

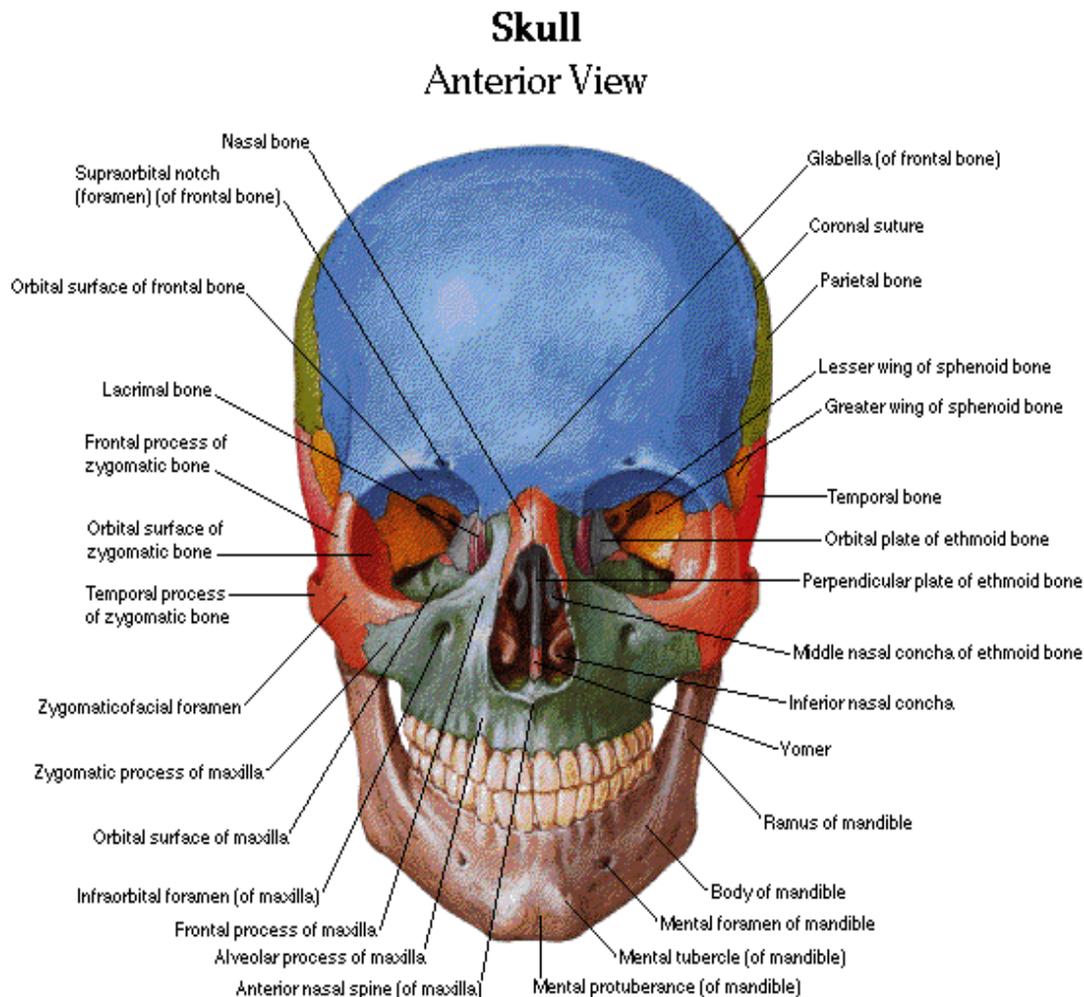
The Skull/ Part I

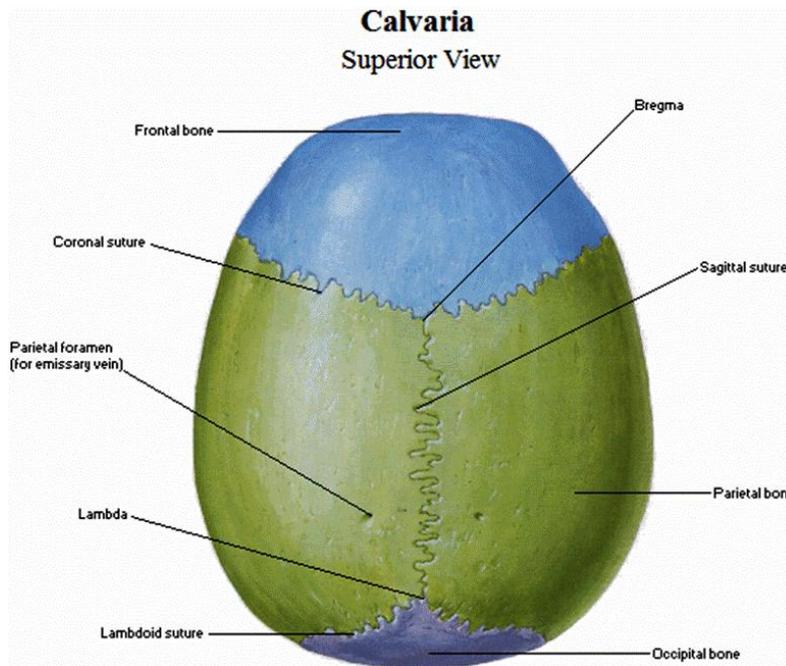
Introduction

- The bones of the head and neck include the skull, middle ear ossicles, hyoid bone, and cervical vertebrae.
- The skull is composed of several separate bones united at immobile joints called sutures. The mandible is an exception to this rule, as it is united to the skull by the mobile, synovial TemporoMandibular Joints (TMJ).
- The bones of the skull are 22 bones, organized into a cranial skeleton (8 bones) that surround the brain and a facial skeleton (14 bones).
- The cranial cavity is the space containing the brain. The skull vault (calvarium) is the upper part of the cranium and forms the roof and side walls of the cranial cavity.
- The base of the skull is the lowest part of the cranium and forms the floor of the cranial cavity.
- The relatively flat bones of the vault (frontal, parietals, and part of the occipital) are composed of external and internal tables of compact bone separated by a layer of spongy bone called the diploë.
- **The cranium consist of the following bones:-**
 - Frontal bone: one bone
 - Ethmoid bone: one bone
 - Sphenoid bone: one bone
 - Occipital bone: one bone
 - Parietal bones: paired (2 bones)
 - Temporal bones: paired (2 bones)

▪ **The facial skeleton consists of the following bones:**

- Zygomatic bones: paired (2 bones)
- Maxillae: paired (2 bones)
- Nasal bones: paired (2 bones)
- Lacrimal bones: paired (2 bones)
- Palatine bones: paired (2 bones)
- Inferior conchae: paired (2 bones)
- Mandible: one bone
- Vomer: one bone



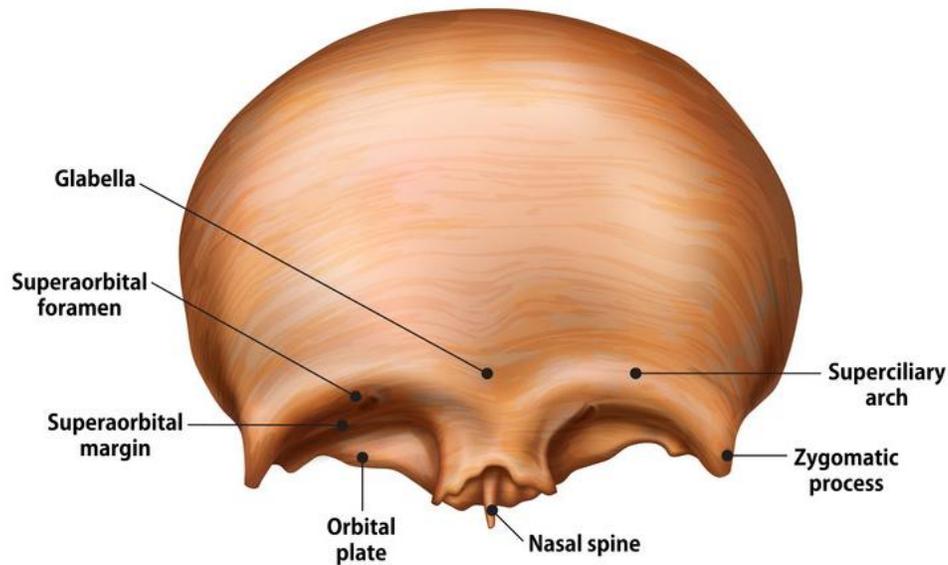


The Cranial Bones:-

1- Frontal Bone

- The frontal bone is a single cranial bone that forms the anterior portion of the calvaria and upper third of the face (forehead).
- The frontal bone articulates laterally with the zygoma at the frontozygomatic suture and medially with the (maxilla at the frontomaxillary suture and nasal bones at the frontonasal sutures).
- In the Base of the skull; in anterior cranial fossa; it articulates with the ethmoid, posteriorly; it articulates with the wings of the sphenoid bone.
- In the vault; it articulates with the parietal bones at coronal suture.
- The frontal bone forms a great portion of the roof of the orbit.
- The thickening of the frontal bone in the anterior region forms the superciliary arches (supraorbital ridges). These curved elevations give the prominence of eye

brow region. The supraorbital notch or foramen crosses this rim and transmits the supra orbital nerve and vessel.

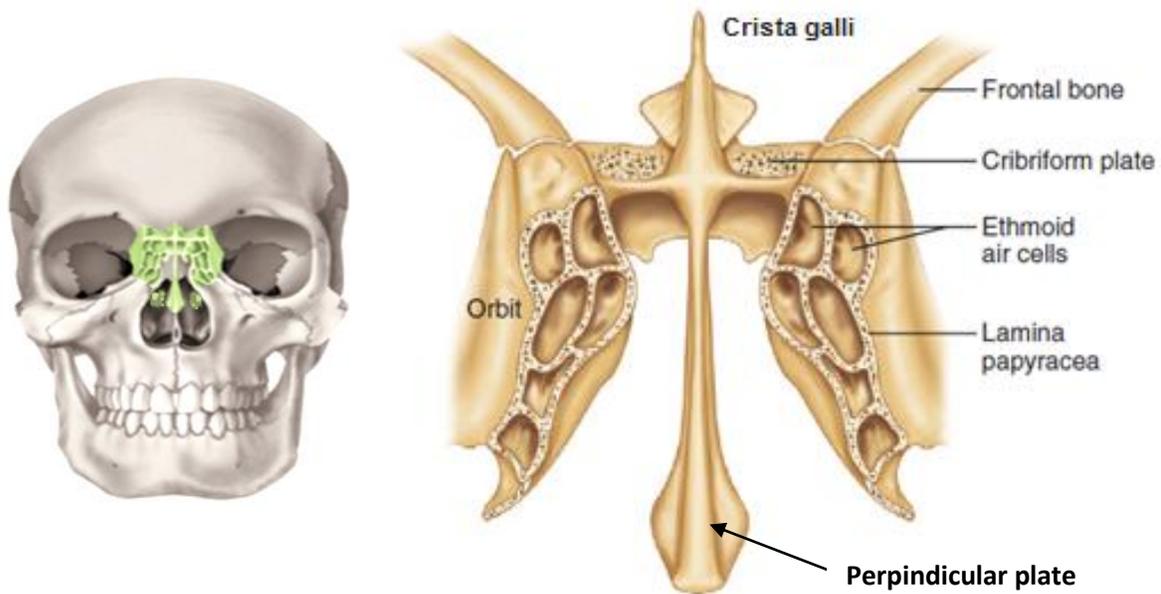


- The frontal bone contains the frontal air sinuses (paranasal sinus), which are two hollow spaces lined with mucous membrane, they just above the orbital margins.

(The paranasal sinuses are mucous membrane lined air filled bone cavities, they are four in number: Maxillary (the largest), Frontal, sphenoid and ethmoid paranasal sinuses, they communicate with the nose and serve to lighten the facial skeleton and act as voice resonators.)

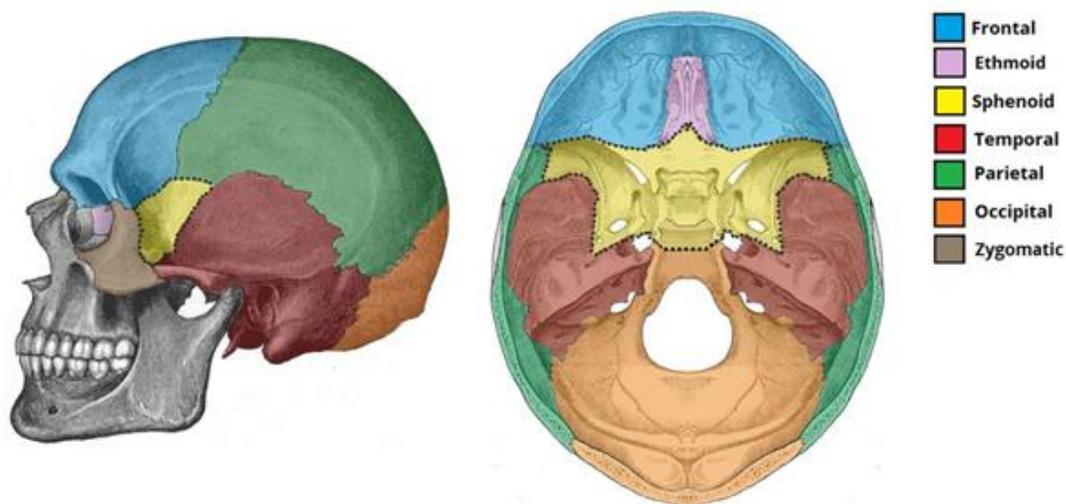
2- Ethmoid Bone

- The ethmoid bone is a single bone that lies in the mid area of the anterior cranial fossa.
- It constitutes part of the: nasal structure, medial orbital walls and anterior cranial fossa.
- Ethmoid bone is a pneumatic bone; contain the ethmoid air cells (ethmoid paranasal sinus).
- **Parts of Ethmoid bone:**
 - i. In anterior cranial fossa; the (*crista galli*)- bony projection upward- gives attachment to Falx cerebri (meningeal layer of dura mater).
 - ii. The *perpendicular plate of ethmoid* descends downward in the midline of nasal cavity to form part of the nasal septum. It articulates with the vomer and with septal cartilage to form the nasal septum.
 - iii. The filaments of olfactory nerve (cranial nerve I) pass through the *cribriform plate* (perforated bony plates) which lies in anterior cranial fossa
 - iv. The *superior and middle nasal conchae* which descend laterally in the nasal cavity, hanging bilaterally from the cribriform plate.
 - v. The *lamina papyracea* -paper like- is an extremely thin plate of ethmoid bone, constitutes most of the medial orbital wall.
 - vi. *Ethmoid air cell*: which lies lateral to lamina papyracea

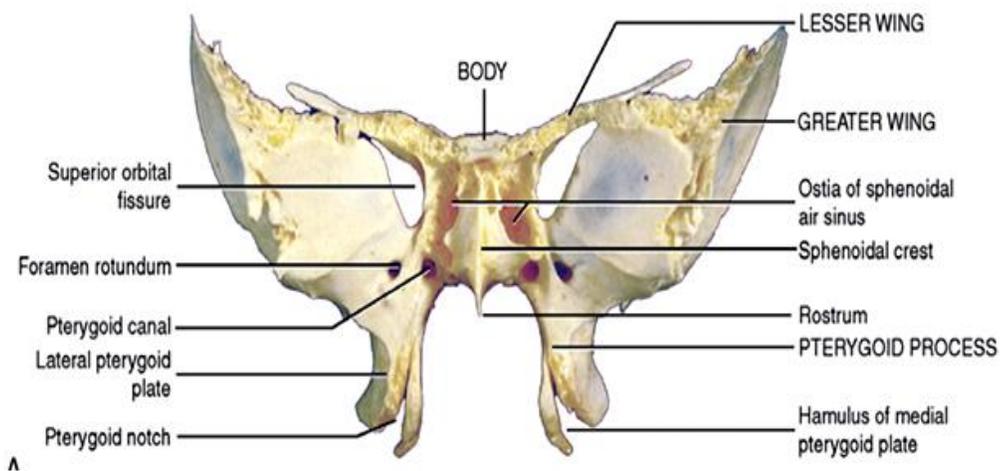
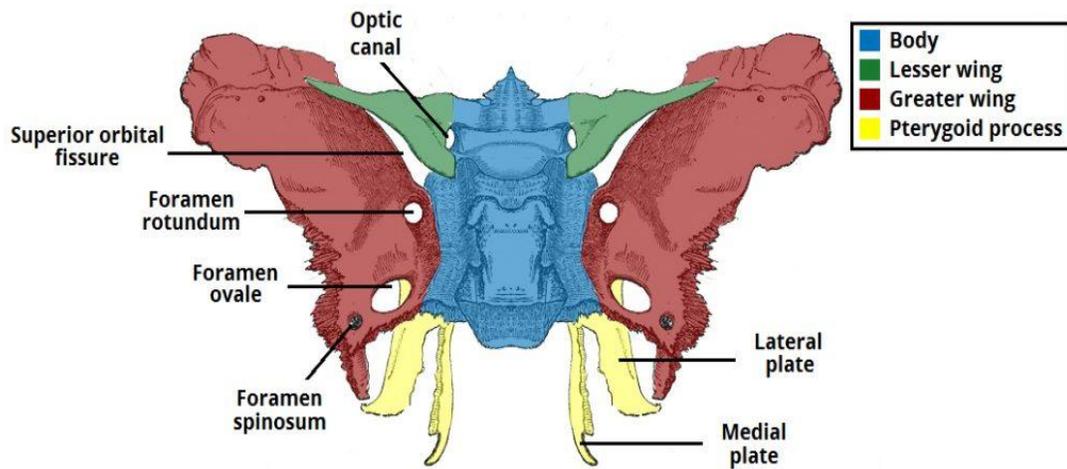


3- Sphenoid Bone

- The sphenoid bone is a single bone situated at the middle of the skull base, it is a part of the anterior and middle cranial fossae.
- This complex bone has many processes that have delicate articulations with the adjacent cranial and facial bones. The sphenoid bone articulates with the frontal, ethmoid, parietal, temporal, occipital, vomer, zygoma, palatine bones, and the tuberosity of the maxilla.



- The sphenoid bone looks like a butterfly in shape; with the following parts:
 - *Lesser wing*
 - *Greater wing*
 - *Body*
 - *Sphenoidal air sinuses* (within the body)
 - *Sella turcica or (hypophysial fossa)*: depression on the roof of the body for the pituitary gland (hypophysis).
 - *Pterygoid plates* (2 medial and 2 lateral).

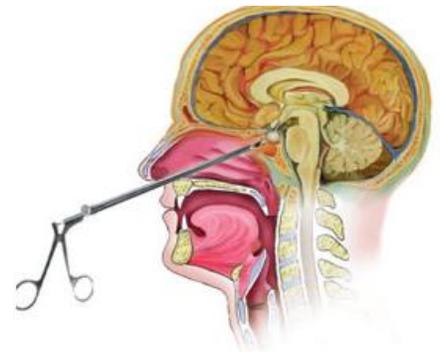


- The sphenoid contains many foraminae and fissures:
 - The **optic canal** (Optic N. CNII),
 - **Foramen rotundum** (Maxillary N. CNV₂),
 - **Foramen ovale** (Mandibular N. CNV₃),
 - **Foramen spinosum** (middle meningeal artery) and
 - **Superior orbital fissure** (Oculomotor N. CNIII, Trochlear N. CNIV, Ophthalmic N. CNV₁, Abducens N. CNVI and superior Ophthalmic Vein) .

❖ Clinical notes:

- The body of the sphenoid lies on the roof of nasal cavity and that's why the **pituitary gland surgery** can be done by passing an endoscope through the nose (transnasal).

Transnasal approach to pituitary gland



- In children; the sphenoid occipital joint is cartilaginous (sphenoid occipital synchondrosis) and considered as growth center for the skull base then it will be transformed to suture at the completion of growth.

This is the End of the Lecture – Good Luck