Superior View of the Skull (Norma Verticalis)

Anteriorly

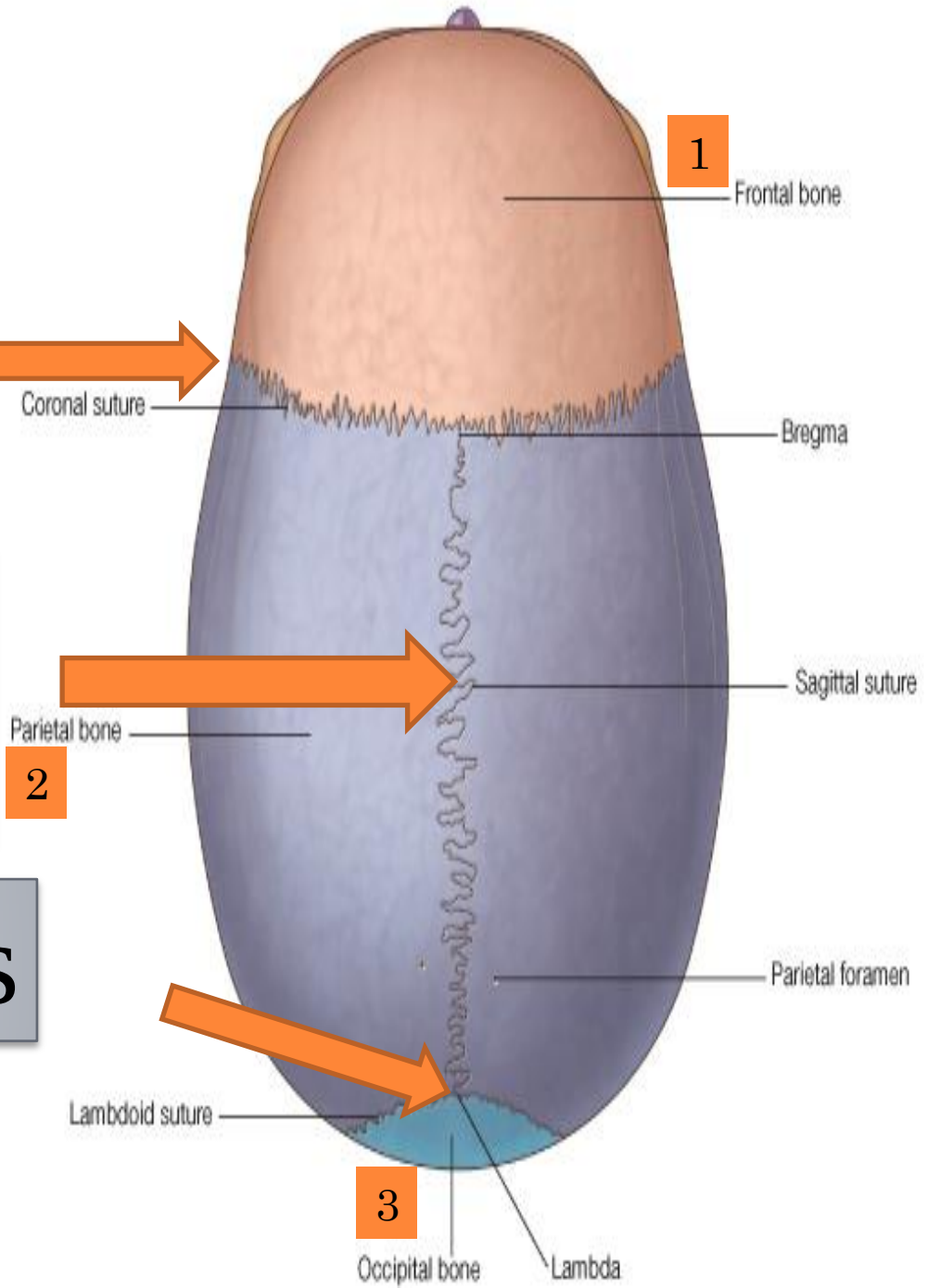
the frontal bone articulates with the two parietal bones

AT THE CORONAL SUTURE

The two parietal bones articulate in the midline

AT THE SAGITTAL SUTURE

lambdoid sutures

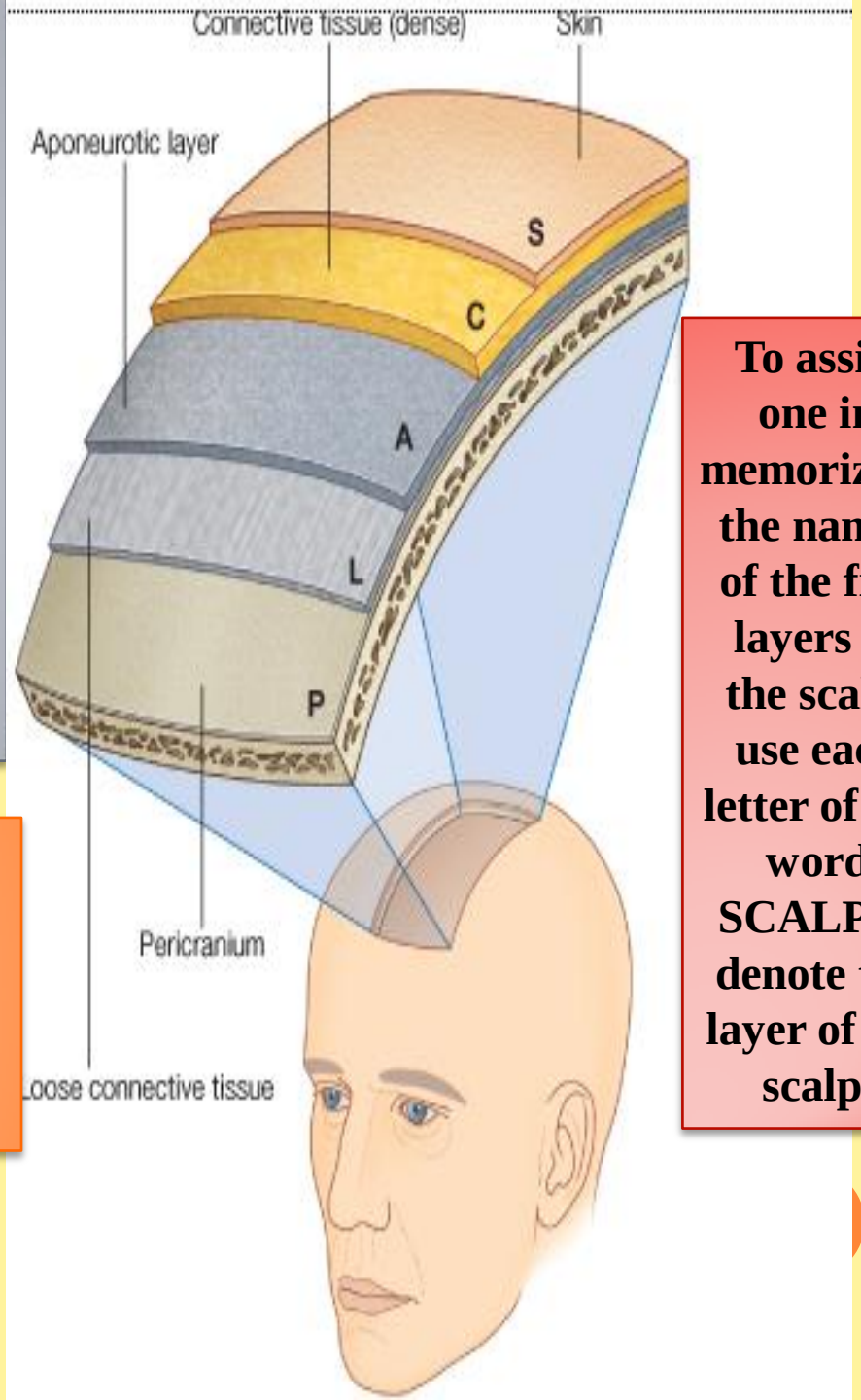


The Scalp

The scalp consists of **FIVE LAYERS**

S-skin
C-connective tissue (dense)
A-aponeurotic layer
L-loose connective tissue
P-pericranium

The first three of which are intimately bound together and move as a unit



1-Skin

is thick contains hair and contains numerous **sebaceous glands**

Remember that scalp is the common site for sebaceous cyst

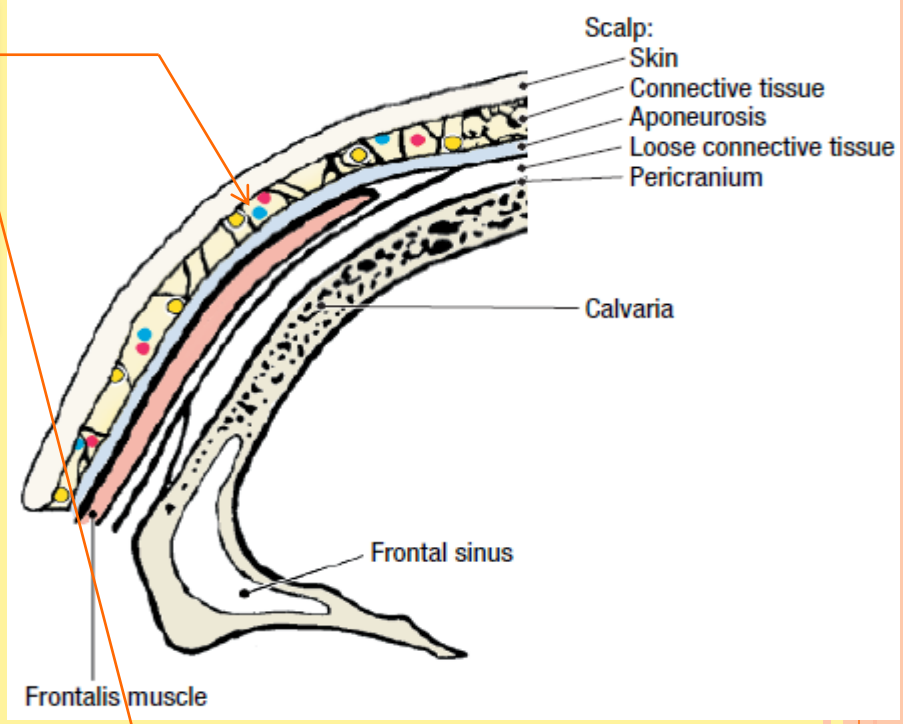
To assist one in memorizing the names of the five layers of the scalp, use each letter of the word SCALP to denote the layer of the scalp.

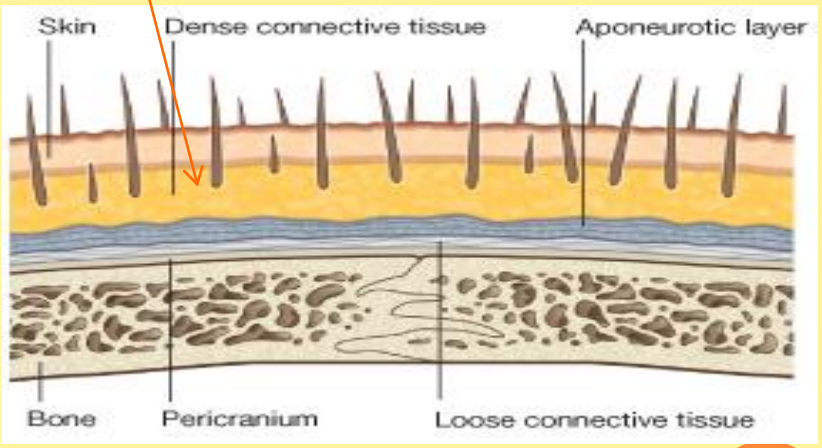
2-Connective tissue

- Made of fibrous fascia and septa which unite the skin to the underlying aponeurosis of the occipitofrontalis muscle
- Contains numerous arteries and veins

It is often difficult to stop the bleeding of a scalp wound because
the arterial walls
are attached to fibrous septa
in the subcutaneous tissue
and are unable to contract or retract to allow blood clotting to take place

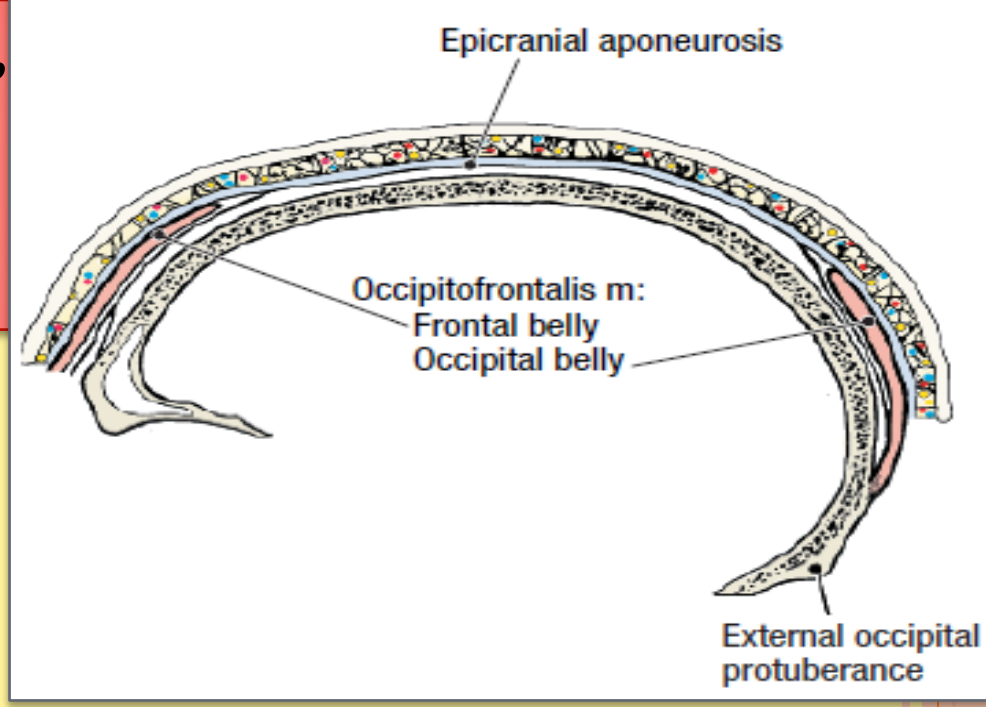
Local pressure applied to the scalp is the only satisfactory method of stopping the bleeding





3-Aponeurosis (epicranial),

is a thin, tendinous sheet that unites the **occipital and frontal bellies** of the **occipitofrontalis** muscle



➢ ***Epicranail aponeurosis***

The lateral margins of the aponeurosis are attached to the temporal fascia.

The subaponeurotic space is the potential space beneath the epicranial aponeurosis. It is limited in front and behind by the origins of the occipitofrontalis muscle, and it extends laterally as far as the attachment of the aponeurosis to the temporal fascia

The tension of the epicranial aponeurosis, produced by the tone of the occipitofrontalis muscles, is important in all deep wounds of the scalp. If the aponeurosis has been divided, the wound will gape open. For satisfactory healing to take place, the opening in the aponeurosis must be closed with sutures

4-Loose areolar tissue

Also called the dangerous area
Of the scalp

Occupies the subaponeurotic space and ***extends anteriorly to the eyelids*** ➢ Therefore, any blood collection in this layer may extend to the root of the nose and the eyelids causing **Black eye**

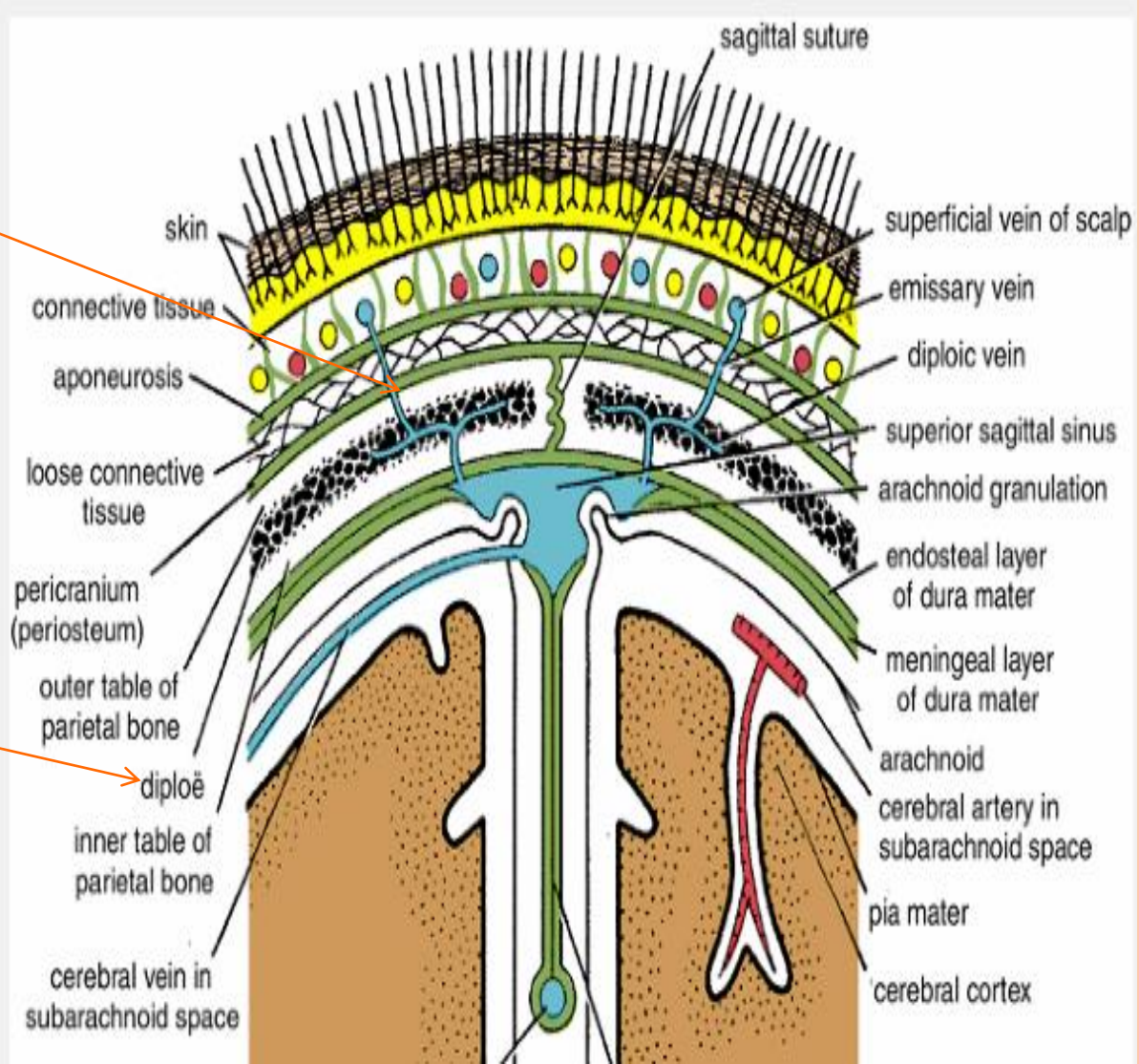
Made of loose areolar tissue which ➢ contains **important emissary veins.**

The emissary veins are valveless and connect **The superficial veins of the scalp with the diploic veins of the skull bones**

Causing

Osteomyelitis

Infected blood in the diploic veins may travel by the emissary veins farther into the venous sinuses and produce venous sinus thrombosis



5-Pericranium

is the periosteum covering the outer surface of the skull bones.

The sutures between individual skull bones, the periosteum on the outer surface of the bones becomes continuous with the periosteum on the inner surface of the skull bones . THEREFORE if there is any fluid collection beneath the pericranium (Cephalhaematoma) it will take the shape of the related bone

Muscles of the Scalp

Occipitofrontalis

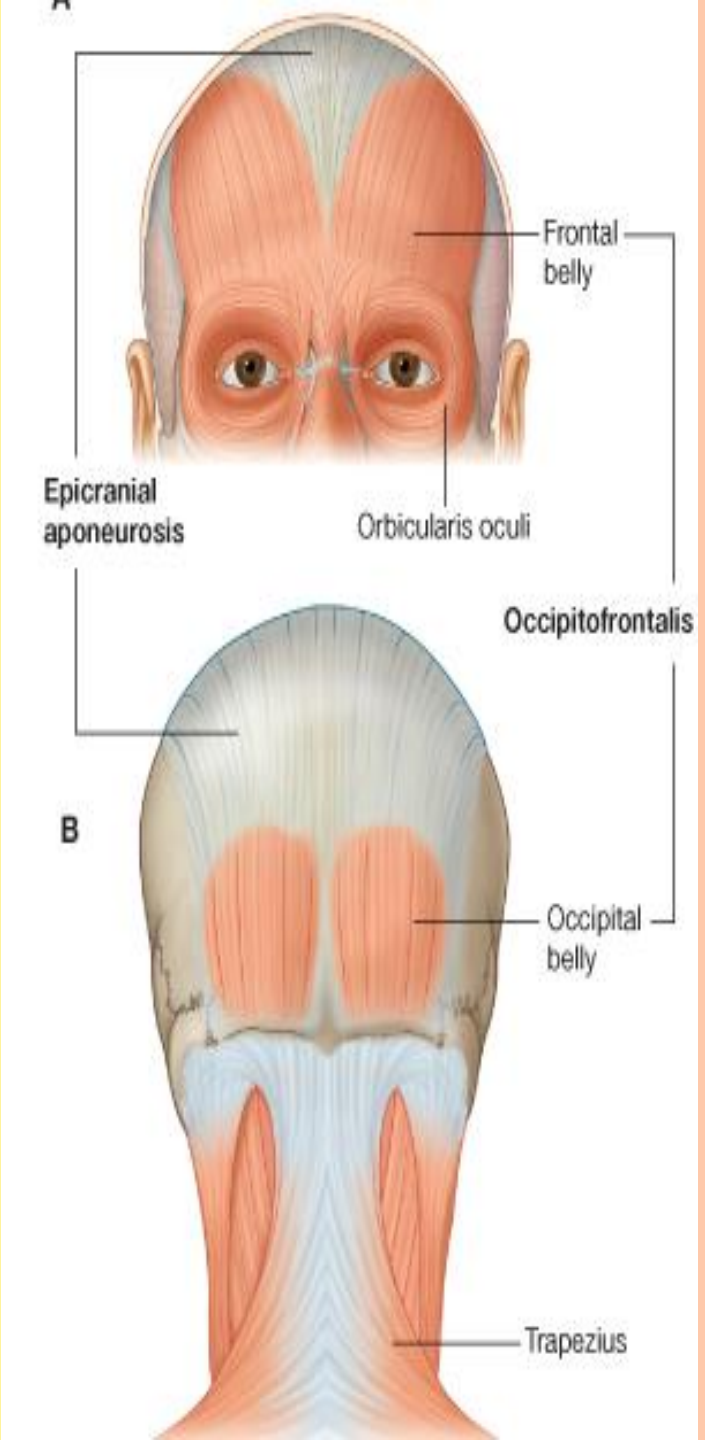
The origin

Insertion

nerve supply

action

The frontal bellies of the occipitofrontalis can raise the eyebrows in expressions of surprise or horror.



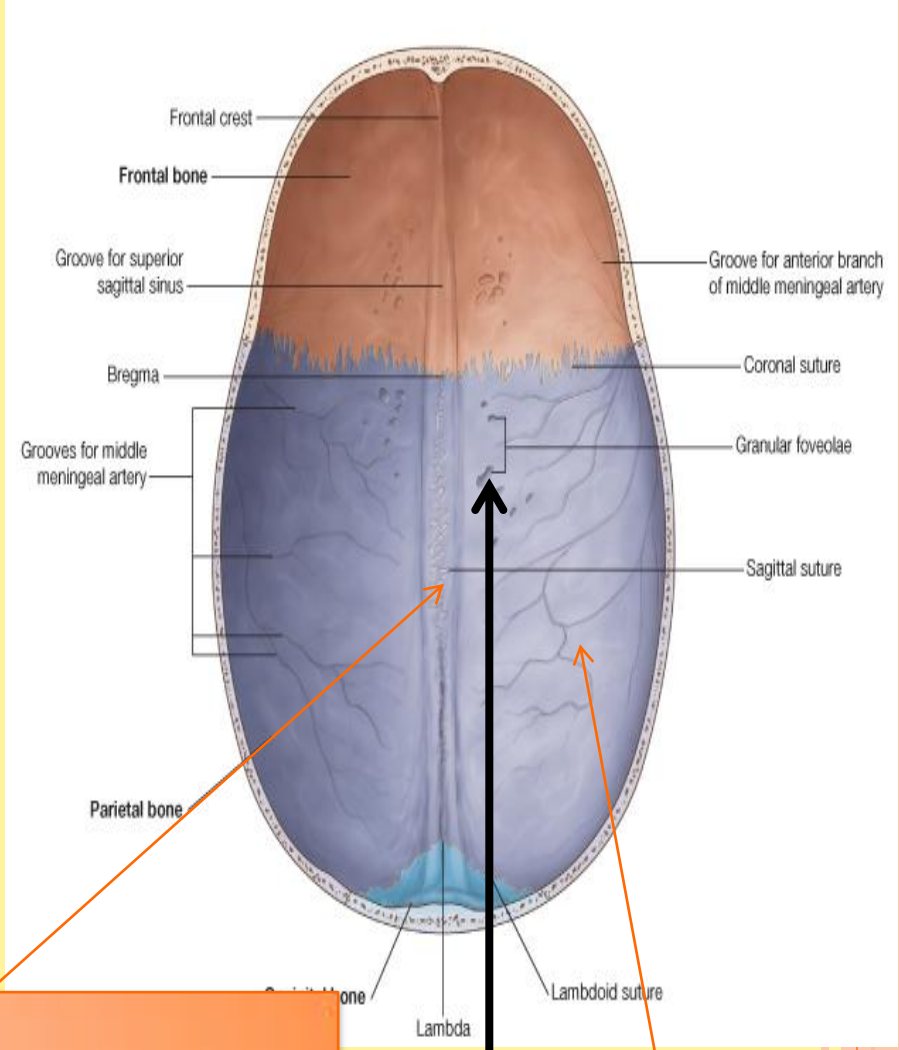
The Cranial Cavity

CONTENTS

1-The brain and its surrounding Meninges
2-Parts of the cranial nerves
3-Arteries
4-Veins
5-Venous sinuses

VAULT OF THE SKULL

The internal surface of the vault presents:
1- The coronal
2- Sagittal
3-Lambdoid sutures



4-In the midline is a shallow **sagittal groove** containing the

SUPERIOR SAGITTAL SINUS

5-On each side of the groove are several small pits, called

GRANULAR PITS? What for

6-Grooves for the middle meningeal artery

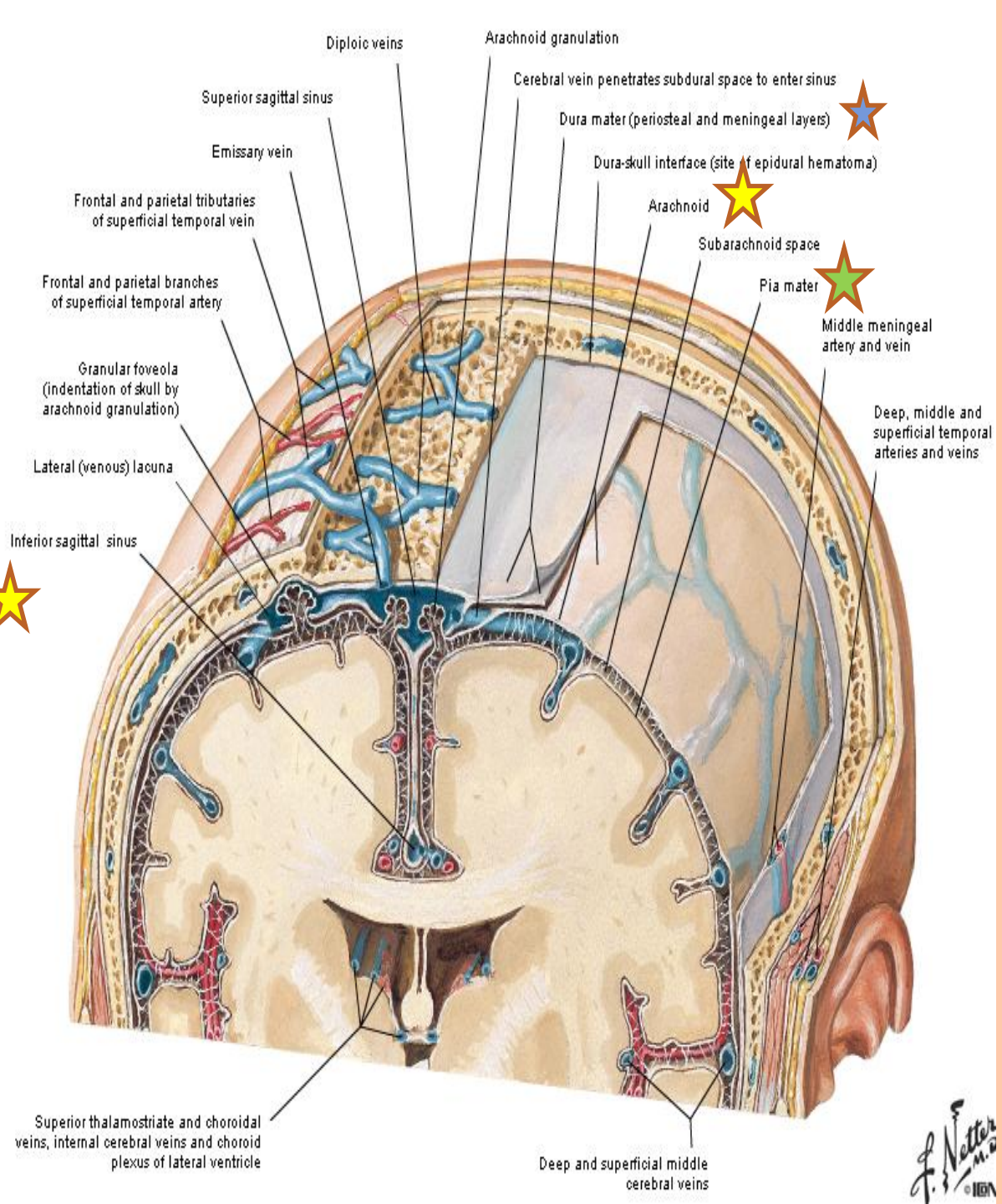
The Meninges

The brain in the skull is surrounded
by three membranes or meninges:

1-THE DURA MATER

2-THE ARACHNOID MATER

3-THE PIA MATER



1-DURA MATER OF THE BRAIN

Made of two layers:
a-The endosteal layer
b-The meningeal layer
These are closely united except along where they separate to form
VENOUS SINUSES

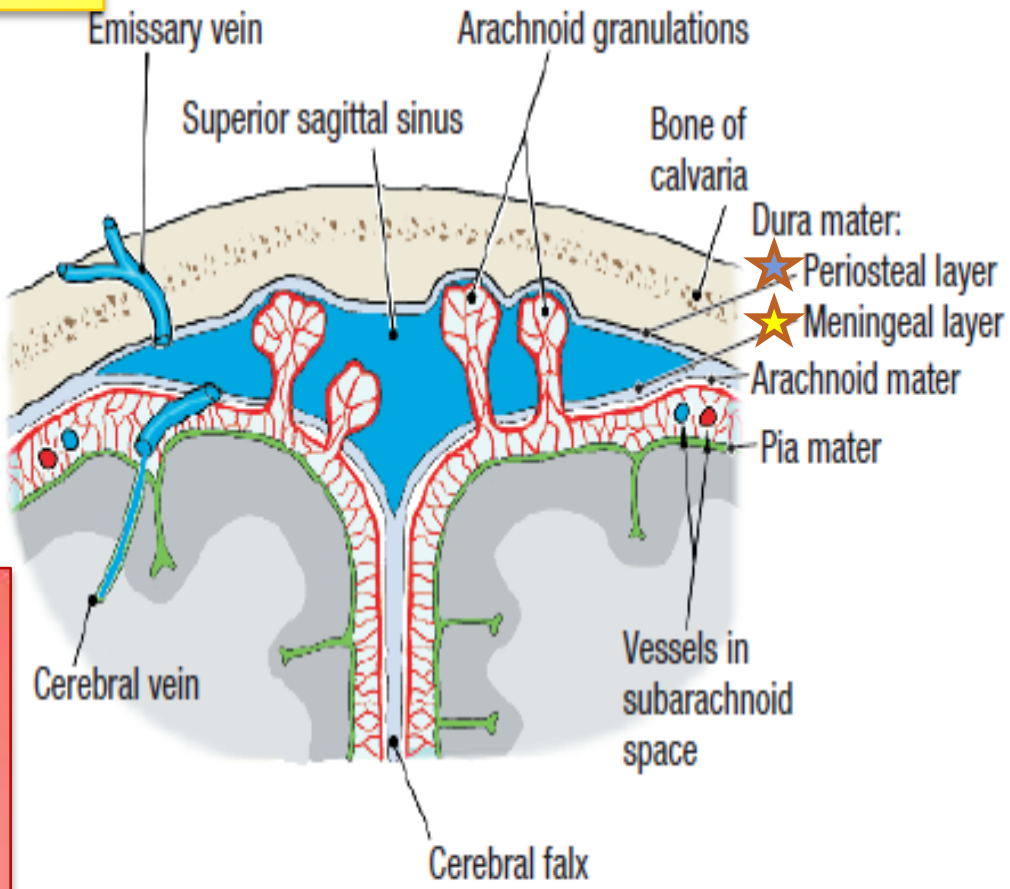
A-The endosteal layer ➢

➢Is the **ordinary periosteum** covering the inner surface of the skull bones

➢It ***does not extend*** through the foramen magnum to become continuous with the dura mater of the spinal cord

➢ Around the margins of all the foramina in the skull it becomes continuous with the periosteum on the outside of the skull bones

➢At the sutures it is continuous with the sutural ligaments.



B-The meningeal layer

- Is the dura mater proper
- It is a dense, strong, *fibrous membrane*
- covering the brain and is ***continuous through the foramen magnum with the dura mater of the spinal cord***
- It provides ***tubular sheaths for the cranial nerves*** as the latter pass through the foramina in the skull
- Outside the skull the sheaths fuse with the ***epineurium*** of the nerves

The meningeal layer sends inward

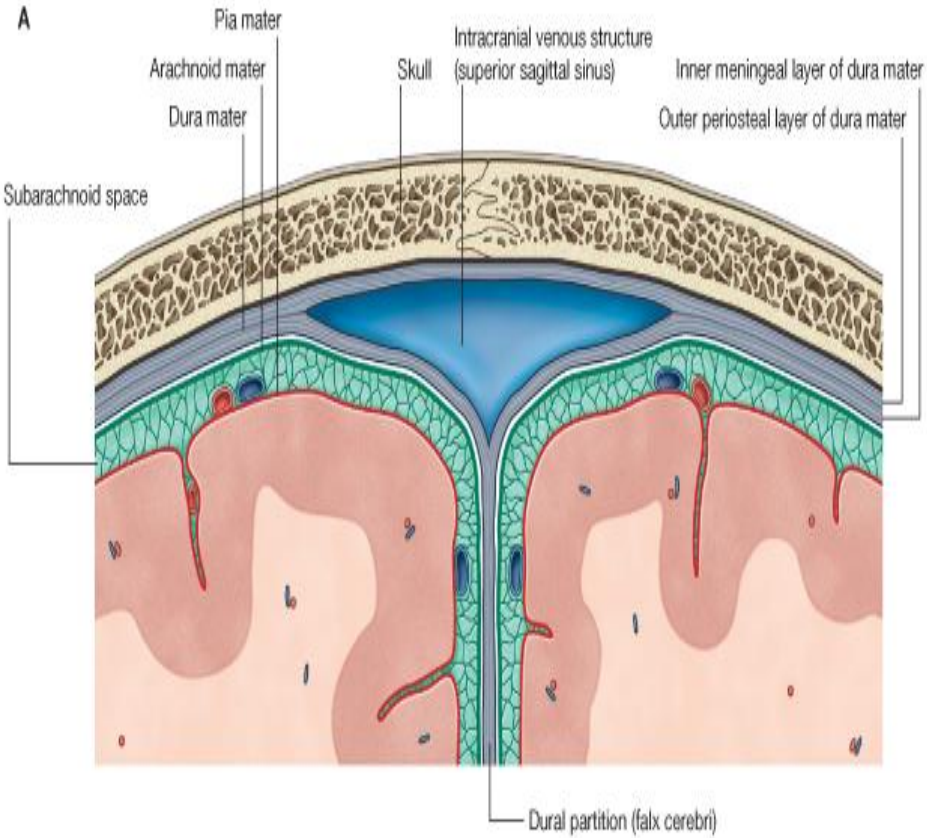
FOUR SEPTA

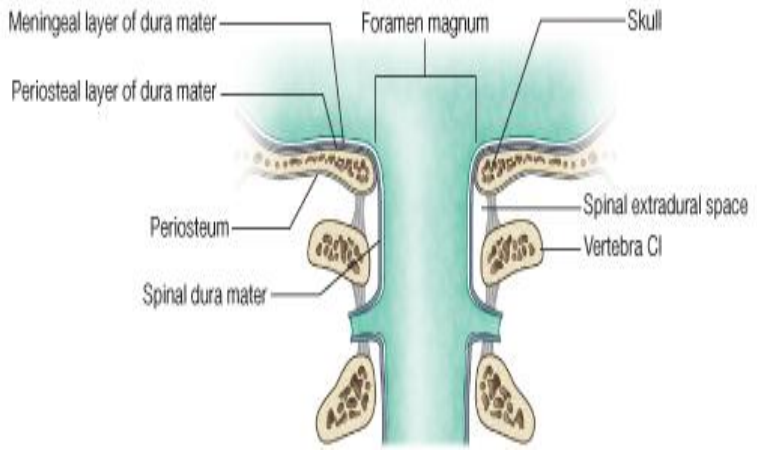
1-THE FALX CEREBRI

2-THE TENTORIUM CEREBELLI

3-THE FALX CEREBELLI

4-THE DIAPHRAGMA SELLAE





1-THE FALX CEREBRI

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

- Its narrow end **in fron**t is attached to the

THE CRISTA GALLI

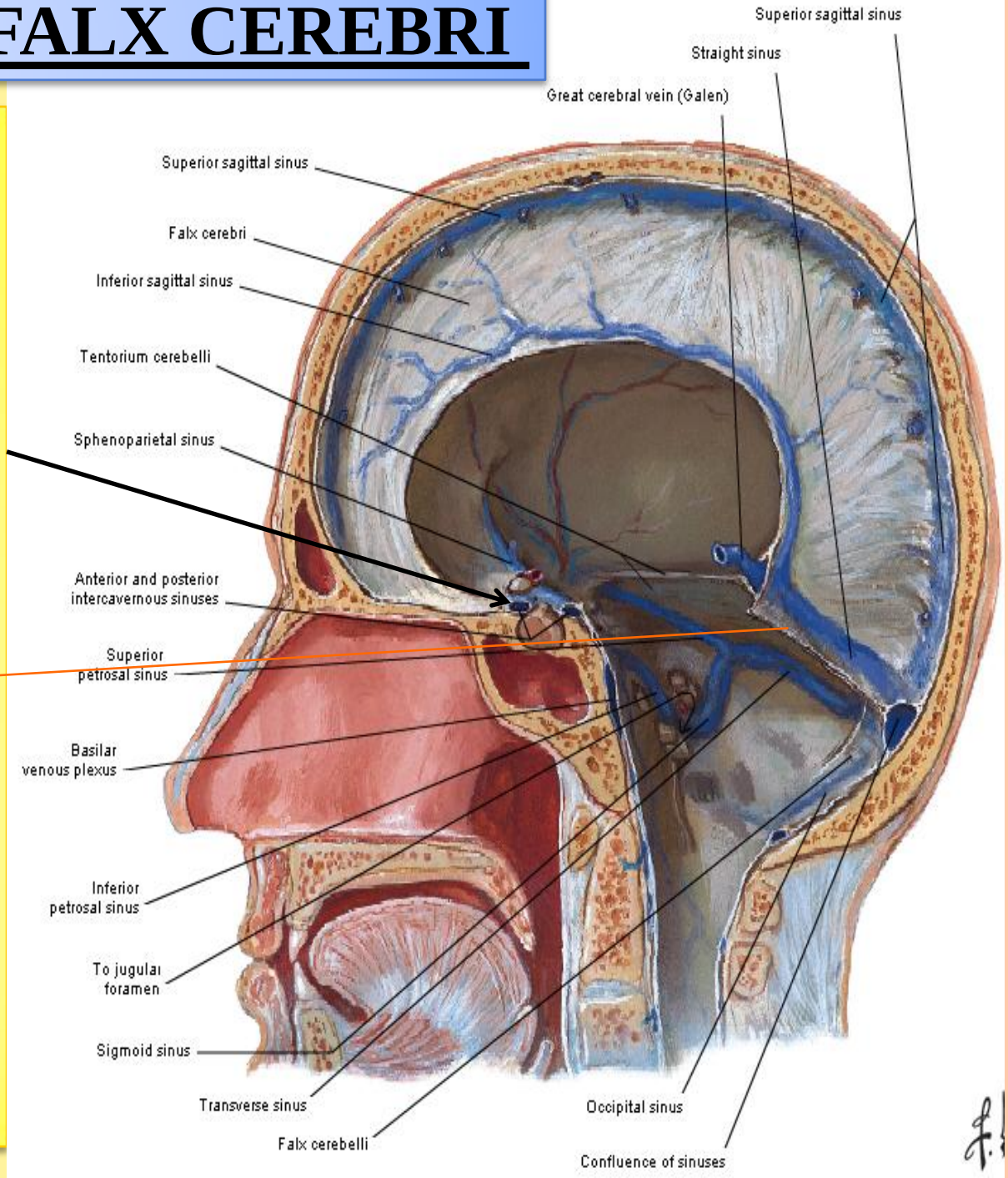
- Its broad **posterior part** blends in the midline with the upper surface of the

Tentorium cerebelli

- The ***superior sagittal sinus*** runs in its ***upper fixed margin***

- the ***inferior sagittal sinus*** runs in its lower ***concave free margin***

- The straight sinus runs along its attachment to the ***tentorium cerebelli.***



THE TENTORIUM CEREBELLI

➢Is a crescent-shaped (or tent-shaped) fold of dura mater

- Roofs over the posterior cranial fossa

➢ It covers the upper surface of the cerebellum and supports the occipital lobes of the cerebral hemispheres.

➢In front is a gap, ***<u>the tentorial notch</u>***, for the passage of the midbrain

➢It has:

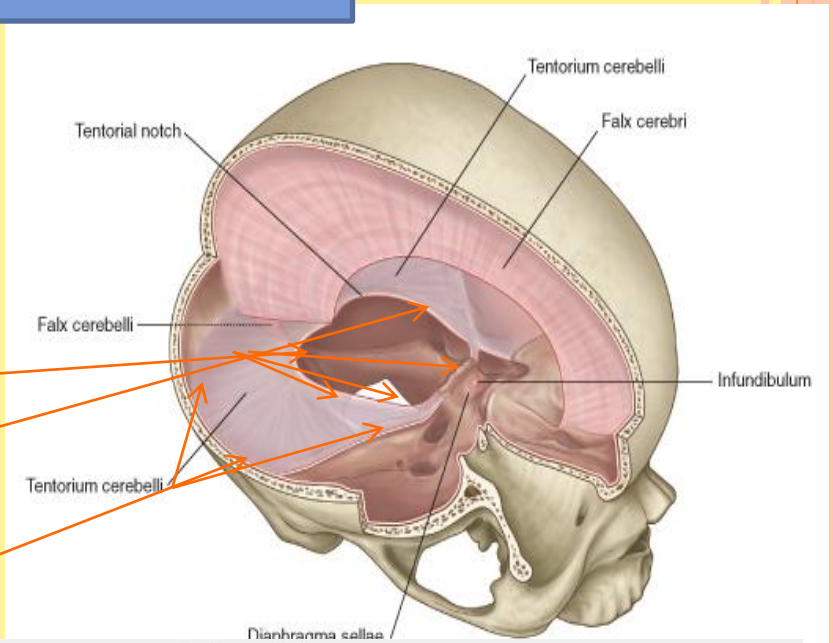
an inner free border

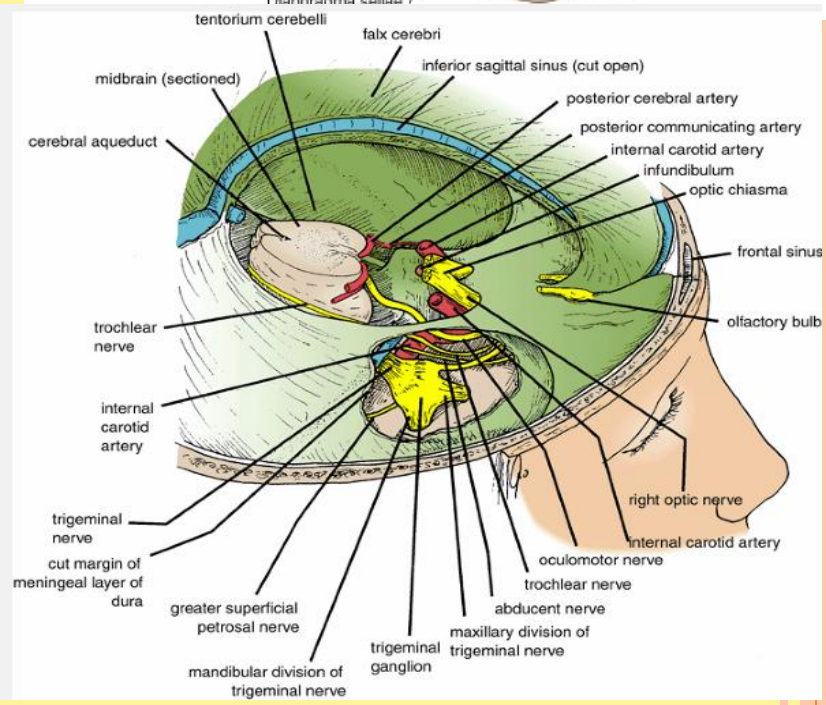
an outer attached or fixed border

➢Divides the cranial cavity into:

1-SUPRATENTORIAL

2-INFRATENTORIAL





➢ **The fixed border is attached to:**

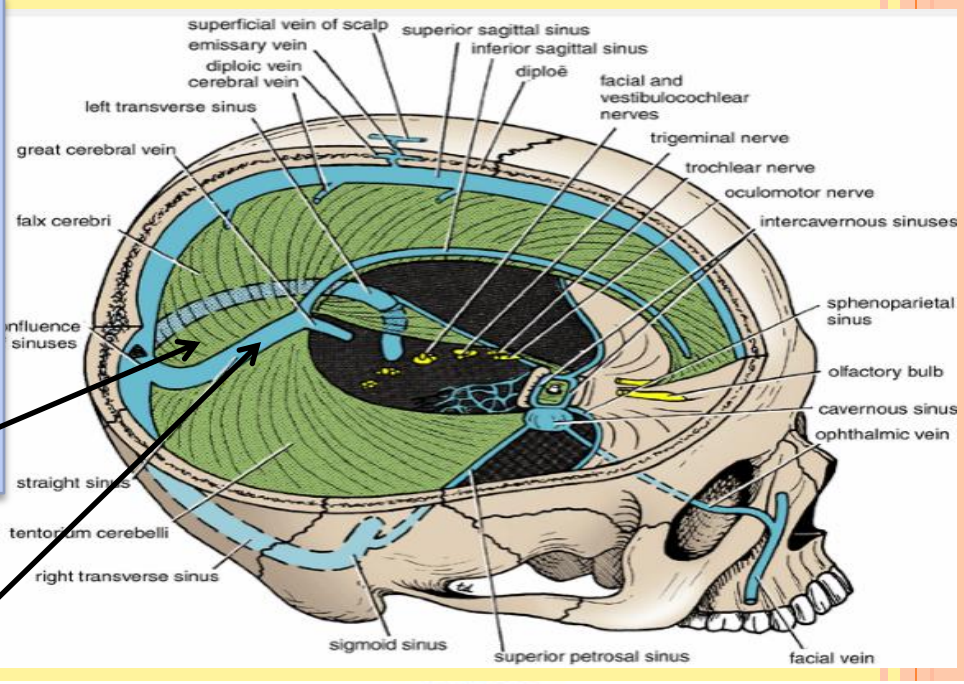
➢ the posterior **<u>clinoid processes</u>**

➢The **<u>superior borders of the petrous bones</u>**

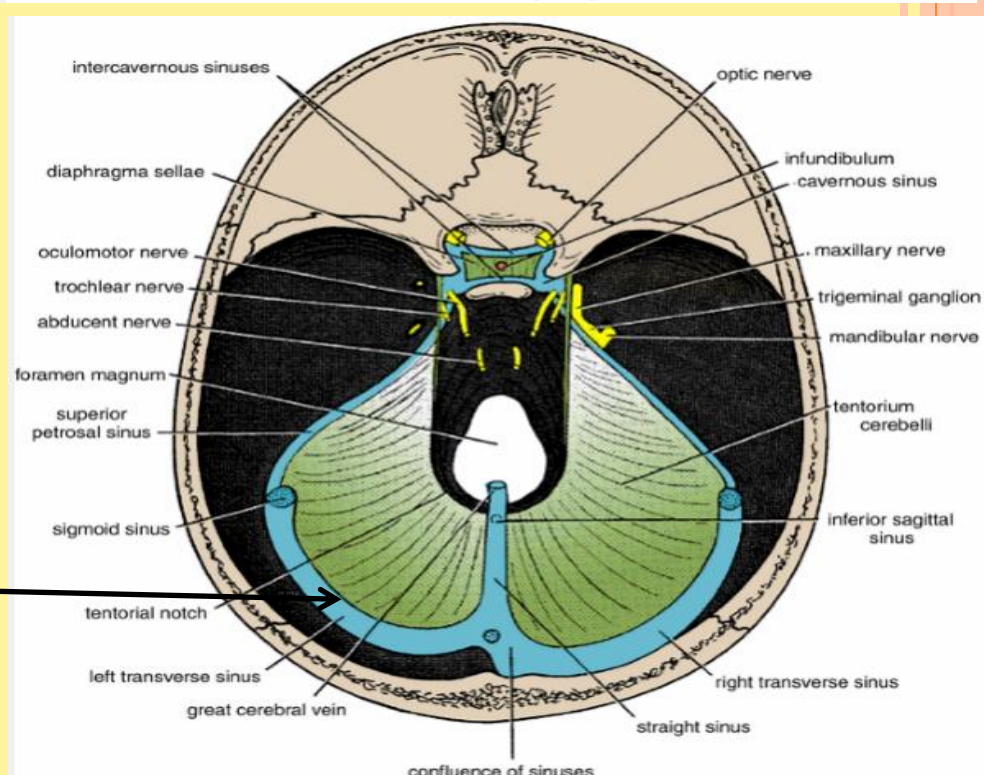
➢The margins of the grooves for the transverse sinuses on the occipital bone

The free border runs forward at its two ends:

- Crosses the attached border
- Attached to the anterior clinoid process on each side.
- At the point where the two borders cross, the third and fourth cranial nerves pass forward to enter the lateral wall of the cavernous sinus



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



3-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.

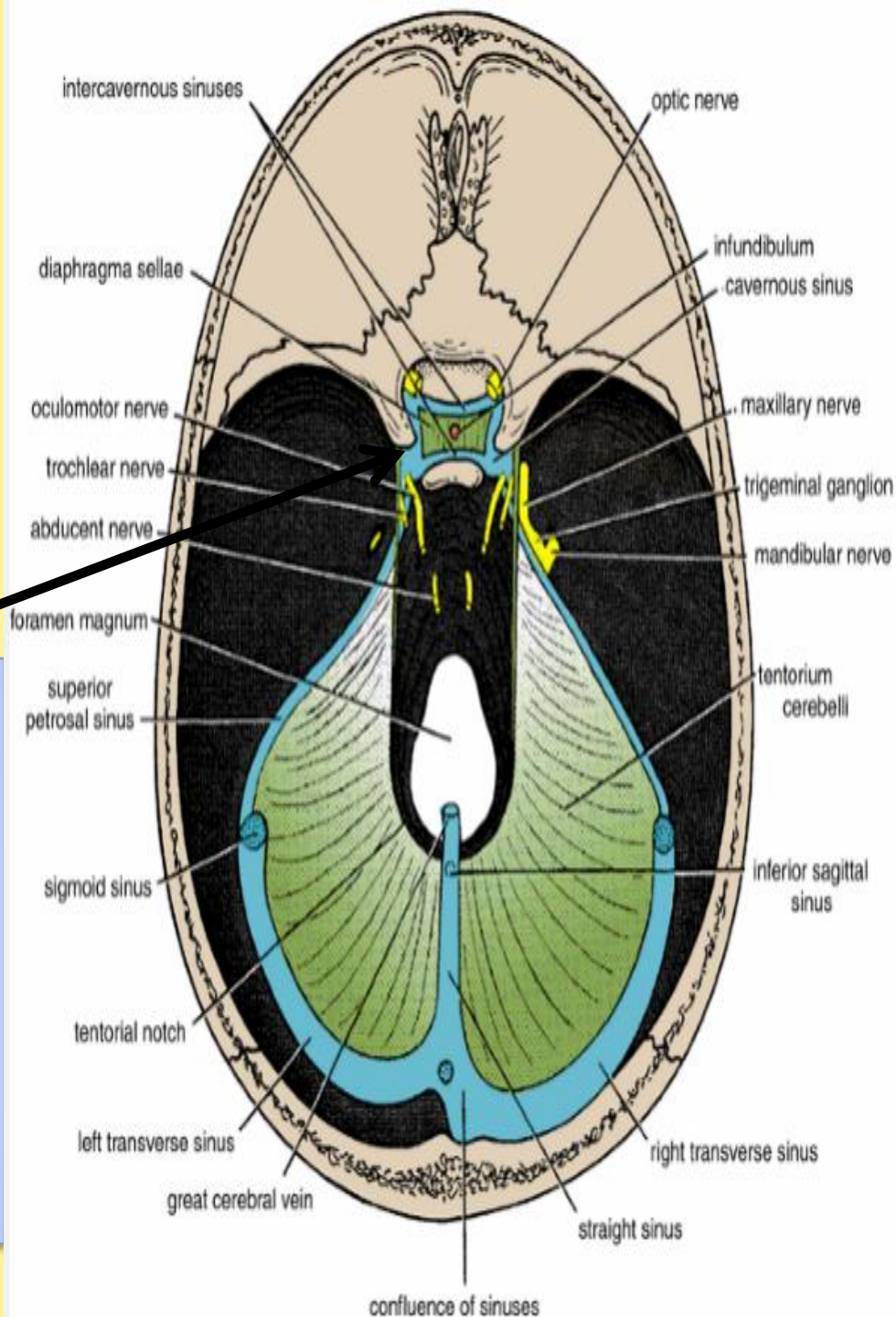
4-THE DIAPHRAGMA SELLAE

➢ Is a small circular fold of dura mater that forms the roof for ***the sella turcica***

➢Attached to the ***tuberculm sellae*** anteriorly

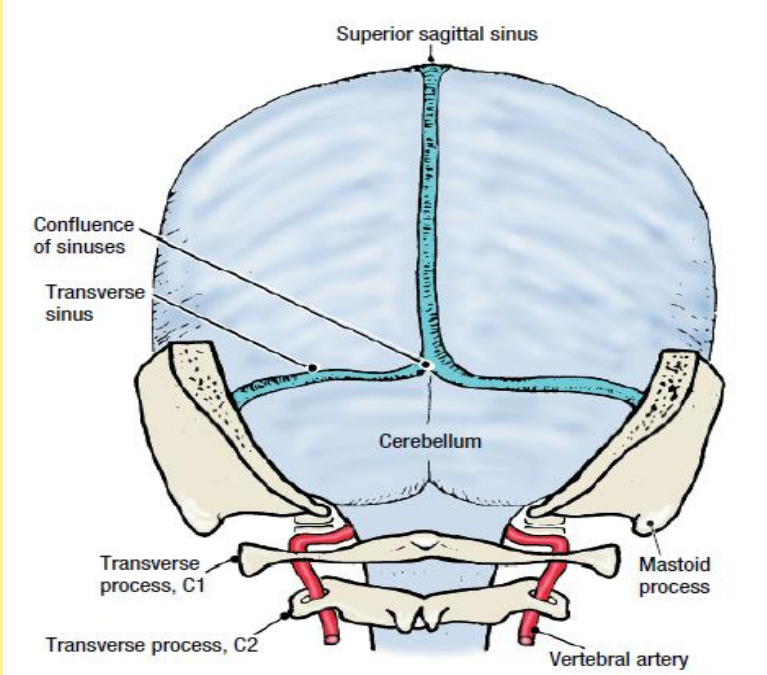
➢Attached to the ***dorsum sellae*** posteriorly

➢A small opening in its center allows passage of the ***stalk of the pituitary gland***



The Venous Blood Sinuses

- are blood-filled spaces situated between the layers of the dura mater
- They are lined by endothelium
- Their walls are thick and composed of fibrous tissue
- They have no muscular tissue
- The sinuses have no valves
- They receive tributaries from the brain, the diplo »ا of the skull, the orbit, and the internal ear



The superior sagittal sinus

lies in the upper fixed border of the falx cerebri

It becomes continuous with ***the right transverse*** sinus.

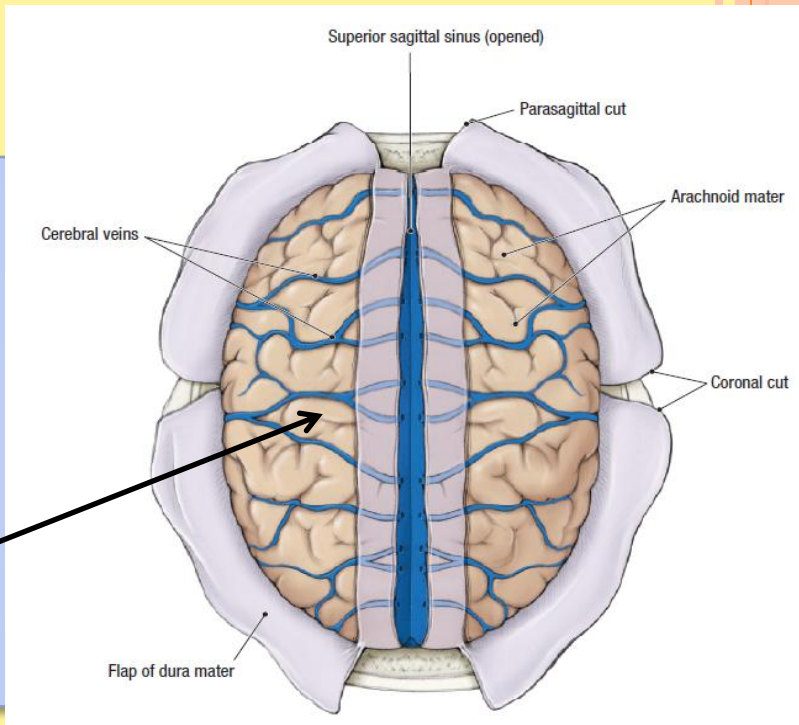
The sinus communicates on each side with the

VENOUS LACUNAE

Numerous arachnoid villi and granulations project into the lacunae

The superior sagittal sinus receives

THE SUPERIOR CEREBRAL VEINS



THE INFERIOR SAGITTAL SINUS

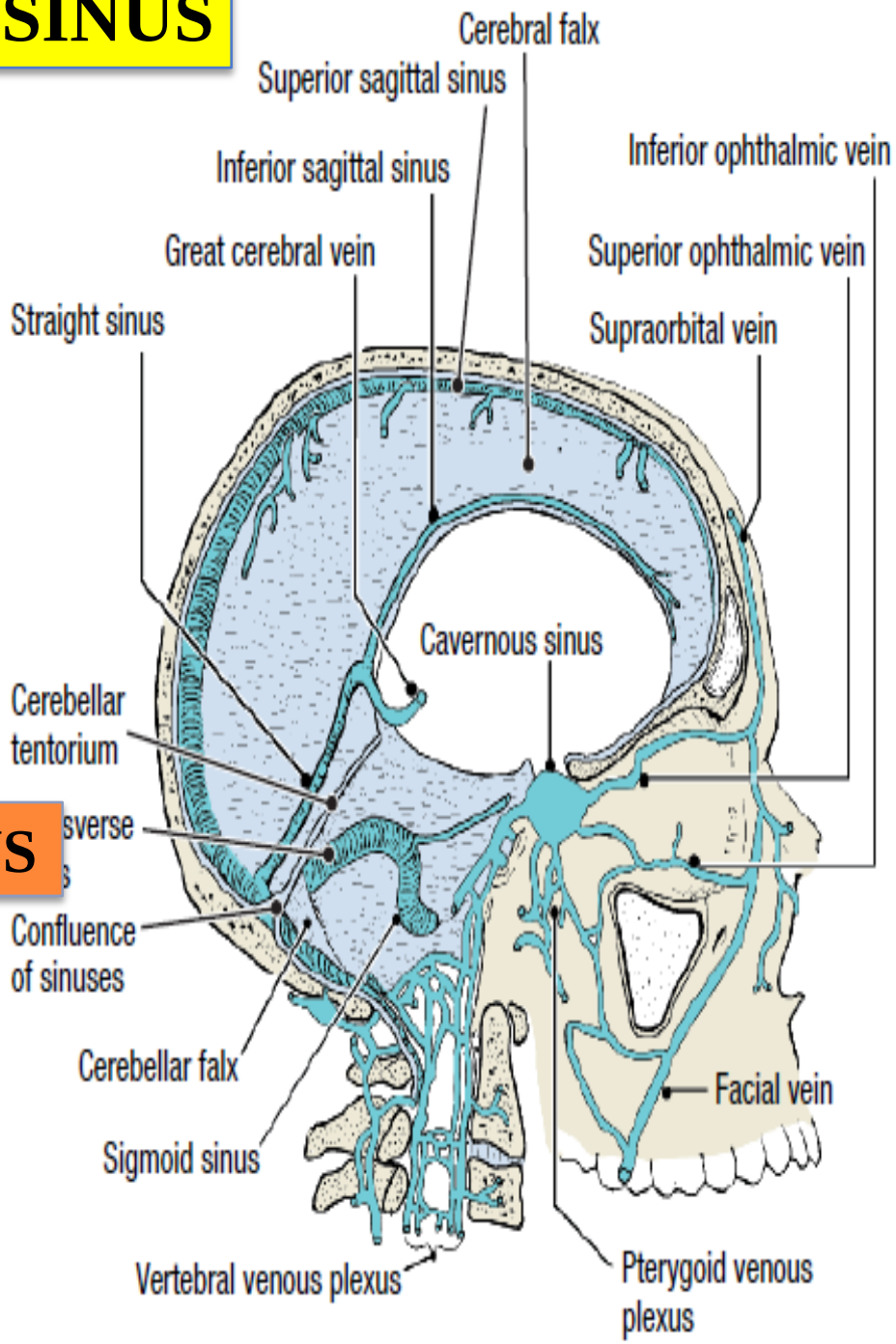
•lies in the free lower margin of the falx cerebri
➢ It runs backward and joins the great cerebral vein to form the straight sinus
➢ It receives cerebral veins from the medial surface of the cerebral hemisphere.

THE STRAIGHT SINUS

➢lies at the junction of the falx cerebri with the tentorium cerebelli
➢Formed by the union of the inferior sagittal sinus with the great cerebral vein
❖ it drains into ***<u>the left transverse sinus</u>***

THE RIGHT TRANSVERSE SINUS

begins as a continuation of ***the superior sagittal sinus; (***the left transverse sinus is usually a continuation of the straight sinus)
❖Each sinus lies in the lateral attached margin of the tentorium cerebelli, and they end on each side by becoming the sigmoid sinus

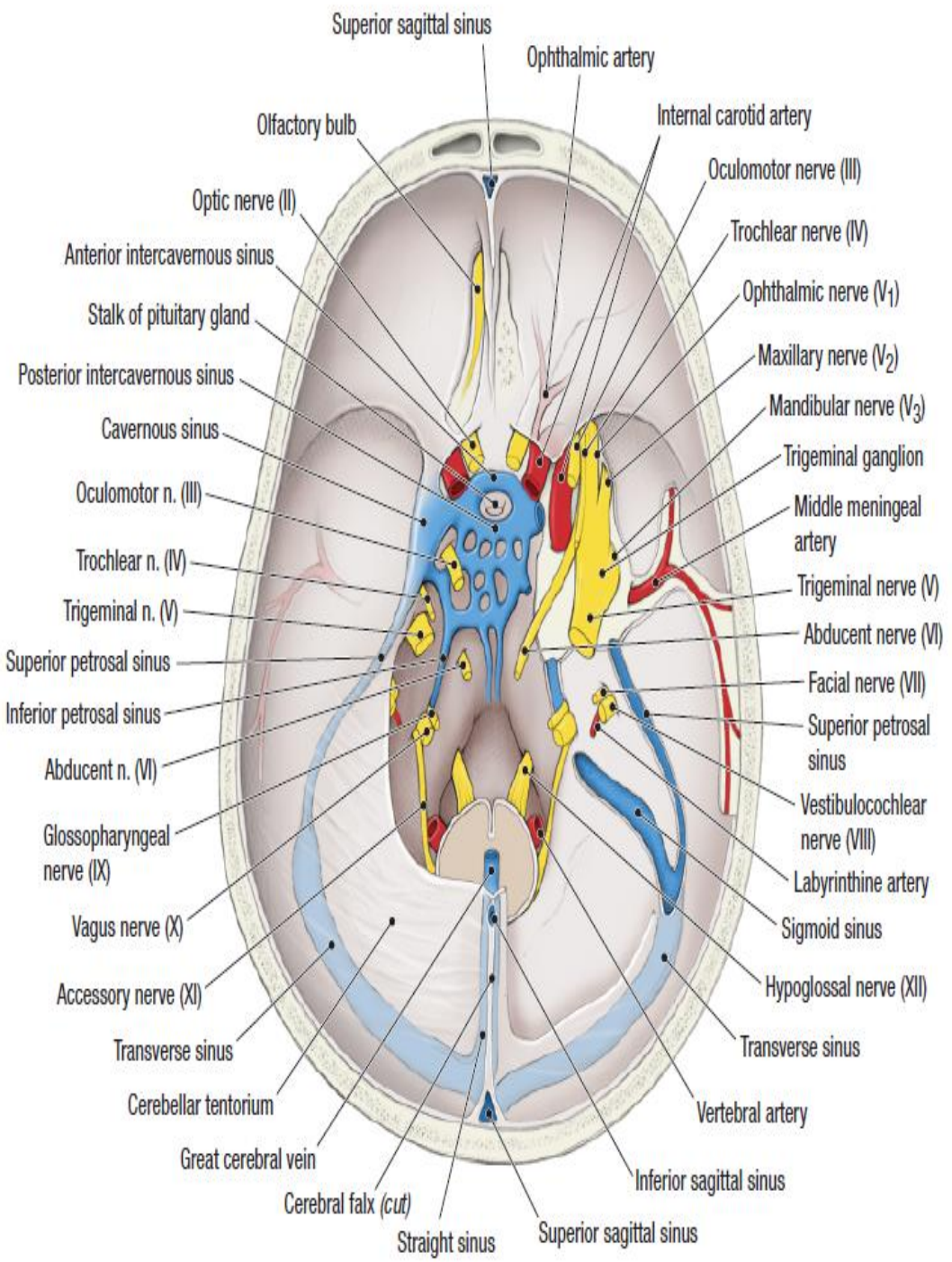


The sigmoid sinuses

- Are a direct continuation of the transverse sinuses
- Each sinus turns downward behind the mastoid antrum of the temporal bone and then leaves the skull through the jugular foramen
- Become the internal jugular vein

The occipital sinus

- lies in the attached margin of the falx cerebelli
- It communicates with the vertebral veins through the foramen magnum and the transverse sinuses



CAVERNOUS SINUS

- lies on the lateral side of the body of the sphenoid bone
- Anteriorly, the sinus receives

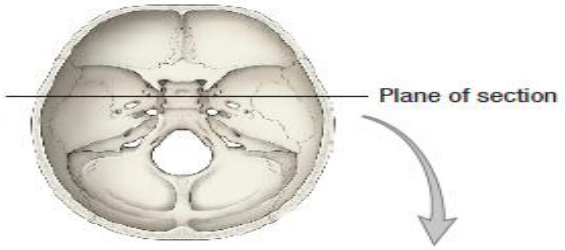
1-The inferior ophthalmic vein

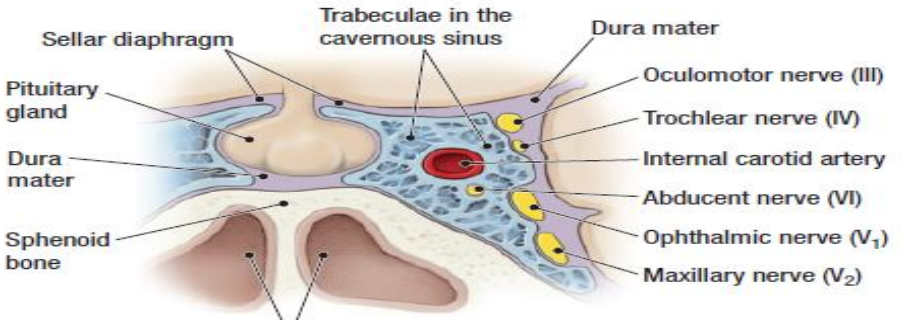
2-The central vein of the retina

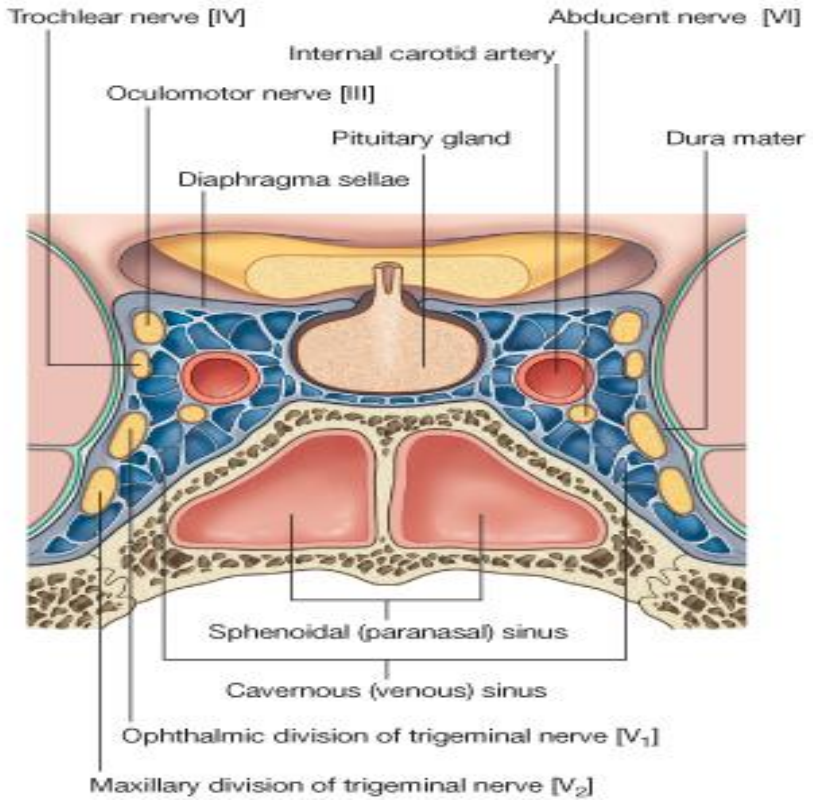
The sinus drains posteriorly into: the *transverse sinus* through

the superior petrosal sinus

Intercavernous sinuses







Important Structures Associated With the Cavernous Sinuses

1-The internal carotid artery

2-The sixth cranial nerve

In the lateral wall

1- The third

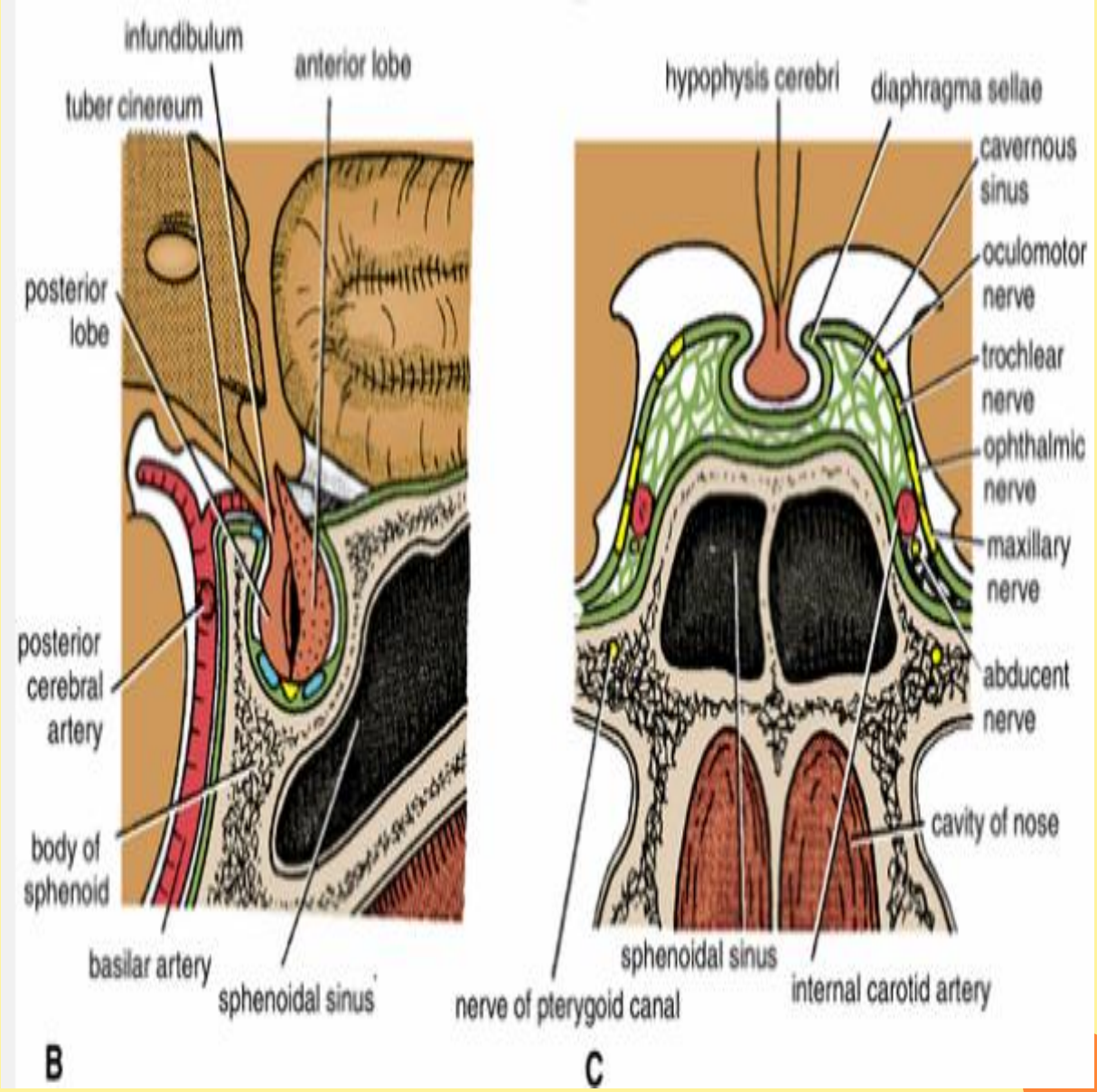
2-Fourth cranial nerves

3-The ophthalmic and maxillary divisions of the fifth cranial nerve

4-The pituitary gland, which lies medially in the sella turcica

5-The veins of the face, which are connected with the cavernous sinus via
1-The facial vein
2-Inferior ophthalmic vein
and are an important route for the spread of infection from the face

6-The superior and inferior petrosal sinuses, which run along the upper and lower borders of the petrous part of the temporal bone



Pituitary Gland (Hypophysis Cerebri)

The pituitary gland is a small, oval structure attached to the undersurface of the brain by the **infundibulum**

The gland is well protected in the sella turcica of the sphenoid bone