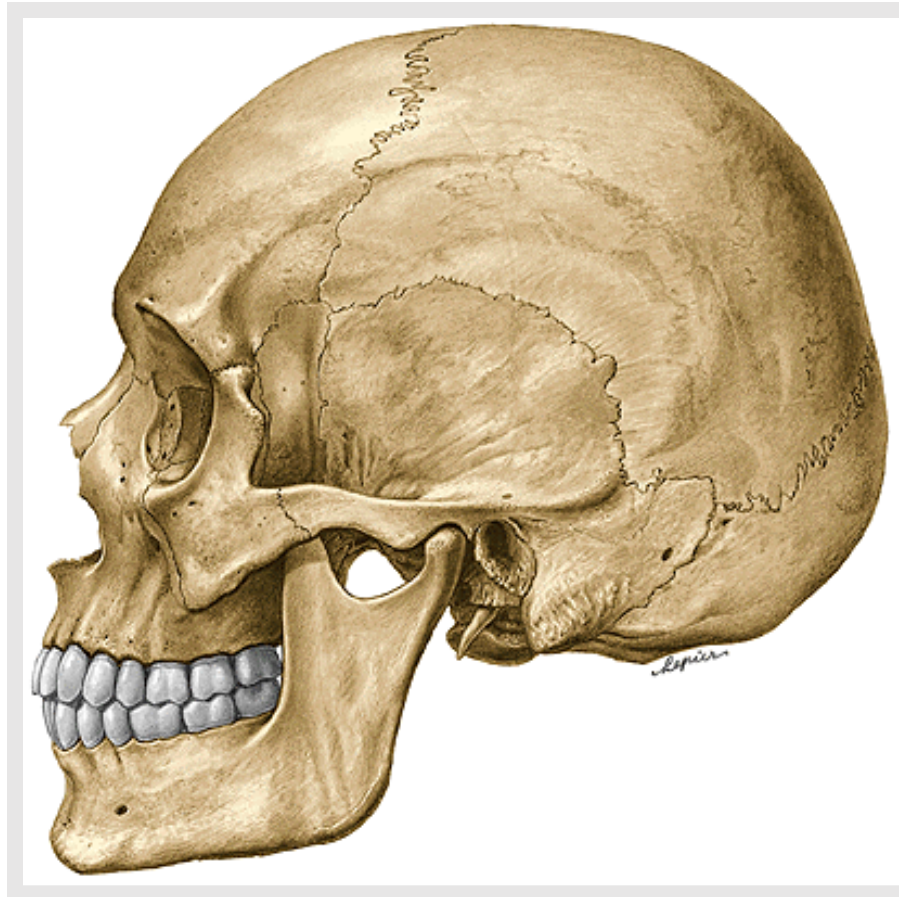


SKULL *(cranium)*

- I. **Neurocranium** - the container for the brain and sensory organs
- II. **Splanchnocranium** (*viscerocranium=facial skeleton*) - contains the initial portions of the digestive and respiratory tracts and substructure for the face



Skull (cranium)

Neurocranium consists of:

Calva (vault=brain case) and basis cranii

os frontale (frontal bone)

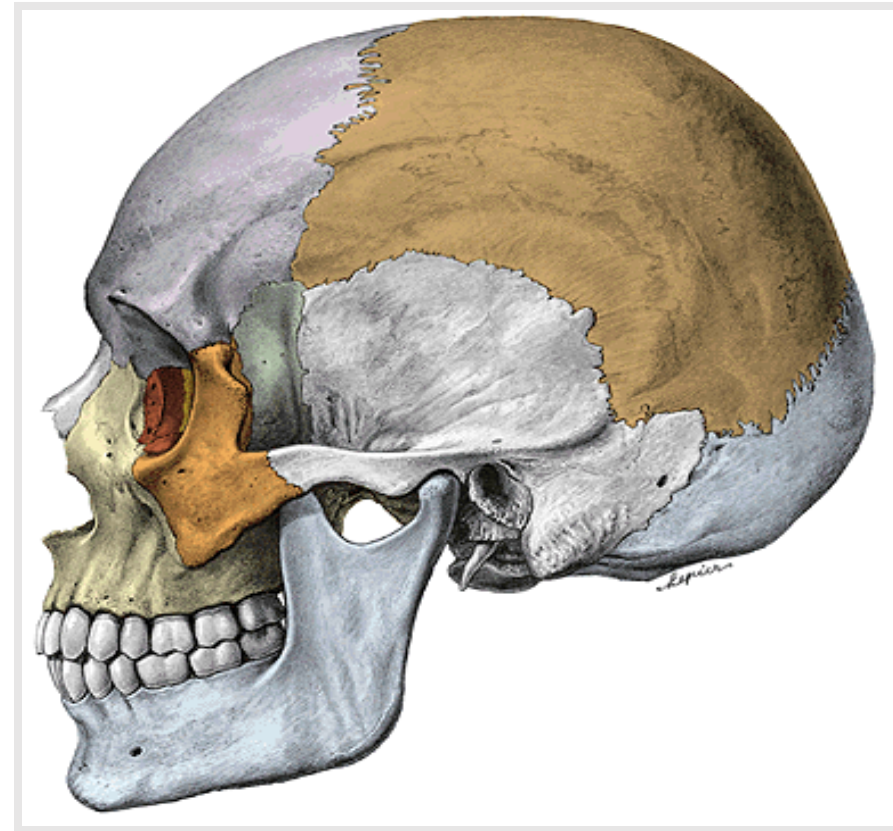
ossa parietalia (parietal bones)

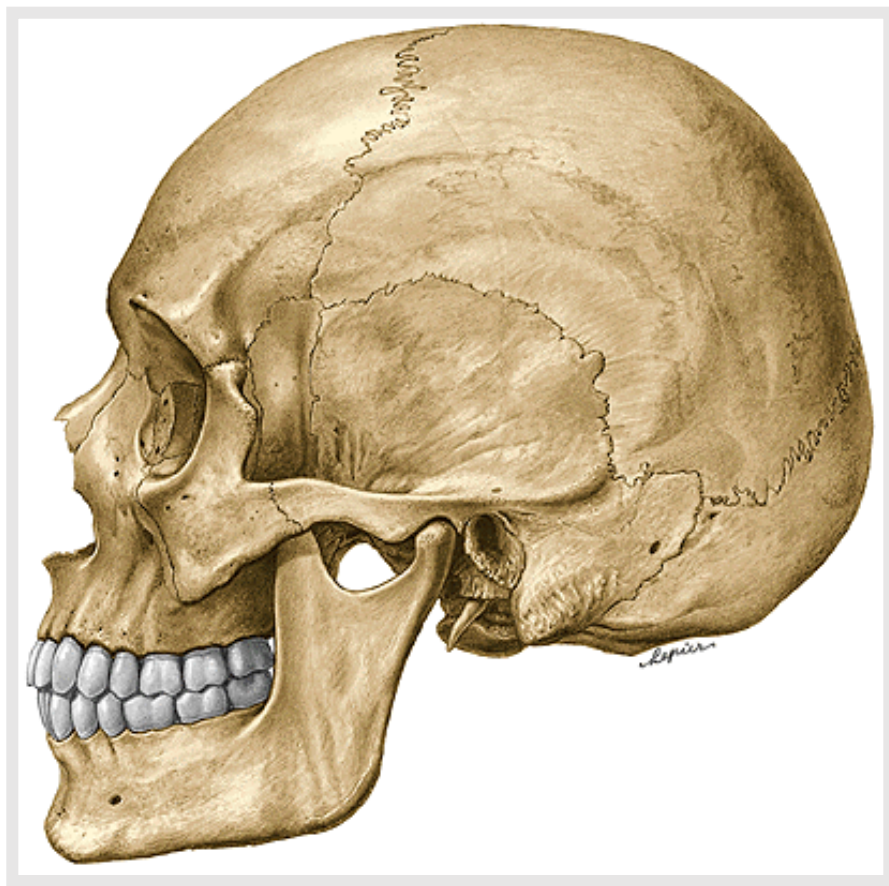
os occipitale (occipital bone)

os sphenoidale (sphenoid bone)

ossa temporalia (temporal bones)

os ethmoidale (ethmoid bone)



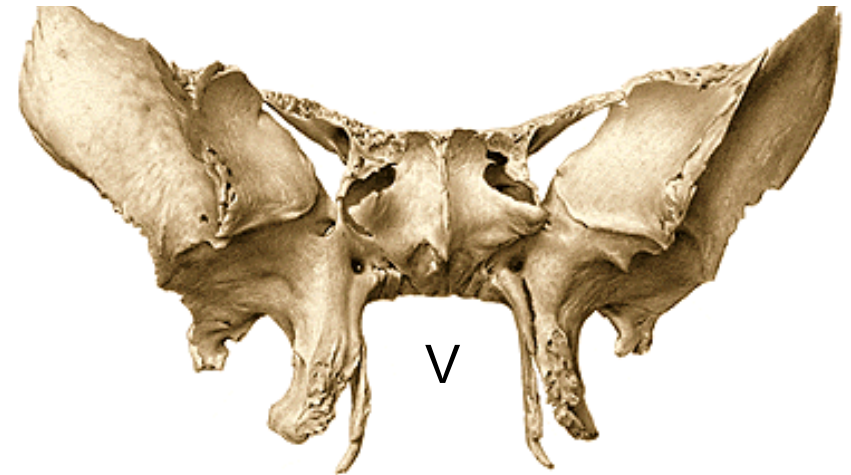
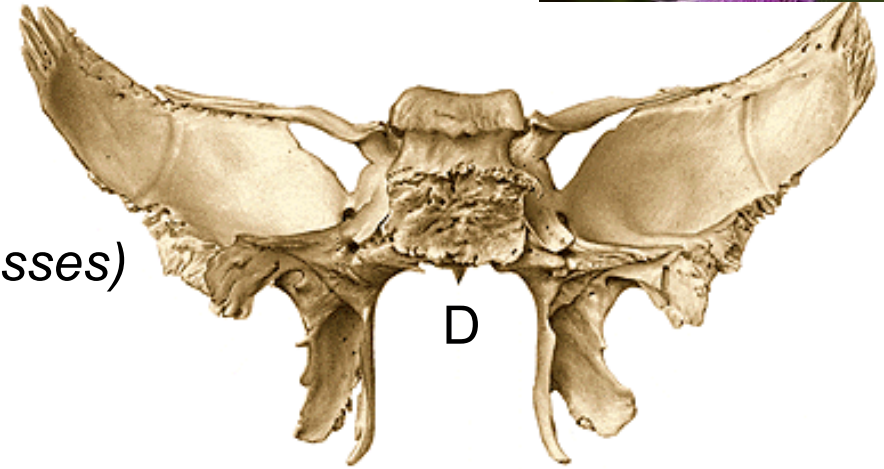
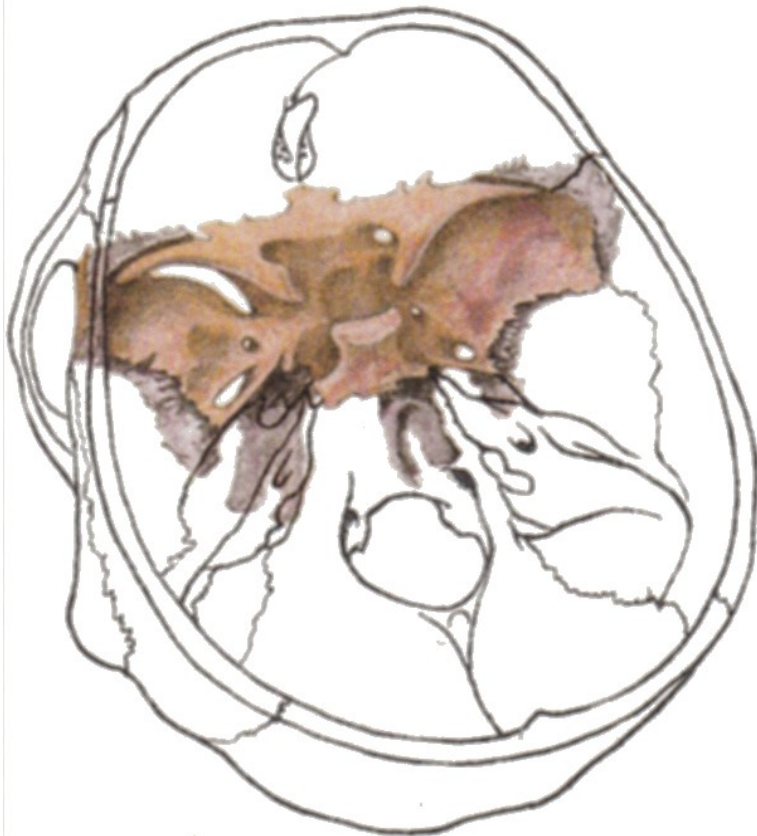




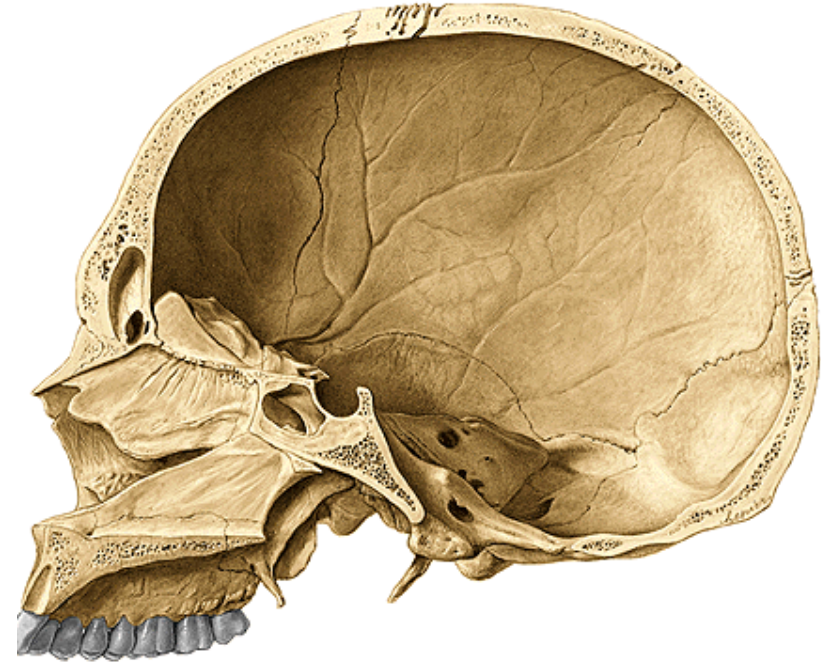
Os sphenoidale (*Sphenoid bone*)



1. Corpus (*Body*)
2. Alae minores (*Lesser wings*)
3. Alae majores (*Greater wings*)
4. Processus pterygoidei (*Pterygoid processes*)

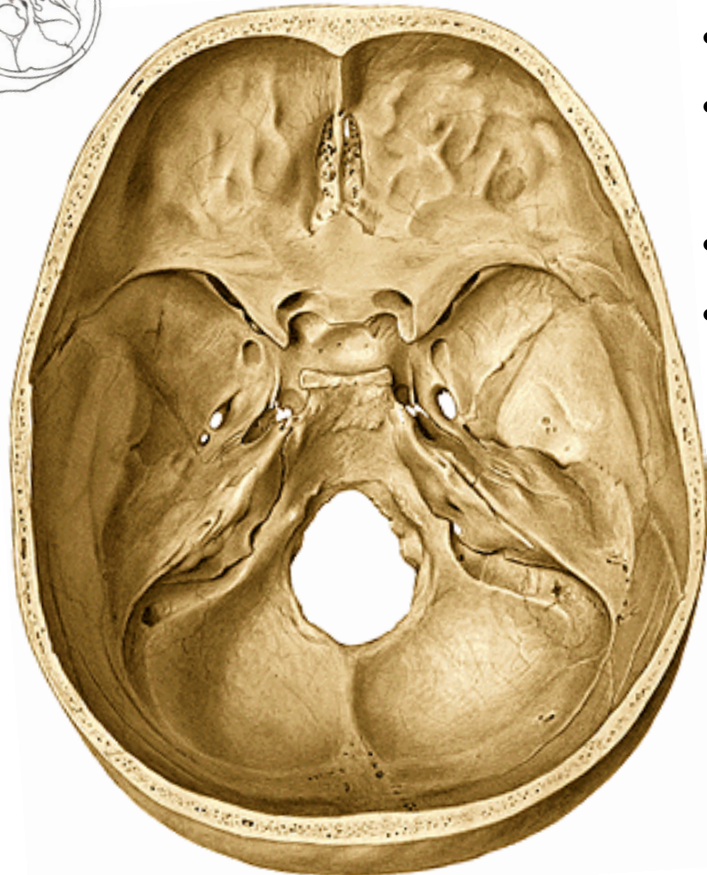


1. Corpus ossis sphenoidalis – ventral and caudal wall



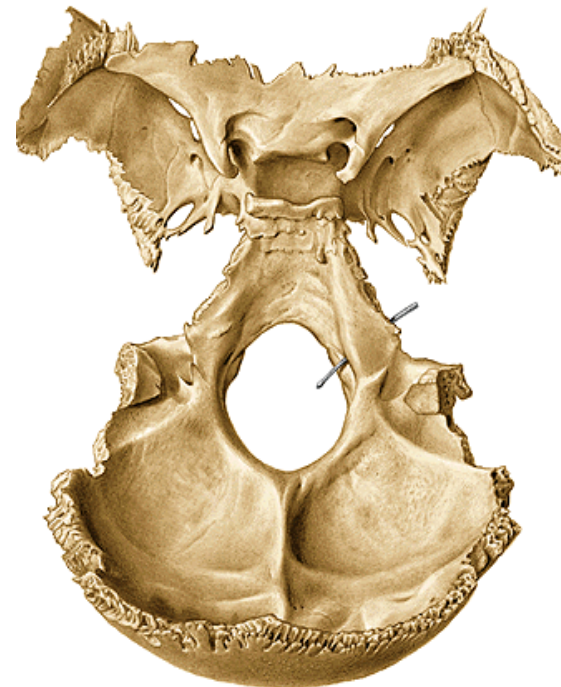
- sinus sphenoidalis (*sphenoid sinus*)
- apertura sinus sphenoidalis (*opening of sphenoidal sinus*)
- septum sinuum sphenoidalium (*septum of sphenoid sinus*)
crista sphenoidalis (*sphenoid crest*)
rostrum sphenoidale (*sphenoid rostrum*)

1. Corpus ossis sphenoidalis – upper and dorsal wall



synchondrosis /synostosis/
sphenooccipitalis

- fossa hypophysialis (*hypophysial fossa*)
- sella turcica (*turkish saddle*)
- dorsum sellae
- processus clinoidi posteriores
(*posterior clinoid processes*)
- sulcus caroticus (*carotid groove*)
- lingula sphenoidalis (*lingula of
the sphenoid bone*)



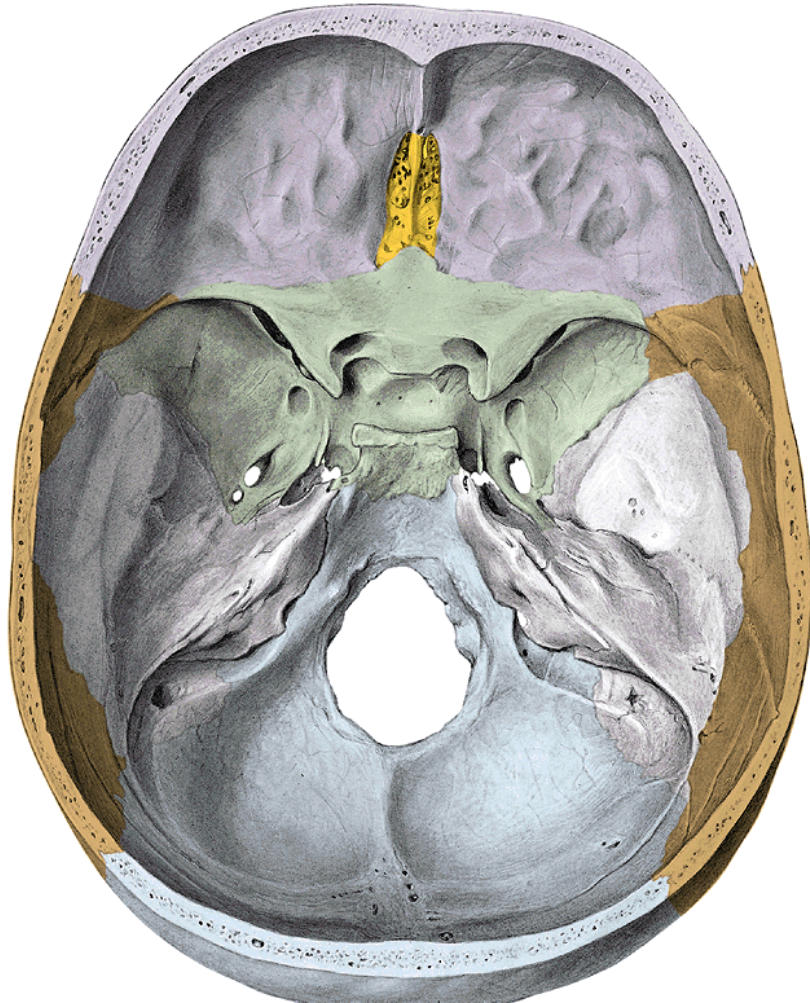
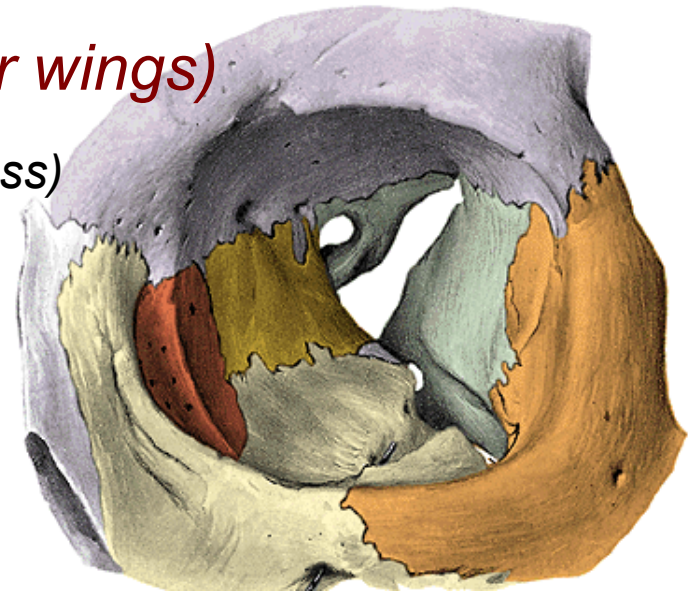
2. Alae minores ossis sphenoidalis (*lesser wings*)

processus clinoidi anteriores (*anterior clinoid process*)

(fissura orbitalis superior)

canalis opticus (*optic canal*)

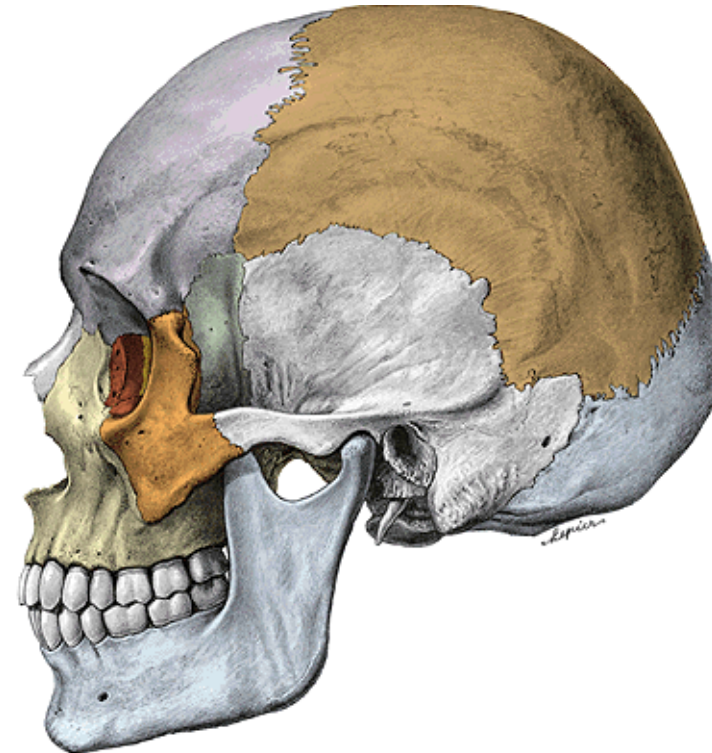
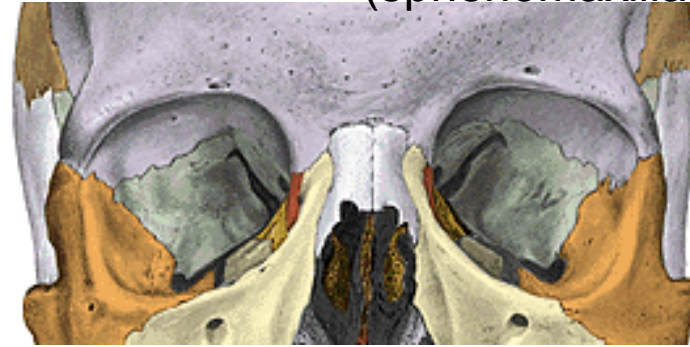
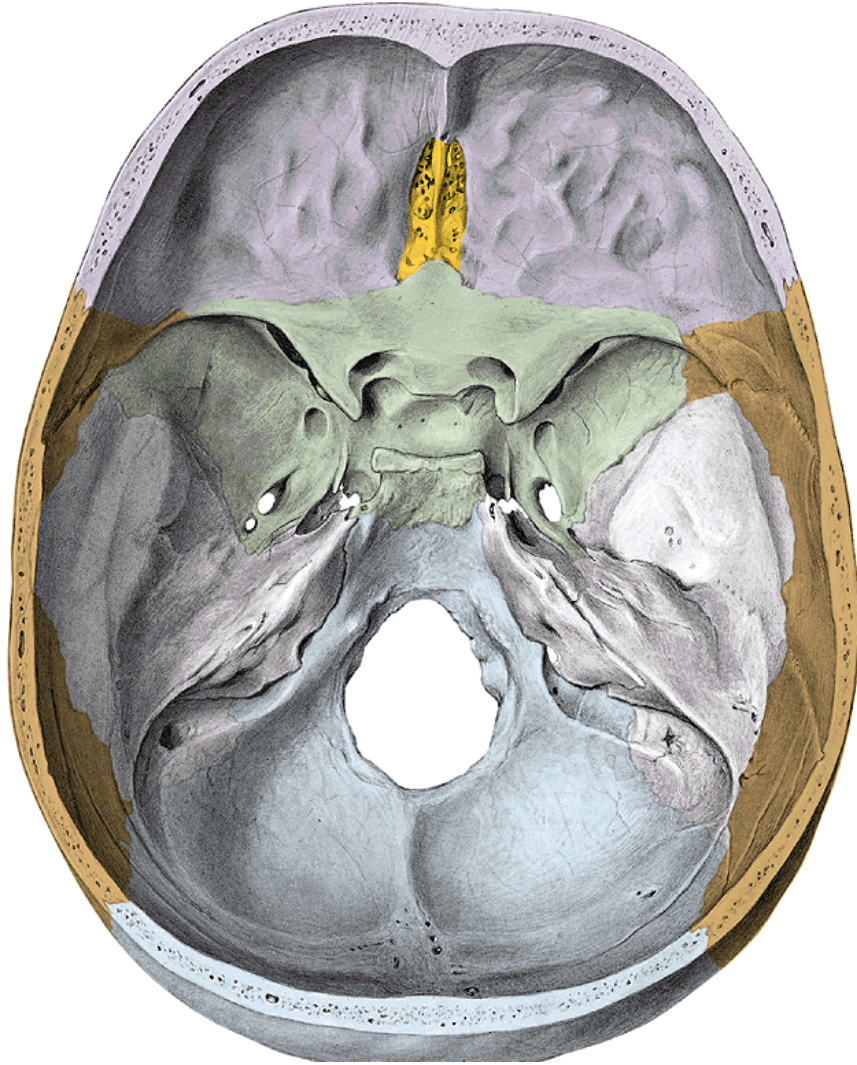
sulcus praechiasmaticus (*prechiasmatic groove*)



3. Alae majores ossis sphenoidalis (*greater wings*)

Facies cerebralis, orbitalis, temporalis, infratemporalis, maxillaris

(sphenomaxillaris)



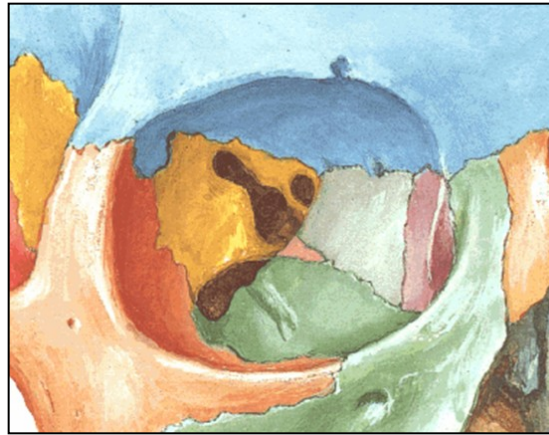
Facies cerebralis (Cerebral surface)



Foramen rotundum
Foramen ovale
Foramen spinosum

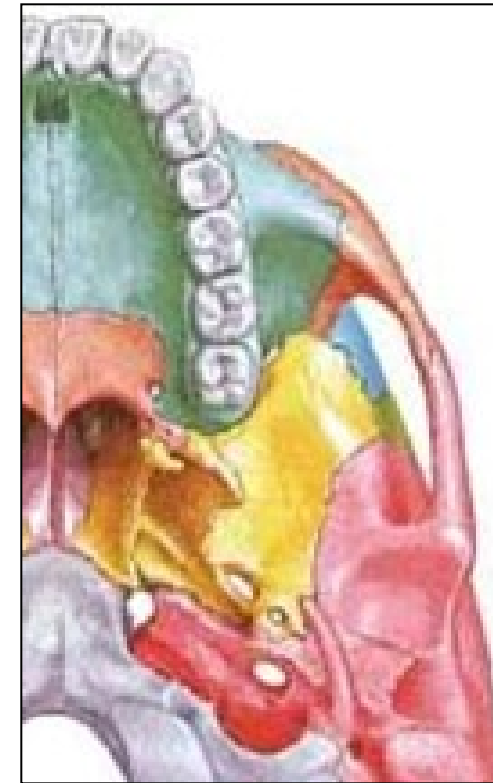
Fissura sphenopetrosa
Foramen lacerum
(fibrocartilago basilaris)

Facies orbitalis



Fissura orbitalis superior
Fissura orbitalis inferior

Facies infratemporalis

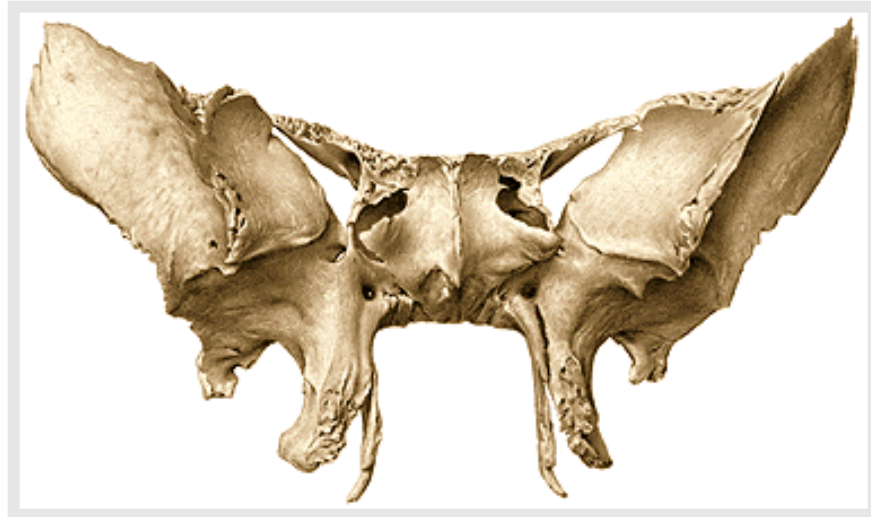


Foramen ovale
Foramen spinosum

Spina ossis sphenoidalis
Crista infratemporalis

4. Processus pterygoidei

lamina lateralis processus pterygoidei
lamina medialis processus pterygoidei
hamulus pterygoideus
fossa scaphoidea
fossa pterygoidea
incisura pterygoidea (*pterygoid notch*)
canalis pterygoideus



Os occipitale (*occipital bone*)

1. partes laterales
2. pars basilaris
3. squama occipitalis

1. partes laterales

condyli occipitales

canalis nervi hypoglossi (*hypoglossal canal*)

fossa condylaris with canalis condylaris

incisura jugularis (*jugular notch*)

2. pars basilaris

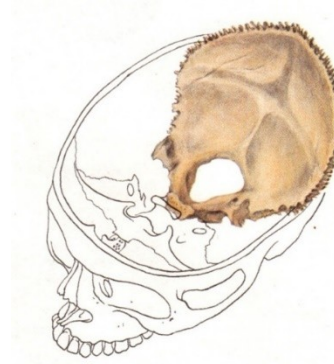
synchondrosis (synostosis) sphenoccipitalis

clivus

tuberculum pharyngeum

fissura petrooccipitalis

foramen magnum



3. Squama occipitalis

external surface:

protuberantia occipitalis externa

crista occipitalis externa

linea nuchae suprema (*highest nuchal line*)

linea nuchae superior

linea nuchae inferior

planum nuchale (*nuchal area - surface*)



Endocranial surface of squama occipitalis:

protuberantia occipitalis interna
crista occipitalis interna
eminentia cruciformis (*cruciate eminence*)

sulcus sinus sagittalis superioris
(*groove for superior sagittal sinus*)
sulcus sinus transversi
sulcus sinus sigmoidei

fossae cerebrales
fossae cerebellares



Os frontale

1. squama ossis frontalis
2. partes orbitales
3. pars nasalis

Ad 1. Squama ossis frontalis

External surface:

sutura coronalis

tuber frontale

glabella

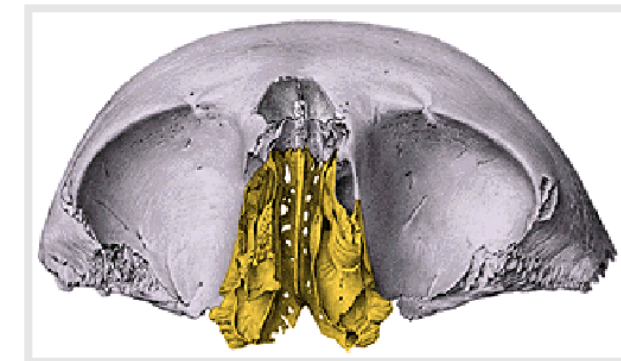
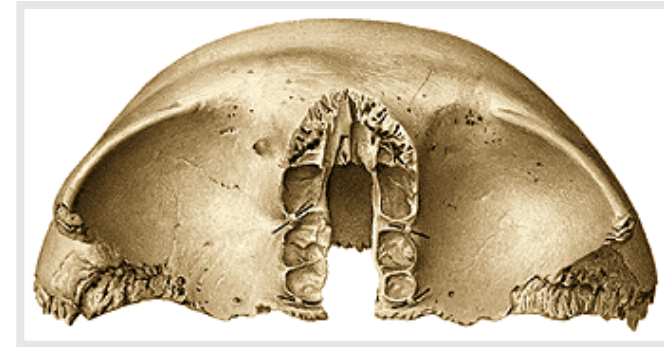
arcus superciliaris (*superciliar arch*)

margo supraorbitalis

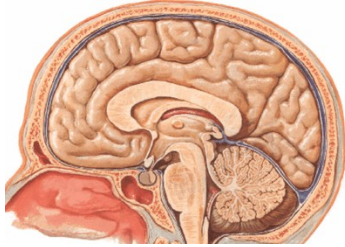
incisura frontalis et supraorbitalis (*frontal notch.....*)

processus zygomaticus

linea temporalis superior (*superior temporal line*)



Internal surface of squama frontalis:



crista frontalis

sulcus sinus sagittalis superioris

impressiones digitatae/gyrorum

juga cerebralia

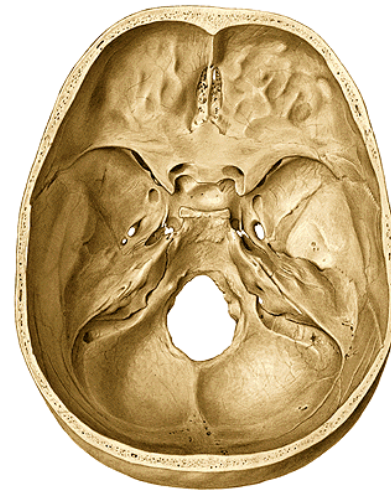
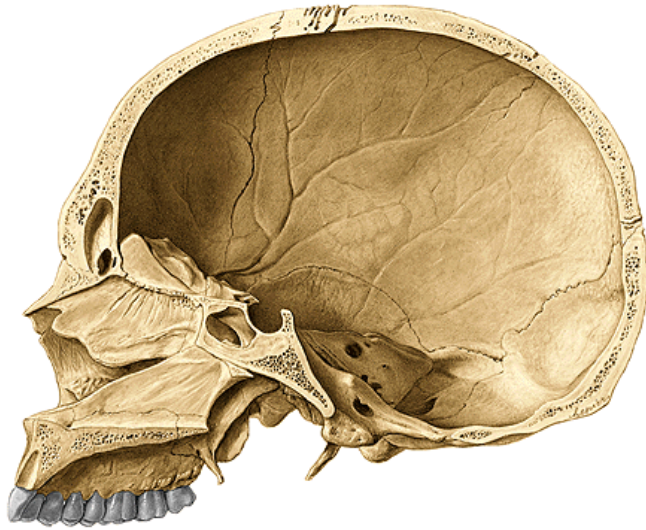
foramen caecum

sulci arteriosi

sinus frontalis

septum sinuum frontaliu

apertura sinuum frontaliu (*aperture of frontal sinus*)

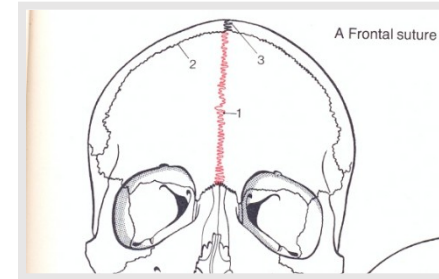


Ad 2. partes orbitales

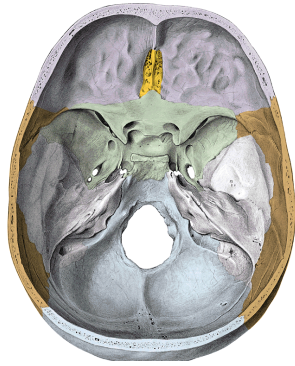
fossa glandulae lacrimalis

spina trochlearis or fovea trochlearis

foramen ethmoidale anterius et posterius

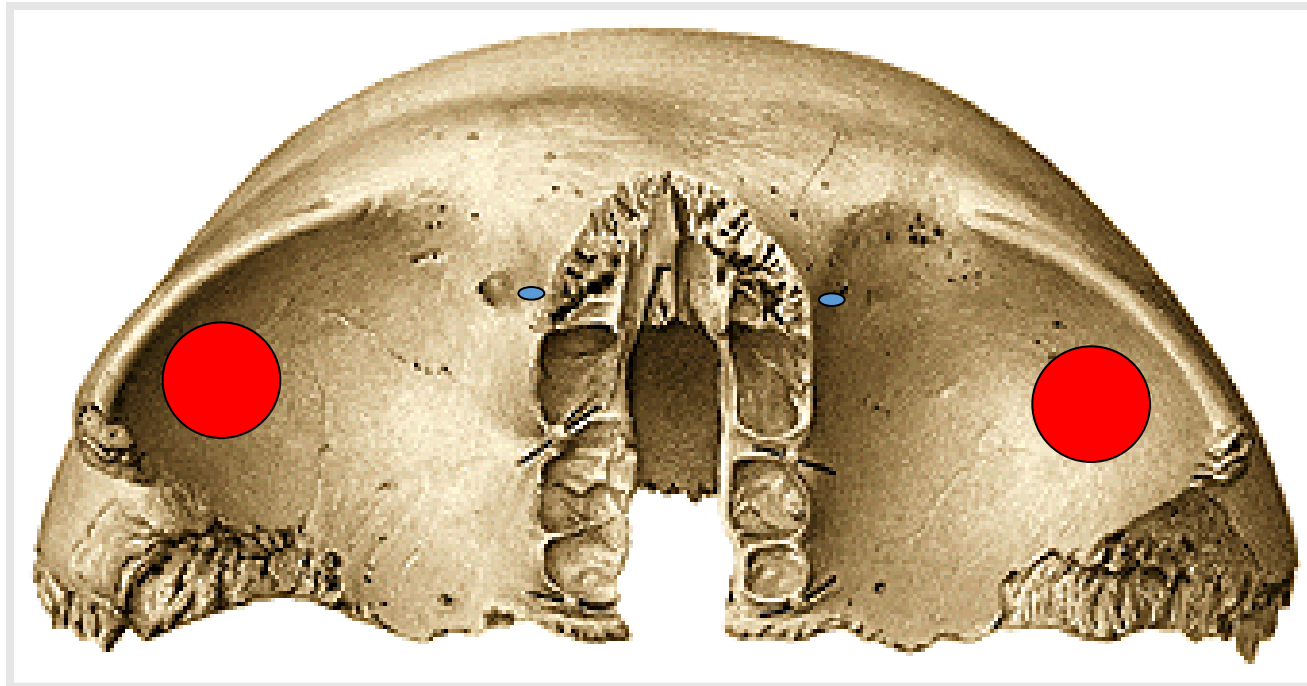


Variation – sutura metopica



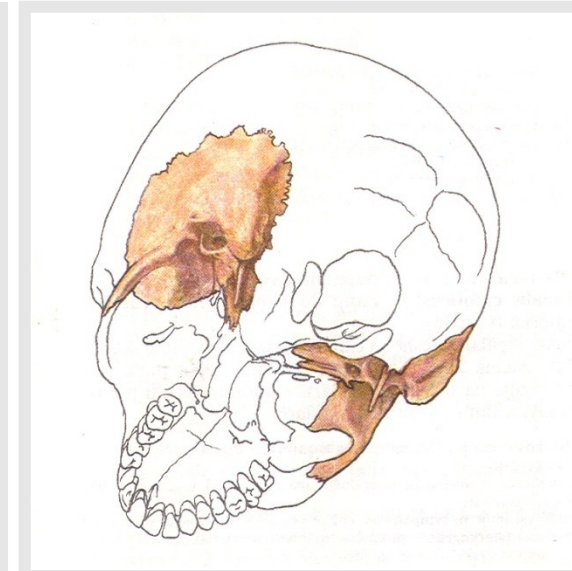
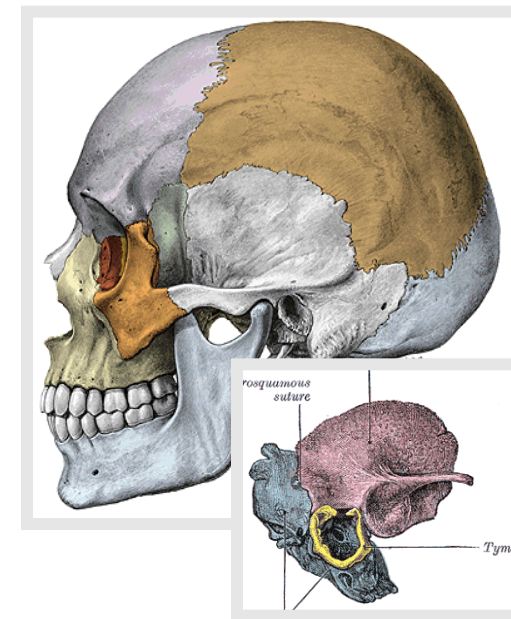
Ad 3. pars nasalis

incisura ethmoidalis



Os temporale (*Temporal bone*)

1. pars squamosa (*squamous part*)
2. pars petrosa – pyramis (*pyramid*)
3. pars mastoidea (*mastoid part*)
4. pars tympanica (*tympanic part*)
5. processus styloideus (*styloid process*)



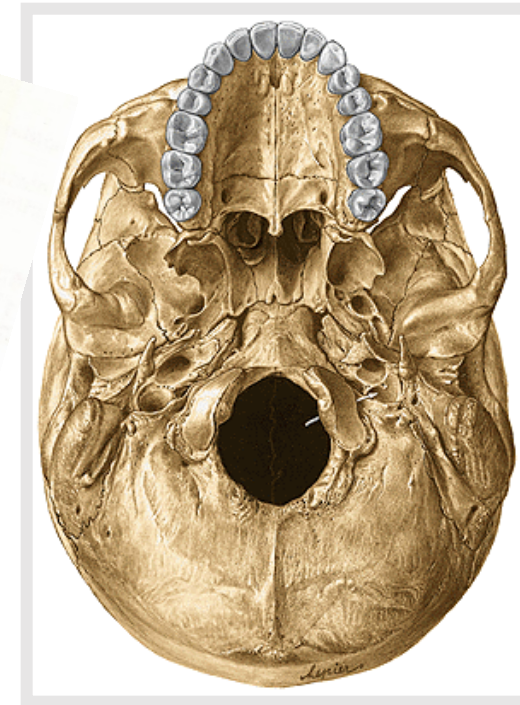
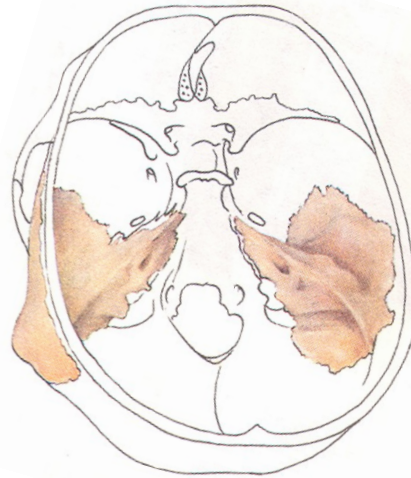
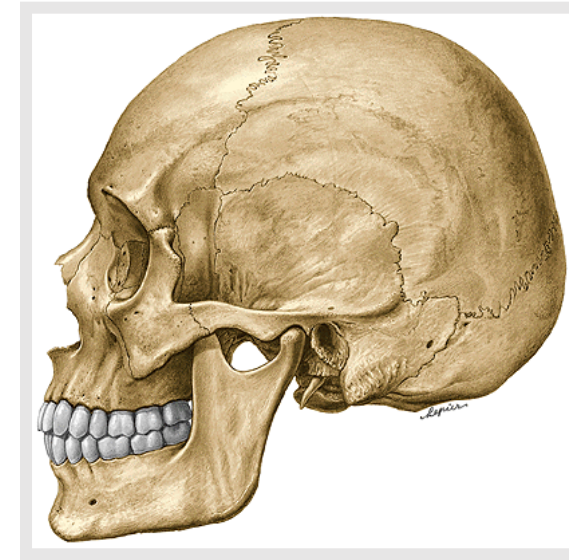
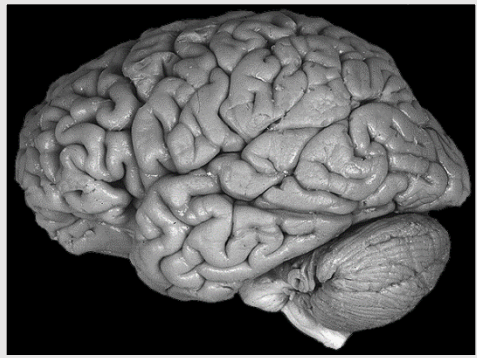
1. Pars squamosa

External surface:

processus zygomaticus
linea temporalis inferior
crista supramastoidea
spina suprameatum
fossa mandibularis
tuberculum articulare

Internal surface:

sulci arteriosi (*grooves for arteries*)
juga cerebraalia
impressiones gyrorum/digitatae



2. Pars petrosa – pyramis (*Petrous part – pyramid*)

Apex pyramidis, facies anterior, posterior, inferior, ventrobasalis

Foramen lacerum

1. Facies anterior - cerebralis (*anterior – cerebral surface*)

eminentia arcuata

tegmen tympani

sulcus and hiatus canalis nervi petrosi majoris (*groove and hiatus of canal for greater petrosal nerve*)

sulcus and hiatus nervi petrosi minoris (*groove and hiatus for lesser petrosal nerve*)

impressio trigemini

apertura interna canalis carotici

canalis musculotubarius

margo superior - crista pyramidis

sulcus sinus petrosi superioris (*groove for superior petrosal sinus*)



2. facies posterior pyramidis (*posterior surface of pyramid*)

sulcus sinus petrosi inferioris (*groove for inferior petrosal sinus*)

porus acusticus internus
(*opening of the internal acoustic porus*)

meatus acusticus internus

fundus meatus acustici interni

area nervi facialis – introitus (*entrance*)
to the facial canal

apertura externa aquaeductus vestibuli
(*the external opening of the vestibular aqueduct*)

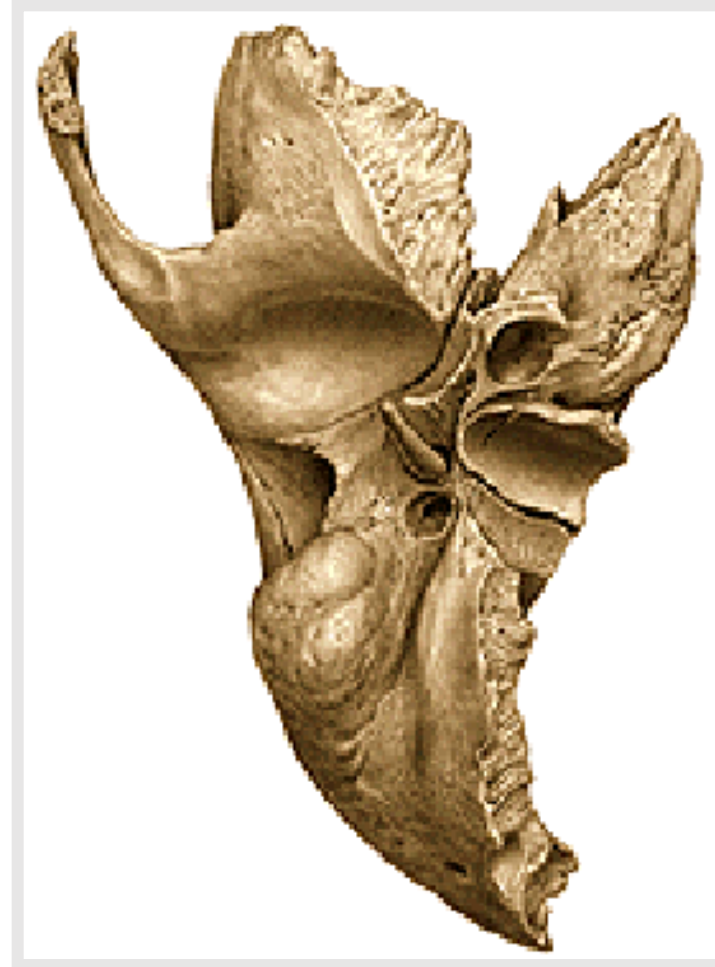
incisura jugularis - foramen jugulare
(*jugular notch – jugular foramen*)

sulcus sinus sigmoidei (*groove for sigmoid sinus*)



3. facies inferior pyramidis

apertura externa canalis carotici (*external aperture of the carotid canal*)
fossa jugularis (*jugular fossa*)



3. pars mastoidea

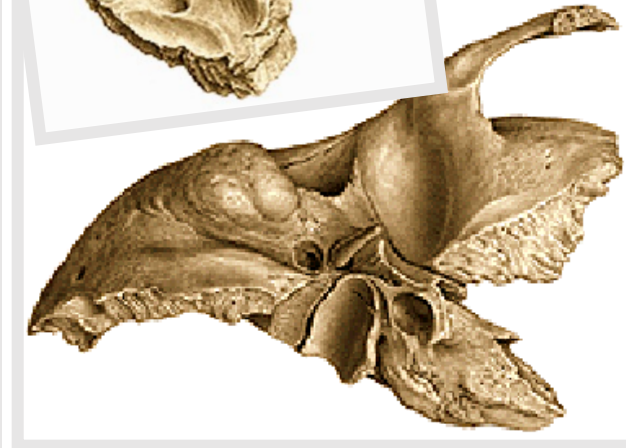
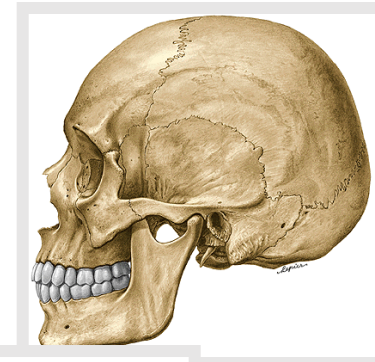
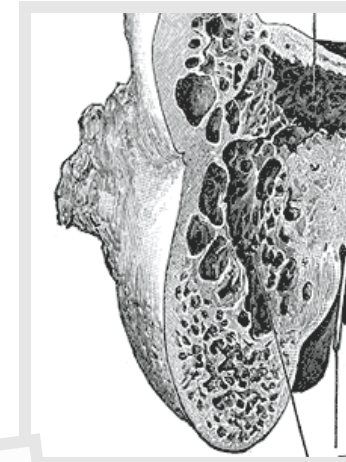
processus mastoideus (*mastoid process*)

sulcus sinus sigmoidei (*groove for sigmoid sinus*)

foramen mastoideum

incisura mastoidea (*mastoid notch*)

sulcus arteriae occipitalis (*groove for the occipital artery*)



4. pars tympanica

porus acusticus externus (*external acoustic porus*)

meatus acusticus externus (*external acoustic meatus*)

fissura tympanomastoidea (*tympanomastoid fissure*)

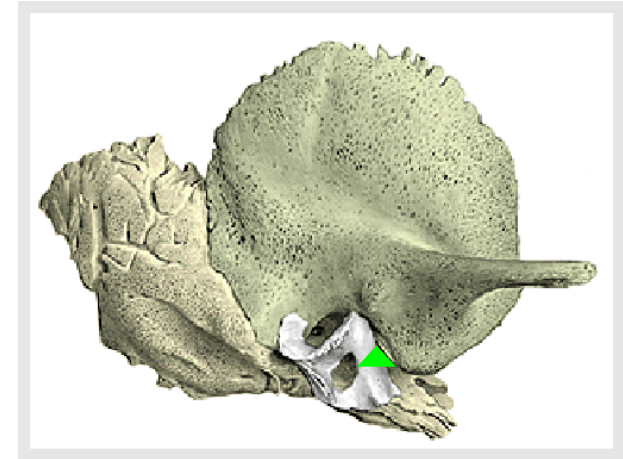
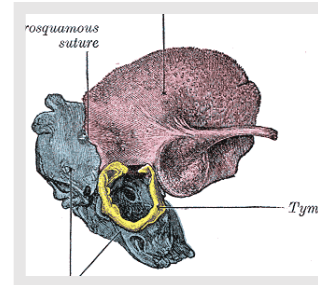
fissura petrotympanica (*petrotympanic fissure*)

sulcus tympanicus (*tympanic groove*)

incisura tympanica (*tympanic notch*)

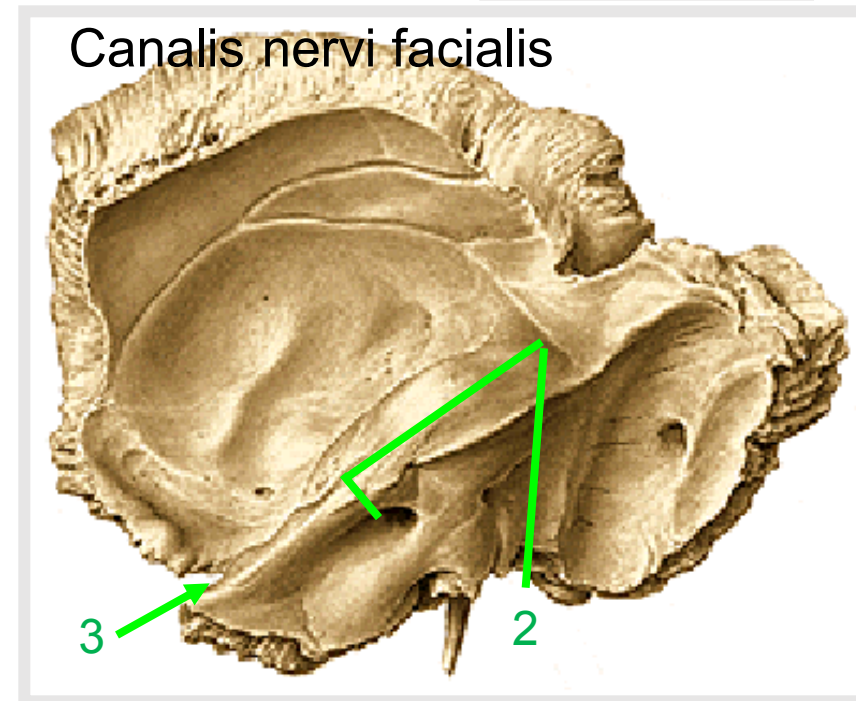
5. processus styloideus

foramen stylomastoideum



Canals of temporal bone

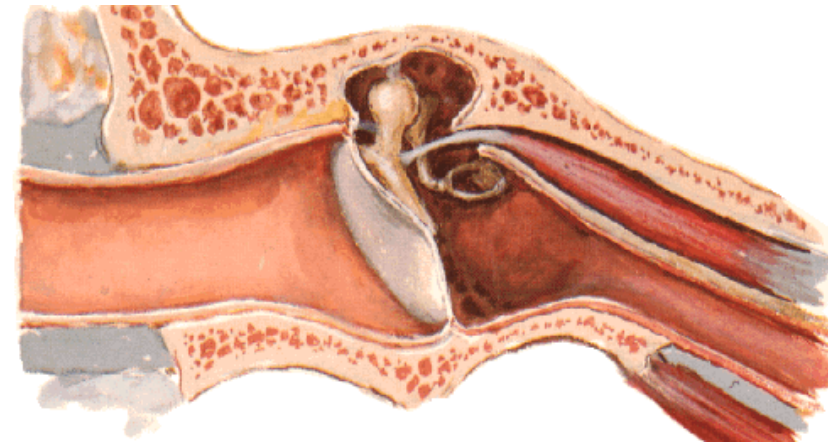
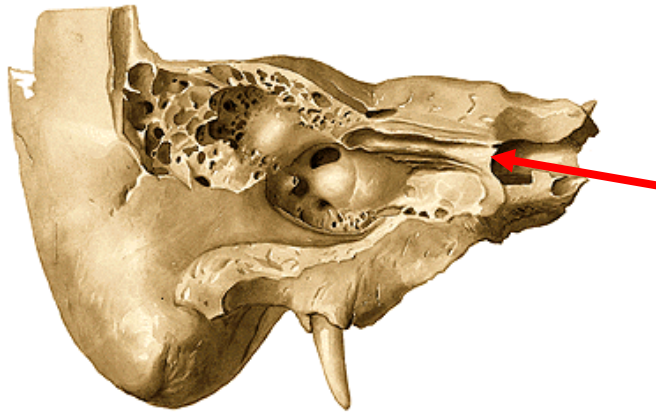
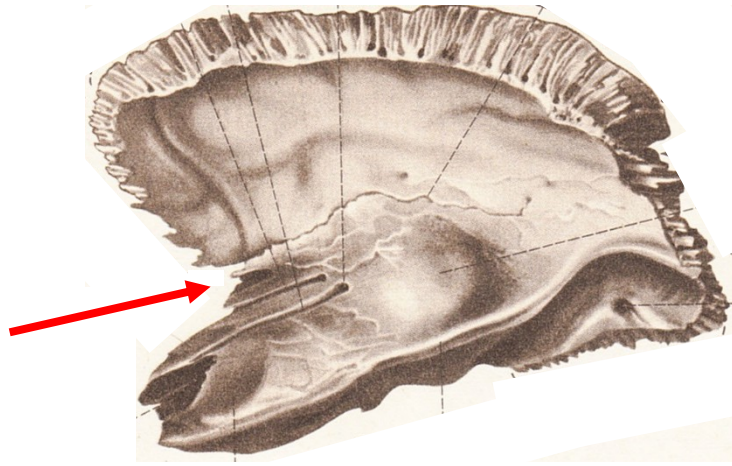
1. canalis caroticus
 - 1a canaliculi caroticotympanici
2. canalis nervi facialis
3. canalis musculotubarius
4. canaliculus chordae tympani
5. canaliculus tympanicus
6. canaliculus cochleae
7. canaliculus vestibuli
8. canaliculus mastoideus



Canalis musculotubarius

consists of:

semicanalis muscoli tensoris tympani
semicanalis tubae auditivae (semicanal
of auditory tube)

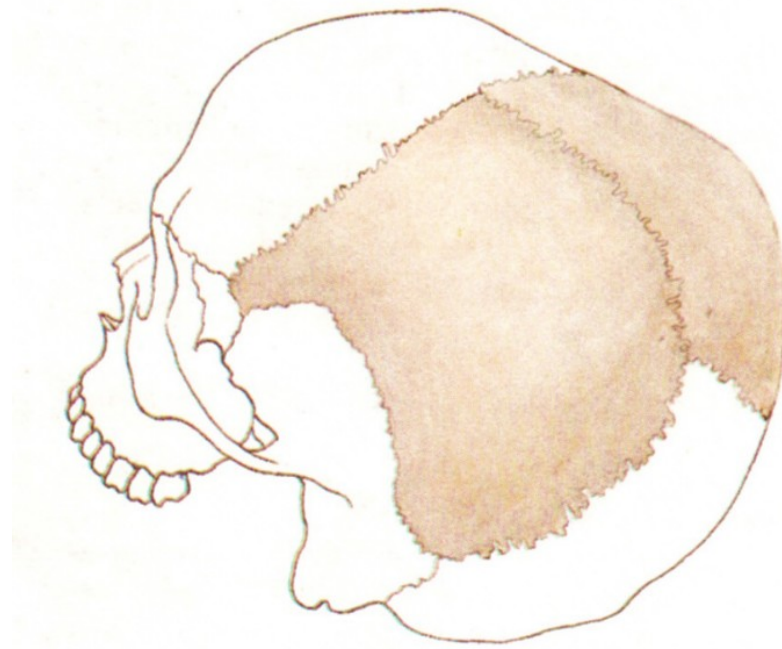


Ossa parietalia

sutura coronalis
sutura sagittalis
sutura lambdoidea
suturae squamosae

External surface:

tuber parietale (*parietal eminence*)
linea temporalis superior
linea temporalis inferior
foramina parietalia



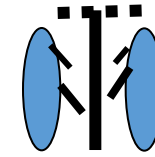
angulus frontalis, sphenoidalis, occipitalis, mastoideus

Internal surface:

sulci arteriae meningae mediae
sulcus sinus sagittalis superioris
foveolae granulares

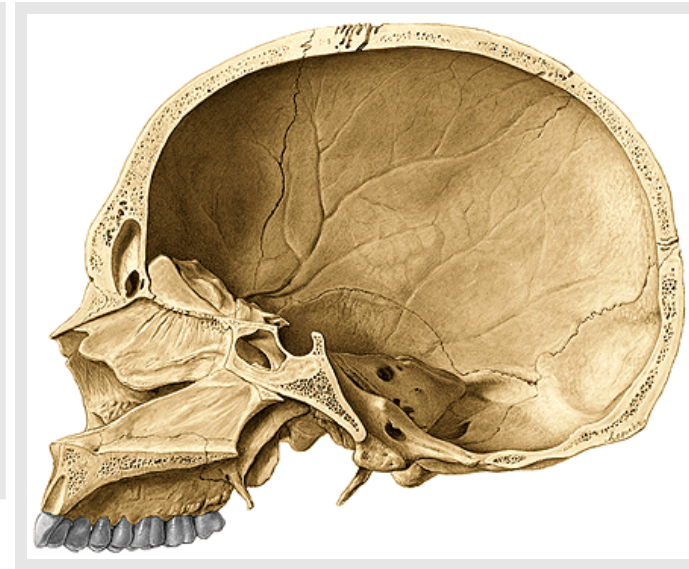
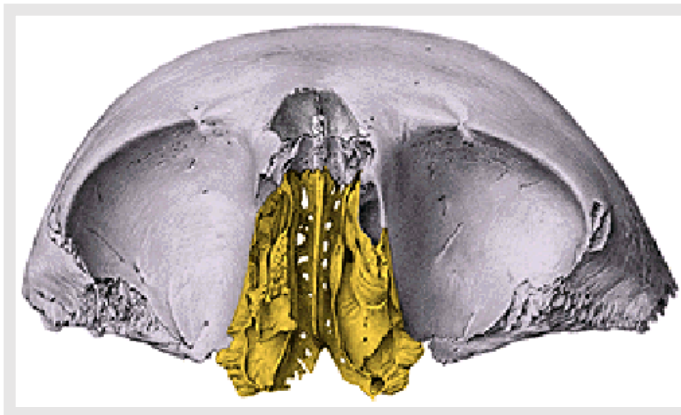


Os ethmoidale (*Ethmoid bone*)



1. Lamina cribrosa (*Cribriform plate*)
2. Lamina perpendicularis (*Perpendicular plate*)
3. Labyrinthus ethmoidalis (*Labyrinth of ethmoid bone*)

1. Lamina cribrosa ossis ethmoidalis (*Cribriform plate of ethmoid bone*)
2. Lamina perpendicularis (*Perpendicular plate of ethmoid bone*) - crista galli



3. Labyrinthus ethmoidalis (*Labyrinth of ethmoidal bone*)_

Cellulae ethmoidales (anterior and posterior)

Lamina orbitalis

Foramen ethmoidale anterius et posterius

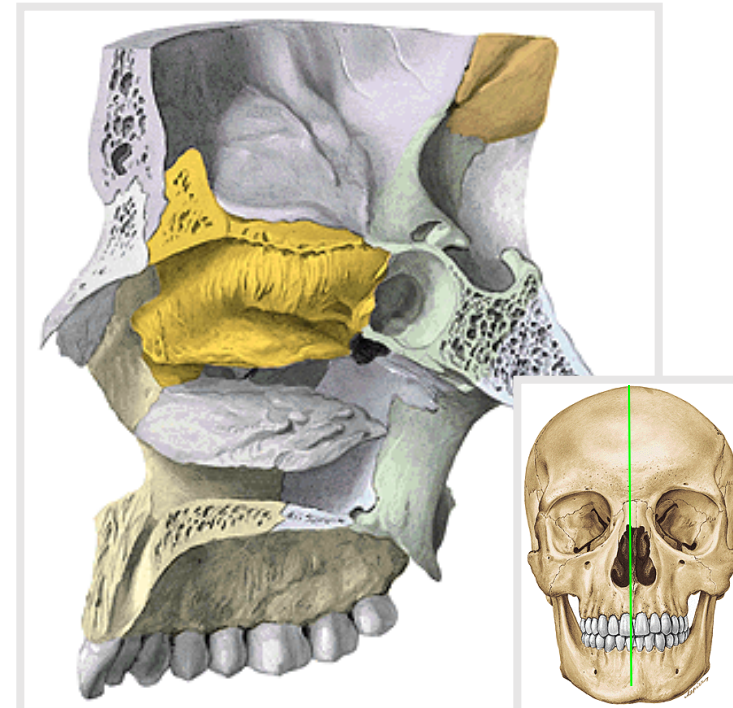
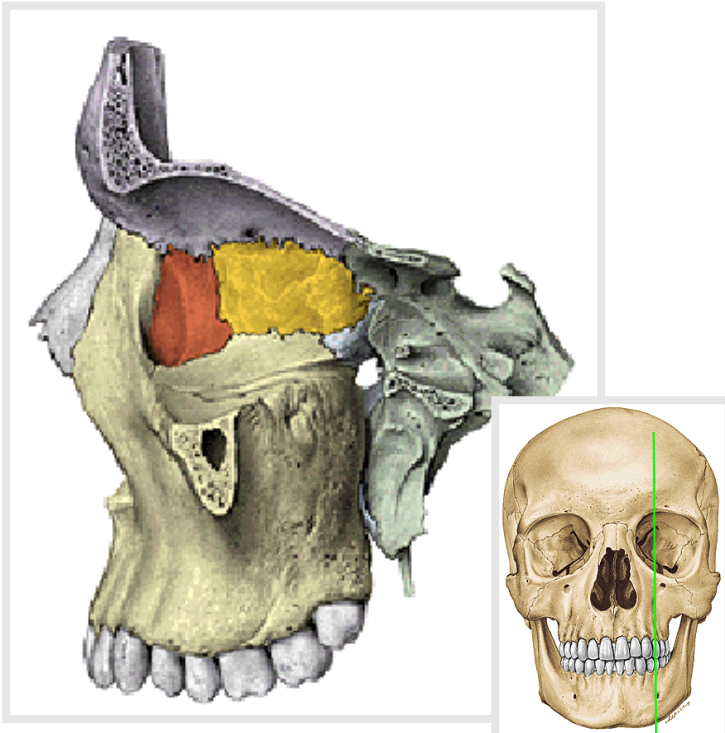
(*Anterior and posterior ethmoidal foramen*)

Concha nasalis superior at media

(*Superior and medial nasal conchae*) (*turbinate bones*)

Processus uncinatus (*Uncinate process*)

Bulla ethmoidalis



Used pictures come from:

Čihák, R. (1987): Anatomie 1. Avicenum, Zdravotnické nakladatelství.

Putz, R. (2008):
Atlas of Human Anatomy Sobotta. Elsevier Books.

Keith L. Moore, Arthur F. Dalley (2005):
Clinically Oriented Anatomy. Williams and Wilkins.

Platzer, W., Kahle, W., Leonhardt H. (1992):
Locomotor system. Georg Thieme Verlag, Stuttgart,
New York, 4th edition.