Lecture 10
Articulations III

2. **Glenohumeral Joint** (Shoulder):
   - Joint Characteristics:
     - Structural: **Synovial** (Ball & Socket)
     - Functional: **Diarthrotic**
       - Most freely moveable
       - Most Unstable
     - Most frequently dislocated joint

   - Articulating surfaces:
     a. Humerus: Rounded Head
     b. Scapula: Glenoid Fossa

   - Unstable articulating surfaces
• Stabilizing Structures:

1. **Girdle Bones**: Stabilize extremity
   a. **Acromion of Scapula**: Stabilize superior–posterior aspect
   b. **Coracoid of Scapula**: Stabilize superior–anterior aspect

2. **Articular Capsule**:
   - **Loosely binding capsule**: Provides little support
   - Stabilizes **ONLY when joint reaches normal limits**
3. Accessory Ligaments: *Intrinsic & Extrinsic*

**a. Glenohumeral ligaments: Intrinsic**
- Stabilize extremity
  - Distinct *thickening* in capsule

**b. Extrinsic: Extra-capsular Ligaments:**
- Stabilize Girdle
  1. **Coracoacromial Ligament**
     - Strengthen superior aspect
2. **Coracoclavicular Ligaments**  
* (Trapazoid & Conoid)  
⇒ Stabilize clavicle & scapula position

3. **Acromioclavicular Ligament**  
⇒ Stabilize clavicle & scapula position
Acromioclavicular Ligament: Sprain
✓ Shoulder separation
✓ Most commonly sprained shoulder ligament

4. Muscle & Associated Tendons:
• Provide Greatest Degree of extremity stabilization
• "Rotator Cuff Muscles": 4 muscles: Move & Stabilize Extremity
  Supraspinatus, Infraspinatus, Teres Minor, Subscapularis
  ⇨ "SITS" muscles

* Hold humeral head against glenoid fossa
* Tendons extend around humeral head
  ➲ Tendons form: Rotator Cuff
5. **Accessory Cartilage**: Stabilize extremity

- **Glenoid Labrum**: *labrum* = “lip”
  - *Fibrocartilage* “lip” exaggerating & deepening Fossa
  - Increases surface area by **50%**
  - **Adding further stability (>20%)**
6. **Bursae**: Reduce friction where muscle & tendons pass joint structure

![Bursae Diagram](image)

**Right Shoulder Injuries**

![Shoulder Injuries Diagram](image)

3. **Tibiofemoral Joint** (Knee Joint)

![Knee Joint Diagram](image)
* Structural: **Synovial** (Hinge Joint*)
* Functional: **Diarthrotic**
  - Moveable – Flexion / extension
  - Bony articulations: Unstable

- Articulation between:
  a. **Femoral Condyles**
  b. **Tibial Condyles**

- Complex Stabilizing Structures
  a. **Articulating Capsule:**
     - *Not primary stabilizing structure*
  b. **Menisci** (Medial & Lateral):
     - Fibrocartilage pads
     - **Medial Meniscus:** Semilunar shaped
     - **Lateral Meniscus:** Circular shaped
• Function: Wedge shaped – Periphery is thicker
  ➔ Refine and stabilize joint movement
  ➔ Absorb shock
  ➔ Circulate Synovial Fluid

• Clinical: Medial meniscus more frequently injured
  ◆ Less mobile: Attached to the medial collateral ligament & joint capsule
  ✔ Tears during knee rotation

Meniscus tear and treatment
Partial meniscectomy
Repair with suture
c. Extracapsular Ligaments:

1. **Tibial (Medial) Collateral Ligament**
   - Attached to joint capsule and meniscus
   - Broad flat band of FCT

2. **Fibular (Lateral) Collateral Ligament**
   - Outside joint capsule
   - Narrow Rope of FCT

* BOTH; Stabilize medial & lateral leg motion

  ⇒ Prevent joint from “OPENING”
3. **Patellar Ligament**

- Stabilize Anterior joint surface

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d. **Intracapsular Ligaments:**

1. **Anterior Cruciate:**
   - Limits forward movement of tibia

2. **Posterior Cruciate:**
   - Limits backward movement of tibia
**ACL tear evaluation:**

**ACL: Positive Lachman Test**

- **Terrible Triad**: Lateral force to knee
  - Force opens *medial aspect* of knee

> ACL, Medial Meniscus, Medial Collateral ligament
4. **Talocrural Joint** (Tibiotalar)

- Joint Characteristics:
  - Structural: **Synovial** (Hinge)
  - Functional: **Diarthrotic**
    - Weight bearing joint
    - Motion – Dorsiflexion  
      Plantar flexion

- Fairly Stable Joint structure
  - Articulating bones: 3 bones
    a. **Tibia**: Medial malleolus
    b. **Fibula**: Lateral malleolus
    c. **Talus**

2 Locations of Stabilization:

1. **High Ankle Joint**: Distal Tibiofibular joint
   - Functional Classification: Synarthrotic Joint  
     (Syndesmosis)

   note: Proximal tibiofibular joint: amphiarthrosis
• Stabilizing Structures:

a. **Interosseous Membrane**: Dense fibrous connective tissue between the bones

  ✓ **Function**: “Binds” the bones together
  ⇄ Prevents separation of leg bones

b. **High Ankle Ligaments**

1. **Anterior Tibiofibular Ligament**
2. **Posterior Tibiofibular Ligament**

  ✓ **Function**: “Binds” the bones together
  ⇄ Further Prevents separation of leg bones
2. Low Ankle Joint: Tibiotalar joint

* Attach the "FOOT" to the "LEG"

a. **Lateral Ligaments**: 3 ligaments

1. Anterior Talofibular ligament
2. Posterior Talofibular ligament
3. Calcaneofibular ligament

⇒ Function: Attach & prevent inversion

b. **Deltoid Ligament**: 3 slips (sections)

* Large Medial Ligament

⇒ Function: Attach and prevent Eversion

**Clinical Significance:**

1. **Synovial Joint Dislocation**: Luxation
   - Articulating surfaces forced out of position
   * Partial dislocation: Subluxation
“Double Jointed” or *Hypermobility*:

- Permit greater range of motion

* Causes: Strong genetic basis
  - a. Joint misalignment or abnormal bone structure
  - b. Collagen defect
  - c. Injury
    - Weakly stabilized joints
    - More prone to luxation

- **Injury**: Displacement can cause *joint structure damage*
  - Cartilage, ligaments, menisci

2. **Sprain**: Over stretching or tearing of ligament or capsule

- Connective tissue damage
  - Cause: *Joint over extension*
  - Repair: ~ 3–4 weeks
3. **Strain**: Over stretching or tearing of **Muscle** or **muscle tendon**
   - Muscle & Connective tissue damage
   - **Cause**: Joint over extension
   - **Repair**: ~ 3–4 weeks

4. **Bursitis**: **Bursa inflammation**
   - **Cause**: Direct fall or blow, overuse or infection