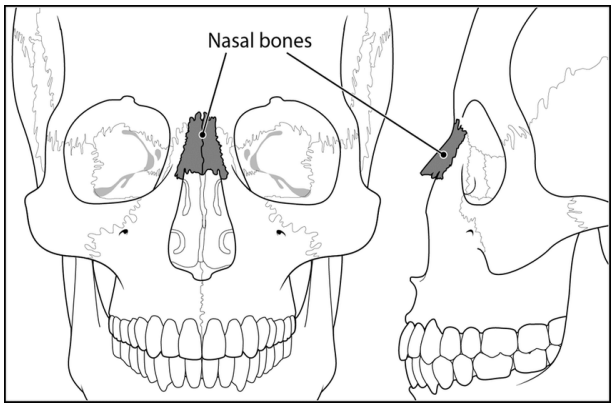
The Skull/ Part II

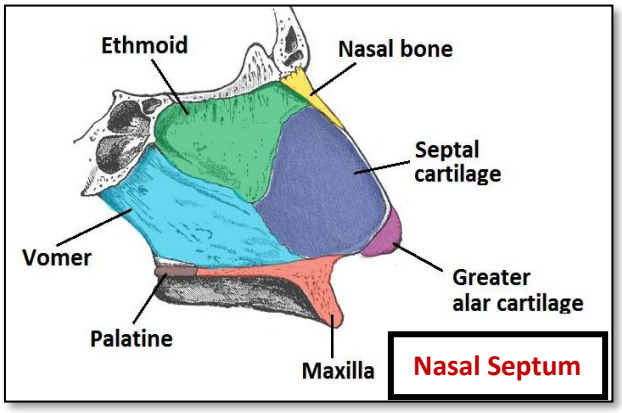
The Facial Bones:-

1) The Nasal Bones



The nasal bones are rectangular bones, they form the bridge of the nose, they articulate with the frontal bone superiorly, with each other at the midline and posteriorly with the frontal process of the maxilla.

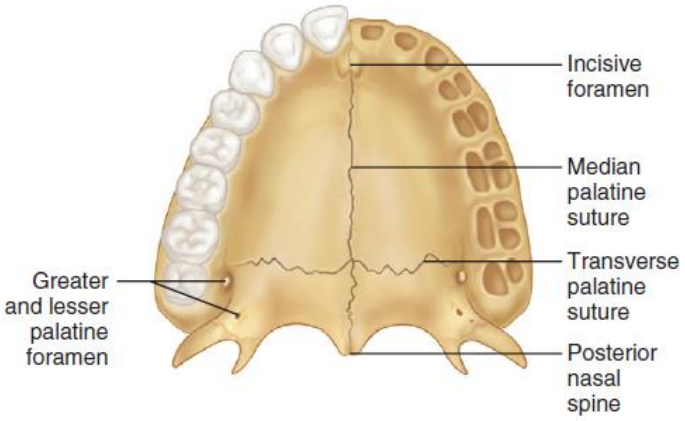
The nasal cavity is divided into two cavities by the nasal septum, which is formed by the vomer, the perpendicular plate of the ethmoid and septal cartilage.



2) The Maxillary Bones

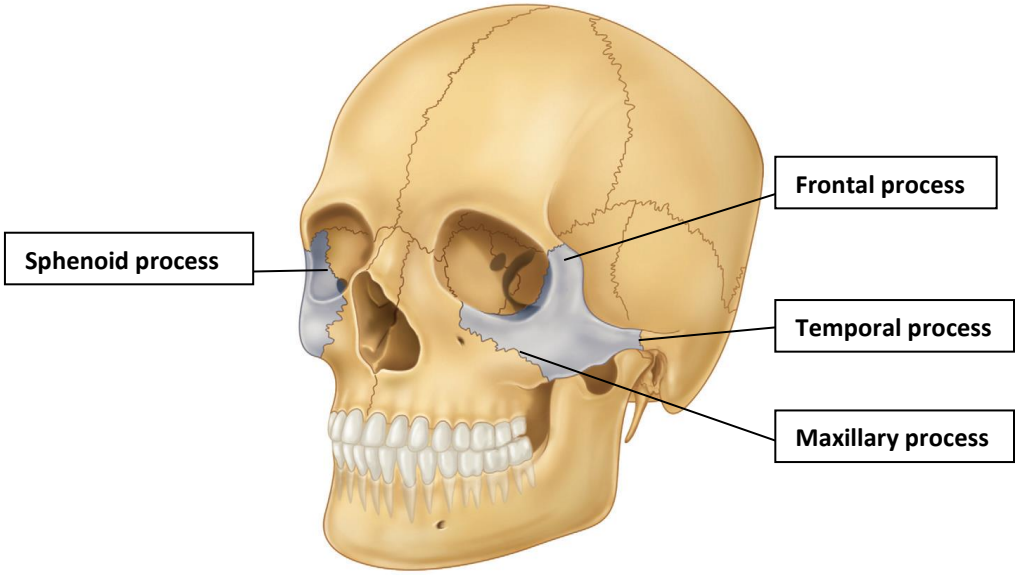
- The two maxillae form the upper jaw, the anterior part of the hard palate, part of the lateral walls of the nasal cavities, and part of the floors of the orbital cavities.
- The two bones meet in the midline at the intermaxillary suture and form the lower margin of the nasal aperture (nasal opening).
- The infraorbital foramen perforates the maxilla below the orbit.
- The alveolar process carries the upper teeth.

- Each hemimaxilla contains a large pyramid-shaped hollow body, the maxillary sinus (antrum of Highmore).
- The anterior wall of the sinus is usually thin. The medial wall is the lateral nasal wall. The superior wall or roof of the sinus is the orbital floor, and the floor of the sinus is the palate.



3) The Zygoma

- The zygoma (zygomatic bone, malar bone) is a paired bone that makes up the cheek prominence.
- This thick, strong, diamond-shaped bone forms is composed of four processes (frontal, sphenoid, temporal, and the maxillary process) which articulates with the four mentioned bones.
- The foramina of the zygomatic bone are the zygomaticofacial foramen, and the zygomaticotemporal which contain the zygomaticofacial and zygomatico-temporal branches of the second division (maxillary division) of the trigeminal nerve.

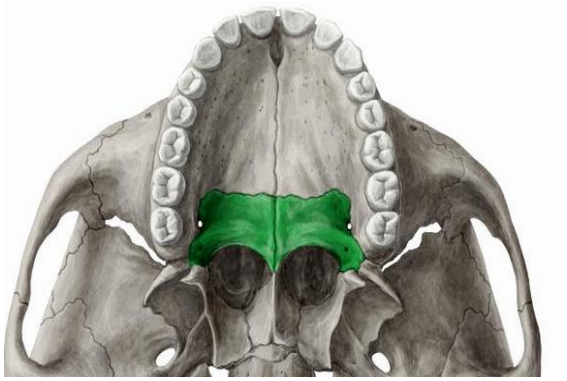


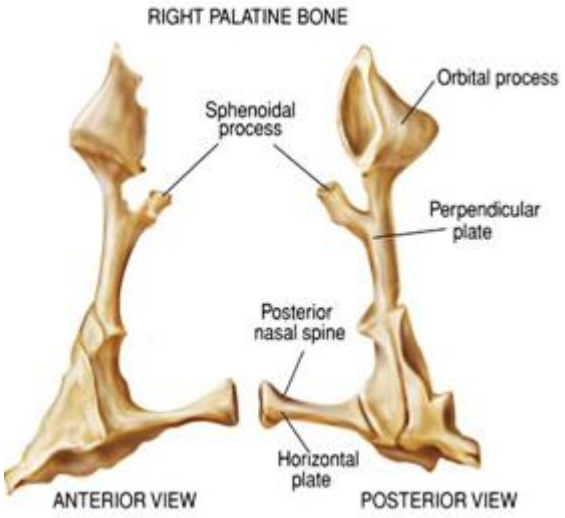
4) Vomer

The vomer is a plow-shaped bone that is located in the midline of the nasal cavity and forms the posterior portion of the nasal septum.

5) Palatine Bones

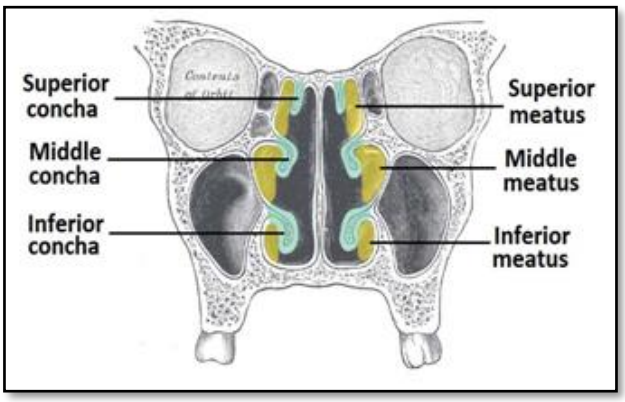
- These are irregularly shaped paired bones; each is composed of a major horizontal portion and vertical perpendicular plates. The horizontal plate articulates anteriorly with the maxilla and with the palatine bone of the opposite side in the midline to form the posterior aspect of the hard palate.
- The vertical plate passes superiorly behind the maxilla and terminates in a small contribution to the orbital floor.
- The palatine bone has two foramenae; the greater and lesser palatine, which lie in the posterior part of the palate and transmit the greater and lesser palatine branches of maxillary nerve and vessels.





6) Inferior Nasal Concha

The inferior nasal concha is a paired bone that forms the bony support of the inferior turbinate bilaterally. It may obstruct the inferior meatus and the drainage of nasolacrimal duct, which needs surgical intervention.

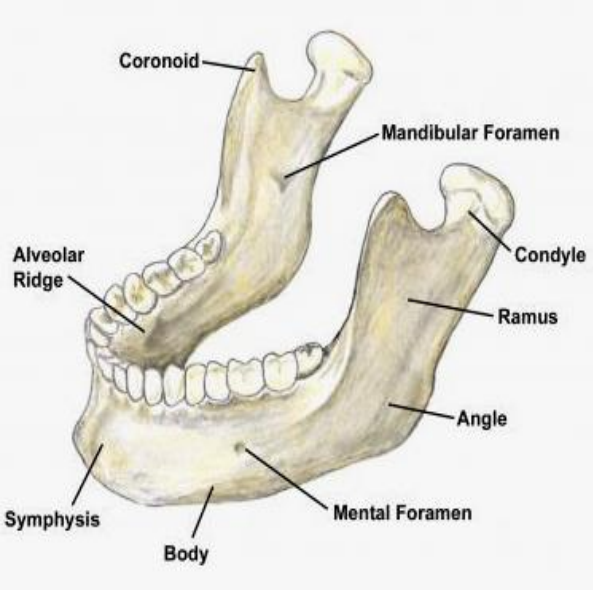


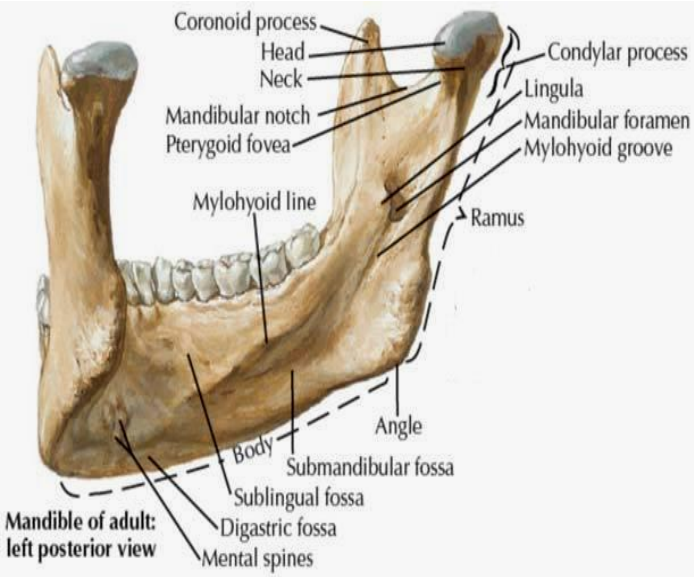
7) Lacrimal Bones

- Lacrima" is latin for "tear", so the name of the bone corresponds with its relation to the lacrimal structures.
- It is a paired bone, they are the smallest and most fragile bones of the face, and they are situated at the front part of the medial wall of the orbit.
- It articulates anteriorly and inferiorly with the maxilla, posteriorly it articulates with the lamina papyracea of the ethmoid, and superiorly with frontal bone.

8) The Mandible

- The mandible is the largest and strongest facial bone.
- It is composed of body and two rami, with their junction at the angle. The body is U-shaped, it has mental foramen.
- Mental foramen is located near the root apices of the first and second premolars, the opening of the foramen is directed backward and laterally, it transmits the mental nerve (terminal branch of inferior alveolar nerve) and vessels.
- The symphysis menti is a shallow ridge on the external midline surface of the body of the mandible; this indicates the line of fusion of the two halves of the mandible during development.
- The mental spines (genial tubercles) are on the midline medial surface of the body of the mandible.
- The mylohyoid line is an oblique ridge that runs backward and laterally from the area of the mental spines to an area below and behind the third molar tooth.
- The submandibular fossa, for the superficial part of the submandibular salivary gland, lies below the posterior part of the mylohyoid line. The sublingual fossa, for the sublingual gland, lies above the anterior part of the mylohyoid line.
- The ramus of the mandible has an anterior coronoid process and a posterior condyloid process, or head. The mandibular notch separates the coronoid and condyloid processes.
- The mandibular foramen lies on the medial surface of the ramus. This transmits the inferior alveolar nerve and vessels.
- The lingula is a projection in front of the mandibular foramen for the attachment of the sphenomandibular ligament.





Views of the Skull

The bones of the cranial skeleton are known as neurocranium while the facial bones are known as splanchocranium.

The brain gives rise to 12 pairs of cranial nerves, which leave the brain and pass through foramina and fissures in the skull. All the cranial nerves are distributed in the head and neck, except the 10th, which supplies the chest and abdomen.

These cranial nerves are (in sequence):

I. Olfactory (sensory)	VII. Facial (mixed)
II. Optic (sensory)	VIII. Vestibulocochlear (sensory)
III. Oculomotor (motor)	IX. Glossopharyngeal (mixed)
IV. Trochlear (motor)	X. Vagus (mixed)
V. Trigeminal (mixed)	XI. Accessory (motor)
VI. Abducens (motor)	XII. Hypoglossal (motor)

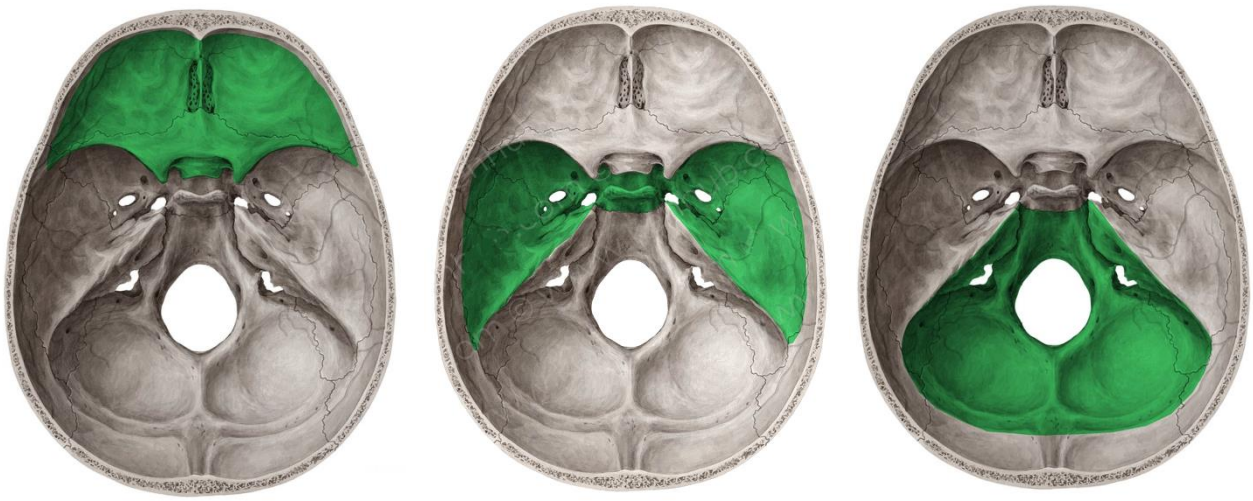
Base of the Skull (Interior view)

The base of the skull is the lowest part of the cranium and forms the floor of the cranial cavity.

The interior of the base of the skull is divided into three cranial fossae: anterior, middle, and posterior. The anterior cranial fossa is separated from the middle cranial fossa by the lesser wing of the sphenoid. The middle cranial fossa is separated from the posterior cranial fossa by the petrous part of the temporal bone.

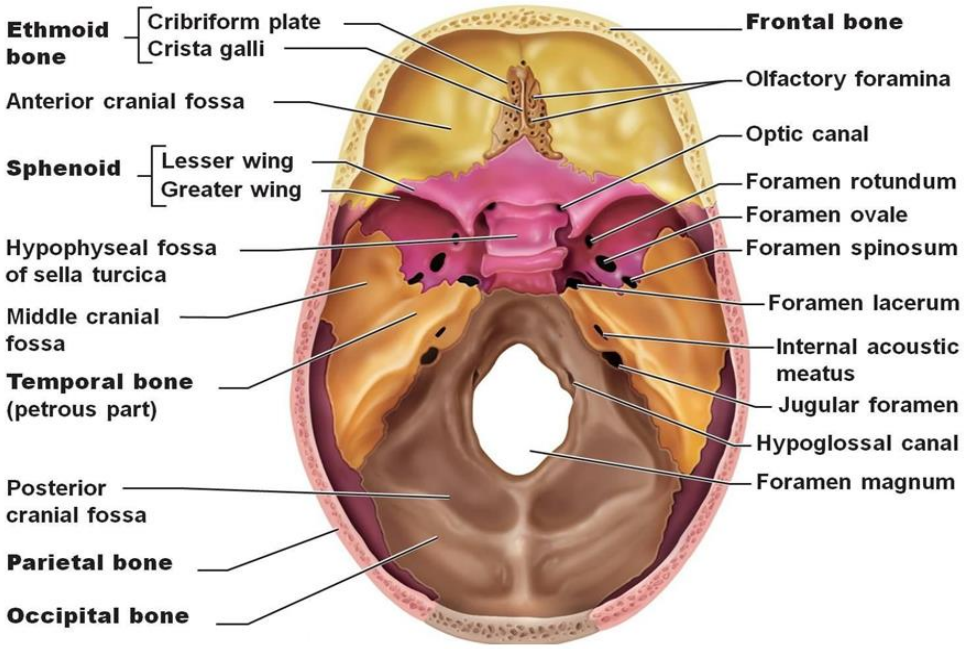
Anterior Cranial Fossa

- The anterior cranial fossa contains the frontal lobes of the cerebral hemispheres.
- It is bounded anteriorly by the inner surface of the frontal bone. Its posterior boundary is the lesser wing of the sphenoid.
- The orbital plates of the frontal bone form the lateral floor of the fossa, and the cribriform plate of the ethmoid forms the floor medially. The crista galli is a sharp upward projection of the ethmoid bone in the midline.



Middle Cranial Fossa

- The middle cranial fossa contains the temporal lobes of the cerebral hemispheres.
- It is bounded anteriorly by the lesser wings of the sphenoid and posteriorly by the superior borders of the petrous parts of the temporal bones. Laterally it is bounded by the squamous parts of the temporal bones, the greater wings of the sphenoid, and the parietal bones.

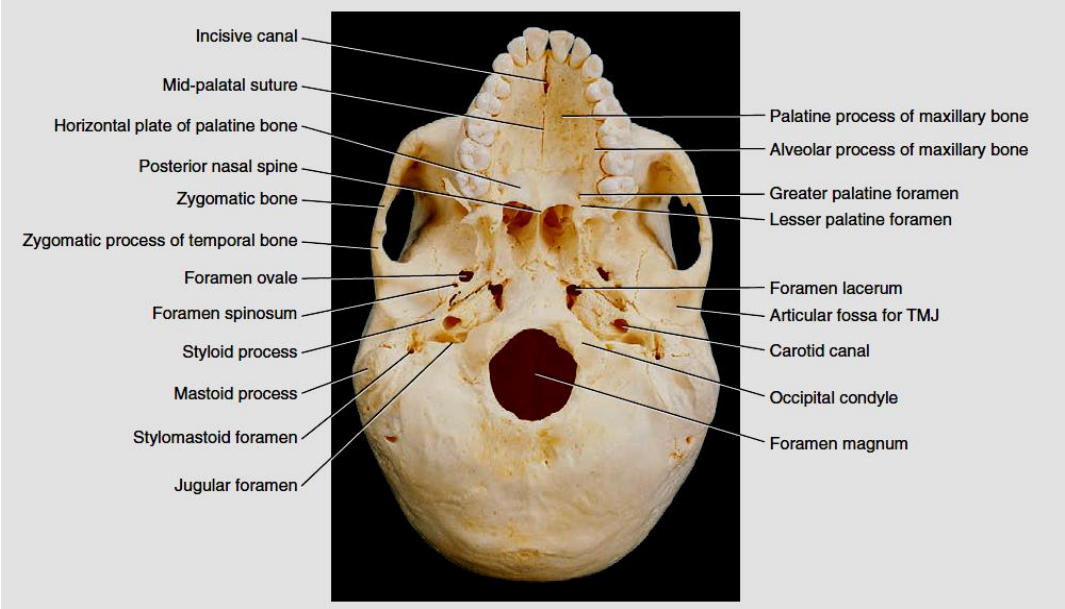


Posterior Cranial Fossa

- The posterior cranial fossa is deep and contains the parts of the hindbrain (the cerebellum, pons, and medulla oblongata).
- The superior border of the petrous part of the temporal bone bounds the fossa anteriorly, and bounded posteriorly by the internal surface of the squamous part of the occipital bone.

- The floor of the posterior fossa is formed by the basilar, condylar, and squamous parts of the occipital bone and part of the temporal bone.

Inferior View

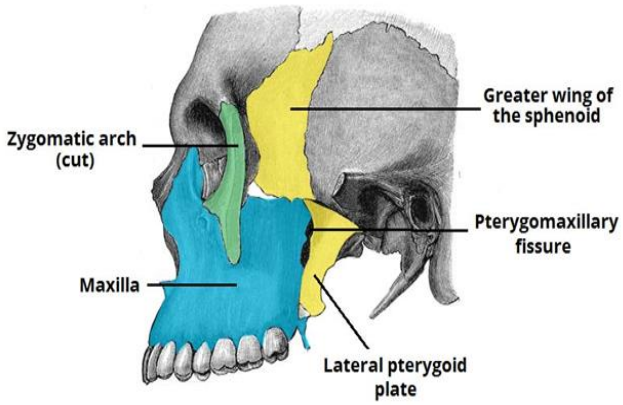


- The anteroinferior part of the skull is formed by the hard palate, which is composed of the palatal processes of the maxillae and the horizontal plates (palatal processes) of the palatine bones. The incisive foramen is in the anterior midline, and the greater and lesser palatine foramina lay posterolaterally.
- The choanae (posterior nasal apertures) are above the posterior edge of the hard palate.
- The inferior end of the medial pterygoid plate is prolonged as a curved spike of bone, the pterygoid hamulus.
- The mandibular fossa of the temporal bone (glenoid fossa) form the upper articular surfaces for the temporomandibular joint.

- The styloid process of the temporal bone projects downward and forward from its inferior aspect.
- The stylomastoid foramen sits in the interval between the styloid and mastoid processes.
- The occipital condyles are on either side of the foramen magnum. They articulate with the first cervical vertebra, the atlas

Lateral View

- The frontal bone articulates with the parietal bone at the coronal suture.
- The parietal bones form the sides and roof of the cranium and articulate with each other in the midline at the sagittal suture. They articulate with the occipital bone behind, at the lambdoid suture.



- Clinically, the pterion is an important area because it overlies the anterior division of the middle meningeal artery and vein.
- The pterygomaxillary fissure is a vertical opening that lies between the pterygoid process and back of the maxilla. It leads medially into the pterygopalatine fossa.

This is the End of the Lecture – Good Luck