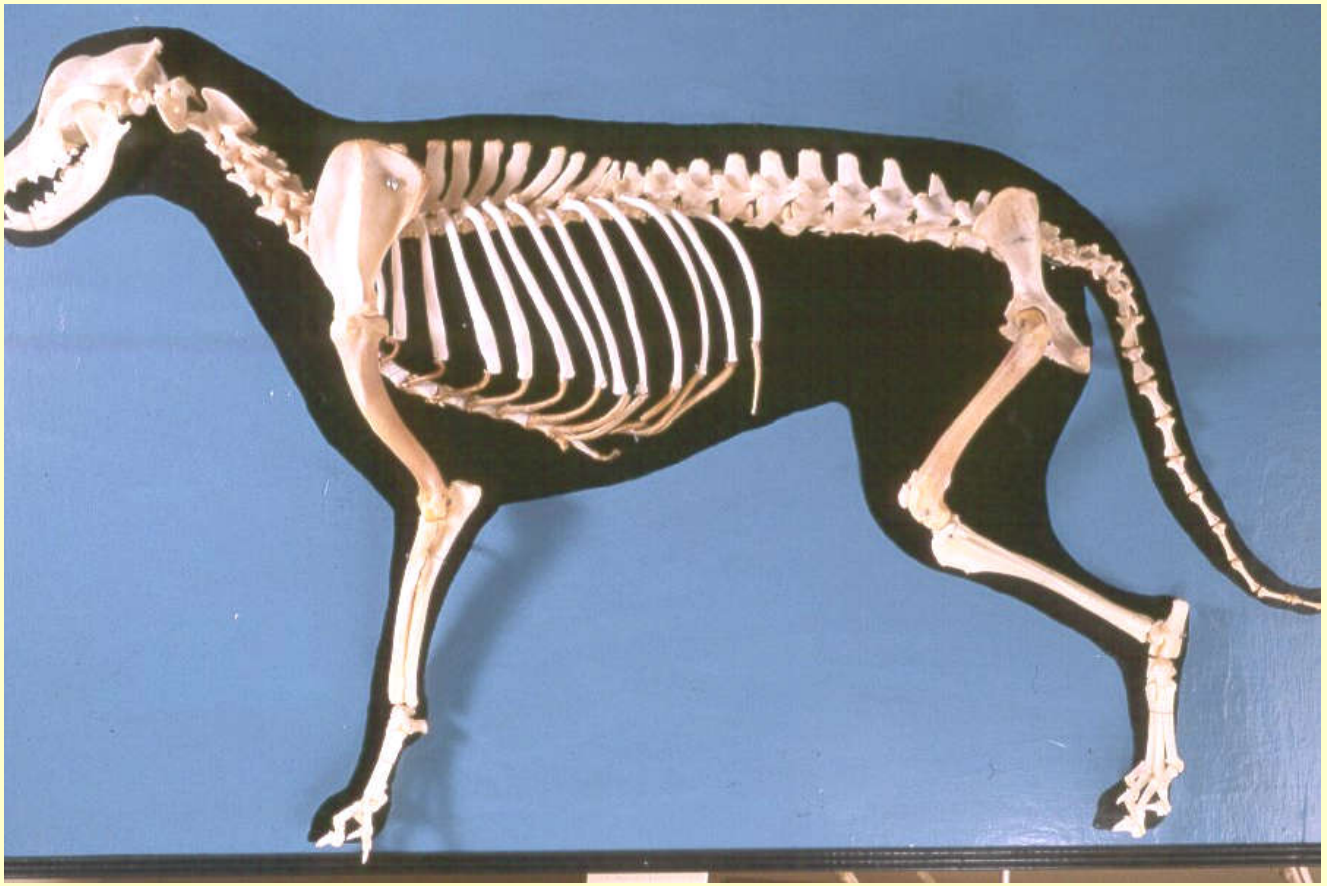
Arthrology

Study of joints and their accessory structures ,tendon and ligaments

ARTHROLOGY



Where 2 or more bones join.

functions of Joints

- Allow movement.
  - Directed not random.
- Provide stability.
- Bone growth sites

Classification of joints

- 1. Fibrous joints – joined by dense white fibrous connective tissue.
  - Sutures –narrow strips of CT. Found mostly in the skull. Allows the growth of bone plates. Stops as ossification occurs.
  - Syndesmosis –a type of fibrous joint in which the intervening fibrous connective tissue forms an interosseous membrane or ligament. Between radius and ulna.
  - Gomphosis –Implantation of tooth in their alveoli

A. Sutures

B. Syndesmosis

C. Gomphosis

2. Cartilaginous joints

- Symphysis – divided by a series of tissues, i.e.. cartilage, fibrocartilage, or fibrous tissue in the middle of symmetrical halves. Pubis, mandible.
- Synchondrosis –a union between two bones formed by either hyaline cartilage or fibrocartilage; it is usually temporary, the intervening cartilage being converted into bone before adult life. Skull, hyoid bones.
- Physis – between epiphysis and diaphysis.
- Intervertebral disks.

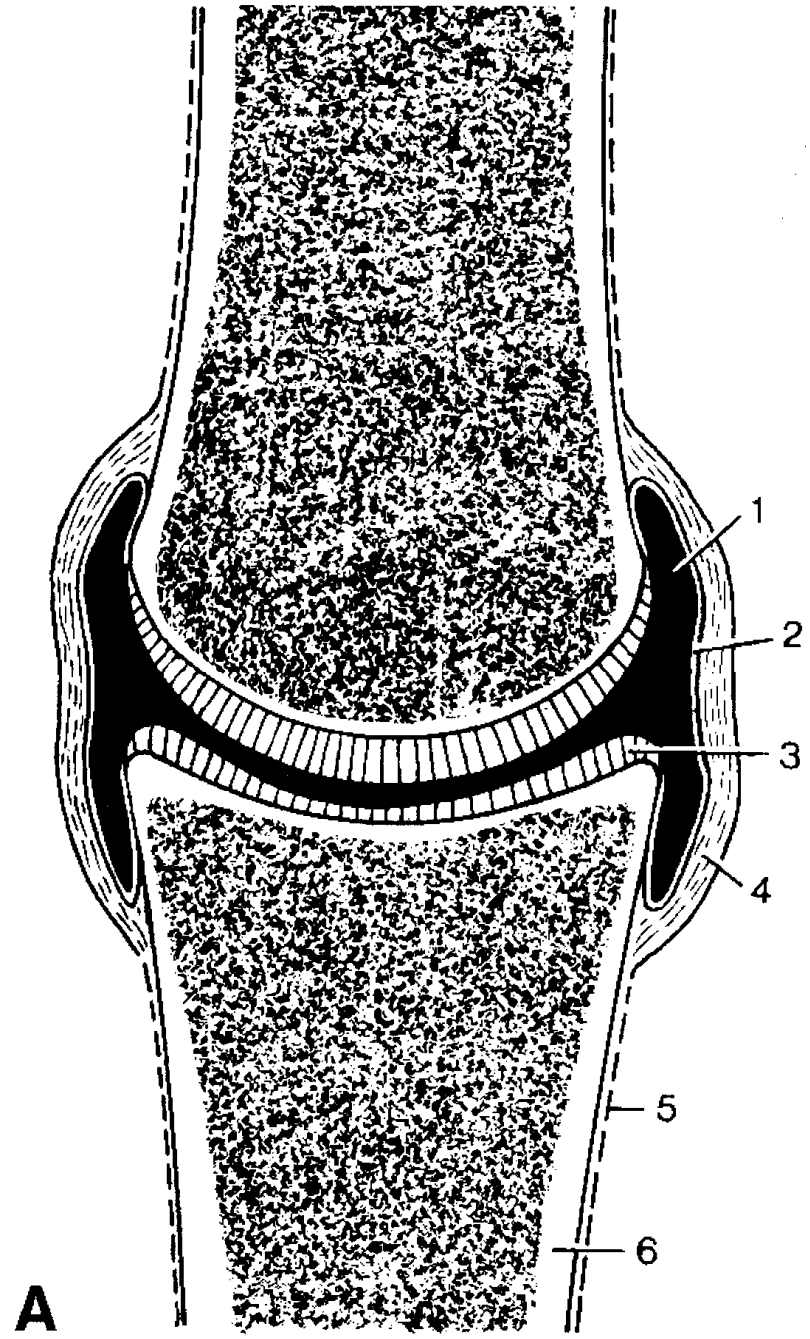
3. Synovial joints

- Separated by fluid-filled space.

Periarticular
- synovial membrane
- fibrous capsule
- fibrous bands – ligaments

Articular
- articular surface
  - hyaline cartilage (fibrocartilage).

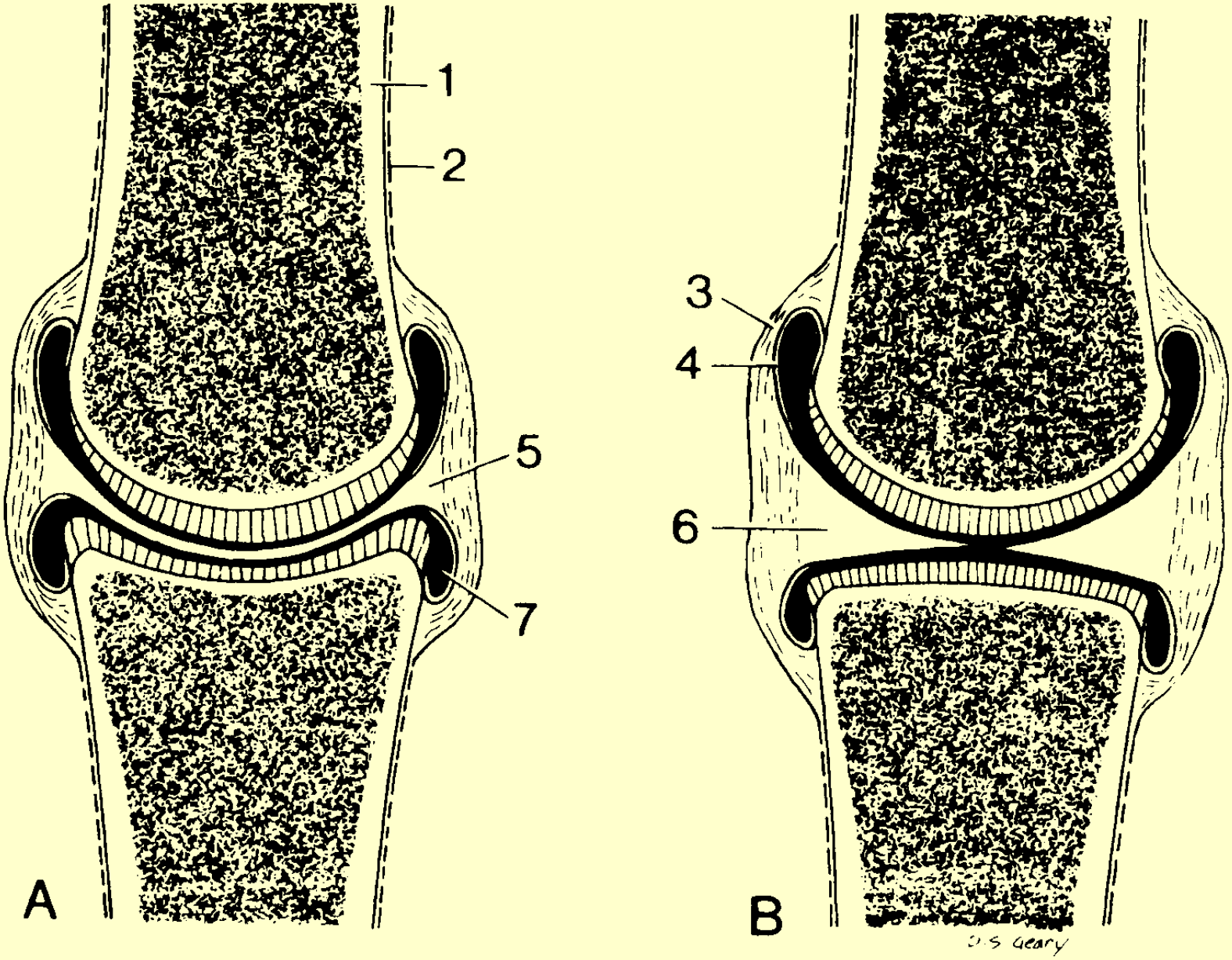
Intraarticular
- synovial fluid
  - lubrication AND nutrition
- disks or menisci
  - provide support for bony incongruities
  - stifle and tmj



Synovial Joint Structure

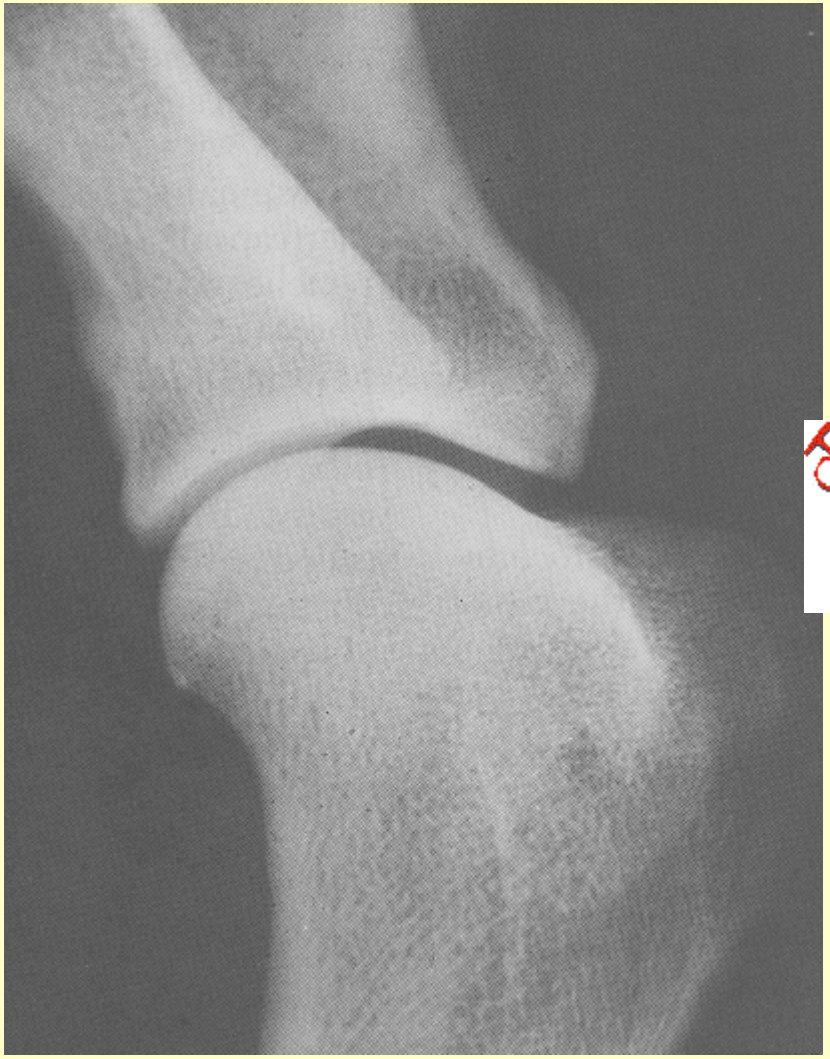
- 1. Synovial fluid / space
  - lubrication
  - nutrition
  - clear-yellow, viscous
- 2. Synovial membrane
- 3. Articular cartilage
  - avascular
  - no nerves
  - nutrition by diffusion
    - synovial fluid
    - vessels – capsule and bone
- 4. Fibrous joint capsule
- 5. Periosteum
- 6. Cortex

Synovial – Disk and Meniscus



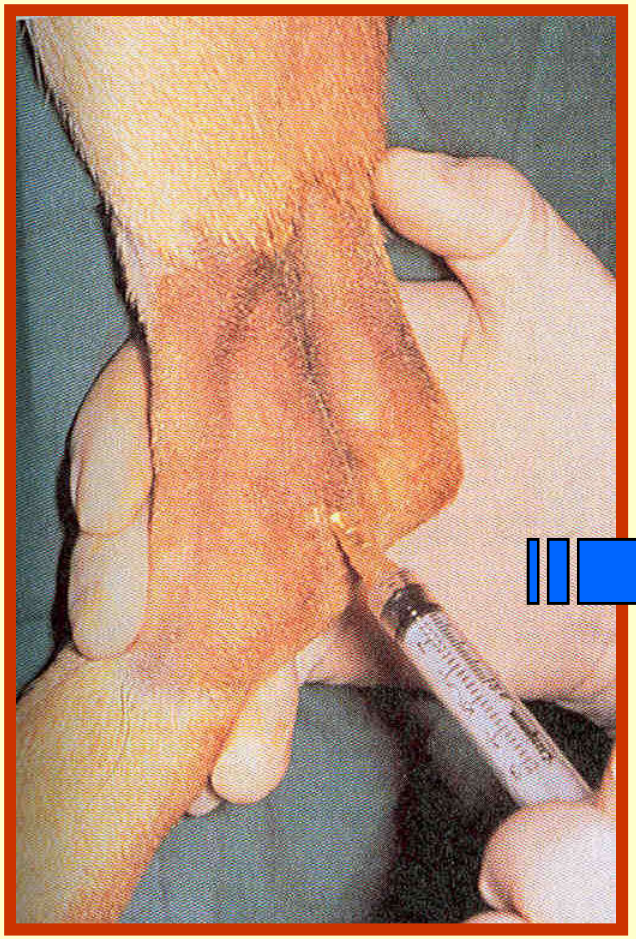
Joint Capsule and Ligaments

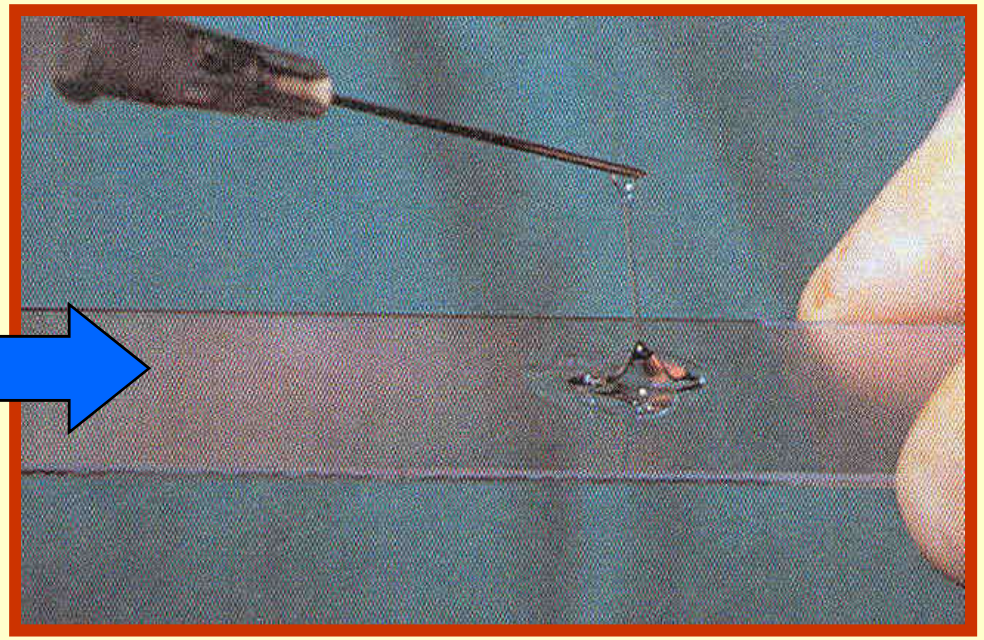
Shoulder Radiograph and Arthrogram



Contrast media in joint space.

Joint Taps - Synovial Fluid Analysis



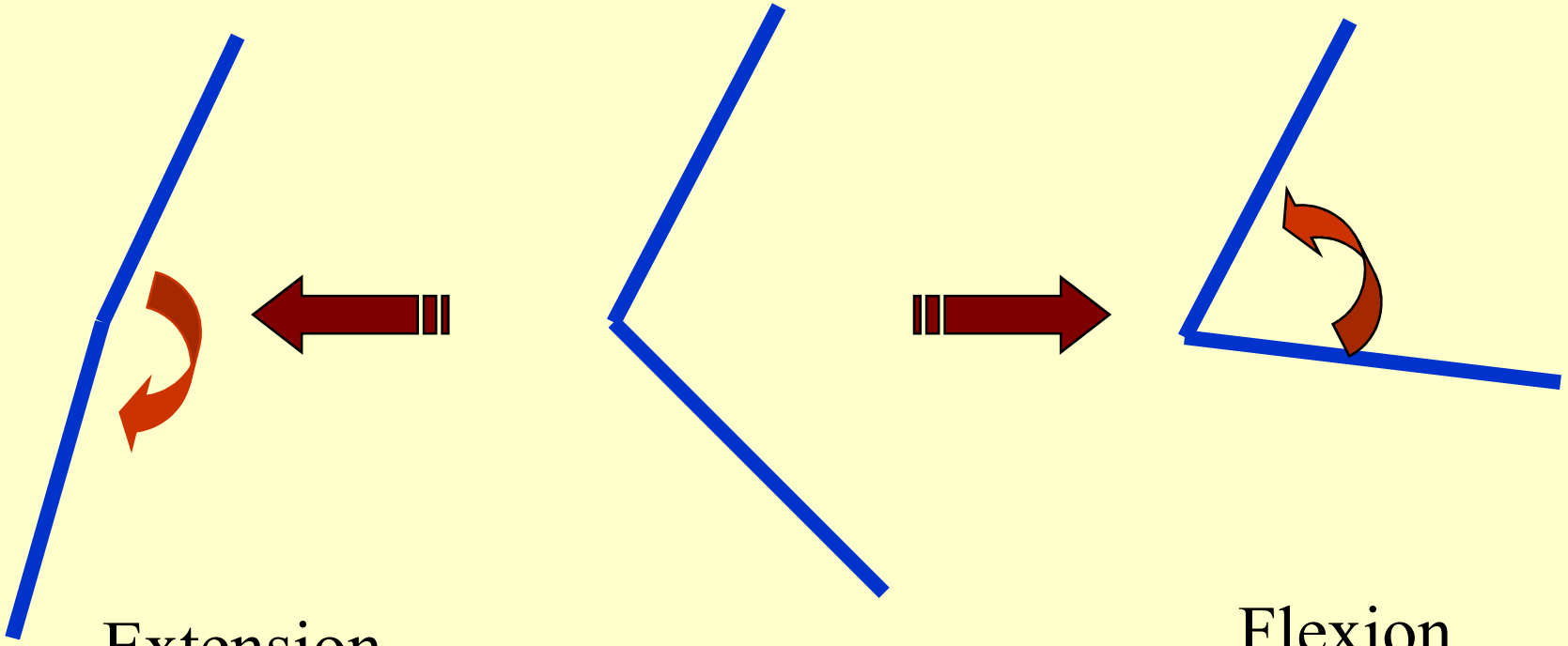


Movements

- Translation – sliding without changing orientation
- Rotation
  - Inward
  - Outward
- Pendular – angular or swinging about an axis
  - flexion
  - extension
  - adduction
  - abduction
  - circumduction

Flexion and Extension

In saggital plane



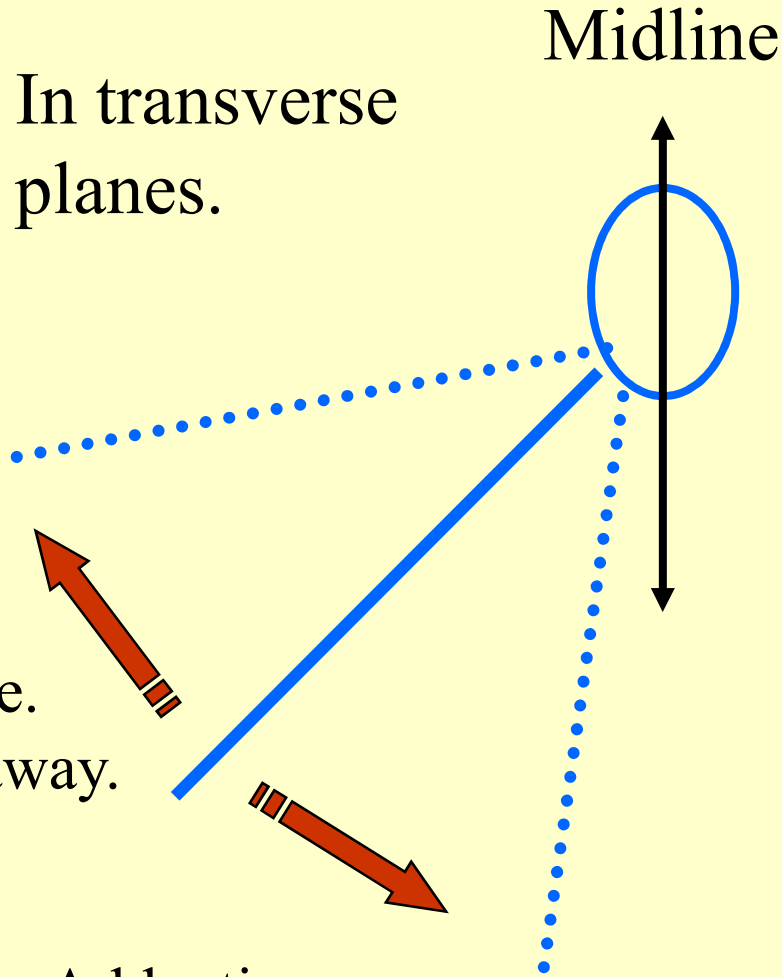
Extension
increase joint angle

Flexion
decrease joint angle

Hyper extension / flexion – beyond normal ranges.

Adduction & Abduction

In transverse planes.

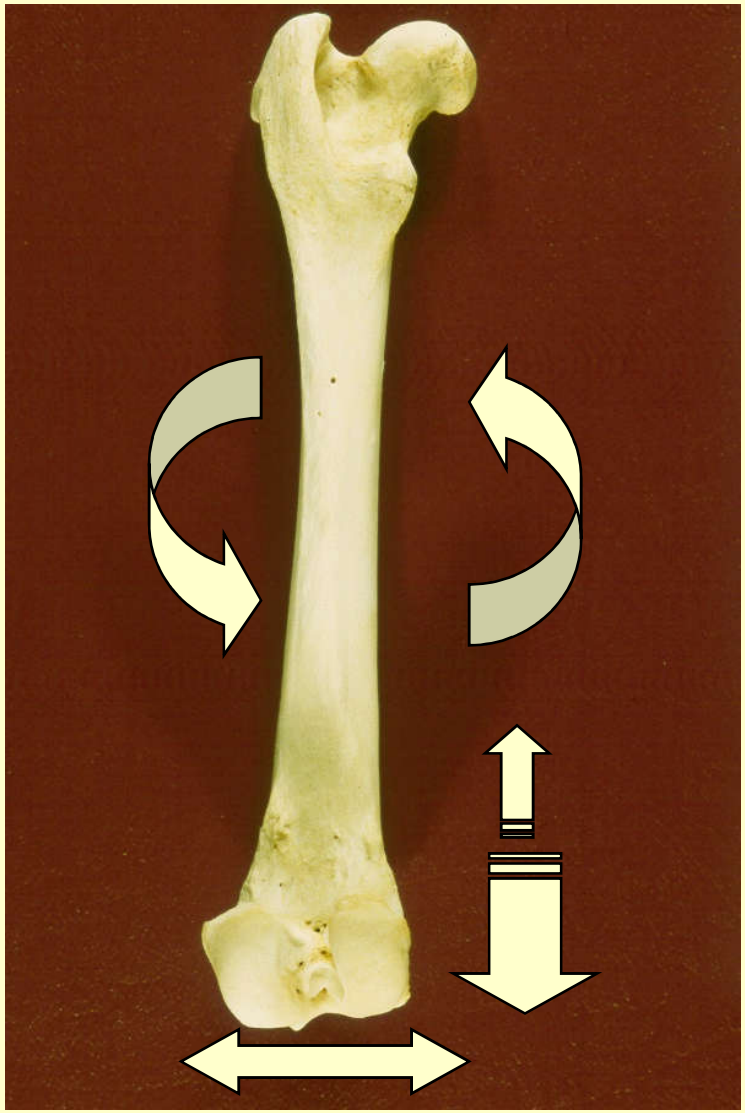


Abduction –
move away from median plane.
The child was abducted – taken away.

Adduction -
bring towards median plane.
Add 2 numbers – bring together.

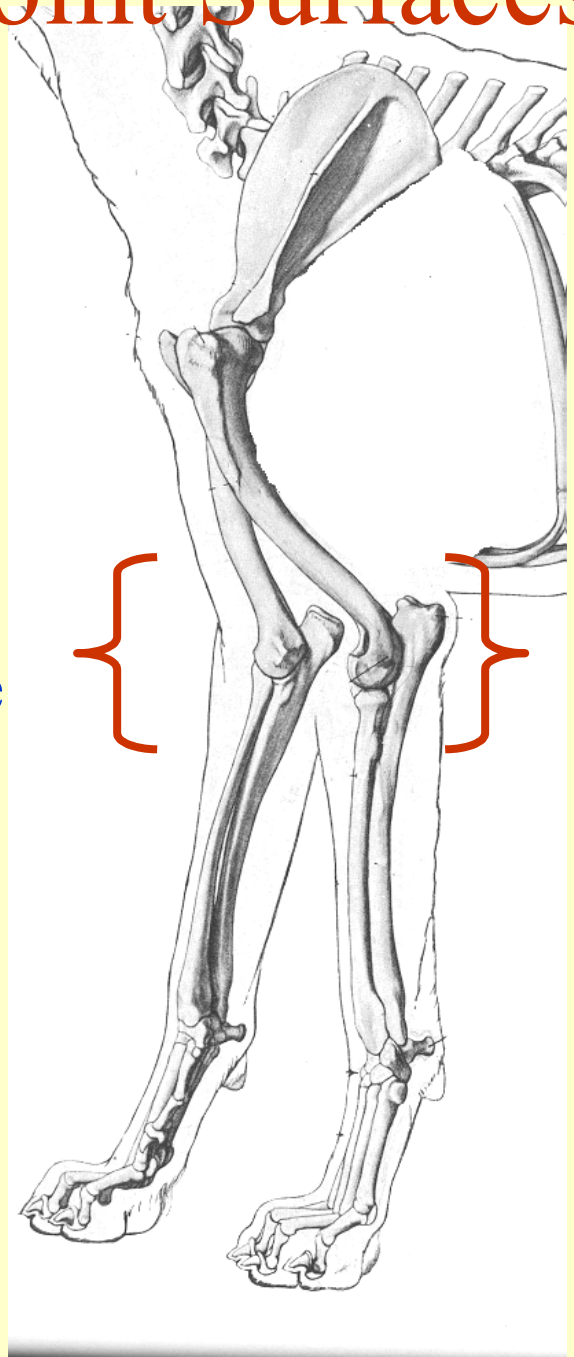
Circumduction

Flexion
+/-
Extension
+/-
Adduction
+/-
Abduction



Infinitely variable number of combinations to form complex actions.

Joint Surfaces



Flexor Surface

Extensor Surface

Flexion

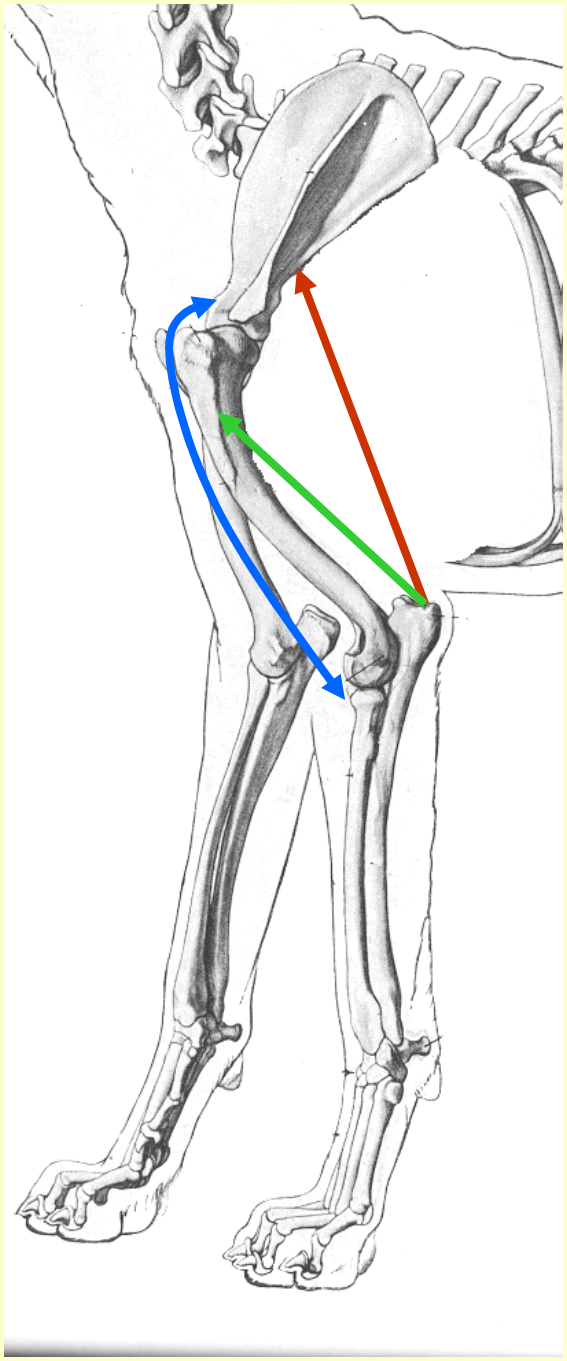
Angle

Extension

Angle

Biceps brachii

1. extend shoulder
2. flex elbow



Triceps:
Same insertion
Different origins

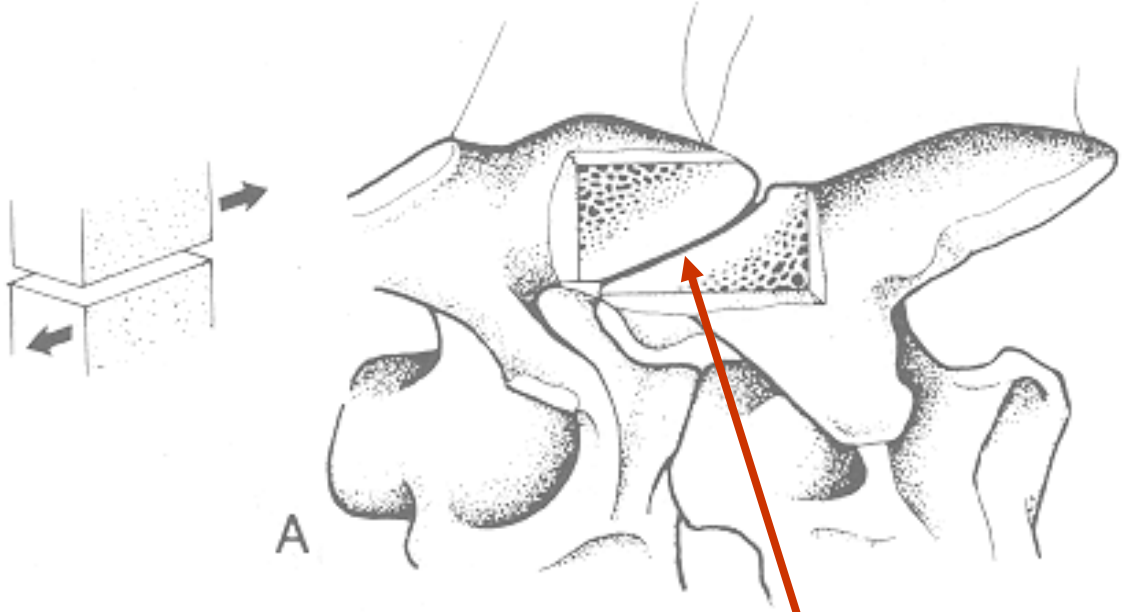
Long head triceps:

1. flex shoulder
2. extend elbow

Other triceps:
extend elbow only

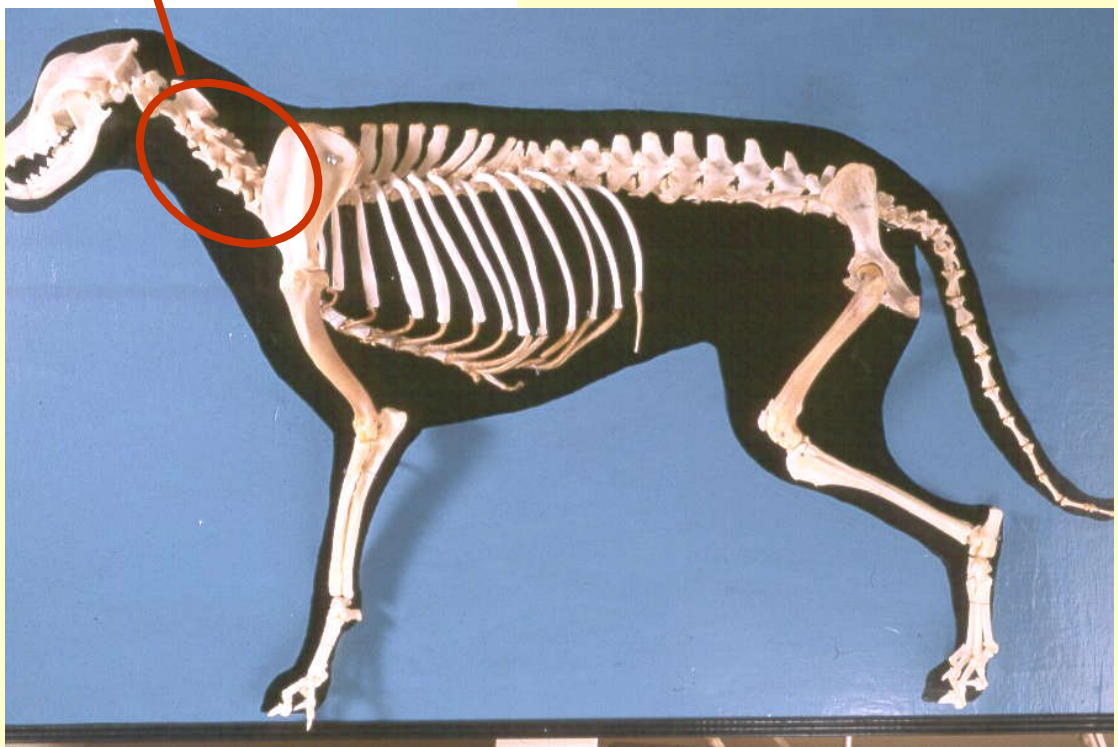
Classification of Synovial Joints

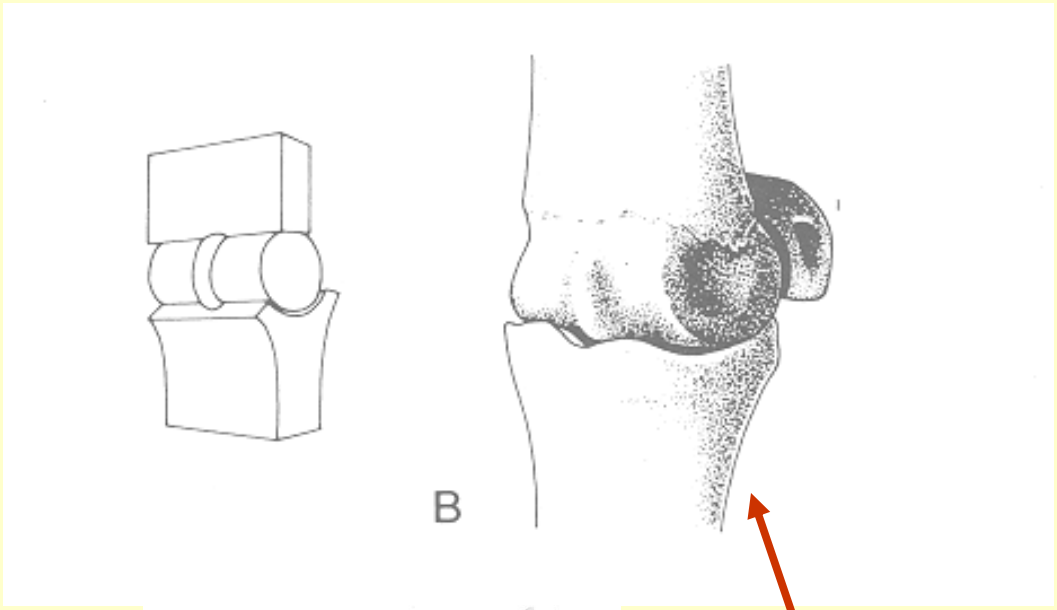
- Plane
- Hinge
- Pivot
- Condylar
- Ellipsoidal
- Saddle
- Spheroidal



Plane joint vertebral articulations

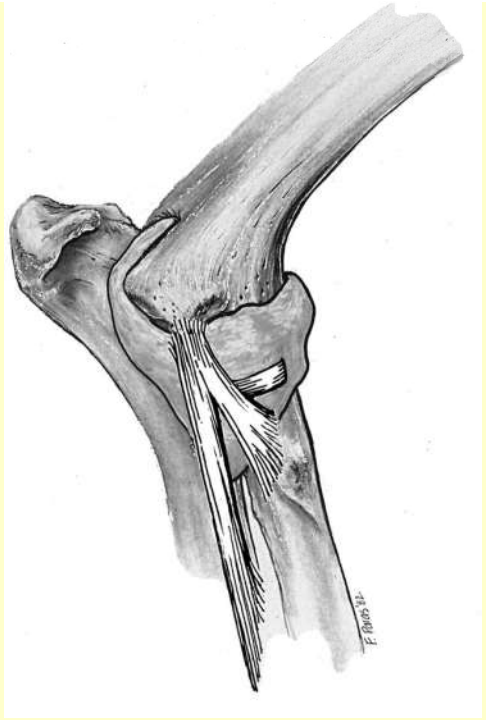
Plane joint
2 “flat” planes

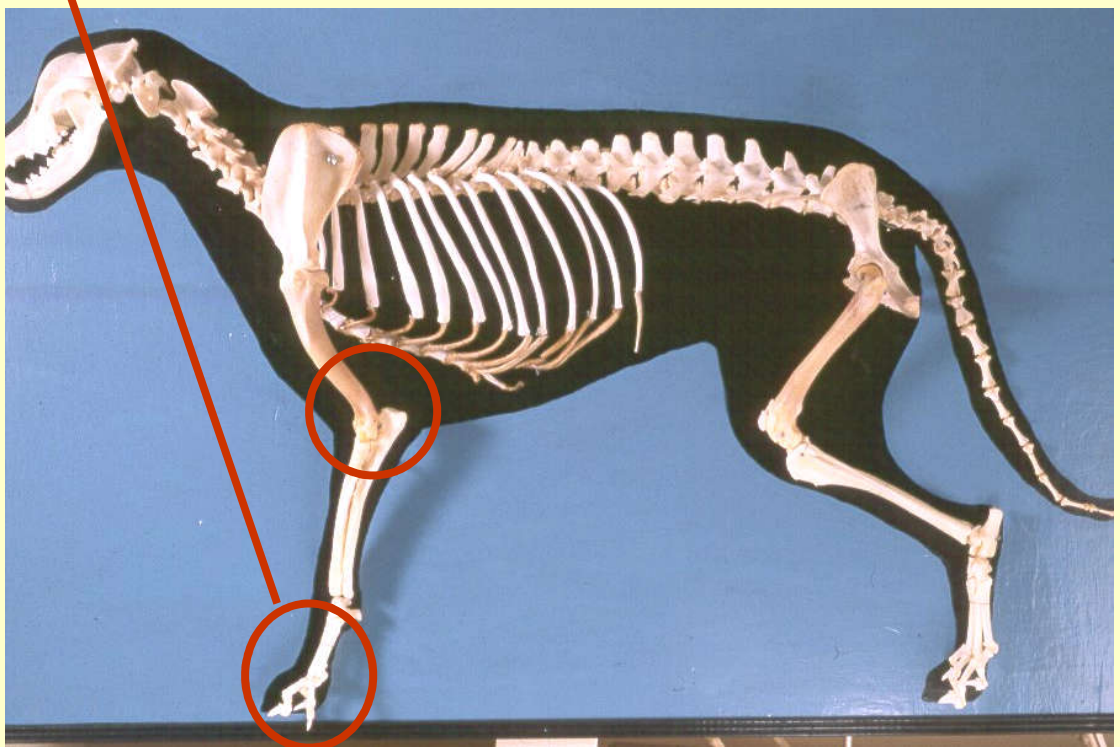




Hinge joint (ginglymus = hinge)

Movement in only 1 plane





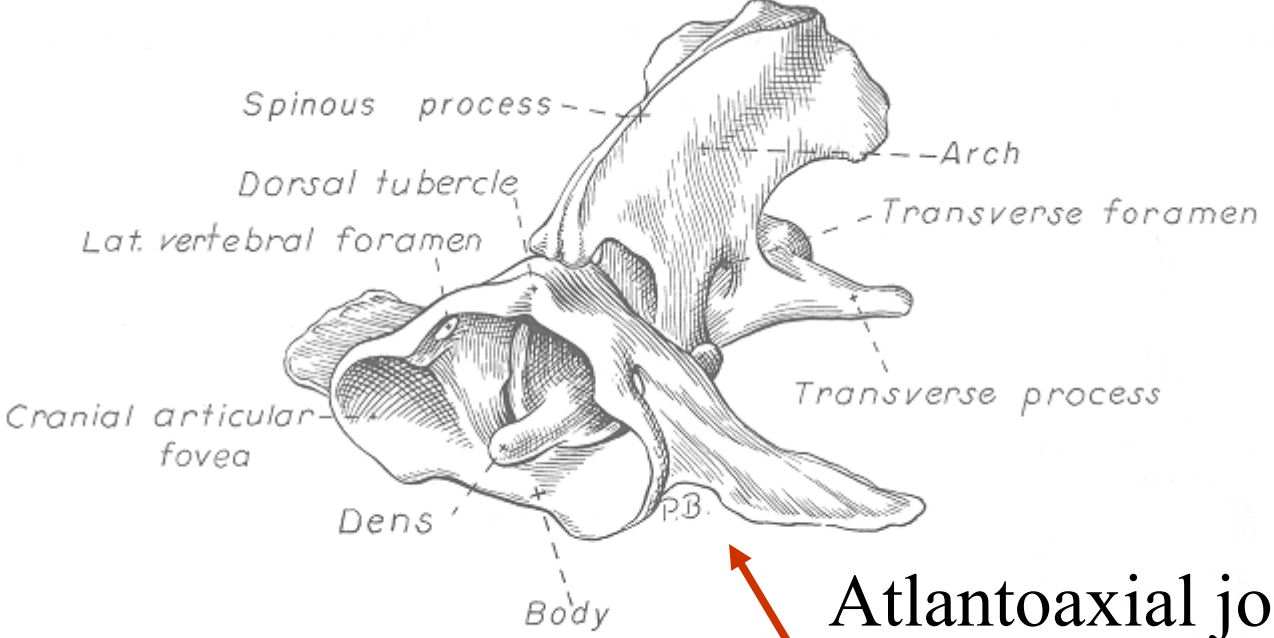
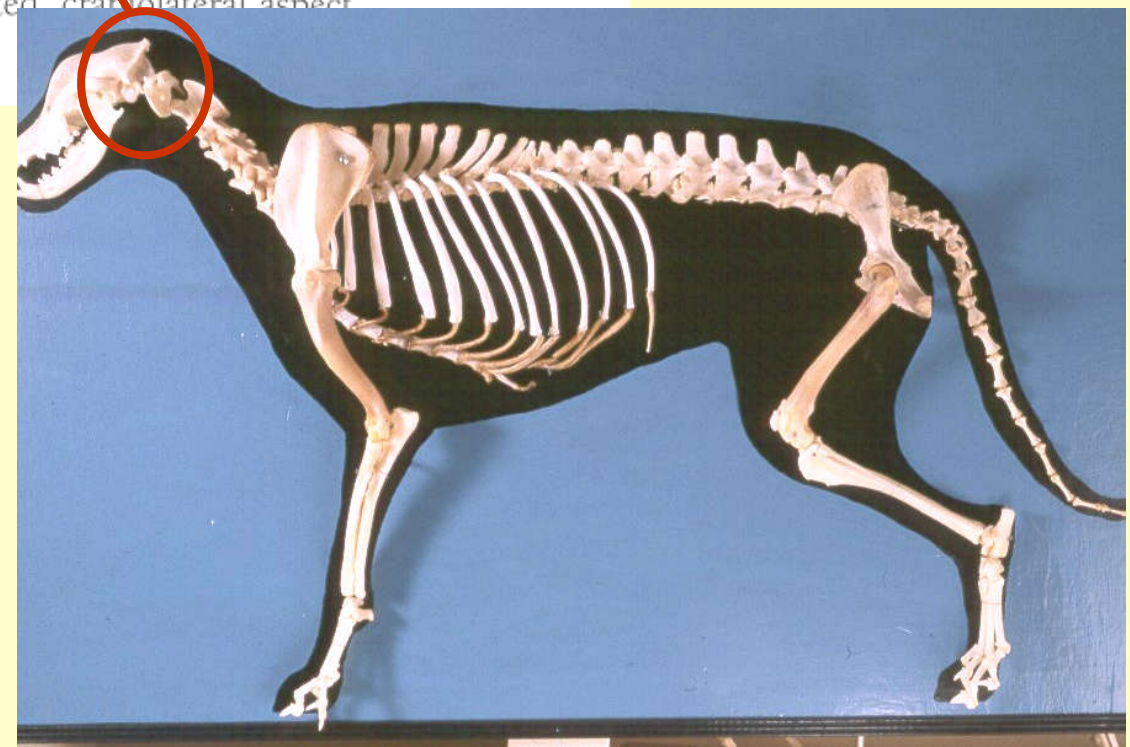
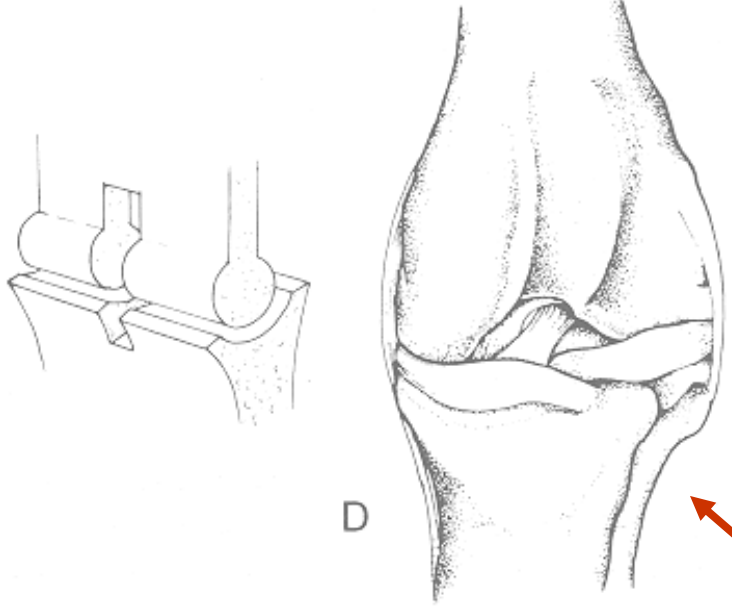


Fig. 68. Atlas and axis articulated, craniolateral aspect

Pivot joint
peg in ring

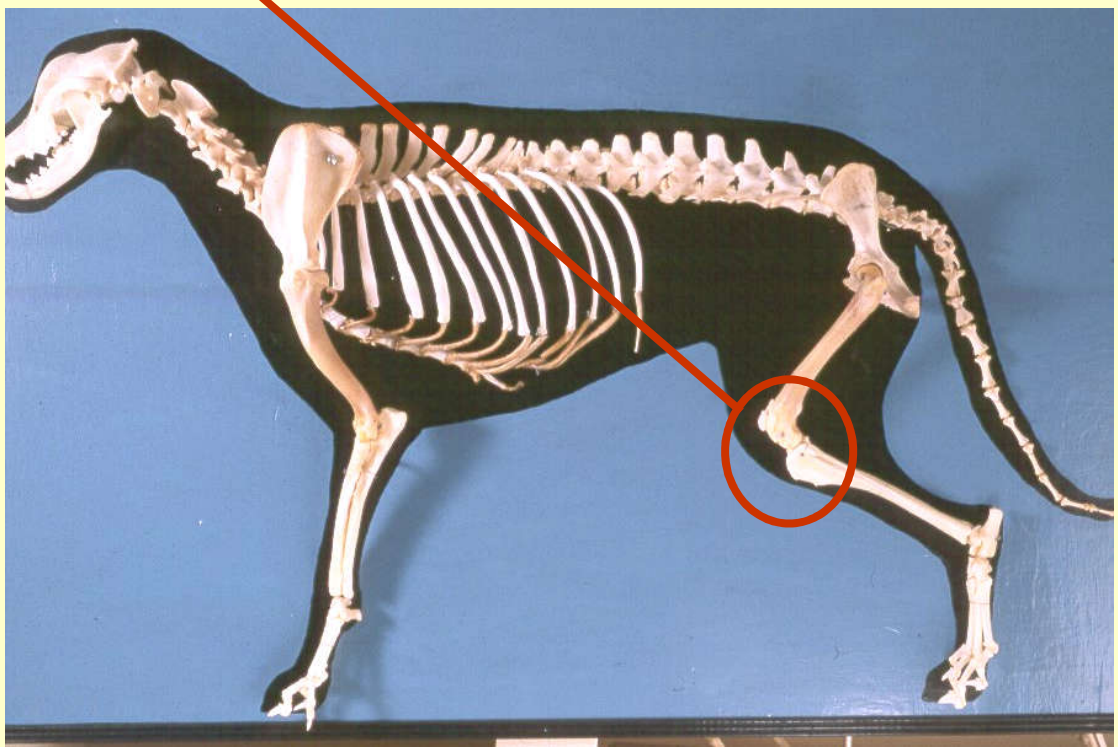
Atlantoaxial joint

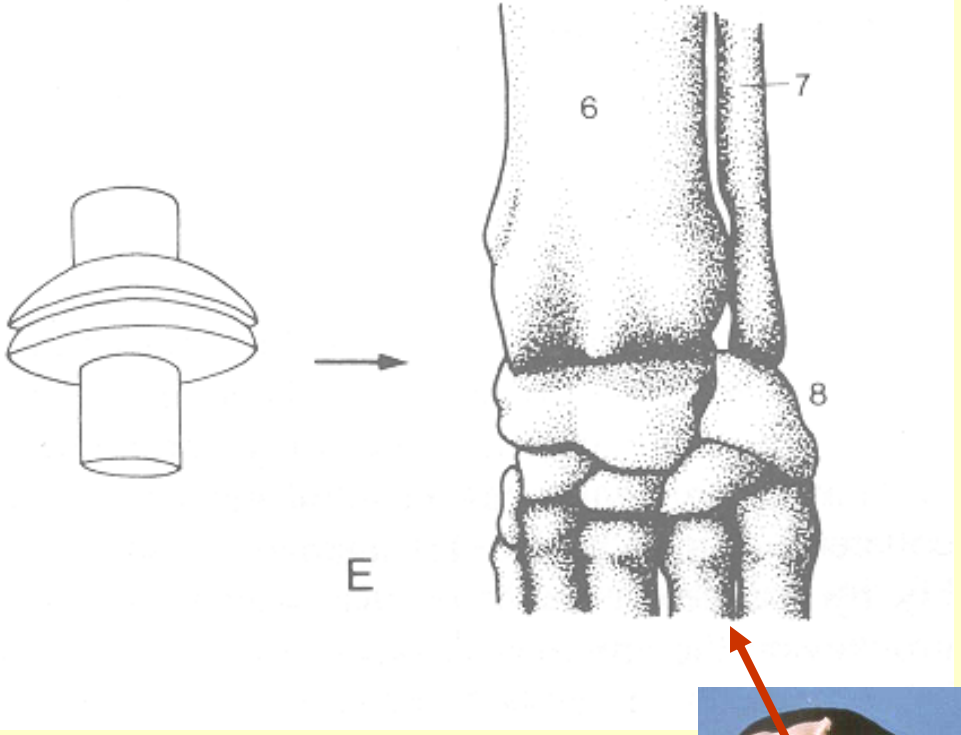




Condylar

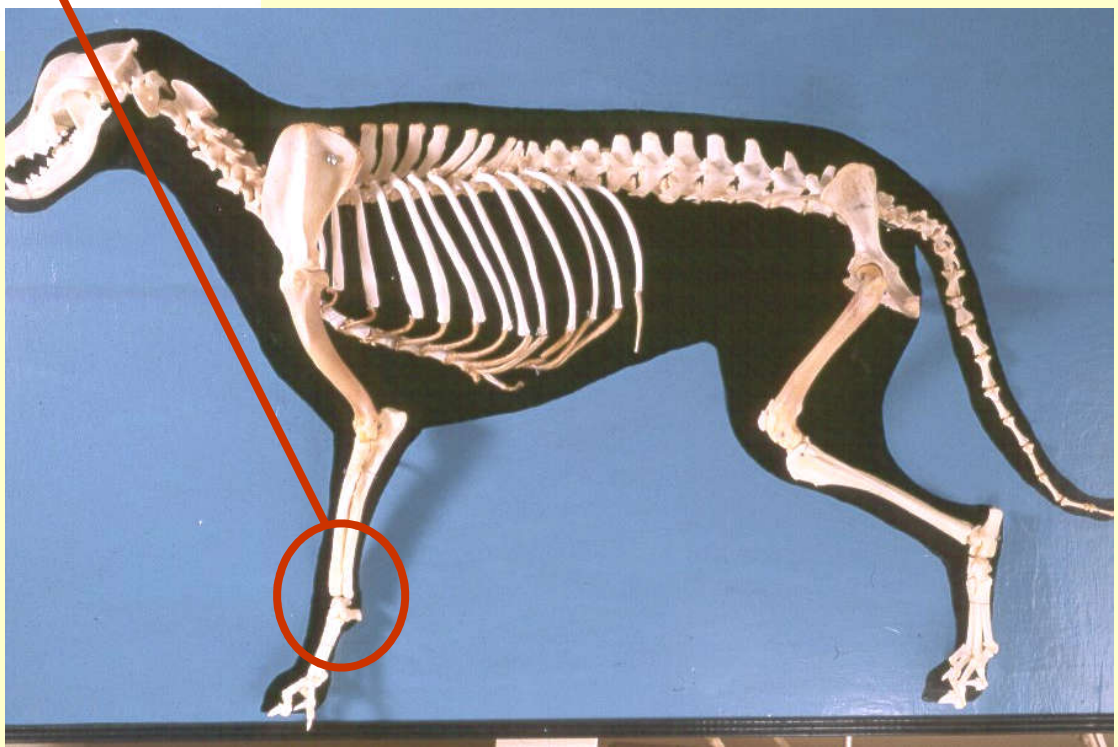
Stifle
"Knee"
Femorotibial

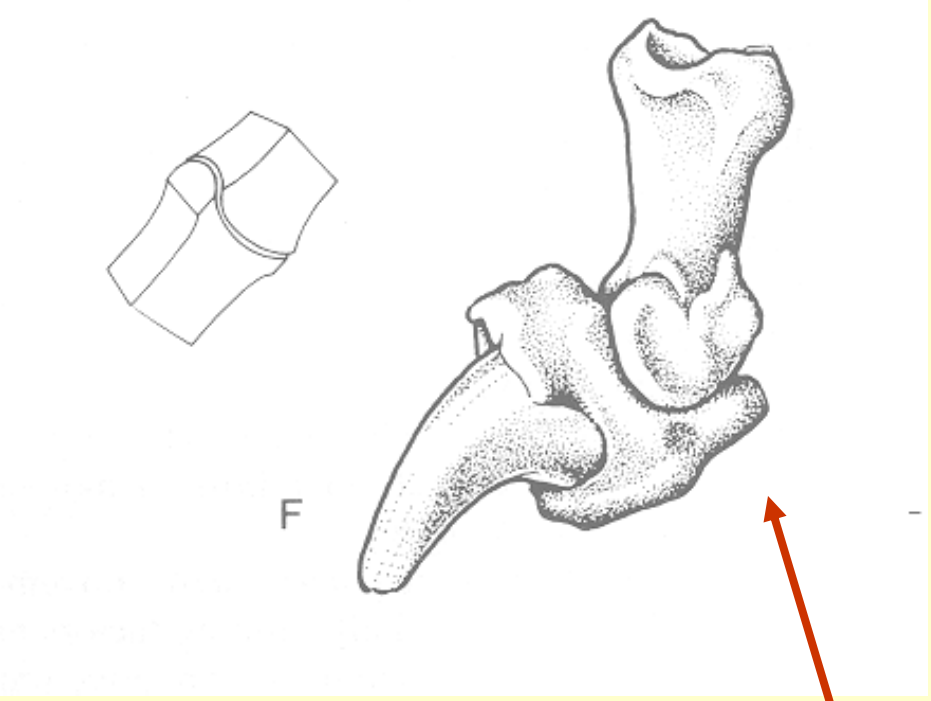




Ellipsoidal

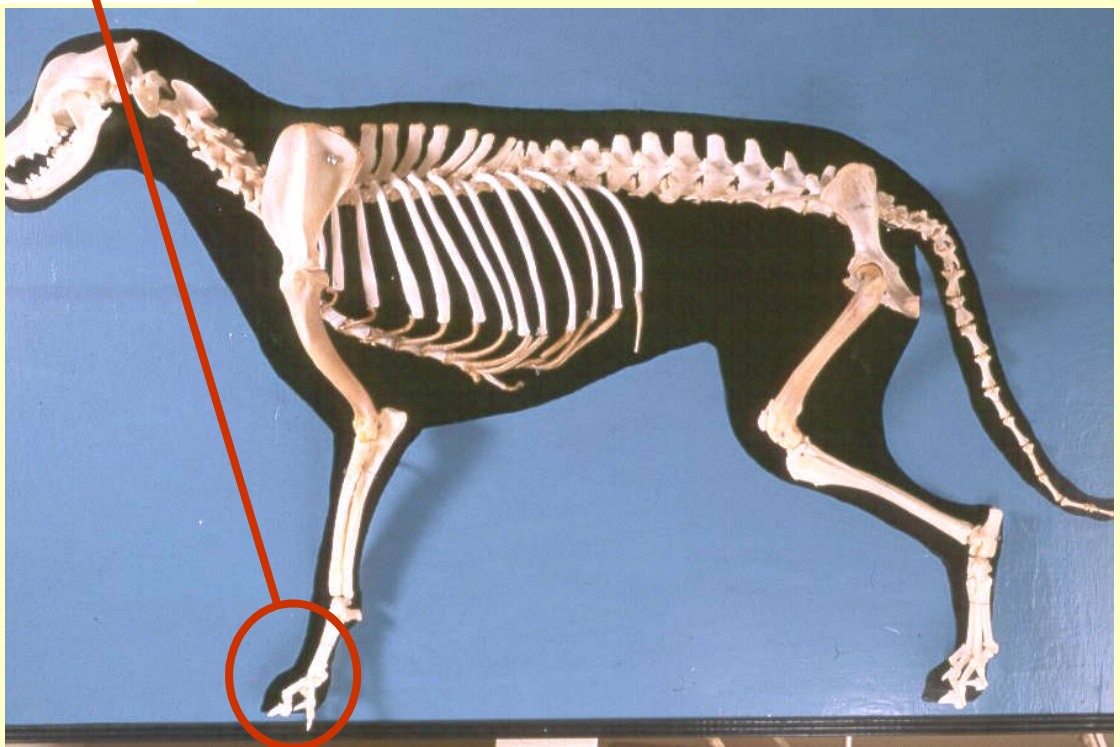
Oval surface
movement in 2 planes

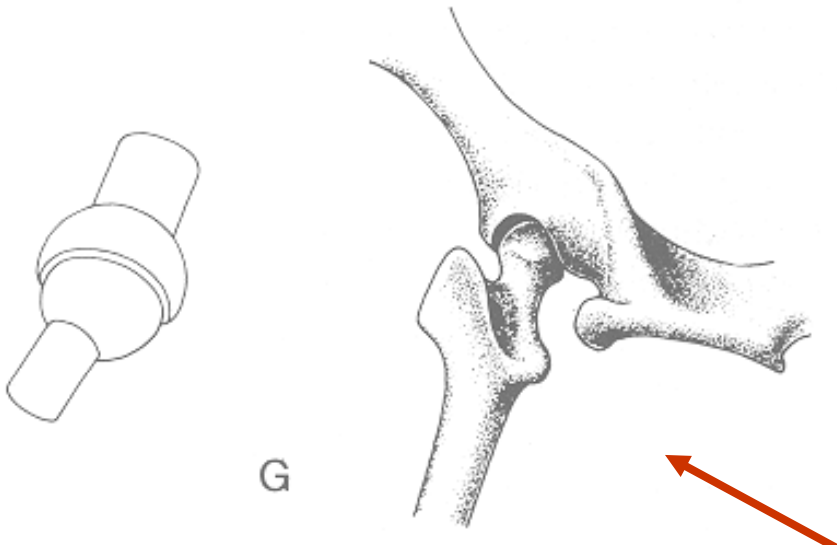




Saddle

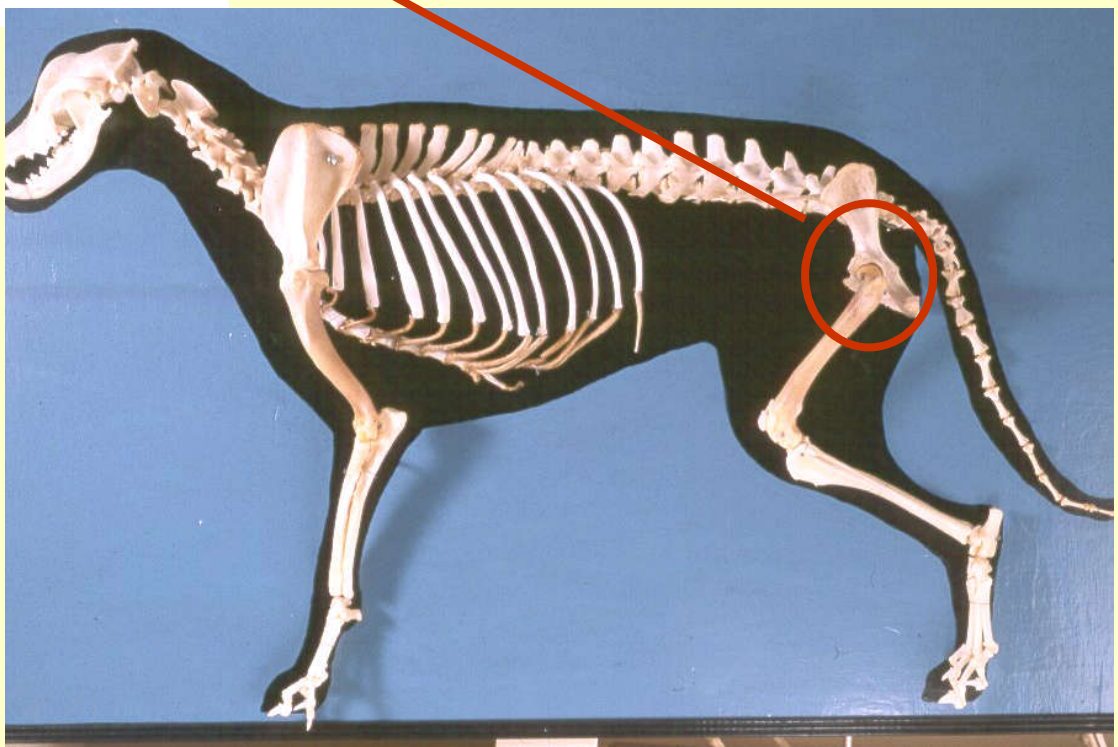
2 surfaces
biaxial movement

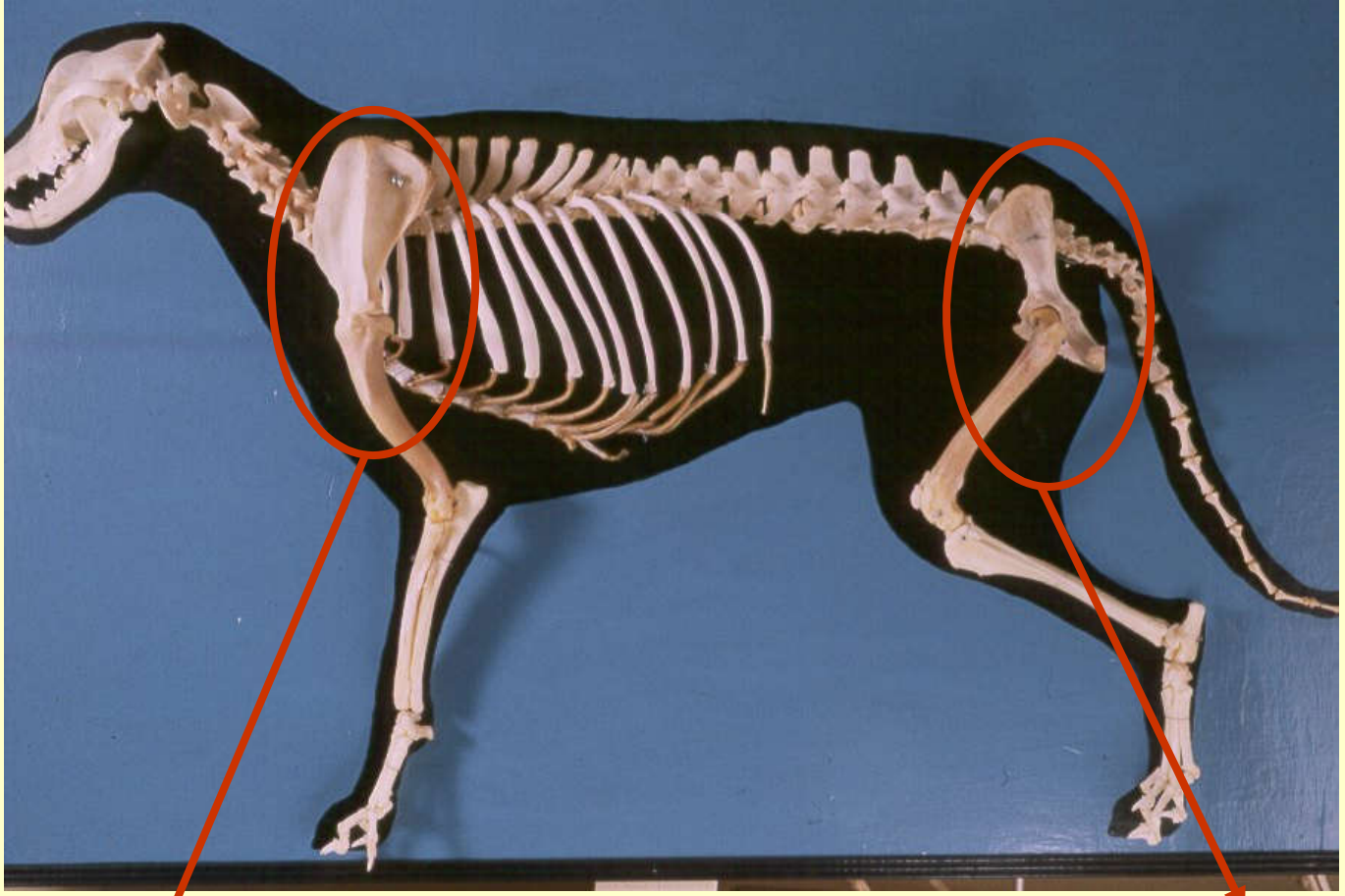




Spheroidal

ball and socket
greatest movement

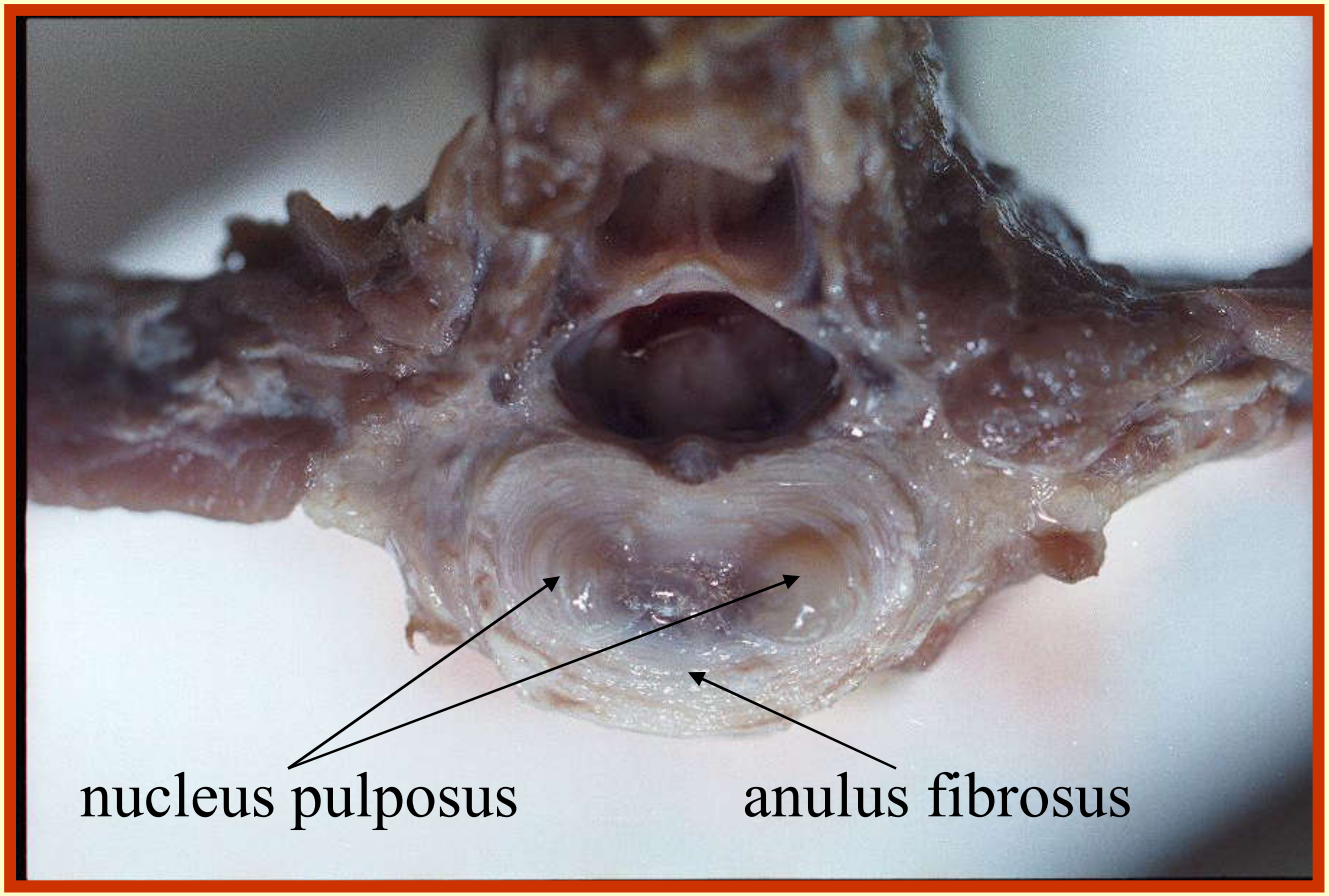




Shoulder
bounded by:
scapula and humerus
scapulohumeral joint

Hip
bounded by:
os coxae (pelvis)
and femur
coxofemoral joint

Intervertebral Disk



intervertebral articulations

The intervertebral articulations consist of cartilaginous and synovial joints. The cartilaginous joints are formed by the intervertebral discs joining the bodies of the vertebrae ,The synovial joints are formed by caudal and cranial articular processes of the adjacent vertebrae.