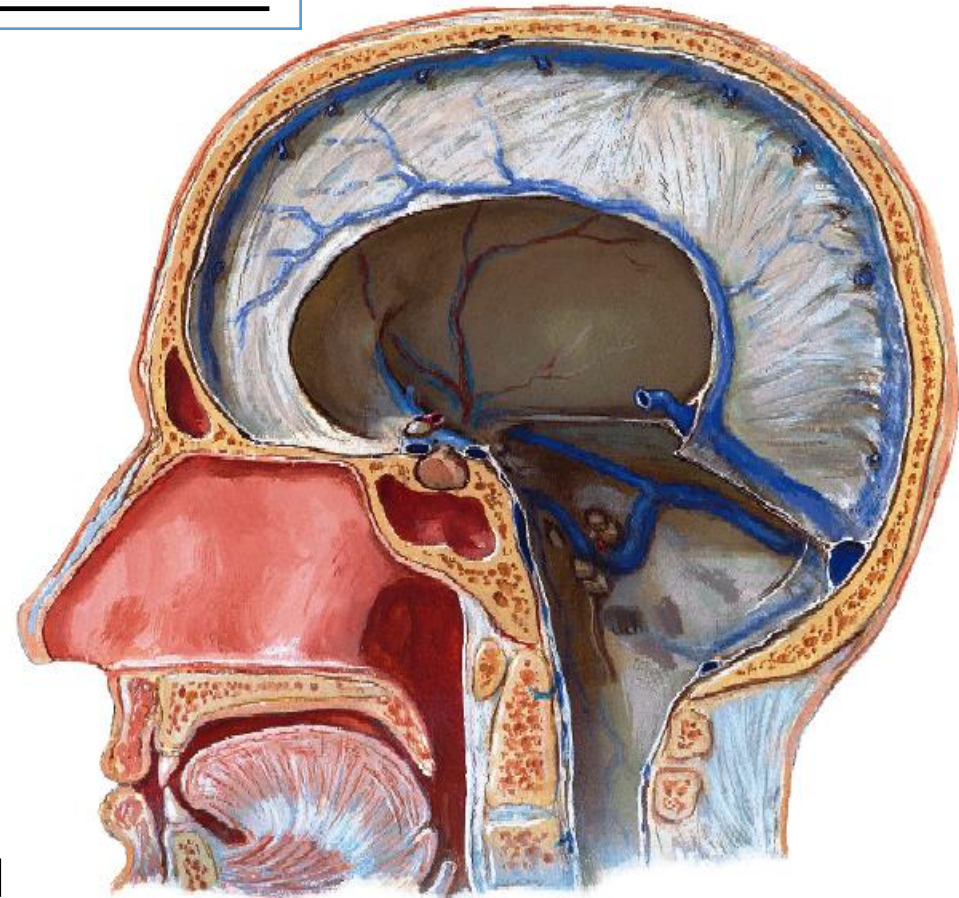
1- Superior sagittal sinus

Site:

- Along the upper attached margin of falx cerebri

Course:

- Starts anteriorly at crista galli
- Runs **upwards & backwards**
- Ends opposite internal occipital protuberance
- by turning usually to the **right side** to continue as the right transverse sinus.
- The dilated posterior end is referred to as the confluence of sinuses.

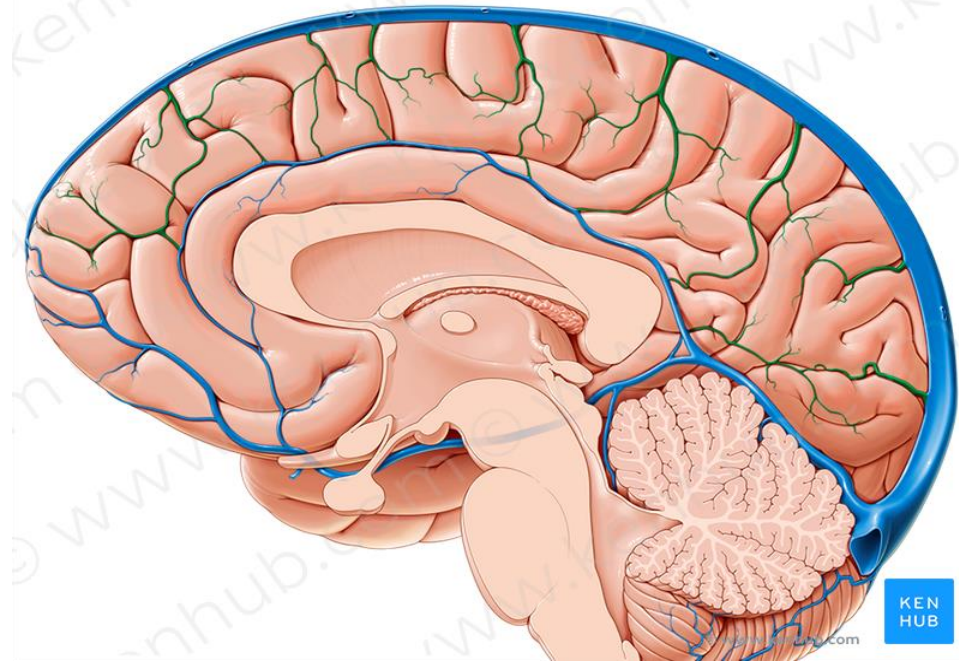
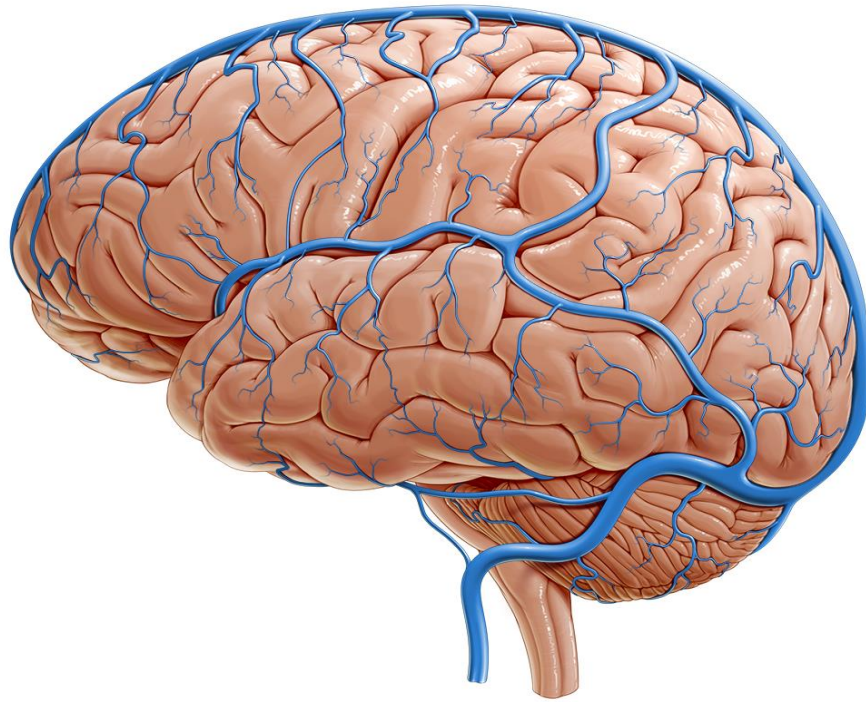


DURAL VENOUS SINUSES

1- Superior sagittal sinus

□ Tributaries: I- Superior cerebral veins.

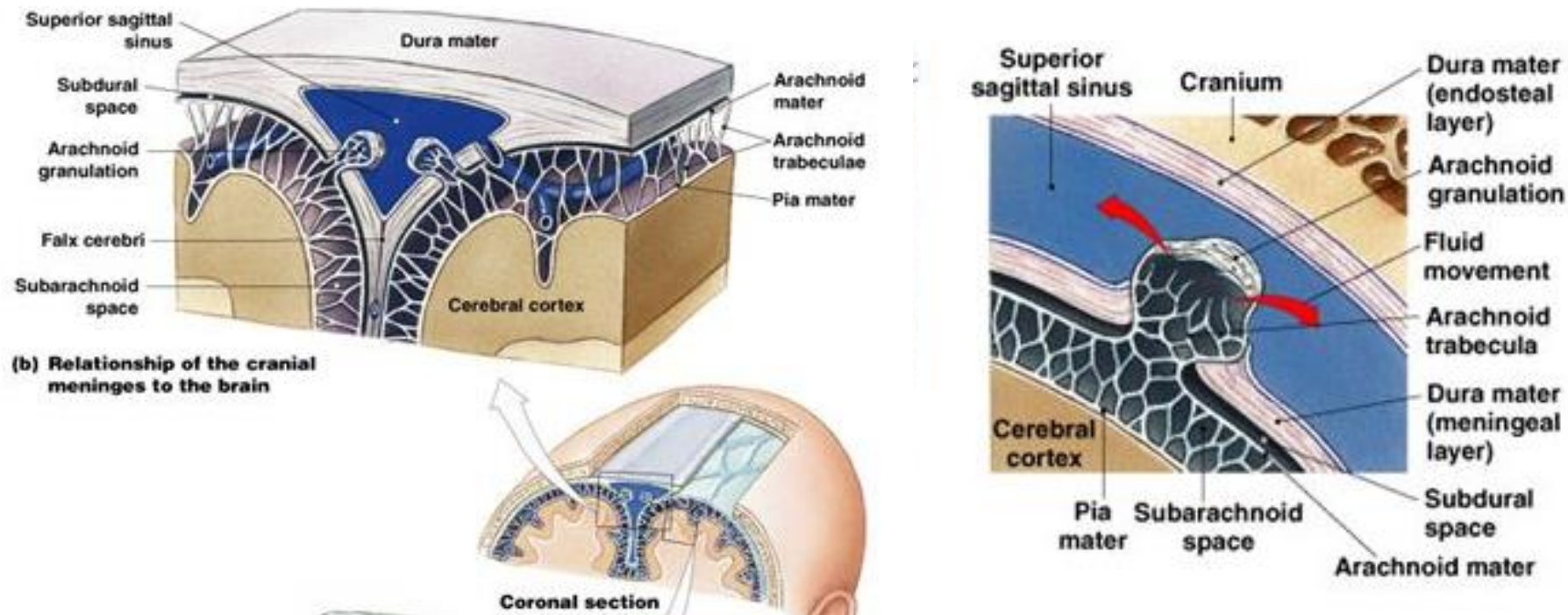
II- communication may exist between transverse sinus, straight sinus, superior sagittal sinus and occipital sinus.



DURAL VENOUS SINUSES

1- Superior sagittal sinus

Arachnoid villi and granulations projecting into the sinus



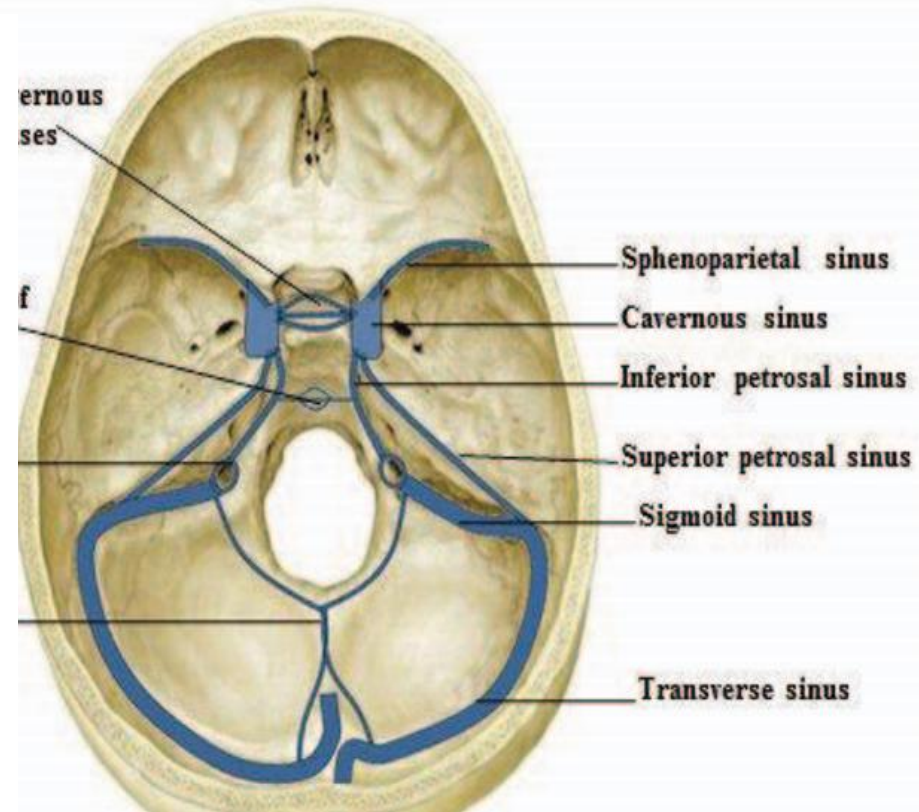
DURAL VENOUS SINUSES

2- Cavernous Sinus:

It is a large venous space lying in middle cranial fossa, on either side of body of sphenoid bone

Extent:

- Its anterior end reaches the medial end of superior orbital fissure
- its posterior end reaches the apex of petrous temporal b.



DURAL VENOUS SINUSES

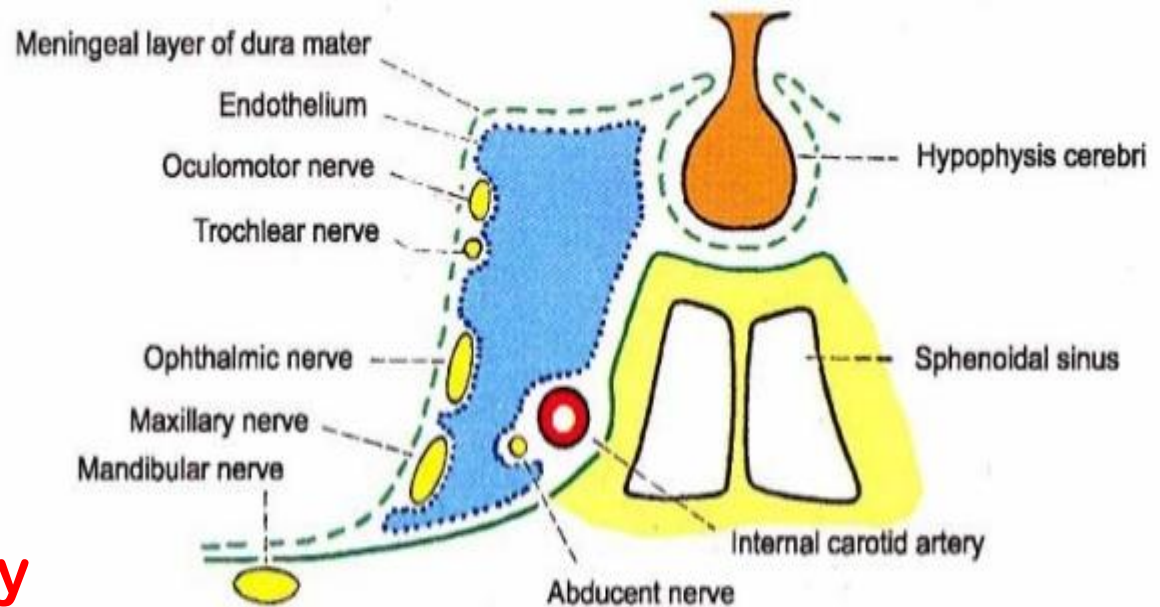
2- Cavernous Sinus:

□ Structures in the lateral wall of the sinus from above downwards;

- i. Oculomotor nerve
- ii. Trochlear nerve.
- iii. Ophthalmic nerve
- iv. Maxillary nerve

□ Structures passing through the sinus:

- i- **Internal carotid artery**
- ii- abducent nerve
(inferolateral to the artery)



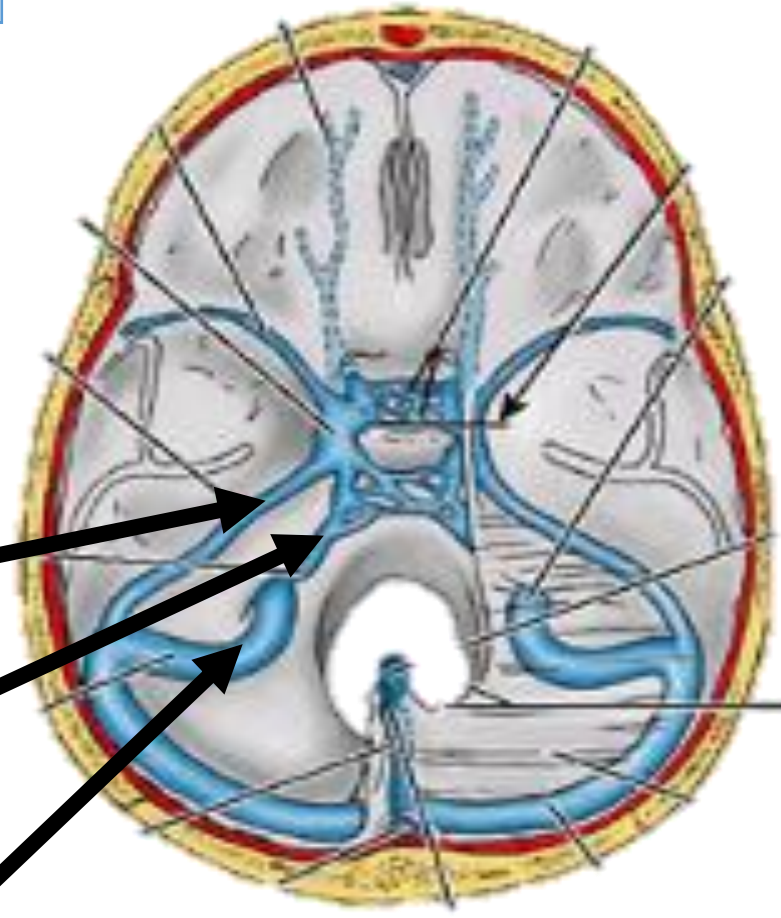
DURAL VENOUS SINUSES

2- Cavernous Sinus:

- ❑ Tributaries:
 - a. From the orbit:
 - b. From the brain
 - c. From the meninges

- ❑ Drainage:
 - a. Superior petrosal sinus →
Transverse sinus.
 - b. Inferior petrosal sinus →
IJV.

**Then the superior petrosal
drain into the sigmoid sinus**

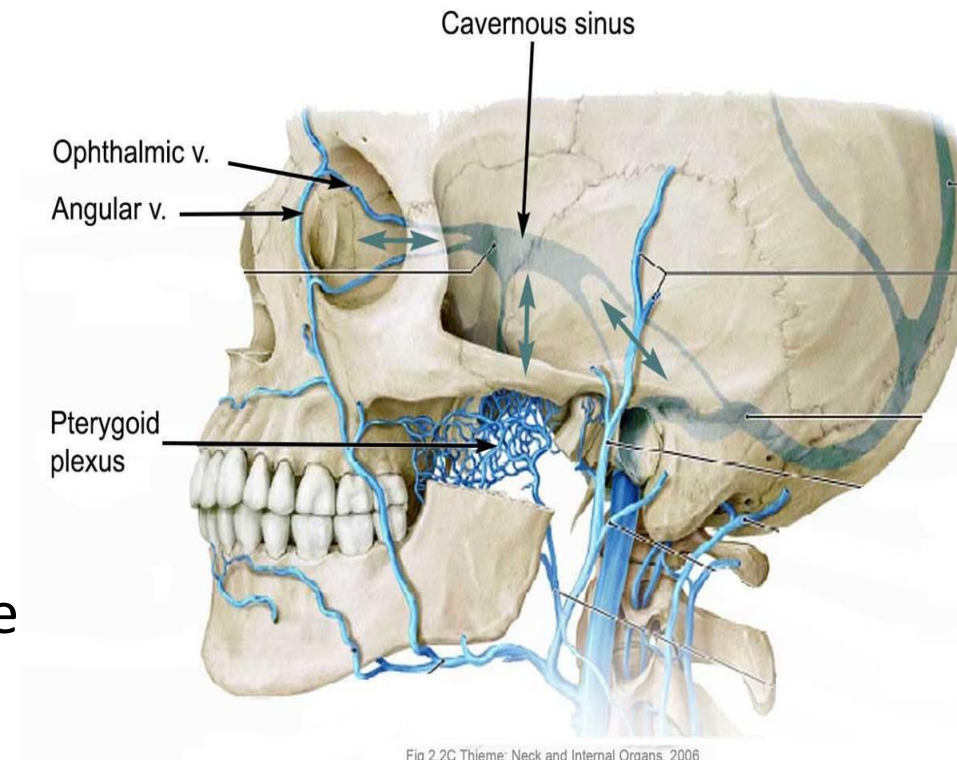


DURAL VENOUS SINUSES

2- Cavernous Sinus:

☐ Communications with:

- 1- **Pterygoid venous plexus**
via emissary vs.
- 2- **Facial v.**
via superior ophthalmic v.
- 3- **Its fellow on the opposite side**
via 3 intercavernous sinuse

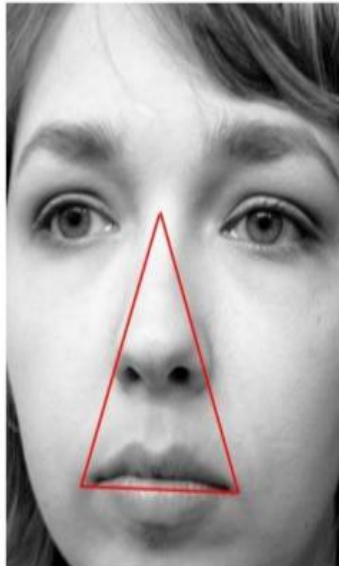
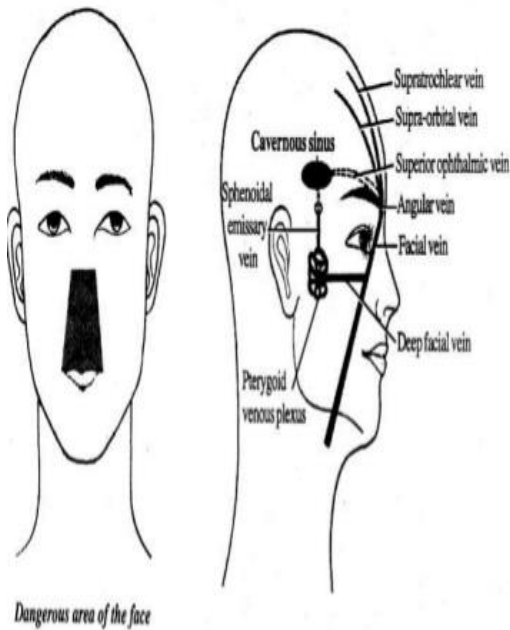


DURAL VENOUS SINUSES

Thrombosis of Cavernous Sinus

Is caused by spread of infection from the dangerous area of face.

This affects cranial nerves III, IV & VI.



Clinical

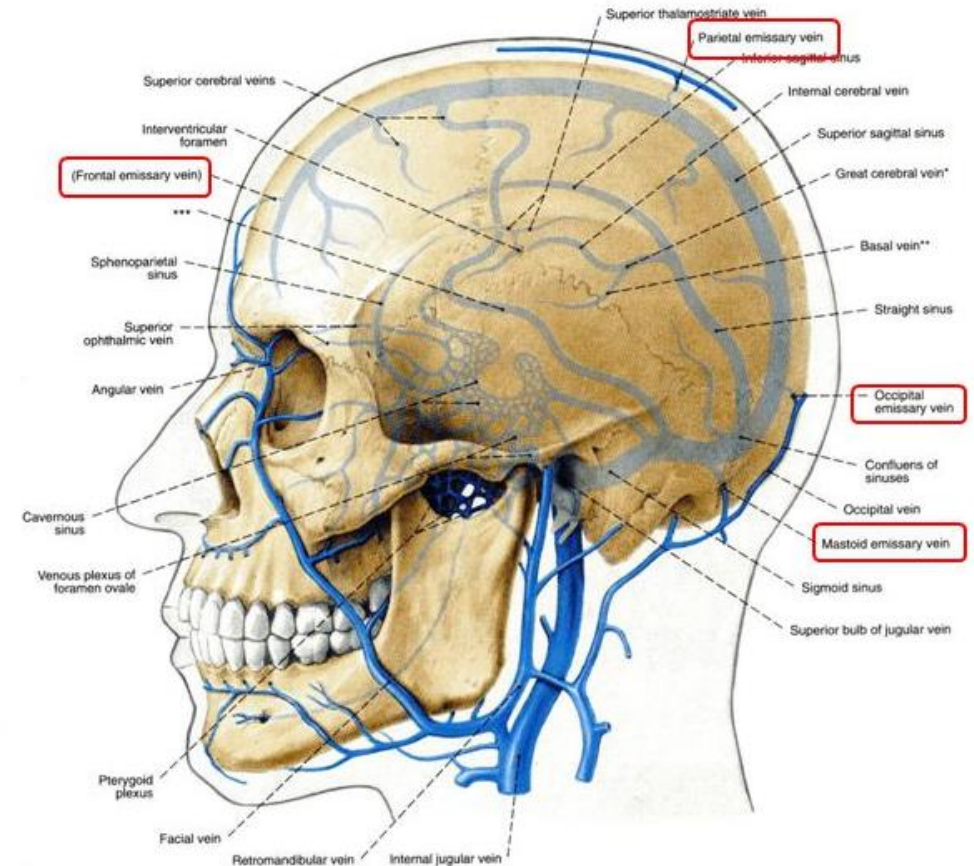
- High **fever**
- **Periorbital edema** and **chemosis** (conjunctival edema)
- **Cranial nerve palsies** (CN VI most common)
- Decreased **visual acuity**

EMISSARY VEINS:

They are valveless veins connecting dural sinuses & extracranial veins. –

clinical importance:

1. Equalizing venous pressure between outside & inside the skull
2. Spreading infection from outside to inside the skull

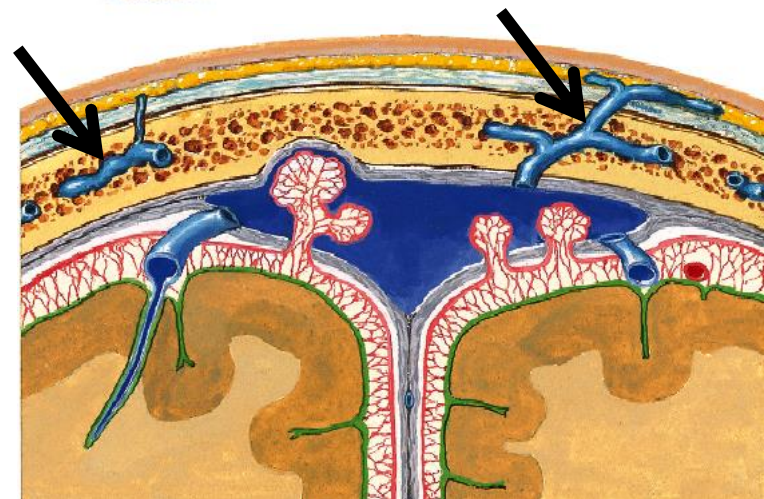
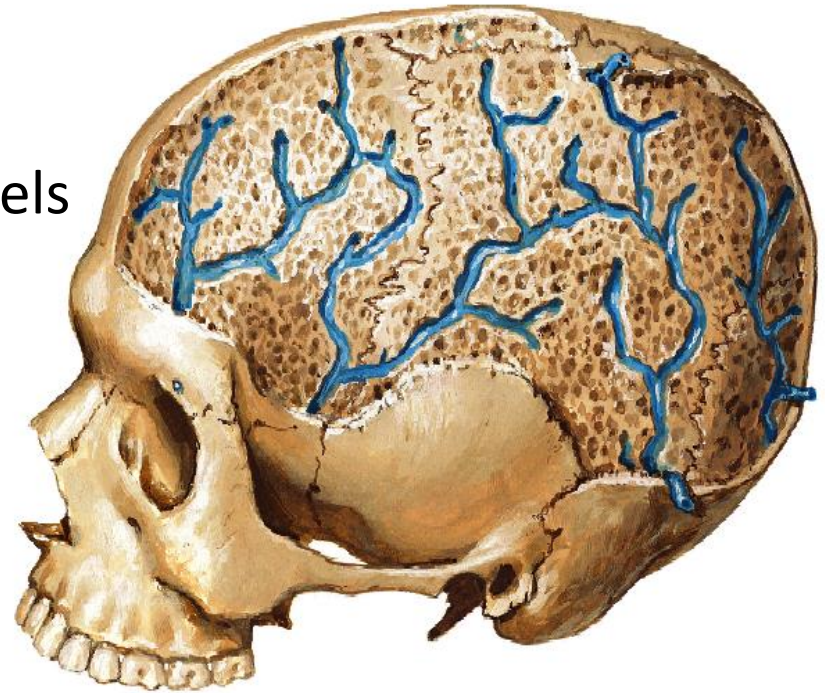


DIPLOIC VEINS:

- They are thin walled & valveless channels
- present inside the diploe of skull
- absent at birth but they are developed after 2 years postnatally.
- They communicate with
 - I. scalp
 - II. meningeal veins
 - III. dural sinuses.

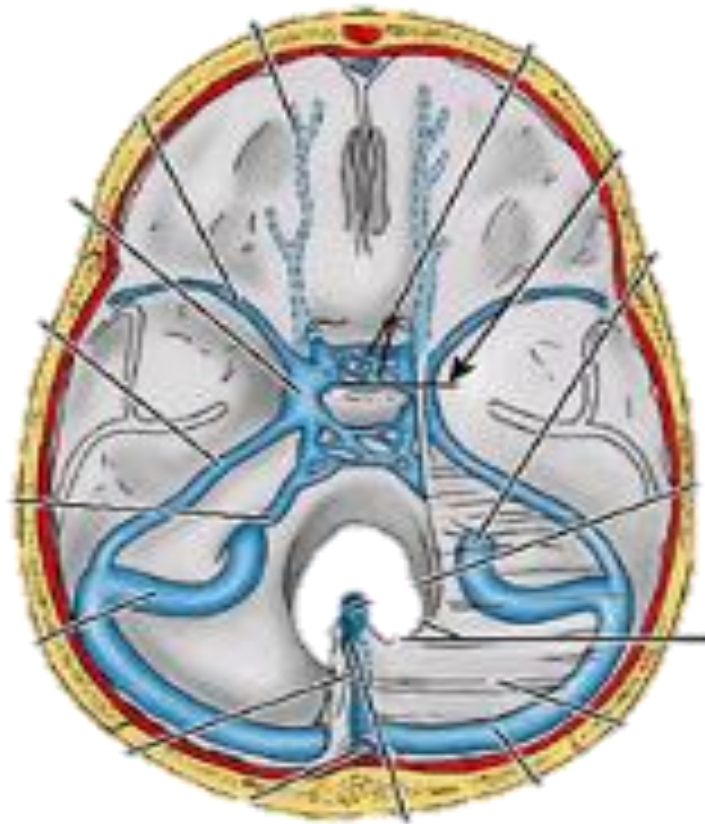
clinical importance:

spreading an infection of skull bones to the dural sinuses.



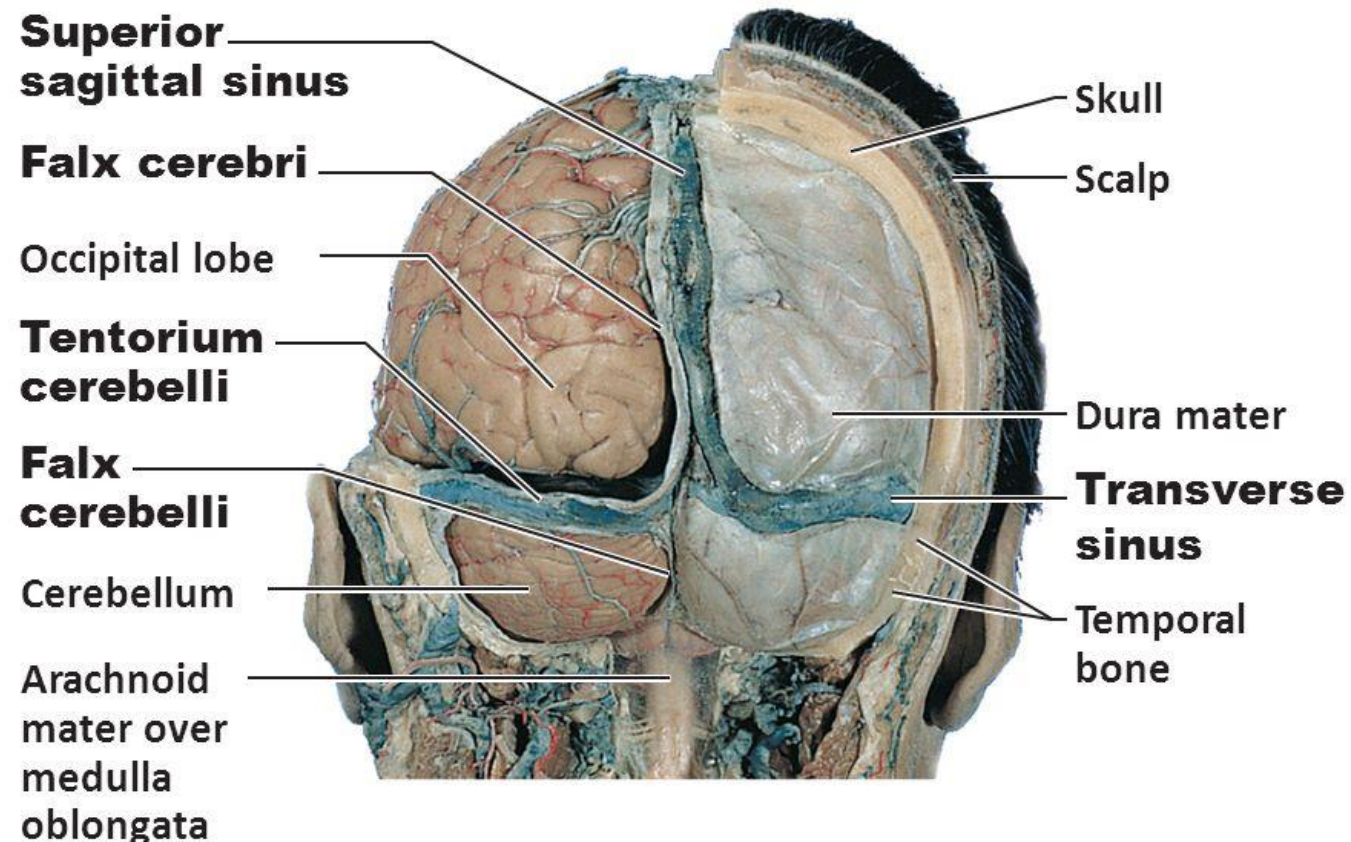
Lecture Quiz

1. Identify Venous Sinuses present in this figure?
2. Describe the flow of Blood in dural sinuses?



Lecture Quiz

1. Identify Venous Sinuses present in this figure?
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Lecture Quiz

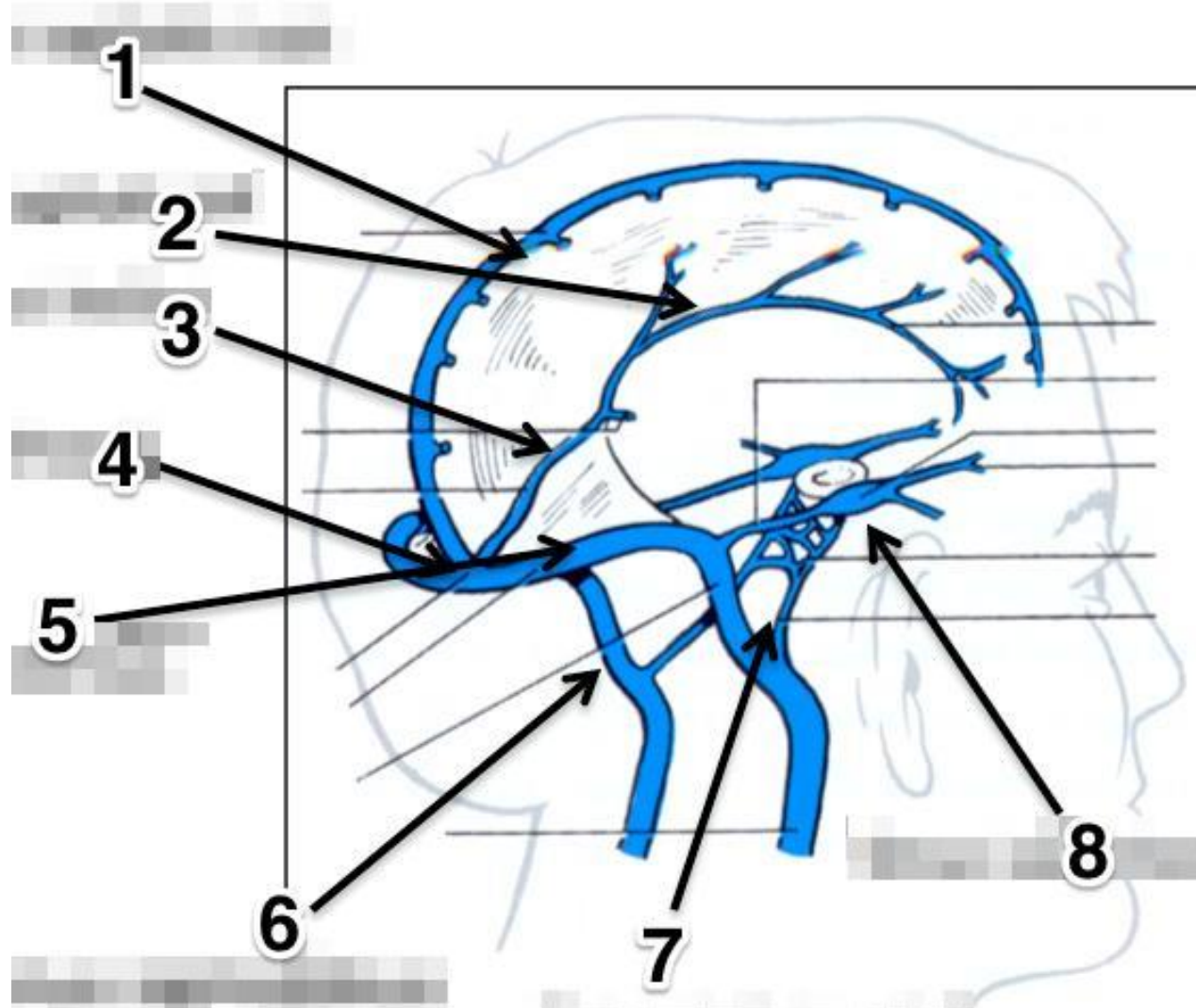
ST SINUS

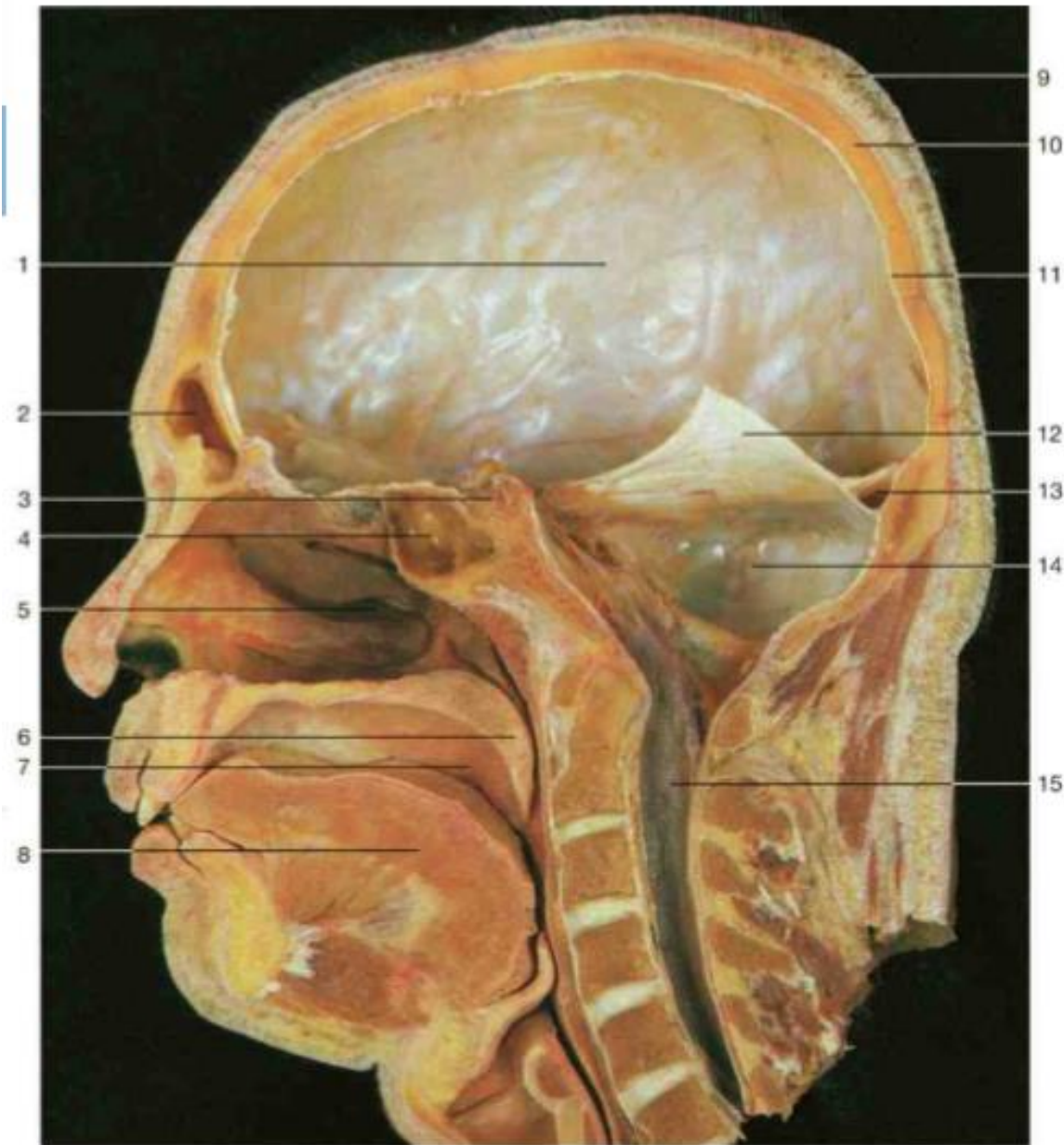
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Sigmoid sinus

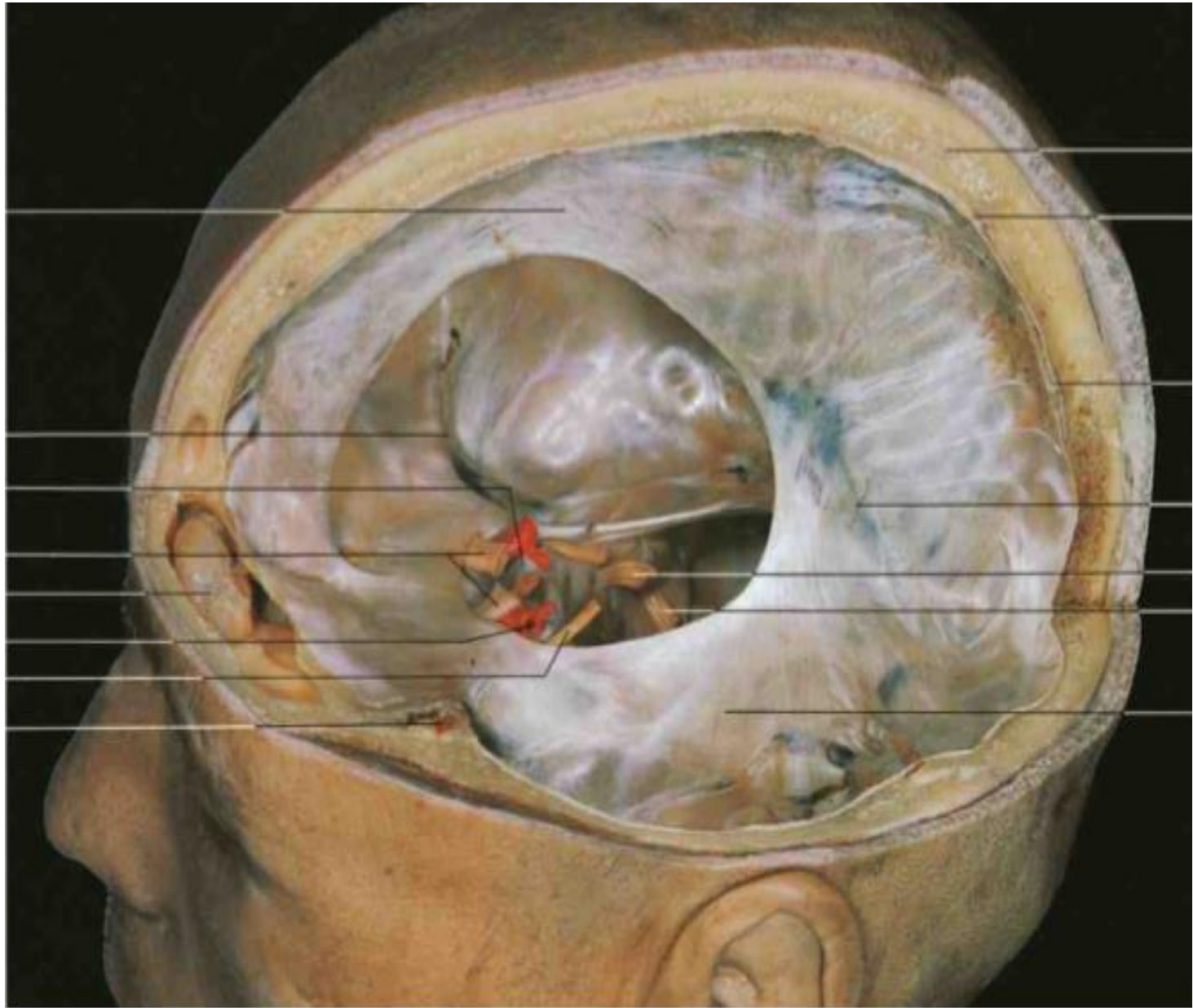
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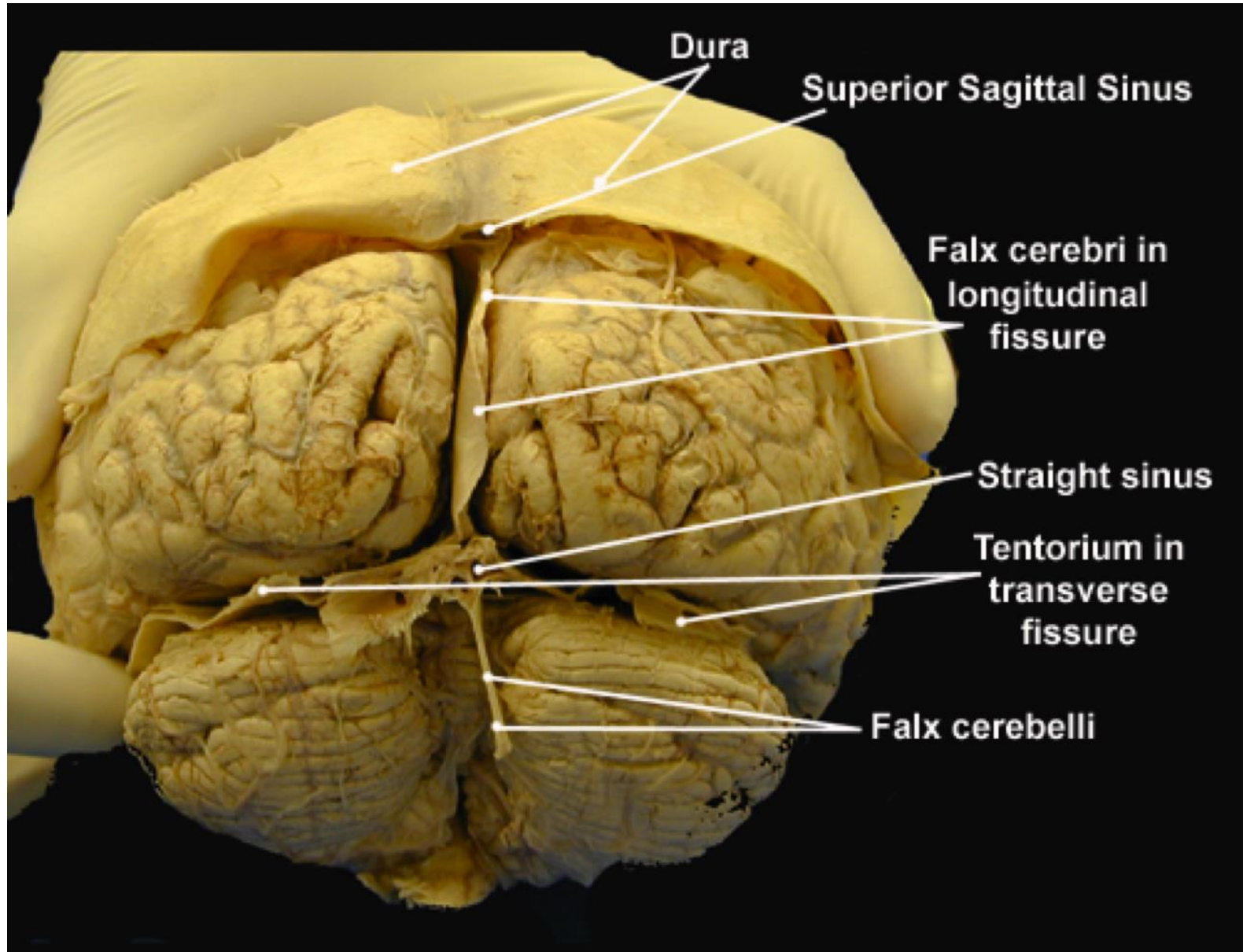




- 1 Cranial cavity with dura mater (right cerebral hemisphere has been removed)
- 2 Frontal sinus
- 3 Hypophysial fossa with pituitary gland
- 4 Sphenoidal sinus
- 5 Nasal cavity
- 6 Soft palate (uvula)
- 7 Oral cavity
- 8 Tongue
- 9 Skin
- 10 Calvaria
- 11 Dura mater
- 12 Tentorium cerebelli
- 13 Confluence of sinuses
- 14 Infratentorial space (cerebellum and part of the brain stem have been removed)
- 15 Vertebral canal
- 16 Frontal branch of middle meningeal artery and veins
- 17 Middle meningeal artery
- 18 Diploe
- 19 Parietal branch of middle meningeal artery and vein
- 20 Occipital pole of left hemisphere covered with dura mater

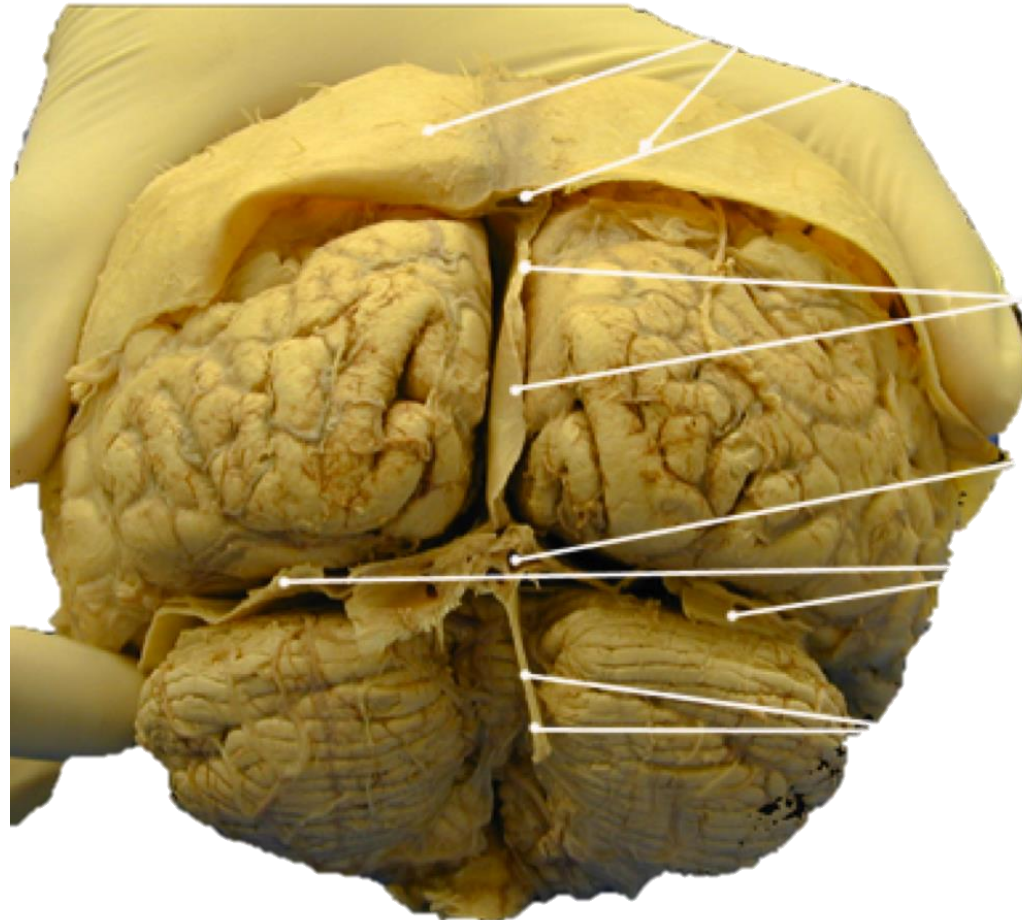


Dura mater and venous sinuses of the dura mater. The brain has been removed (oblique lateral aspect).



Lecture Quiz

- ✓ Identify the dural fold present in this section?
- ✓ Describe its relation?



Lecture Quiz

Which of the following is covering the superior surface of cerebellum?

- 1) Falx Cerebri**
- 2) Tentorium Cerebelli**
- 3) Falx Cerebelli**
- 4) Diaphragma Sellae**