Arthrology

Arthrology: A branch of anatomy studys the joints and articulation.

Articulation: is the site where the ridgid elements of skeleton are meet.

Joints: Are the places of the union between two or more skeleton elements.

Classification of joints

A.Classification based on structure.

B.Classification based on function.

Classifications based on structure

Based on materials that bind bones together and based on present or absecent of joint cavity.

1) Fibrous joints: are fixed, immovable.

2) Cartilagenous joints: are slightly move (semimovable).

3) Synovial Joints: are movable.

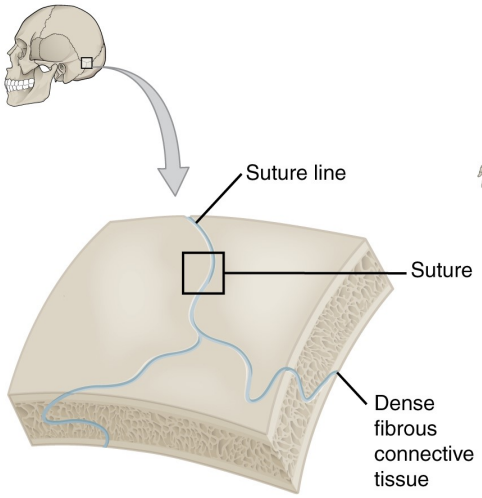
Fibrous Joints

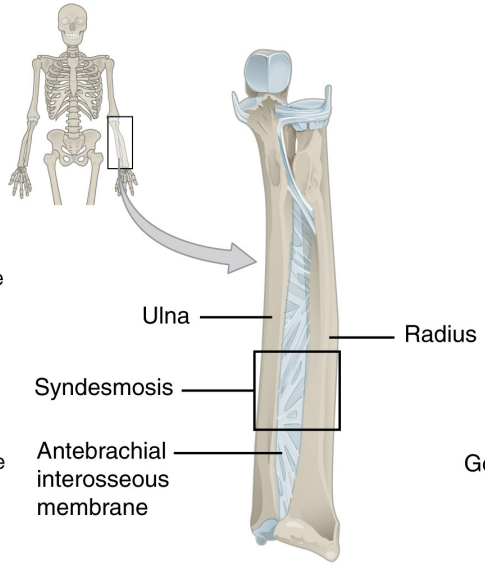
- Bones in this type of joints are connected by fibrous tissue
- No movement is there and no joint cavity

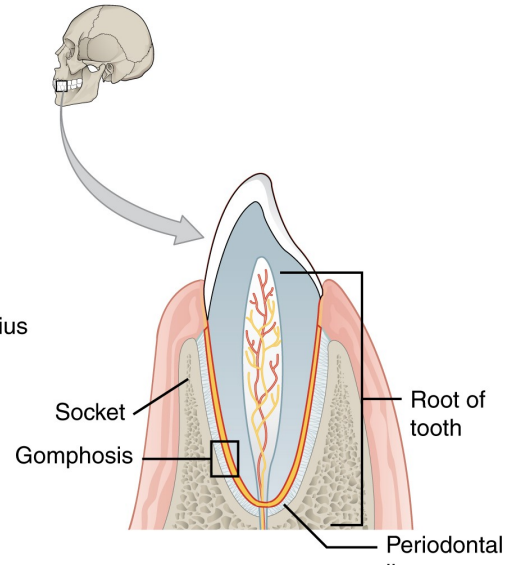
I. Suture

II. Syndesmoses

III. Gomphoses

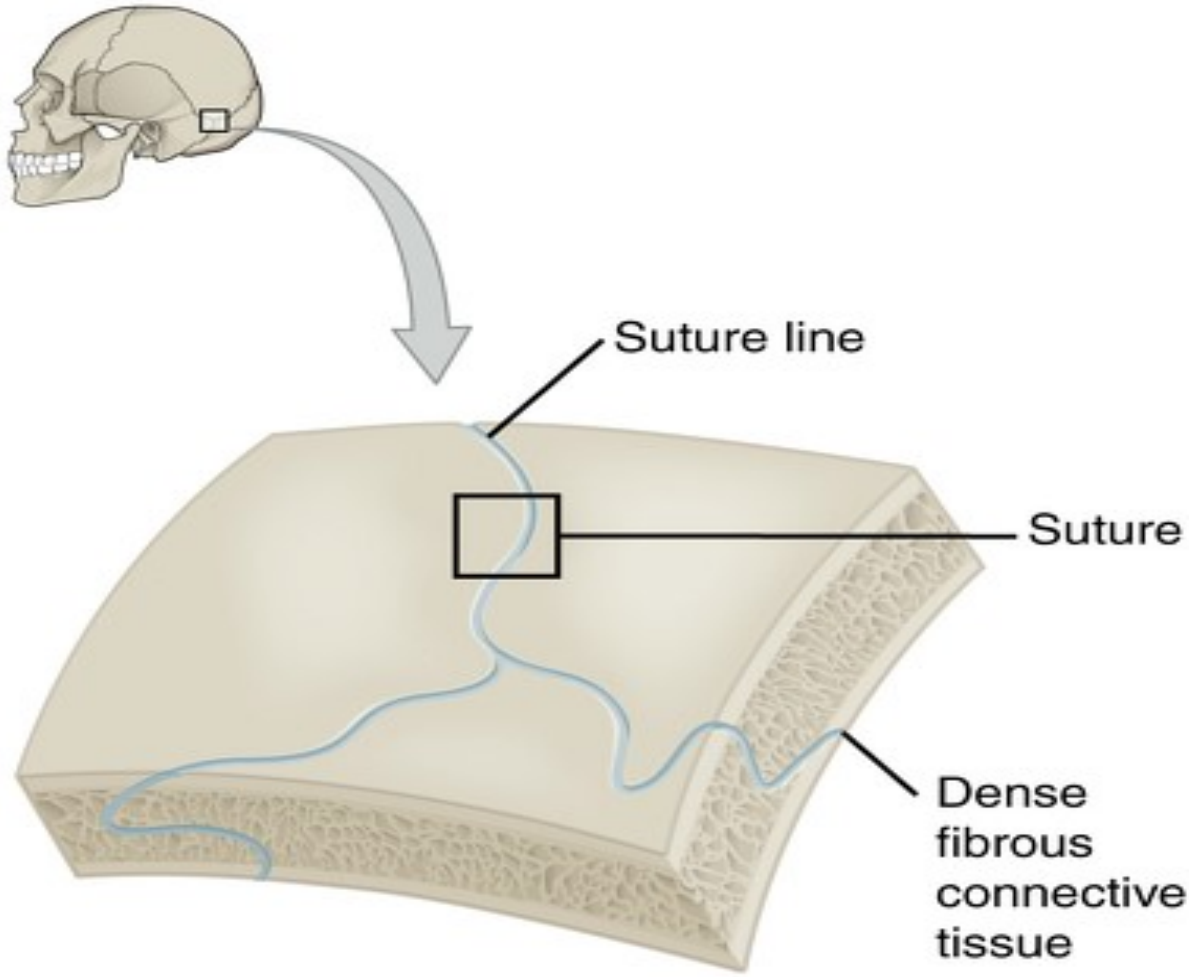






SUTURE

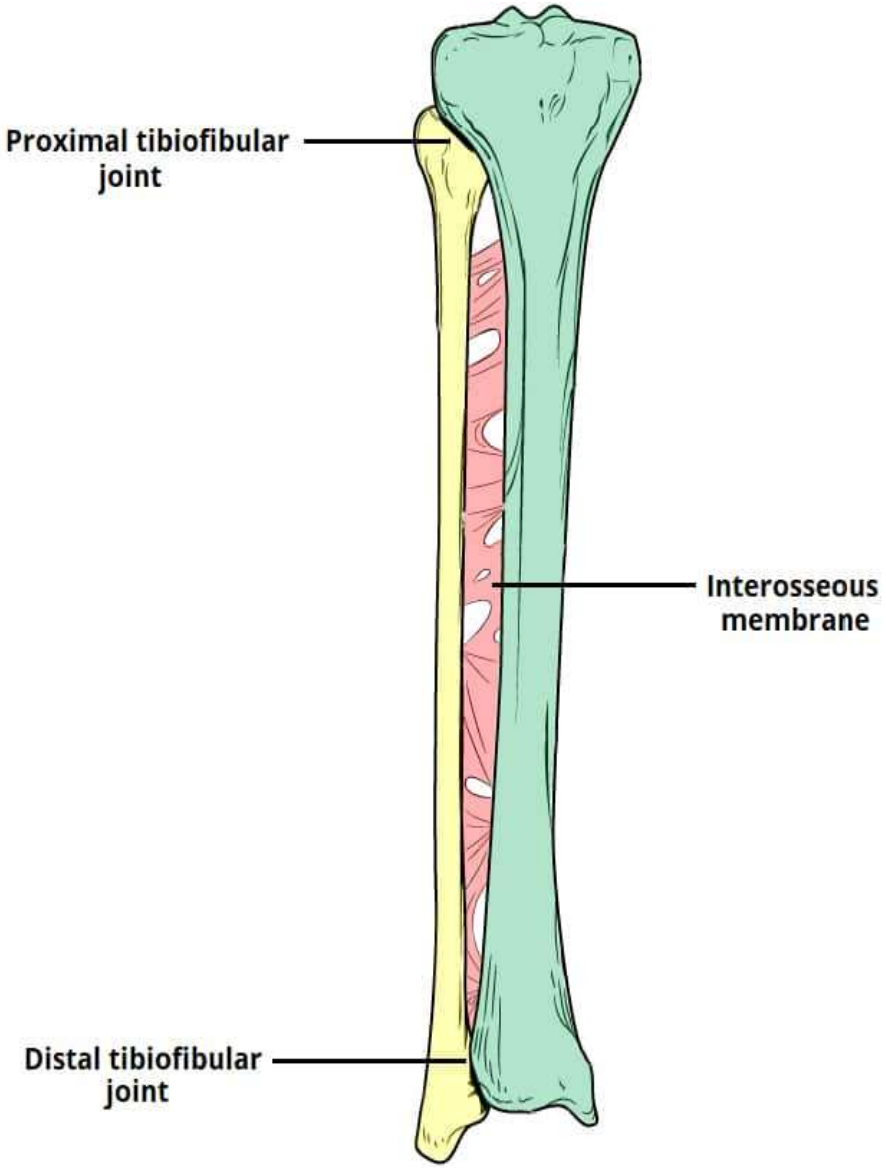
- Thin layer of dense fibrous connective tissue united bones of the skull
- Irrigular edge to add a strenght and prevent fracture
- synarthroses beacuse it is immovable
- Synostosis: suture has fused completely and replaced by bones.



syndesmosis

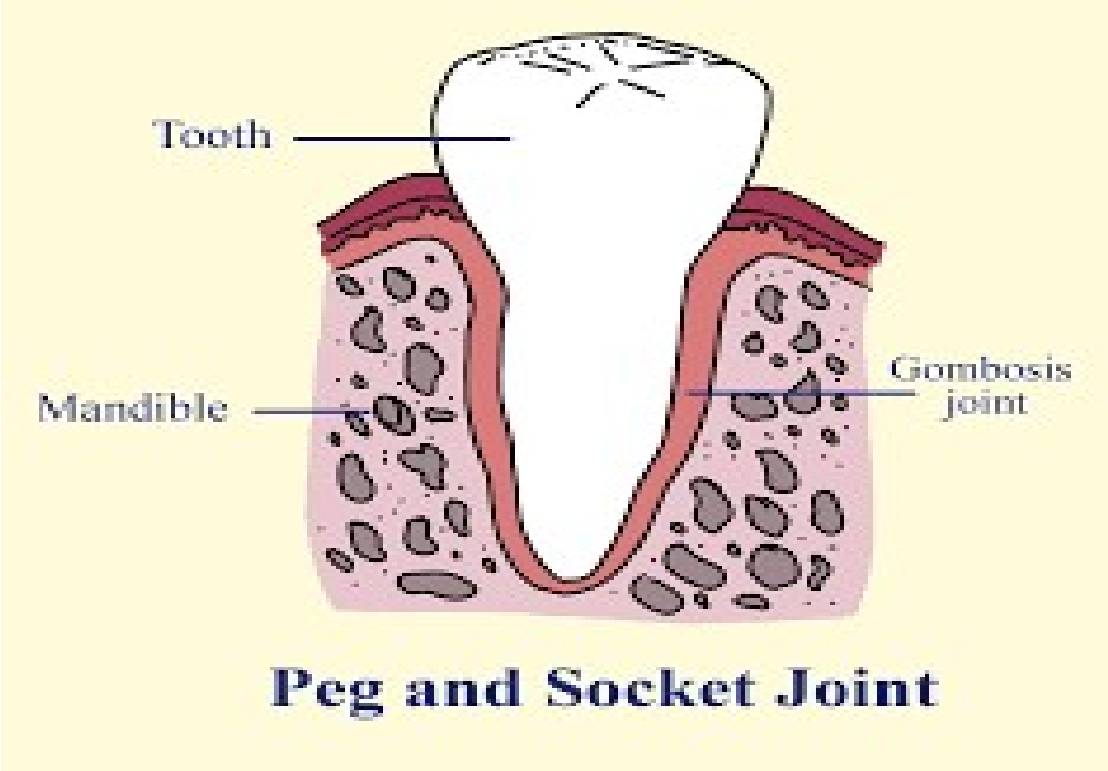
- **The distence between articulated bones are biger than suture with more fibrous connective tissues.**
- **The C.T can be arranged as bandle (ligement) or sheet (interosseous membrane)**
- **Amphiarthosis: which mean limited movement**

Ex: Anterior Tibiofabular joint, interosseous memberane in leg and arm.



Gomphoses

- Cone shape pegs in bony socket
- Synarthosis
- Ex: Teeth



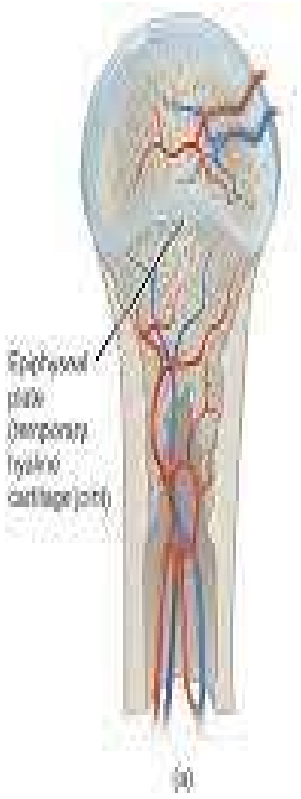
Cartilaginous Joint

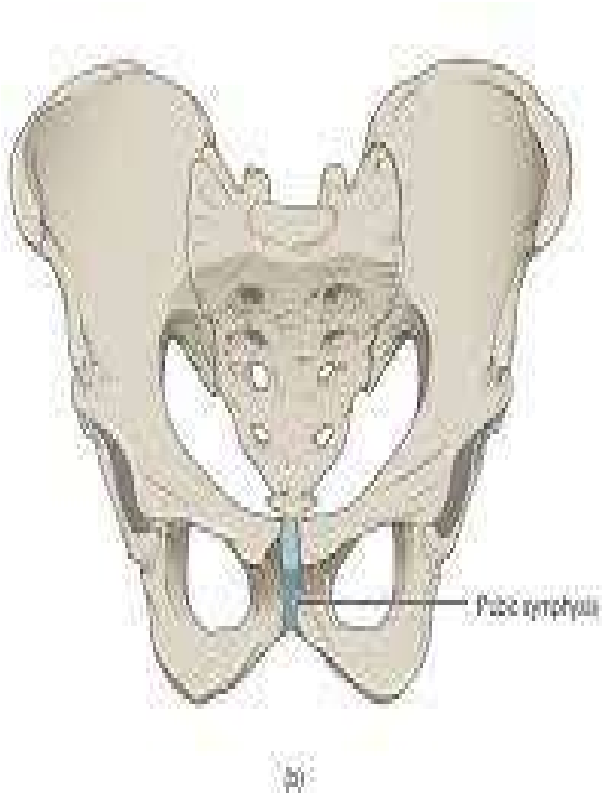
- Bones united by cartilage
- There is no joint cavity
  - Synchondrosis: Hyaline cartilage united bones
  - Symphyses: Fibrocartilage united bones

Synchondrosis

Hyaline cartilage is the material that connected bones

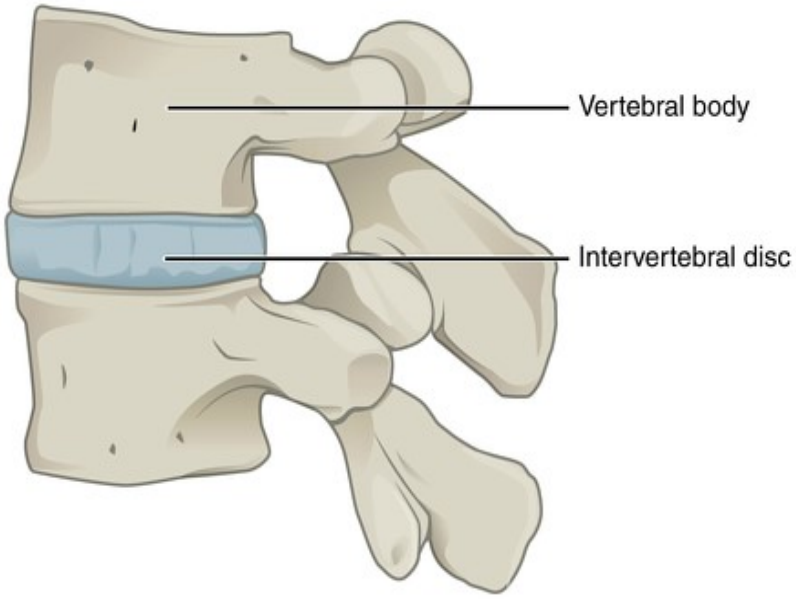
- **Synarthrosis**
- **Ex: Epiphyseal plates of bone**
- **Attachment between ribs and sternum**
- **Become synostosis when cartilage replace by bone**





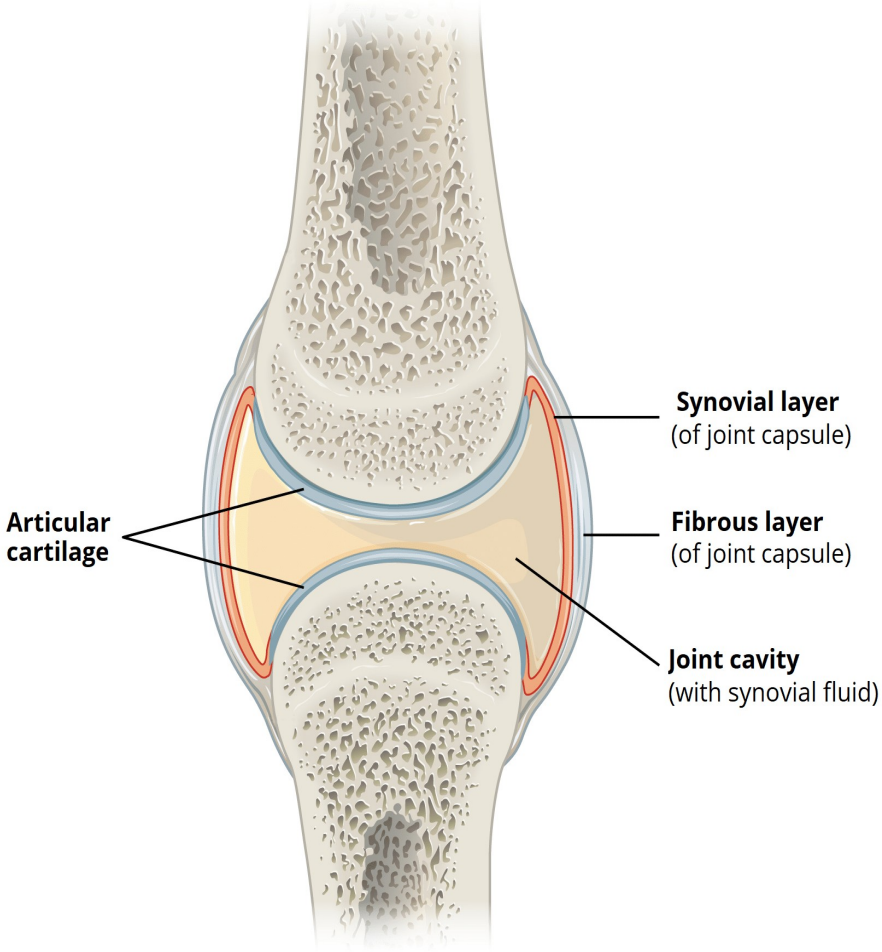
symphysis joint

- Cartilaginous joints composed of fibrocartilage.
- amphiarthroses: meaning permit a slight movement
- Ex: interverterbral disc
- Found in midline of skeleton



Synovial joint

- Most movable joint in the body
- There is a joint cavity (synovial fluid and synovial cavity)
- Articular cartilage cover the end of oppsing bones.
- articular capsule is an envelope surrounding a synovial joint. Each joint capsule has two parts: an outer fibrous layer or membrane, and an inner synovial layer or membrane.

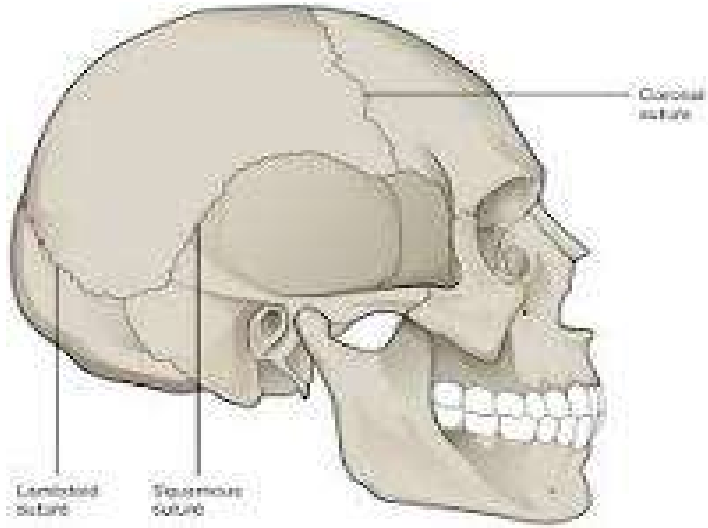


Classification based on function

- **Synarthroses: Immovable joint like suture**
- **Amphiarthroses Slightly movable joint like in intervertebral disc.**
- **Diarthroses: movable joint like synovial joint.**

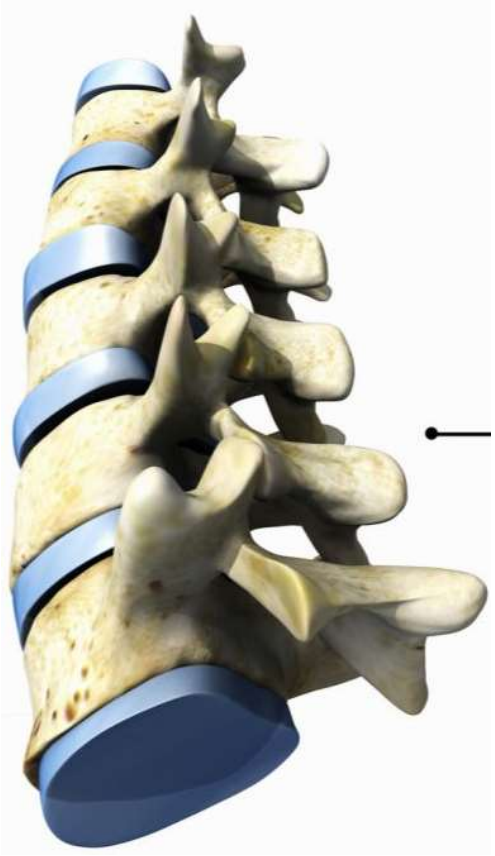
Synarthroses:

- Called sometime Synostosis or Syndesmosis
- Bone to bone union.
- Started as a fibrouse tissue between bones.
- Can be fibrous joint or ligemantous joint
- Immovable
- Ex: Suture between skull bones.



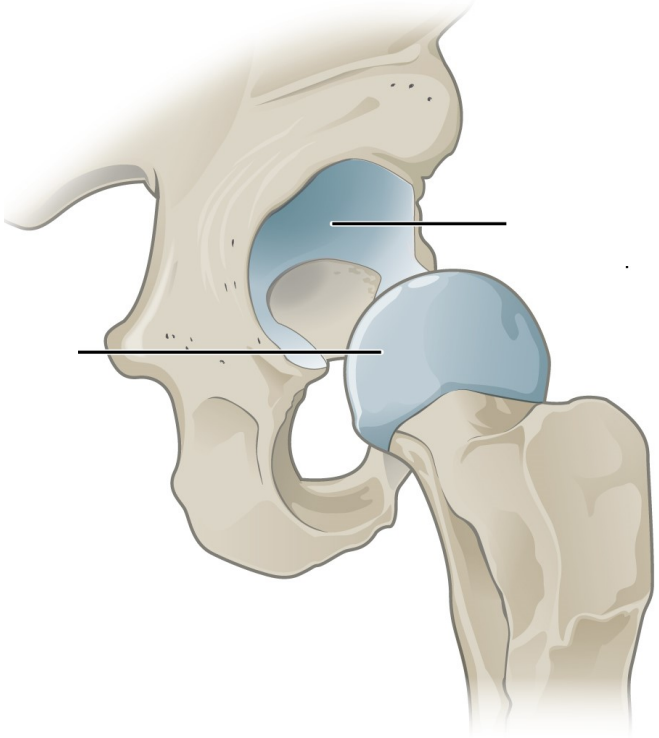
Amphiarthroses

- Cartilage between bones
- Movable and immovable
- This type of joints move slightly while keep providing protection.
- Ex: intervertebral disc



Diarthroses

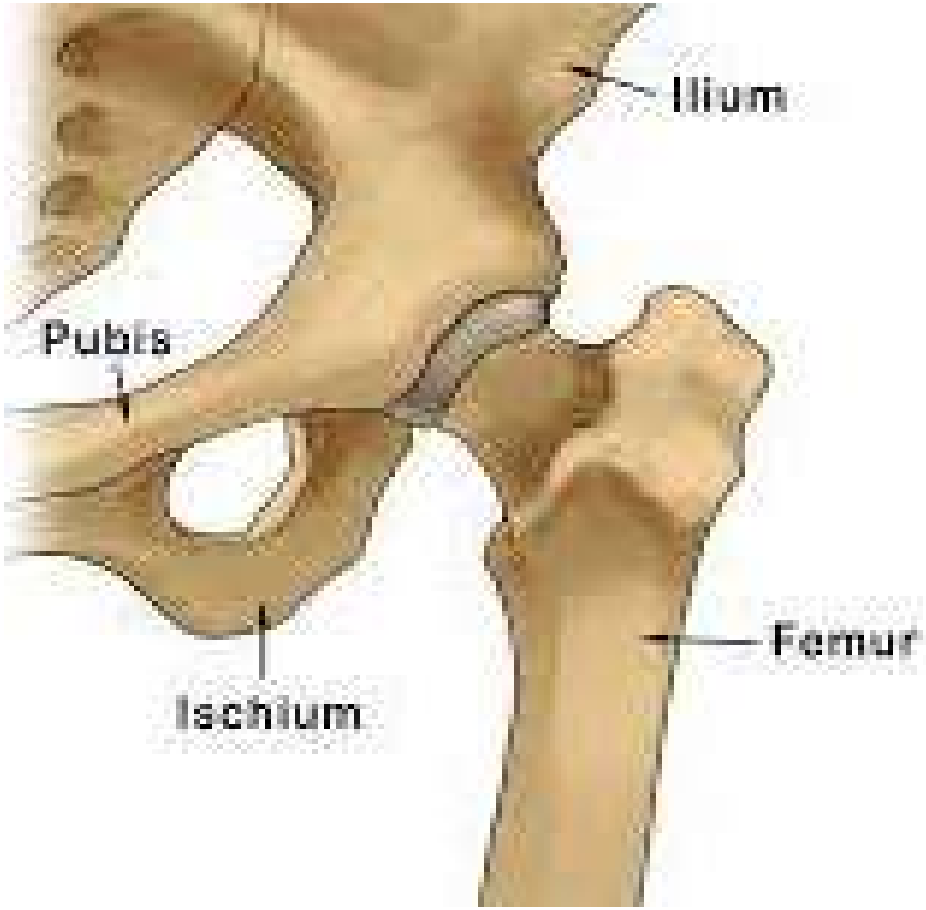
- Allow free movement
- Have three characteristics
- Synovial membrane
    - produce synovial fluid
    - protect friction
    - absorb shock
- Articular cartilage
- Capsule Dense connective tissue covering the joint



TYPE OF ARTICULATIONS

Ball and socket joint

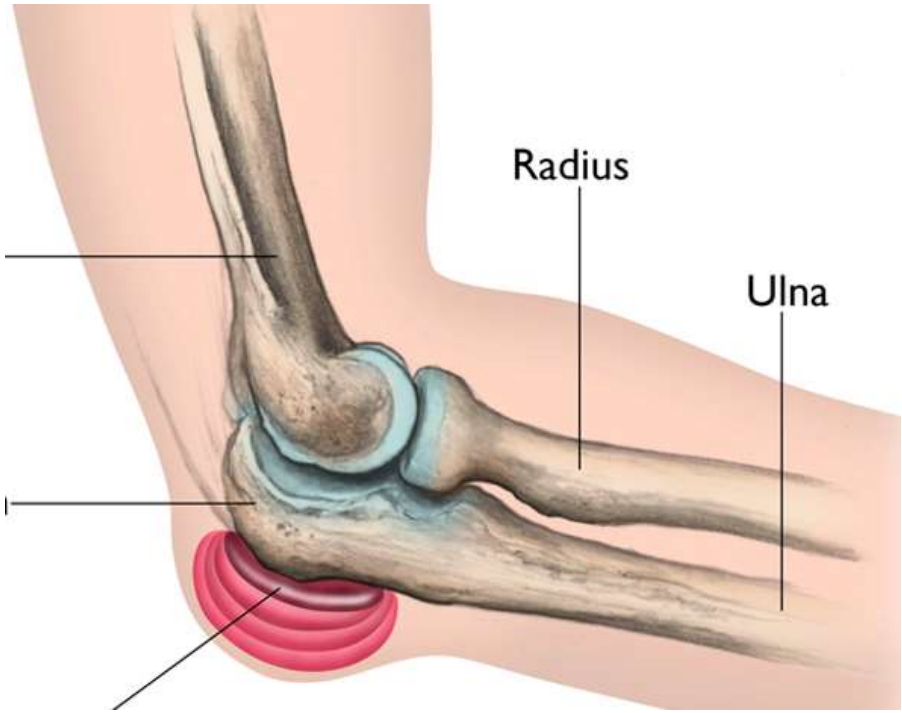
- Allow for more freedom movement
- Movement: flexion, extension, abduction, adduction, and rotation.
- Biaxial: two directions



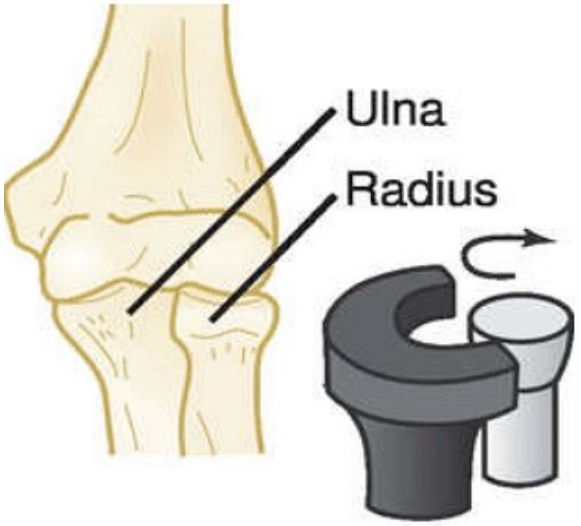
TYPE OF ARTICULATIONS

Hinge joints

- **Uniaxial: allow the movement in one direction front and back.**
- **Allow the flexion and extension only.**
- **Ex: elbow joint**

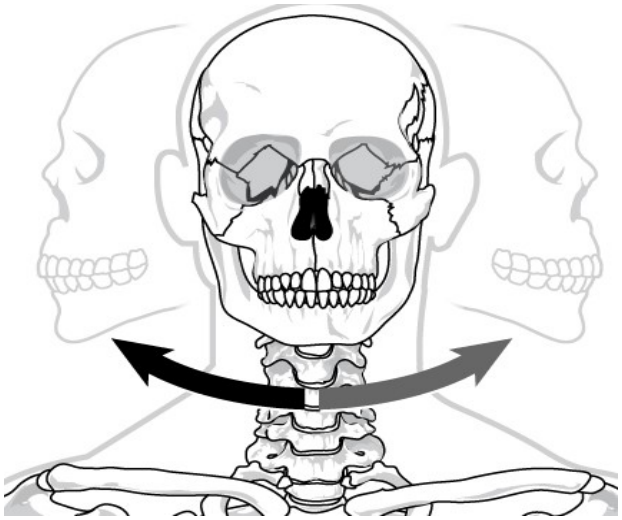


TYPE OF ARTICULATIONS



Pivot joints

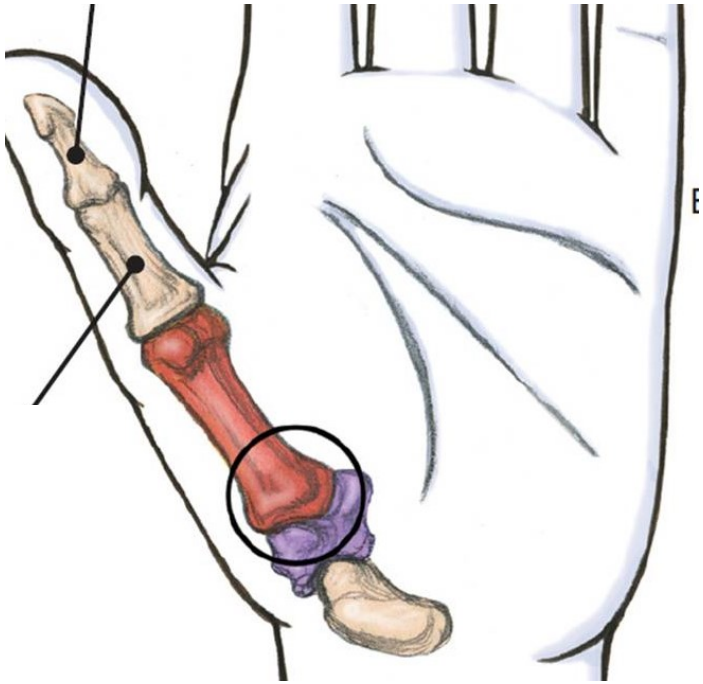
- **Uniaxial: allow the movement in one direction.**
- **Allow the rounded and pointed only.**
- **Ex: The joint between redius and ulna and pivot joint in neck.**



TYPE OF ARTICULATIONS

Saddle joints

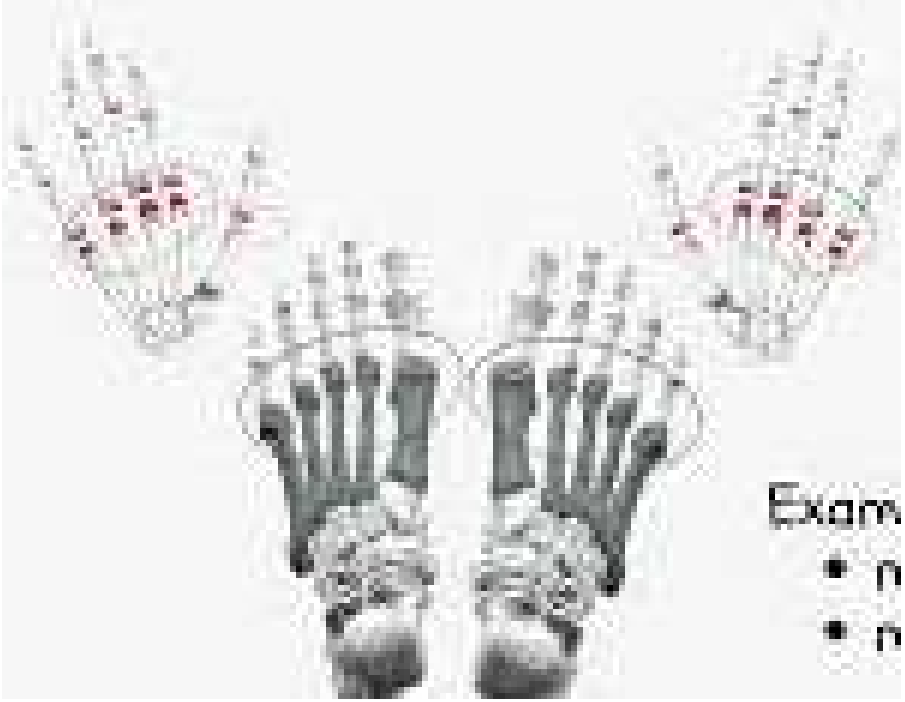
- **Biaxial: allow the movement in two directions.**
- **Allow the flexion, extension, abduction, adduction, and circumduction movement.**
- **Ex: The joint in the thumb.**



TYPE OF ARTICULATIONS

Condyloid joints

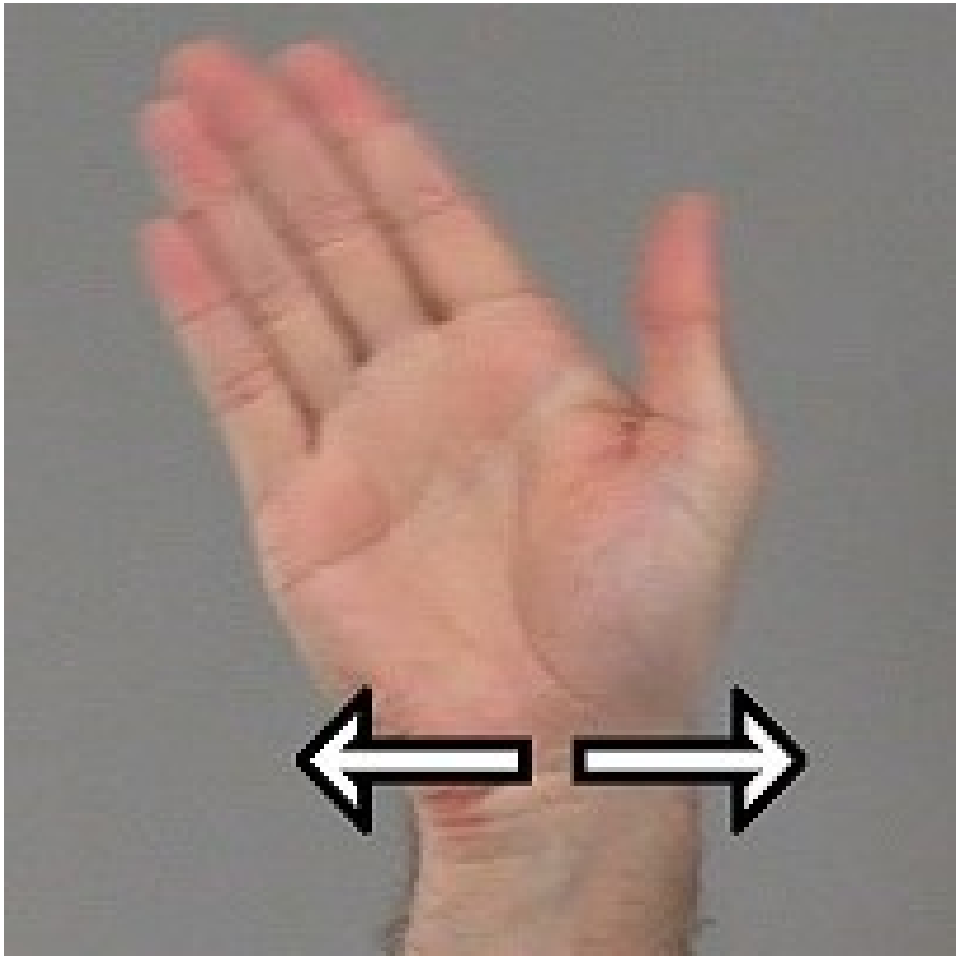
- One bone is concave shape and the second bone convix shape
- Biaxial: allow the movement in two directions.
- Allow the flexion, extension, abduction, and adduction, but no rotation movement.
- Ex: The joint in the toes and fingures.



TYPE OF ARTICULATIONS

Sliding or gliding joints

- Biaxial: allow the movement in two directions.
- Side to side and back and front
- Bones are flat shape slide one over each other
- Ex: The joint in the ankles, wrist.



Basic structure and general anatomy

Articular capsules:

- **Encloses the joint cavity.**
- **Continuous with periosteum**
- **And lining with synovial membrane**

Basic structure and general anatomy

Synoival fluid :

- **Feed the cartilage.**
- **Slippery fluid**
- **Synovial fluid production is from fibroblast like type B synovial cells.**
- **Contain hyaluronan, lubricin, proteinase, collagenases, and prostaglandins.**

Basic structure and general anatomy

Articular cartilage:

- **Hyaline cartilage cover the joint surface.**

Articular discs and menisci

- **Absorb shock, guide movement, and distribute force.**
- **Find in jaw, wrest, knee, and sternoclavical joint.**

Tendon: attach bone to muscle

Ligament: attach bone to bone

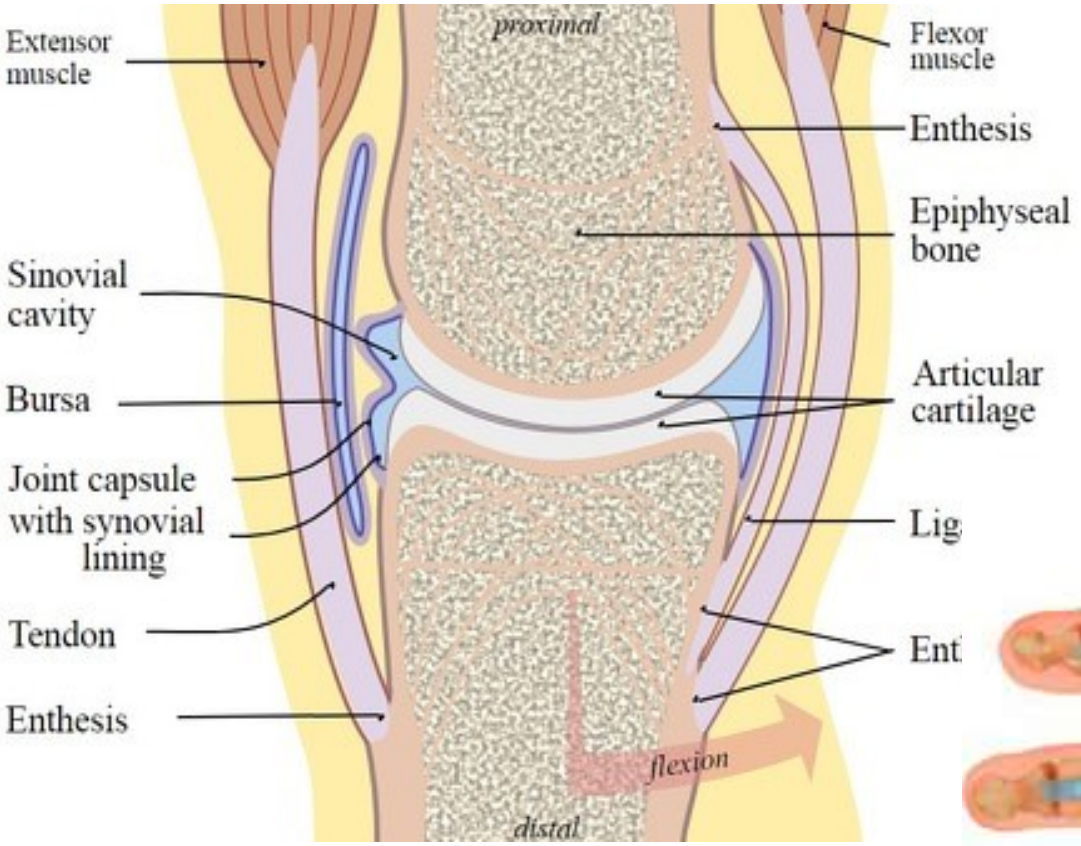
Basic structure and general anatomy

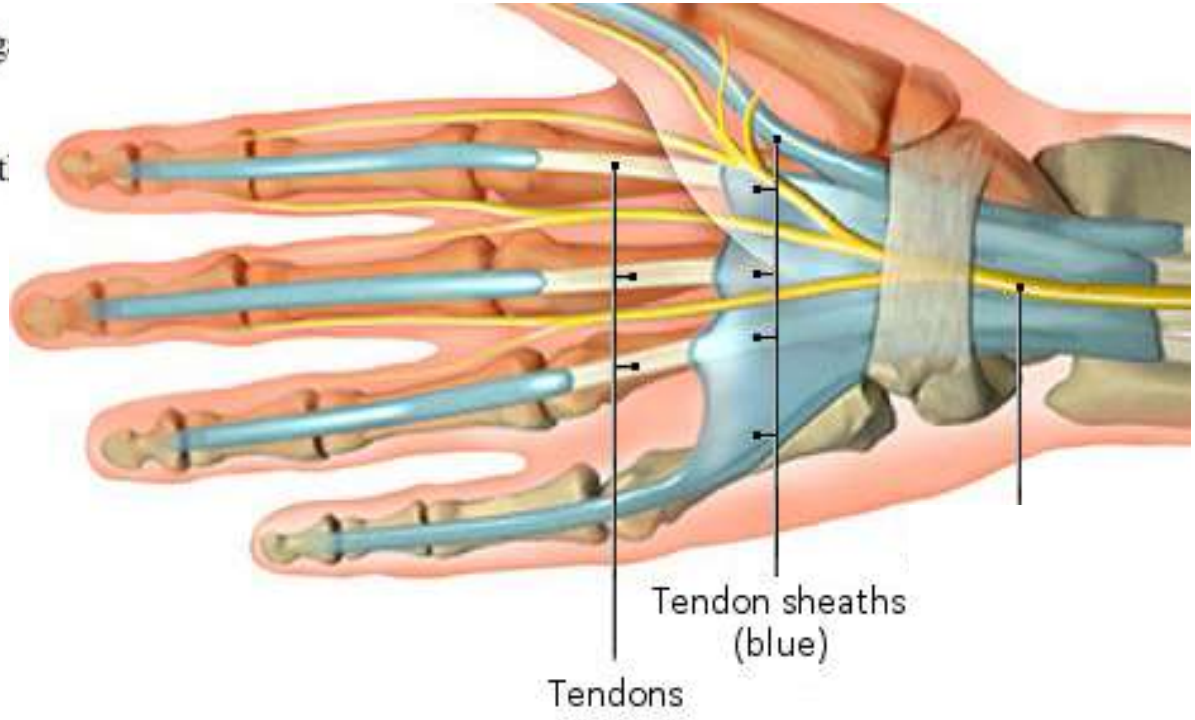
Bursa:

- Saclike estension of joint capsule.
- Located between close structure to make sliding more easy.

Tendon sheaths:

- cylinder connective tissue lining within synovisl membrane and wrapping around the tendon.


Extensor muscle
proximal
Flexor muscle
Enthesis
Epiphyseal bone
Sinovial cavity
Articular cartilage
Bursa
Joint capsule with synovial lining
Lig
Tendon
Ent
Enthesis
flexion
distal


Tendon sheaths (blue)
Tendons


THE
END