

Bones

I. Mandible (L. jaw)

A. Body

1. External surface
 - a. Mental protuberance (L. chin)
 - b. Mental tubercle
 - c. Mental foramen
function – transmits the mental n., a. & v.
2. Base
 - a. Digastric fossa (G. di-, two + gaster, belly)
attachment – anterior digastric m.
3. Alveolar part (L. alveus, trough, hollow sac, cavity)
function – houses roots of teeth
4. Internal surface
 - a. Mylohyoid line (G. myle, a mill, molar teeth)
attachment – mylohyoid m.
 - b. Submandibular fossa
function – houses the submandibular gland
 - c. Sublingual fossa (L. tongue)
function – houses the sublingual gland
 - d. Superior genial tubercle (superior mental spine) (G. geneion, chin)
attachment – genioglossus m.
 - e. Inferior genial tubercle (inferior mental spine)
attachment – geniohyoid m.
 - f. Mylohyoid groove
function – houses mylohyoid n.

B. Mandibular ramus

1. Angle
attachment – masseter & medial pterygoid m.
2. Medial surface
 - a. Mandibular foramen
function – transmits the inferior alveolar n., a. & v.
 - b. Mandibular canal
function – houses the inferior alveolar n., a. & v.
 - c. Lingula
attachment – sphenomandibular l.
 - d. Mylohyoid groove
function – houses mylohyoid n.
3. Anterior border
 - a. Oblique line
 - b. Retromolar fossa
4. Coronoid process (G. korone, hooked or curved)
attachment – temporalis m.
 - a. Temporal crest
attachment – temporalis m.
5. Mandibular (sigmoid) notch
function – transmits the nerve & artery to the masseter m.
6. Condylar process (G. kondylos, knuckle)
 - a. Head of mandible
 - i. Medial pole
 - ii. Lateral pole
 - b. Neck of mandible
 - c. Pterygoid fovea (G. pteron, wing)
attachment – lateral pterygoid m.

II. Hyoid bone (G. hyoeides, shaped like the letter epsilon)

A. Body

attachment – mylohyoid, genioglossus, sternohyoid, omohyoid & thyrohyoid m.

B. Greater cornu (L. horn)

attachment – middle constrictor, hyoglossus & stylohyoid m.

C. Lesser cornu

attachment – middle constrictor & stylohyoid lig.

III. Occipital bone

A. Squama (L. scale, plate)

1. External occipital protuberance

attachment – ligamentum nuchae

2. Superior nuchal line

attachment – trapezius, sternocleidomastoid & splenius capitis m.

3. Inferior nuchal line

attachment – rectus capitis posterior major & minor m.

4. Internal occipital protuberance

attachment – falx cerebelli

5. External occipital crest

attachment – ligamentum nuchae

6. Superior sagittal sulcus

function – houses superior sagittal sinus

7. Sulcus for transverse sinus

function – houses the transverse sinus

B. Basilar part

attachments – longis capitis & rectus capitis anterior m.

1. Foramen magnum (L. magnus, large)

function – transmits the spinal cord, vertebral a. & v., & accessory nerve

2. Pharyngeal tubercle

attachments – pharyngeal raphe

C. Lateral part

1. Occipital condyles

function – articulates with atlas

2. Hypoglossal canal

function – transmits hypoglossal n

3. Jugular notch & foramen (L. jugulum, throat)

function – transmits the internal jugular v., glossopharyngeal n., vagus n. & accessory n.

IV. Sphenoid Bone (L. wedge)

A. Body

1. Sulcus chiasmatis (G. chiasma, two crossing lines, from the letter chi)

function – houses the optic chiasm

2. Optic canal

function – transmits the optic n. & ophthalmic a.

3. Tuberculum sellae (L. saddle)

4. Sella turcica

a. Hypophyseal fossa (G. an undergrowth)

function – houses the pituitary

b. Dorsum sellae

c. Posterior clinoid processes (G. klino, to slope, incline or bend)

5. Carotid groove

function – houses internal carotid a. & carotid n.

6. Sphenoid sinus

B. Greater wings

1. Cerebral surfaces

2. Foramen rotundum

function – transmits the maxillary n.

3. Foramen ovale

function – transmits the mandibular n. & accessory meningeal a.

4. Spine

attachments – sphenomandibular lig.

5. Foramen spinosum

function – transmits the middle meningeal a. & the meningeal (recurrent) branch of the mandibular n.

6. Lateral surface

attachments – temporalis & lateral pterygoid m.

7. Orbital surface

- a. Superior orbital fissure
function – transmits the ophthalmic n., oculomotor n., trochlear n., abducens n., & ophthalmic v.
- 8. Foramen lacerum (L. lacero, to tear)
- C. Lesser wings
 - 1. Anterior clinoid processes
attachments – tentorium cerebelli
- D. Pterygoid process
 - 1. Pterygoid fossa
attachments – medial pterygoid m.
 - 2. Scaphoid fossa (G. skaphe, skiff, boat)
attachments – tensor palatini m.
 - 3. Pterygoid canal
function – transmits the nerve of the pterygoid canal
 - 4. Lateral pterygoid plate
attachments – lateral & medial pterygoid m.
 - 5. Medial pterygoid plate
 - a. Pterygoid hamulus (L. small hook)
function – deflects the tendon of the tensor palatini m.

V. Temporal bone

- A. Squamous part
 - 1. Temporal surface
attachments – temporalis m.
 - 2. Zygomatic process (G. zygon, yoke, a joining)
attachments – masseter m.
 - 3. Mandibular fossa
function – articulates with TMJ disc
 - a. Articular eminence and tubercle
 - b. Petrotympanic fissure (L. petra, rock, G. tympanon, drum)
function – transmits chorda tympani n.
 - c. Squamotympanic fissure
attachments – articular disc
 - d. Tegmen tympanii
details – sliver of bone in squamotympanic fissure
 - e. Opening of osseous portion of auditory tube
 - 4. External auditory meatus (L. a going, passage)
- B. Mastoid part [G. mastos, breast + G. eidos, resemblance]
 - 1. Mastoid process
attachments – sternocleidomastoid, splenius capitis & longissimus capitis m.
 - a. Mastoid notch
attachment – posterior belly of digastric m.
 - b. Occipital groove
function – houses occipital a.
 - 2. Sigmoid sulcus
function – houses sigmoid sinus
- C. Petrous part [L. petra, rock]
 - 1. Trigeminal impression
function – houses trigeminal ganglion
 - 2. Posterior surface
 - a. Internal auditory meatus
function – transmits facial & vestibulocochlear n.
 - 3. Inferior surface
 - a. Carotid canal
function – transmits the internal carotid a. & carotid n.
 - b. Jugular fossa
function – transmits the internal jugular v., glossopharyngeal n., vagus n. & accessory n.
 - c. Canaliculus for the tympanic n. (L. small canal)
function – transmits the tympanic n.
 - 4. Superior border
attachments – tentorium cerebelli
 - a. Groove for the superior petrosal sinus

function – houses the superior petrosal sinus

D. Tympanic part [G. tympanon, drum]

1. Styloid process (G. stylos, pillar, post)

attachments – stylohyoid, stylopharyngeus & styloglossus m. & stylohyoid l.

2. Stylomastoid foramen

function – transmits the facial n.

VI. Parietal Bone (L. paries, wall)

A. External surface

1. Superior temporal line

attachments – temporal fascia

2. Inferior temporal line

attachments – temporalis m.

B. Internal surface

1. Groove for the superior sagittal sinus

function – houses the superior sagittal sinus

2. Granular foveolae

function – house arachnoid granulations

VII. Frontal Bone

A. External surface

1. Superciliary arch (L. cilium, eyelash)

2. Glabella (L. glabellus, hairless)

3. Supraorbital margin

- a. Supraorbital notch or foramen

function – transmits the supraorbital n., a. & v.

4. Zygomatic process

B. Internal surface

1. Groove for the superior sagittal sinus

function – houses the superior sagittal sinus

C. Orbital part

1. Orbital surface

- a. Fossa for the lacrimal gland (L. lacrima, a tear)

function – houses the lacrimal gland

- b. Anterior ethmoidal foramen

function – transmits the anterior ethmoidal n., a. & v.

- c. Posterior ethmoidal foramen

function – transmits the posterior ethmoidal n., a. & v.

D. Frontal sinus

VIII. Ethmoid bone

A. Cribriform plate (L. a sieve)

1. Crista galli (L. crest)

attachments – falx cerebri

2. Olfactory foramina

function – transmit the olfactory n.

B. Perpendicular plate

C. Ethmoidal labyrinths

1. Air cells

2. Orbital plate

- a. Anterior ethmoidal foramen

function – transmits the anterior ethmoidal n., a., & v.

- b. Posterior ethmoidal foramen

function – transmits the posterior ethmoidal n., a., & v.

3. Medial surface

- a. Superior concha (L. shell)

- b. Middle concha

- c. Bulla ethmoidalis (L. bubble)

IX. Inferior nasal concha

X. Lacrimal Bone

A. Orbital surface

1. Fossa for the lacrimal sac

function – house the lacrimal sac

XI. Nasal bones

XII. Vomer (L. ploughshare)

- A. Ala (L. wing)
- B. Groove for the nasopalatine n.

XIII. Maxilla

A. Body

- 1. Anterior surface
 - a. Incisive fossa
 - b. Canine eminence
 - c. Canine fossa
 - d. Infraorbital margin
 - e. Infraorbital foramen
 - function – transmits the infraorbital n., a. & v.
 - f. Anterior nasal spine
 - 2. Infratemporal surface (tuberosity)
 - a. Alveolar canals
 - function – transmits the superior alveolar n., a. & v.
 - 3. Orbital surface
 - a. Infraorbital groove and canal
 - function – transmits the infraorbital n., a. & v.
 - 4. Nasal surface
 - a. Greater palatine canal
 - function – transmits the greater palatine n., a. & v.
 - b. Nasolacrimal canal
 - function – transmits the nasolacrimal duct
 - 5. Maxillary sinus
 - a. Hiatus
- B. Zygomatic process
- C. Frontal process
- 1. Anterior lacrimal crest
 - attachments – medial palpebral lig.
- D. Alveolar process
- function – houses roots of upper teeth
- E. Palatine process
- 1. Incisive fossa and canal
 - function – transmits the nasopalatine n. & a., greater palatine a.

XIV. Palatine bones

- A. Horizontal plate
- B. Perpendicular plate
 - 1. Greater palatine canal & foramen
 - function – transmits the greater palatine n., a. & v.
 - 2. Lesser palatine canal & foramen
 - function – transmits the lesser palatine n., a. & v.
 - 3. Sphenopalatine foramen
 - function – transmits the sphenopalatine a. & v., & the posterior superior nasal n.
- C. Orbital process

XV. Zygomatic bones

- A. Lateral surface
 - attachments – zygomaticus major & masseter m.
- B. Temporal surface
- C. Orbital surface
- D. Frontal process
- E. Maxillary process
- F. Temporal process

XVI. Miscellaneous

- A. Spaces
 - 1. Anterior cranial fossa
 - 2. Middle cranial fossa
 - 3. Posterior cranial fossa
 - 4. Temporal fossa
 - 5. Infratemporal fossa
 - 6. Pterygopalatine fossa

a. Communications

- i. Foramen rotundum
function – transmits the maxillary n.
- ii. Pterygoid canal
function – transmits the nerve of the pterygoid canal
- iii. Inferior orbital fissure
function – transmits the zygomatic n.
- iv. Infraorbital groove
function – transmits the infraorbital n., a. & v.
- v. Sphenopalatine foramen
function – transmits the sphenopalatine a. & v., & posterior superior nasal n.
- vi. Pterygomaxillary fissure
function – transmits the posterior superior alveolar n., & the infraorbital, sphenopalatine & greater palatine a. & v.
- vii. Palatovaginal canal
function – transmits the pharyngeal branch of the maxillary n.
- viii. Greater palatine canal
function – transmits the greater palatine n., a. & v.

B. Reference points

1. Bregma (G. the forepart of the head)
details – junction of coronal and sagittal sutures
2. Lambda
details – junction of sagittal and lambdoid sutures
3. Pterion
details – area where parietal sphenoid, frontal and temporal bones meet
4. Nasion
details – junction of internasal and frontonasal suture

C. Structures

1. Zygomatic arch
attachments – masseter m.

D. Sutures

1. Coronal
details – between frontal & parietal bones
2. Cruciform
details – between palatine processes of maxilla and horizontal processes of the palatine bones
3. Lambdoid
details – between occipital and parietal bones
4. Sagittal
details – between parietal bones

XVII. Atlas (G. Atlas, in Greek mythology a Titan who supported the heavens on his shoulders)

A. Anterior arch

1. Anterior tubercle
attachments – anterior longitudinal lig. & longus coli m.

B. Lateral masses

1. Superior facet
function – articulates with occipital condyles
2. Inferior facet
function – articulates with axis

C. Posterior arch

1. Groove for the vertebral artery
function – houses the vertebral a. & v. & suboccipital n.
2. Posterior tubercle
attachment – ligamentum nuchae & rectus capitis posterior minor m.

D. Transverse process

- attachments – levator scapulae, obliquus capitis inferior & obliquus capitis superior
1. Transverse foramen
function – transmits the vertebral a. & v.

XVIII. Axis (L. axle)

A. Body

1. Superior articular facet
function – articulates with the atlas

- B. Dens (L. tooth)
 - 1. Impressions for the alar lig.
attachments – alar lig.
 - 2. Groove for the transverse lig.
function – houses the transverse ligament (cruciate)
- C. Neural arch
 - 1. Pedicle
 - a. Vertebral notch
function – transmits C3 spinal nerve
 - b. Transverse process
attachments – levator scapulae & middle scalene
 - i. Transverse foramen
function – transmits the vertebral a. & v
 - 2. Lamina
 - 3. Spinous process
attachments – semispinalis cervicis, rectus capitis posterior major & inferior oblique m.

XIX. Vertebrae (C3 – C7)

- A. Body
- B. Spaces
 - 1. Vertebral foramen & canal (L. an aperture)
function – houses spinal cord
 - 2. Vertebral notches (indentation at the edge of a bone)
 - a. Intervertebral foramen
function – transmits spinal nerves & radicular vessels
- C. Neural arch
 - 1. Pedicle (L. pediculus, foot)
 - a. Transverse process (bony projection)
attachments – longus capitis, longus colli, scalenus anterior, scalenus medius, scalenus posterior & semispinalis capitis
 - i. Transverse foramen
function – transmits vertebral a. & v.
 - b. Superior articular process
 - i. superior articular facet
function – articulates with adjacent vertebra
 - c. Inferior articular process
 - i. Inferior articular facet
function – articulates with adjacent vertebra
 - 2. Lamina (L. plate, leaf)
 - 3. Spinous process
attachments – splenius capitis & semispinalis cervicis

XX. Auditory Ossicles

- A. Malleus (L. hammer)
attachments – tensor tympani m.
- B. Incus (L. anvil)
- C. Stapes (L. stirrup)
attachments – stapedius m.

XXI. Sternum

- A. Manubrium
 - 1. Jugular notch
 - 2. Clavicular notch & facet
function – articulates with clavicle (articular disc)
 - 3. Anterior surface
attachments – sternocleidomastoid m.
 - 4. Posterior surface
attachments – sternohyoid & sternothyroid m.

XXII. Clavicle

- A. Sternal end
function – articulates with sternum (articular disc)
 - 1. Superior surface
attachments – sternocleidomastoid m.