

JOINTS

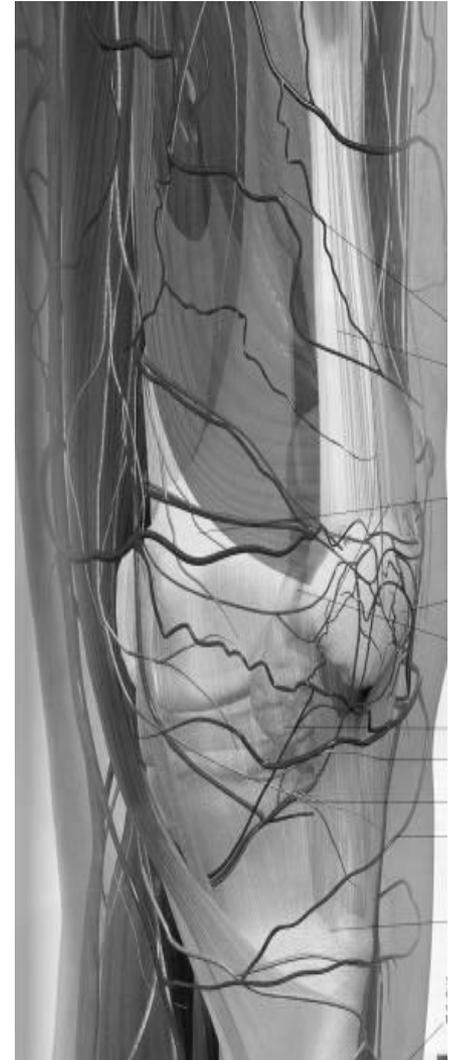
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Joints

- Joint

point at which two bones meet (**articulation**), whether or not movement occurs between them

- Classified according to the tissues that lie between them (by **structure**) or by the way they move
- Various types of joints
 - **Fibrous joints** (no movement)
 - **Cartilaginous joints** (primary & secondary)
 - **Synovial joints** (freely moveable)

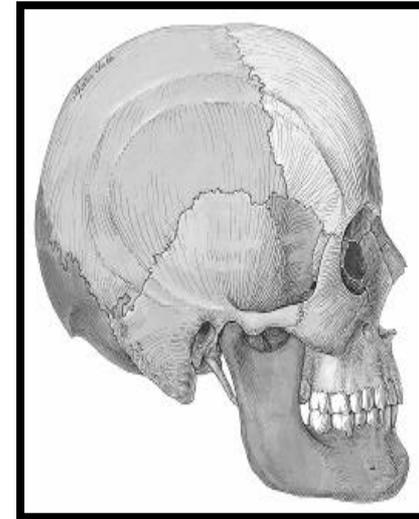


Structures that form Joints

1. Bone
2. Cartilage (articular surfaces)
3. Fibrocartilage (menisci and discs)
4. Ligament
5. Synovial membrane (thin secretory membrane)

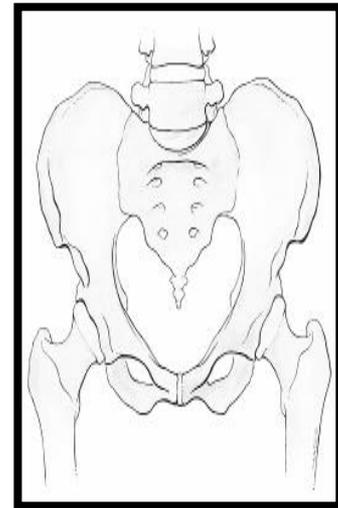
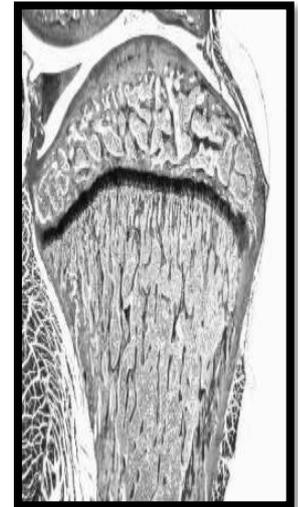
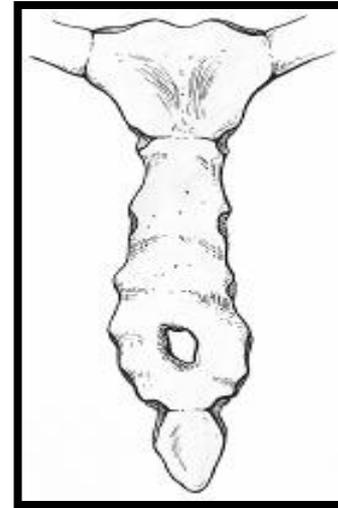
Fibrous Joints - Features

- Articulating surfaces joined by fibrous tissue
- Degree of movement depends upon the collagen fibres between the bones
- Sutures of the vault of skull
- Inferior tibiofibular joint*



Cartilaginous Joints - Features

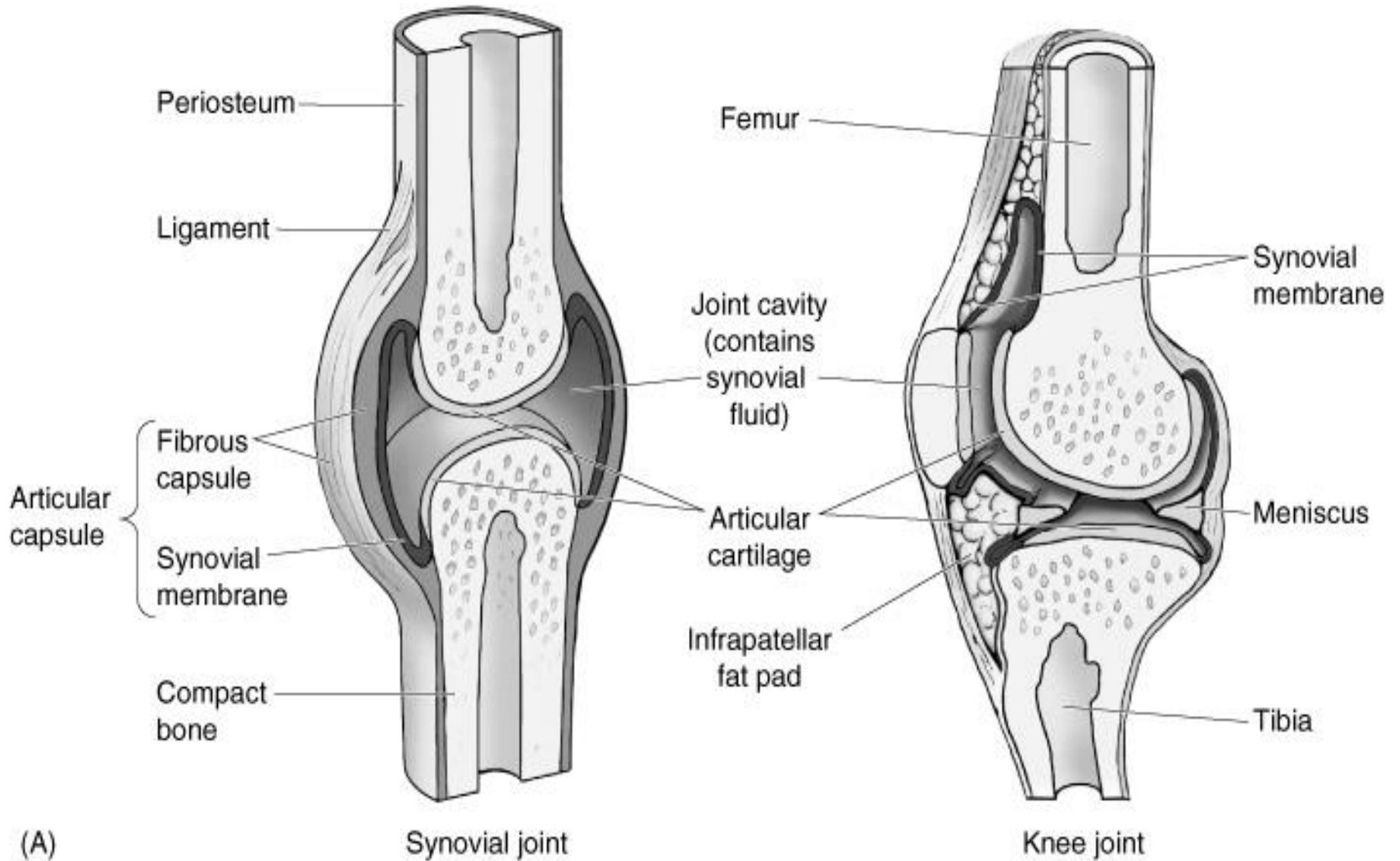
- Two types - 1° & 2°
- **1° (Primary)** – bones united by a plate of hyaline cartilage (**no movement**)
 1. epiphyseal plate of a growing bone
 2. 1st rib & manubrium sterni
- **2° (Secondary)** – bones united by a plate/disc of fibrocartilage & joint surfaces covered by hyaline cartilage (**small amount of movement**)
 1. inter-vertebral joints (IVJ)
 2. symphysis pubis



Synovial Joints - Features

- Also called freely movable joints
- Articular surfaces covered by **hyaline cartilage** separated by a **joint cavity**; this arrangement permits a great degree of freedom of movement
- Cavity lined by **synovial membrane** that extends from the margin of the one articular surface to that of the other
- Protected on the outside by a tough fibrous tissue – **capsule**
- Joint surfaces are lubricated by viscous **synovial fluid**; produced by the synovial membrane
- In some joints, such as the knee joint, discs (**articular discs**) of fibrocartilage are found between joint surfaces
- **Fatty pads** lie between synovial membrane and fibrous capsule in some joints(e.g. hip & knee joints)

I.13A. Various types of joint: synovial joint.



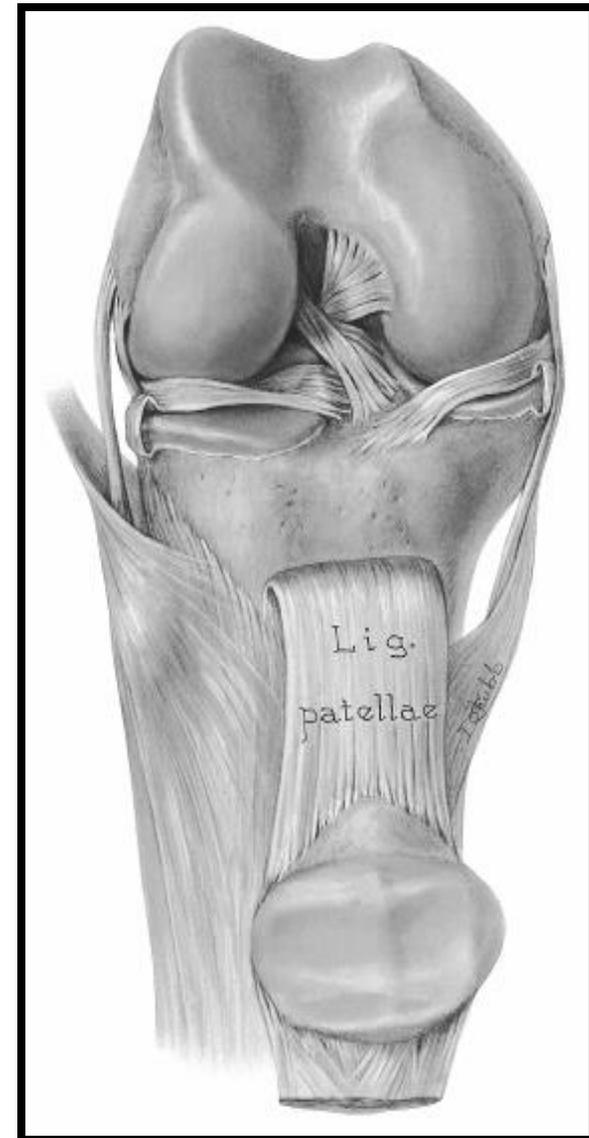
Types of Synovial Joints

(by arrangement of articular surfaces & types of movement)

- **Hinge** – permit flexion & extension only (e.g. elbow joint)
- **Saddle** – concave & convex joint surfaces (e.g. 1st MPJ)
- **Plane** – permit gliding or sliding movements (e.g. acromioclavicular joint)
- **Pivot** – allow rotation; a round bony process fits into a bony ligamentous socket (e.g. atlantoaxial joint & proximal Radio-ulnar joint)
- **Condylloid** – permit flexion & extension, adduction, adduction & circumduction (e.g. MPJ)
- **Ball & Socket** – permit movement in several axes; a rounded head fits into a concavity (e.g. shoulder & hip joints)

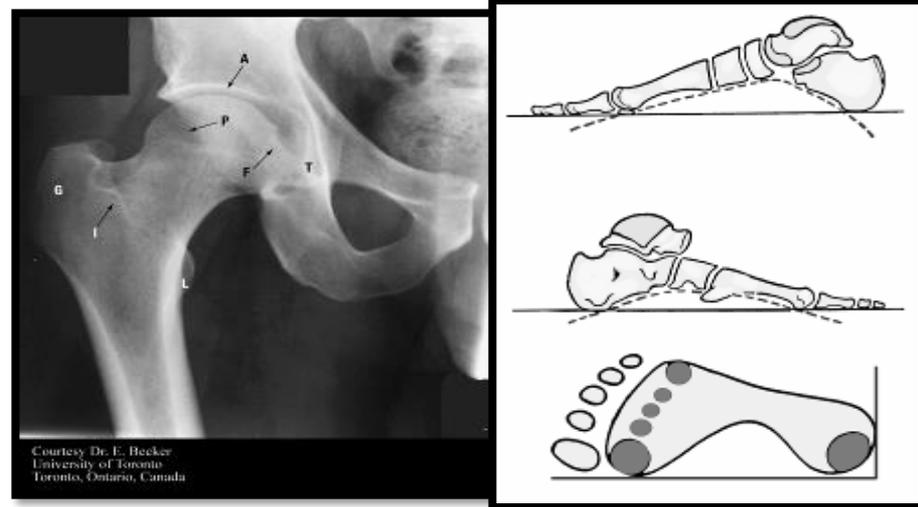
Degree of movement

- Limited by the **shape** of the bones
- Coming together of **adjacent anatomical structures** (e.g. flexion of the thigh against the anterior abdominal wall)
- Presence of **ligaments** uniting the bones – e.g. extra- & intra-capsular ligaments (e.g. cruciate ligaments)



Stability of Joints

- Depends on 3 main factors
- **Shape, size & arrangement of articular surfaces** – e.g. hip joint & ankle joint
- **Ligaments** – prevent excessive movement; if stresses continue, ligaments stretch – e.g. ligaments between the bones that form the arches of the foot
- **Tone of muscles** – major factor – e.g. tone of the rotator cuff muscles keeps the head of humerus in the shallow glenoid cavity of the scapula; loss of tone, shoulder joint will dislocate

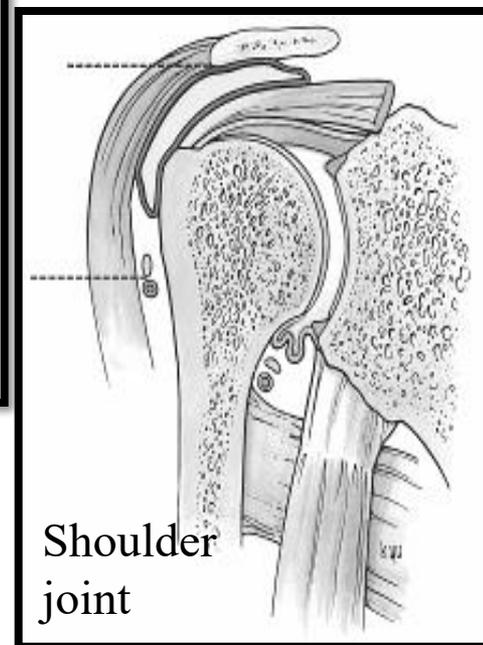
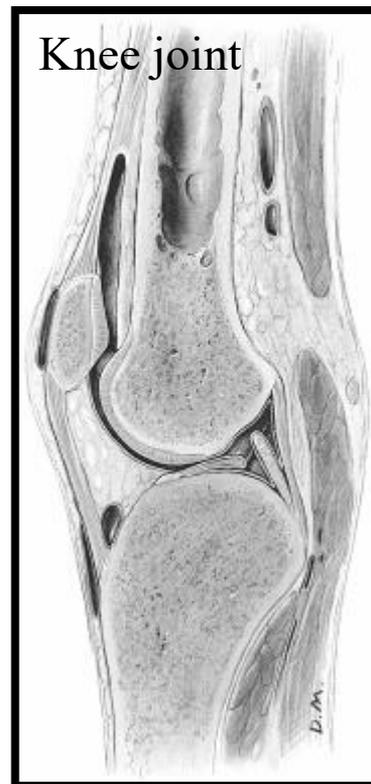


Neurovascular Supply to Joints

- Capsule & ligaments receive abundant sensory supply
- Nerve supplying the joint also supplies the muscles moving the joint & overlying skin (**Hilton's law**)
- Stretching of the capsule and ligaments produces reflex contraction of muscles around the joint; excessive stretching produces pain
- Stretch receptors in the capsule & ligaments – proprioception information to CNS for position of joints; information from muscle & tendons supplements – maintains postural tone and co-ordination of voluntary movement
- Rich network of blood vessels around the joint (**periarticular network or anastomoses**); blood vessels innervated by sympathetic fibres – control blood supply

Bursae associated with joints

- Closed fibrous sacs containing viscous fluid
- Found where tendons rub against bones, ligaments or other tendons
- Commonly found close to joints where the skin rubs against underlying bony surfaces; occasionally the cavity of the bursa communicates with the cavity of a synovial joint
- Inflammation of the bursa may result from repeated and/or excessive trauma – “housemaid’s knee”, “clergyman’s knee”, “miner’s knee”, “student’s elbow” (**pre-patellar bursitis, olecranon bursitis, subacromial bursitis, etc.**)



Injuries to Joints

Dislocation – disruption of joint in which normally opposing surfaces have no contact

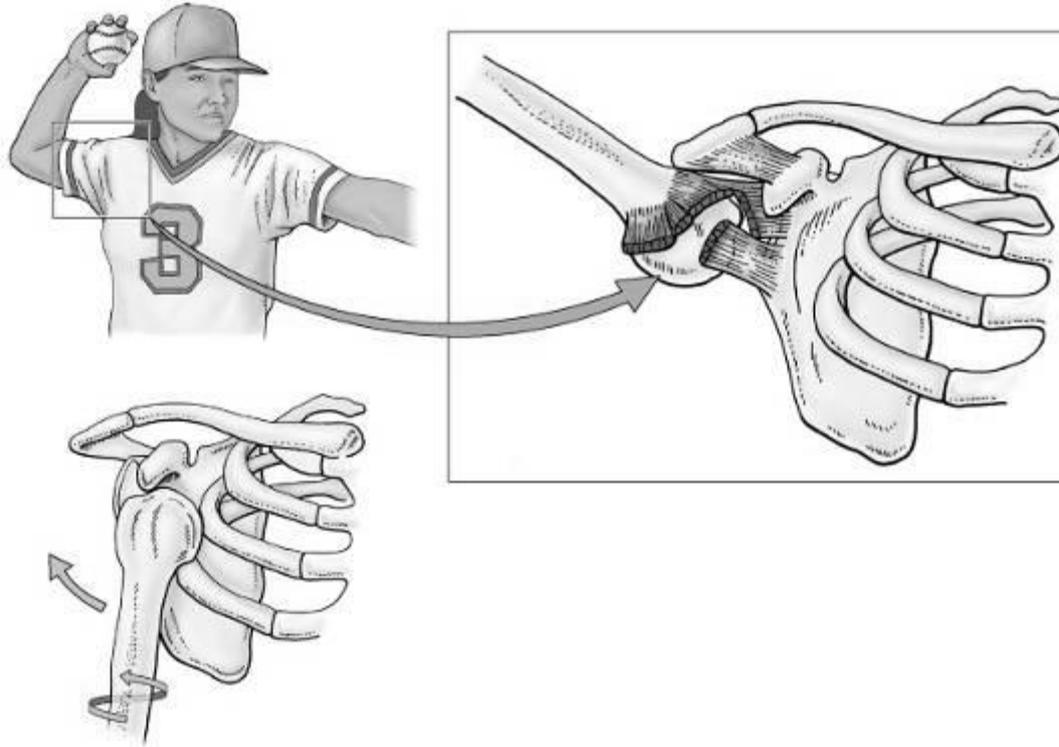
Fracture – a structural break in the continuity of bone

Subluxation – disruption of joint in which normally opposing surfaces have partial contact

Ligament Tears , ligament stretching

Injuries to Joints—Dislocation/Fracture

p. 794: Dislocation of the glenohumeral joint



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p. 724: Separation of humeral epiphysis
Surgical neck fracture of
humerus



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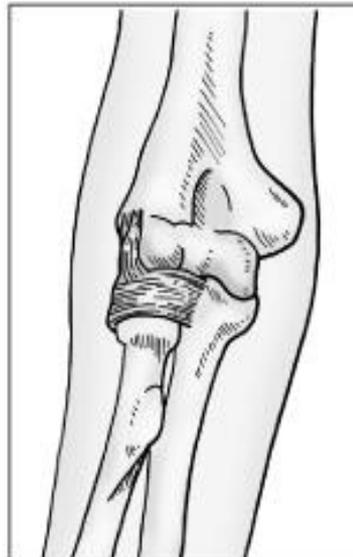
Injuries to Joints – Dislocation & Subluxation

Dislocation – disruption of joint in which normally opposing surfaces have no contact

Subluxation – disruption of joint in which normally opposing surfaces have partial contact



(B) Normal



Subclinical subluxation

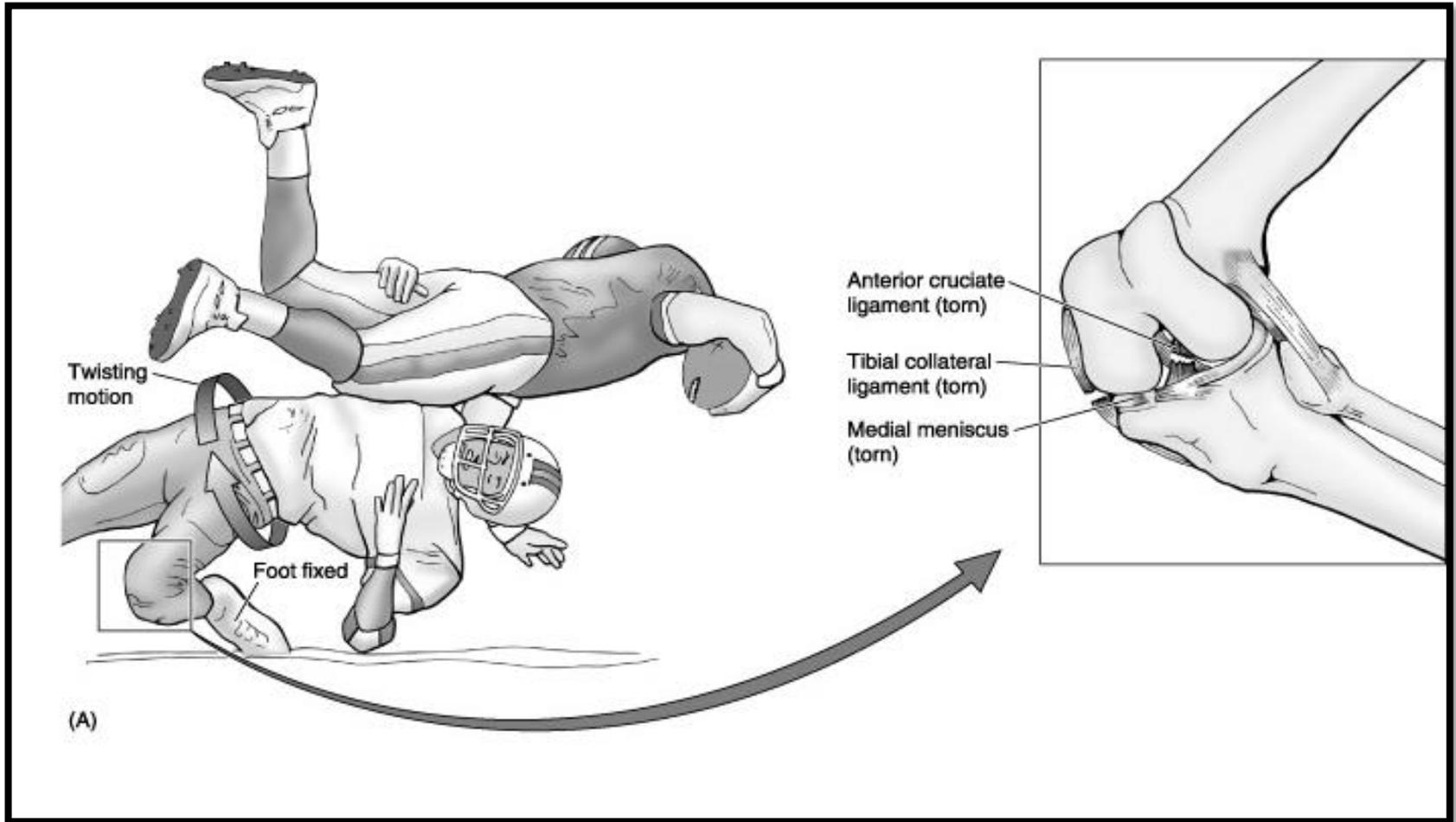


Dislocation



Subluxation

Injuries to Joint – Ligament Tears



Other Injuries to Joints

- **Degenerative** joint diseases arthritis
(osteoarthritis & rheumatoid arthritis)
- **Joint infection**(septic joint)
- **Haemarthrosis** (blood within synovial cavity)
- **Joint effusions** (excessive synovial fluid accumulation within the joint cavity)

thanks