

**Presentation  
about**

**Meninges  
Of  
The  
Brain**



**By Dr Nudrat Nawaid**

# Objectives

## Part 1

- \* Meninges of brain there blood supply and nerve supply

## Part 2

- \* Intracranial hemorrhage

## Part 3

- \* Dural venous sinuses

- Part 1
- Meninges

Three meninges

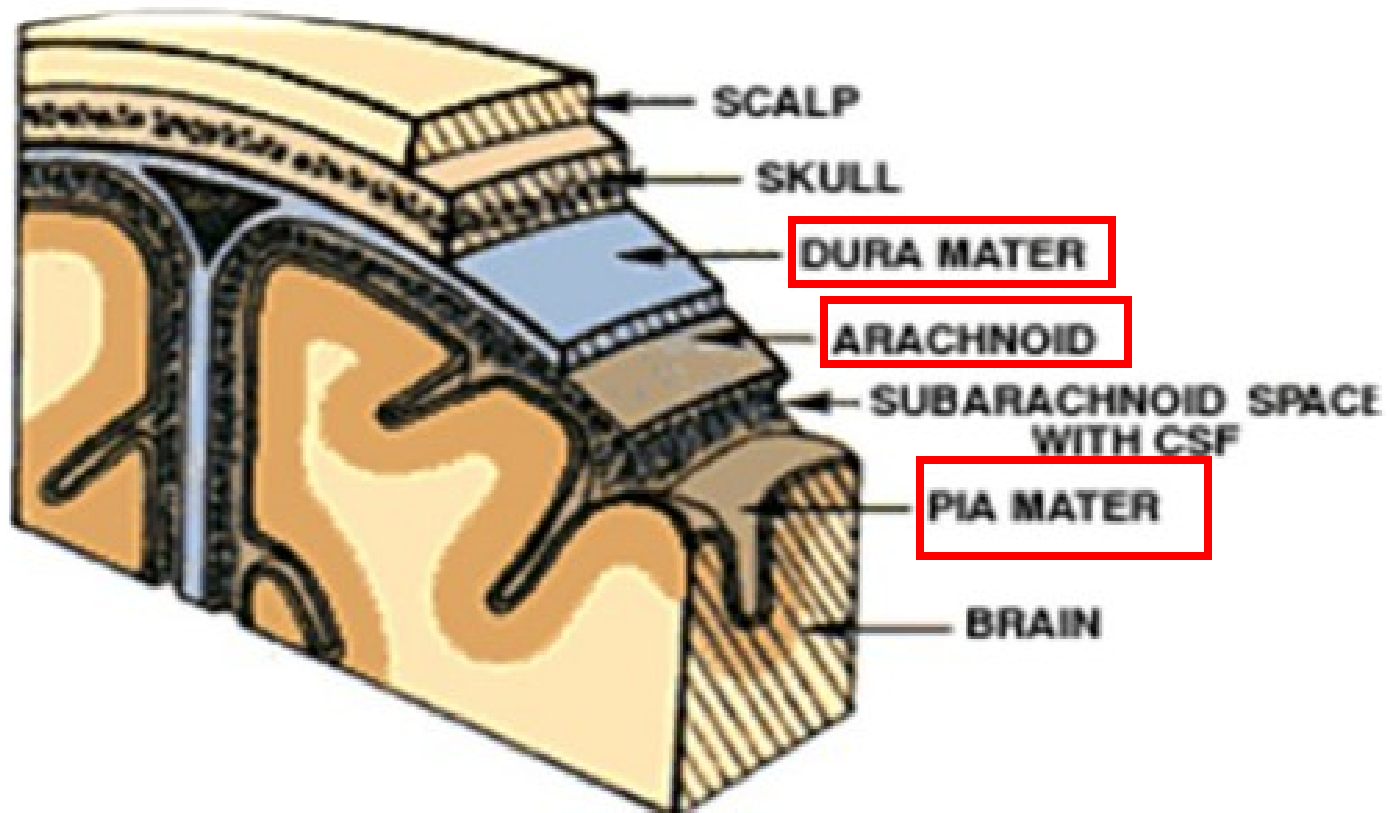
Two spaces

Four dural septa

Nerve supply and blood supply of duramater

# Part 1

## Meninges

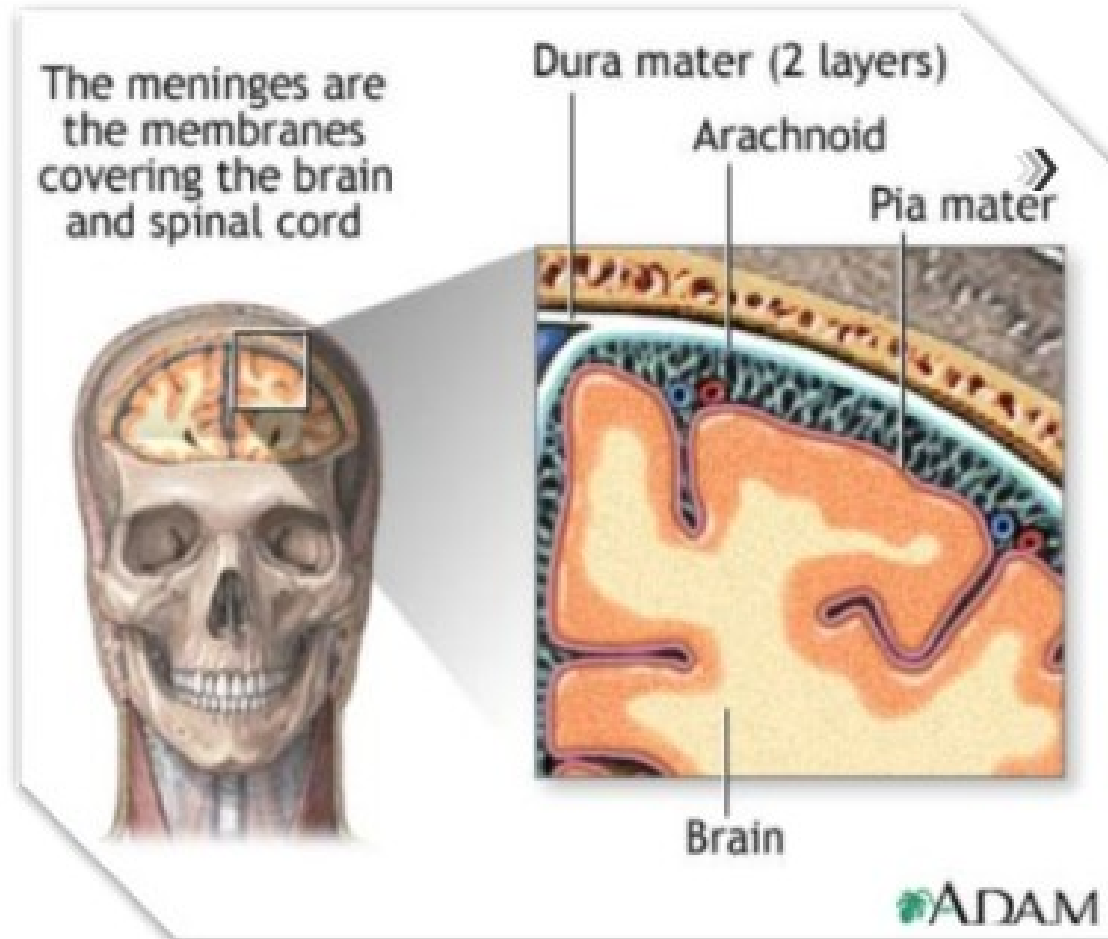


# The Meninges

- The brain and spinal cord are enclosed by three membranous coverings or **meninges**

These are

- ❖ The **Dura mater**
- ❖ The **Arachnoid mater**
- ❖ The **Pia mater**

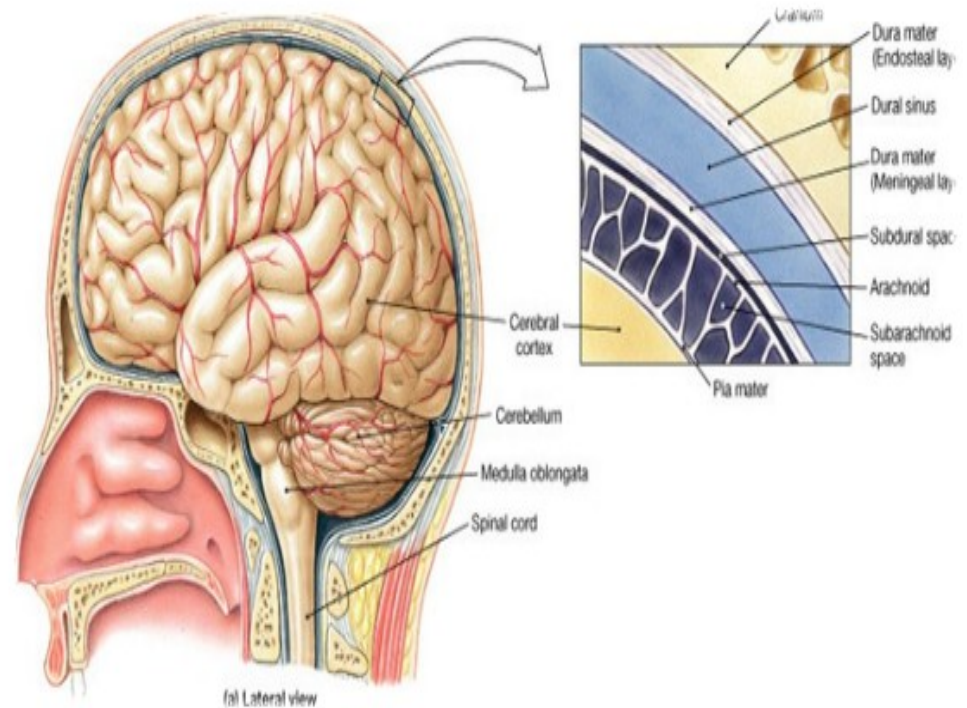


# Spaces Between the meninges

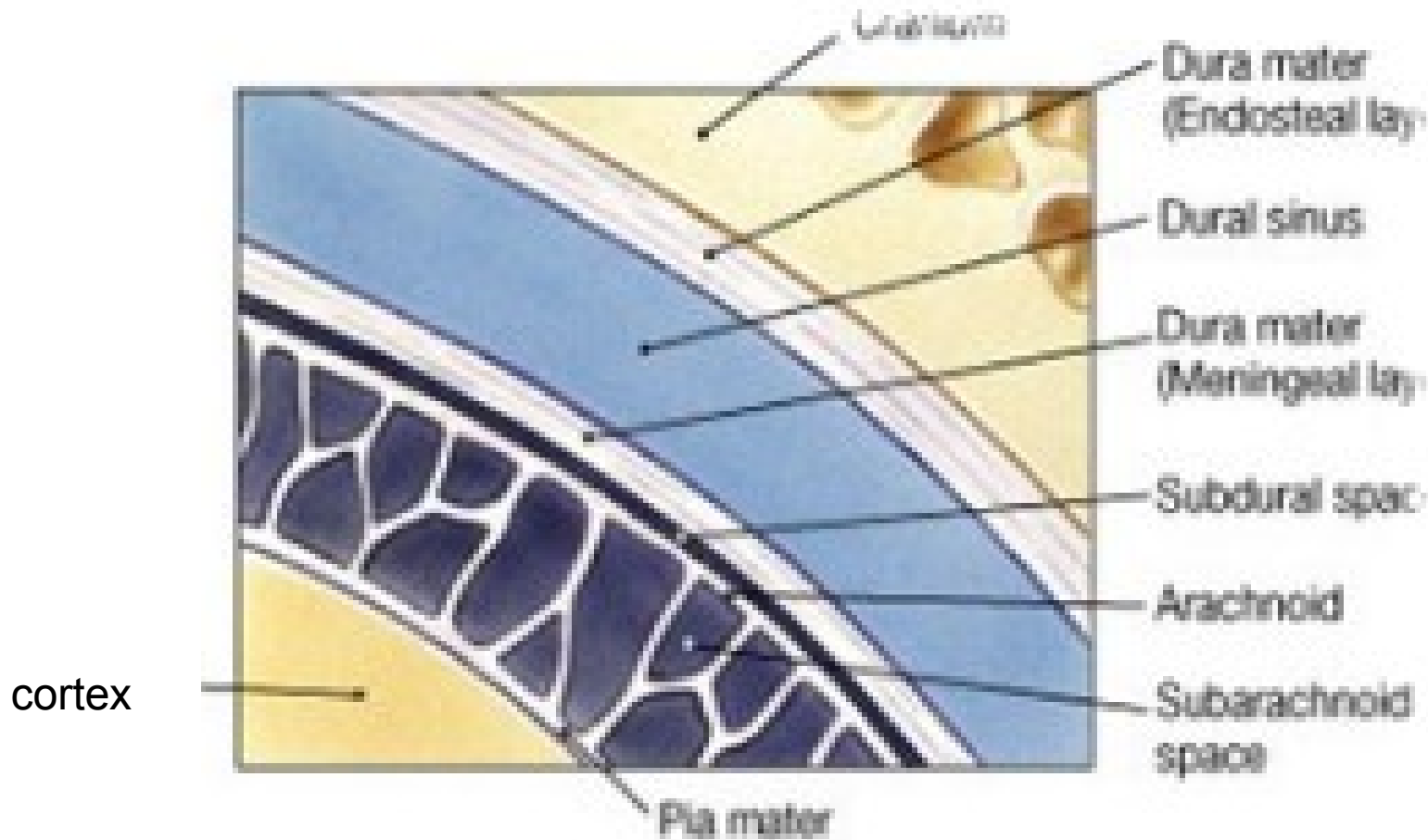
1) Sub dural space

2) Sub arachnoid space

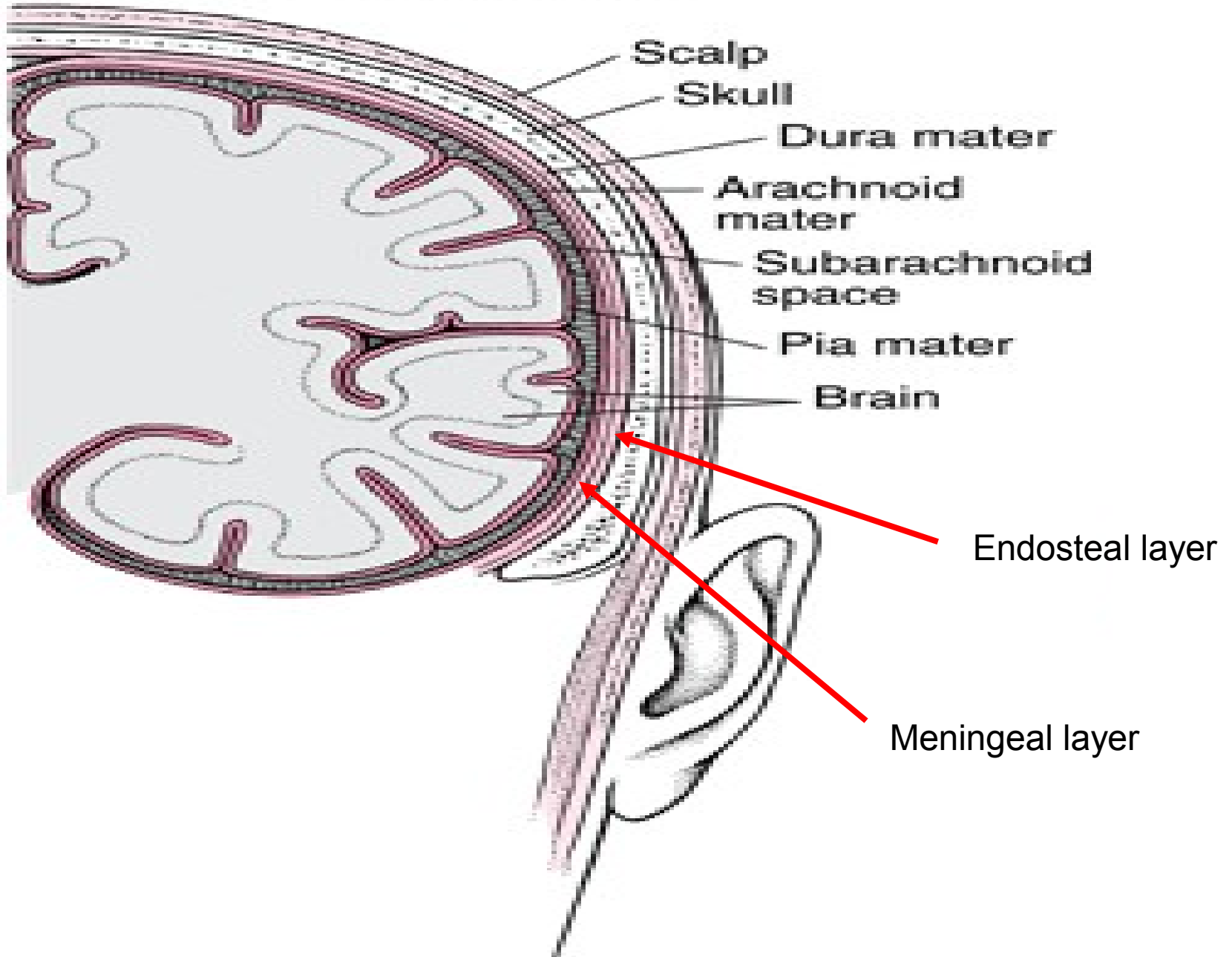
## The Meninges



# Subdural and subarachnoid space contd.....



# Cross Section of the Brain

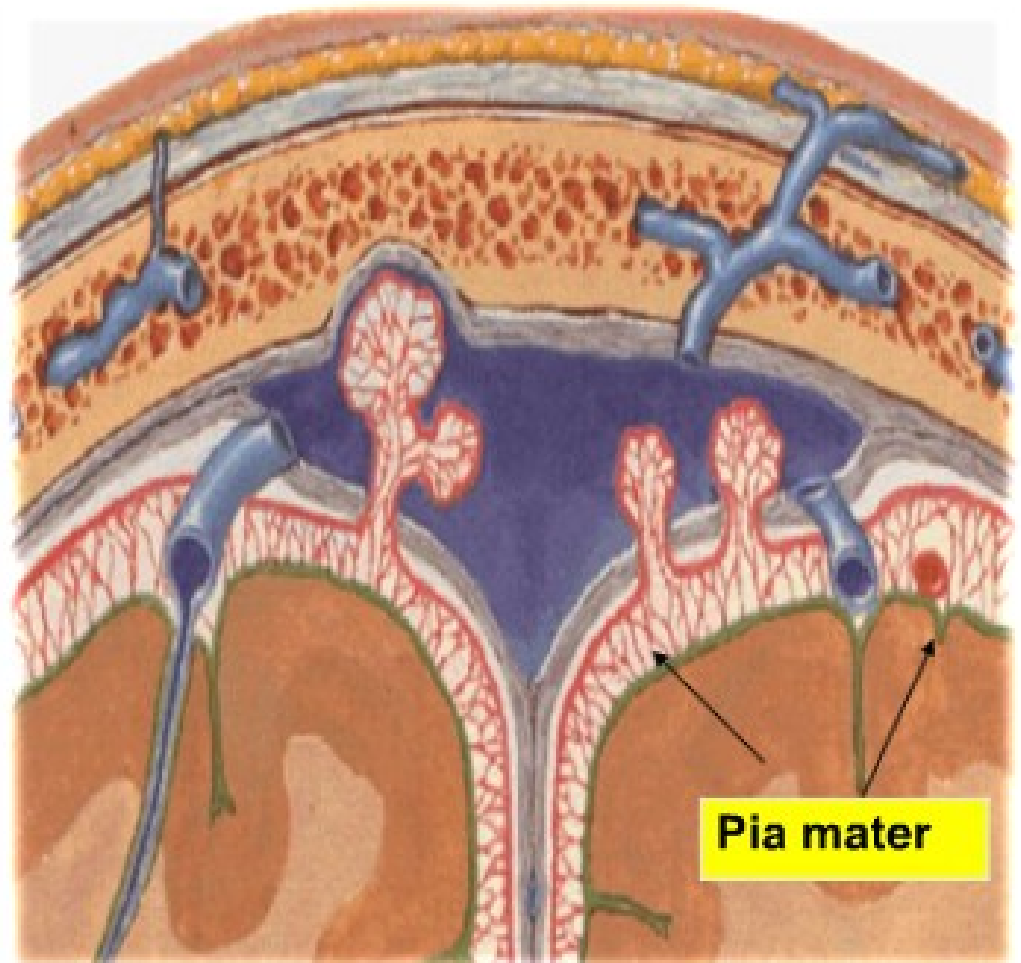




# Pia Mater

- Is a delicate highly vascular membrane that closely invests the brain and the spinal cord

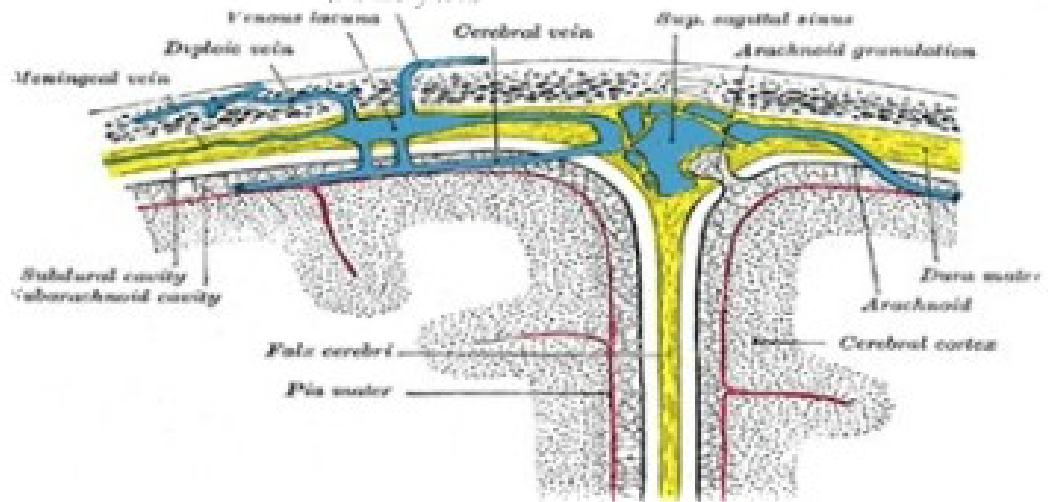
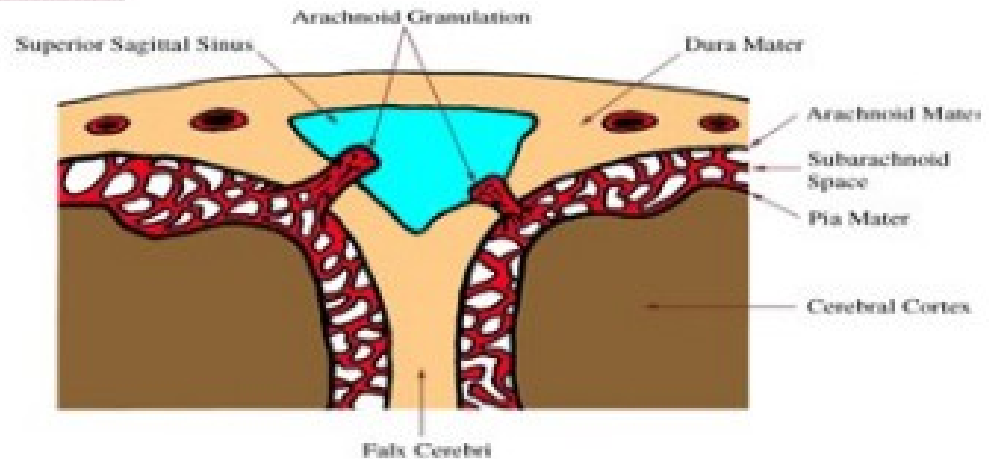
Innermost layer



# Arachnoid mater

- It is named so because it has a *spider web like* appearance
- it is a thin transparent nonvascular membrane located between the dura mater and the pia mater.
- it is separated from the dura by *subdural space*
- Separated from pia mater by *the subarachnoid space* (filled with CSF)

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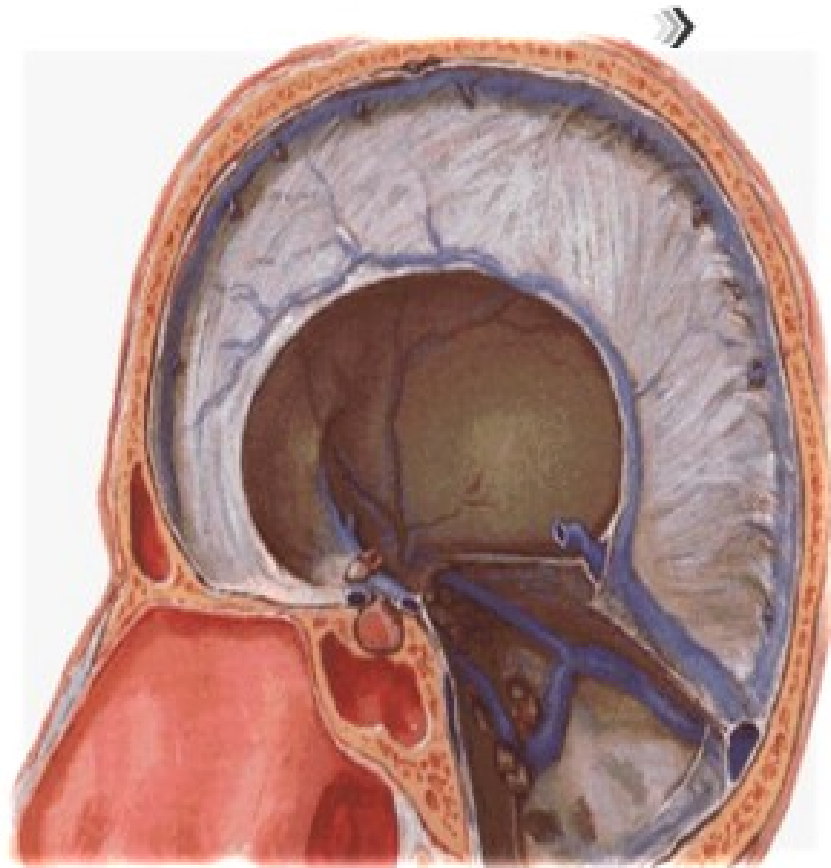


# DURA MATER

- It's a thick membrane forming the outermost covering of the brain .

- It consists of 2 layers

- ❖ Outer ( endosteal ) layer
- ❖ Inner ( meningeal ) layer



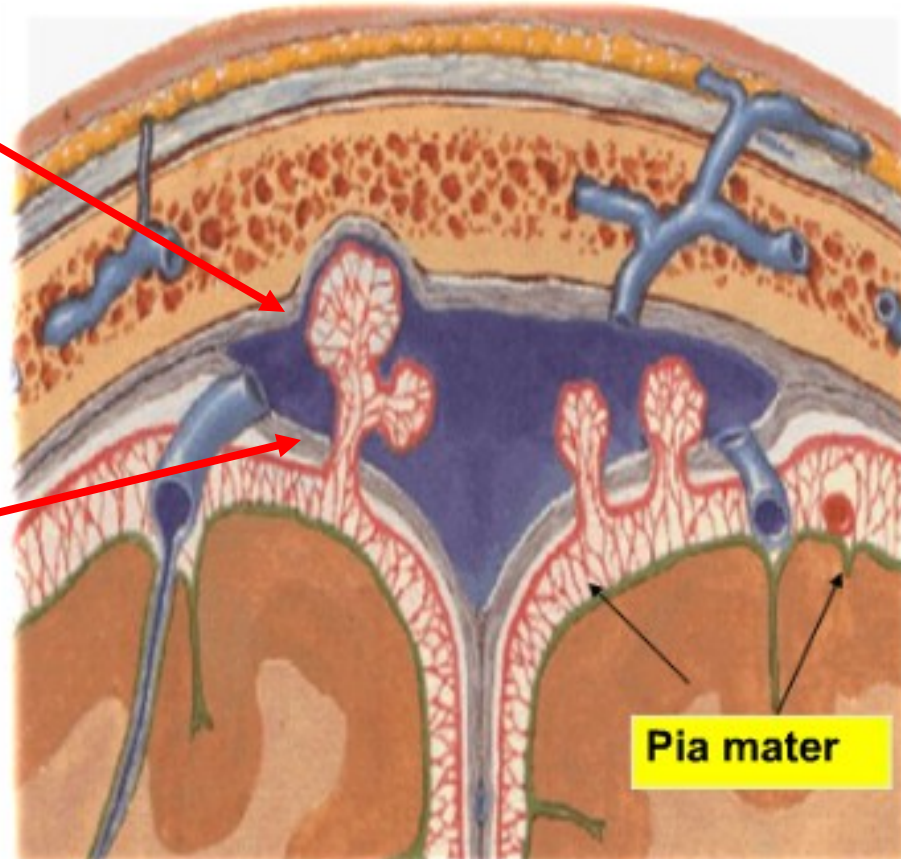
# DURA MATER

## Endosteal layer

- Lines the inner surface of the skull bones
- Not continuous with dura mater of spinal cord

## Meningeal layer

- Dura mater proper
- Covering the brain
- Folded inwards as 4 septa between part of the brain



# Dural septa

Meningeal layer sends inward four septa which divide the cranial cavity

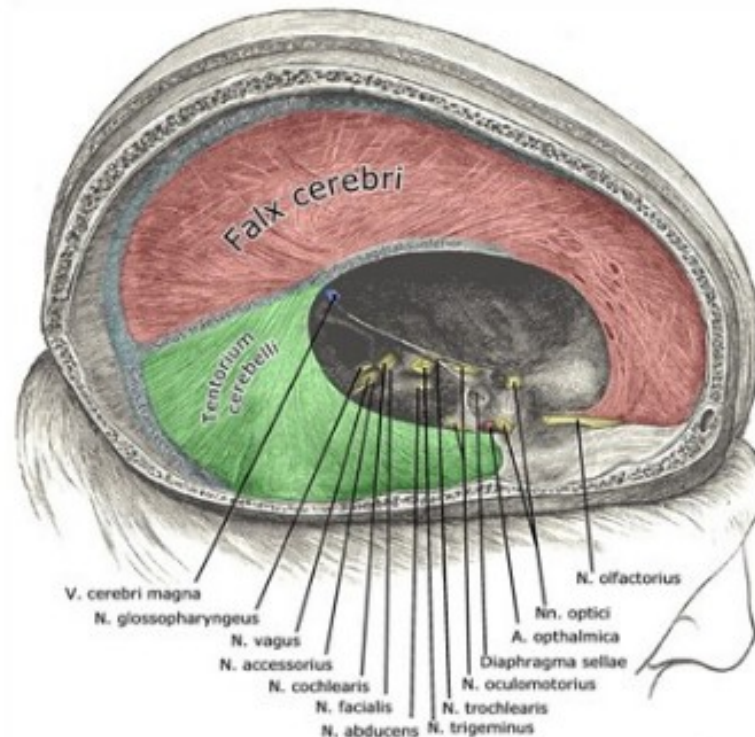
## The dura mater

Falx cerebri

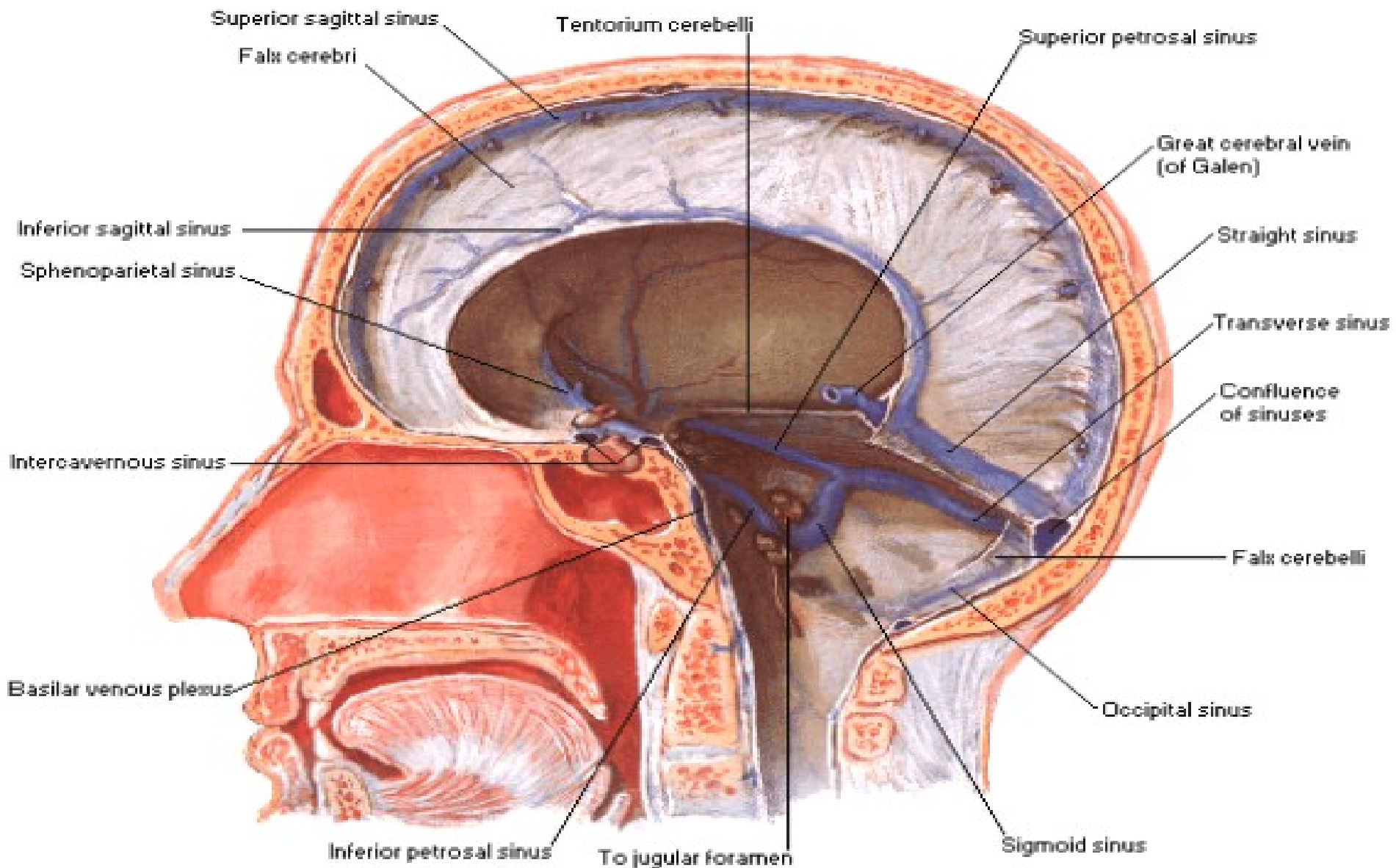
Falx cerebelli

Tentorium cerebelli

Diaphragma sella



# Sagittal Section

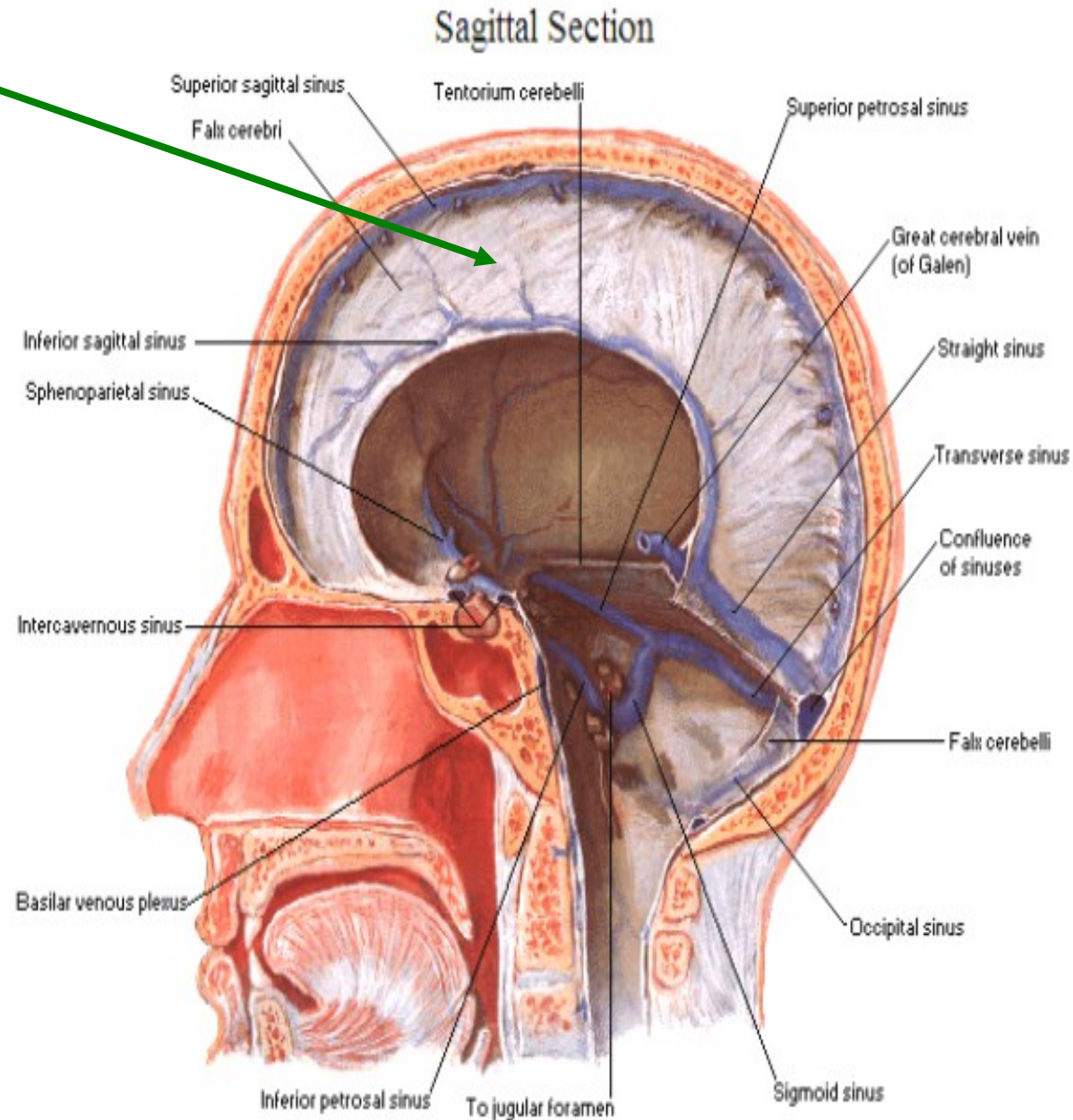


# Falx cerebri

-It is a *sickle*-shaped fold of dura mater that lies in the *midline between the two cerebral hemispheres*.

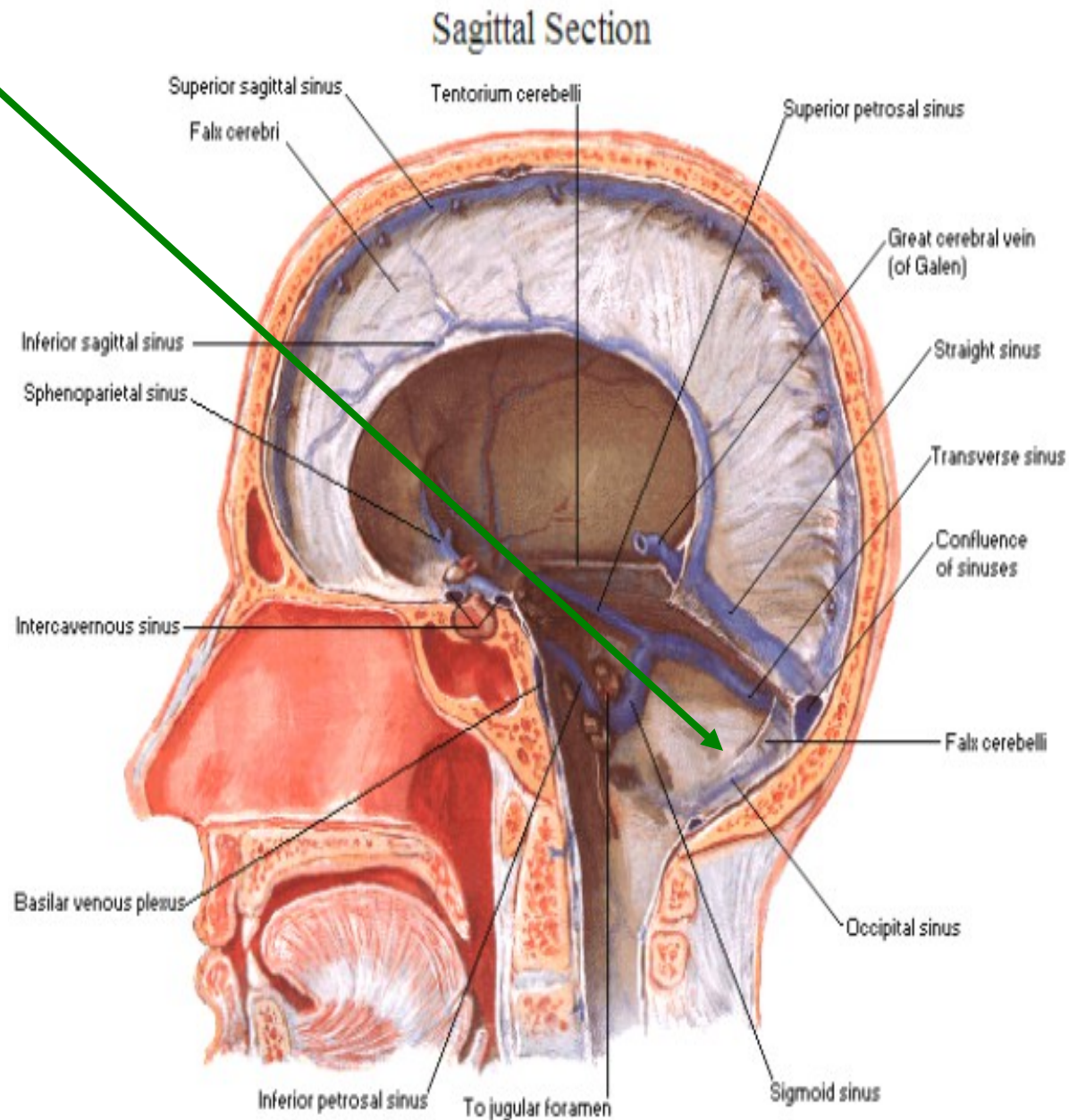
-Its narrow end in front is attached to the *internal frontal crest and the crista galli*.

-Its broad posterior part blends in the midline with the upper surface of the tentorium cerebelli.



# Falx cerebelli

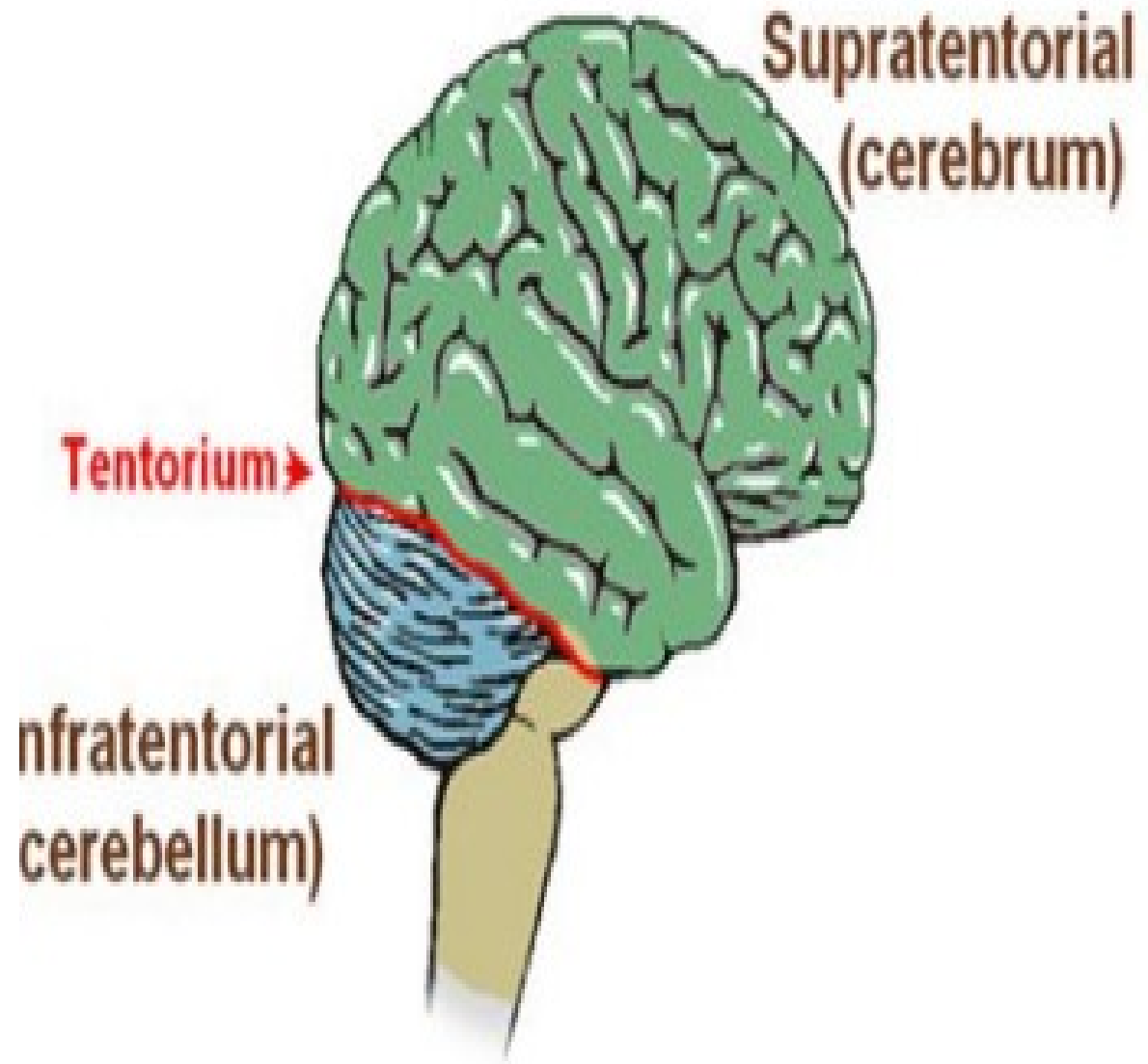
- The falx cerebelli is a small, *sickle*-shaped fold of dura mater that is attached to *the internal occipital crest* and projects forward between the two cerebellar hemispheres.
- Its posterior fixed margin contains *the occipital sinus*





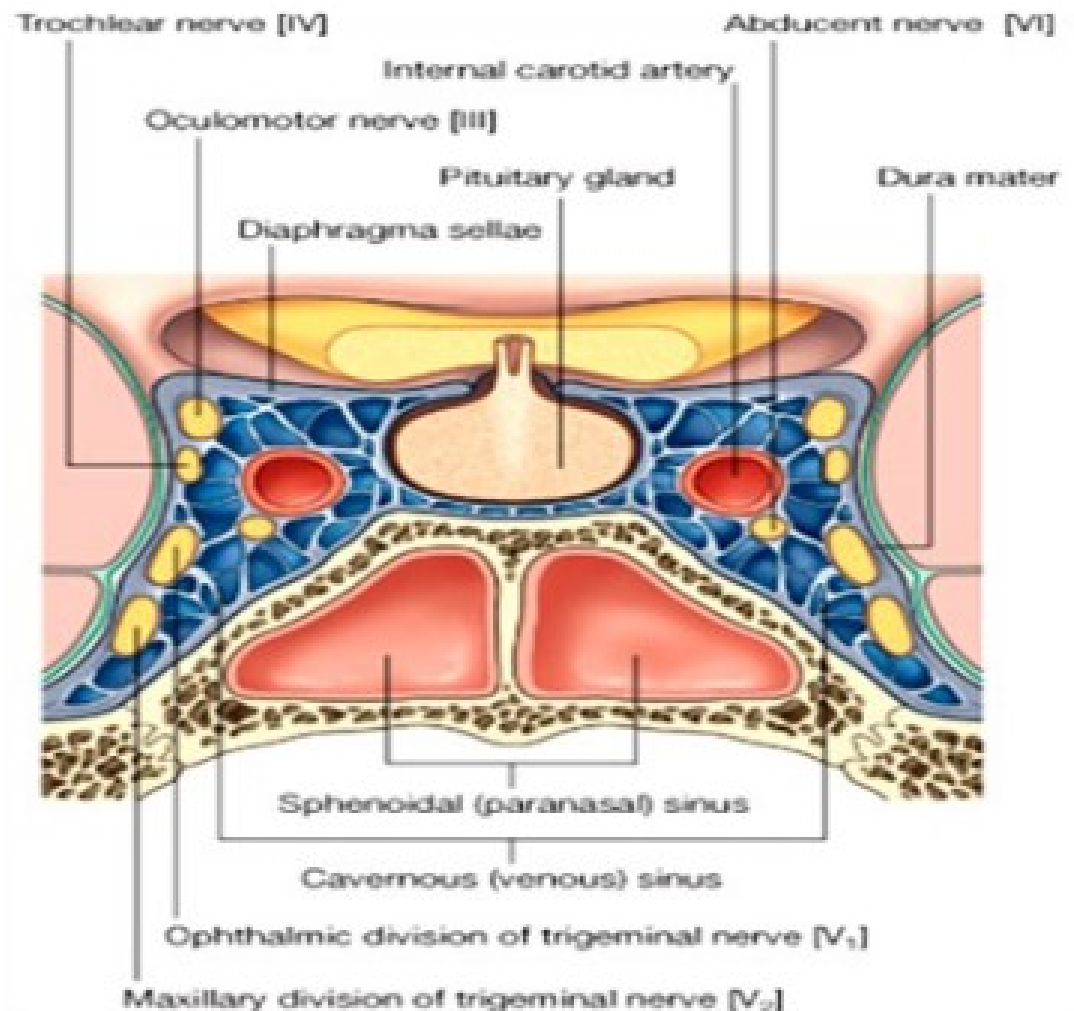
# The Tentorium Cerebelli

- The tentorium cerebelli is a *crescent*-shaped fold of dura mater that roofs over *the posterior cranial fossa*.
- It covers the upper surface of *the cerebellum* and supports the occipital lobes of the cerebral hemispheres.



## The □ Diaphragma □ Sellae

- The diaphragma sellae is a small *circular* fold of dura mater that forms the roof for *the sella turcica*.
- A small opening in its center allows passage of the stalk of *the pituitary gland*



# Nerve supply and blood supply of duramater

## Nerve supply

- Branches of the trigeminal, vagus, and first three cervical nerves

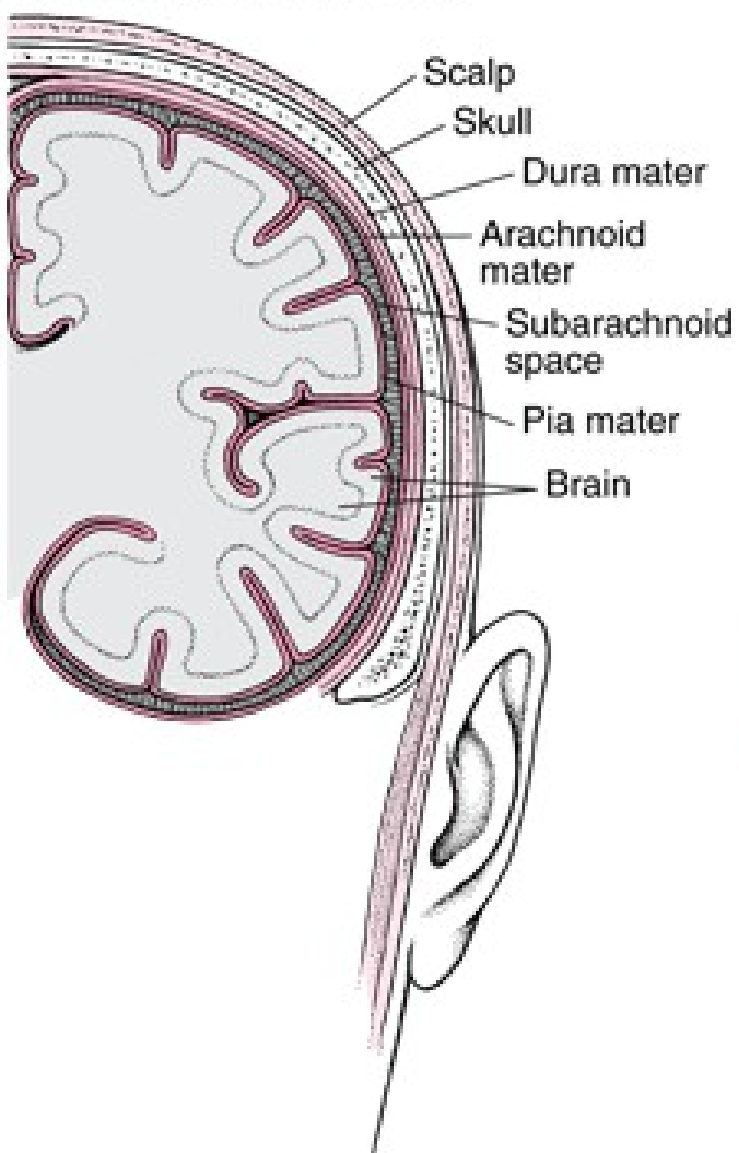
## Blood supply

- The dura mater's arteries supply from the internal carotid, maxillary, ascending pharyngeal, occipital, and vertebral arteries.
- the most important is the **middle meningeal artery**, which is commonly damaged in head injuries

- Part 2
- Intracranial hemorrhage

# Intra cranial hemorrhage

## Cross Section of the Brain

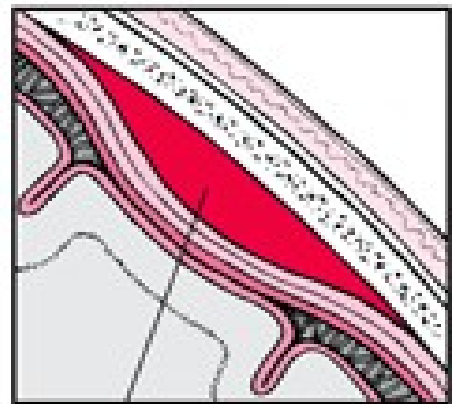


### Intracerebral Hemorrhage



Bleeding inside the brain

### Epidural Hematoma



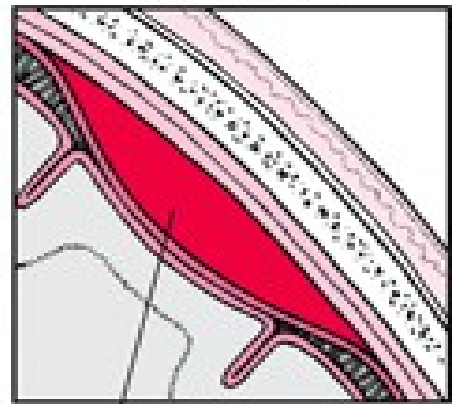
Bleeding between the dura mater and the skull

### Subarachnoid Hemorrhage



Bleeding in the subarachnoid space

### Subdural Hematoma



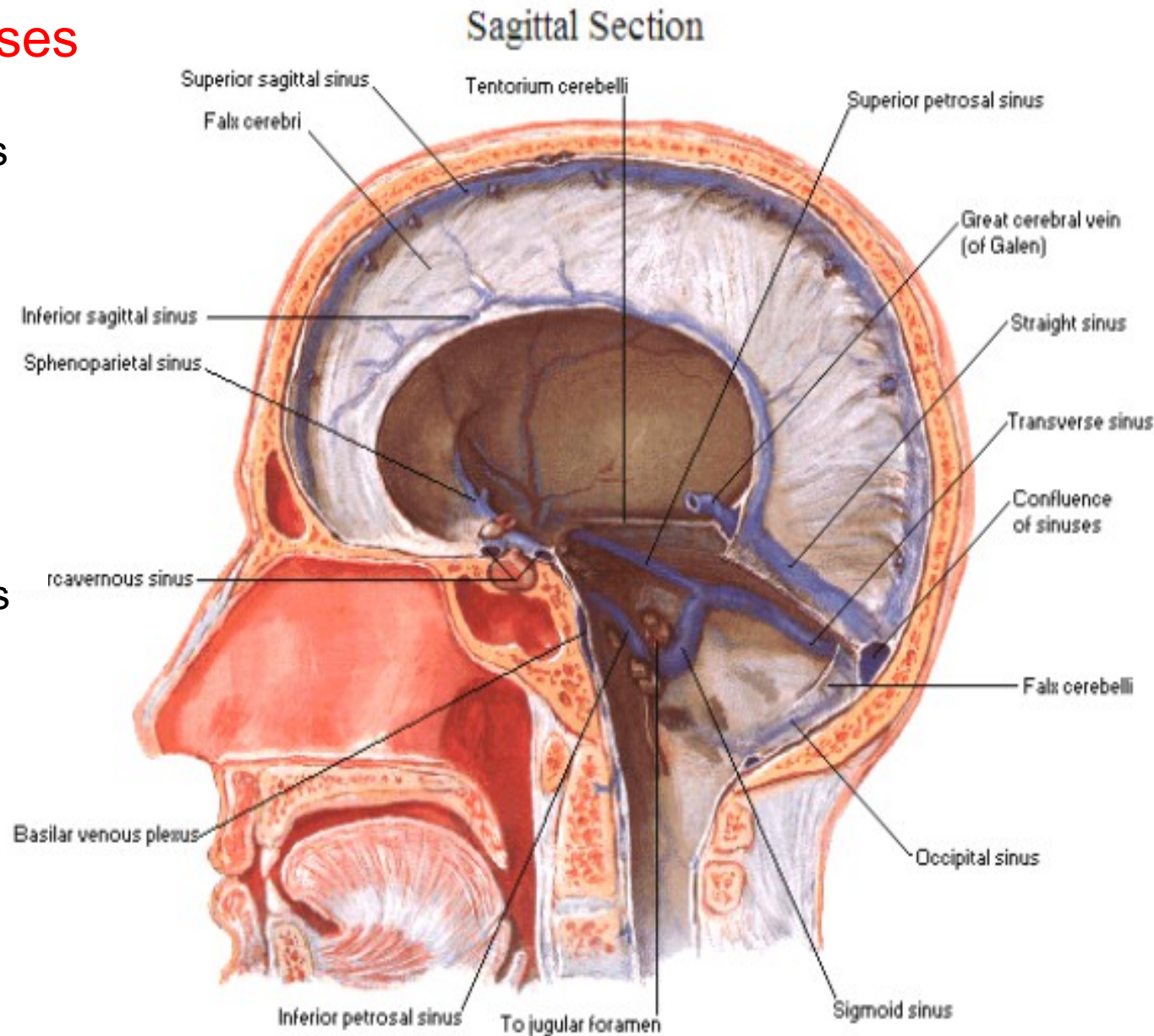
Bleeding between the arachnoid mater and the dura mater

## Part 3

- Dural venous sinuses

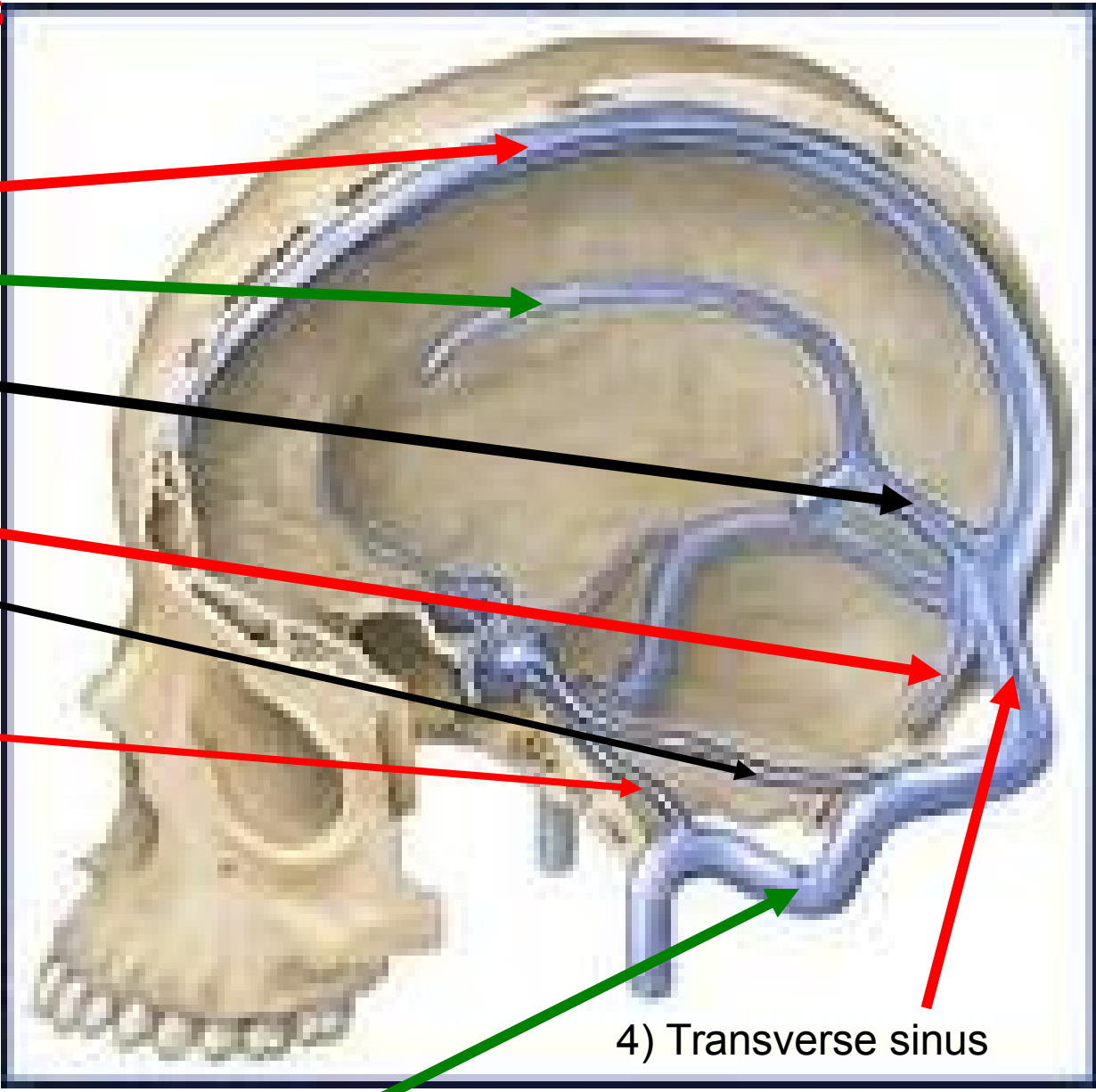
# Dural venous sinuses

- 1) Superior sagittal sinus
- 2) Inferior sagittal sinus
- 3) Straight sinus
- 4) Transverse sinus
- 5) Sigmoid sinus
- 6) Occipital sinus
- 7) Superior petrosal sinus
- 8) Inferior petrosal sinus
- 9) Cavernous sinus



# Dural venous sinuses

- 1) Superior sagittal sinus
- 2) Inferior sagittal sinus
- 3) Straight sinus
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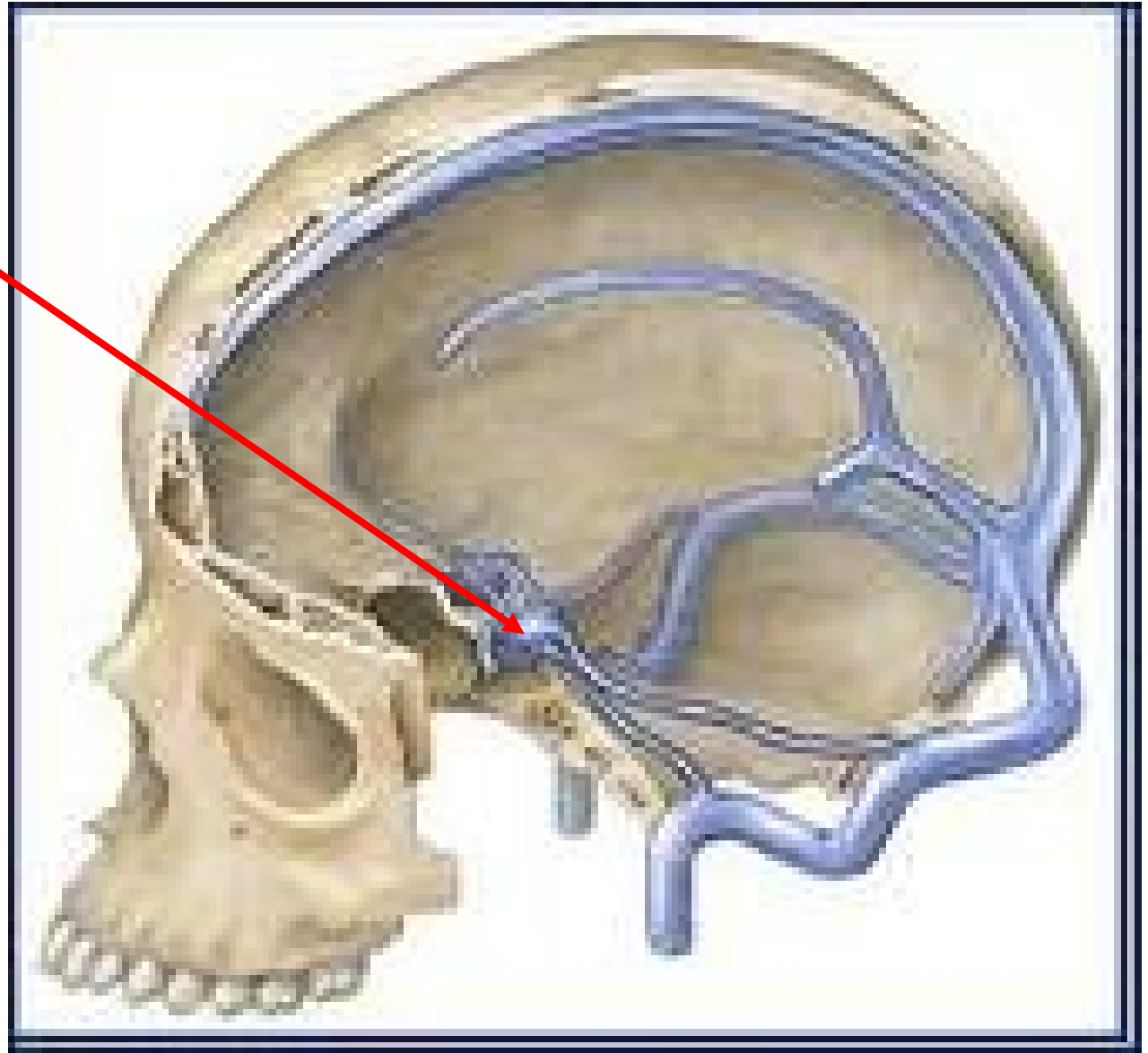
4) Transverse sinus

5) Sigmoid sinus



# Dural venous sinuses

Cavernous sinus



**superior sagittal sinus**

**inferior sagittal sinus**

**cavernous sinus**

**superior petrosal sinus**

**sigmoid sinus**

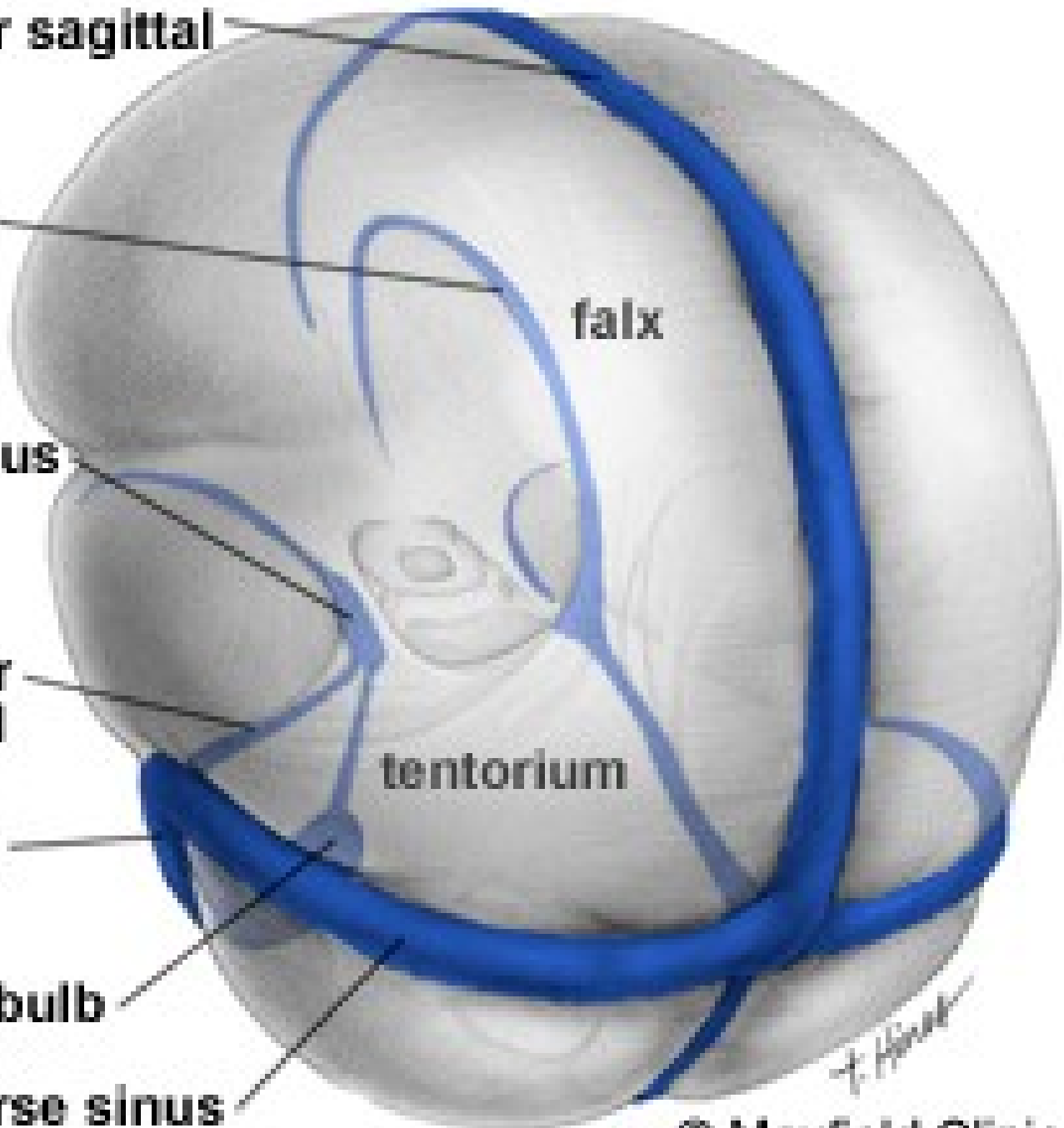
**jugular bulb**

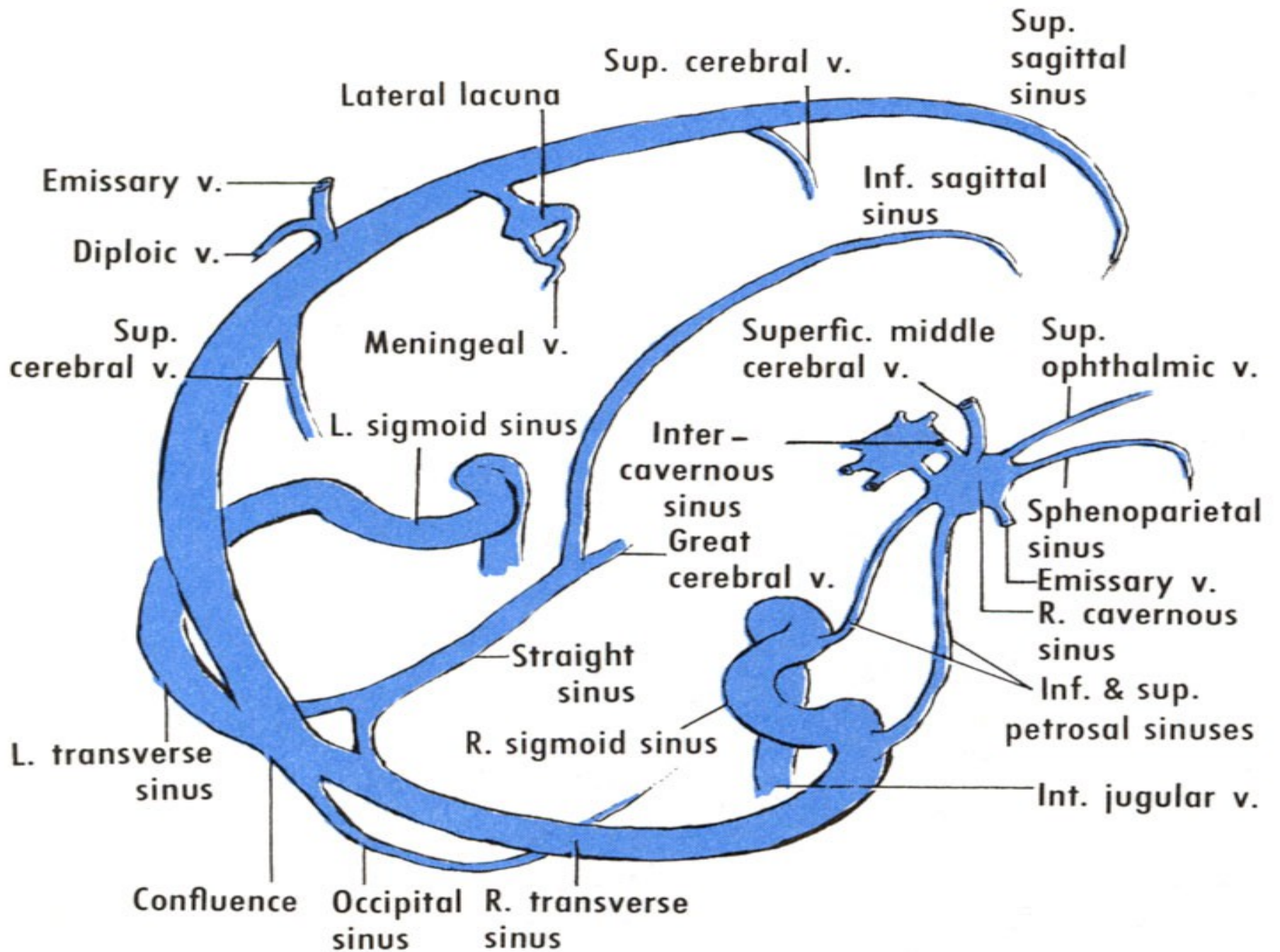
**transverse sinus**

**falx**

**tentorium**

*T. Hinder*





# Contents of cavernous sinus

\* Cranial nerves

III

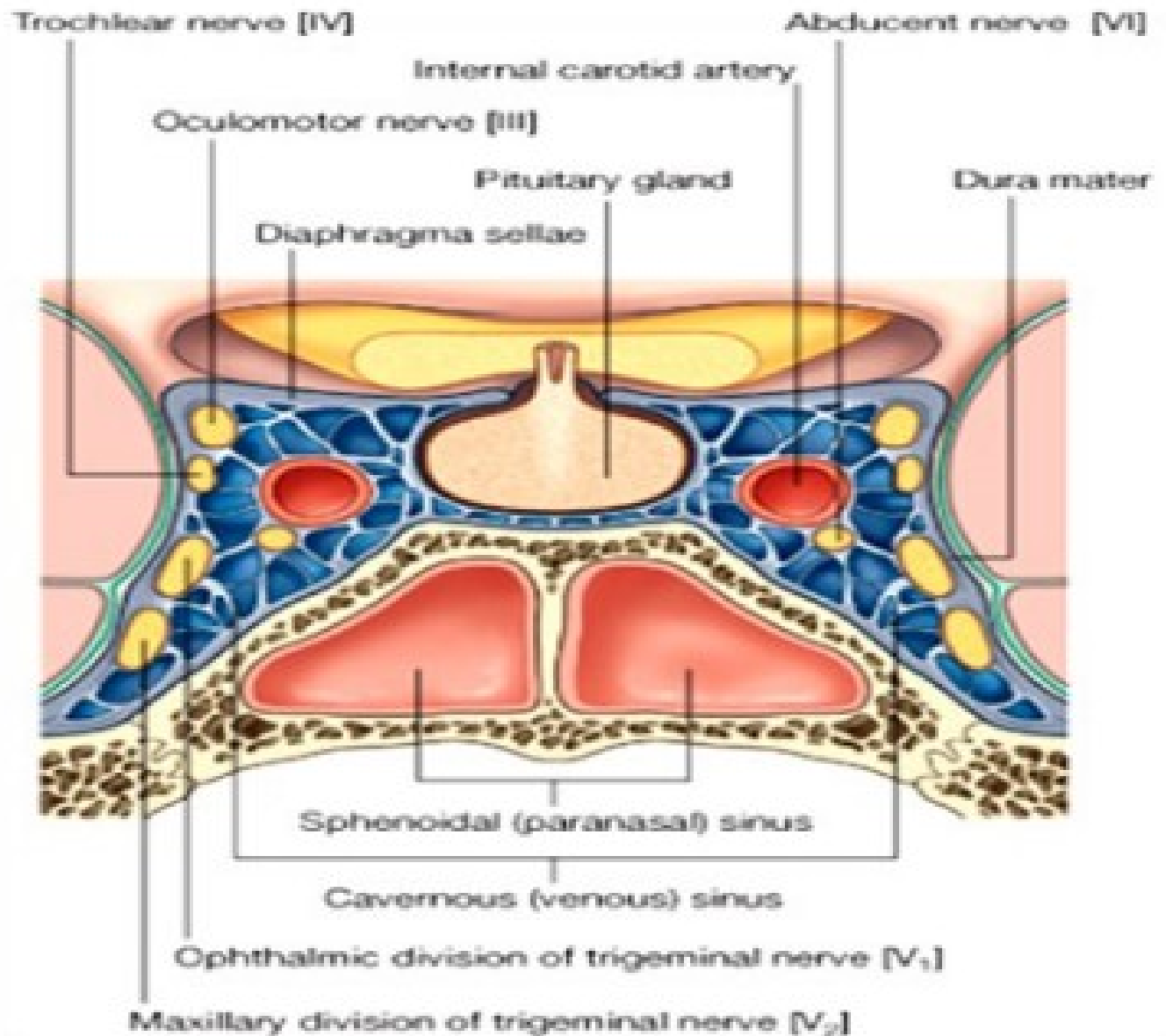
IV

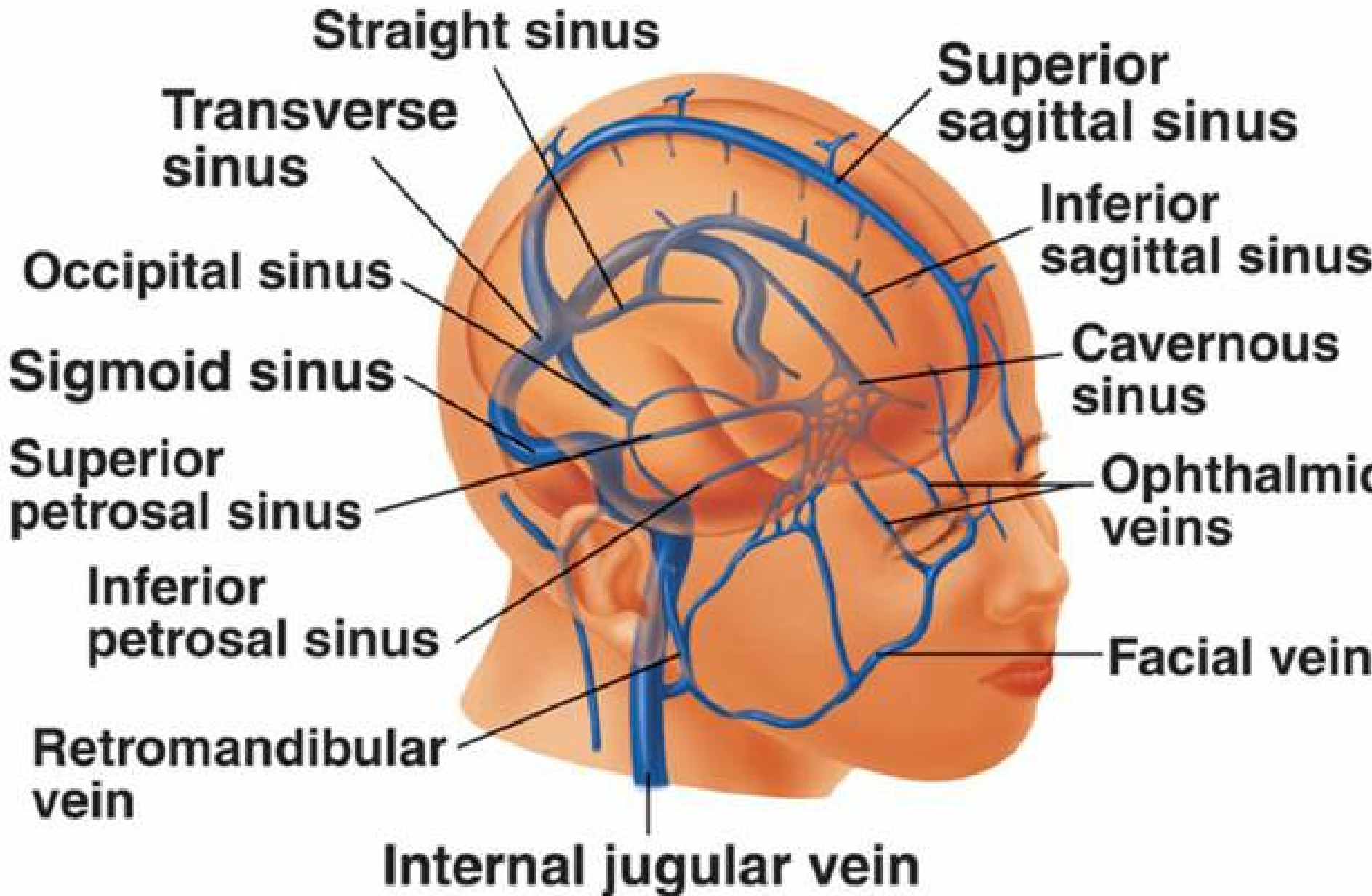
V<sub>1</sub>

V<sub>2</sub>

VI

Internal carotid artery





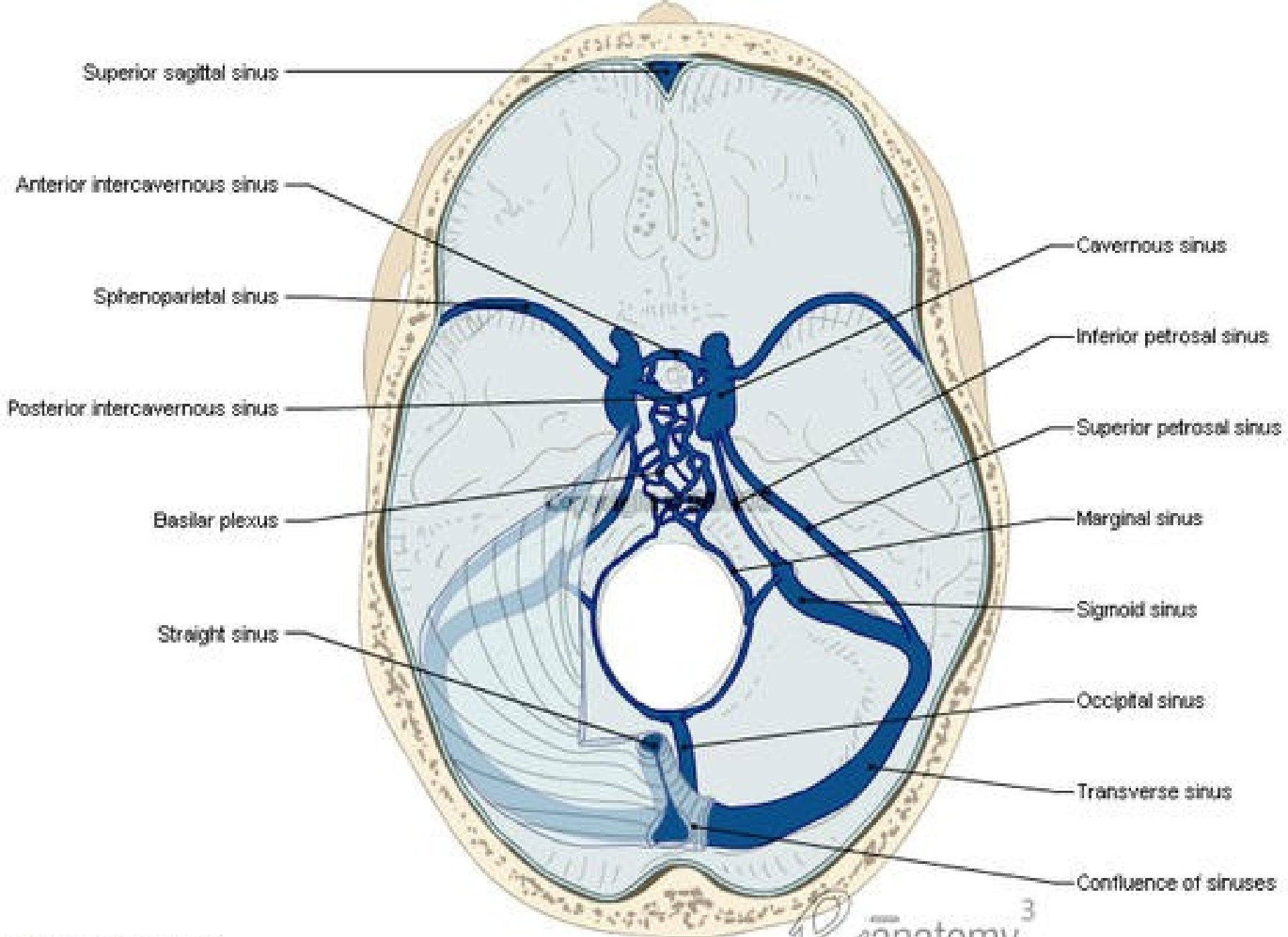
## **Communications of cavernous sinus**

<b>Anteriorly</b>	<b>Superior ophthalmic vein</b> <b>Inferior ophthalmic vein</b>
<b>Posteriorly</b>	<b>Superior petrosal sinus</b> <b>inferior petrosal sinus</b>
<b>Inferiorly</b>	<b>Pterygoid venous plexus</b>

**Two cavernous sinuses communicate with each other through**

**Anterior intercavernous sinus**

**Posterior intercavernous sinus**



## **Tributaries of cavernous sinus**

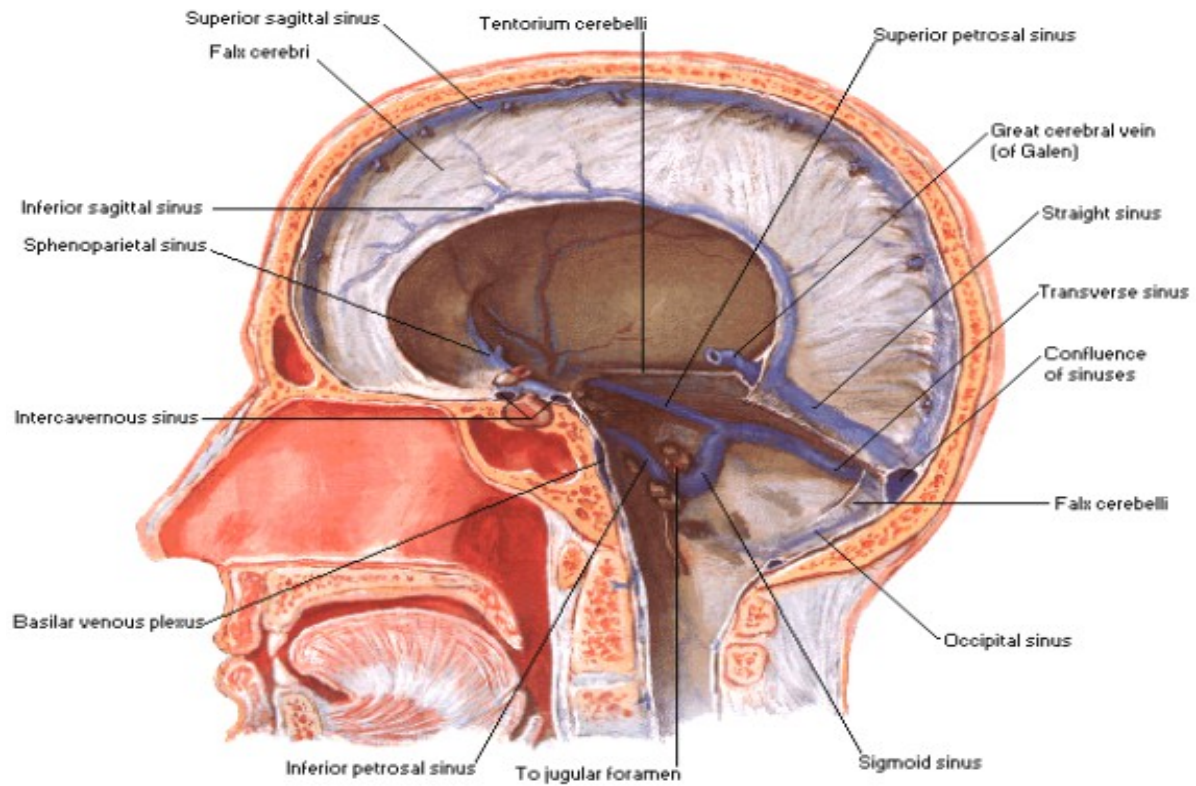
- 1) Superior ophthalmic vein
- 2) Inferior ophthalmic vein
- 3) Inferior cerebral vein
- 4) Sphenoparietal sinus
- 5) Central vein of retina



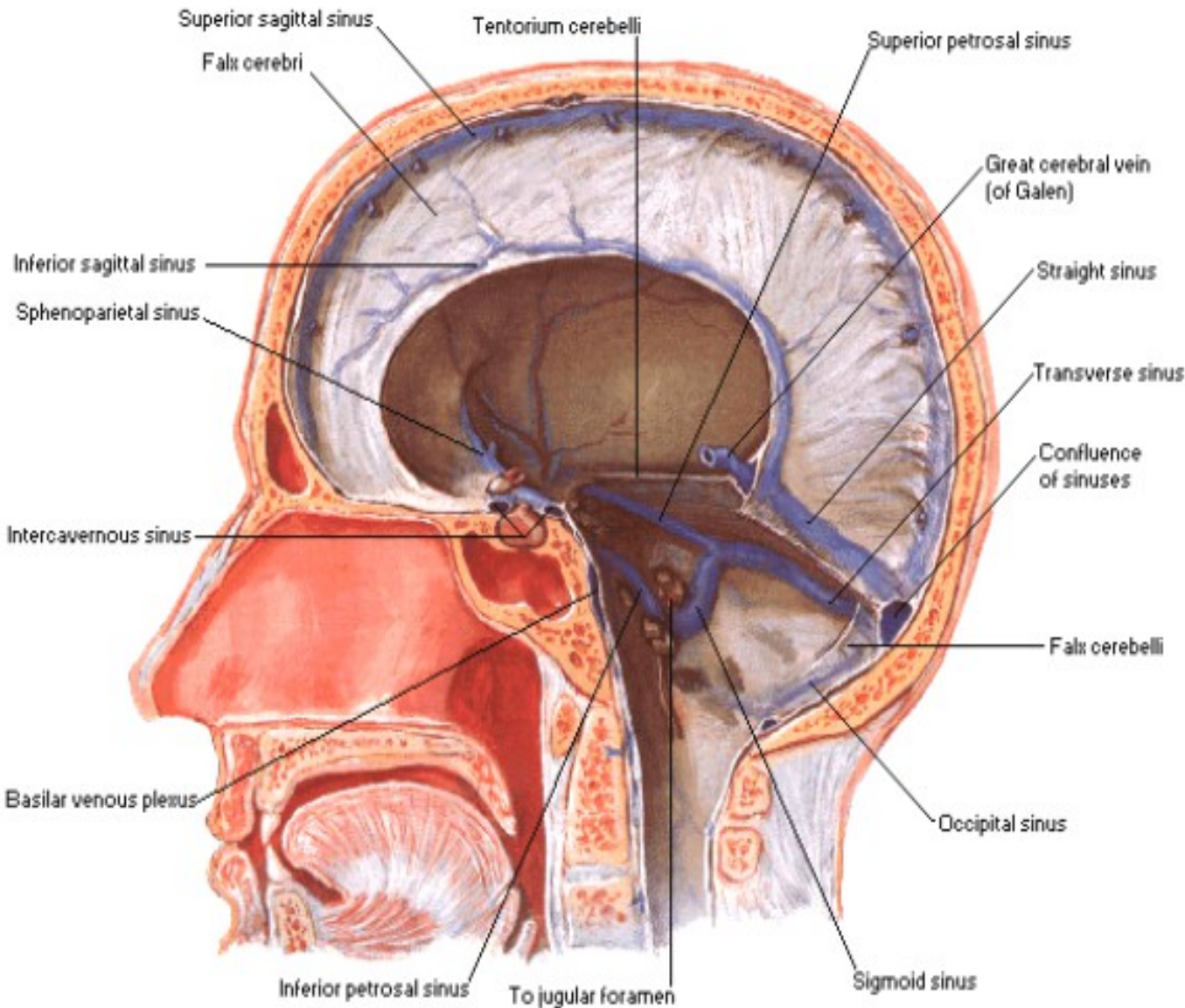
- **THANK YOU**



## Sagittal Section

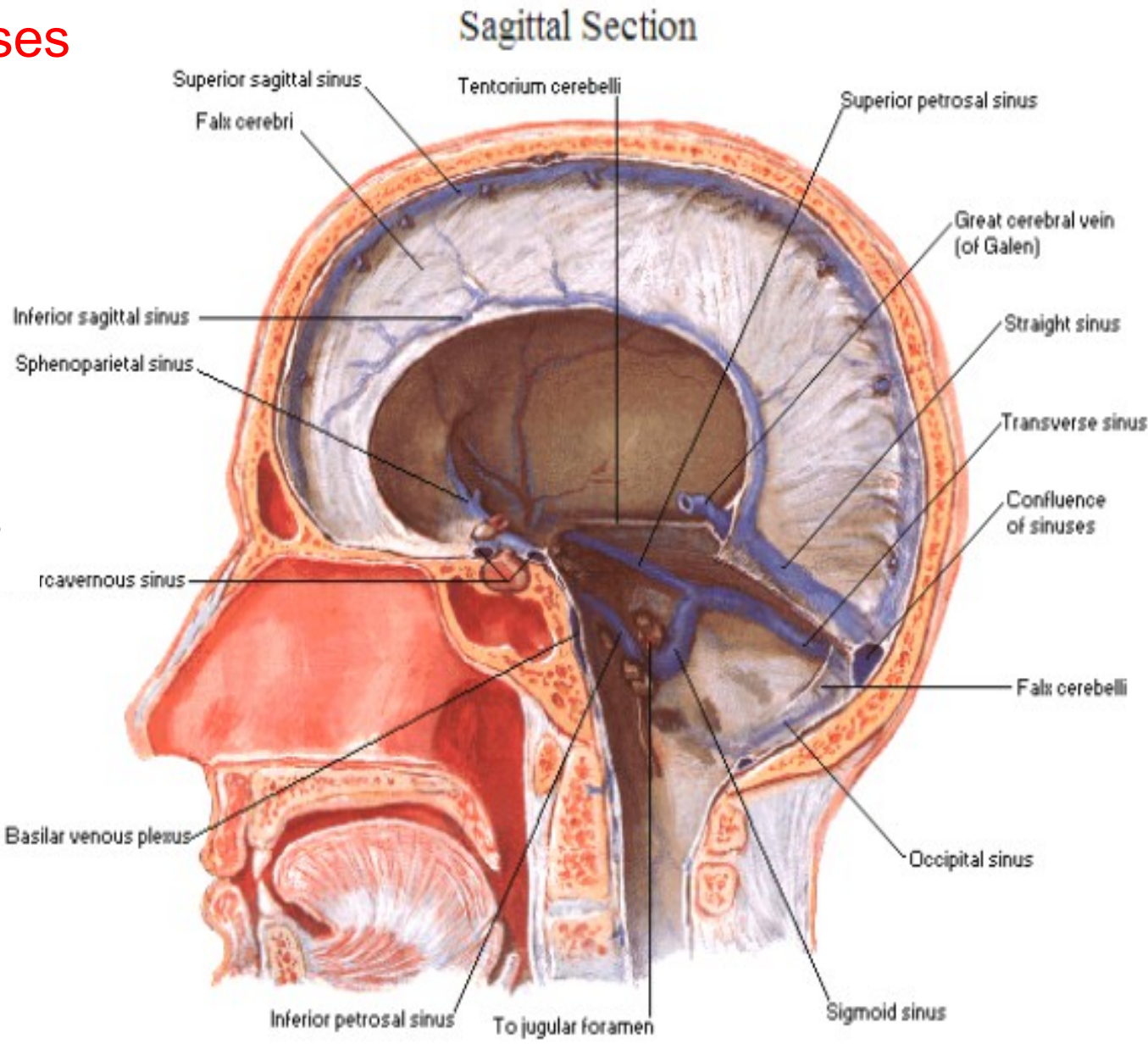


# Sagittal Section



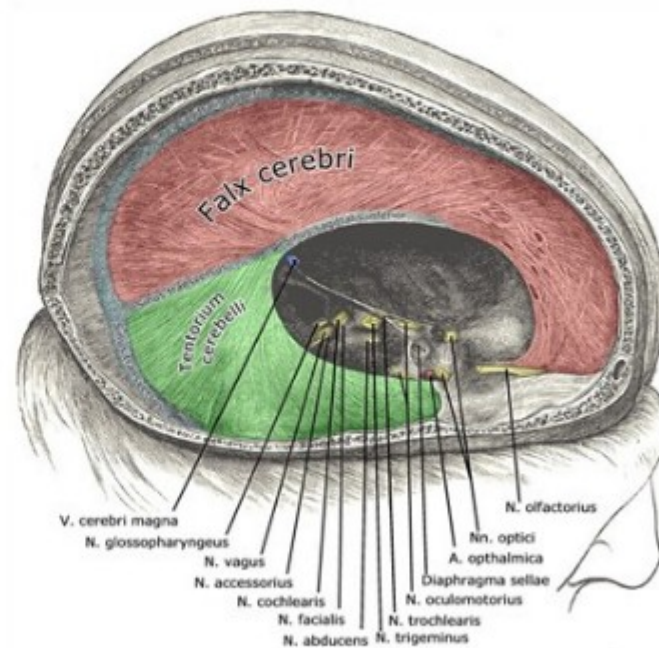
# Dural venous sinuses

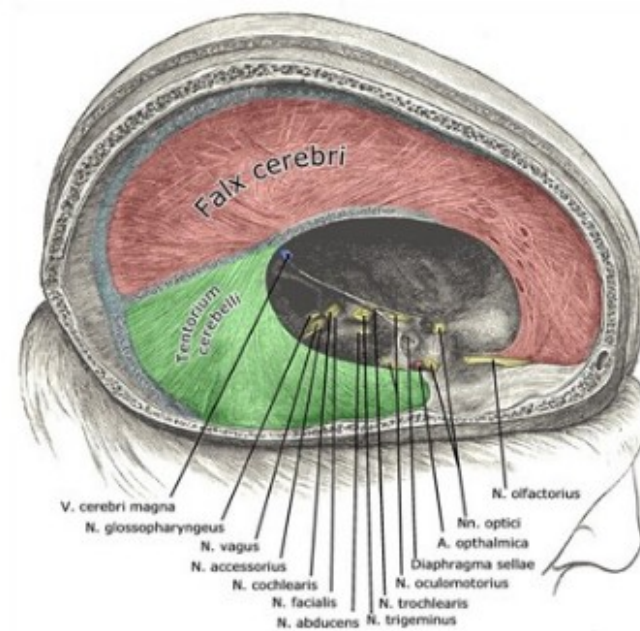
- 1) Superior sagittal sinus
- 2) Inferior sagittal sinus
- 3) Straight sinus
- 4) Transverse sinus
- 5) Sigmoid sinus
- 6) Superior petrosal sinus
- 7) Inferior petrosal sinus
- 8) Cavernous sinus





- The **superior sagittal sinus** runs in its upper fixed margin, the **inferior sagittal sinus** runs in its lower concave free margin, and the **straight sinus** runs along its attachment to the tentorium cerebelli.



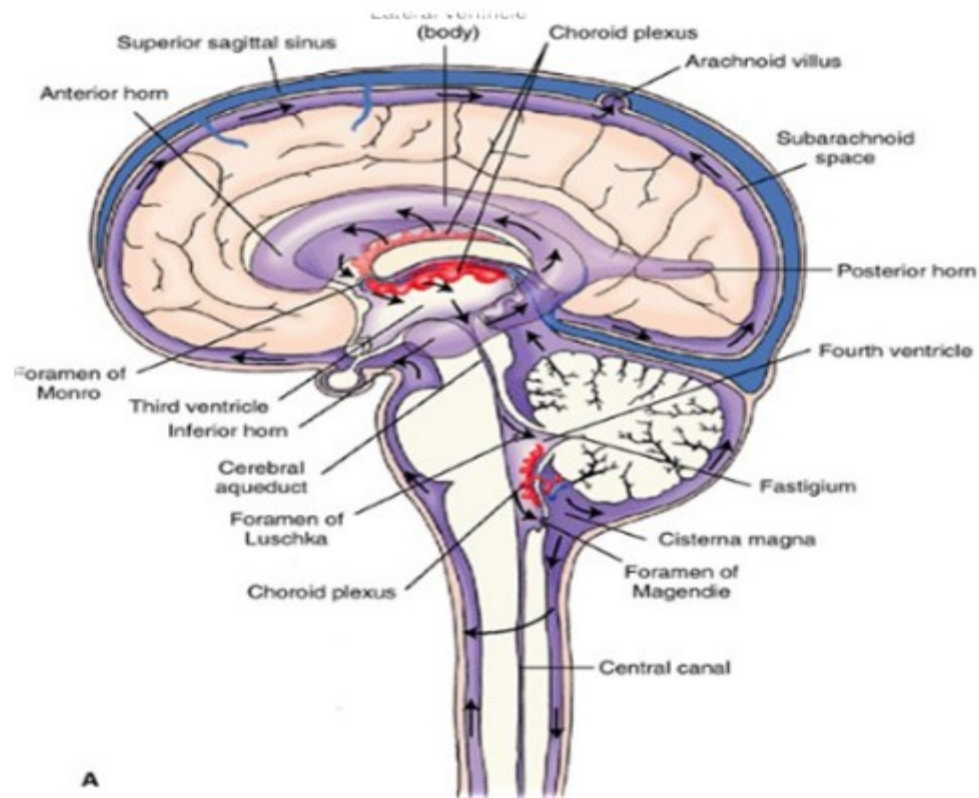




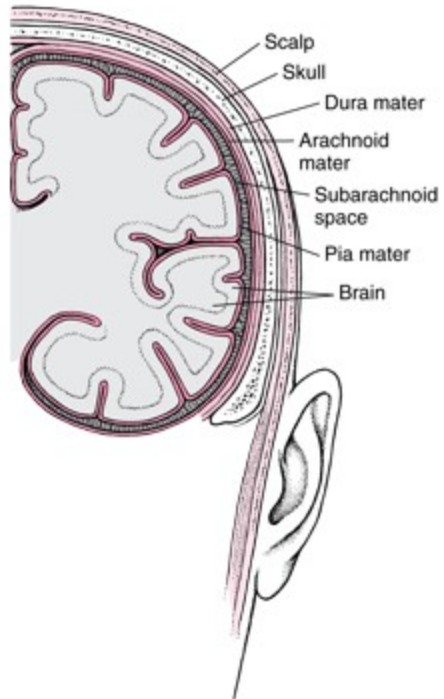
## The □ Tentorium □ Cerebelli

The falx cerebri and the falx cerebelli are attached to the upper and lower surfaces of the tentorium, *the straight sinus* runs along its attachment to the falx cerebri, *the superior petrosal sinus* along its attachment to the petrous bone, and *the transverse sinus* along its attachment to the occipital bone.

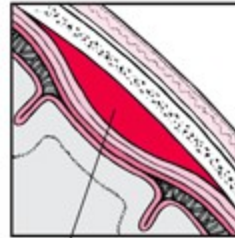




**Cross Section of the Brain**



**Epidural Hematoma**



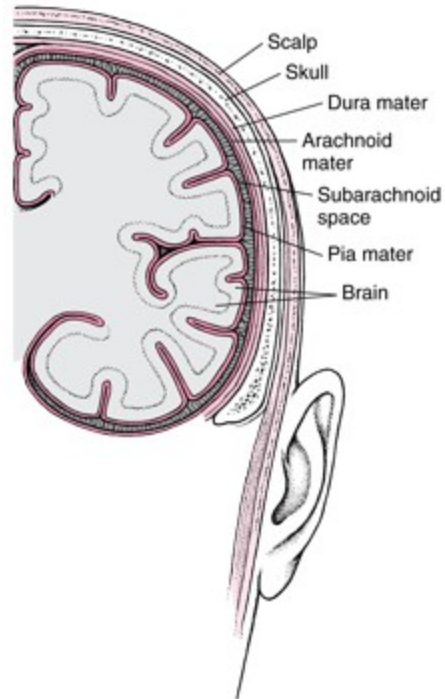
Bleeding between the dura mater and the skull

**Subdural Hematoma**

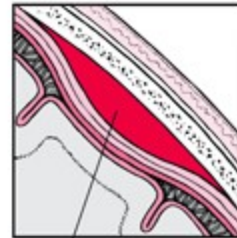


Bleeding between the arachnoid mater and the dura mater

**Cross Section of the Brain**



**Epidural Hematoma**



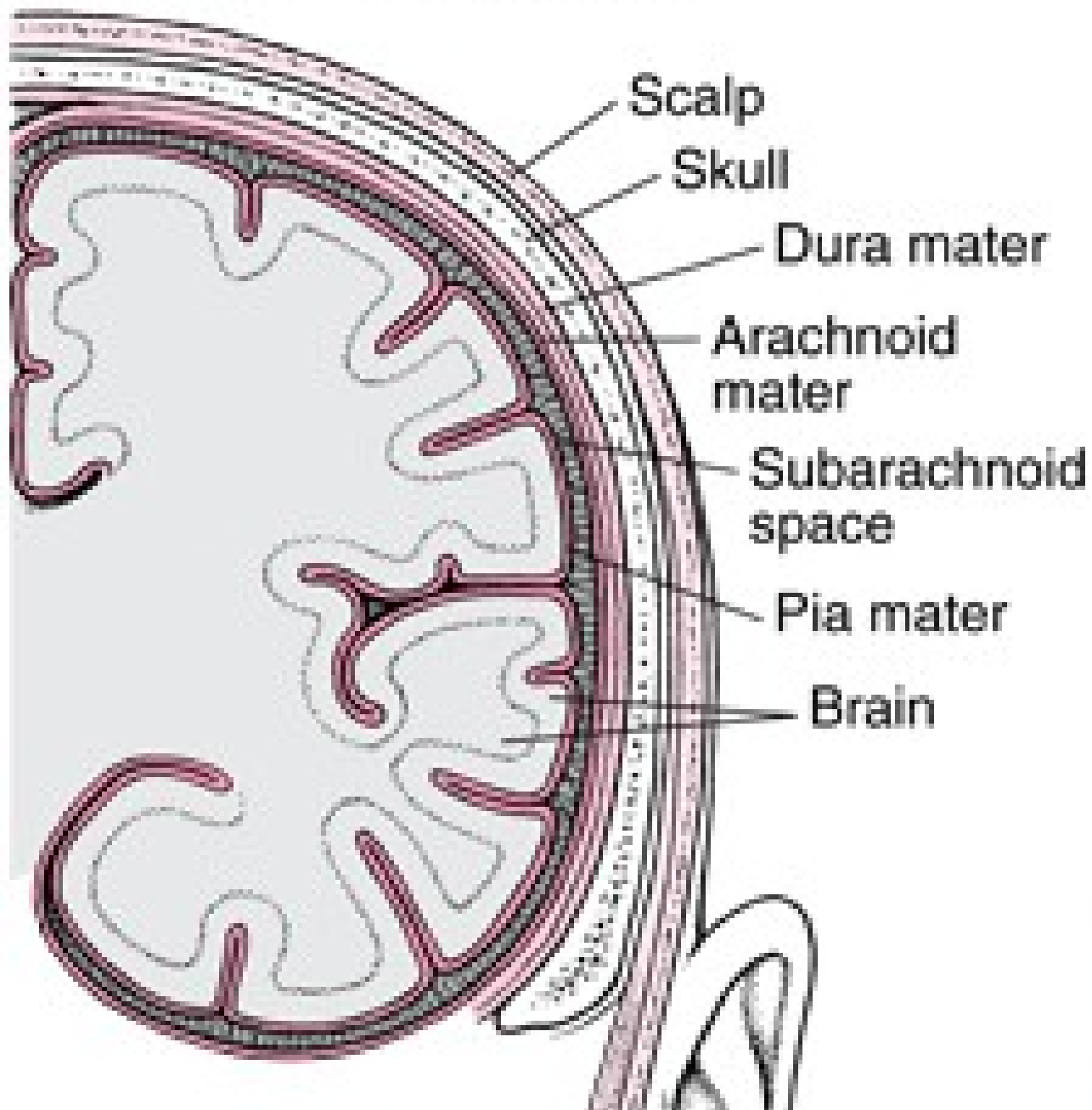
Bleeding between the dura mater and the skull

**Subdural Hematoma**



Bleeding between the arachnoid mater and the dura mater

# Cross Section of the Brain



# DURA MATER

## Dura mater septa

Falx cerebri

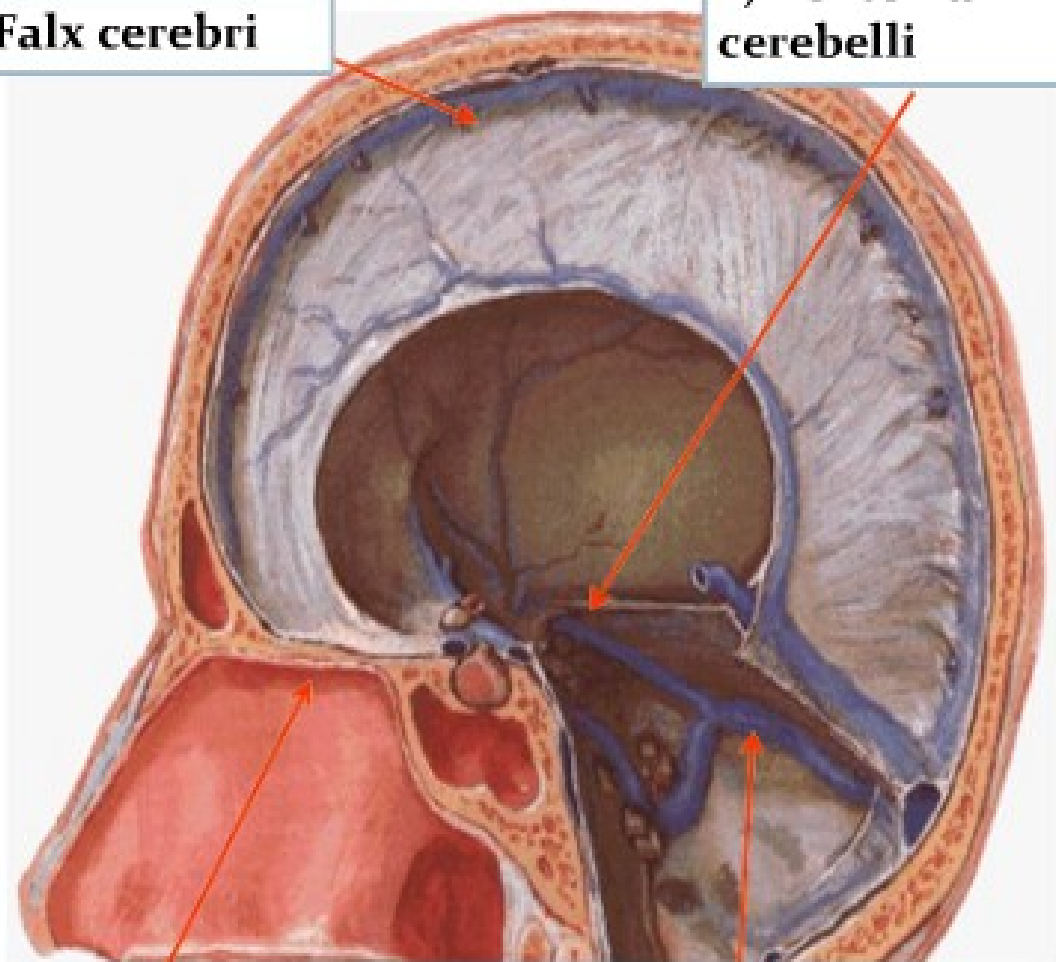
Falx cerebelli

Tentorium cerebelli

Diaphragma sella

1) Falx cerebri

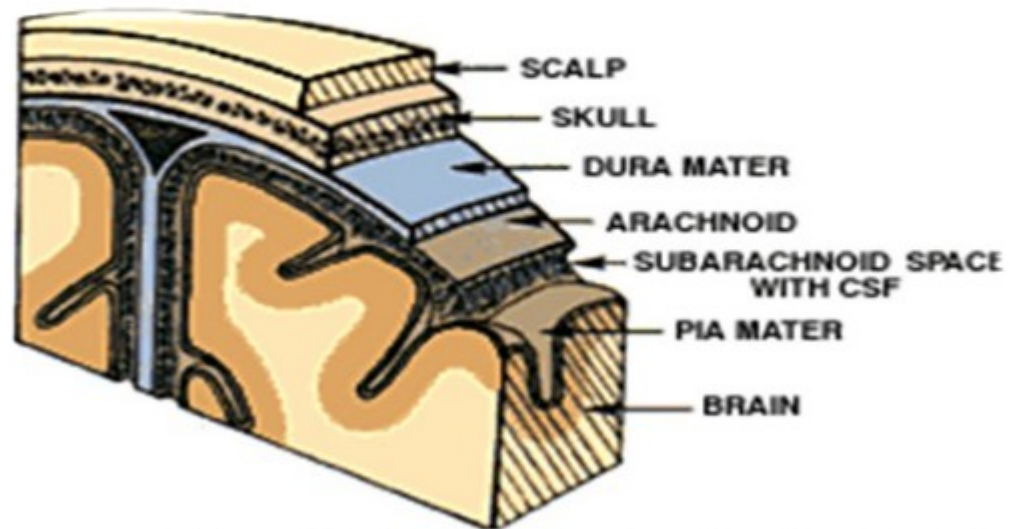
2) Tentorium cerebelli



4) Diaphragma sellae

3) Falx cerebelli





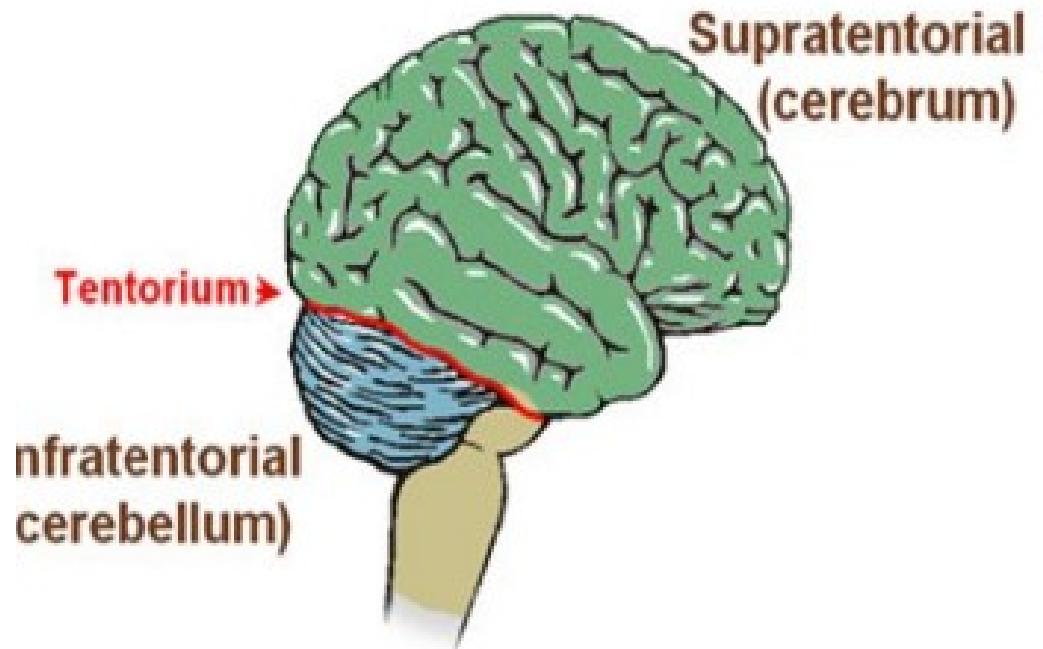


-It is a *sickle*-shaped fold of dura mater that lies in the *midline between the two cerebral hemispheres*.

-Its narrow end in front is attached to the *internal frontal crest and the crista galli*.

-Its broad posterior part blends in the midline with the upper surface of the tentorium cerebelli.

## The Tentorium Cerebelli



## Intracerebral Hemorrhage



Bleeding inside the brain

## Subarachnoid Hemorrhage

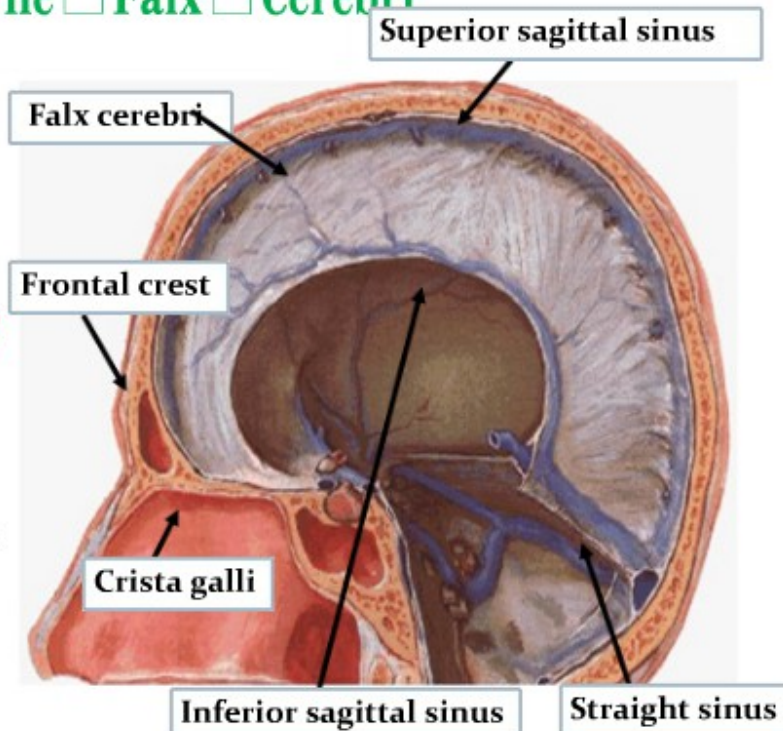


## The Falx Cerebri

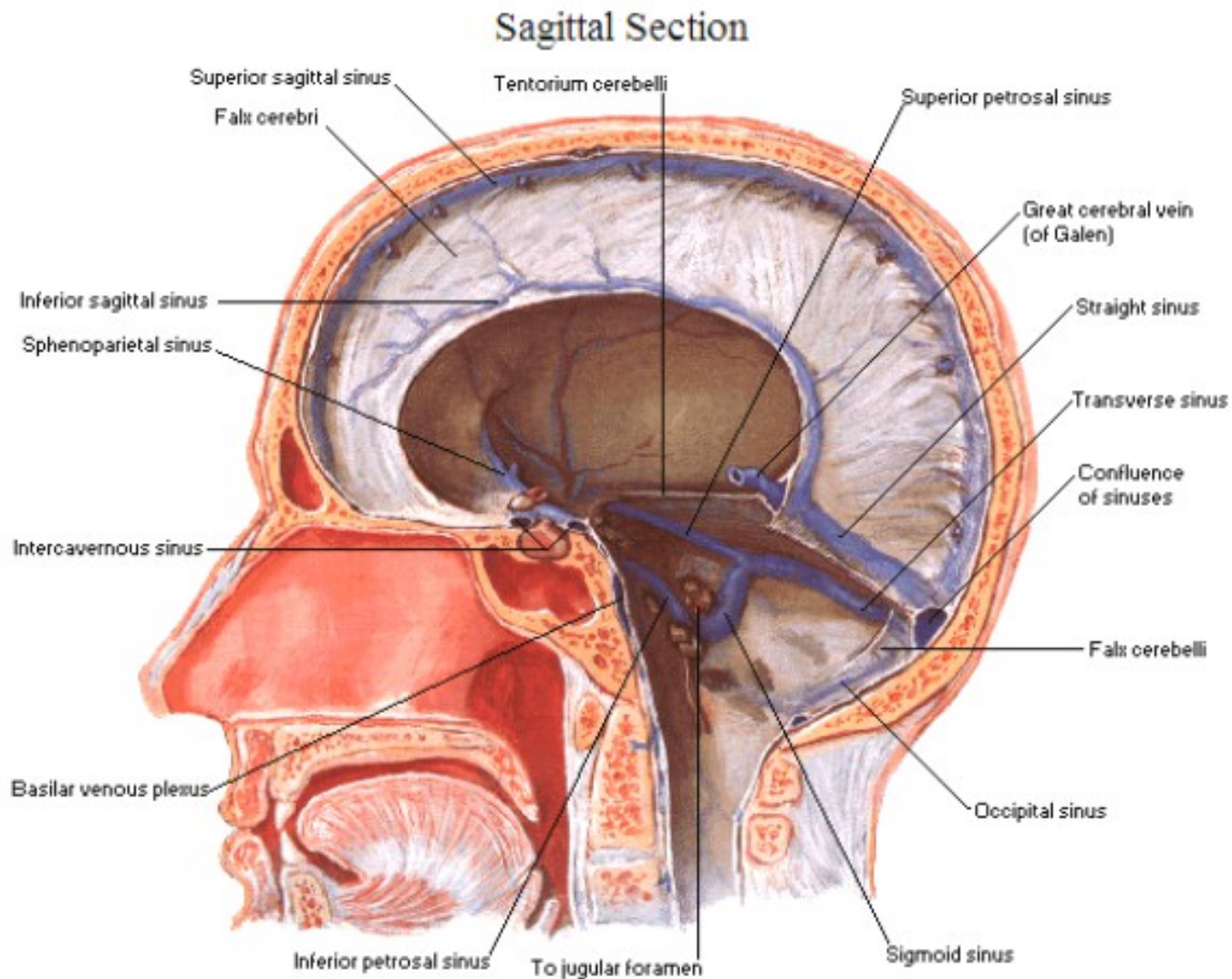
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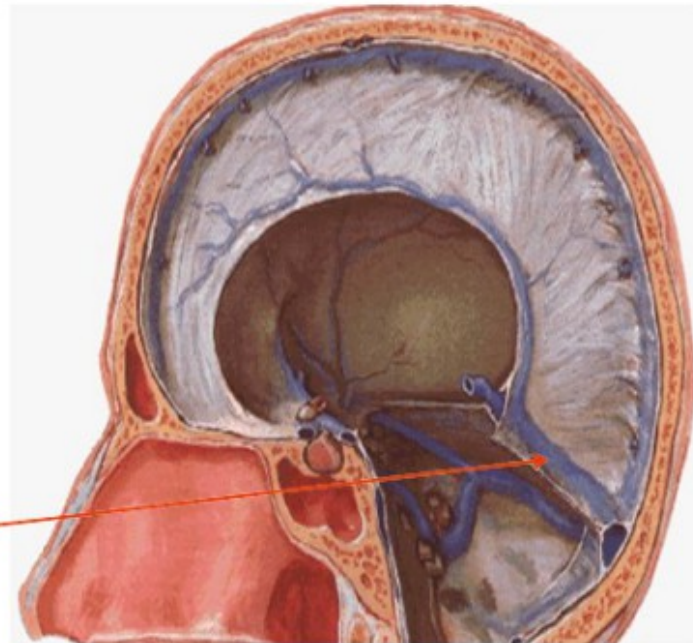


# Dural venous sinuses



## The Falx Cerebelli

- The falx cerebelli is a small, *sickle*-shaped fold of dura mater that is attached to *the internal occipital crest* and projects forward between the two cerebellar hemispheres.
- Its posterior fixed margin contains *the occipital sinus*



3) Falx cerebelli