

Joint Classification

- **Structure**
- **Function**

Joint Classification--Function

- **Immovable (Synarthroses)**
- **Slightly Movable (Amphiarthroses)**
- **Freely Movable (Diarthroses)**

Joint Classification--Structure

- **Fibrous**
--bound by fibrous connective tissue.
- **Cartilaginous**
--unite two bones by either fibrocartilage or hyaline cartilage.
- **Synovial**
--freely movable joints, filled with synovial fluid.

Fibrous Joints

- Sutures • (*synarthroses*)
- Syndesmoses • (*amphiarthroses*)
- Gomphoses • (*synarthroses*)

Cartilaginous Joints

- Synchondroses • (*synarthroses or amphiarthroses*)
--primary
- Symphyses • (*amphiarthroses*)
--secondary

Synovial (*diarthrosis*) Joints

Basic Features:

- articular capsule
- synovial membrane
- articular cartilage
- ligaments
- tendons
- bursae

Synovial Fluid

Three Primary Functions:

- Lubrication
- Nutrient distribution
- Shock absorption

Articular Motions

- Gliding
- Angular
- Rotation

Types of Movements

flexion/extension	plantar/dorsal flexion
hyperextension	inversion/eversion
abduction/adduction	pronation/supination
circumduction	elevation/depression
inward/outward rotation	protraction/retraction
lateral flexion	opposition/reposition
horizontal abduction	
horizontal adduction	

Types of Synovial Joints

- gliding
- hinge
- pivot
- condyloid
- saddle
- ball & socket

Joints of the Upper Limb

Sternoclavicular Joint

--*saddle-type synovial*

--only bony articulation between the limb and the upper extremity.

--function of the clavicle is hold the upper limb away from the trunk ⇒ freedom of movement.

Joints of the Upper Limb

Sternoclavicular Joint

Ligaments:

- *sternoclavicular ligaments* (ant./post.)
- *interclavicular ligament* (superiorly)
- *costalclavicular ligament* (inferiorly)

Joints of the Upper Limb

Acromioclavicular Joint

--*gliding-type synovial joint*

--“point of the shoulder”

--although weak, strengthened superiorly by the *acromioclavicular ligament* and by fibers of *trapezius*

Joints of the Upper Limb

Coracoclavicular Ligament

--anchors the clavicle to the coracoid process of the scapula.

--Two parts:

conoid ligament

trapezoid ligament

Coracoacromial Ligament

Joints of the Upper Limb

Shoulder Joint

--*ball-and-socket type synovial joint*

--mobility at the expense of stability

--Fibrous Capsule

--loose when arm is adducted; taut when arm is abducted

--weakest inferiorly....*WHY??*

Joints of the Upper Limb

Ligaments of the Shoulder Joint

- *glenoid humeral ligaments*
- *transverse humeral ligament*
- *coracohumeral ligament*
- *coracoacromial arch* (formed by coracoid process, coracoacromial ligament, and acromion)

Joints of the Upper Limb

Elbow Joint

--*hinge-type synovial joint*

--*uniaxial* ⇒ flexion/extension

Includes 3 articulations:

1. humeroulnar
2. humeroradial
3. proximal radioulnar

Joints of the Upper Limb

Elbow Joint

Intrinsic Collateral Ligaments:

--*radial collateral ligament*

--*ulnar collateral ligament*

Anular Ligament (pivot-type)

Joints of the Upper Limb

Distal Radioulnar Joint

--*pivot-type synovial joint*

Wrist Joint

--*condyloid-type synovial joint*

--dorsal and palmar radioulnar ligaments

--collateral ligaments

Joints of the Upper Limb

Intercarpal Joints

--*gliding-type synovial joints*

--enclosed in fibrous capsule

Carpometacarpal Joint of the Thumb

--*saddle-type synovial joint*

--flexion, extension, abduction, adduction,
and opposition

Joints of the Lower Limb

Hip Joint

--*ball-and-socket type synovial joint*

--sacrifice movement for stability and
strength

--strong fibrous capsule

Jointns of the Lower Limb

Hip Joint

Iliofemoral Ligament

--Y-shaped

--"screws" the head of the femur into the acetabulum

Pubofemoral Ligament

--prevents overabduction

Jointns of the Lower Limb

Ischiofemoral Ligament

--prevents hyperextension at the hip joint

Ligamentum Teres (L. Capitis Femoris)

--weak and of little importance in strengthening the joint (contains a nutrient artery in 80% of population)

Jointns of the Lower Limb

Knee Joint

--often classified as a *hinge-type synovial joint*, however, more appropriately it is classified as a *condyloid-type*

Includes 3 articulations:

1. femur & patella
2. lateral tibiofemoral
3. medial tibiofemoral

Joints of the Lower Limb

Knee Joint

Patellar Ligament

--continuation of the tendon of the quadriceps femoris muscle

Fibular (Lateral) Collateral Ligament

Tibial (Medial) Collateral Ligament

--firmly attached to the medial meniscus and the fibrous capsule of the knee

Joints of the Lower Limb

Oblique Popliteal Ligament

--expansion of the semimembranosus muscle

--strengthens the joint posteriorly

Arcuate Popliteal Ligament

--also strengthens the joint posteriorly

Joints of the Lower Limb

The Cruciate Ligaments of the Knee Joint

Anterior Cruciate Ligament

--weaker of the two

--prevents posterior displacement of the femur on the tibia and hyperextension of the knee joint

Joints of the Lower Limb

The Cruciate Ligaments of the Knee Joint

Posterior Cruciate Ligament

--prevents anterior displacement of the femur on the tibia and hyperflexion of the knee joint

Joints of the Lower Limb

“The Unhappy Triad”

- *medial collateral ligament*
- *anterior cruciate ligament*
- *medial meniscus*

Joints of the Lower Limb

Ankle (Talocrural) Joint

--*hinge-type synovial joint*

--**box-like mortise**

Medial (Deltoid) Ligament

1. tibionavicular
2. anterior tibiotalar
3. posterior tibiotalar
4. tibiocalcaneal

Joints of the Lower Limb

Lateral Ligaments

- anterior talofibular
- posterior talofibular
- calcaneofibular

Joints of the Lower Limb

Stability of the Ankle Joint

- strong in dorsiflexion
- relatively unstable in plantar flexion
- most frequently injured major articulation in the body
- *laterally or medially?? WHY??*

Arches of the Foot

- Longitudinal
 - medial
 - lateral
- Transverse

Arches of the Foot

Plantar Calcaneonavicular ("Spring") Lig.

--main supporter of the medial longitudinal arch

--if abnormally stretched during long periods of standing, the spring ligament cannot adequately support the head of the talus and *flat feet* result.


