Articulations & axial skeleton
Classification of articulations/joints

• Two classification methods:
  – The **type of movement allowed** at the joint (the **function** of the joint) (subjective)
  
  – The **type of connective tissue** that joins the bones (the **structure** of the joint)
Functional joint classification

- **Synarthroses** - no movement at the joint
  - Between skull bones
- **Amphiarthroses** - slight motion at the joint
  - Symphysis pubis
- **Diarthroses/Synovial** - freely moveable joint with a joint cavity
  - Elbow
Synarthroses

- Boney edges interlock
- Connective tissues fibers attach bones
- epiphyseal plate in developing long bone
Amphiarthroses

- Very limited movement
Diarthroses/Synovial

- Wide range of motion
- Bones do not contact each other

Fig 8.1

(a) Synovial joint, sagittal section
Structural joint classification

• Three types:
• **Fibrous joints**-fibrous connective tissue holds the joint together
• **Cartilaginous joints**-cartilage hold the joints together
• **Synovial joints**-bones are held together by a joint cavity (knee, elbow)
Fibrous joints

- **Sutures**- suture bone holding bones together
- **Syndesmoses**- long connective tissue bands (interosseous membrane between bones in distal appendages)
- **Gomphosis**- short connective tissue bands (only example- ligaments attached to the teeth)
Cartilaginous joints

- **Synchondroses** - hyaline cartilage between bones (1\textsuperscript{st} rib to sternum, epiphyseal plate in growing long bone)
- **Symphyses** - fibrocartilage holds bones together (symphysis pubis, intervertebral discs)
Synovial joint - cavity between the bones

- Bones separated by articular cartilage
  - Reduce friction
  - Absorb shock
- Articular capsule
  - Fibrous joint capsule
  - Synovial membrane
    - Produces synovial fluid
Synovial fluid

- Synovial fluid:
- Provides lubrication
- Nourishes chondrocytes
- Acts as a shock absorber
Accessory structures of synovial joints

- **menisci**—subdivide cavity/restrict movement
- **Ligaments**—connect bone to bone
- **Tendons**—connect muscle to bone

![Diagram of synovial joint with labels](image)
- **Bursae**- small pockets filled with synovial fluid
- reduce friction put tendons
Fig 8.6

(a) Gliding joint
(b) Hinge joint
(c) Pivot joint
(d) Ellipsoidal joint
(e) Saddle joint
(f) Ball-and-socket joint

Clavicle, Manubrium, Humerus, Ulna, Radius, Scaphoid bone, Metacarpal bone of thumb, Trapezium, Scapula
A hyperextension-hyperflexion injury

The neck hyperextends:
- Anterior longitudinal ligament
  - Torn, swelling
- Atlas
  - Vertebral arch may break
- Anulus fibrosus
  - C2/C3 may rupture-dislocation of skull

The neck is hyper flexed:
- Supraspinous/Interspinous ligament
  - Tear
- Interspinales muscles
  - Tear
- Crushed vertebral bodies
- Dens of axis may be jammed into the spinal cord
- Herniated intervertebral discs
Bony orbit-bones around the eye socket

Palatine, lacrimal, ethmoid, sphenoid, frontal, maxillary, & zygomatic bones
Normal spinal curve
Scoliosis

lateral thoracic/lumbar curve

Kyphosis

Exaggerated thoracic curve

J.Lo dorsis
Ligamentum nuchae

• The name of the supraspinous ligament when it reaches the cervical vertebrae
Fig 8.9

(a) Lateral view of distorted intervertebral disc

(b) Herniated disc, superior view

- Anulus fibrosus
- Nucleus pulposus

Area of distortion

Compressed area of spinal nerve

Spinal cord

Spinal nerve

Nucleus pulposus

Anulus fibrosus
Carotid canal
Jugular foramen

Fig 6.3
Nasal septum =
Vomer (inferior) +
Perpendicular plate of the ethmoid bone (superior)
Fig 6.4

Anterior cranial fossa
Middle cranial fossa
Posterior cranial fossa
Hyoid bone
Frontal bone

- Squamous part (squamous surface)
- Metopic (frontal) suture
- Superior temporal line
- Superciliary arch
- Supraorbital margin
- Supraorbital foramen
- Supraorbital notch

(a) External surface
Right vs. left parietal bone
The pituitary gland sits in the sella turcica of the sphenoid bone.
Alveolar processes-the teeth sockets
Intermaxillary suture
Median palatine suture
Fontanel-soft spots on a fetal/baby skull