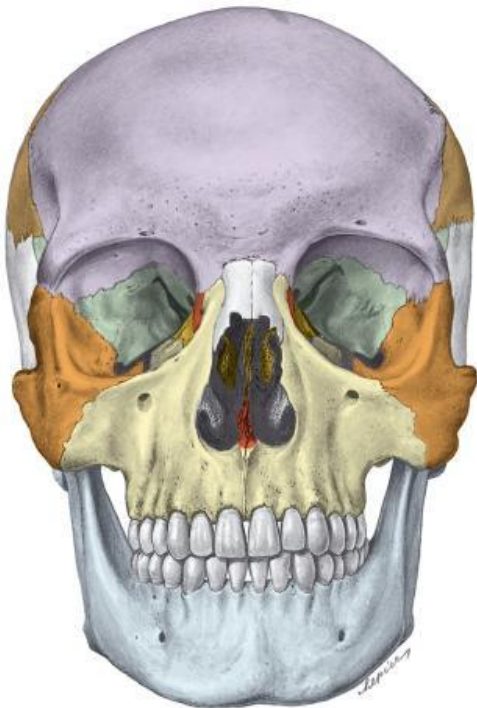
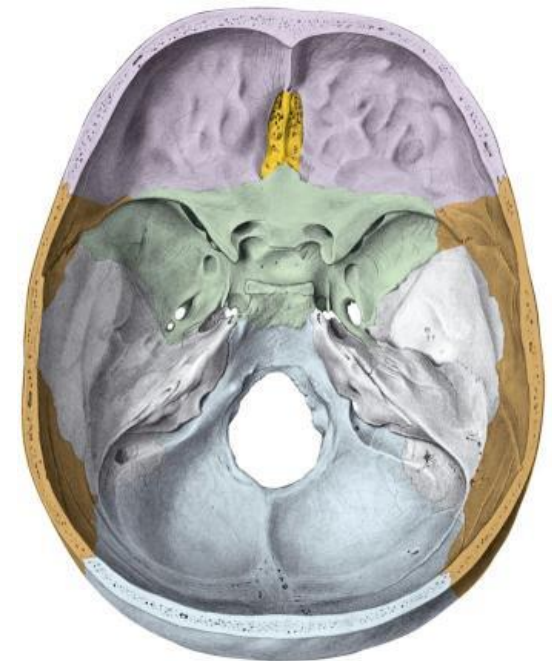


Skull.

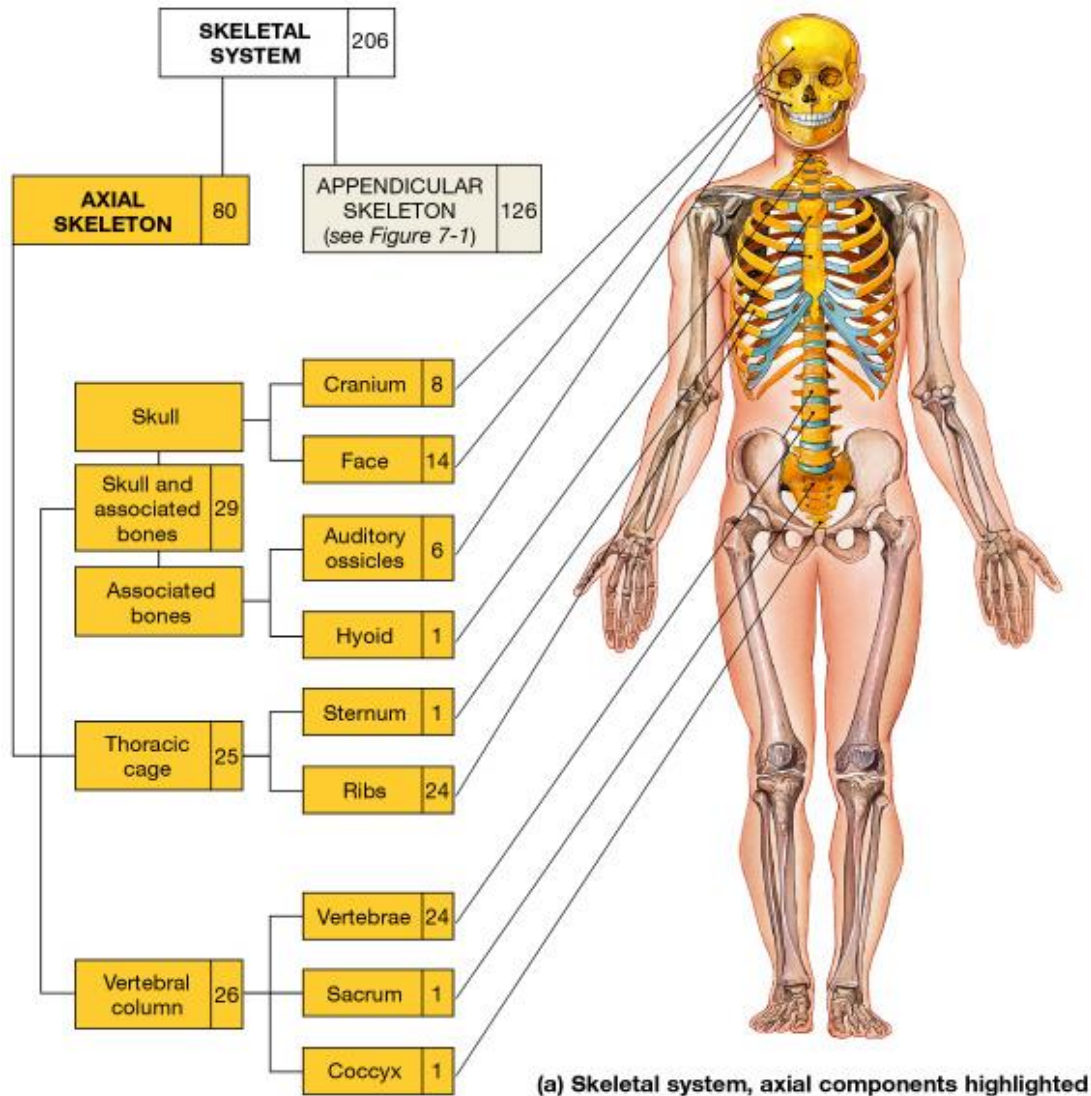
Sphenoid and ethmoid bones



János Hanics MD



SKELETAL SYSTEM



MAIN PARTS OF THE SKULL

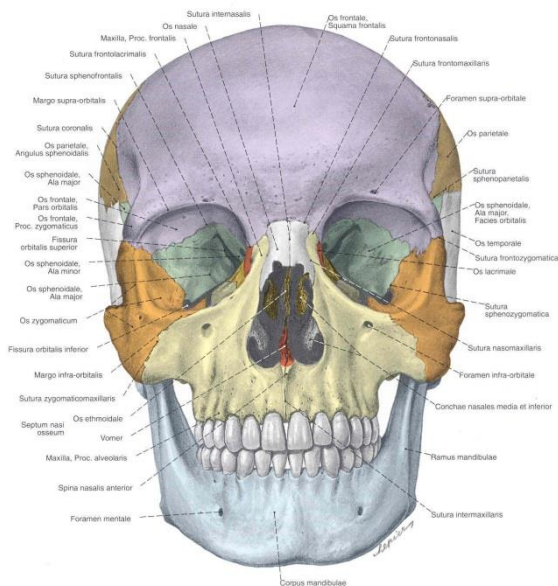
•Constitute by 22 bones:

•**neurocranium** (8) – **UNPAIRED**: frontal, occipital, sphenoid, ethmoid bones
PAIRED: temporal, parietal bones

•**viscerocranium** (14) -**UNPAIRED**: mandibule, vomer.

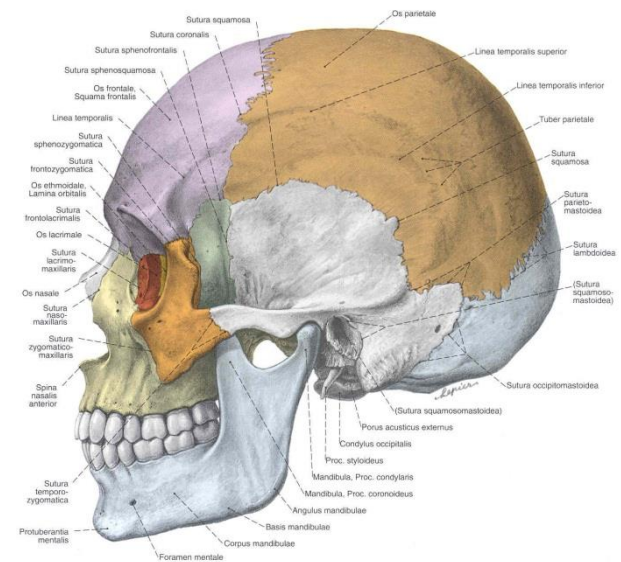
PAIRED: nasal, maxilla, zygomatic, lacrimal,
 palatine, inferior nasal concha

Their role – formation of cavities, protect viscera, voice formation, initial portions of the gastrointestinal and respiratory systems, insertion of muscles (mastication, head movements)



Cavities:

Cranial cavity,
Nasal cavity,
Paranasal sinuses
Oral cavity,
Orbit,
(Tympanic cavity,
Inner ear)

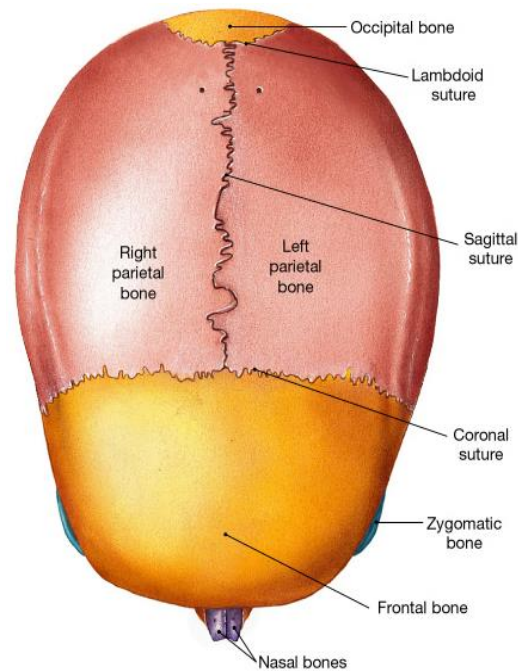


Joints between the cranial bones

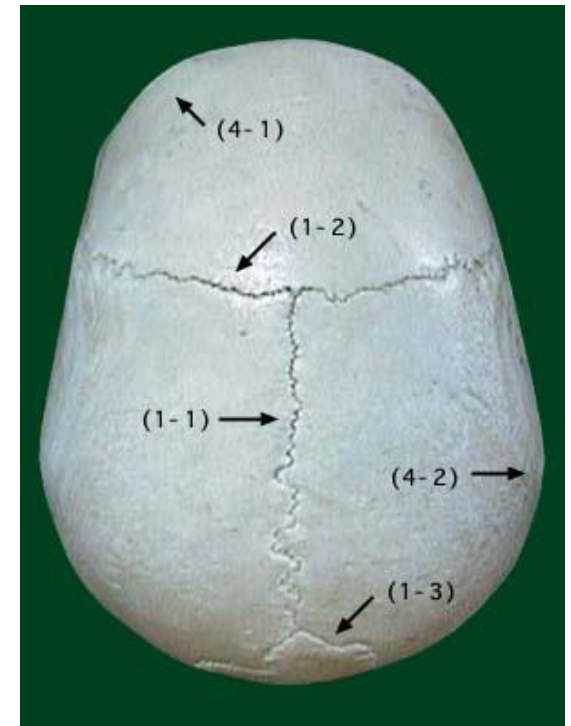
- **Synchondrosis, synostosis**
(cartilagineal and bony connections)

- **Sutures**

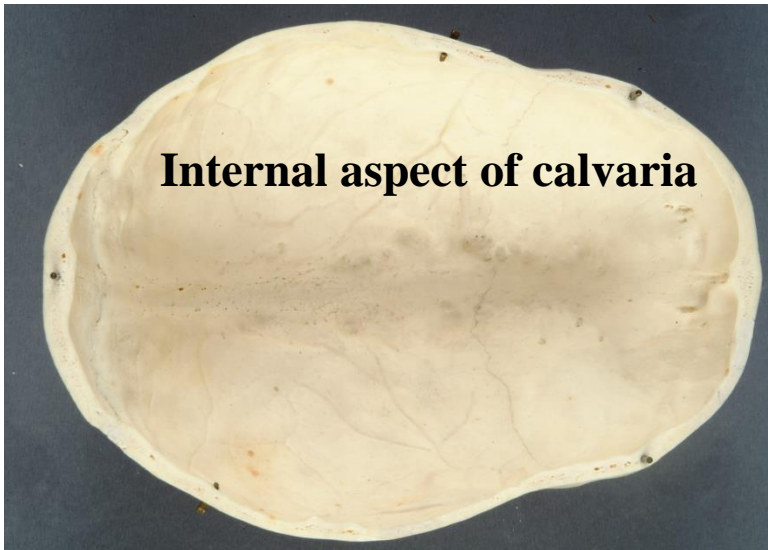
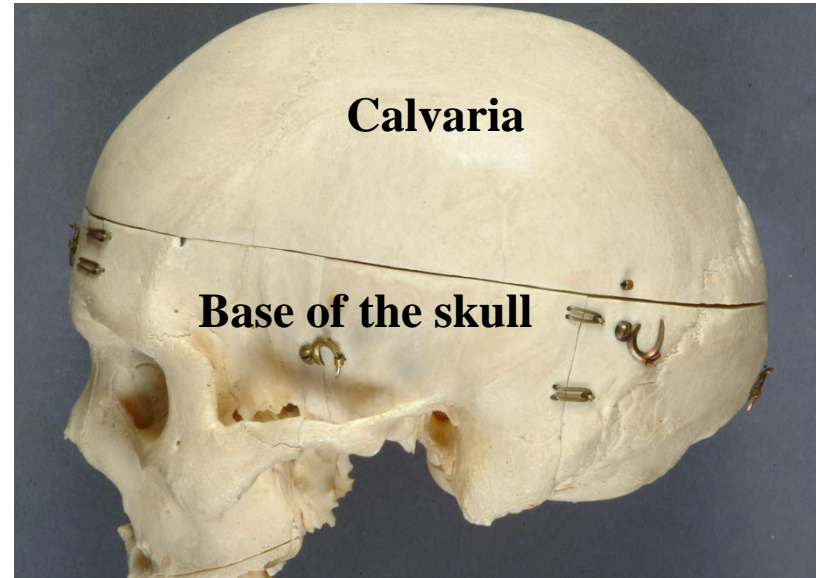
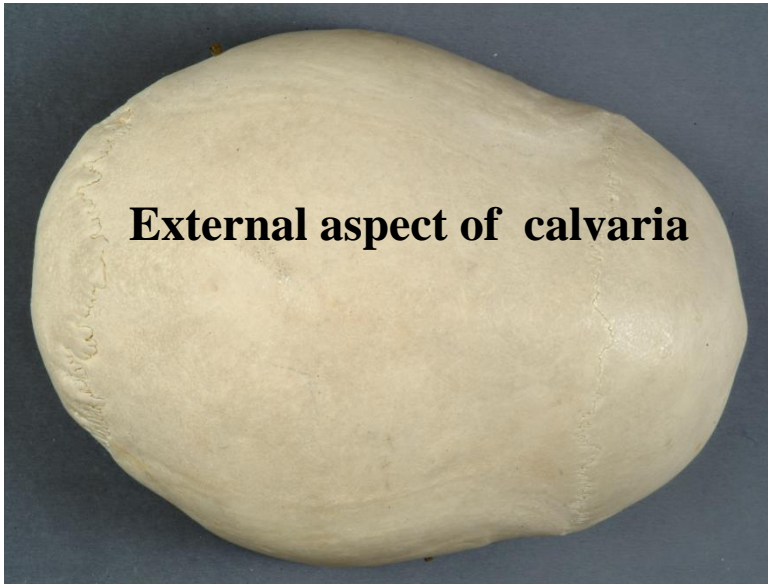
- Coronal
- Sagittal
- Lambdoid



(b) Superior view

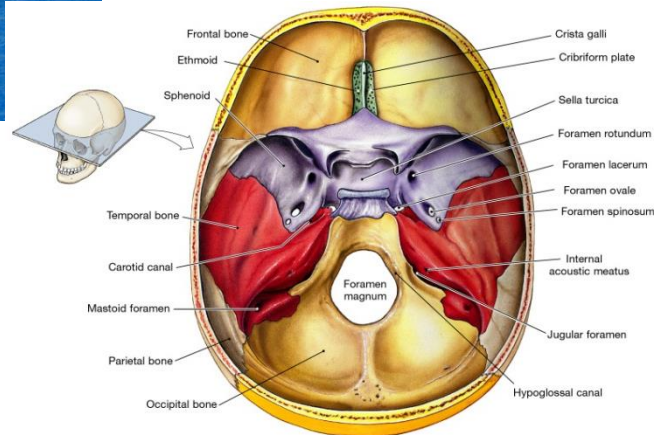
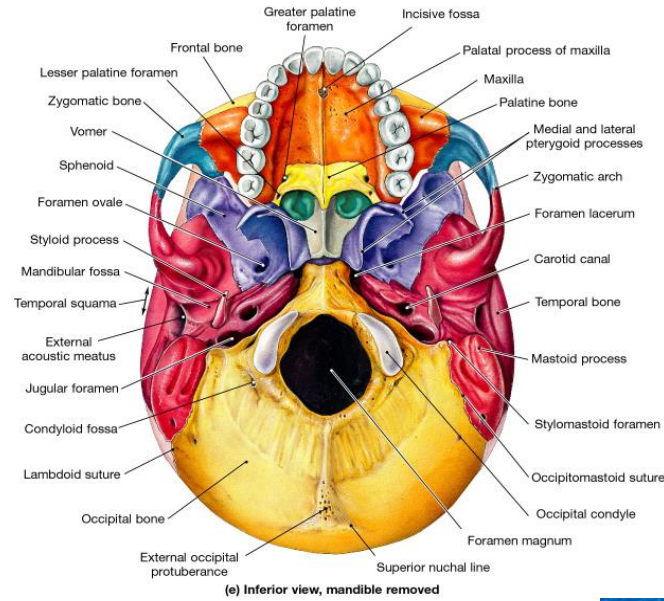
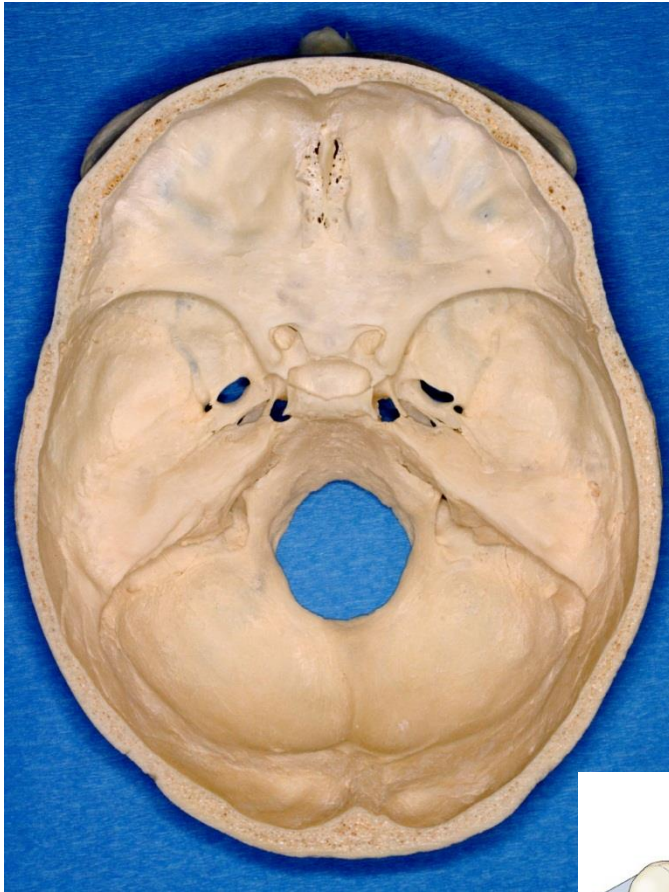


CALVARIA AND BASE OF THE SKULL

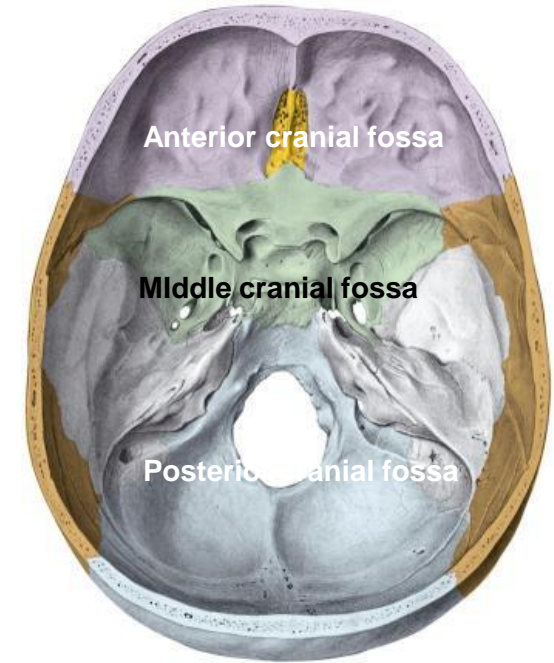
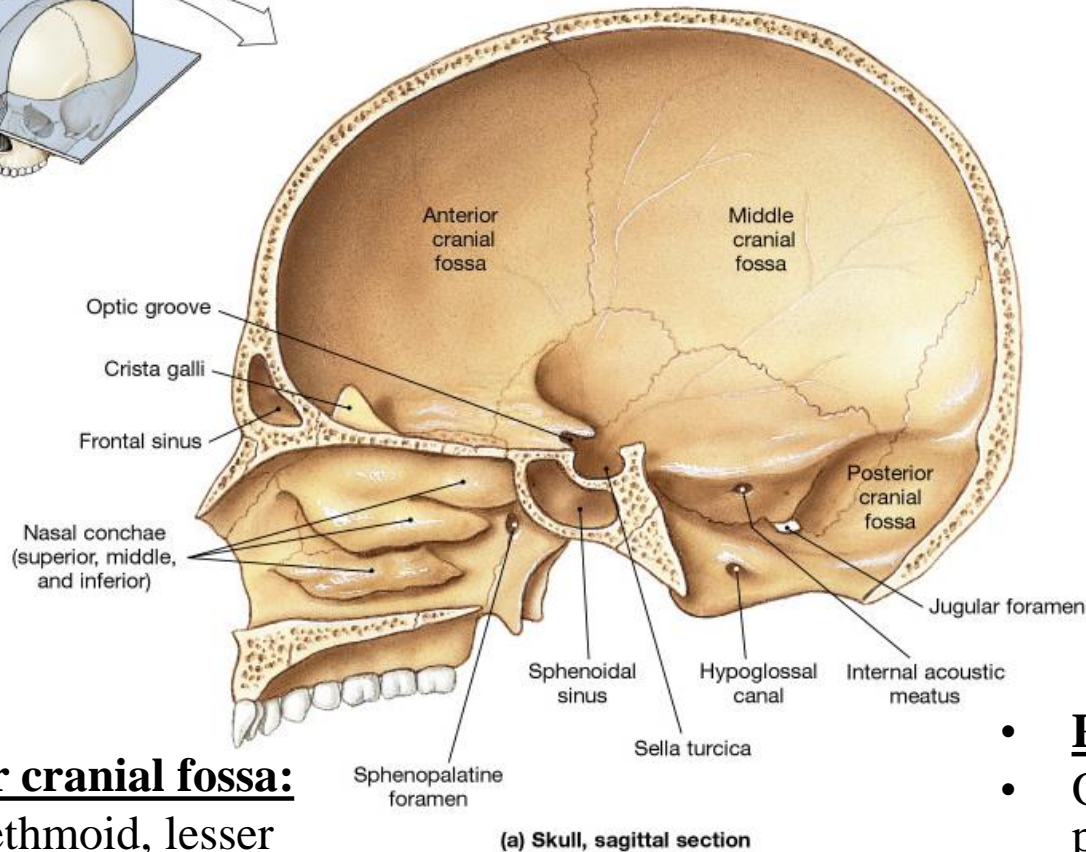
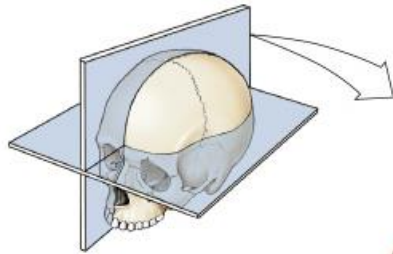


BASE OF THE SKULL

(INTERNAL AND EXTERNAL ASPECT)



FOSSAE CRANII

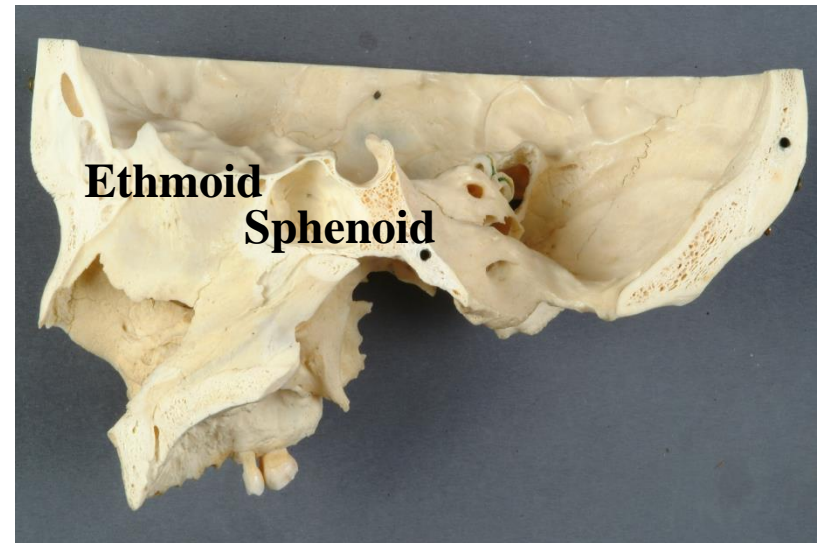
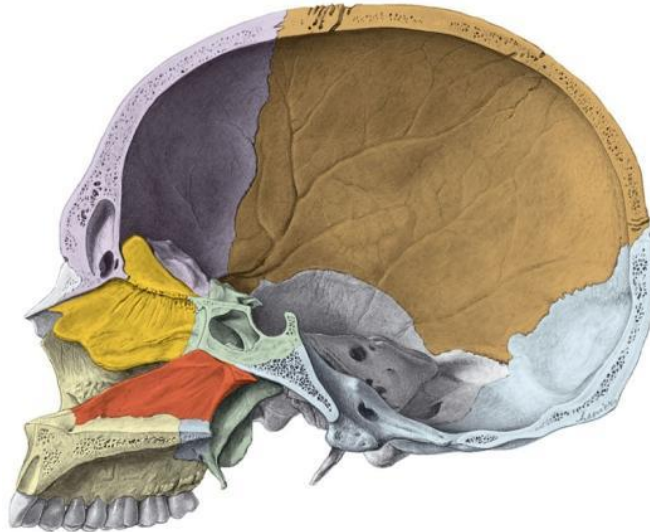
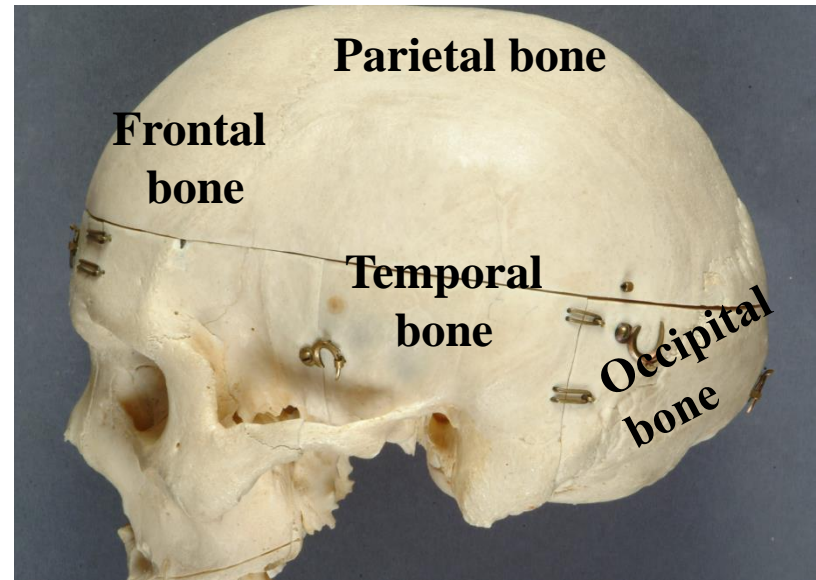
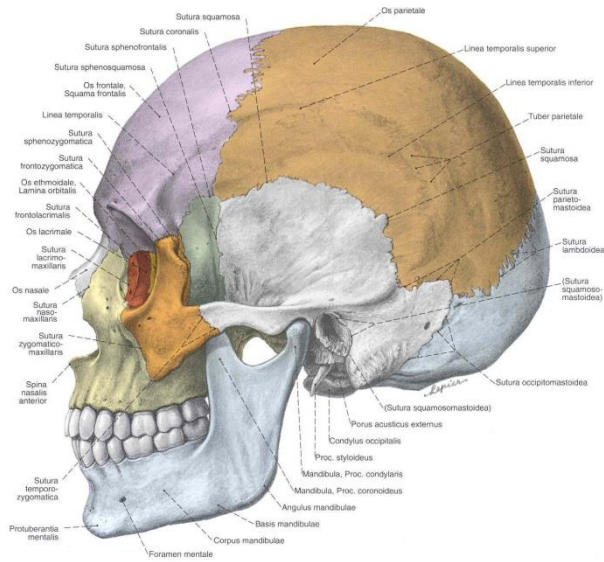


- **Anterior cranial fossa:**
frontal, ethmoid, lesser wings of sphenoid

- **Middle cranial fossa:**
sphenoid, temporal bones, parietal bones

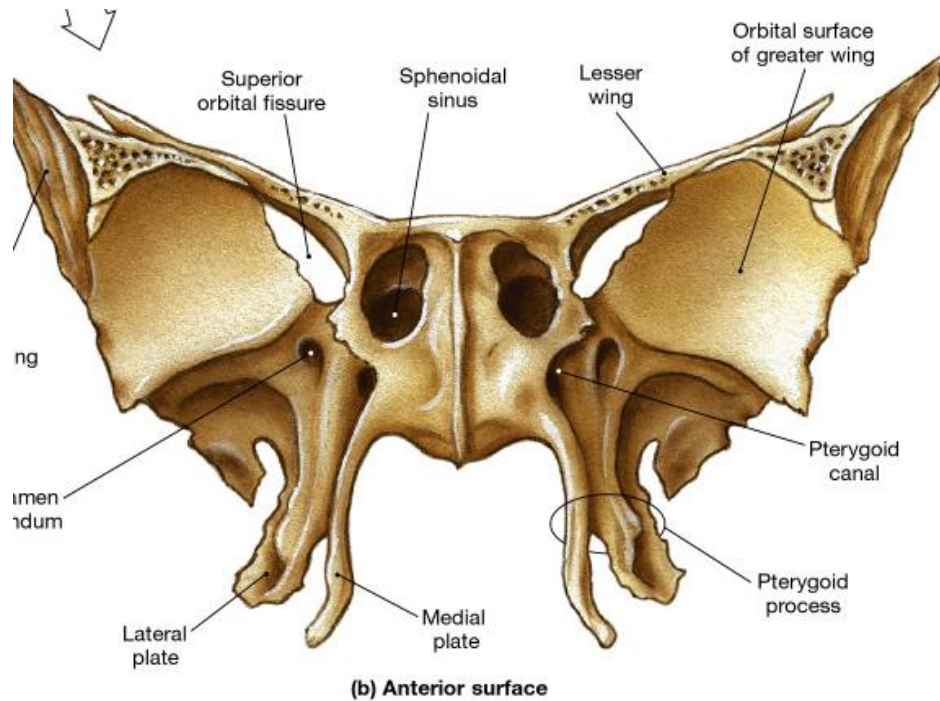
- **Posterior cranial fossa:**
- Occipital, temporal bones, parietal bones

BONES OF NEUROCRANIUM

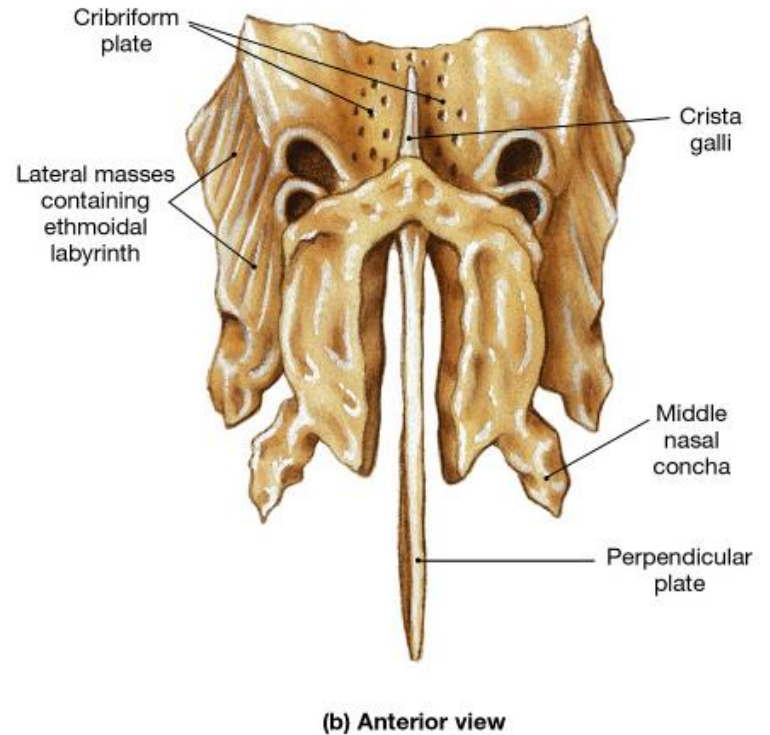


BONES OF THE SKULL

SPHENOID

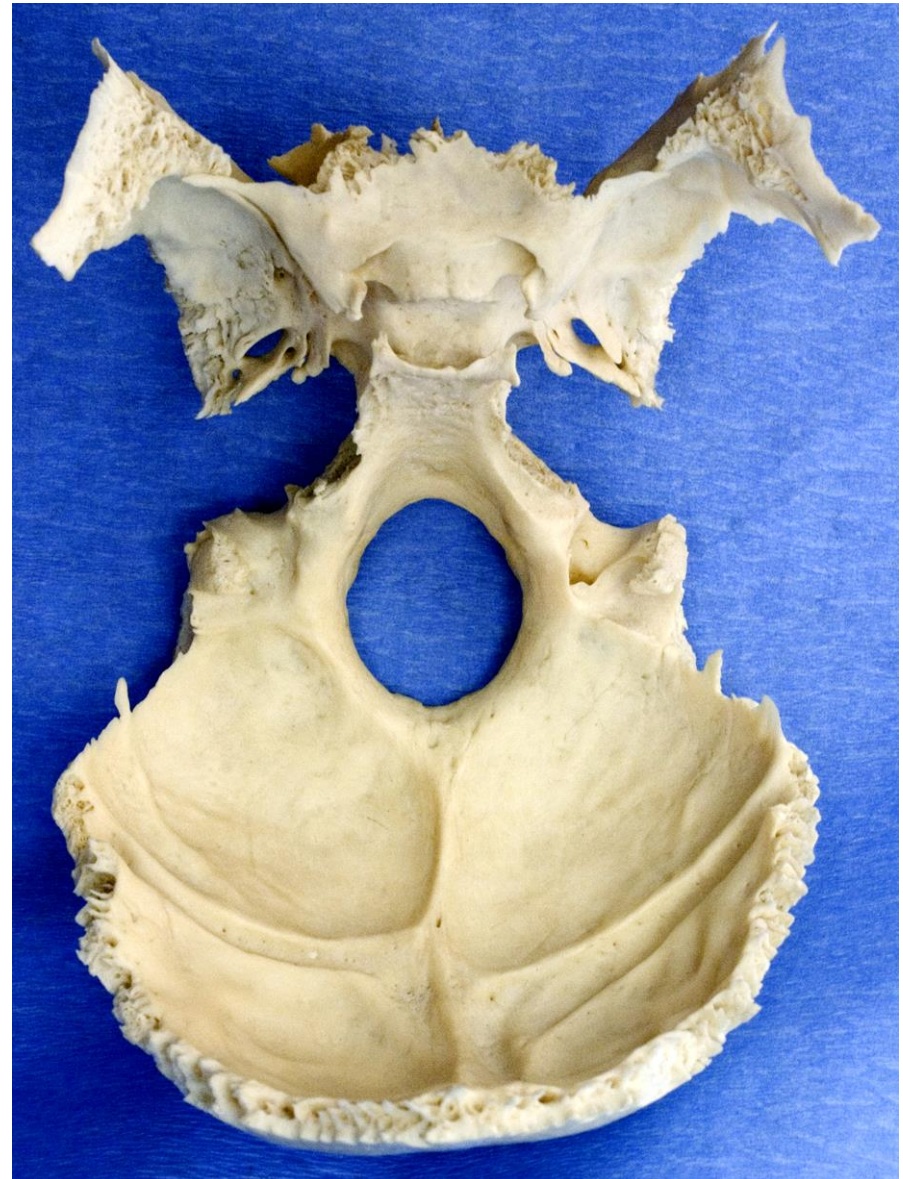
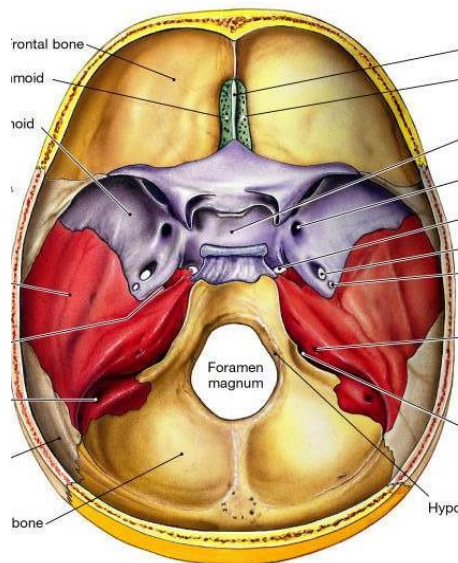


ETHMOID



SPHENOID

- Form the external and internal aspect of the base of the skull
- Connected to *frontal, ethmoid, temporal, zygomatic, parietal, maxilla, palatine, vomer and occipital bones*
- Bordering the *neurocranium and viscerocranium*
- Constitute the wall of *temporal, infratemporal and pterygopalatine fossae*

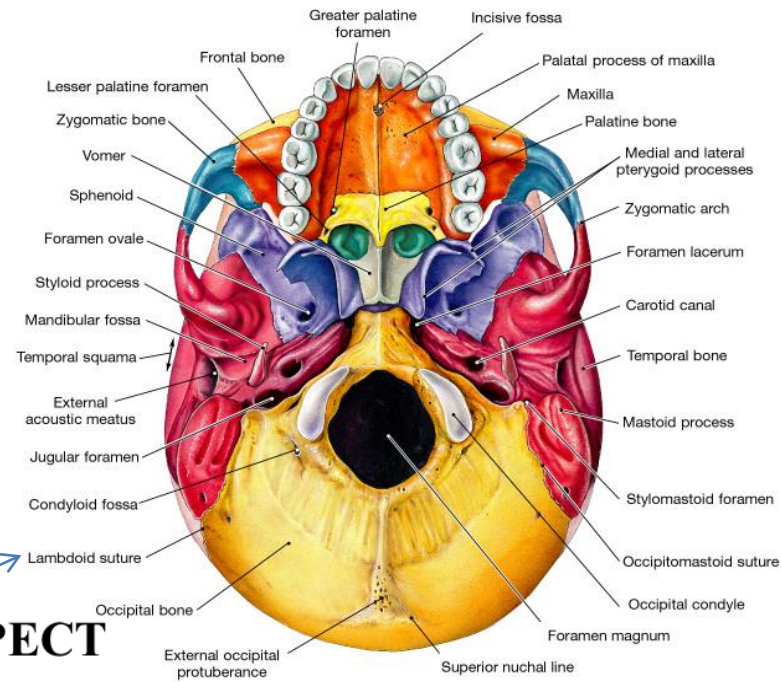
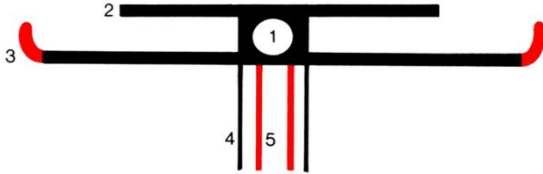


Parts of sphenoid:

- Body
- Greater wing
- Lesser wing
- Pterygoid process

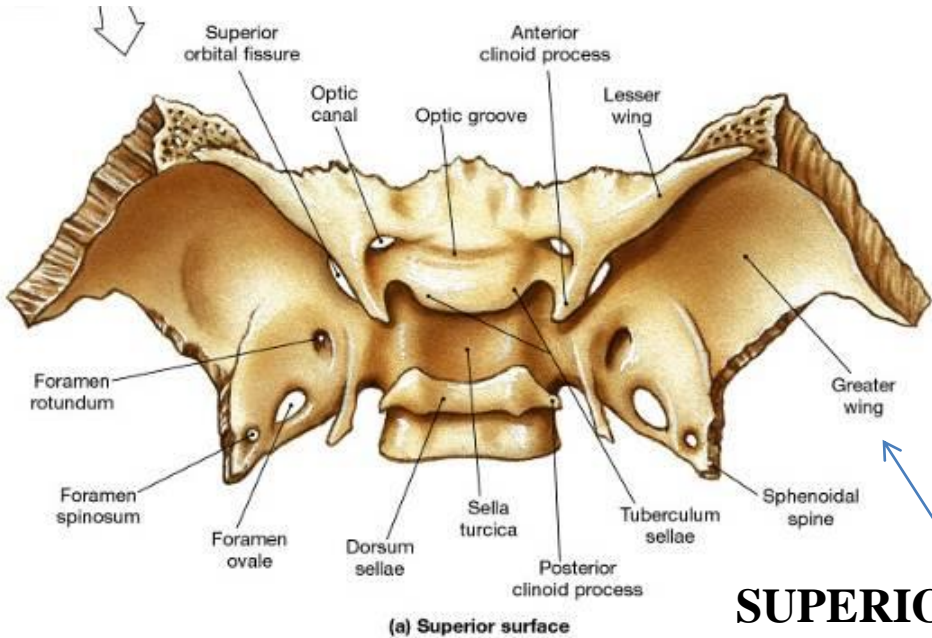


POSTERIOR ASPECT



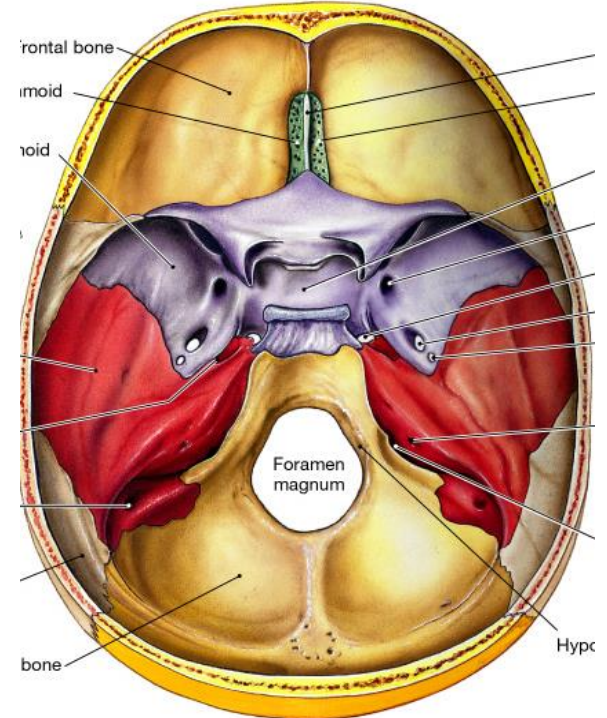
INFERIOR ASPECT

(e) Inferior view, mandible removed

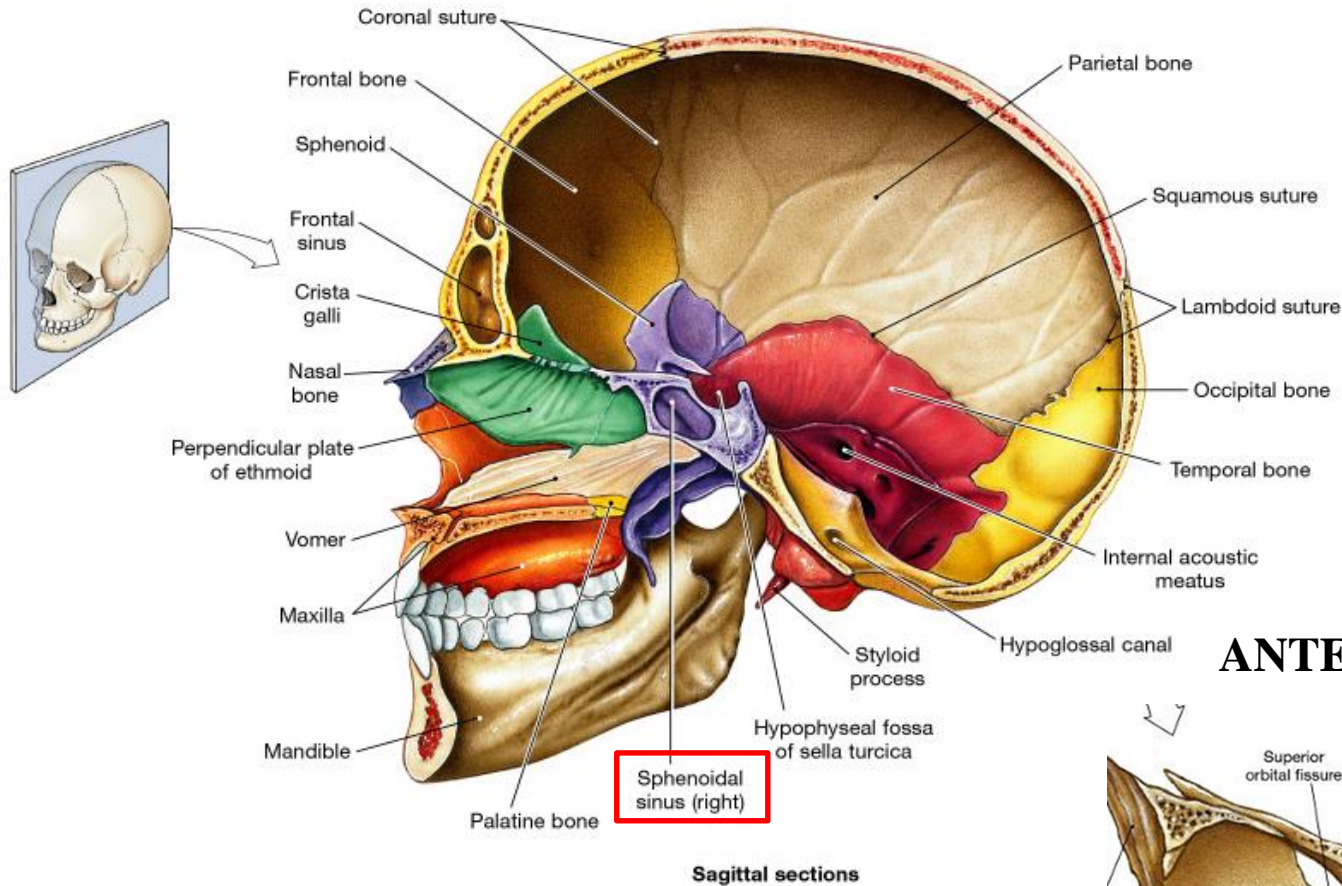


(a) Superior surface

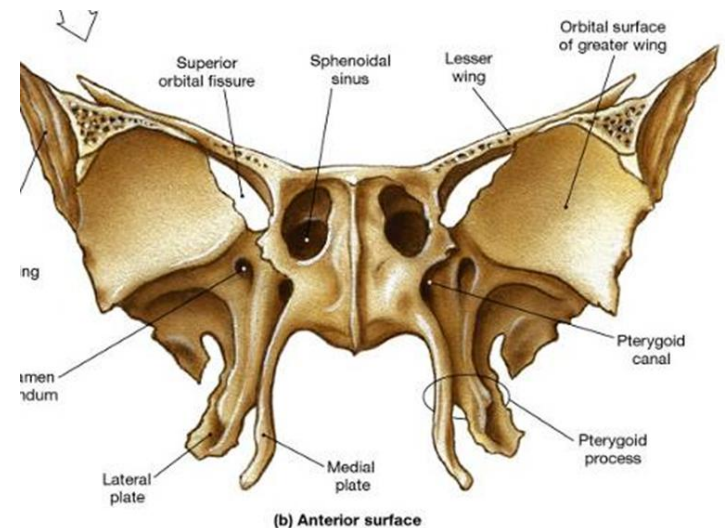
SUPERIOR ASPECT



Body of the sphenoid – sphenoidal sinus



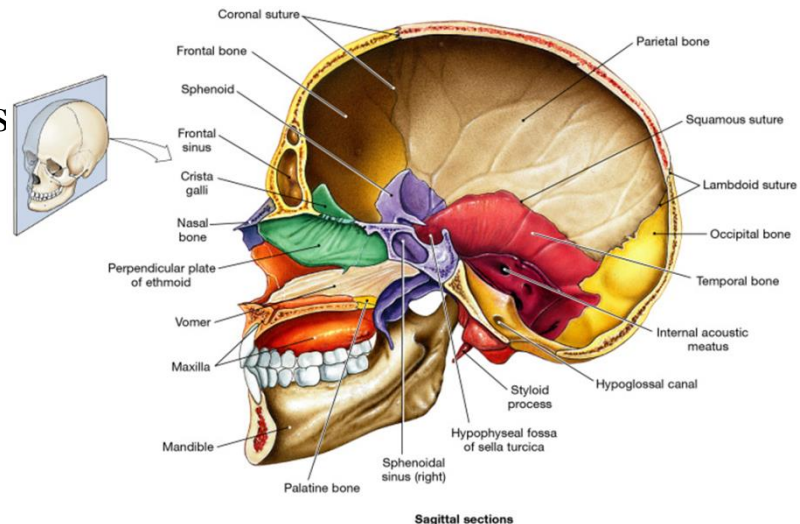
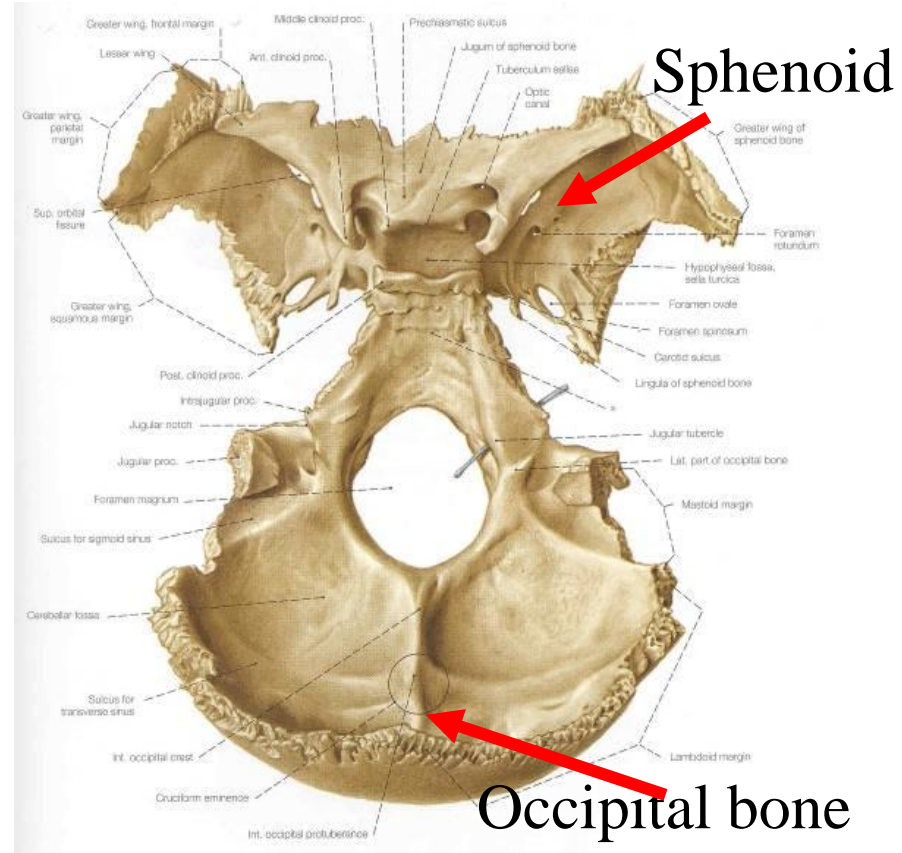
ANTERIOR ASPECT



Aperture of the sphenoidal sinus
Opens to the nasal cavity

Body of sphenoid:

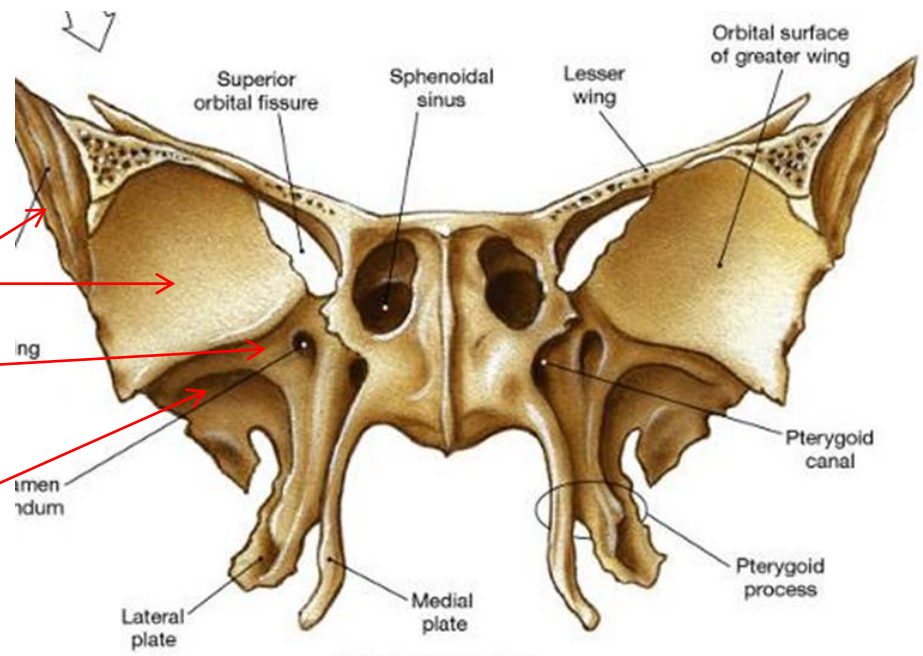
- (cuboid shape)
- **Posterior surface** - connected to the basilar part of the occipital bone
- **Inferior surface** - connected to vomer
- **Superior surface** - sella turcica, *tuberculum sellae*, *dorsum sellae*, (*anterior/middle/posterior clinoid process*)
- **Anterior surface** – looking to the nasal cavity (aperture of sphenoidal sinus)
- **Lateral surfaces** – origin of greater wings and the position of carotic grooves



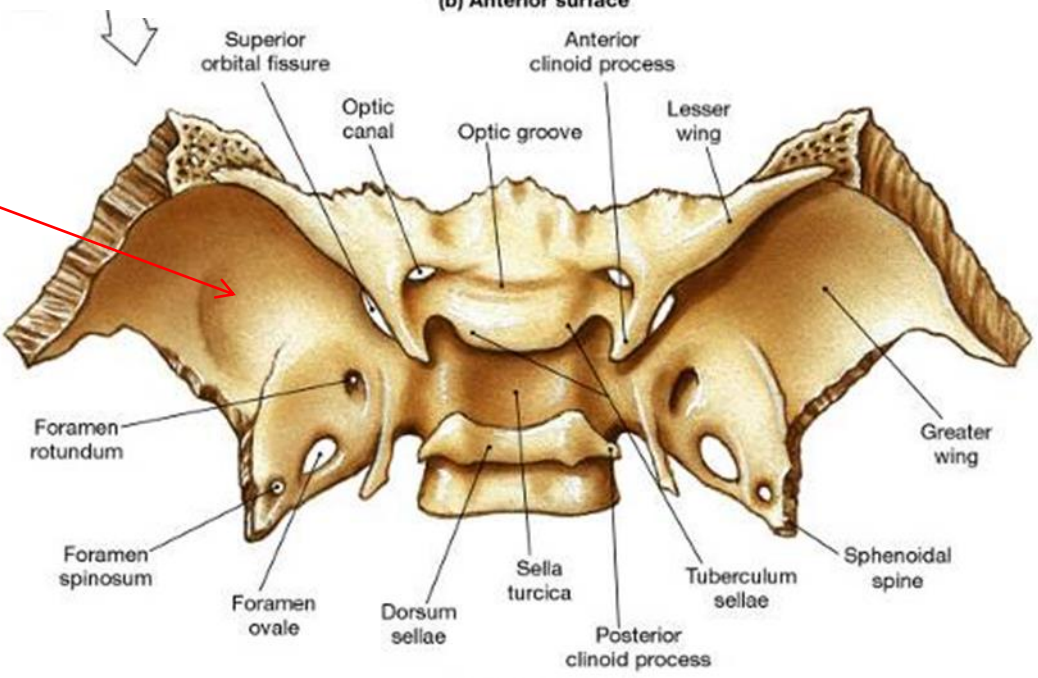
Sphenoid

Surfaces of the greater wing:

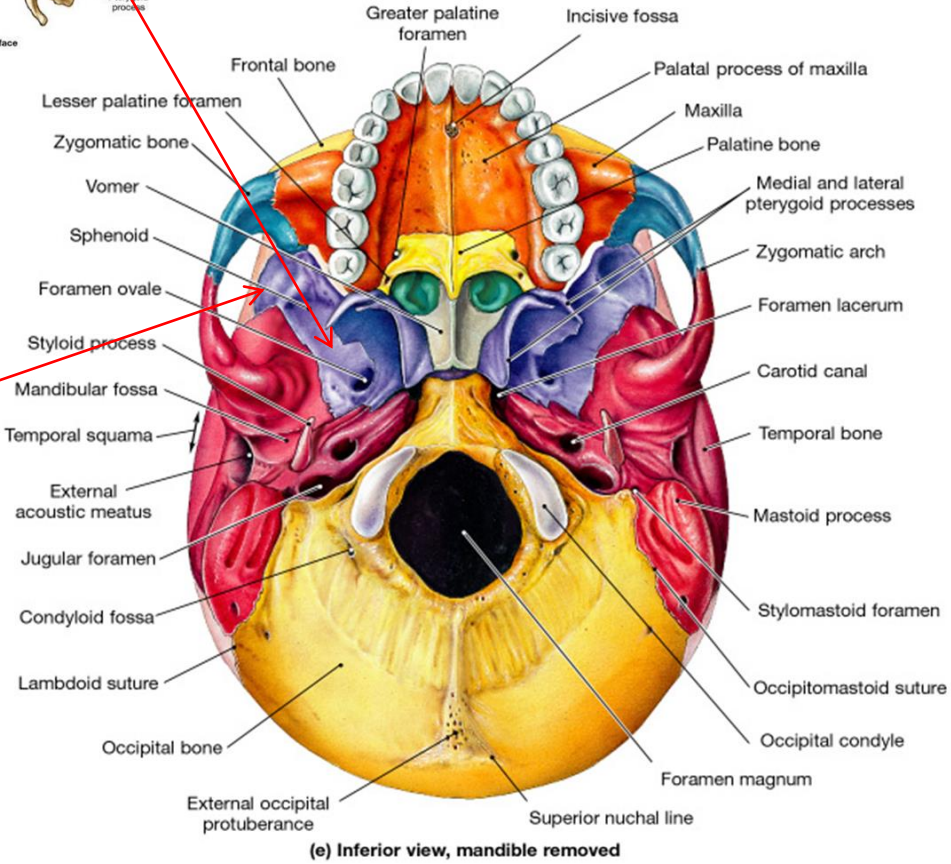
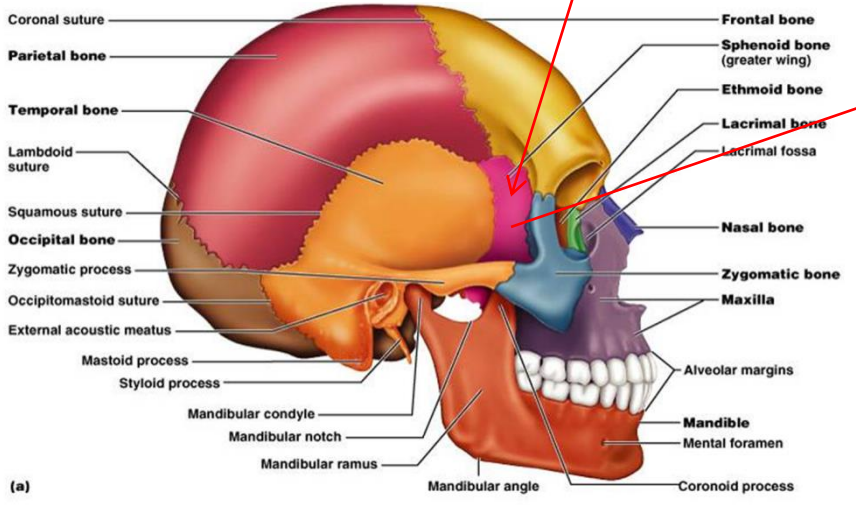
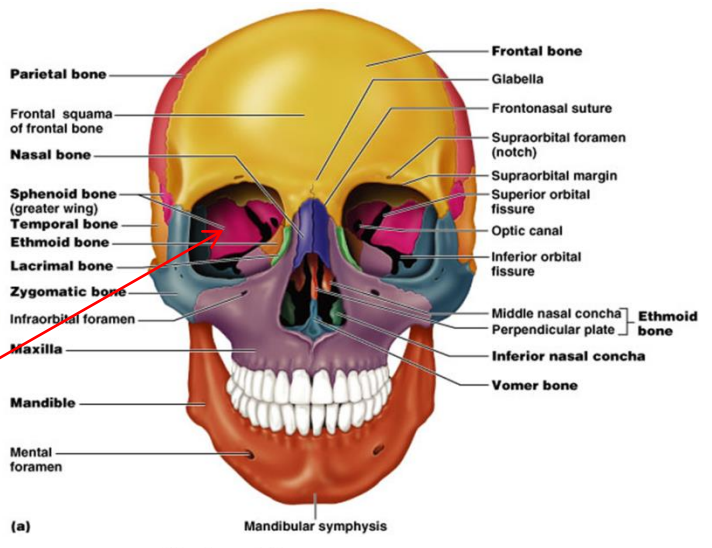
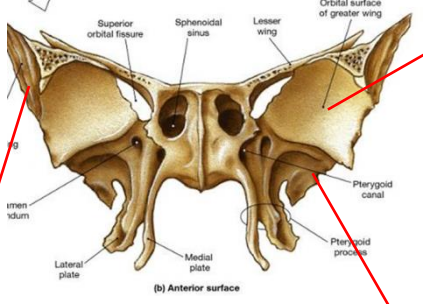
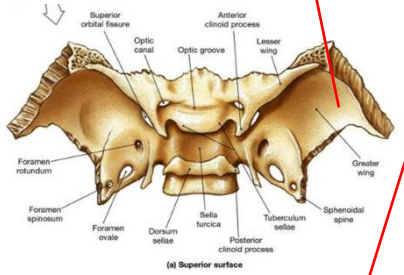
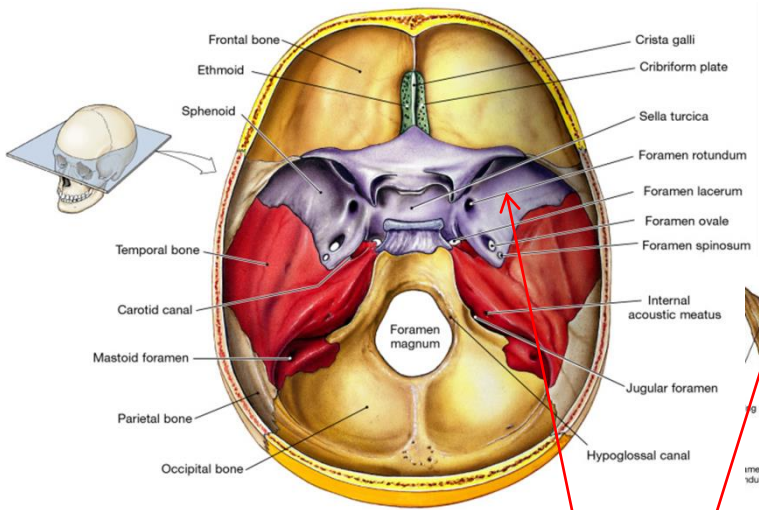
- orbital surface
- maxillary surface (around foramen rotundum)
- temporal surface
- infratemporal surface
- cerebral surface



(b) Anterior surface



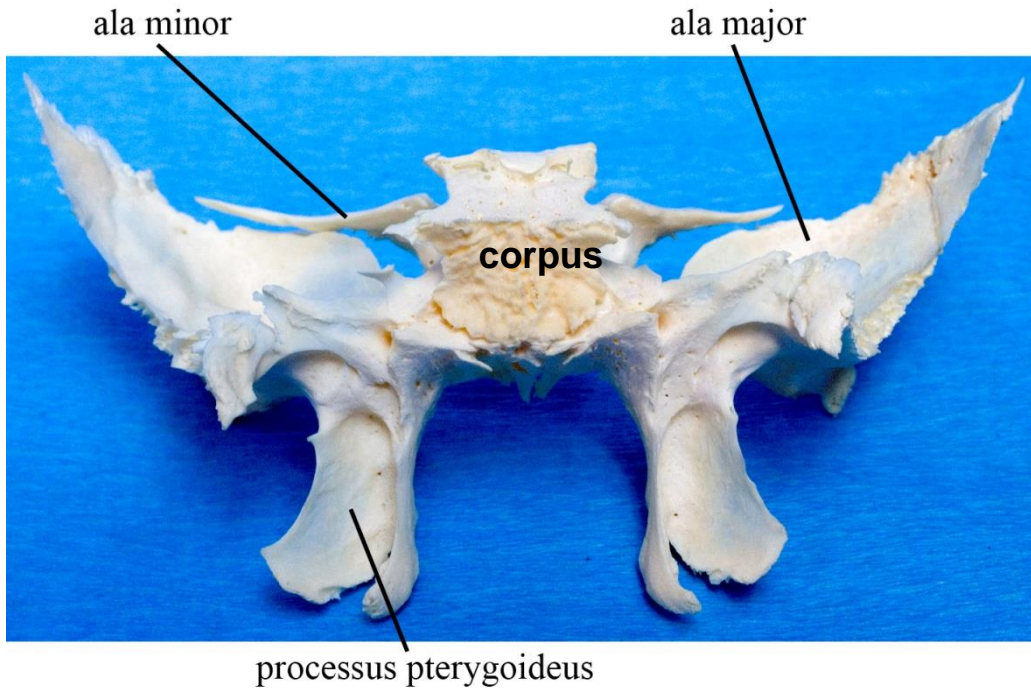
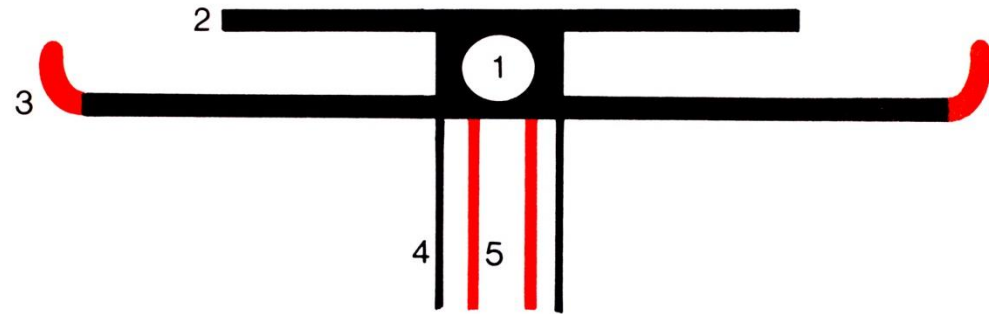
(a) Superior surface



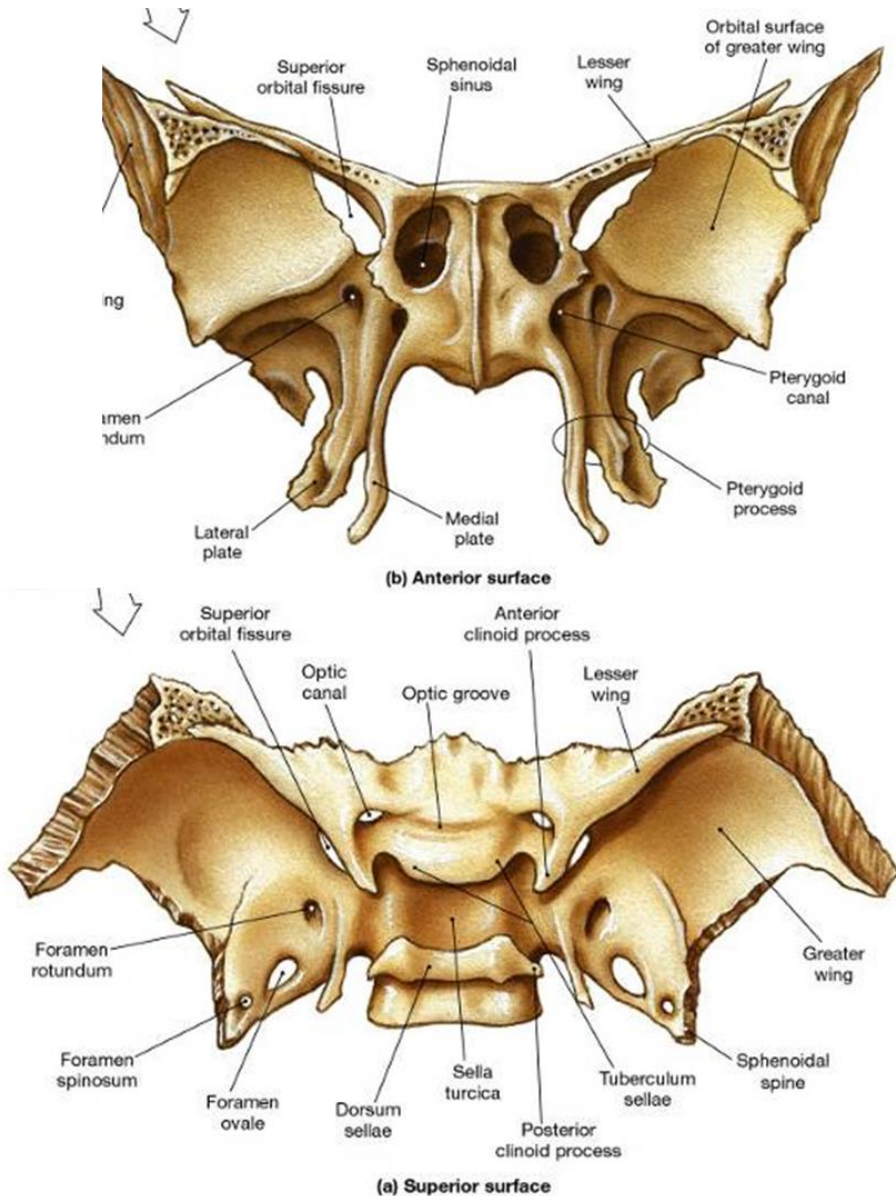
PTERYGOID PROCESS

PARTS:

- *lateral and medial lamina*
- scaphoid fossa
- pterygoid fossa



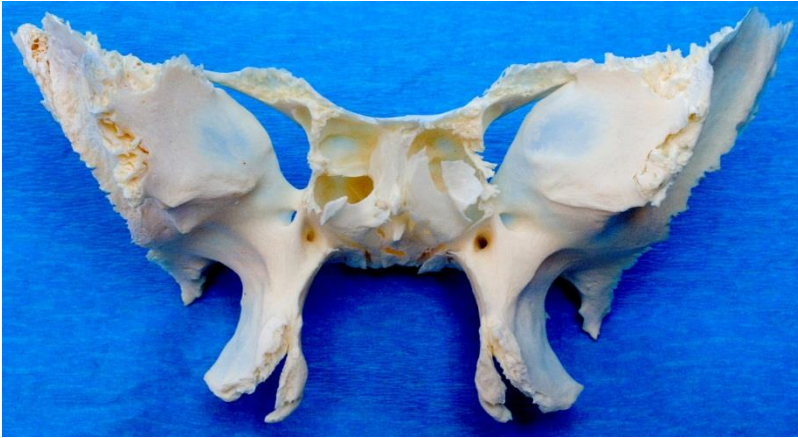
SPHENOID - OPENINGS



- superior orbital fissure
- optic canal
- foramen ovale
- foramen rotundum
- foramen spinosum
- pterygoid canal

ASPECTS OF SPHENOID

ANTERIOR ASPECT



POSTERIOR ASPECT



INFERIOR ASPECT



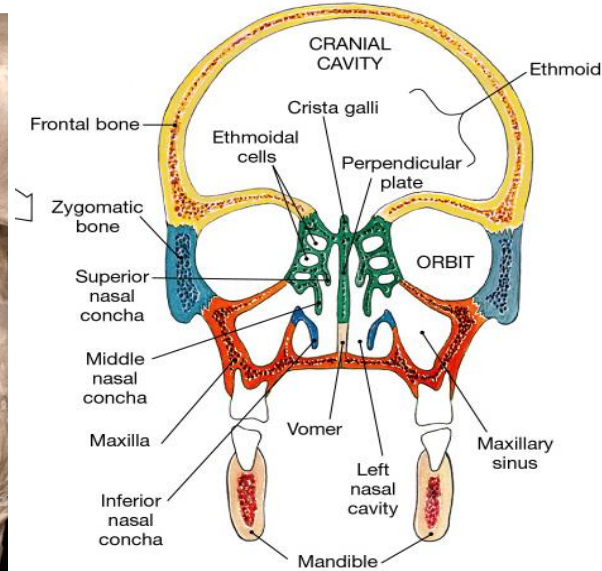
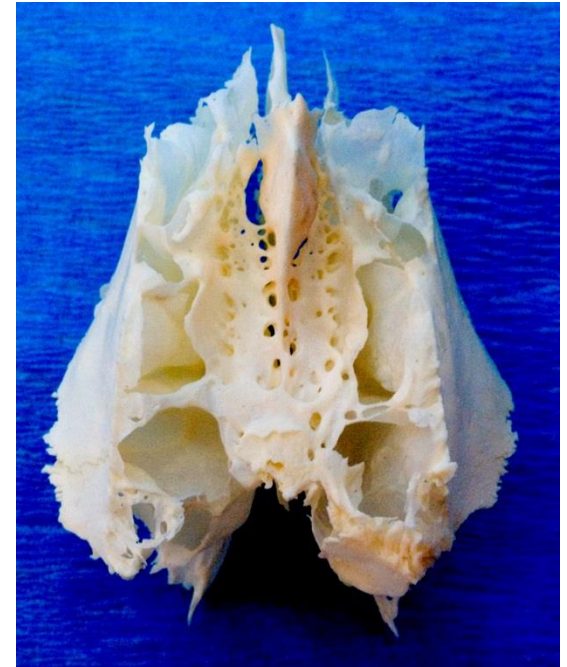
SUPERIOR ASPECT

ETHMOID

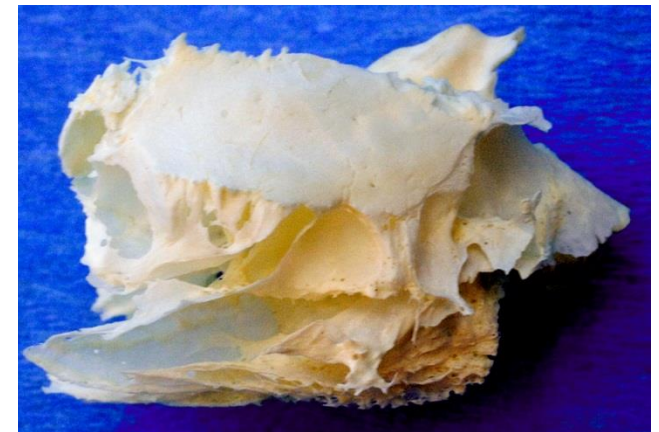
ANTERIOR ASPECT



SUPERIOR ASPECT



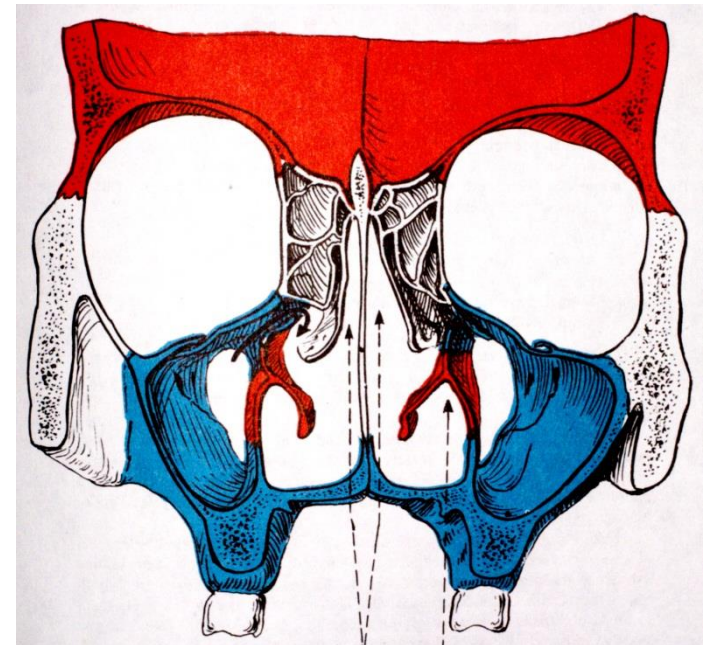
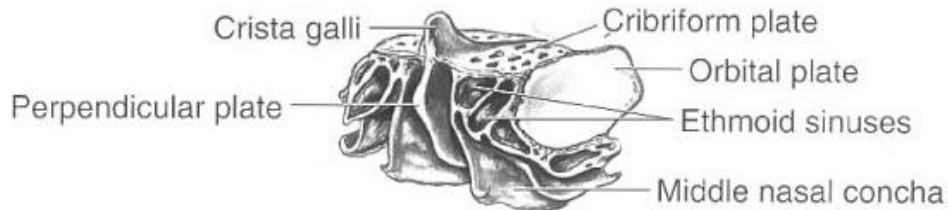
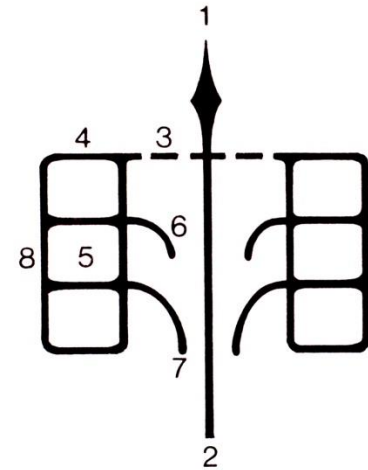
(d) Frontal section



LATERAL ASPECT

ETHMOID

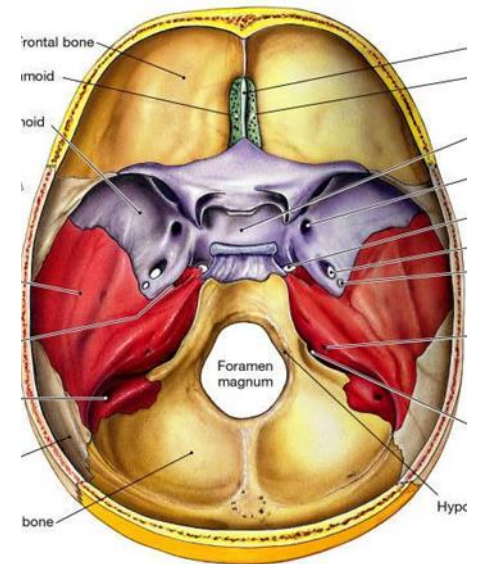
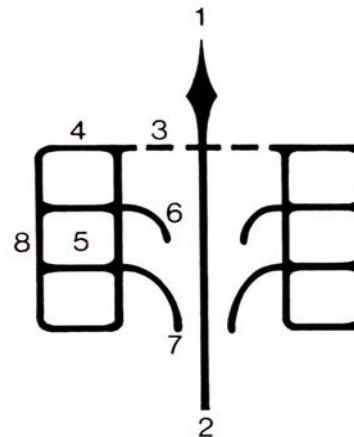
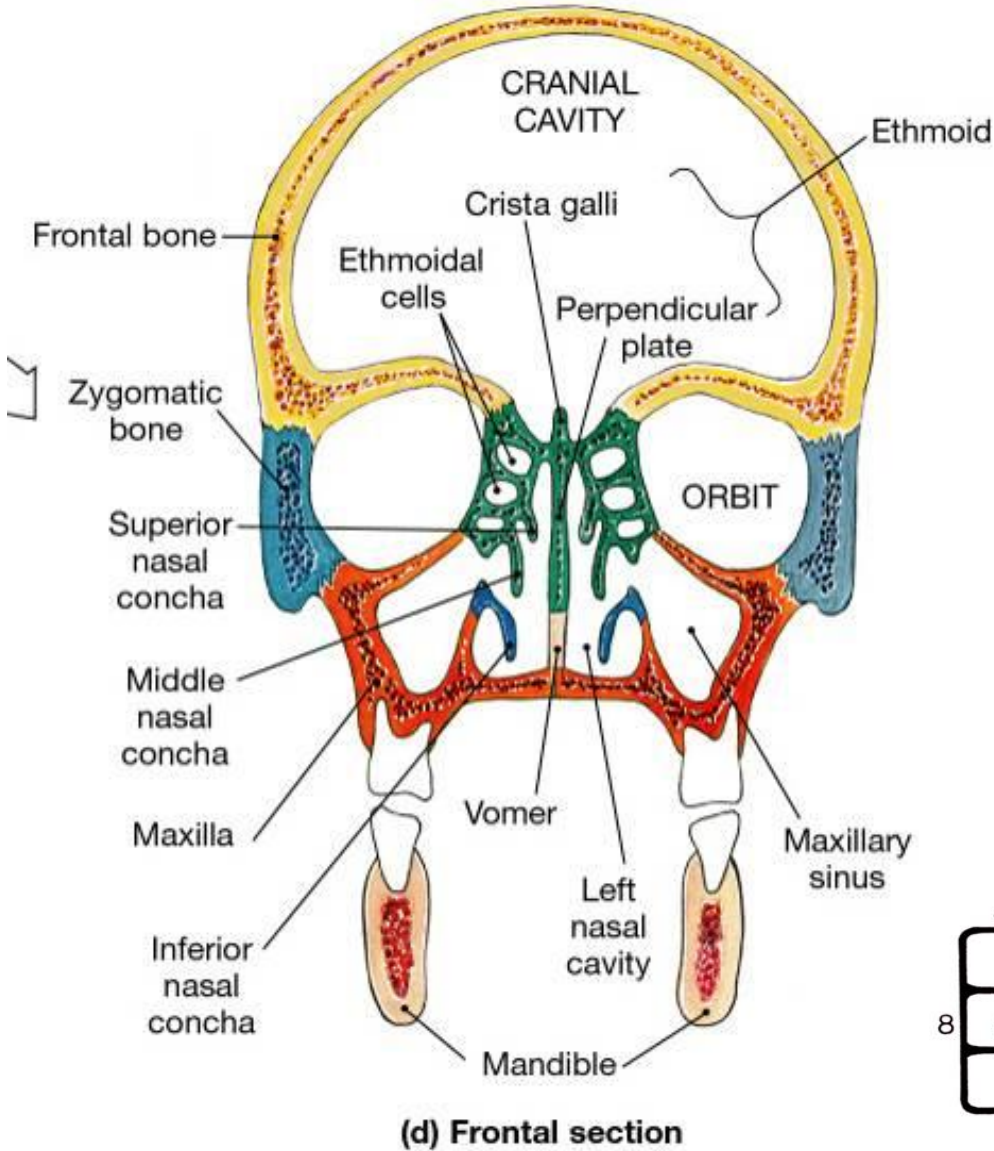
- irregular bone
- Form the wall of *orbit and nasal cavity*
- Connects to *frontal, sphenoid, lacrimal and maxilla*
- The lateral massive parts contain the - **labyrinth**
- inside cavities (*ethmoidal cells*)
- It forms with vomer the bony nasal septum



ETHMOID

Parts:

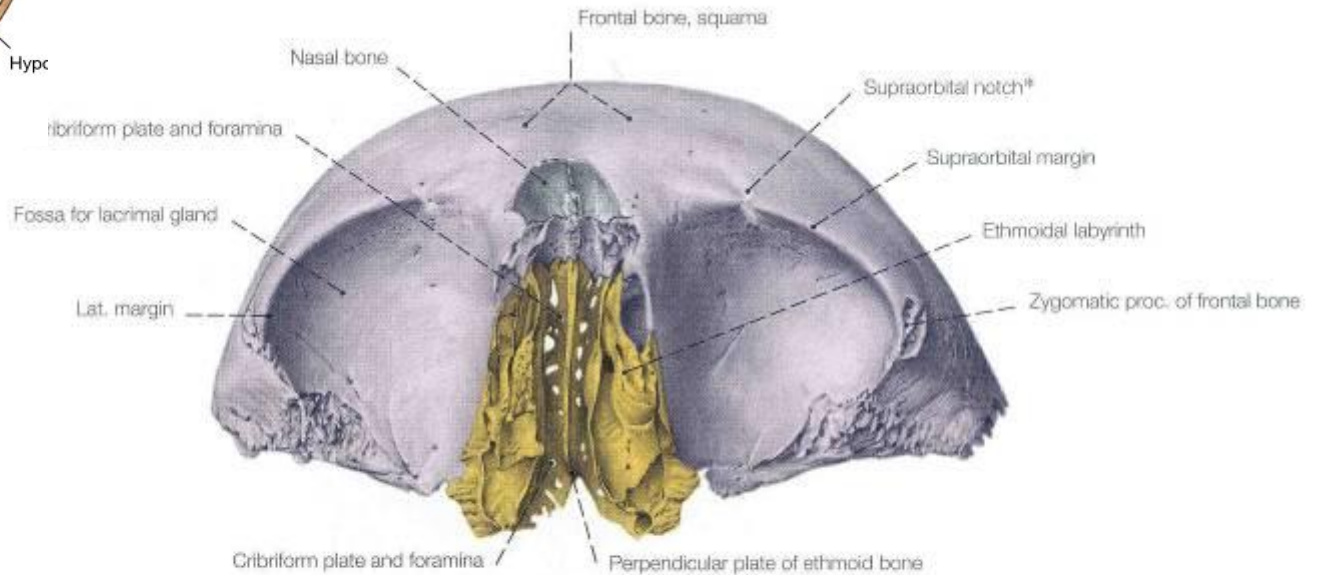
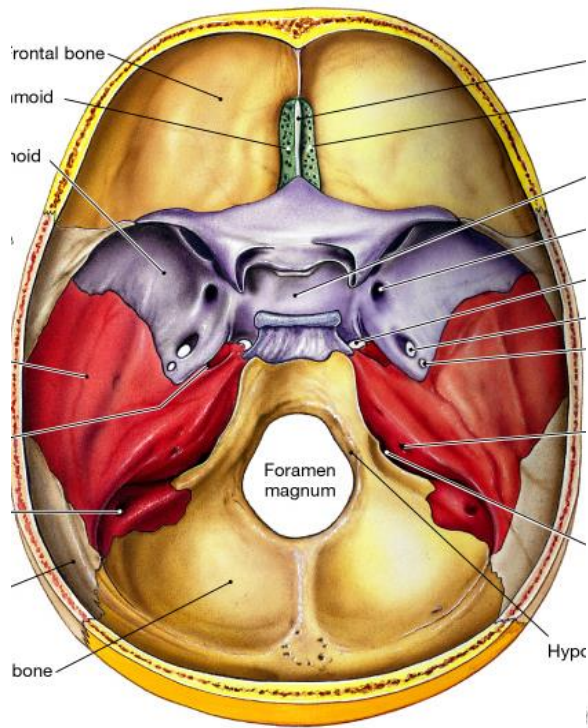
- cribriform plate and foramina
- perpendicular plate
- orbital plate
- ethmoidal labyrinth (cellulae)
- superior nasal concha
- middle nasal concha
- crista galli



ETHMOID

Cribriform plate, crista galli,

Ethmoid cells, orbital plate



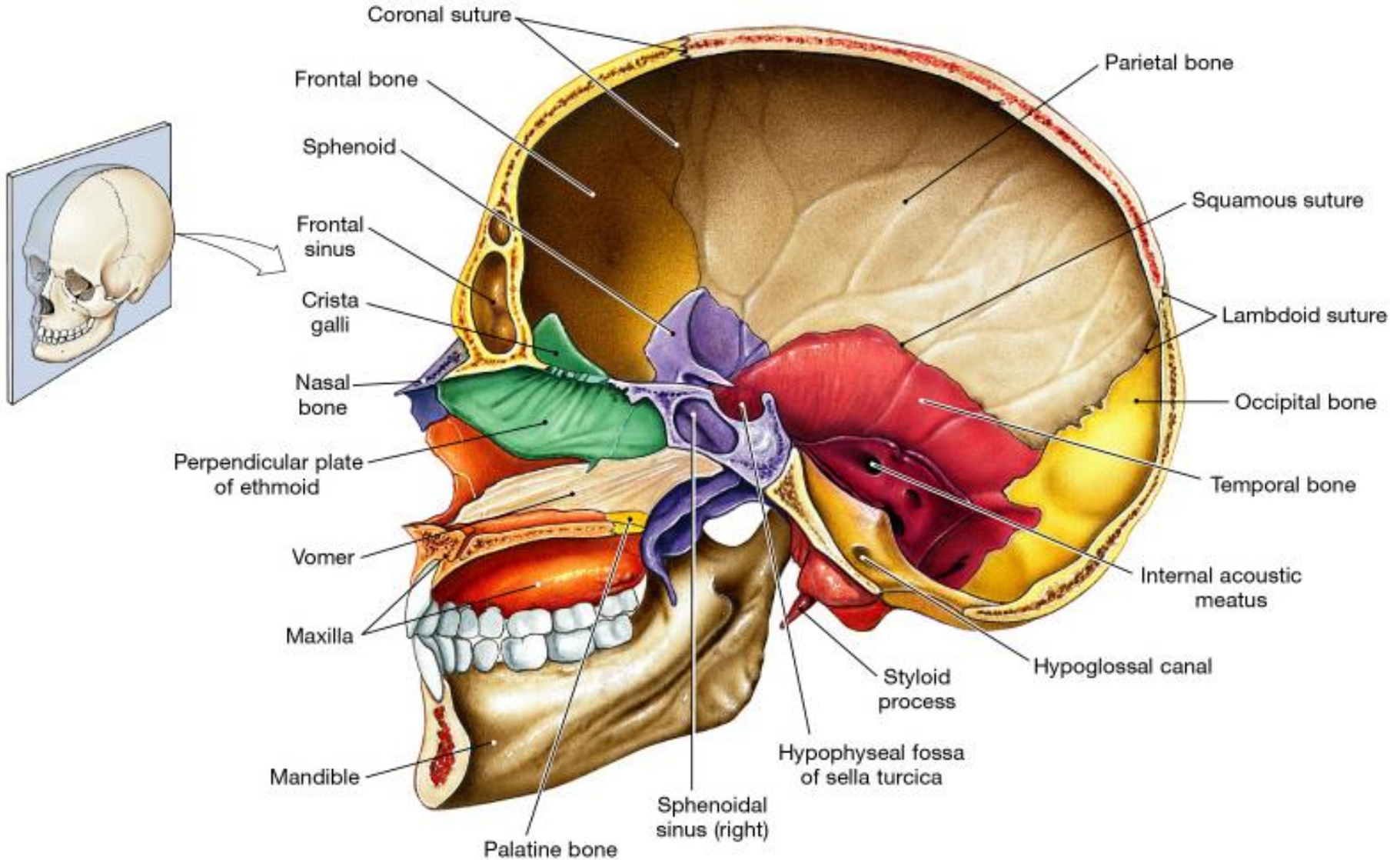
Frontal bone

Ethmoid bone

Nasal bone

ETHMOID

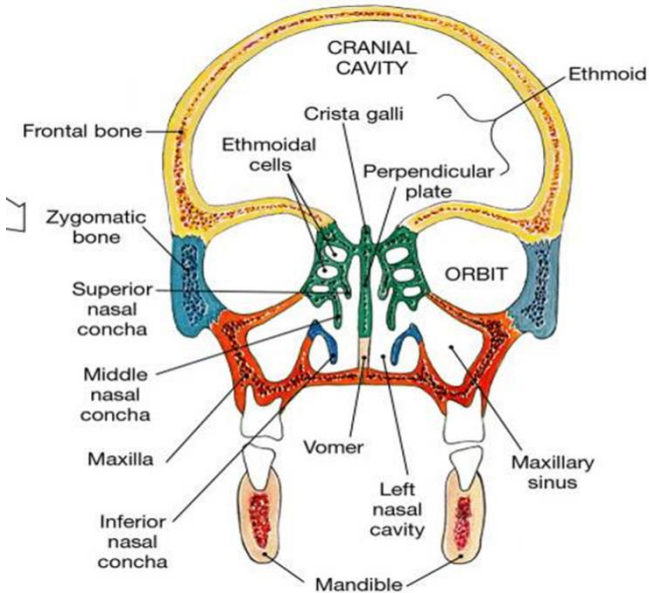
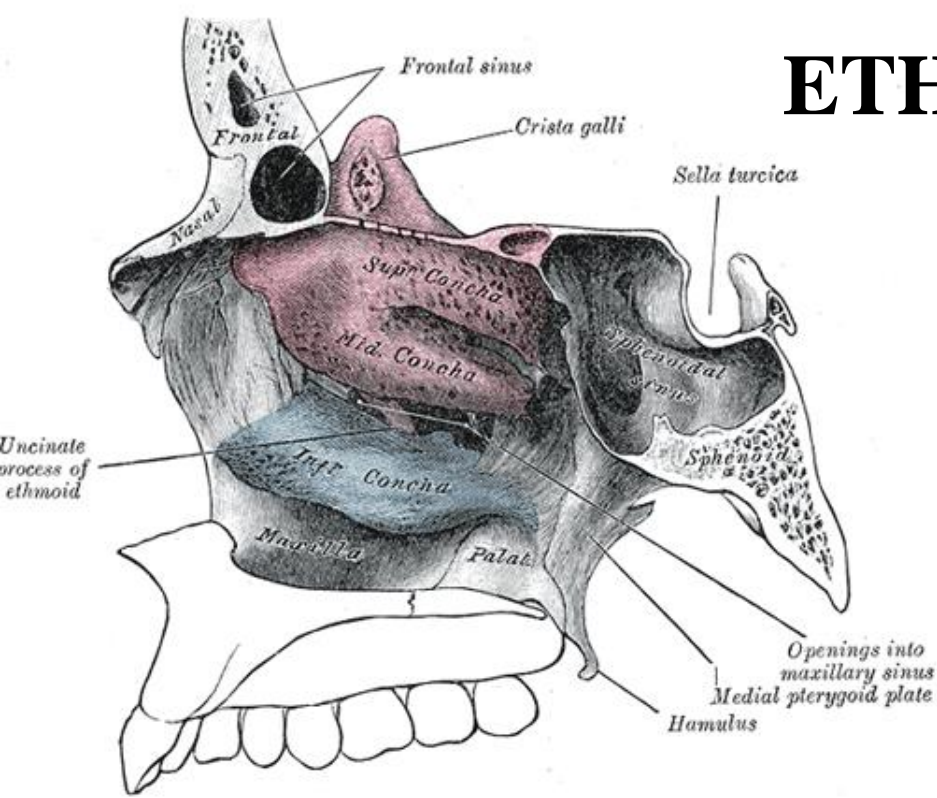
Perpendicular plate and crista galli



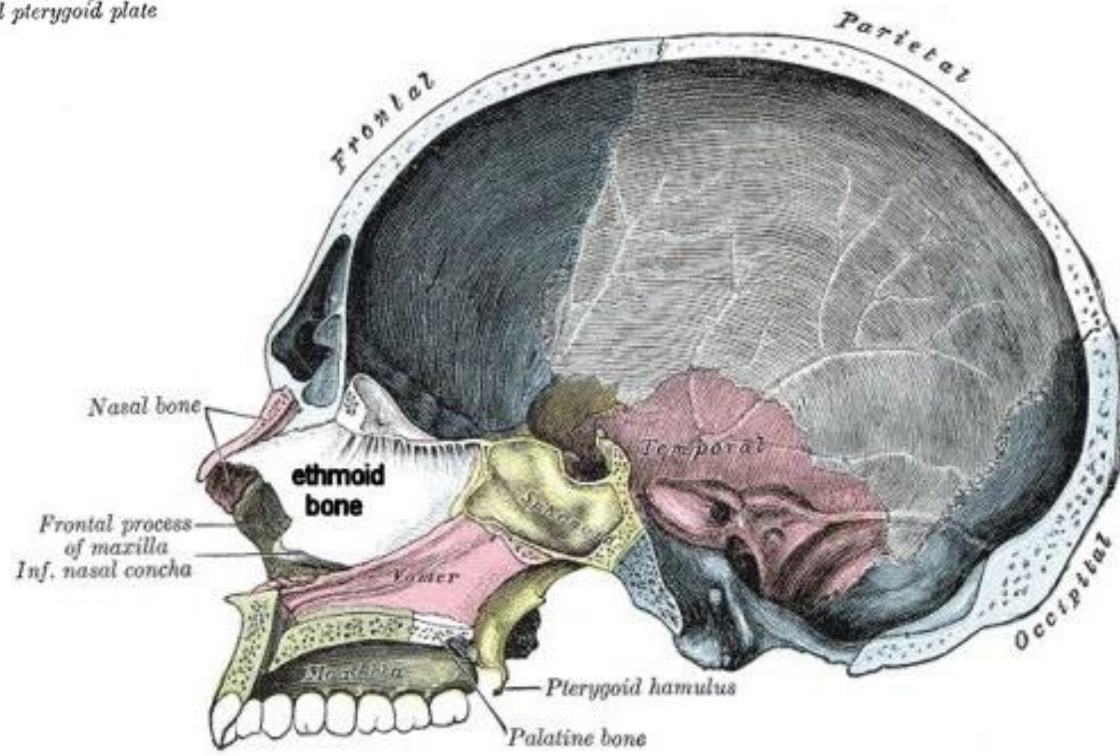
Sagittal sections

ETHMOID

- Superior and middle nasal concha



(d) Frontal section



ETHMOID

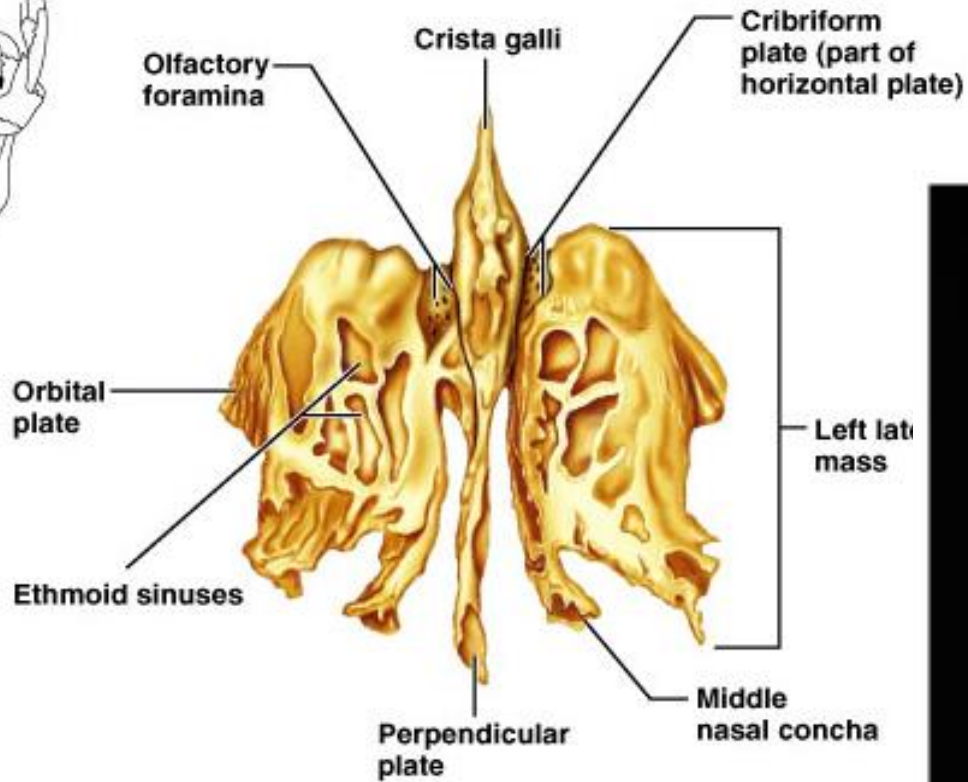
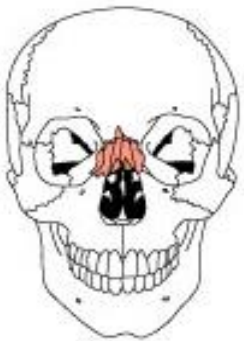
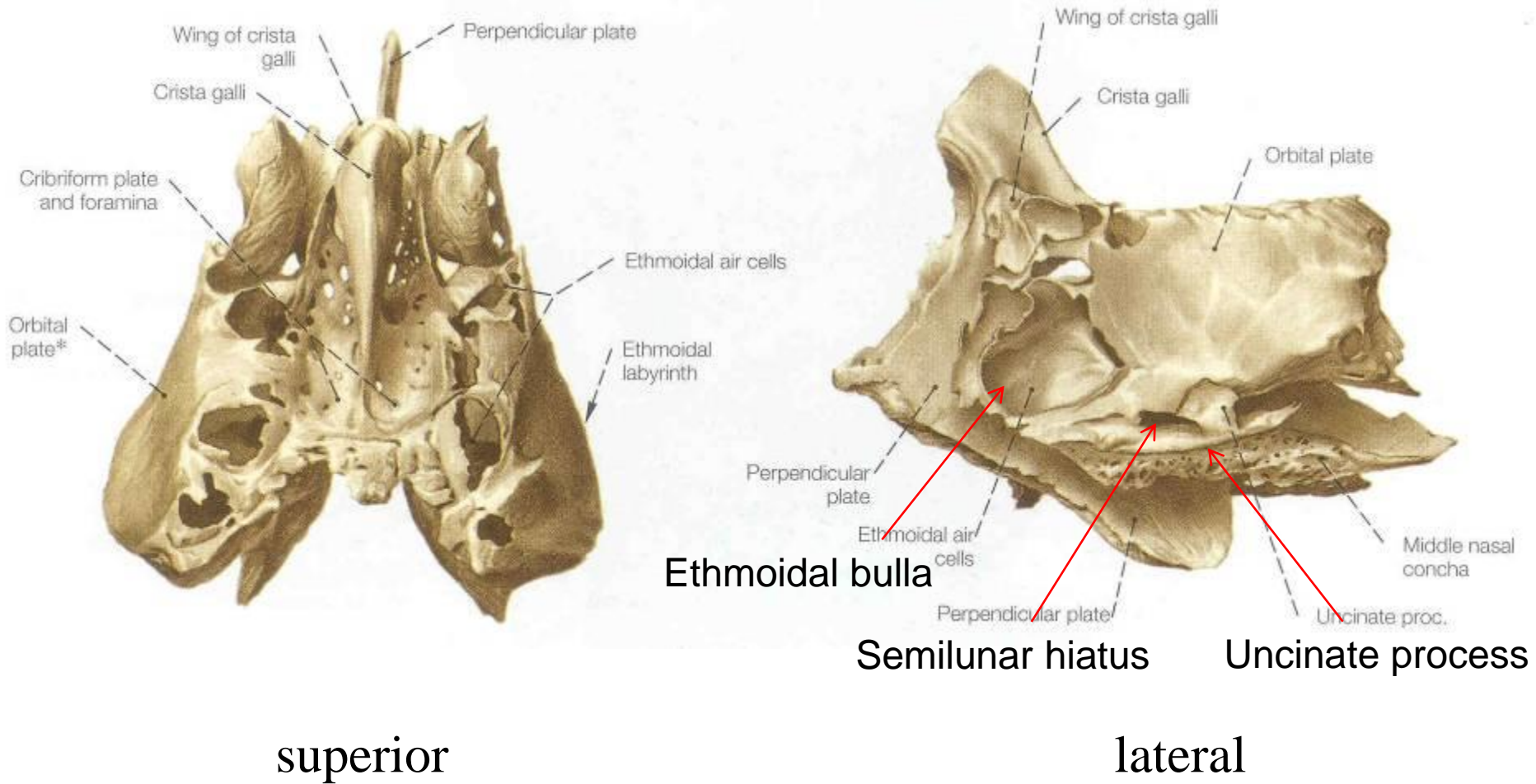
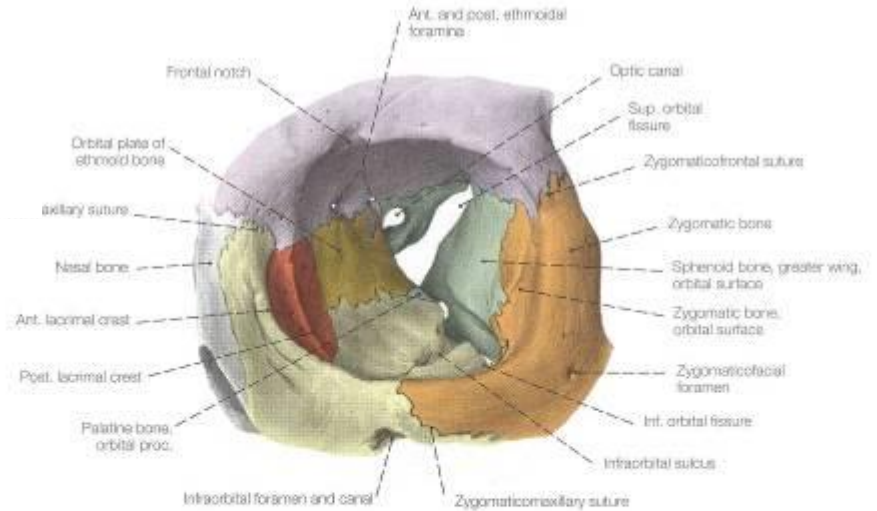
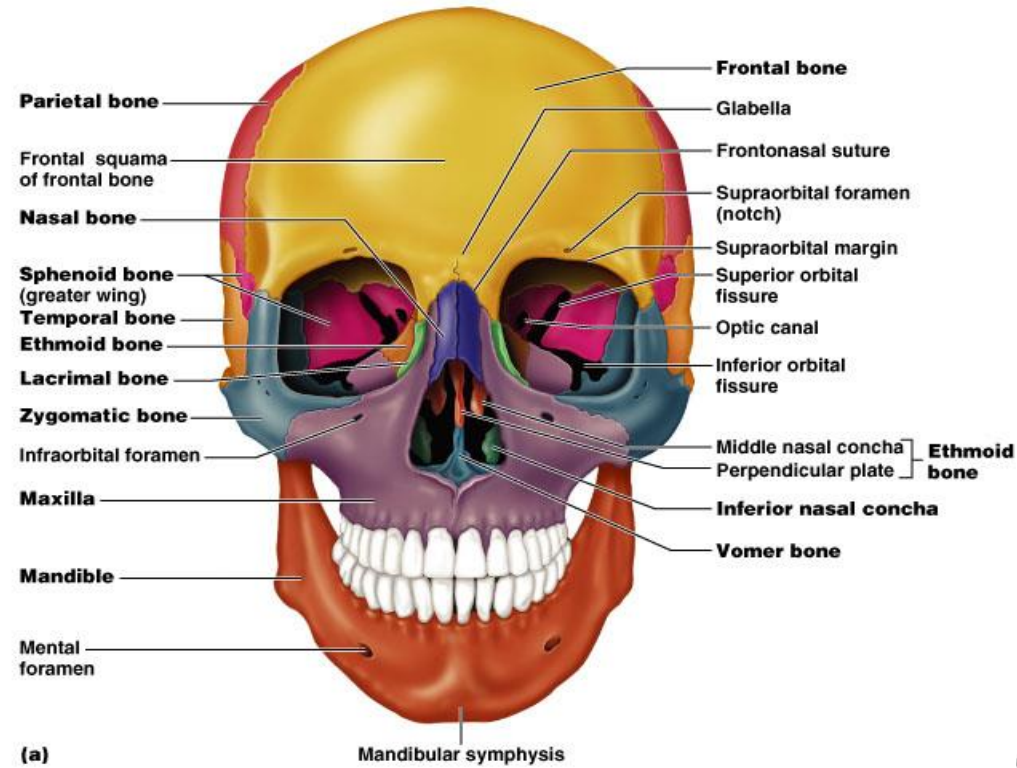


Figure 7.7

ETHMOID



Ethmoid - orbital plate

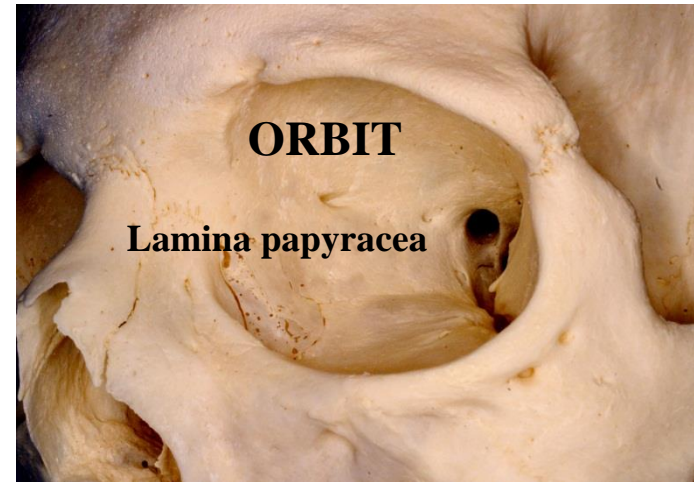
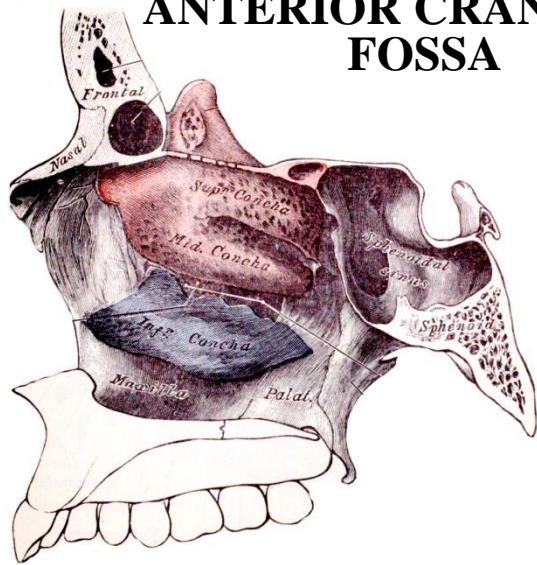


The left orbit, anterolateral view (110%). The probe is in the infraorbital canal.

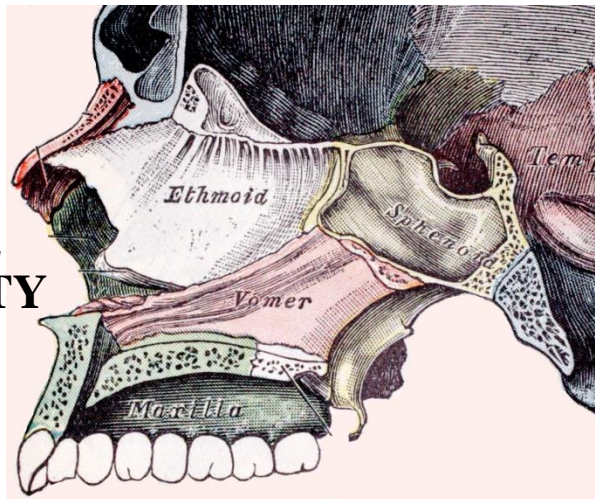


CAVITIES BORDERED BY THE ETHMOID

ANTERIOR CRANIAL FOSSA



NASAL CAVITY



Recommended note

Connections of the skull


Made by: dr. Károly Altdorfer Revised by: dr. György Somogyi
Semmelweis University Medical School - Department of Anatomy, Histology and Embryology, Budapest, 2002-2005



Oral cavity

	From where (to where)	Contents
Incisive canal "Y"-shaped canal	Nasal cavity (common nasal meatus)	Nasopalatine a. Nasopalatine n. (of Scarpa) (from V/2 n.)
Greater palatine canal or greater pterygopalatine/ sphenopalatine canal (ends with greater palatine foramen)	Pterygopalatine fossa	Greater palatine n. (from V/2 n.) Descending palatine a. Lesser palatine nerves (from V/2 n.)
Lesser palatine canals (end with lesser palatine foramina)		
(Mandibular canal) starts with mandibular foramen	Mental foramen; the incisive canal of the mandible goes further in the mandible until the incisive teeth	Inferior alveolar a., v., n.

Tympanic cavity (or middle ear)

	From where (to where)	Contents
Musculotubarian canal  a) (Semi)canal of tensor tympani muscle b) (Semi)canal of the auditory tube	External base of the skull	a) Tensor tympani muscle b) Auditory (Eustachian) tube
Caroticotympanic canaliculi	Carotid canal	Caroticotympanic arteries Caroticotympanic plexus (sympathetic nerves)
Canaliculus of chorda tympani In the tympanic cavity it opens with the tympanic aperture of the canaliculus of chorda tympani	Facial canal (from its 3 rd , descending part)	Chorda tympani (from VII. n.) Post. tympanic a.
Stapedius canaliculus	Facial canal (from its 3 rd , descending part)	Stapedius n. (from VII. n.)
Tympanic canaliculus	Fossula petrosa (external base of the skull)	Tympanic n. (from IX. n.) Inf. tympanic a.
Canal of the lesser petrosal nerve	Middle cranial fossa (opens on the anterior aspect of the pyramid)	Lesser petrosal n. (from IX. n.) Sup. tympanic a.
Mastoid antrum Opens with aditus to antrum	Mastoid air cells	-- ventilation
(Fenestra vestibuli)	Inner ear	
(Fenestra cochleae)	Inner ear	