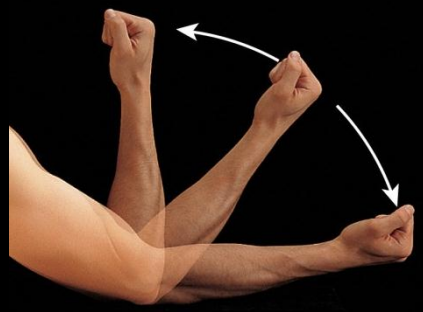
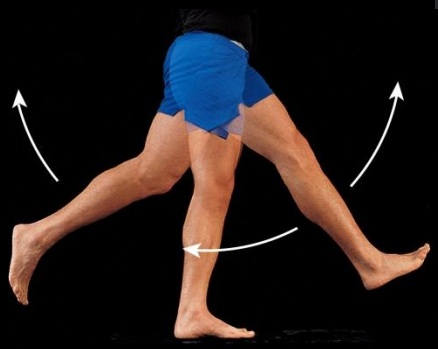
Lecture 5: Articulations





Functional Classification

1. Synarthroses

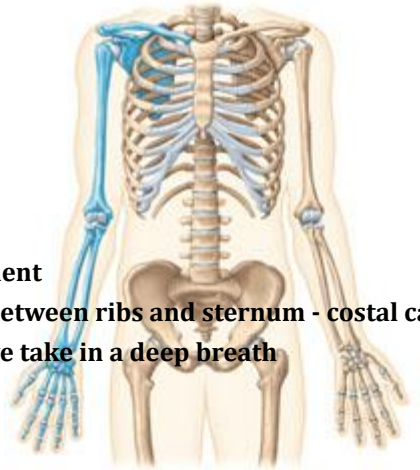
- skulls bones
- you dont want them too move

- *Immovable*

2. Amphiarthroses

- CAN be movement
- articulationg between ribs and sternum - costal cartilage
- bc ours when we take in a deep breath

- *Slightly moveable*



3. Diarthroses

- *Freely moveable*

knee, hip, shoulder joints

AXIAL ***APPENDICULAR***

Structural Classification

- **Fibrous Joints**
  - "tight", no joint cavity, no hyaline
  - little to no movement – *dense connective tissue*
  - Sutures, Sydesmoses, Gomphoses - interclavicular joint - fibrous joint holds two clavicles together
    - skull, interossesus membranes, teeth
- **Cartilaginous Joints** - by cartilage
  - still no joint cavity, might have hyaline
  - articulation bones are united with cartilage
  - not very moveable limited movement across these joints
  - Synchondroses, Symphyses
    - with hyaline, without hyaline

CONNECTS PROVIDES SURFACE

- **Synovial Joints** - more movement allowed with joint cavity
  - Have it all…joint cavity, hyaline, movement
  - Most joints in the body are synovial joints.
  - Let's look at the general structure of these joints

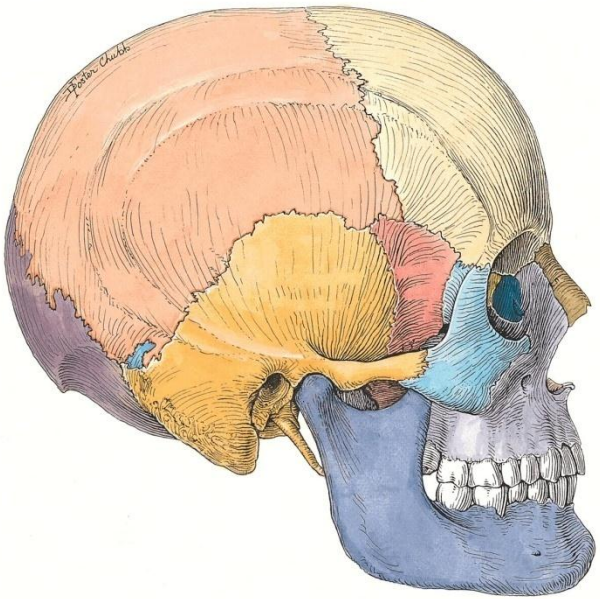
Fibrous Joints

Interosseus membrane

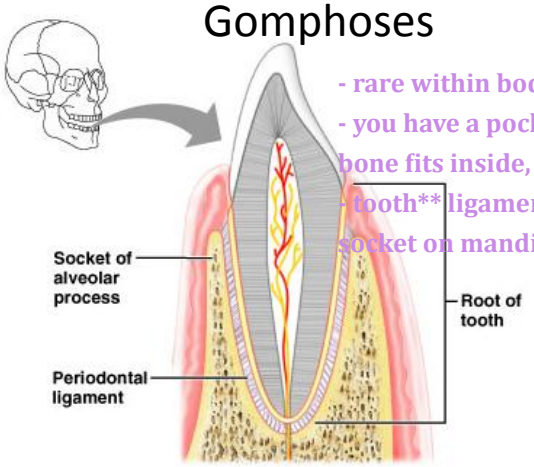
Syndesmoses

Ligaments

Sutures



Gomphoses

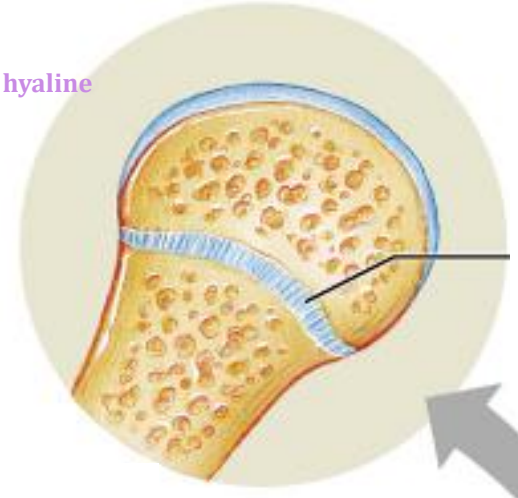


- rare within body
- you have a pocket bone, where another bone fits inside, attached via a ligament
- tooth** ligament attaches tooth to the socket on mandible

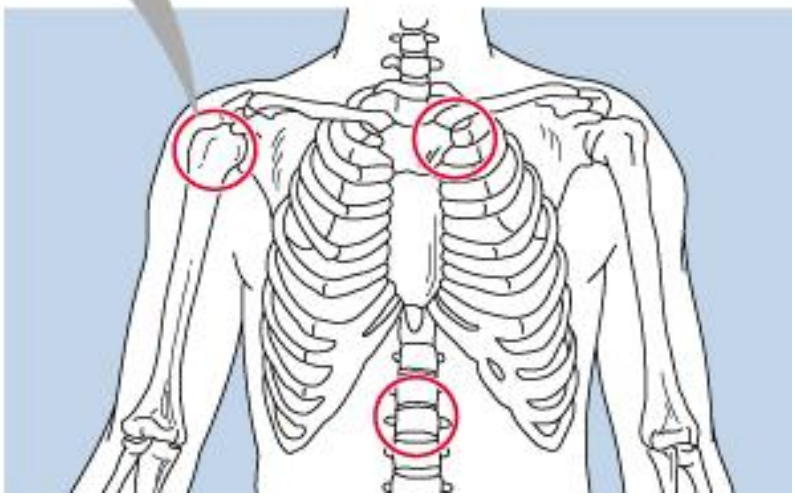
Cartilaginous Joints

Synchondroses

two bones and hyaline cartilage
- humerus



Epiphyseal Line

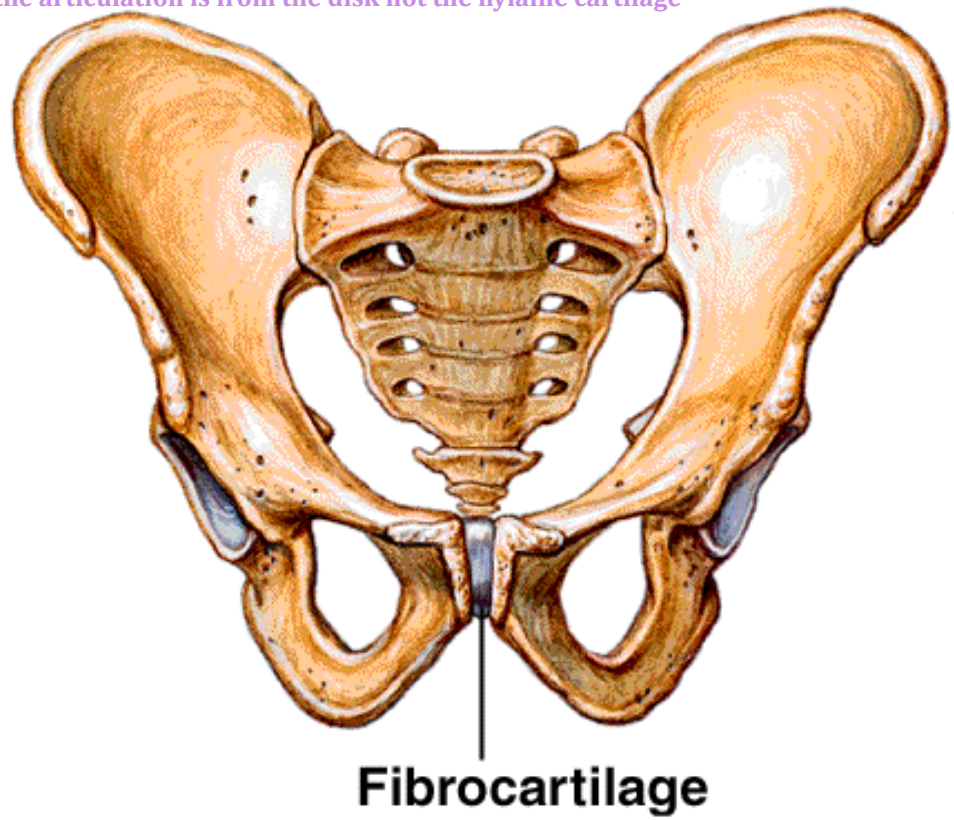


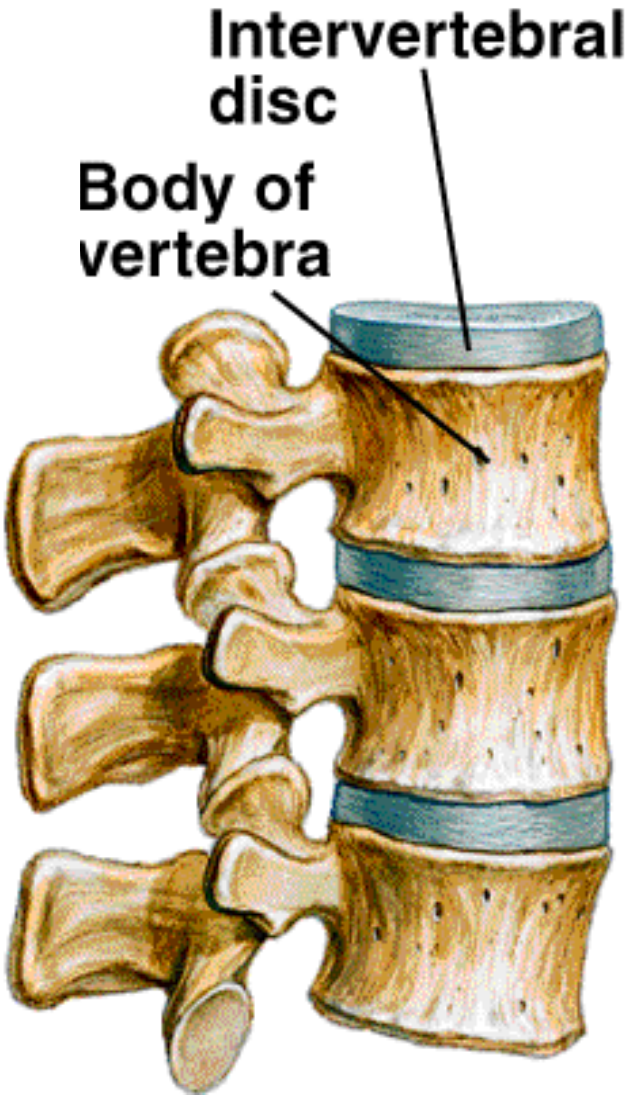
Cartilaginous Joints Cont'd

Symphyses

DISK in between the two boney articulations

- synchondroses --> the hyaline caritlage is the material that makes up the articulation (joints the bones) whereas in symphases, there is a disk in the center, but on the surfaces the disk sits on there is hyaline cartilage (for movement so there is no friction)
- the articulation is from the disk not the hylaine cartilage





Synovial Joints

- Articular Cartilage (what kind?)
  -discs or menisci may be present.

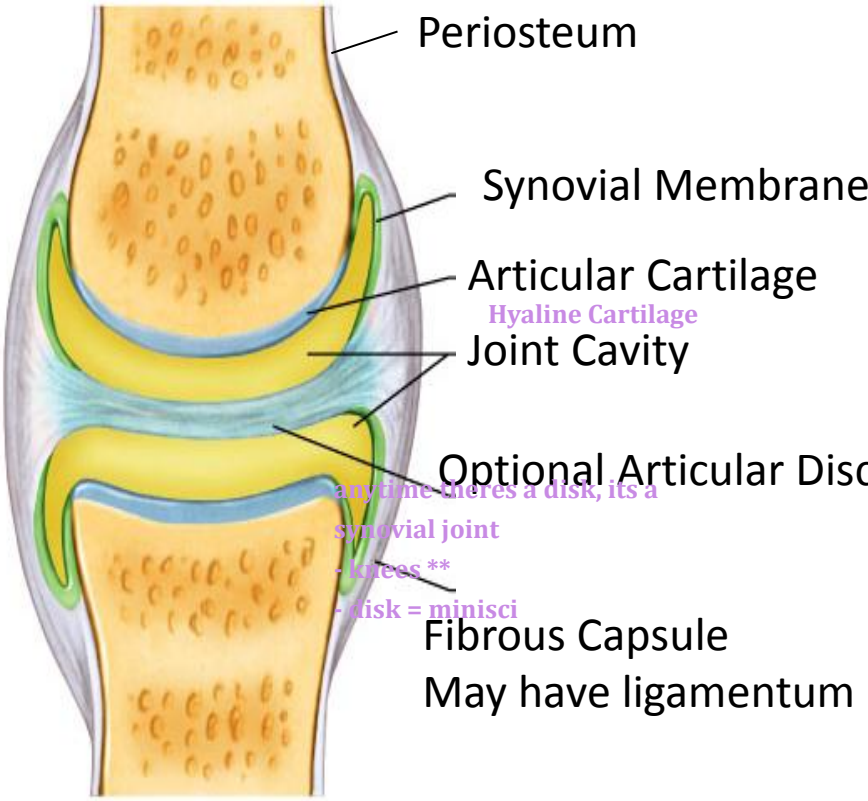
- Joint Cavity (aka Synovial Cavity)
  -unique potential space holding fluid

- Articular Capsule
  -outer fibrous capsule (irregular dense) and inner synovial membrane
  - inside space in capsule there is

- Synovial Fluid
  - egg white type fluid
  - nourishes/lubes articular surfaces

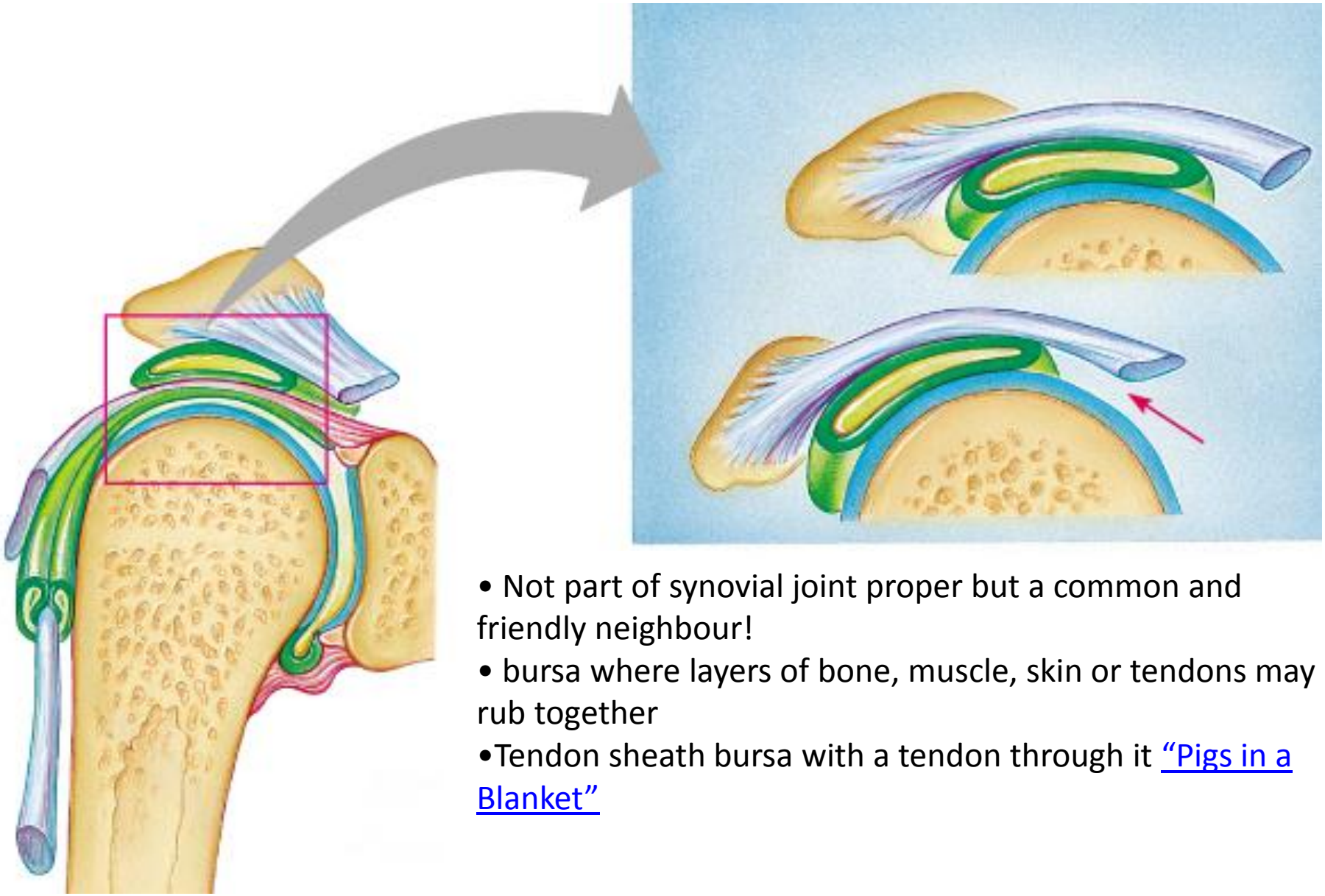
- Reinforcing Ligamentum
  - intra or extracapsular

- Nerves and Vessels
  -feedback about stretch allow proprioception
  -vessels in synovial membrane allow fluid production – *weeping lubrication*



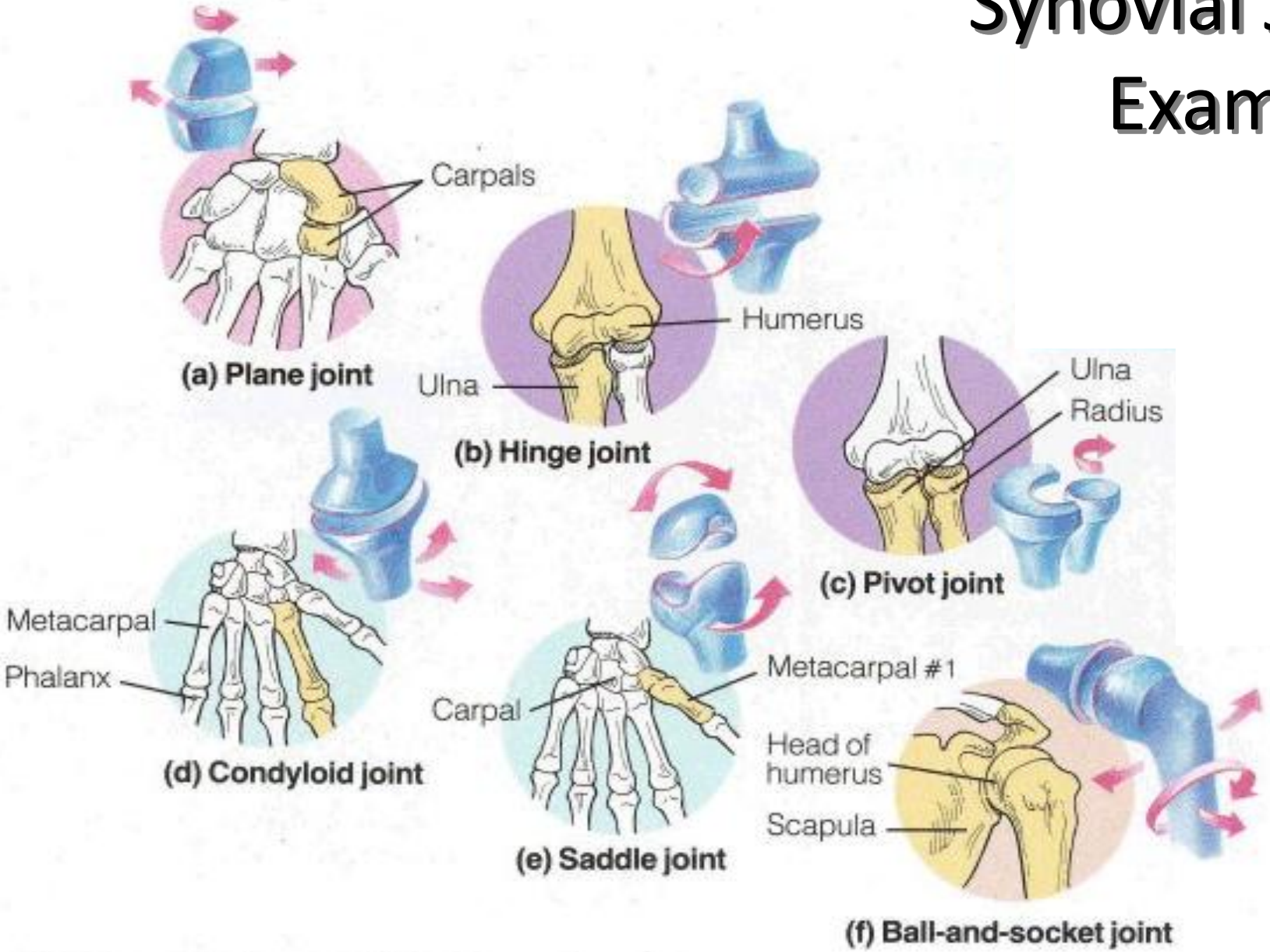
Synovial Fluid is a filtrate of blood

Bursae and Tendon Sheaths

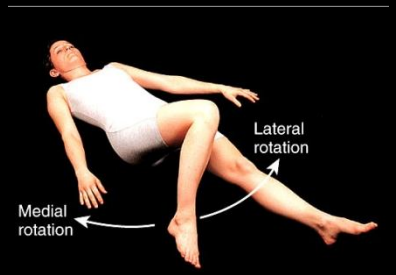


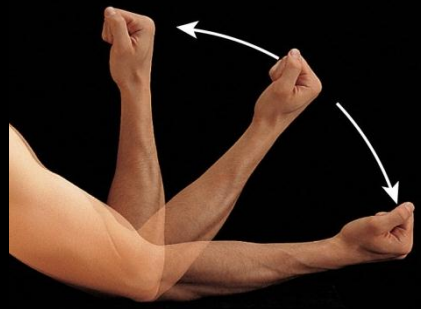
- Not part of synovial joint proper but a common and friendly neighbour!
- bursa where layers of bone, muscle, skin or tendons may rub together
- Tendon sheath bursa with a tendon through it "Pigs in a Blanket"

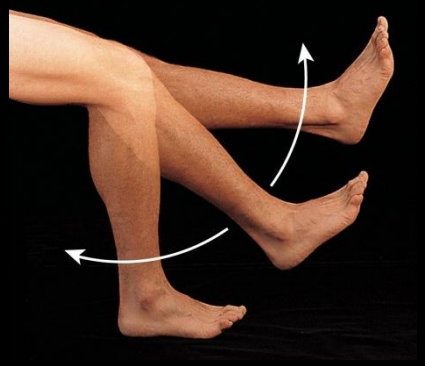
Synovial Joint Examples



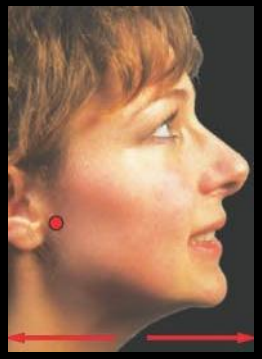
Review: Types of Movements







Special Movements
Ex. Protraction/Retraction



Major Synovial Joints

Describe the structural and functional components of the major joints:

- Temporomandibular (TMJ)
- Glenohumeral
- Elbow and Radial/ulnar
- Hip, Knee, Ankle

TMJ

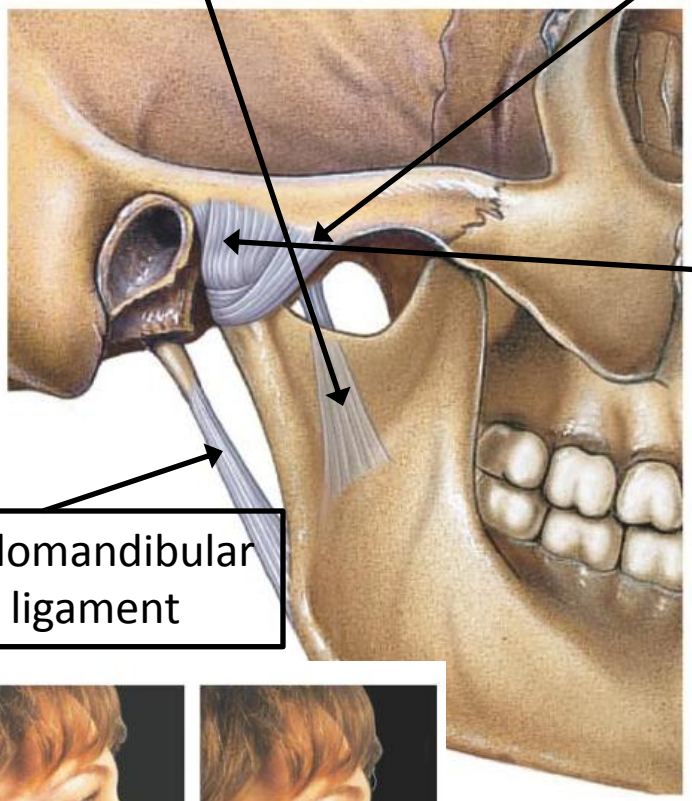
Sphenomandibular ligament

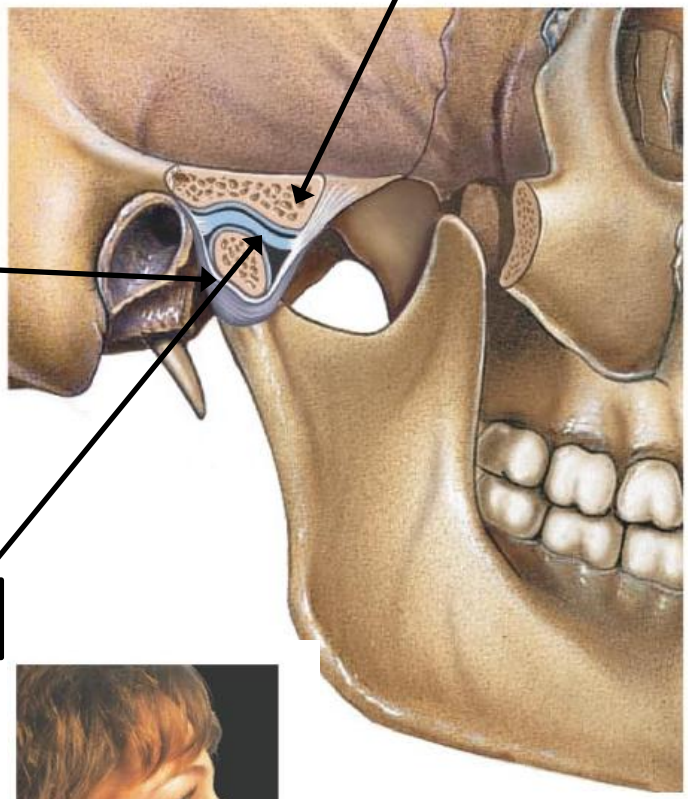
Lateral temporomandibular ligament

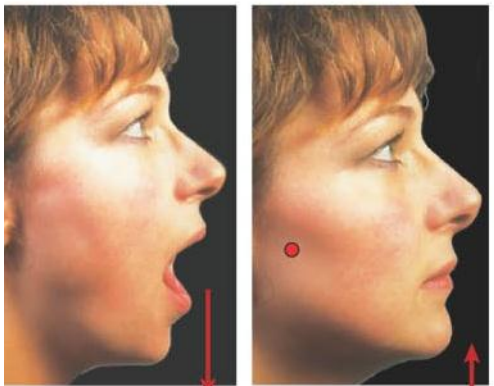
Articular Capsule

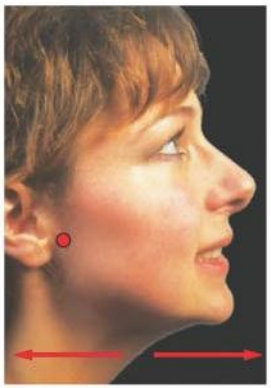
Stylomandibular ligament

Articular DISC

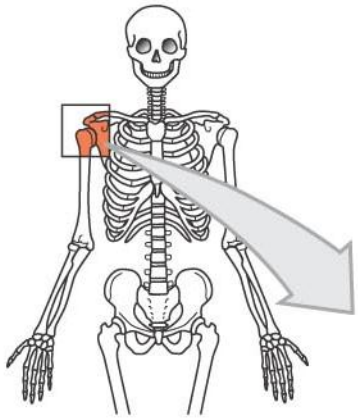


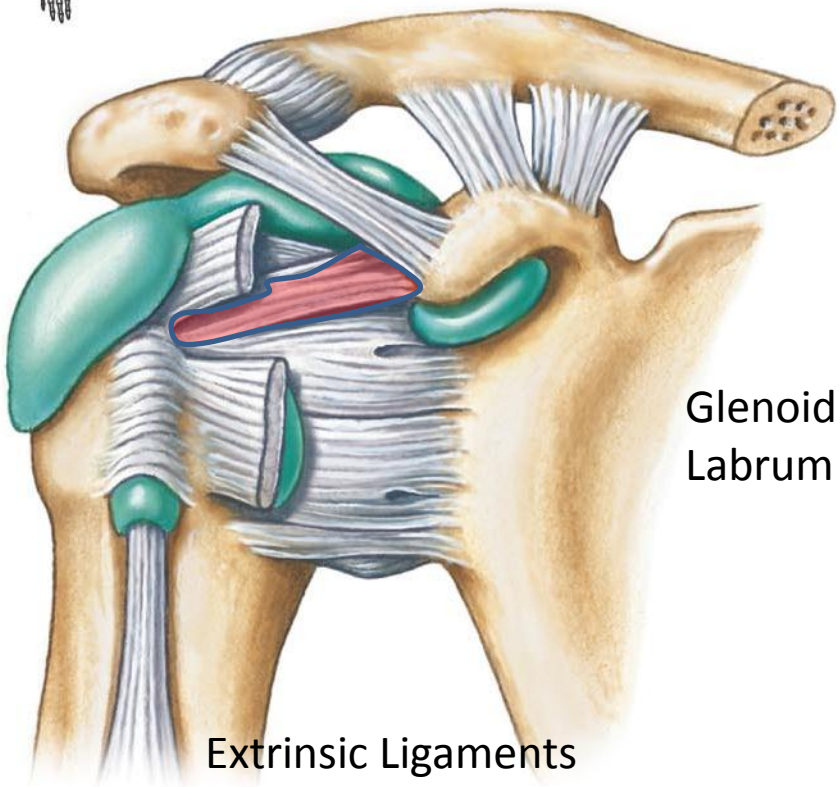




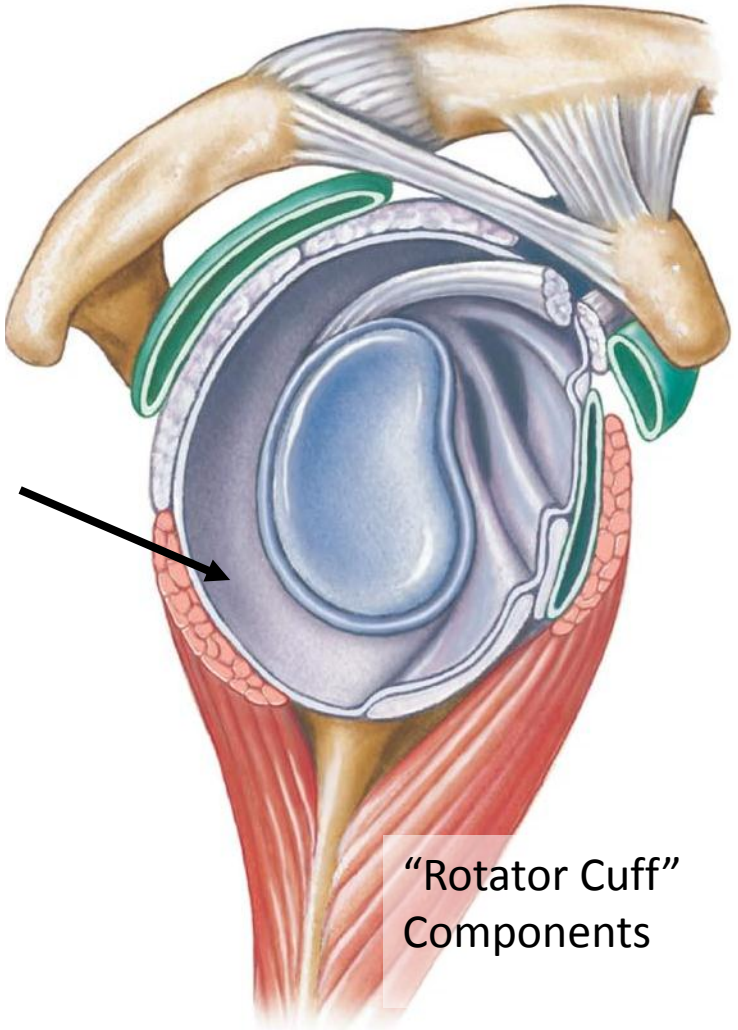


Glenohumeral Joint





Glenoid Labrum



Extrinsic Ligaments and muscle tendons contribute to stability

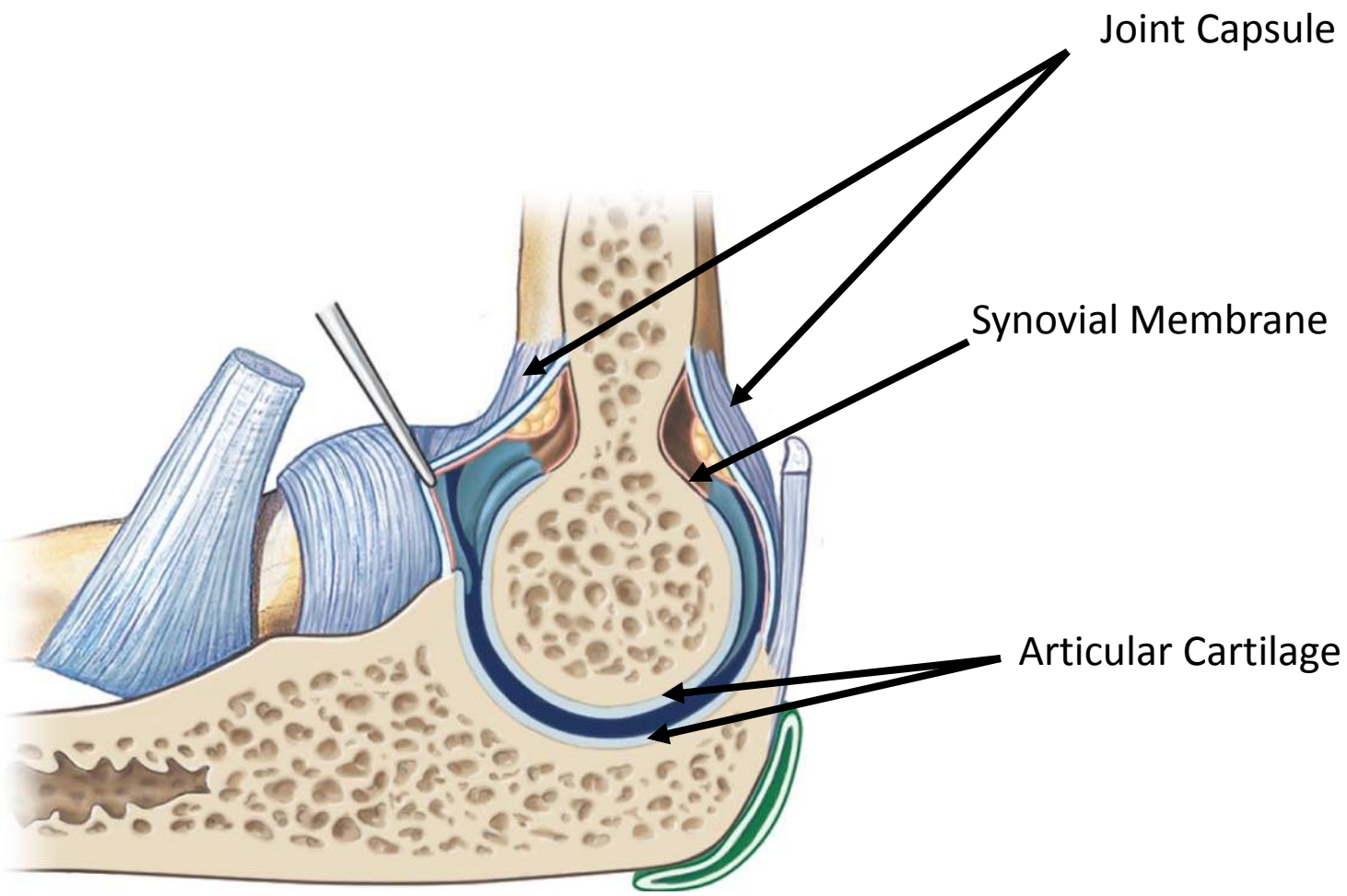
Only one dedicated ligament

"Rotator Cuff" Components

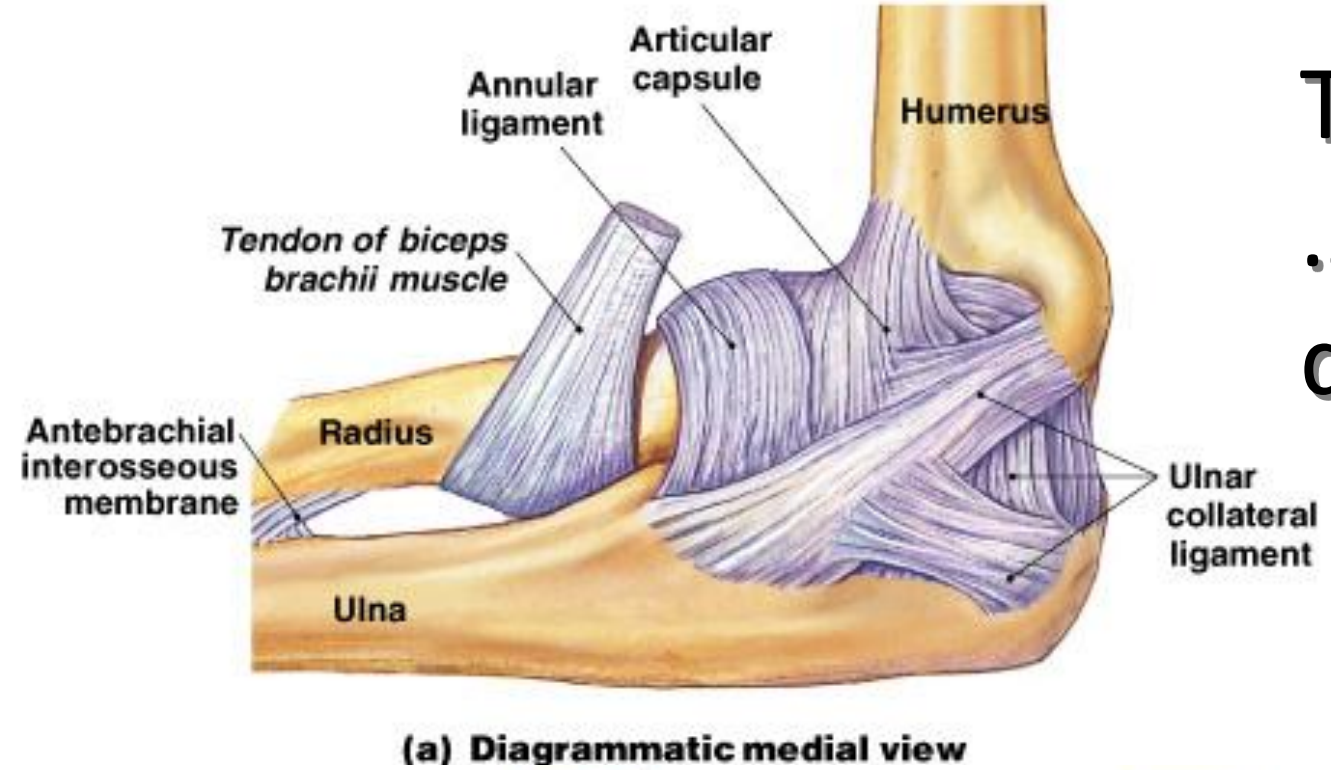
Glenoid Facts

- the most mobile joint in the body
  - sacrifices stability
    - often injured
- stabilized superiorly by bones and associated ligaments
- coracohumeral, coracoclavicular, acromioclavicular, coracoacromial
- major stability comes from muscles (tendons) of rotator cuff

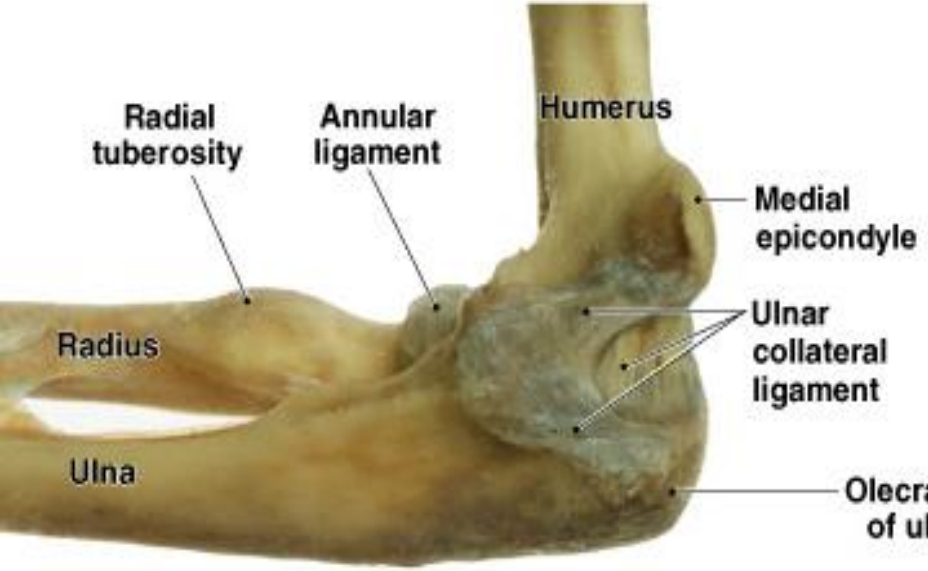
The Elbow



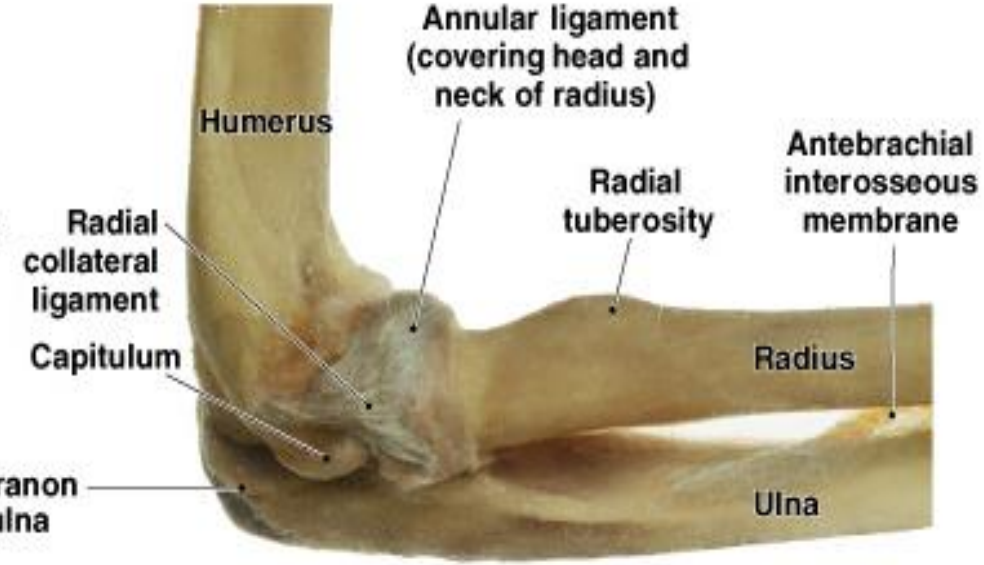
The Elbow ….a little deeper



(a) Diagrammatic medial view

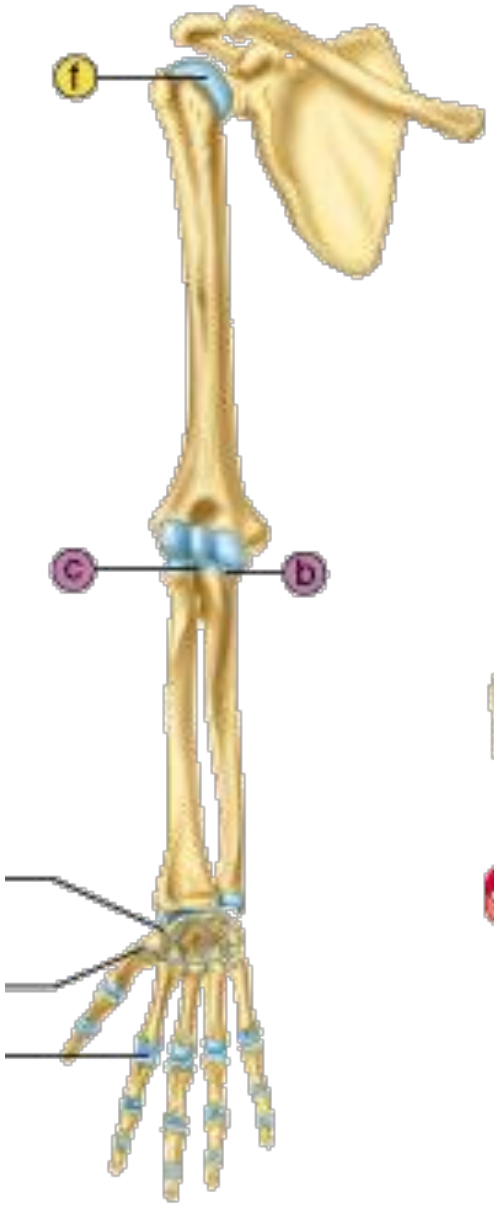


(b) Medial view

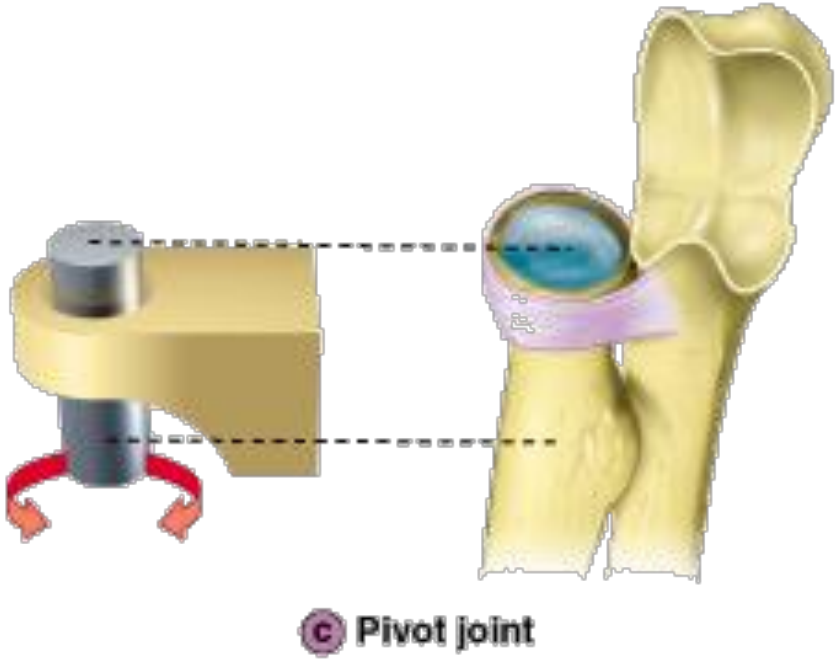


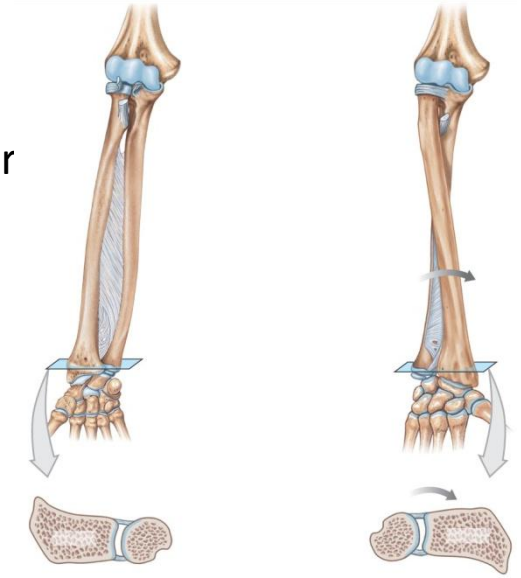
(c) Lateral view

Hinge and Pivot Joint



Hinge joint is easy to see about trochlear notch but what is the pivot joint on the the radial head about?

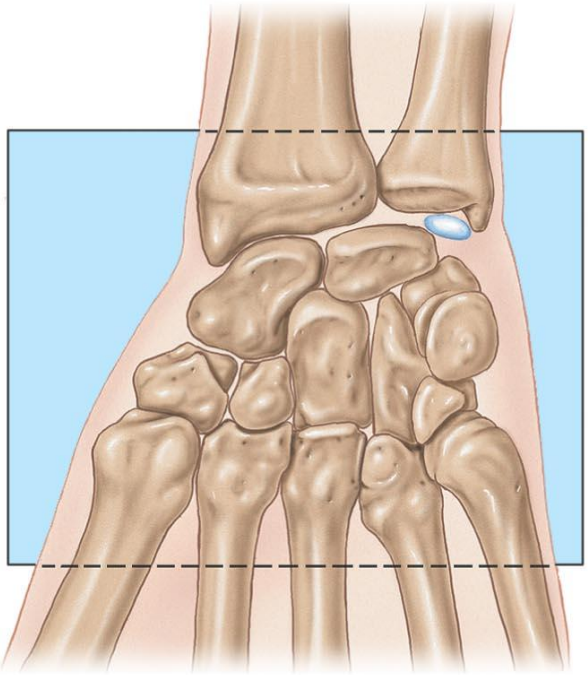


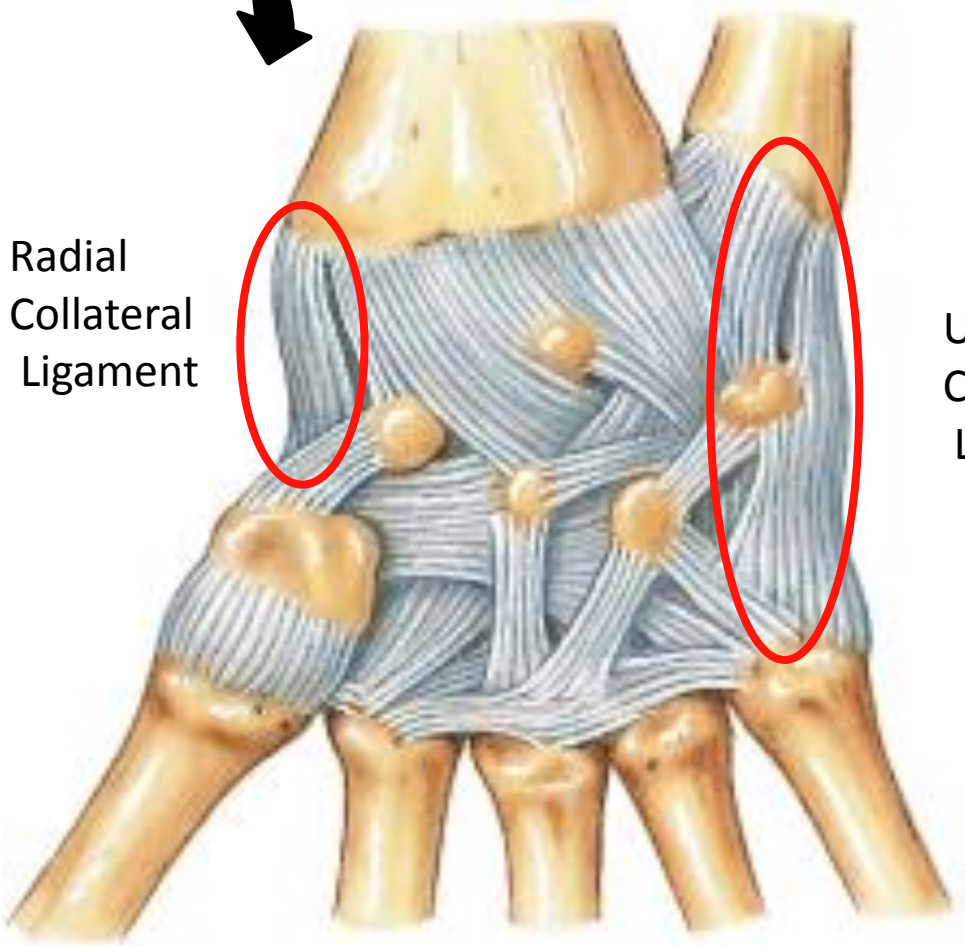


S P

What articulates here?

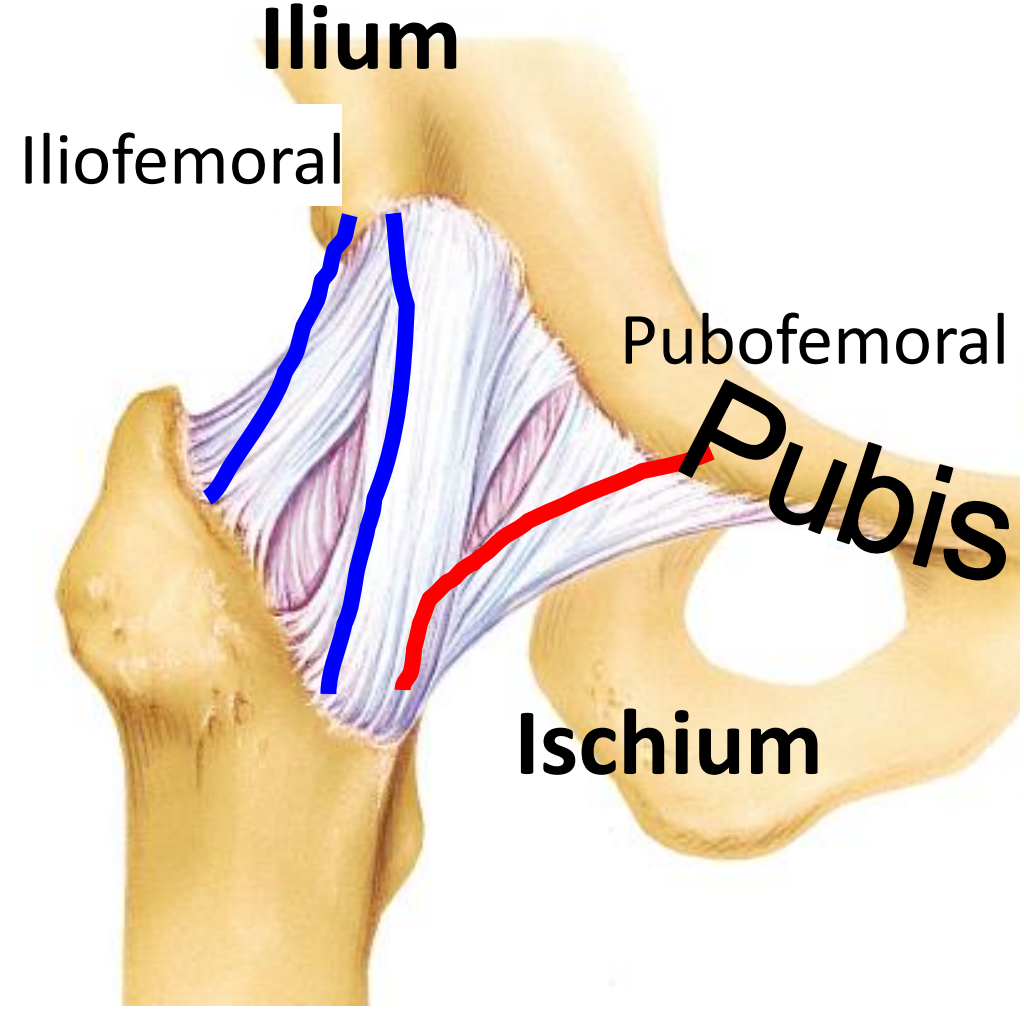
The Wrist

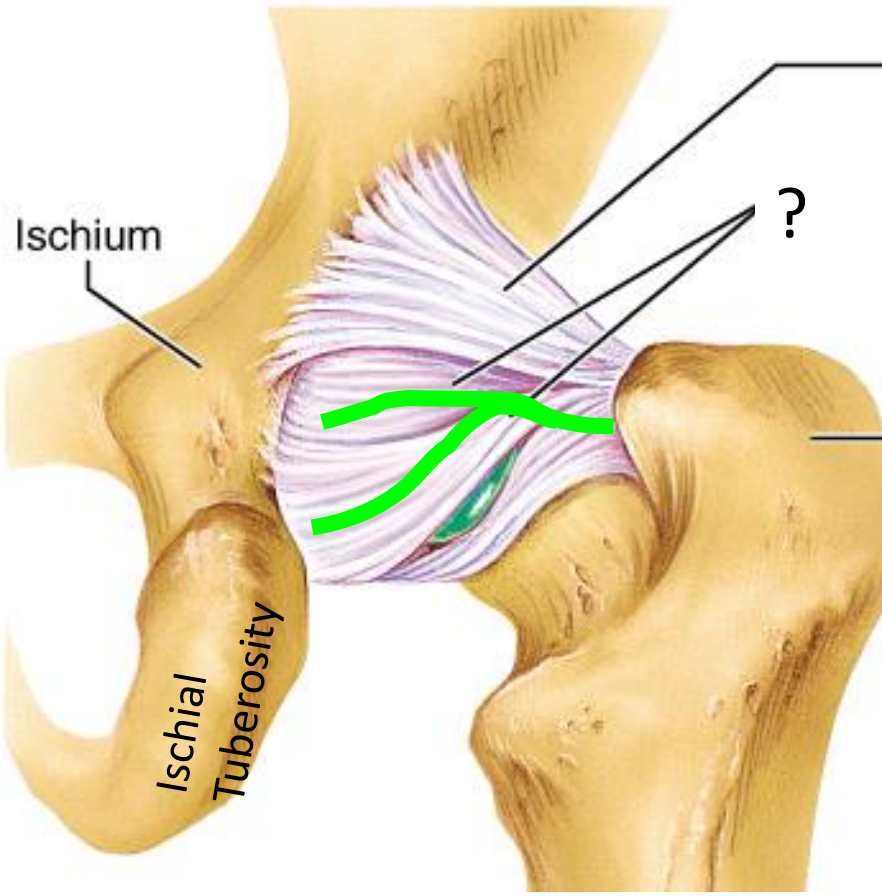




Hip

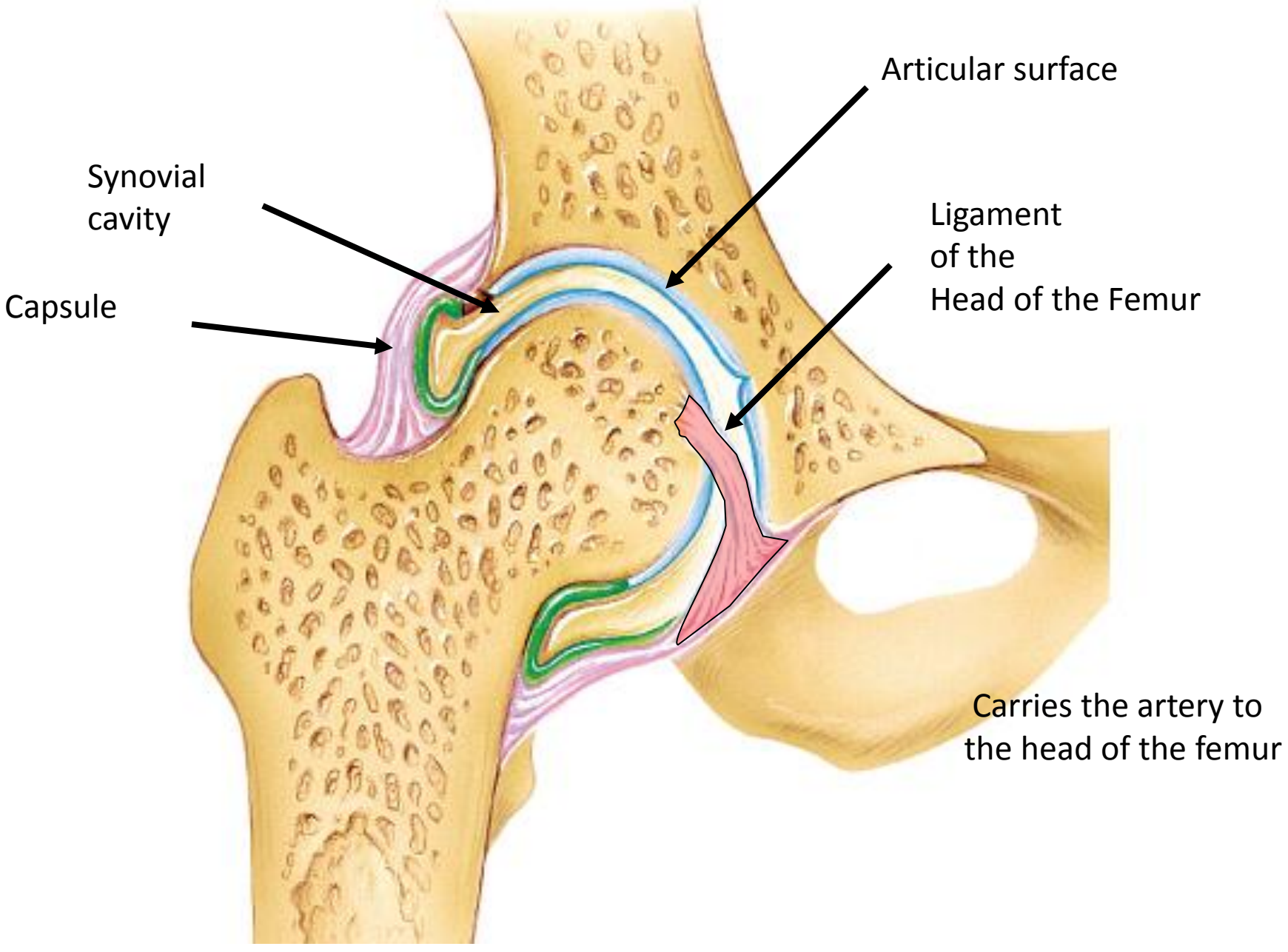
Anterior View





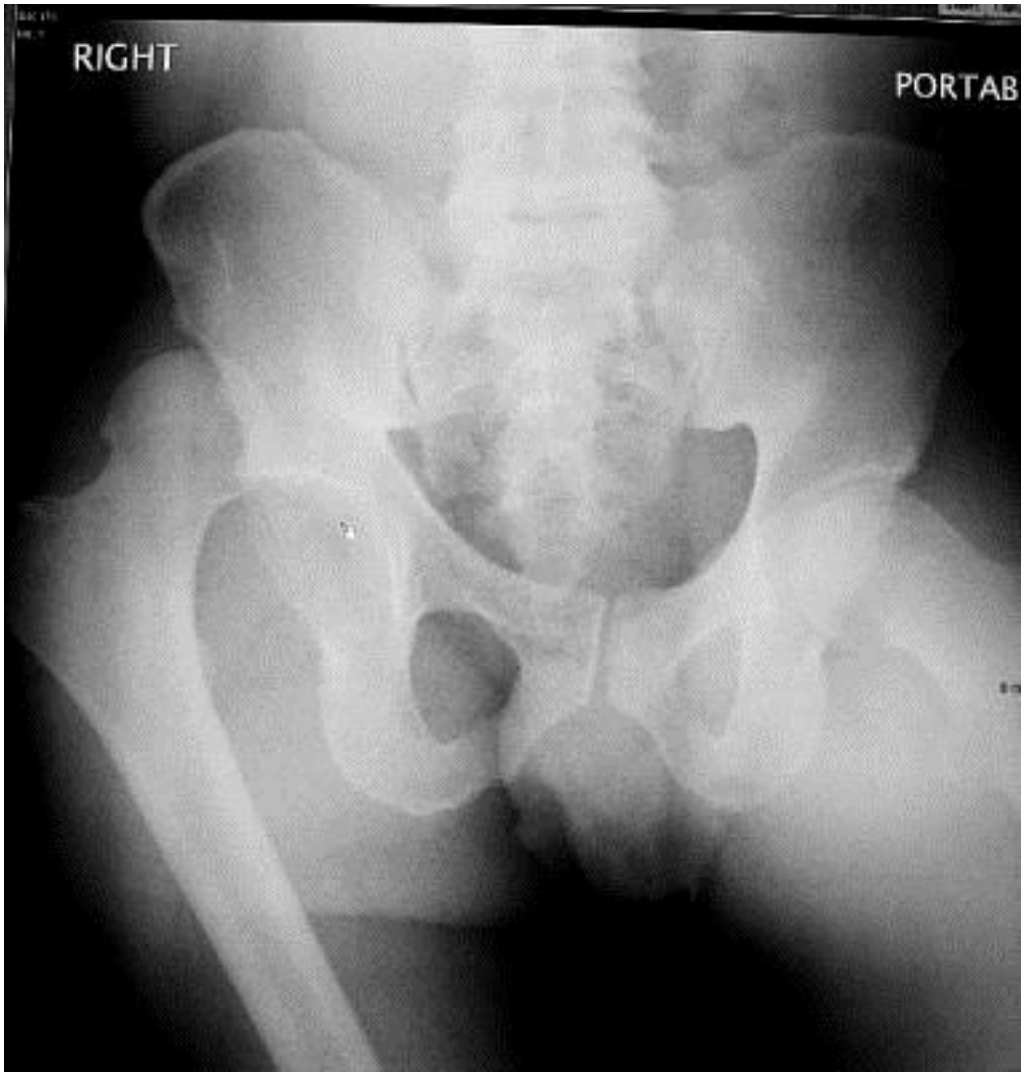
Posterior View

It’s synovial



Hip Dislocations

- 90% are posterior
- flexed knee and force transmitted along long axis
- blood supply?

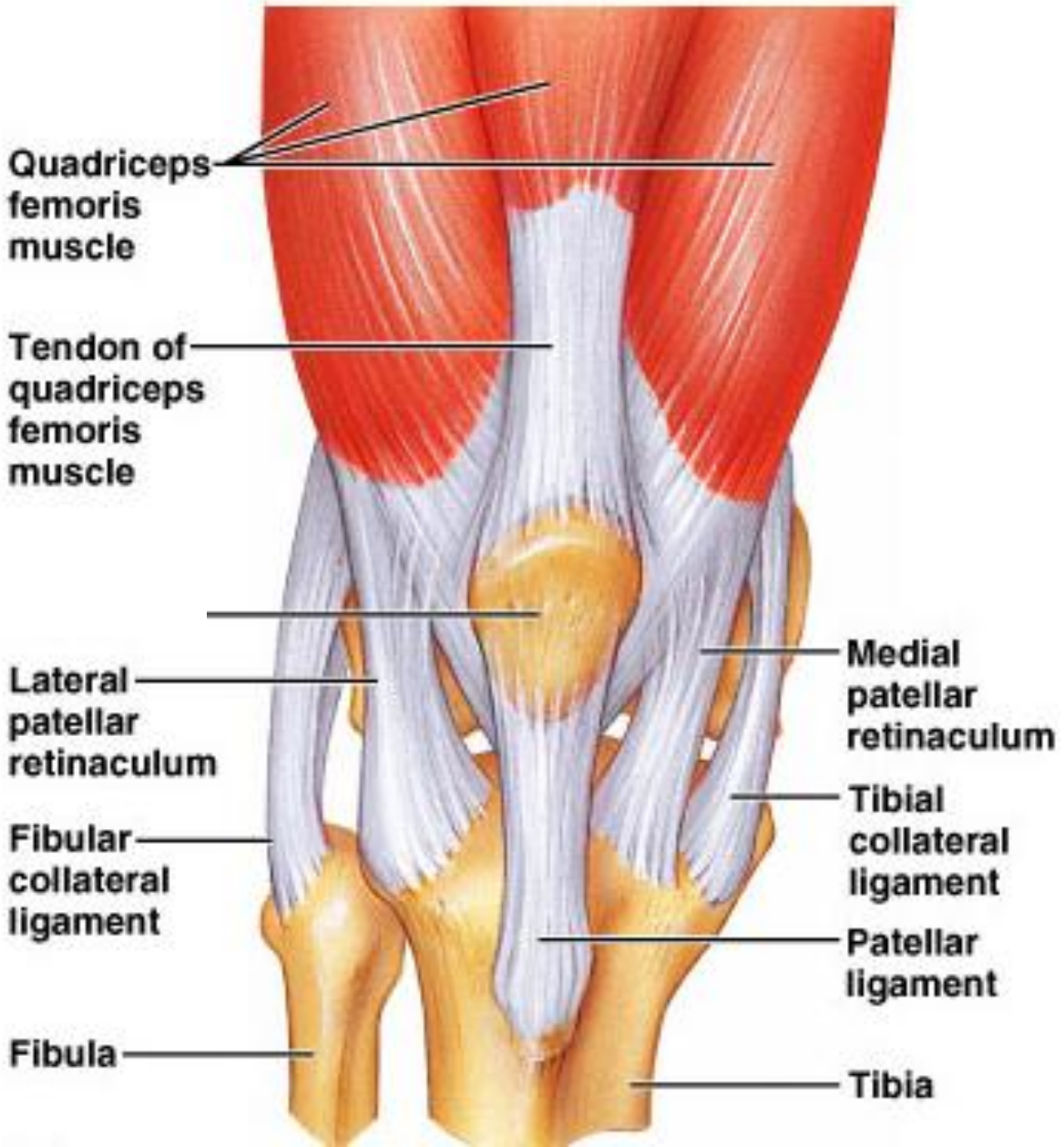


The **Knee Joint**

- largest and most complex joint in the body

- major hinge joint (F/E) but also pivot (rotational)

- complicated lig/ capsular arrangement in this, you guessed it, synovial joint.

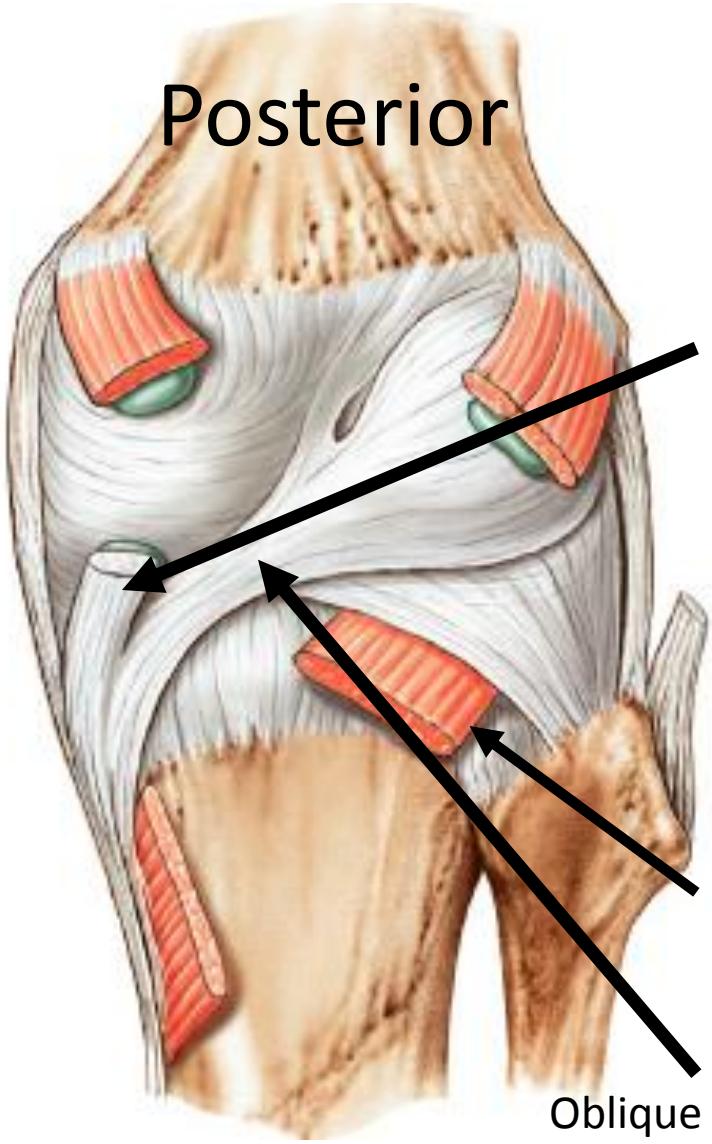


Knee

Menisci
- medial and lateral
- help tibial plateau cup femoral condyles

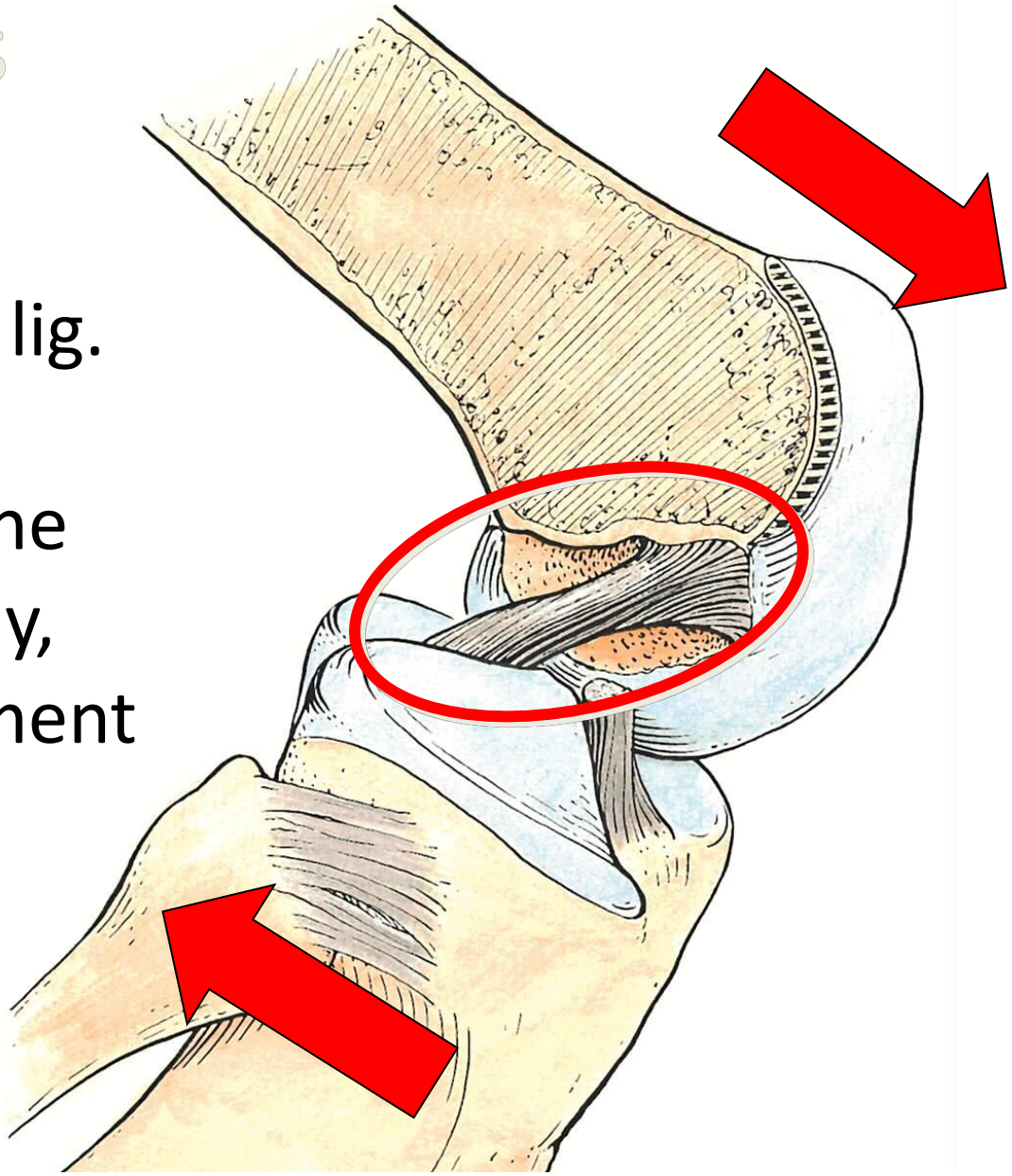
Ligaments
- (med & lat) collateral
- (ant & post) cruciates
- patellar ligament

Deep and Shallow Posterior Knee

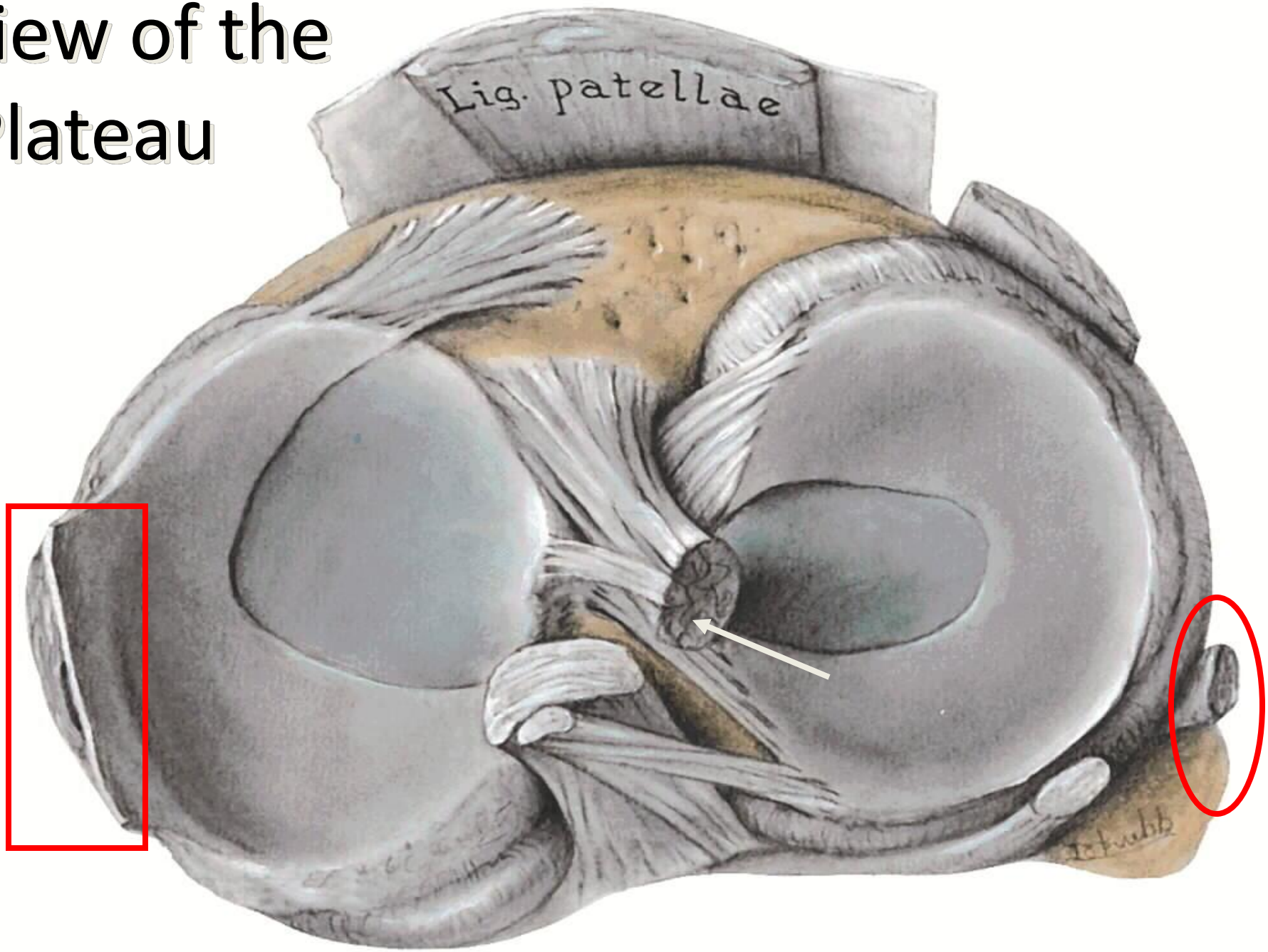


How it Works

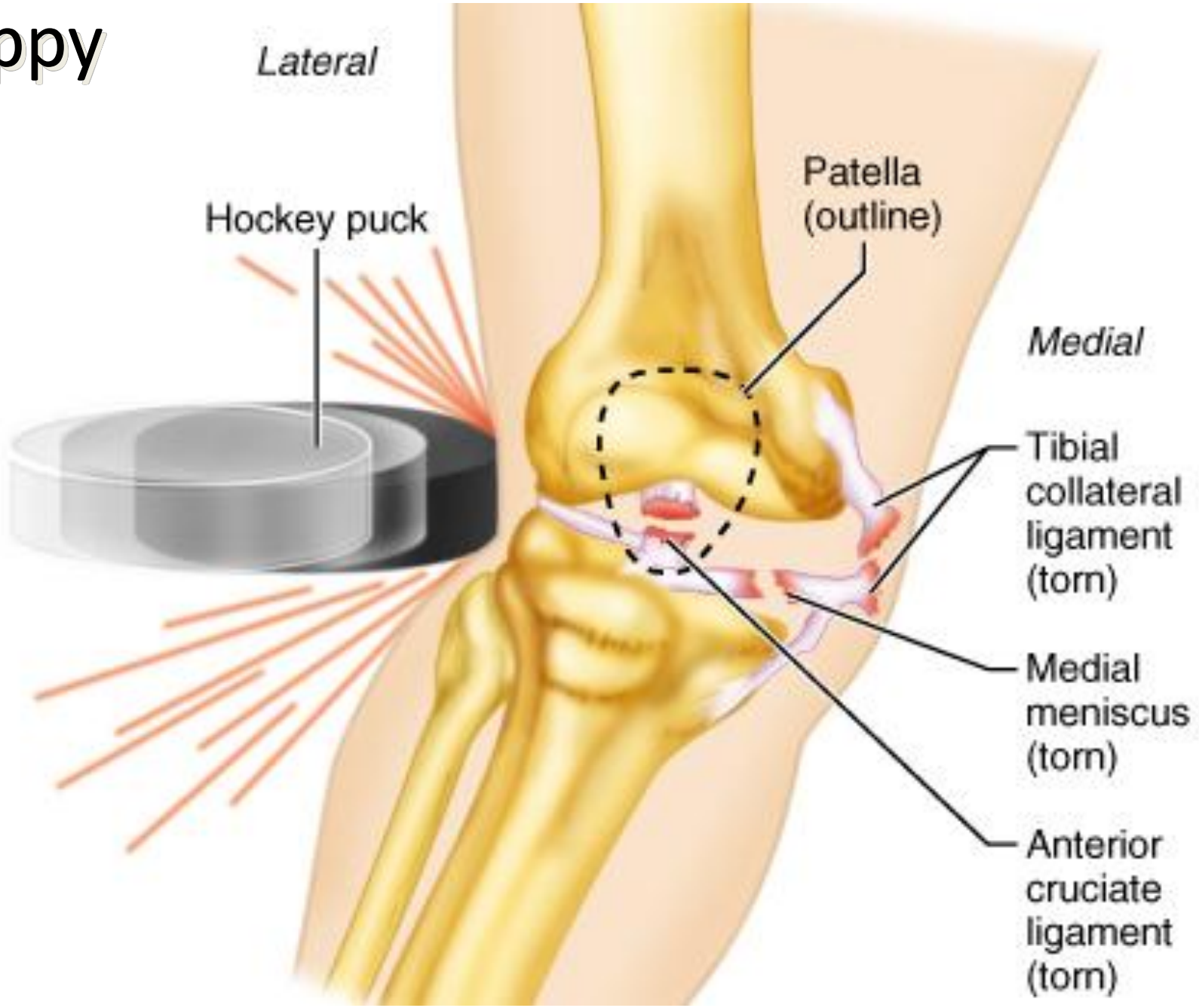
Posterior cruciate lig. controls posterior displacement of the tibia OR conversely, anterior displacement of the femur.



View of the Plateau

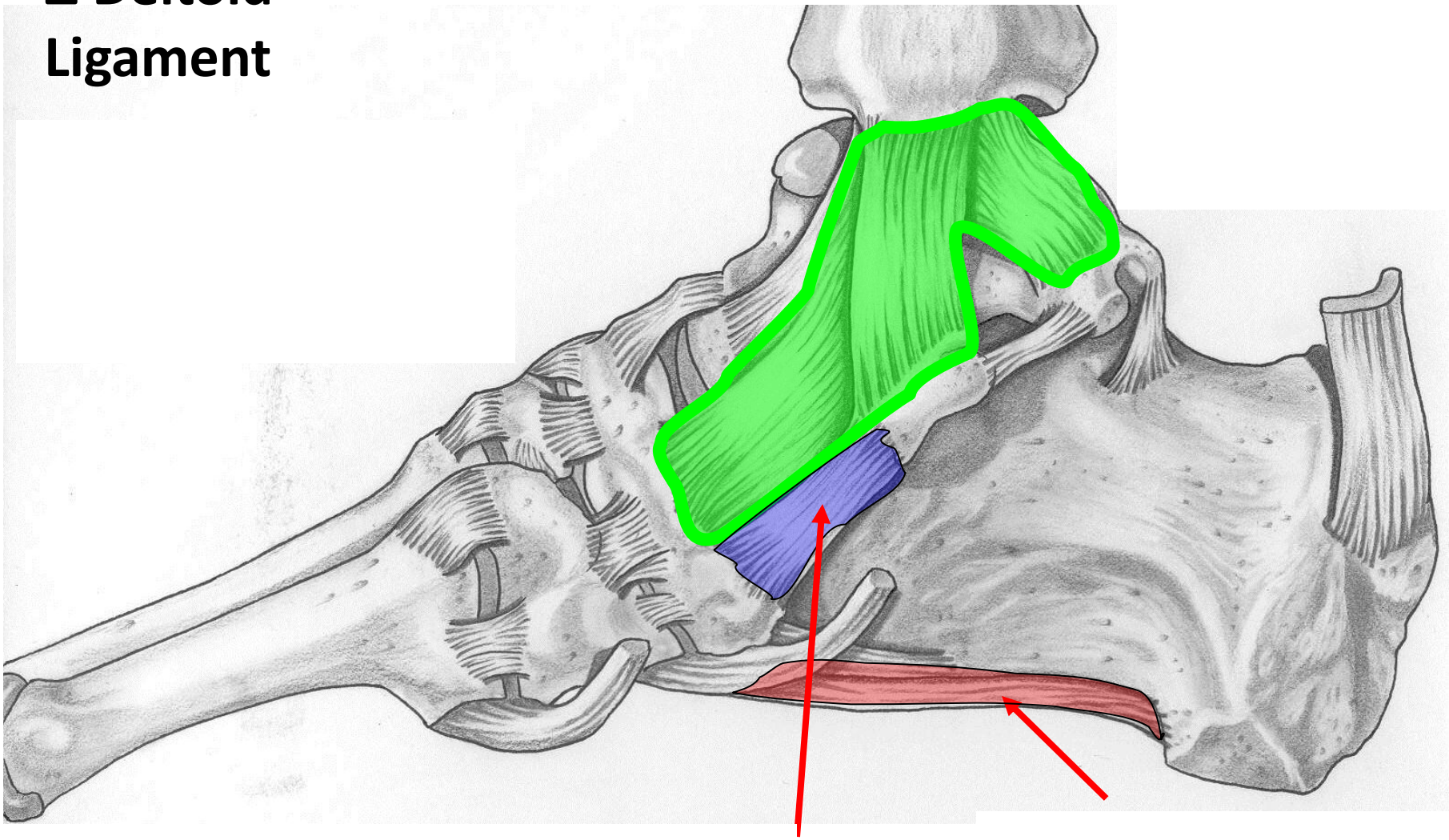


Unhappy Triad



Medial Ankle Joint and Arch Supports

Δ Deltoid Ligament



Lateral Ligaments

Calcaneofibular Ligament