

Cranial anatomy

. Cranial sutures

- A. Coronal
- B. Sagittal
- C. Lambdoidal
- D. Squamosal

. Frontal bone

- A. External surface
 - 1. Frontal eminence (boss): more highly developed in females
 - a) Temporal line: associated with the temporalis muscle
 - b) Zygomatic process
 - c) Supraorbital notch of foramen
 - d) Glabella
 - e) Metopic suture (remnant)
 - 2. Internal surface
 - a) Sagittal sulcus
 - b) Frontal crest
 - c) Foramen cecum
 - d) Arachnoid (or pacchionian) depressions
 - e) Depressions for convolutions of the frontal lobes
 - f) Frontal sinuses (inside the bone)

. Parietal

- A. External surface
 - a) Parietal eminence (or boss)
 - b) Temporal lines
 - c) Parietal (or obelionic) foramen
- B. Internal surface
 - a) Arachnoid (or pacchionian) depressions
 - b) Grooves for the middle meningeal vessels
 - c) Sagittal sulcus

. Temporal

- A. Squama
 - a) Zygomatic process
 - b) Suprameatal crest (supramastoid crest)
 - c) Articular tubercle
 - d) Mandibular fossa (or glenoid fossa)
 - e) Post-glenoid process
 - f) Parietal notch
 - g) Groove for middle meningeal vessels on internal surface
- B. Mastoid portion
 - a) Mastoid process
 - b) Mastoid foramen
 - c) Sigmoid sulcus on internal surface
- C. Petrous portion
 - a) Carotid canal
 - b) Jugular fossa
 - c) Styloid process
 - d) Internal auditory meatus
- D. Tympanic portion
 - a) External auditory meatus
 - b) Tympanic dehiscence
 - c) Exostosis of the external auditory meatus

. Occipital bone

- A. Squama
 - a) External occipital protuberance

- b) Nuchal lines
 - c) Internal occipital protuberance
 - d) Sagittal sulcus
 - e) Transverse sulcus
 - B. Lateral portion
 - a) Occipital condyle
 - b) Hypoglossal canal
 - c) Condylod fossa (foramen)
 - d) Jugular notch
 - C. Basilar portion
- . **Maxilla**
 - A. body
 - 1. Maxillary sinus
 - 2. Infraorbital foramen
 - B. zygomatic process
 - C. Frontal process
 - D. alveolar process
 - E. palatine process
 - 1. Incisive foramen
 - 2. Premaxilla
- . **Zygomatic (malar)**
 - A. frontal process
 - B. temporal process
 - C. Maxillary process
- . **Sphenoid**
 - A. Body
 - 1. Optic foramina
 - 2. Sella turcica
 - 3. Carotid grooves
 - 4. Sphenoidal sinus
 - B. Greater and lesser wings
 - C. Medial and lateral pterygoid plates
- . **Additional cranial bones**
 - A. palatine
 - B. nasal
 - C. Ethmoid
 - D. lacrimal
 - E. Nasal conchae
 - F. Vomer
- . **Mandible**
 - A. Body
 - 1. Mandibular symphysis
 - 2. Mental eminence
 - 3. Mental foramen
 - 4. Alveolar process
 - B. Ramus (ascending)
 - 1. Mandibular foramen
 - 2. Coronoid process
 - 3. Condylod process
 - C. Gonial angle (angular process)

Long bones

- A. Humerus
 - 1. Proximal end
 - a) Head
 - b) Greater (supraspinatus) tuberosity
 - c) Lesser tuberosity
 - d) Bicipital groove
 - 2. II. Shaft
 - a) Deltoid tuberosity
 - 3. Distal end
 - a) Medial epicondyle
 - b) Lateral epicondyle
 - c) Capitulum
 - d) Trochlea
 - e) Coronoid fossa
 - f) Radial fossa
 - g) Olecranon fossa
- B. Radius
 - 1. Proximal end
 - a) Head
 - b) Neck
 - c) Radial Tuberosity
 - 2. Shaft
 - a) Interosseous crest
 - 3. Distal end
 - a) Styloid process
 - b) Dorsal tubercle
 - c) Carpal surface
- C. Ulna
 - 1. Proximal end
 - a) Olecranon
 - b) Coronoid process
 - c) Trochlear notch
 - d) Radial notch
 - 2. Shaft
 - a) Interosseous crest
 - 3. Distal end
 - a) Head
 - b) Styloid process
- D. Femur
 - 1. Proximal end
 - a) Head
 - b) Fovea capitis
 - c) Greater trochanter
 - d) Lesser trochanter

2. Shaft
 - a) Linea aspera
 - b) Nutrient foramen
 3. Distal end
 - a) Medial epicondyle
 - b) Lateral epicondyle
 - c) Patellar articular surface
 - d) Intercondylar fossa
- E. Patella
1. Posterior surface
 - a) Lateral articular surface (large)
 - b) Medial articular surface (small)
 2. Notch
- F. Fibula
1. Proximal end
 - a) Head
 - b) Styloid process
 2. Shaft
 - a) Interosseous crest
 3. Distal end
 - a) Lateral malleolus
 - b) Malleolar fossa
- G. Tibia
1. Proximal end
 - a) Intercondylar eminence
 - b) Medial condyle
 - c) Lateral condyle
 - d) Fibular articular surface
 2. Shaft
 - a) Anterior crest
 - b) Interosseous crest
 - c) Nutrient foramen
 3. Distal end
 - a) Medial malleolus
 - b) Squatting facet

Miscellaneous Bones

- . **Os coxae**
 - A. Ilium
 - 1. Iliac crest
 - 2. Greater sciatic notch
 - 3. Auricular surface
 - 4. Preauricular sulcus
 - B. Ischium
 - 1. Ischial tuberosity
 - C. Pubic bone
 - 1. Pubic symphysis
 - 2. Gestation pits
 - D. Acetabulum
- . **Scapula**
 - A. Costal surface (ventral)
 - 1. Subscapular fossa (for subscapularis muscle)
 - B. Dorsal surface
 - 1. Supraspinatus fossa
 - 2. Infraspinatus fossa
 - C. Spine
 - 1. Acromion
 - 2. Articular facet for clavicle
 - D. Coracoid process
 - E. Glenoid fossa
- . **Clavicle**
 - A. Inferior surface
 - 1. Conoid tuberosity (for conoid ligament)
 - 2. Oblique line (for trapezoid ligament)
 - B. Sternal extremity
 - 1. Articular facet for manubrium
 - 2. Articular facet for cartilage of R1
 - C. Acromial extremity
 - 1. Articular facet for acromion of scapula
 - D. Sternum
 - 1. Manubrium
 - 2. Body
 - 3. Xiphoid process
- . **Hands**
 - A. Proximal Row of Carpals (lateral to medial)
 - 1. Scaphoid (navicular)
 - 2. Lunate
 - 3. Triquetral (triangular)
 - 4. Pisiform

- B. Distal Row of Carpals (lateral to medial)
 - 1. Trapezium (greater multangular)
 - 2. Trapezoid (lesser multangular)
 - 3. Capitate
 - 4. Hamate
- C. Metacarpals
- D. Manual Phalanges
 - 1. Proximal
 - 2. Middle
 - 3. Distal

. **Feet**

- A. Calcaneous
- B. Talus
- C. Cuboid
- D. Navicular
- E. Cuneiform I,II and III
- F. Metatarsals
- G. Phalanges
 - 1. Proximal
 - 2. Middle
 - 3. Distal

The Vertebral Column

- . **Features of vertebrae**
 - A. body (centrum)
 - B. pedicles
 - C. transverse processes
 - D. laminae
 - E. superior articular facets
 - F. inferior articular facets
 - G. spinous process

- . **Cervical vertebrae**
 - A. Distinctive features
 - 1. Short transverse processes
 - 2. Transverse foramina
 - 3. Short bifid spinous process
 - 4. Flat body with elevated lateral borders
 - 5. Articular facets tend to have a horizontal orientation
 - B. First cervical vertebra (atlas)
 - 1. Lateral masses for articulation with occipital condyles and the axis
 - 2. Anterior arch with area for articulation with odontoid process
 - C. Second cervical vertebra (axis or epistropheus)
 - 1. Odontoid process (dens)
 - 2. Seventh cervical vertebra
 - 3. Prominent spinous process
 - 4. Large transverse process
 - 5. Cervical ribs occasionally present

- . **Thoracic vertebrae**
 - A. Distinctive features
 - 1. Long pointed spinous processes
 - 2. Well developed transverse process with facet for tubercle of ribs
 - 3. Facet for head of rib on side of centrum
 - 4. Shape of centrum
 - 5. Articular facets allow movement in a coronal plane
 - B. First thoracic
 - 1. Entire costal pit on superior side of centrum
 - 2. Half facet on inferior border of centrum
 - C. Eleventh and twelfth thoracic
 - 1. No facet on transverse process
 - 2. Facet for head of rib on vertebral body
 - D. Twelfth thoracic
 - 1. has superior articular facets like those of the other thoracics and inferior articular facets like those of a lumbar

- . **Lumbar vertebrae**
 - A. Distinctive features

1. Short blunt spinous processes
2. Reduced transverse processes
3. No facets for articular with ribs
4. Articular facets allow movement in a sagittal plane
5. Centrum is large and has a kidney shape
6. Mammillary processes

. **Sacrum (5 fused units)**

- A. Pelvic surface
 1. Transverse ridges
 2. Anterior sacral foramina
- B. Dorsal surface
 1. Middle sacral crest
 2. Posterior sacral foramina
- C. Lateral surface
 1. Auricular surface
- D. Base
- E. Apex
- F. Vertebral canal

. **Coccygeal vertebrae**

Ribs

. **Features of ribs**

- A. Head
- B. Neck
- C. Tubercle
- D. Body
- E. Costal groove
- F. Sternal end

. **True ribs (1-7) articulate directly with sternum**

. **False ribs (8-10) articulate indirectly with sternum**

. **Floating ribs (11-12) have a free ventral extremity**