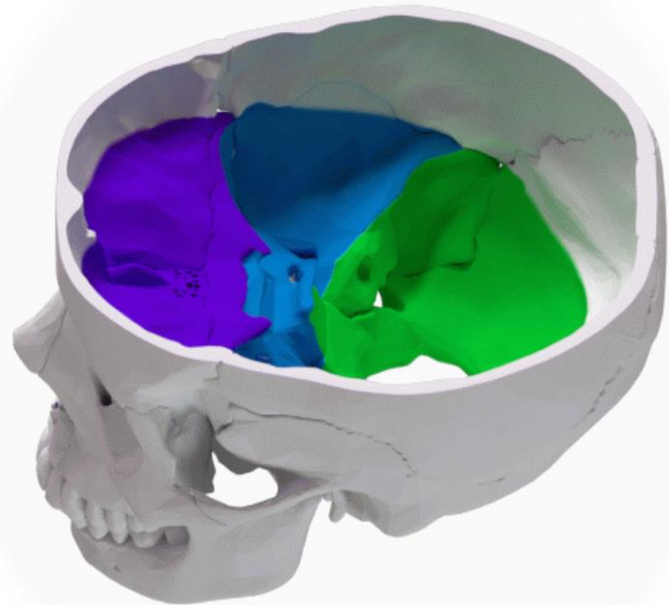




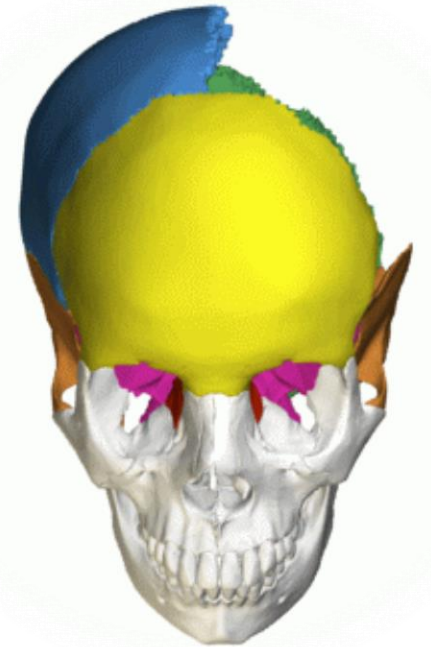
Human Anatomy - 2nd year



**Cranial cavity
Lecture (3)
By Dr: Hassna Bader Jawad
Department of human
anatomy
College of medicine
University of Basrah**

At the end of lecture you should be able to :

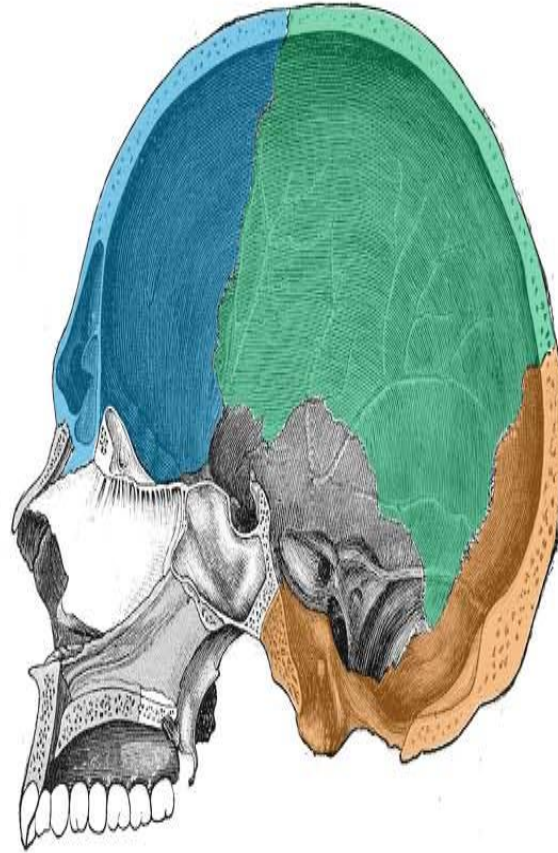
- 1. Identify the cranial fossae**
- 2. Recognize the different foramina and the structures passed through.**



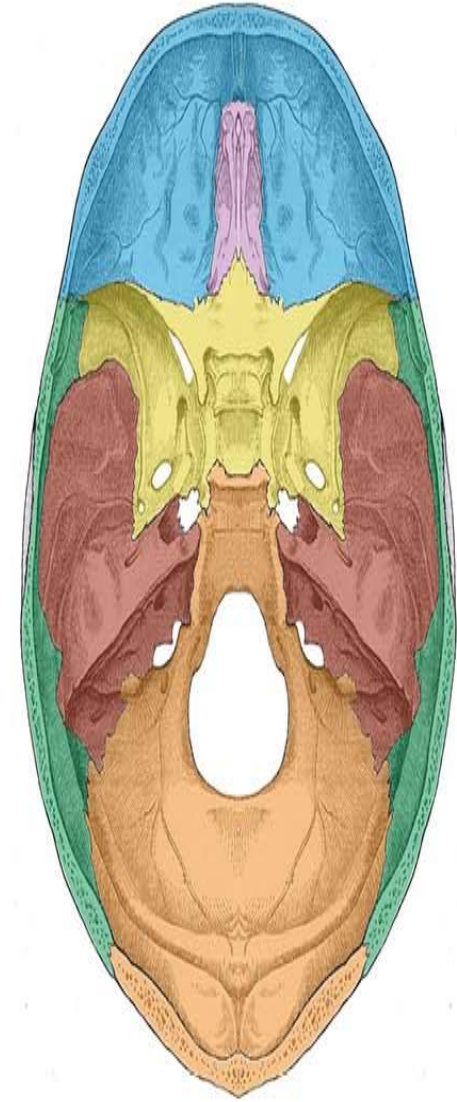
The cranial cavity

The cranial cavity (interior of skull) is divided into

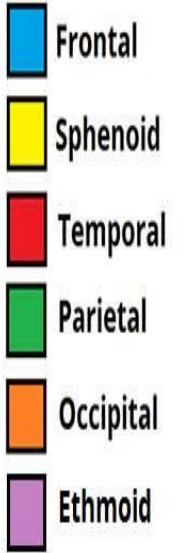
1. Calvaria (superior)
2. Base of the skull (inferior)



a) Bones of the calvarium



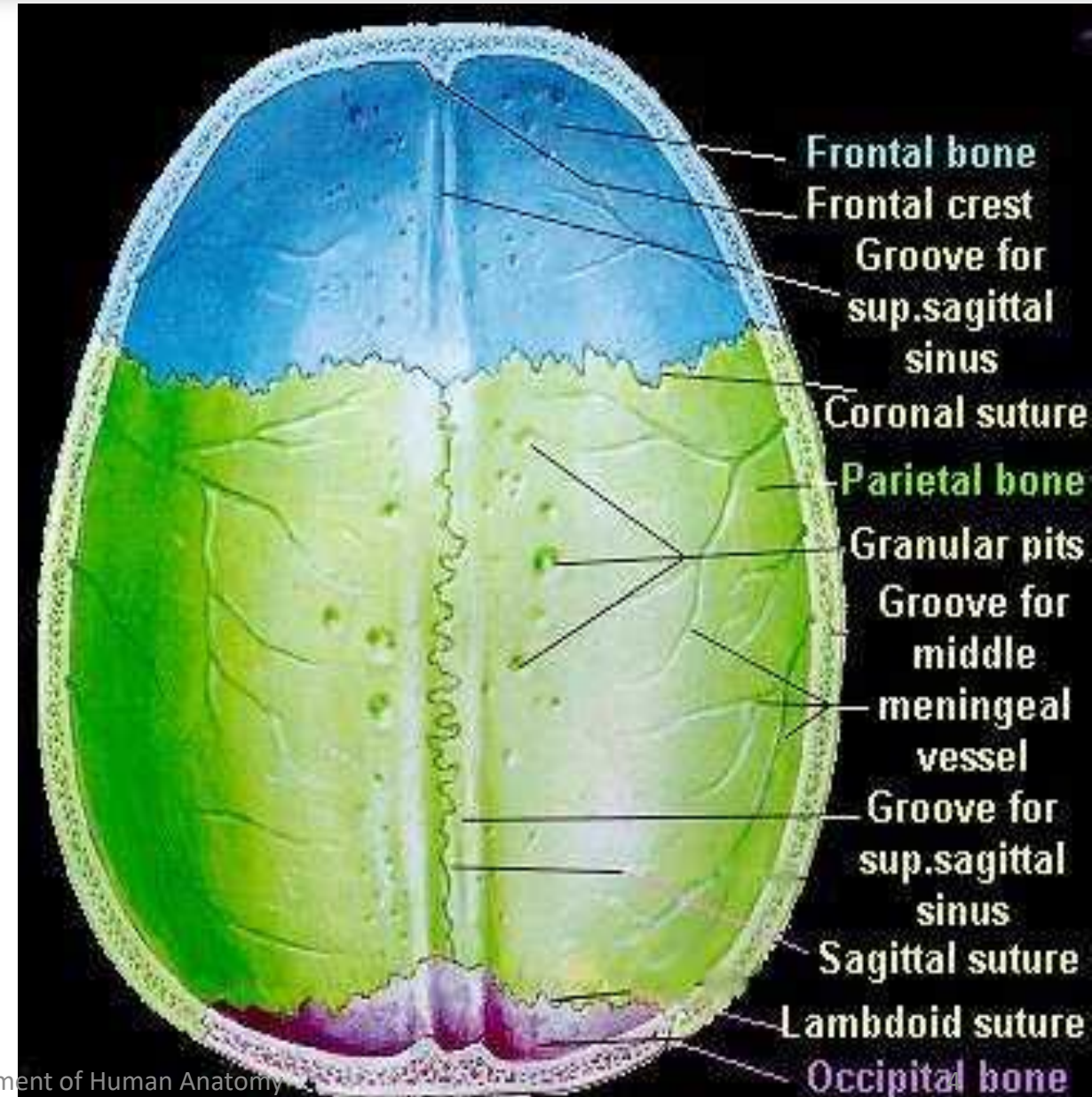
b) Bones of the cranial base



Calvaria

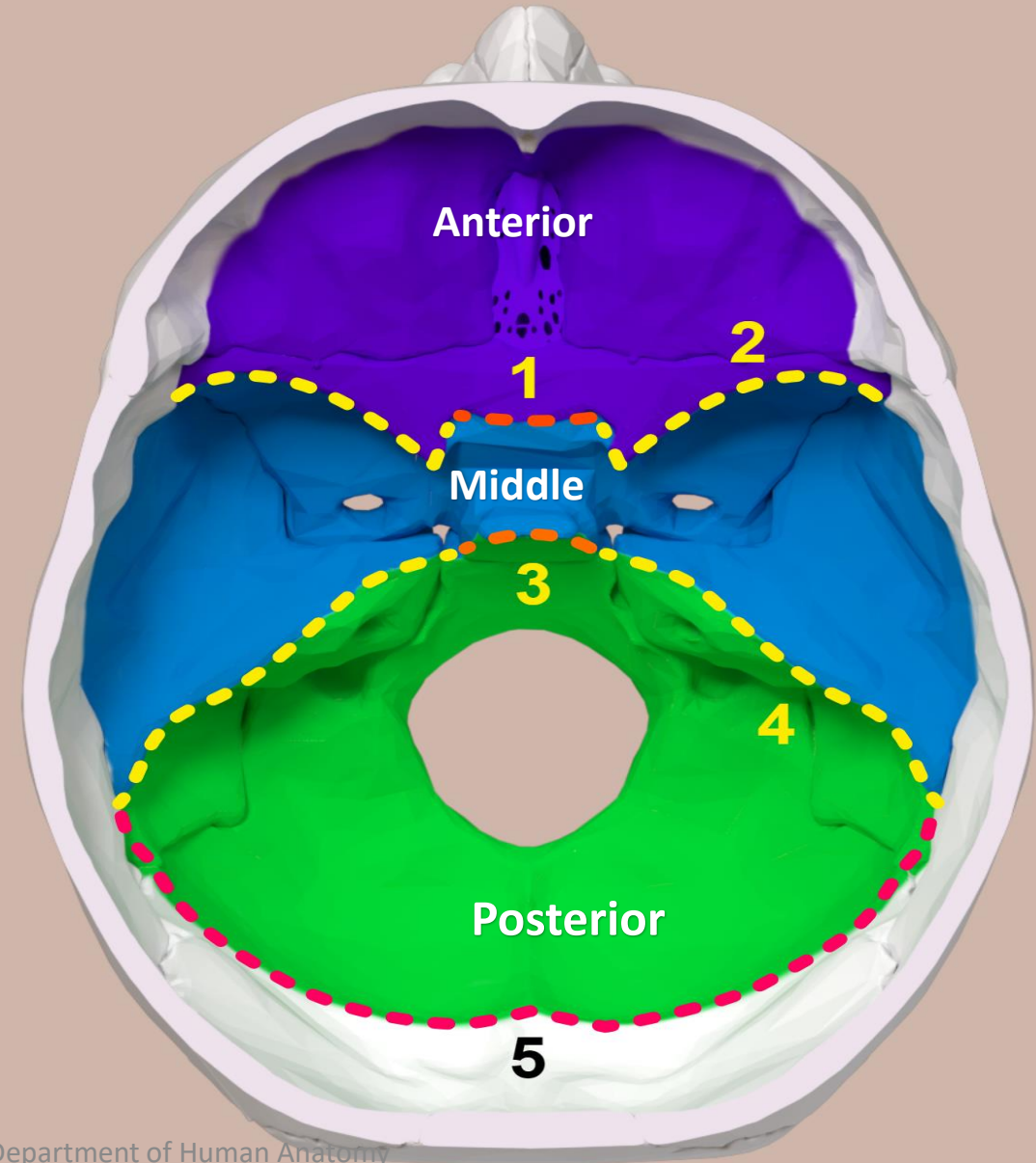
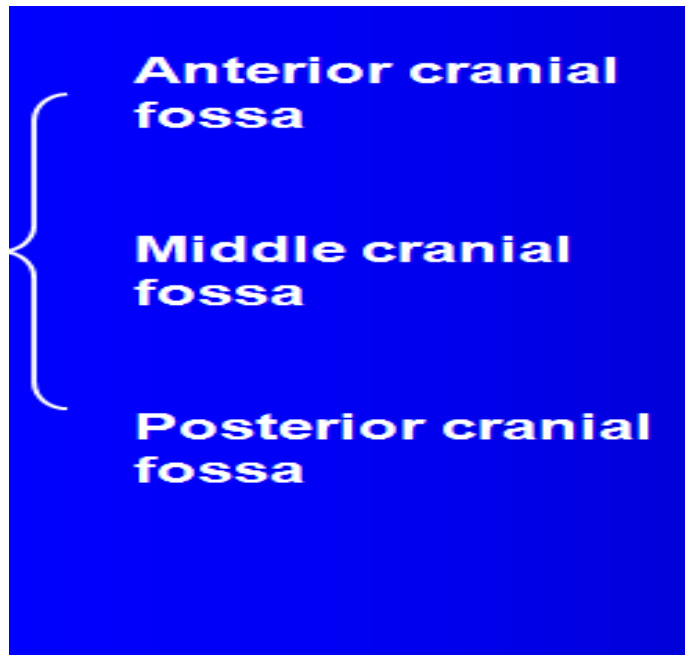
It is (Roof of skull) top part of the neurocranium and covers the cranial cavity containing the brain. It is made up of the superior portions of the frontal bone, occipital bone, and parietal bones .It contains :

- Sulcus for superior sagittal sinus
- Granular foveola pits
- Arterial grooves
- Frontal crest
- Coronal suture
- Sagittal suture
- Lambdoid suture



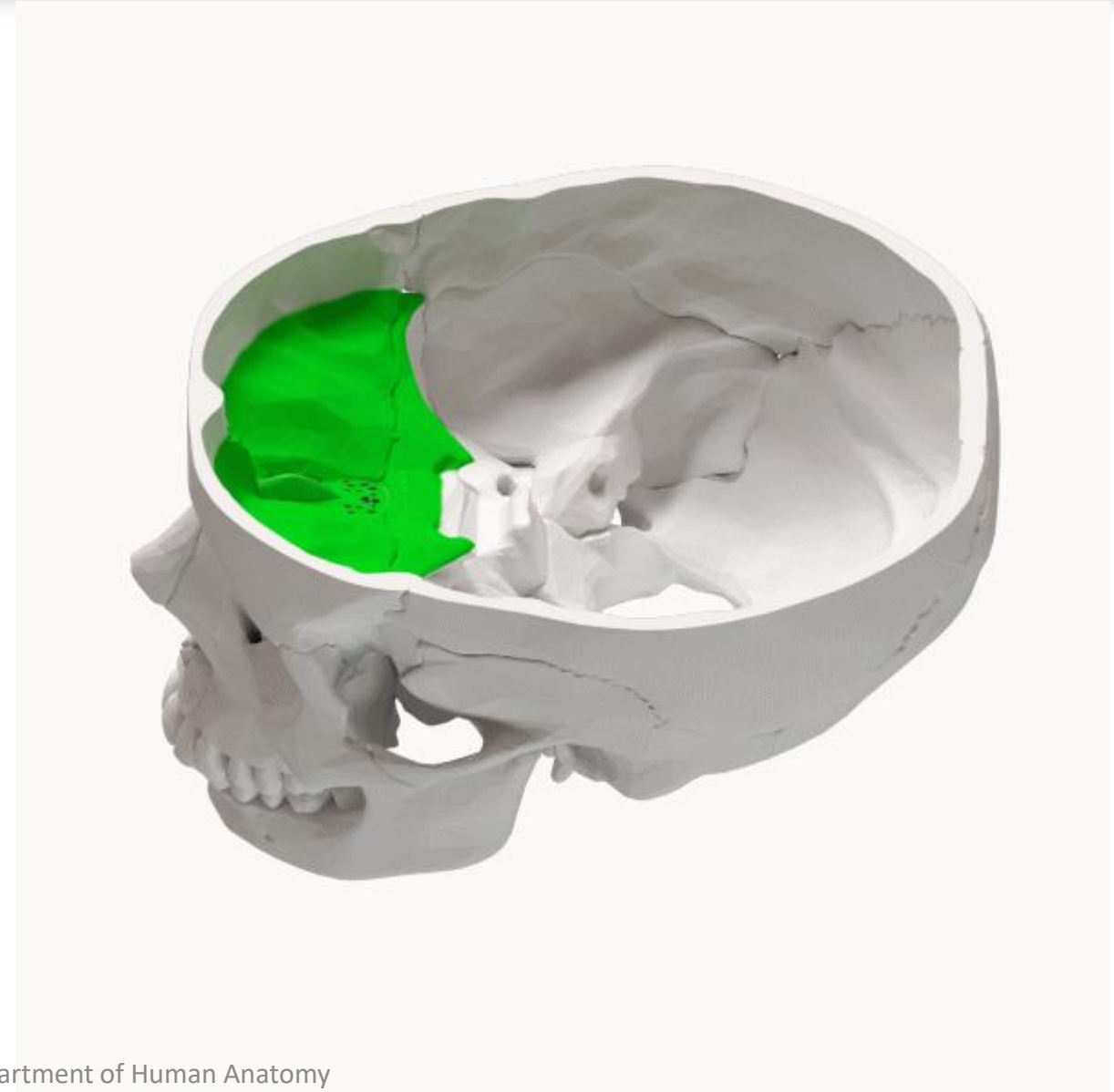
Base of skull

Forms the floor of the cranial cavity and separates the brain from other facial structures



Anterior Cranial Fossa

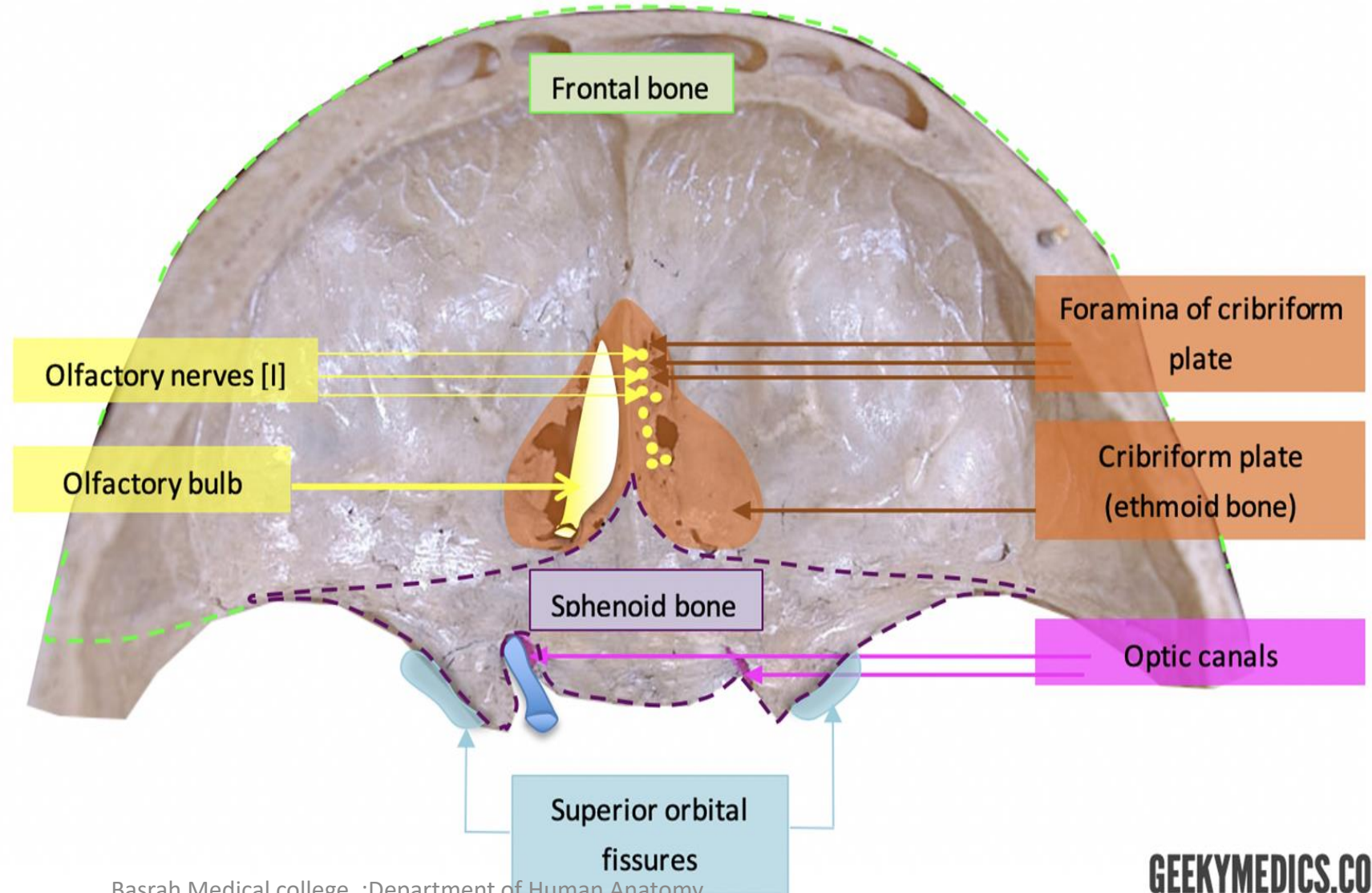
Is a depression in the floor of the cranial vault which houses the projecting frontal lobes of the brain. It is formed by the following bones:



Anterior Cranial Fossa

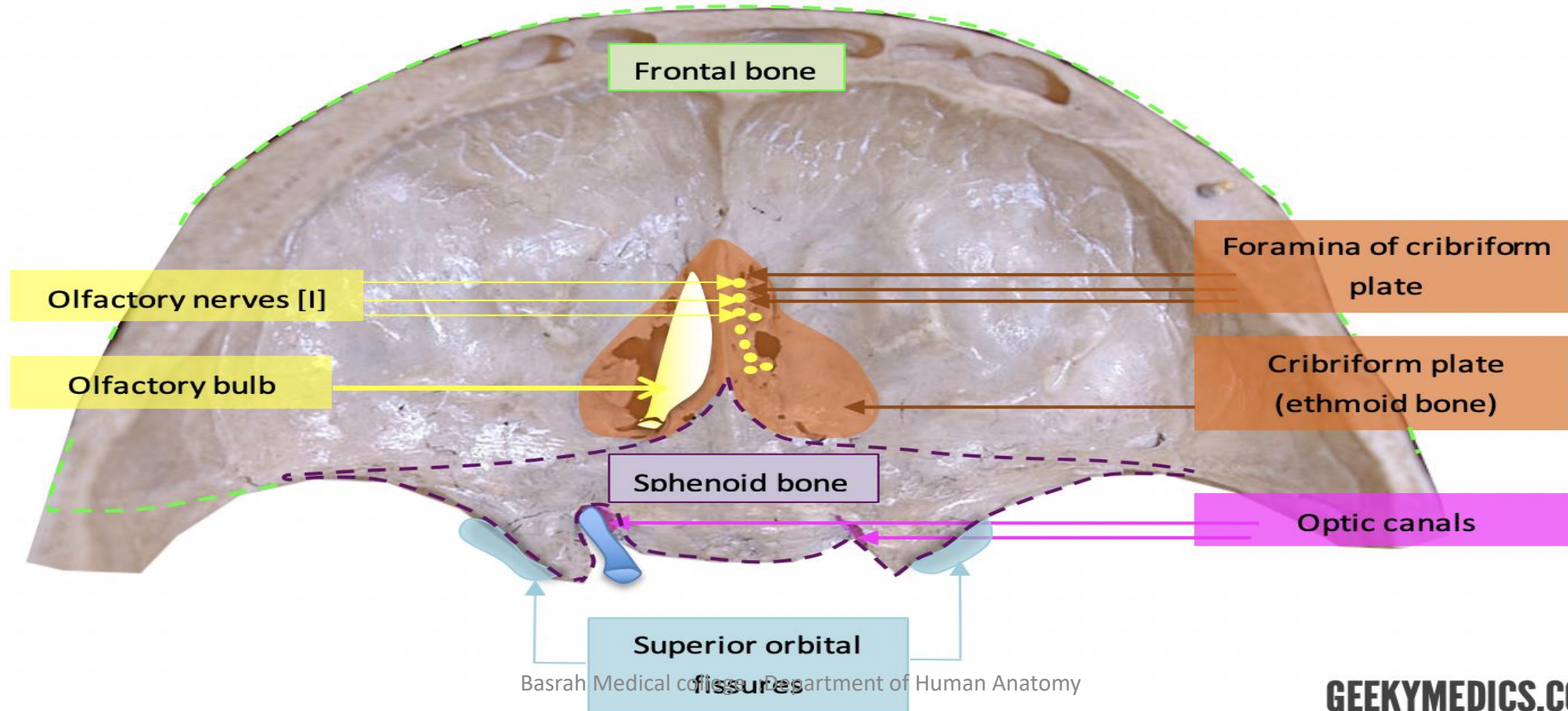
Bones Forming the fossa

1. **Orbital plates of the frontal bone**
2. **The cribriform plate of ethmoid bone**
3. **The lesser wings and the front of the body of sphenoid.**
4. **Olfactory foramen**



Boundaries

**1. Anteriorly and laterally by the inner surface of the frontal bone.
In the midline there is a crest for the attachment of the falx cerebri.**

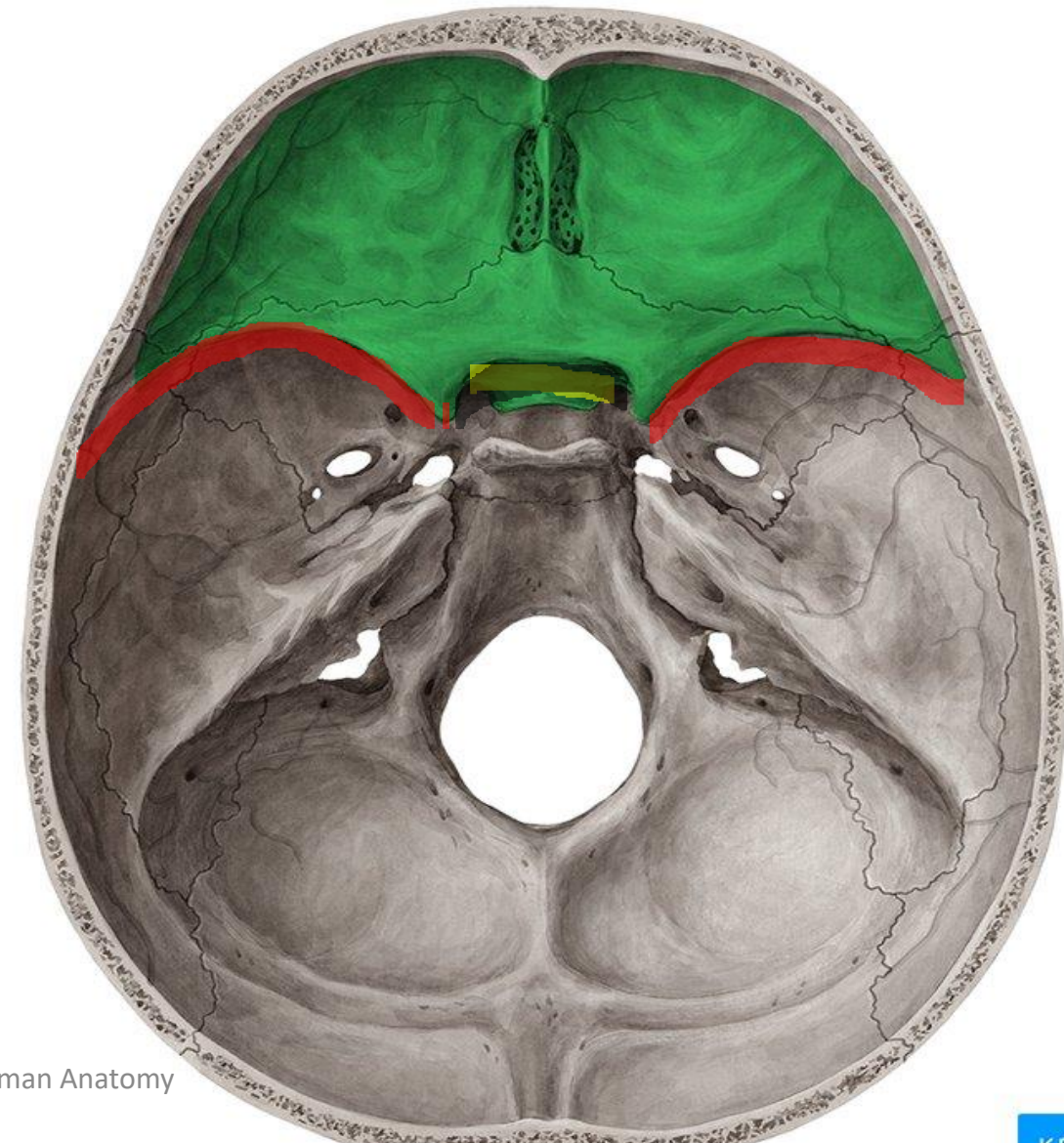


Boundaries

2. Posteriorly

Lesser wing of the sphenoid bone

Groove for the optic chiasma



Boundaries

The floor is formed
Laterally by
orbital plates of the frontal
bone

Centrally by the cribriform
plate of the ethmoid bone
and crista galli

Foramina cecum Small
aperture between the
crista galli and the crest of
the frontal bone. It
transmits emissary vein
from nose to superior
sagittal sinus.

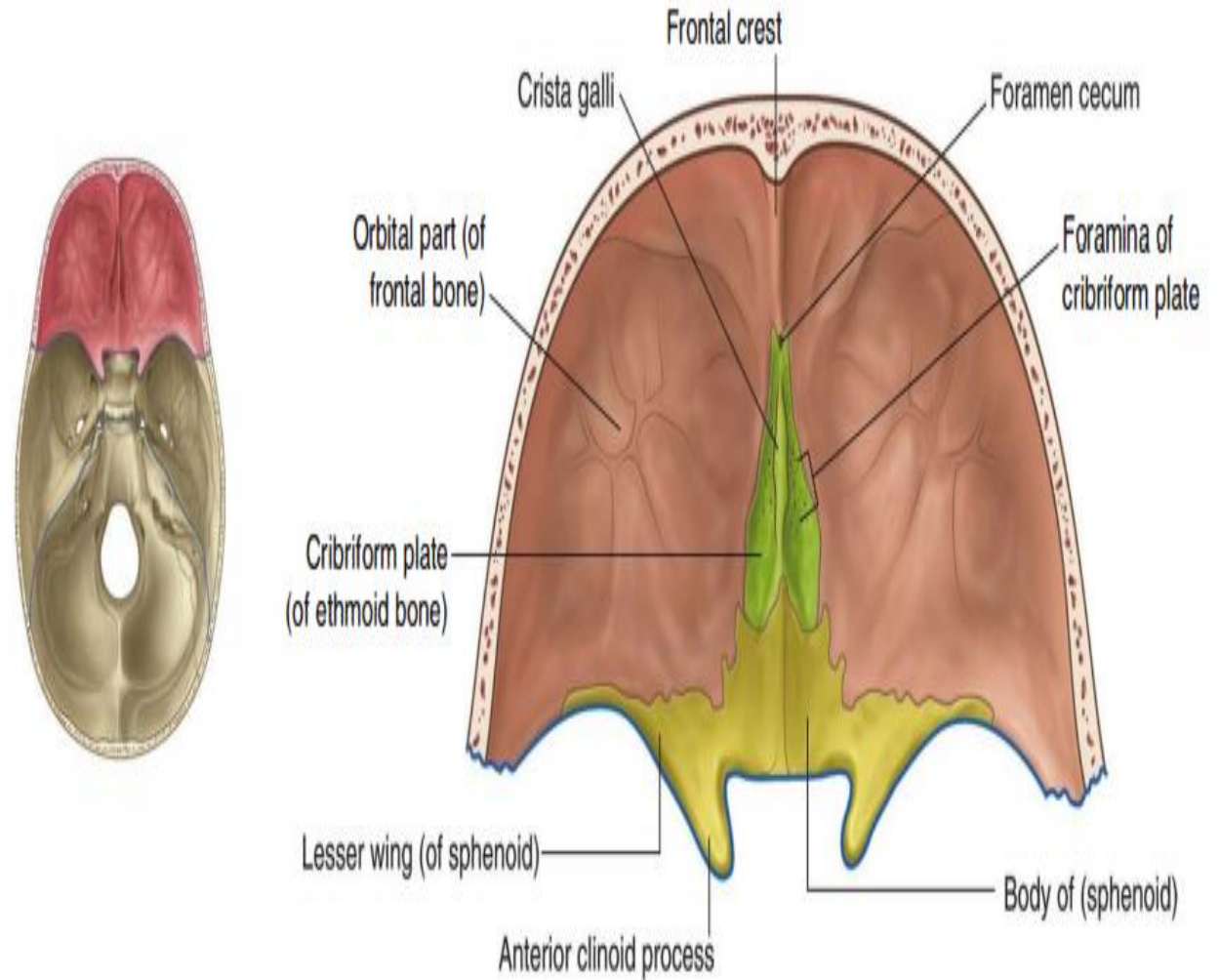
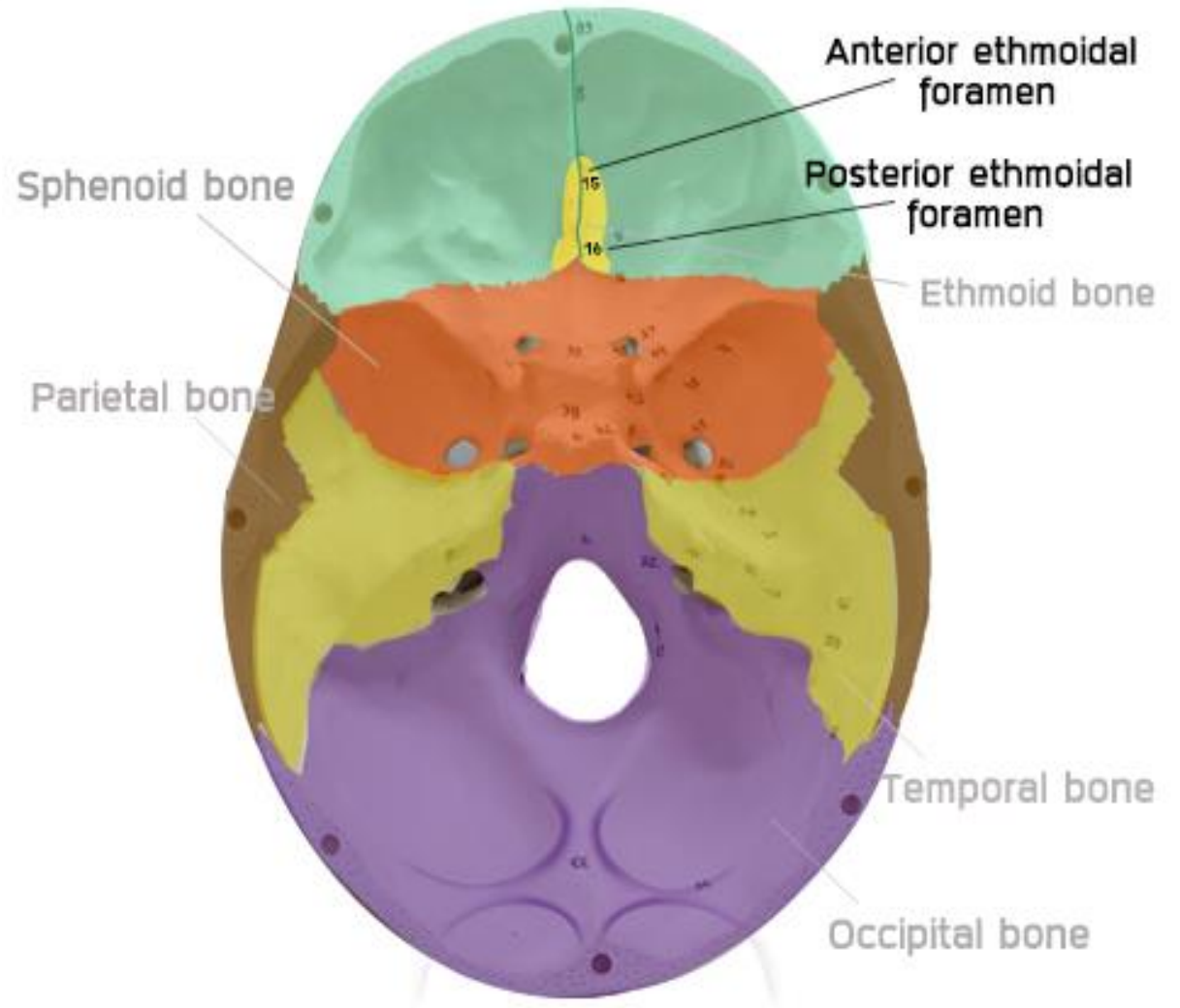


Fig. 8.25 Anterior cranial fossa.

Boundaries

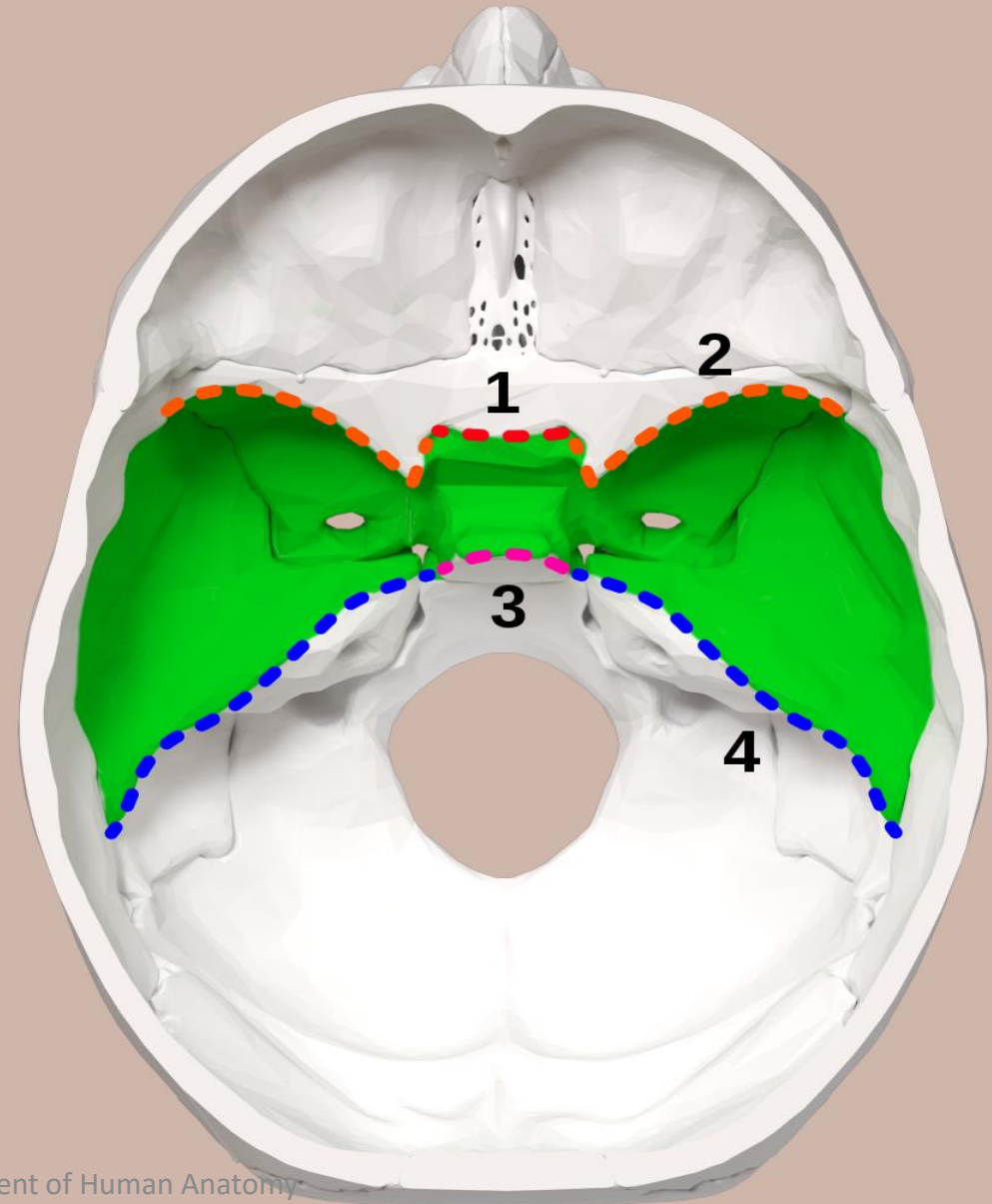
- ➡ **Anterior and posterior Ethmoidal canals:**
- ➡ **There are 2 anterior Ethmoidal canals on the sides of upper surface of ethmoid for the passage of anterior Ethmoidal vessels and nerves. While posterior Ethmoidal canals give passage to post Ethmoidal vessels only.**



1. **Orbital part** of frontal bone not only forms the floor of anterior cranial fossa but also the roof of the orbit. If injury occurs to this plate, then bleeding from eyes could occur.
2. **If cribriform plate** is injured, then there will be loss of sensation of smell.
3. **Regarding foramina cecum** in that infection of the nose and nearby areas can be transmitted to brain and meninges through emissary vein .

Middle cranial fossa

is the centermost of the three fossae in the base of skull. It lodges the temporal lobes of the cerebral hemispheres. It is formed by the following bones:



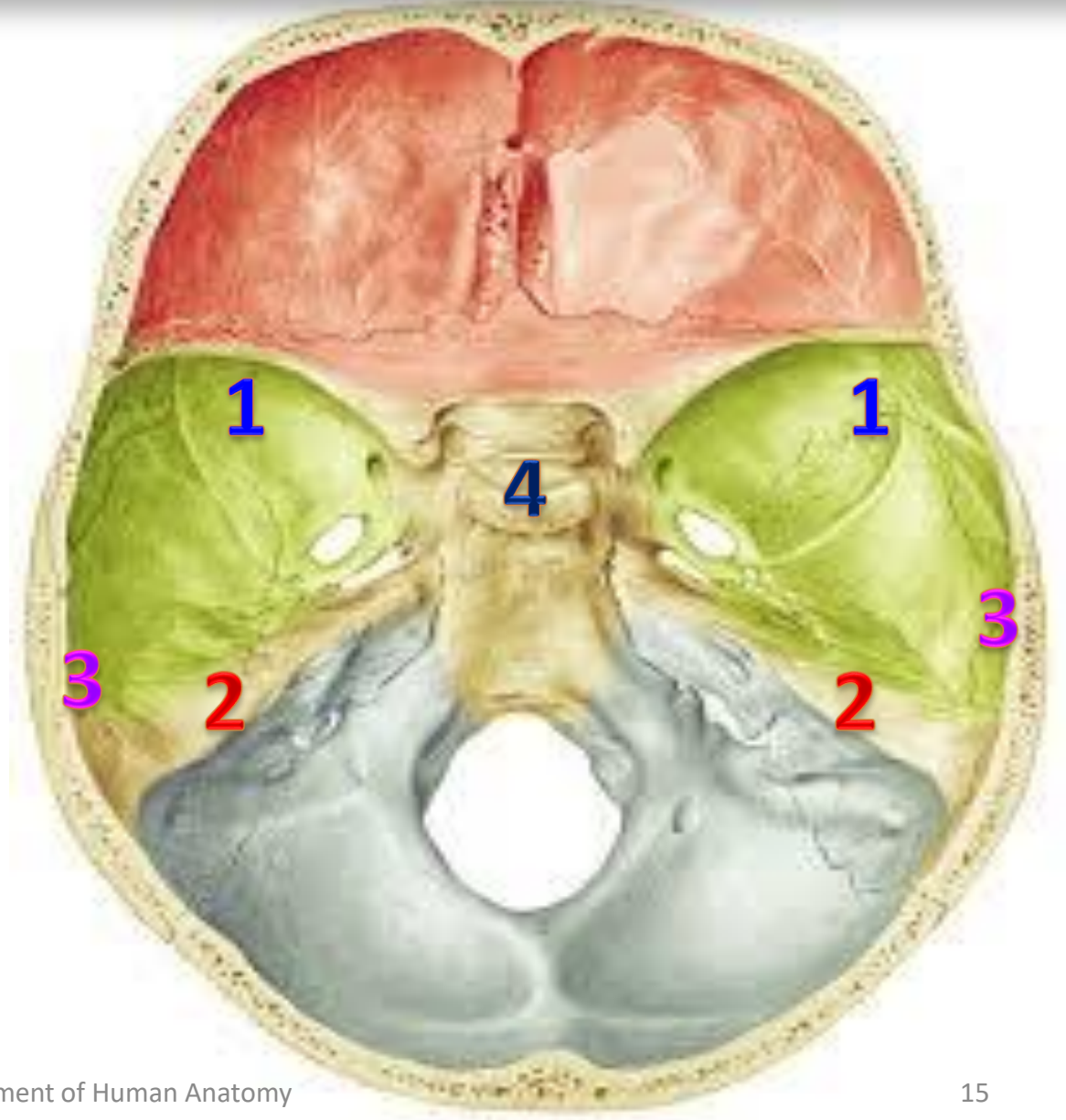
Middle cranial fossa

1. Body and greater wing of sphenoid bone.
2. Parts of temporal bone.
3. Parts of parietal bone.



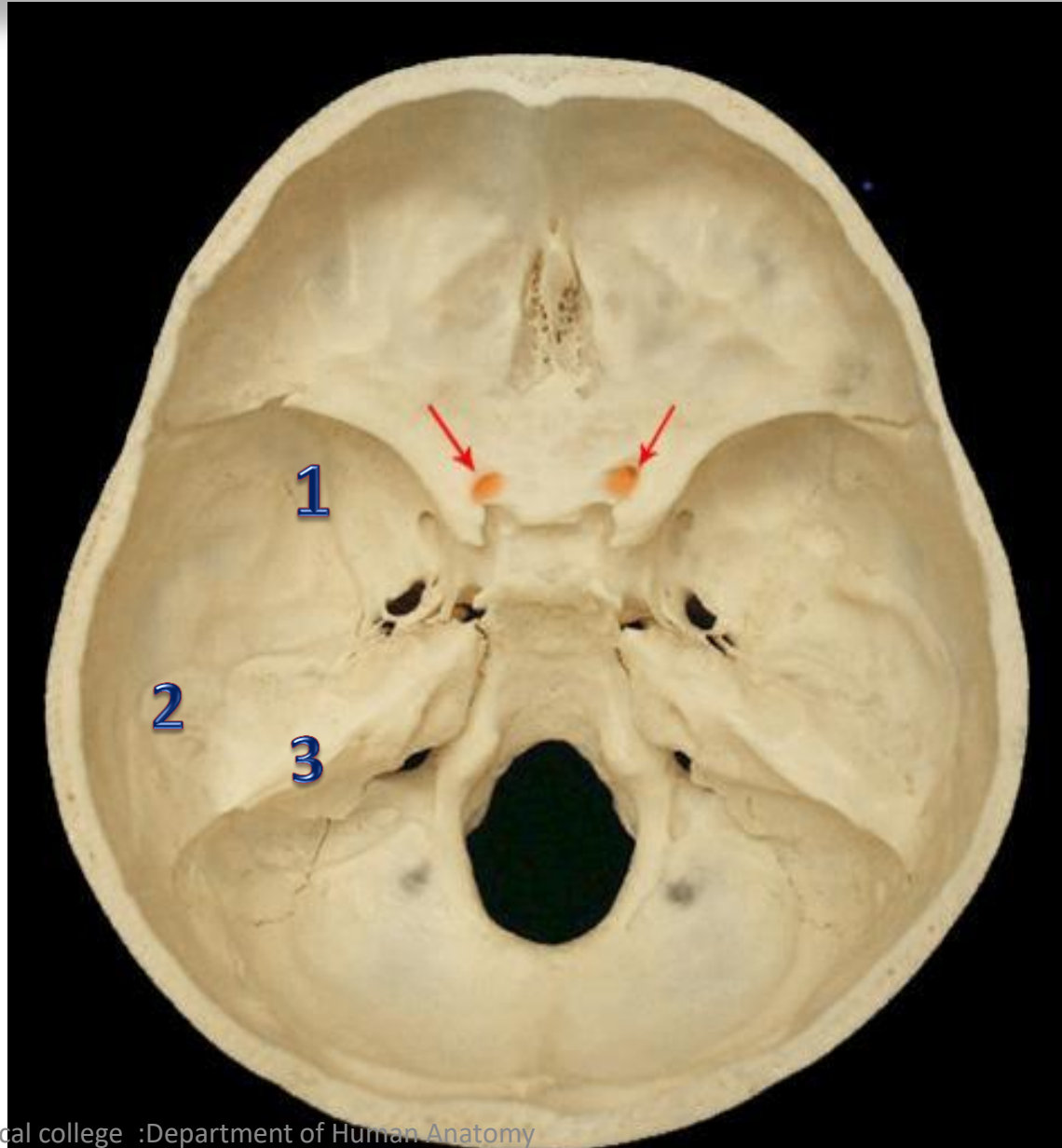
Boundaries

- **1. Anteriorly: Greater wing of sphenoid bone**
- **2. Posteriorly: superior borders of petrous part of temporal**
- **3. Laterally: squamous part of temporal and some part of parietal and greater wings of sphenoid**
- **4. Centrally: sella tursica of sphenoid bone**



Middle cranial fossa

- The floor is formed by
- 1. Greater wing of the sphenoid
- 2. Squamous part of temporal bone
- 3. Petrous parts of the temporal bone



Middle cranial fossa

1. Optic canal:

Transmits the optic nerve & ophthalmic artery

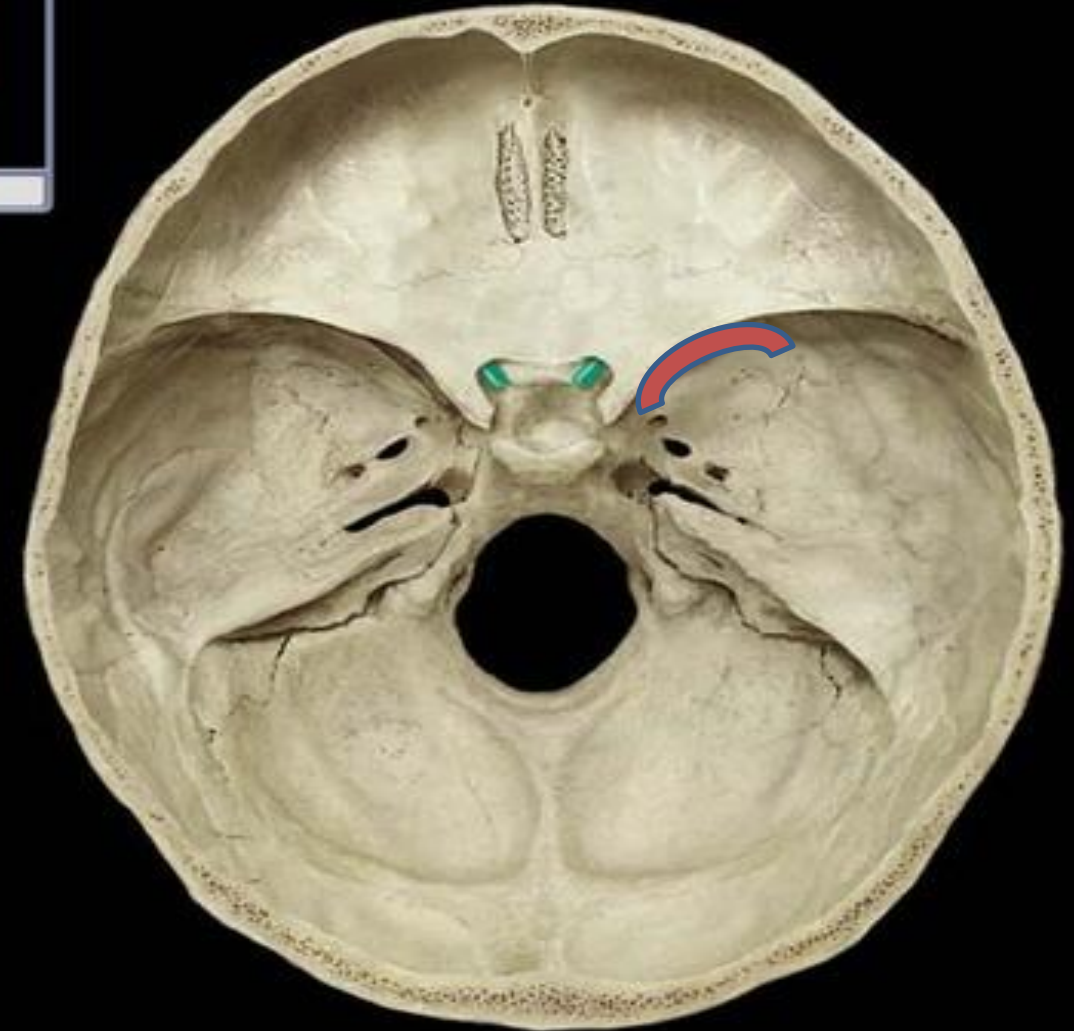
2. Superior orbital fissure:

Transmits ophthalmic division of trigeminal nerve (5th cranial nerve)

lacrimal, frontal, trochlear (4th cranial nerve) , oculomotor (3rd cranial nerve) , nasociliary and abducent (6th cranial nerve) , nerves as well as the ophthalmic veins



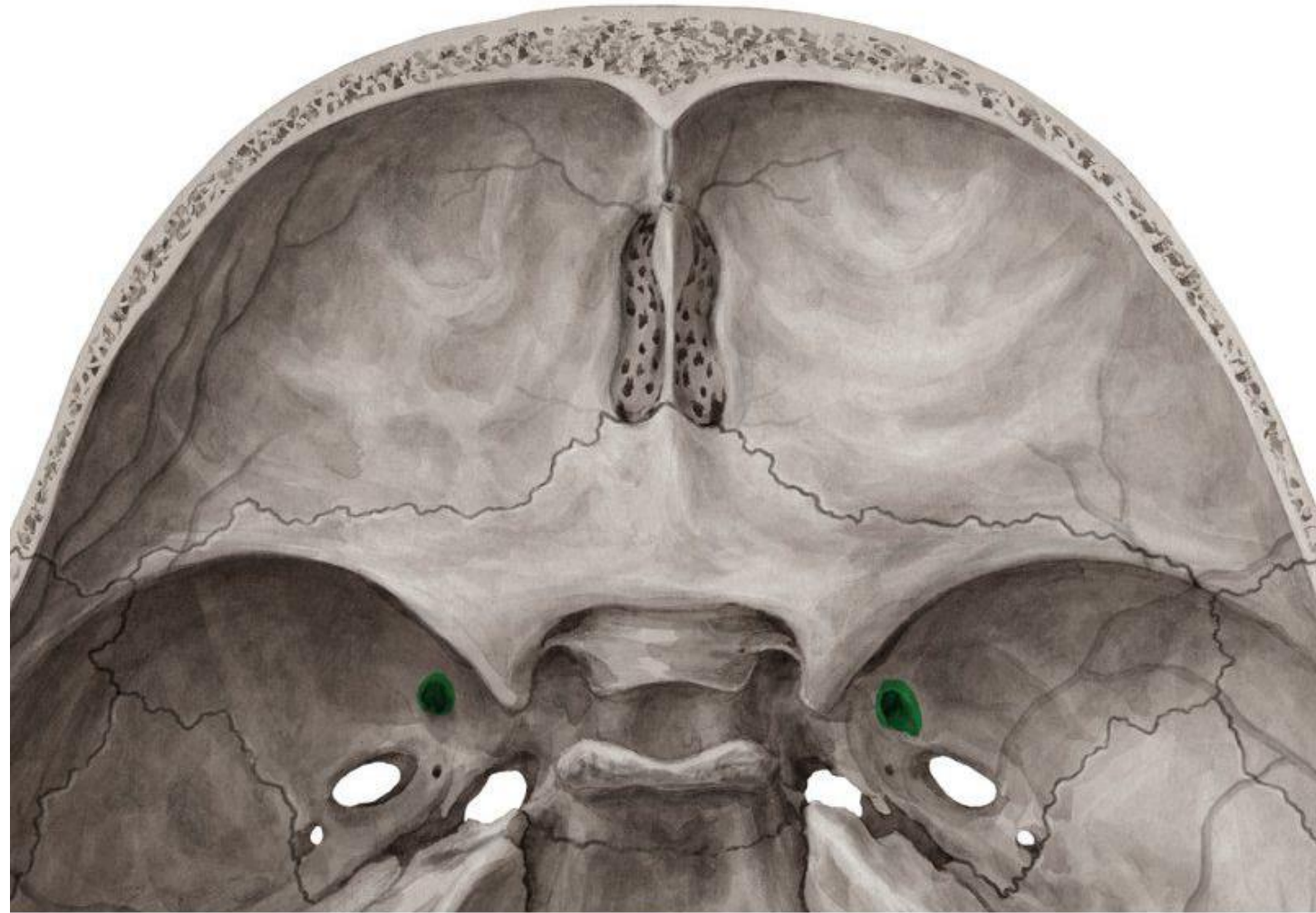
Skull - cranial cavity



Superior view

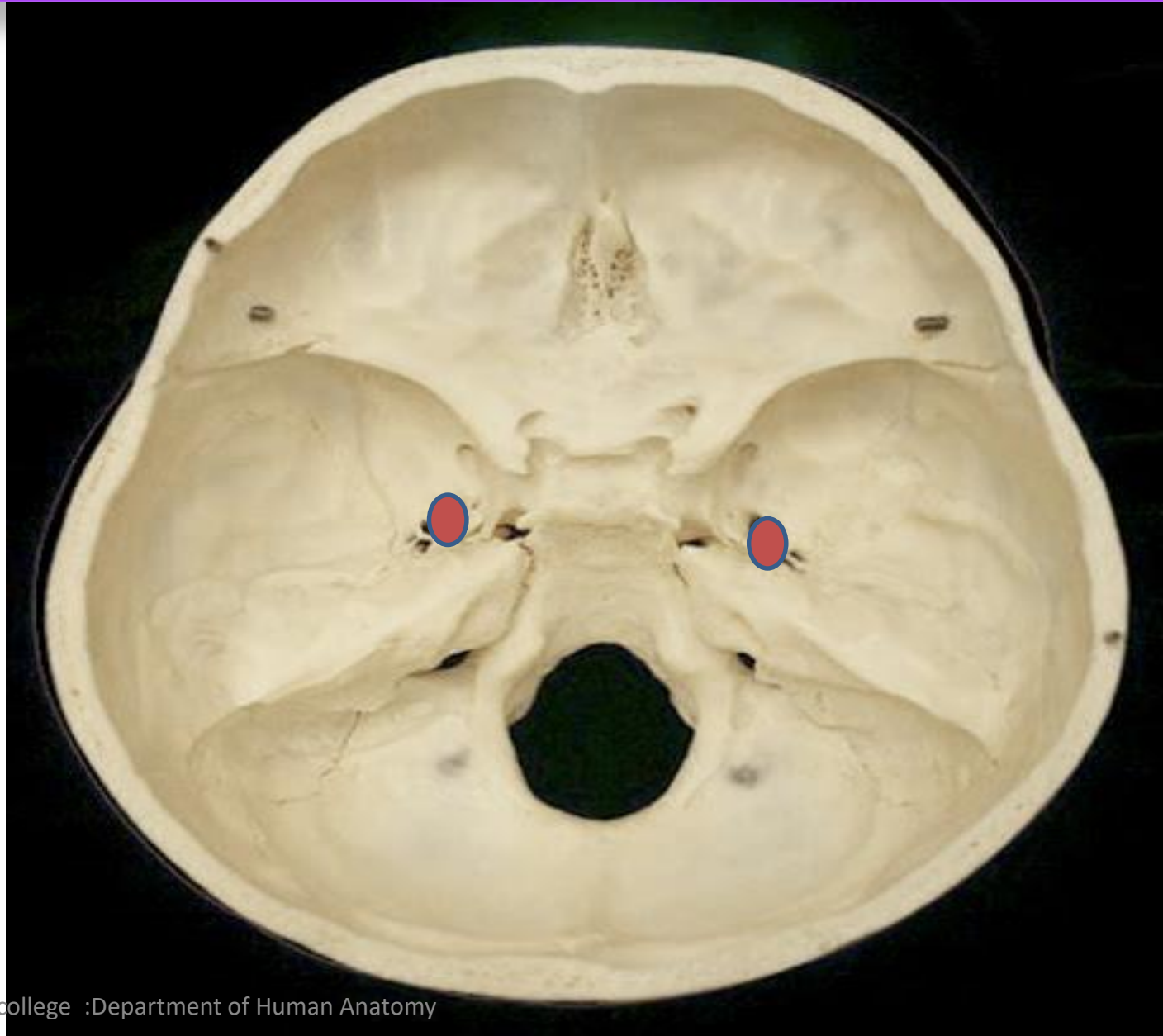
Middle cranial fossa

Foramen rotundum
. It transmits the
maxillary nerve.



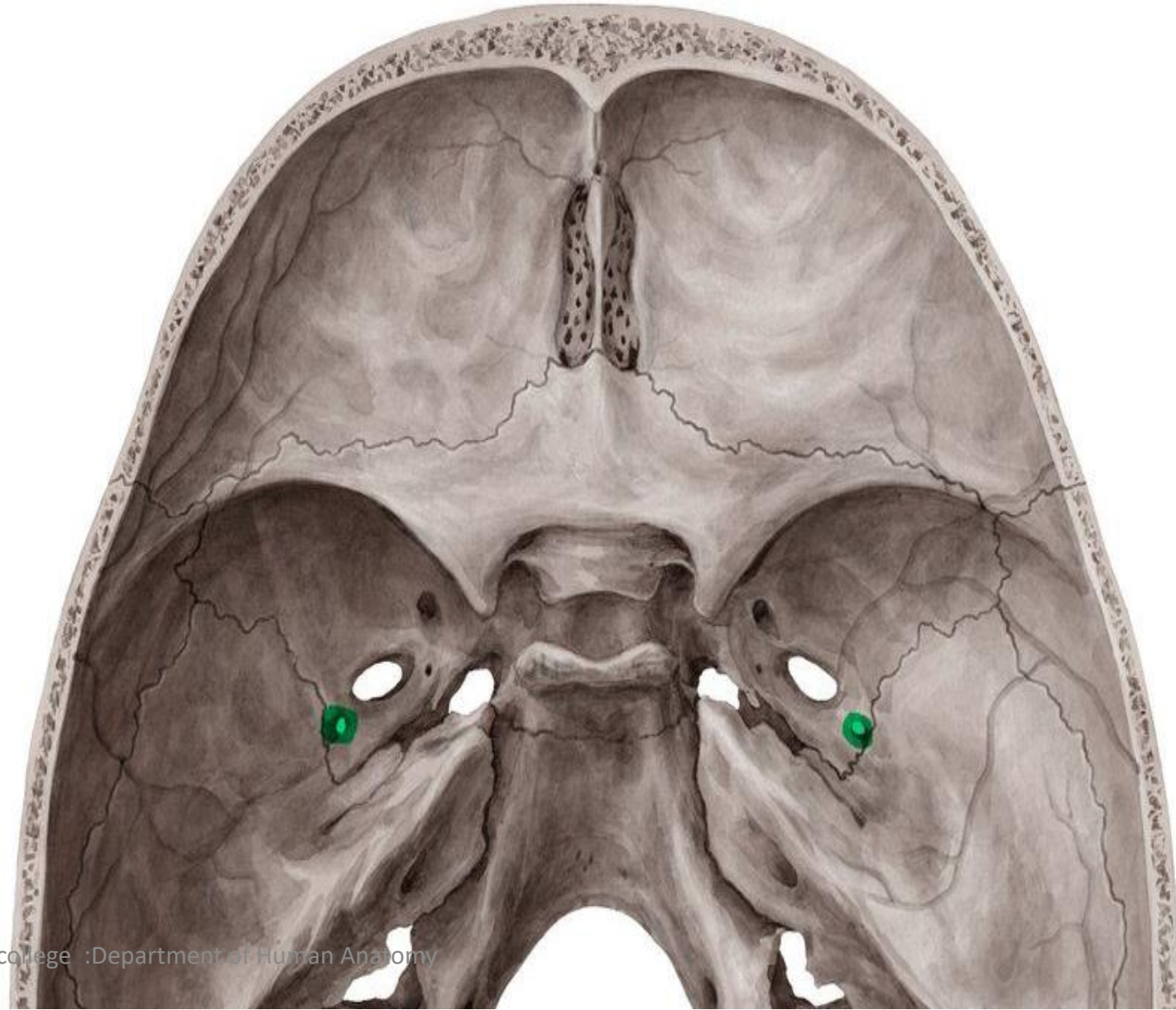
Middle cranial fossa

Foramina Ovale :
It transmits both
the large sensory
root and the small
motor root of the
mandibular nerve.



Middle cranial fossa

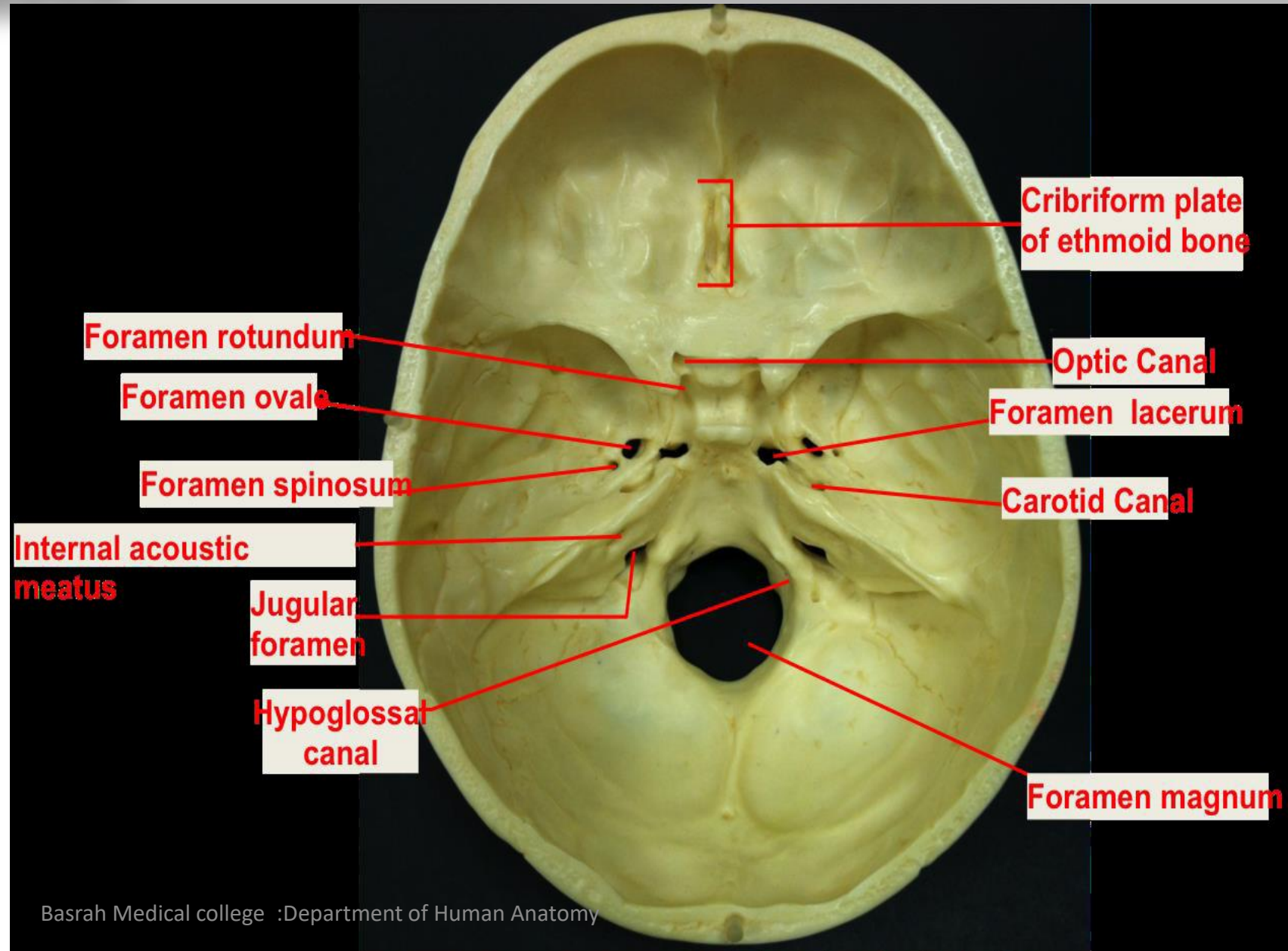
Foramen spinosum:
Transmits the
middle meningeal
artery into the
cranial cavity.



Middle cranial fossa

Foramen lacerum:

In life, the opening of this foramen is filled with cartilage and fibrous tissue and only small blood vessels pass through it.



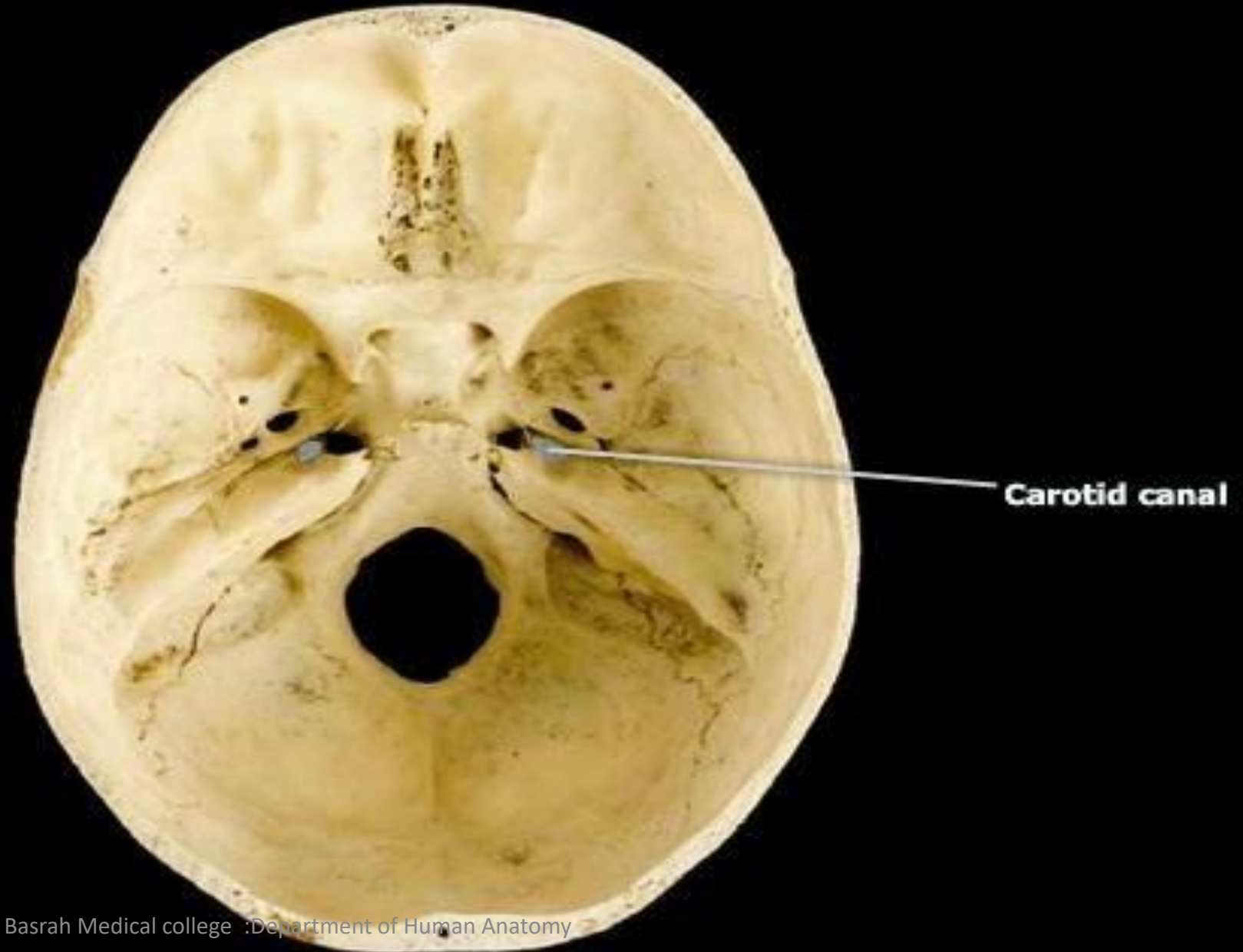
Middle cranial fossa

**Impression for
trigeminal ganglion:**
Lateral to the foramen
lacerum, on the apex
of the petrous part of
the temporal bone



Middle cranial fossa

Carotid canal:
The internal carotid artery enters the foramen lacerum through this canal.



Posterior cranial fossa

Is the posterior-most of the three fossae in the base of the skull. It lodges the parts of the hindbrain, namely, the cerebellum, pons and medulla oblongata. **The posterior cranial fossa has a roof formed by the tentorium cerebelli, which is a fold of the dura. It intervenes between the cerebellum and the occipital lobes of the cerebral hemispheres**



Skull - cranial cavity



Superior view

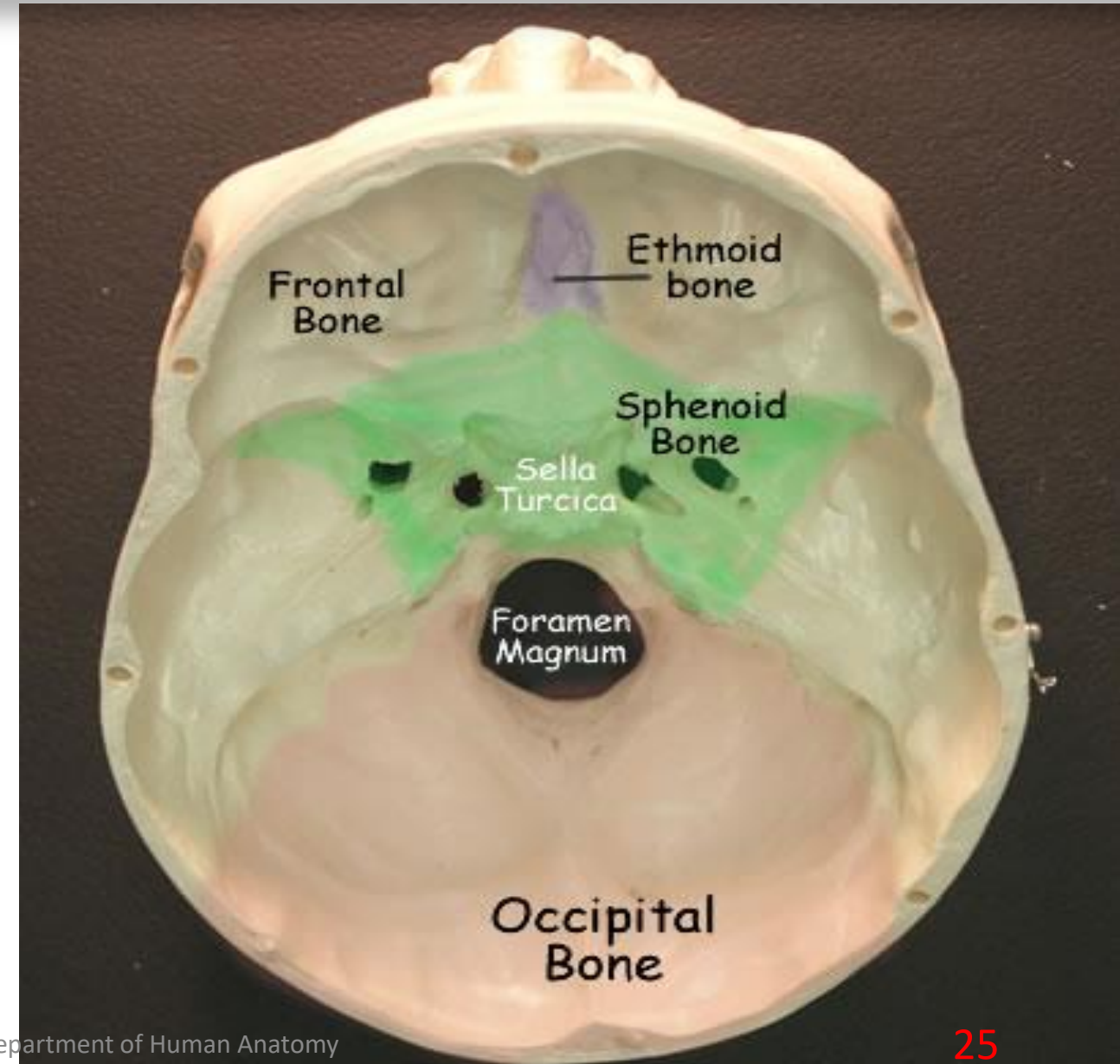
Boundaries

Anteriorly and medially by the dorsum sellae of the sphenoid bone.

Anteriorly and laterally by the superior border of the petrous part of the temporal bone.

Posteriorly by the internal surface of the squamous part of the occipital bone.

The floor consists of the mastoid part of the temporal bone and the squamous, condylar and basilar parts of the occipital bone.



Middle cranial fossa

Foramen magnum:

. It transmits the

*Medulla oblongata and its surrounding meninges.

*Spinal parts of the accessory nerves

*Two vertebral arteries also pass through it.



Posterior cranial fossa

Hypoglossal canal:

. It transmits the hypoglossal nerve.



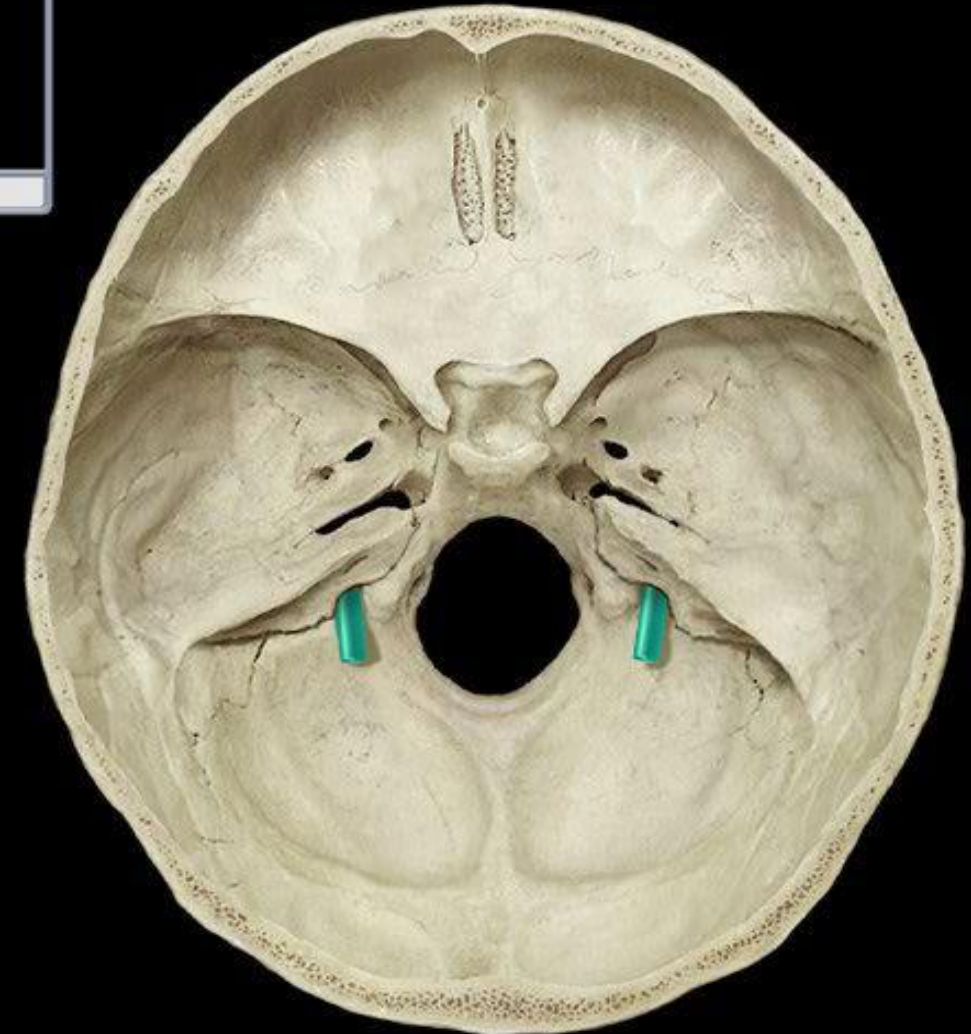
Posterior cranial fossa

Jugular foramen:

- *Inferior petrosal sinus
- *Glossopharyngeal (IX),
- *Vagus (X)
- * Accessory (XI) cranial nerves
- *Sigmoid sinus
(becomes the internal jugular vein below the foramen)



Skull - cranial cavity



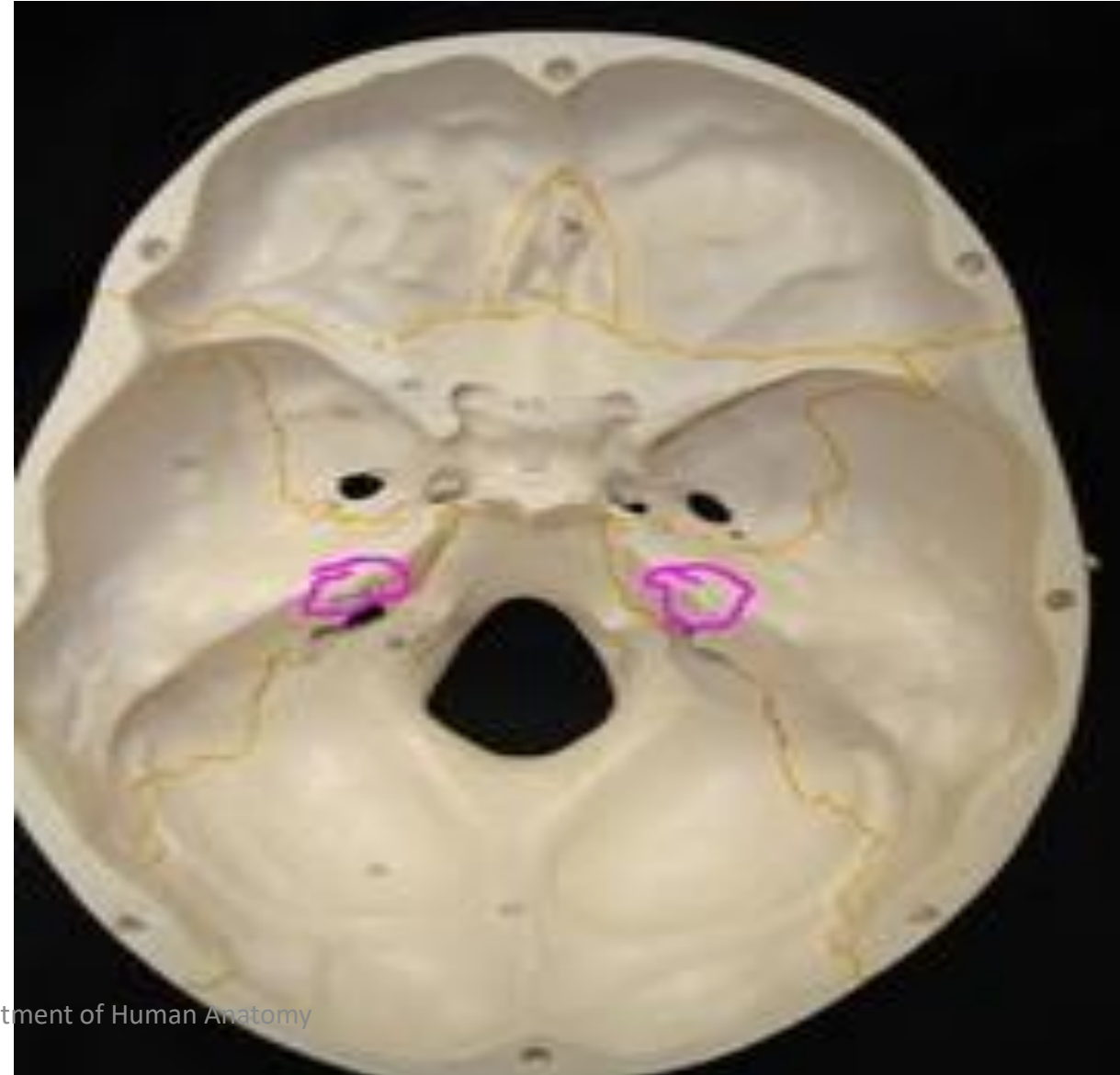
Superior view

Posterior cranial fossa

Internal acoustic meatus

in the petrous part of the temporal bone that carries

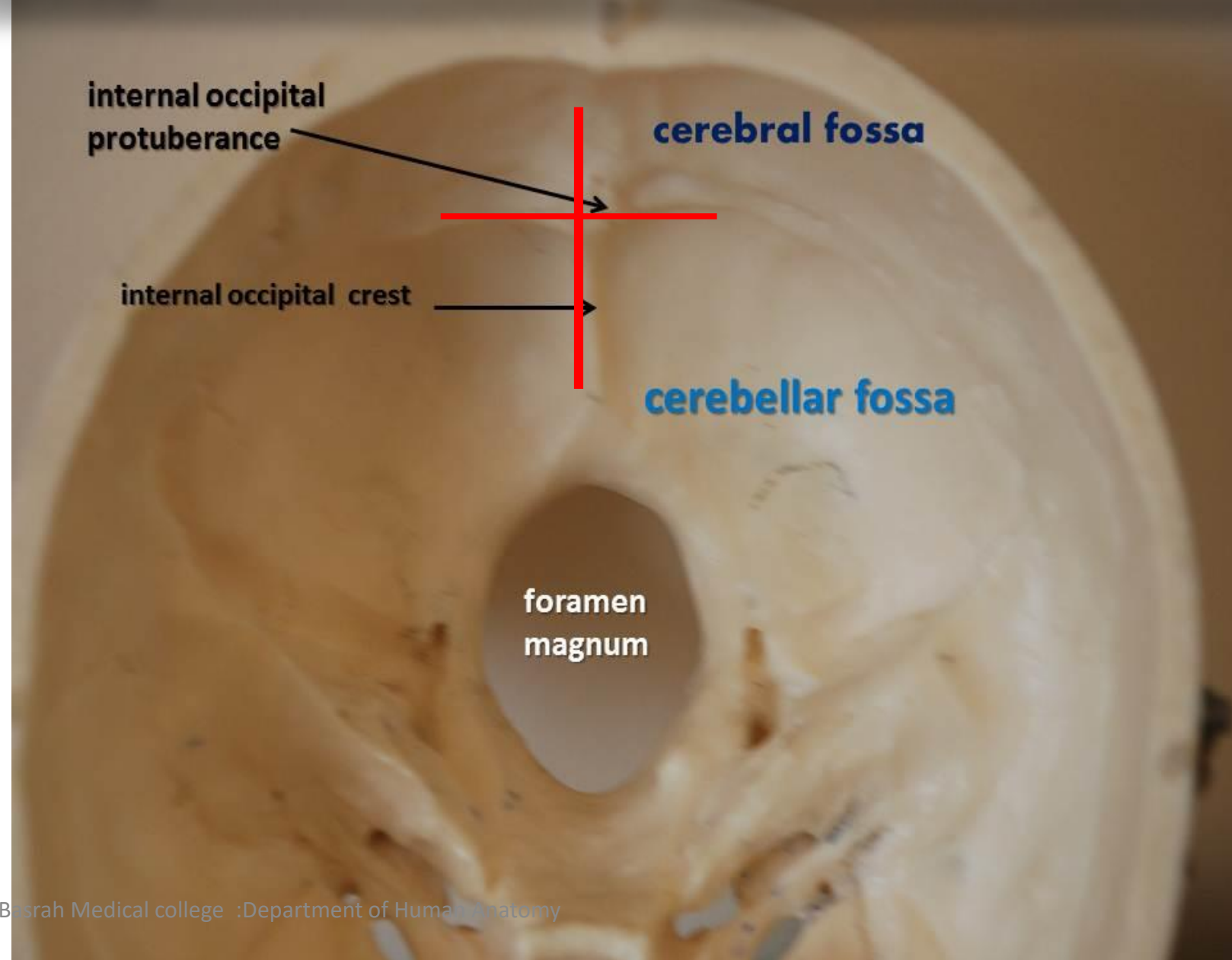
- (facial (VII)
- vestibulocochlear (VIII))



Posterior cranial fossa

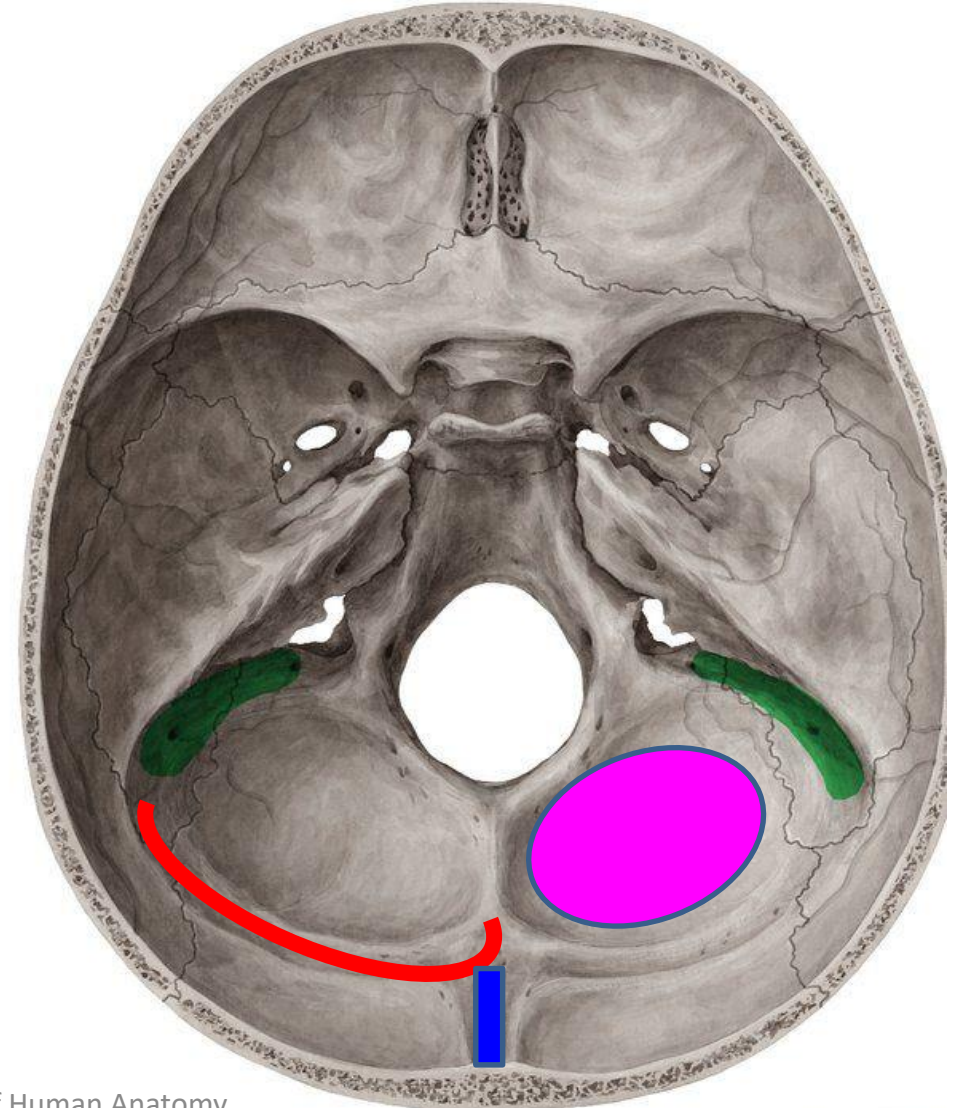
Internal occipital crest:

It is the prominent lower division of the cruciate eminence of the occipital bone. The small falx cerebelli is attached to it.



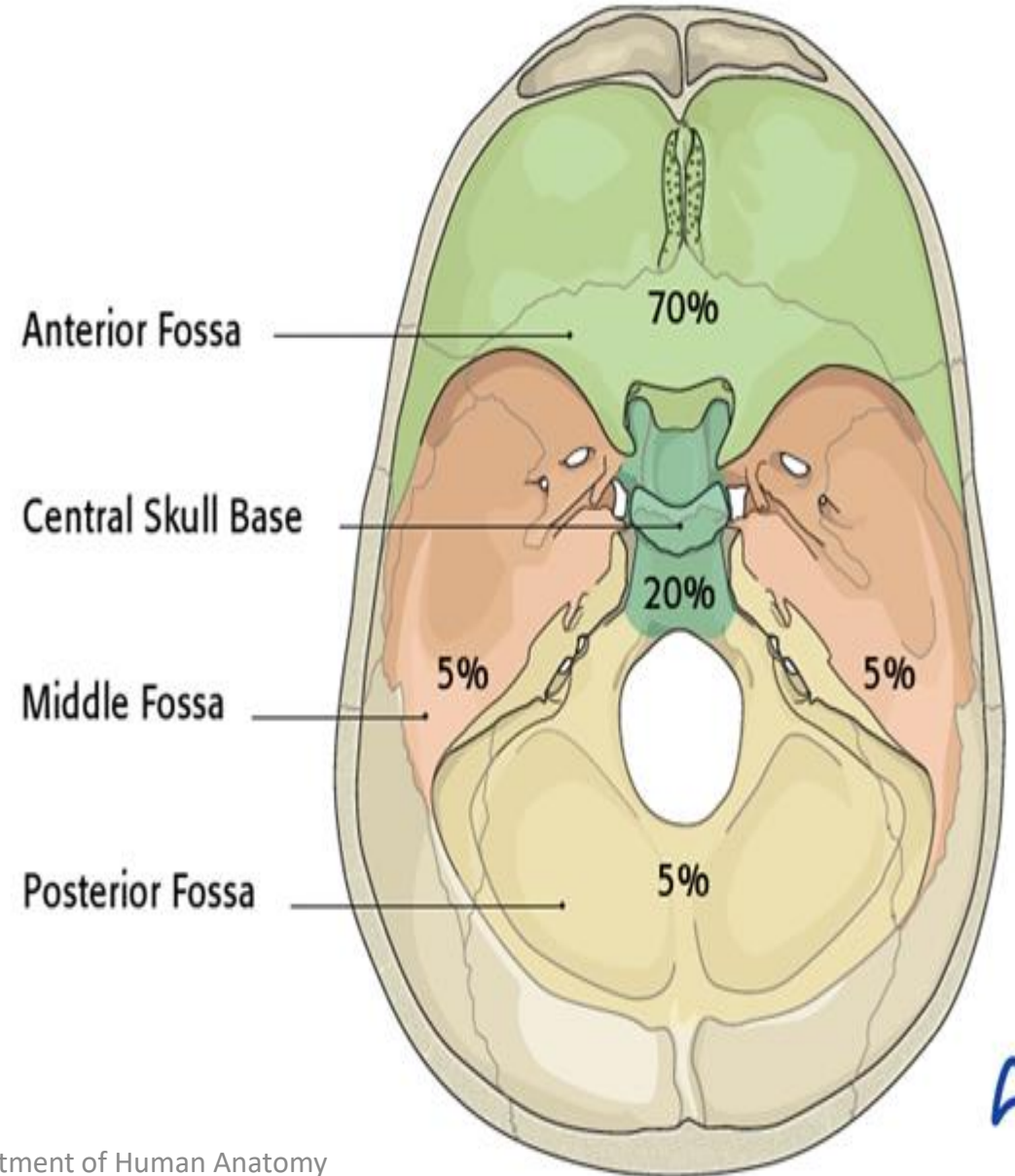
Posterior cranial fossa

- **Sulcus for sigmoid sinus**
- **Groove for superior sagittal sinus**
- **Sulcus for transverse sinus**
- **Cerebellar fossa**



Fractures of the Cranial Fossae

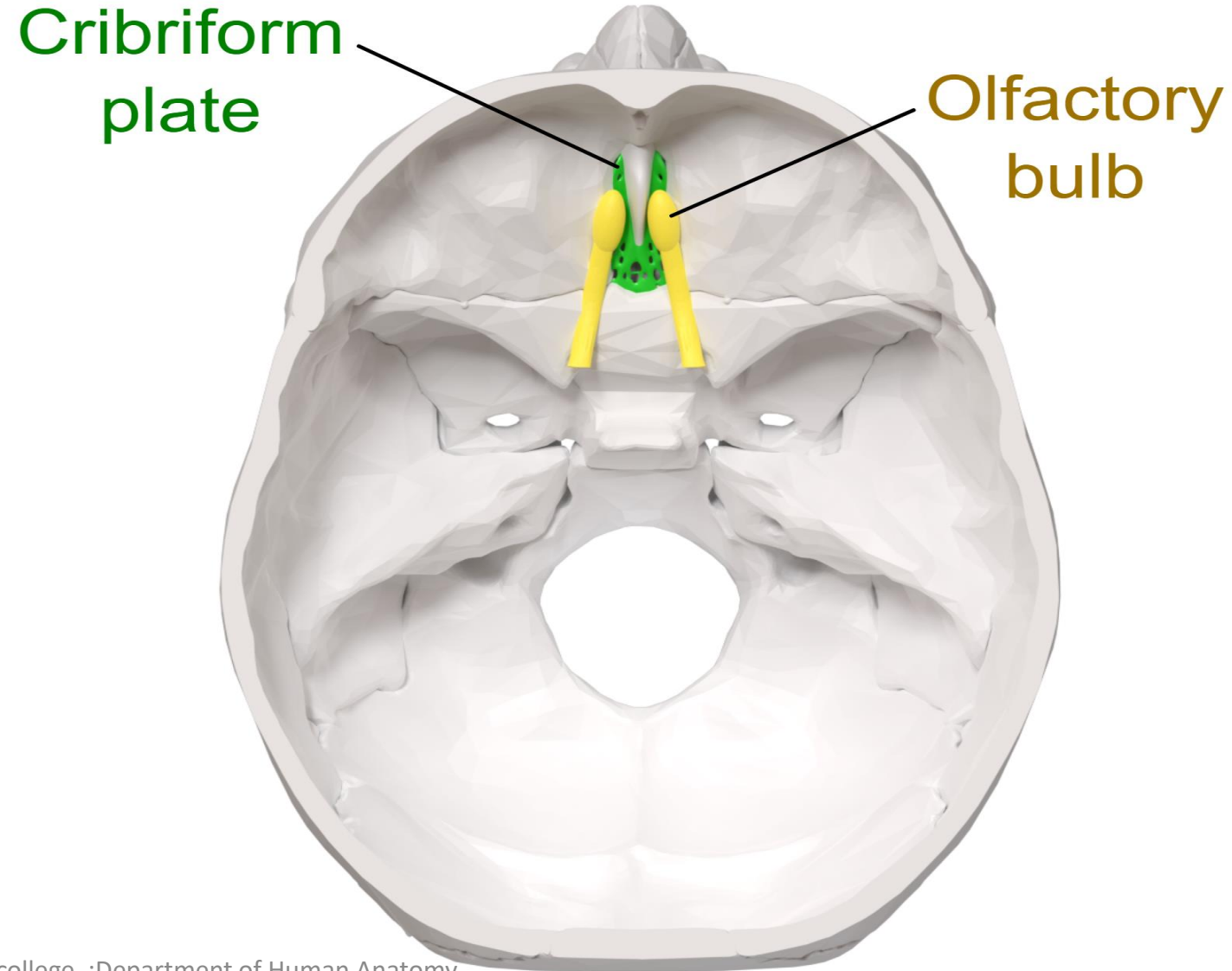
The base of skull is relatively weak part due to its irregular shape and presence of foramina, therefore it the most common site of skull fracture .



AO

Fractures of the Anterior Cranial Fossa

- 1. Fracture of of cribriform plate .** The patient will have bleeding from the nose (epistaxis) and leakage of cerebrospinal fluid into the nose (cerebrospinal rhinorrhea).
- 2. Fracture orbital plate of the frontal bone** result in hemorrhage beneath the conjunctiva and into the orbital cavity, causing exophthalmos..

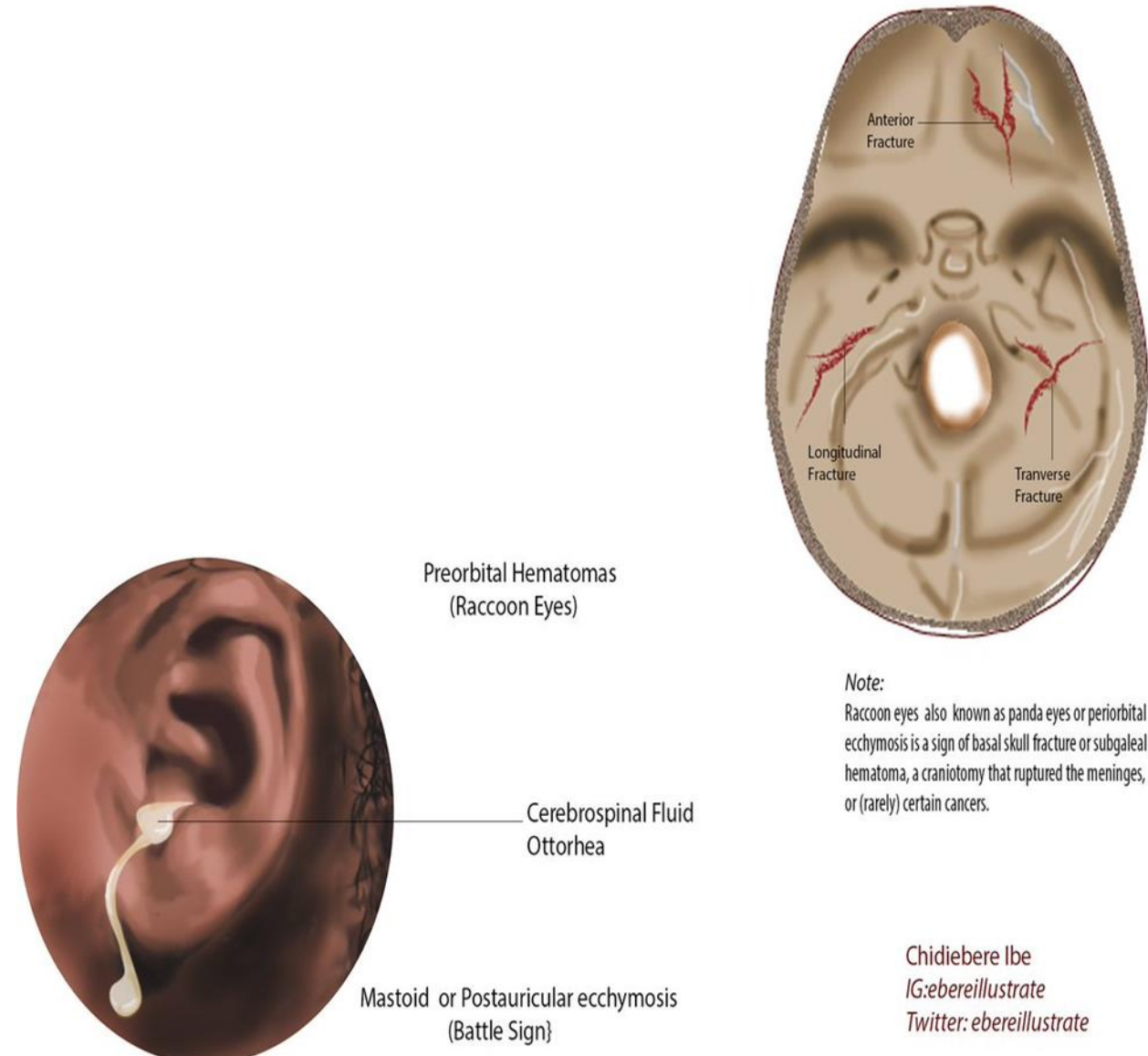




Fractures of the middle cranial fossa

Fractures are common , because this is the weakest part of the base of the skull. Anatomically, this weakness is caused by the presence of numerous foramina and canals in this region

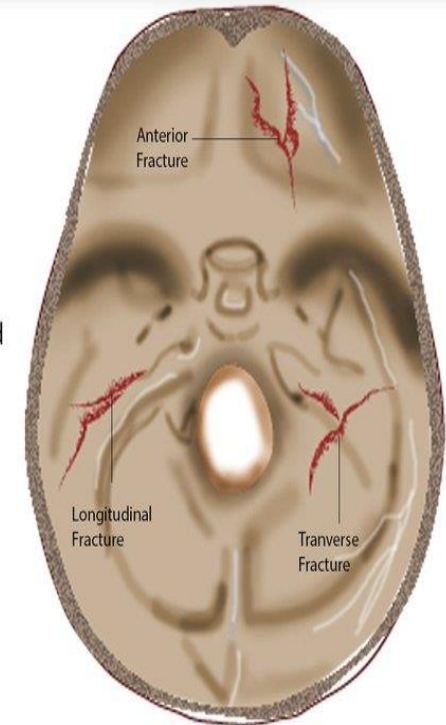
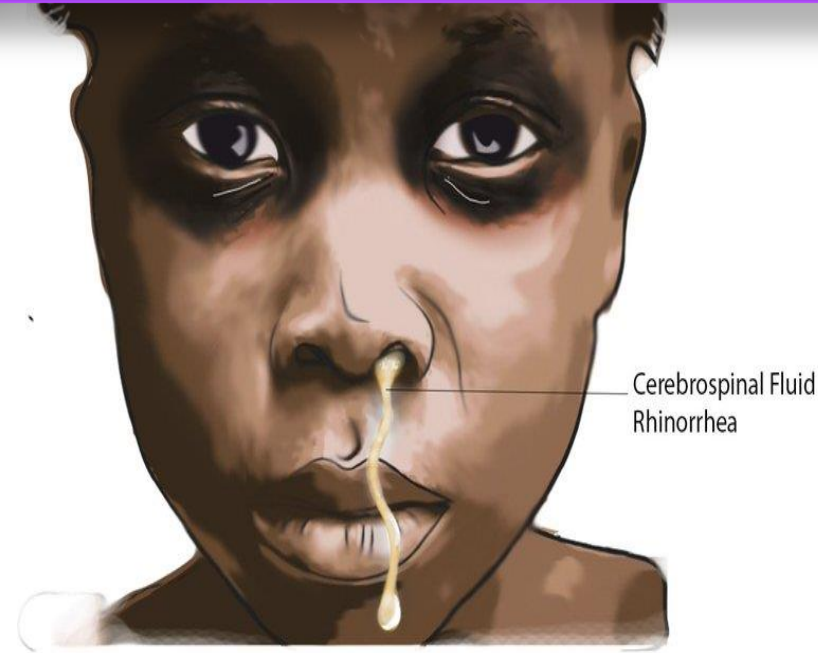
1. The leakage of cerebrospinal fluid and blood from the external auditory meatus is common.



Fractures of the middle cranial fossa

2. The 7th and 8th cranial nerves may be involved as they pass through the petrous part of the temporal bone.

3. The 3rd, 4th and 6th cranial nerves may be damaged if the lateral wall of the cavernous sinus is torn. Blood and cerebrospinal fluid may leak into the sphenoidal air sinuses and then into the nose.



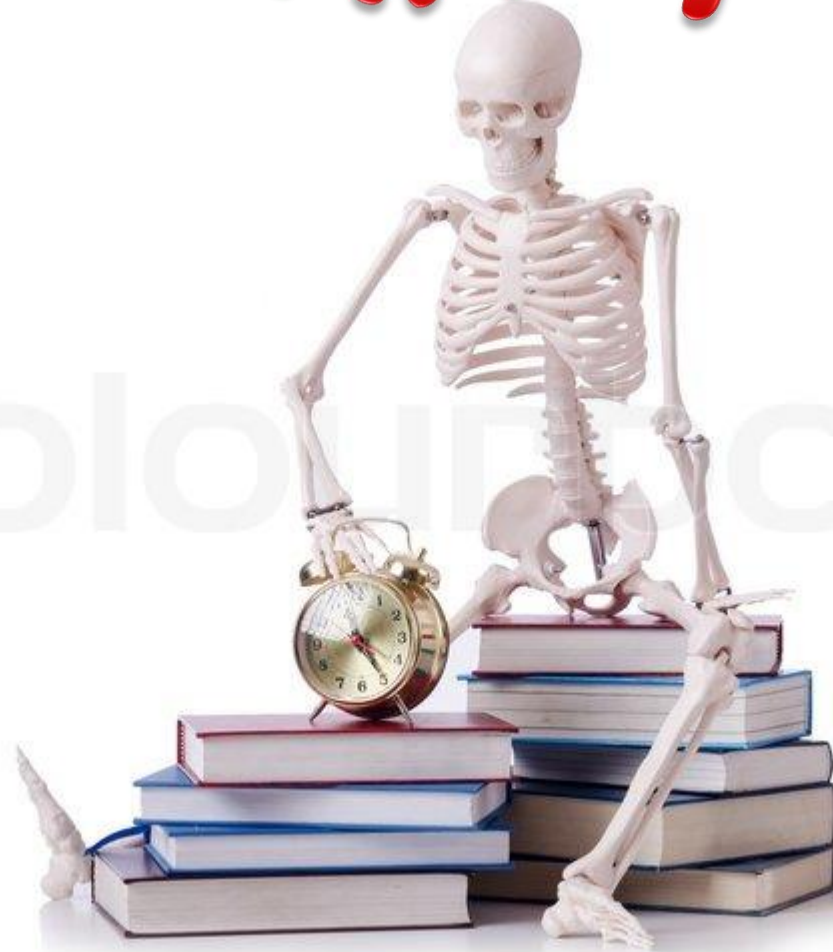
Note:
Raccoon eyes also known as panda eyes or periorbital ecchymosis is a sign of basal skull fracture or subgaleal hematoma, a craniotomy that ruptured the meninges, or (rarely) certain cancers.

Posterior cranial fossa fractures

1. Blood may escape into the nape of the neck deep to the postvertebral muscles and appears in the posterior triangle, close to the mastoid process.
2. If fractures involving the jugular foramen, the 9th, 10th, and 11th cranial nerves may be damaged.
3. The strong bony walls of the hypoglossal canal usually protect the hypoglossal nerve from injury



Thank you



Colourbox