Chapter 9 Articulations Lecture Outline

Articulations

Anatomical classification
1. Fibrous joint
2. Cartilaginous joint
3. Synovial joint

Physiological classification
1. Synarthrosis
2. Amphiarthrosis
3. Diarthrosis

Synarthroses
1. Synostosis
2. Suture
3. Gomphosis
4. Synchondrosis

Amphiarthroses
1. Syndesmosis
2. Symphysis

Diarthroses

Features:
1. Articular cartilage
2. Synovial cavity
3. Articular capsule
   - Fibrous capsule
   - Synovial membrane
4. Synovial fluid
   - Hyaluronic acid
Functions:
   a. lubrication
   b. shock absorption
   c. diffusion
5. Accessory structures
   A. Meniscus
   B. Fat pads
   C. Ligaments
   D. Tendons
   E. Bursa
   F. Synovial tendon sheath

Injuries
Sprain
Bursitis
Luxation
Subluxation

Movements
1. Linear
2. Angular
   - Flexion
   - Extension
   - Hyperextension
   - Abduction
   - Adduction
   - Circumduction
3. Rotational
   - Medial rotation
   - Lateral rotation

4. Special
   - Inversion
   - Eversion
   - Dorsiflexion
   - Plantar flexion
   - Opposition
   - Pronation
   - Supination
   - Protraction
   - Retraction
   - Elevation
   - Depression

Ranges of motion
1. Monaxial
2. Biaxial
3. Triaxial
4. Multiaxial

Types of synovial joints
1. Gliding/Plane joint
2. Hinge joint
3. Pivot joint
4. Ellipsoidal joint
5. Saddle joint
6. Ball and socket joint

Aging
Rheumatism
Arthritis
1. Osteoarthritis
2. Rheumatoid arthritis
   - Ankylosis
3. Gouty arthritis
Diarthroses = Synovial Joint

Features:

1. Articular cartilage: Hyaline cartilage, no perichondrium/periosteum
2. Synovial cavity: space between/around opposing bones, has synovial fluid
3. Articular capsule: 2 layers
   - outer = dense irregular connective tissue, continuous with periosteum
   - inner = synovial membrane (areolar CT), covers inside surface of cavity except articular cartilage, secretes synovial fluid
4. Synovial fluid: filtrate from blood plasma + hyaluronic acid from fibroblasts
   Functions:
   A. Lubrication
   B. Shock absorption
   C. Nutrient distribution: diffusion medium
5. Accessory structures
   A. Meniscus: fibrocartilage pad, subdivides cavity or changes shape of articular surface, limits range of motion
   B. Fat pad: adipose, superficial to capsule, protection and space filler
   C. Accessory ligaments: dense regular connective tissue, either part of capsule, inside joint, or outside capsule; strengthen joint
   D. Tendons: dense regular connective tissue, attach muscle to bone, add stability to joint
   E. Bursa: synovial fluid filled pocket, reduces friction
   F. Synovial tendon sheath: tubular bursa around a tendon
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<tr>
<th>Types of Synovial Joints</th>
<th>Movement</th>
<th>Examples</th>
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| Gliding joint               | Slight nonaxial or multiaxial | • Acromioclavicular and claviculoesternal joints  
• Intercarpal and intertarsal joints  
• Vertebrocostal joints  
• Sacroiliac joints                                                    |
| Hinge joint                 | Monaxial       | • Elbow joint  
• Knee joint  
• Ankle joint  
• Interphalangeal joint                                                    |
| Pivot joint                 | Monaxial (rotation) | • Atlas/axis  
• Proximal radioulnar joint                                                    |
| Ellipsoidal joint           | Biaxial        | • Radiocarpal joint  
• Metacarpophalangeal joints 2–5  
• Metatarsophalangeal joints                                                    |
| Saddle joint                | Biaxial        | • First carpometacarpal joint                                                    |
| Ball-and-socket joint       | Triaxial       | • Shoulder joint  
• Hip joint                                                    |