

University of Cihan-Sulaimaniya
College of Science
Department of ANS
Second year students



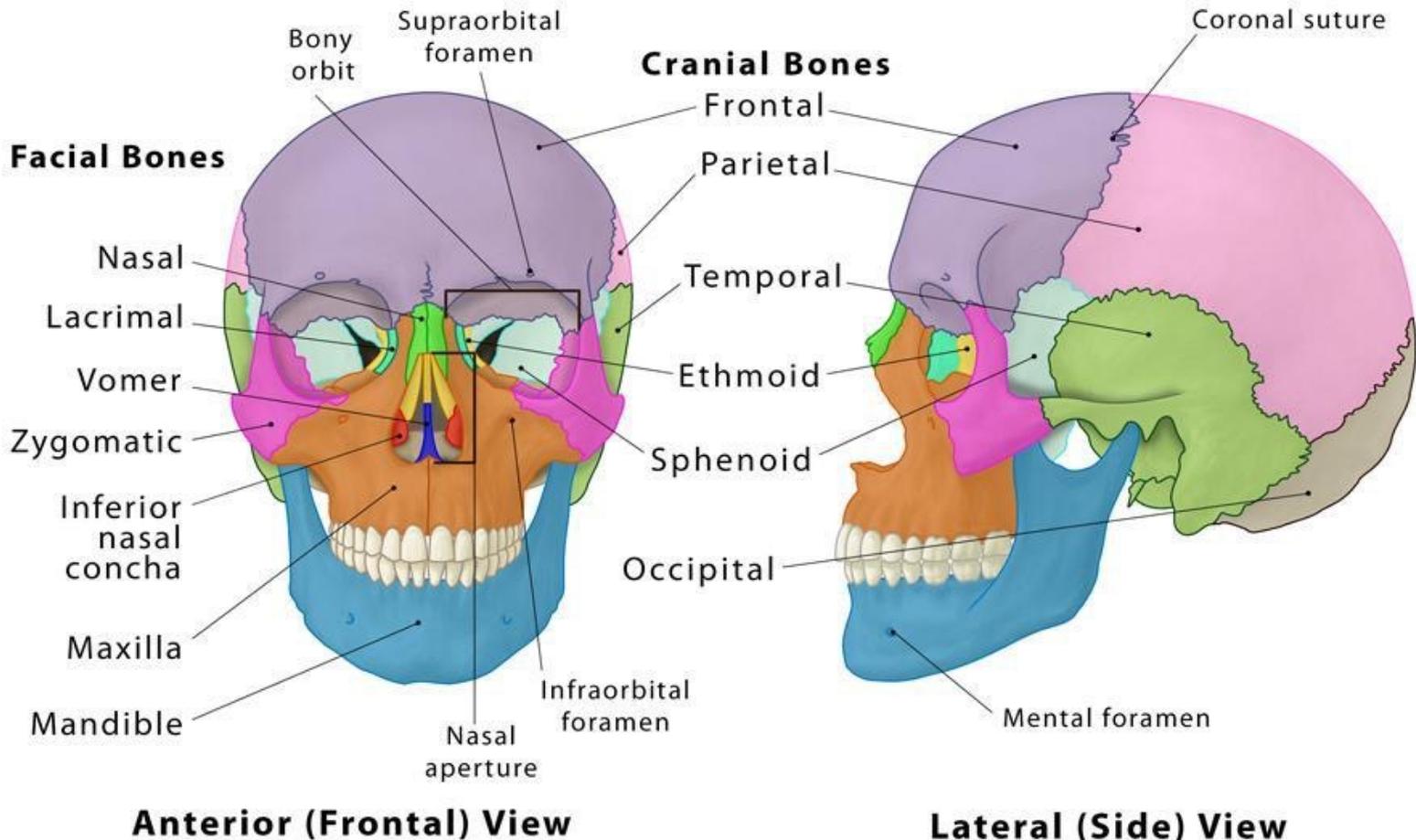
Human Anatomy

Lecture Three

Axial Skeleton

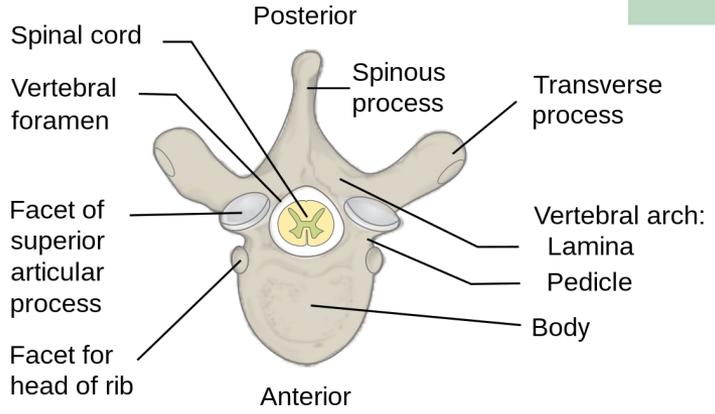
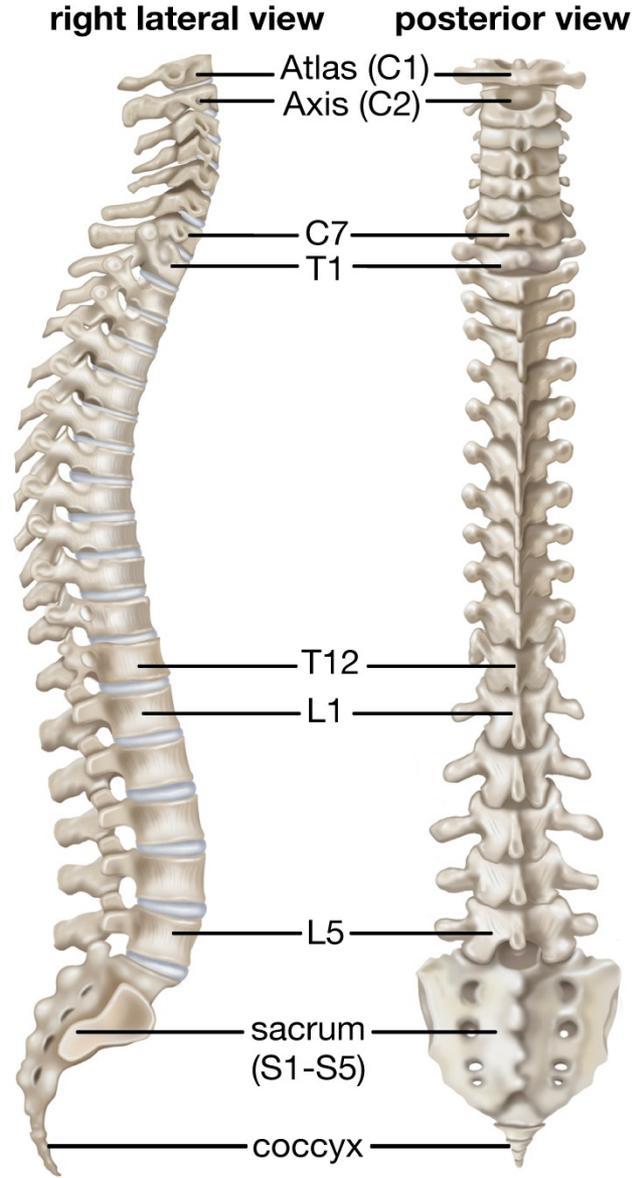
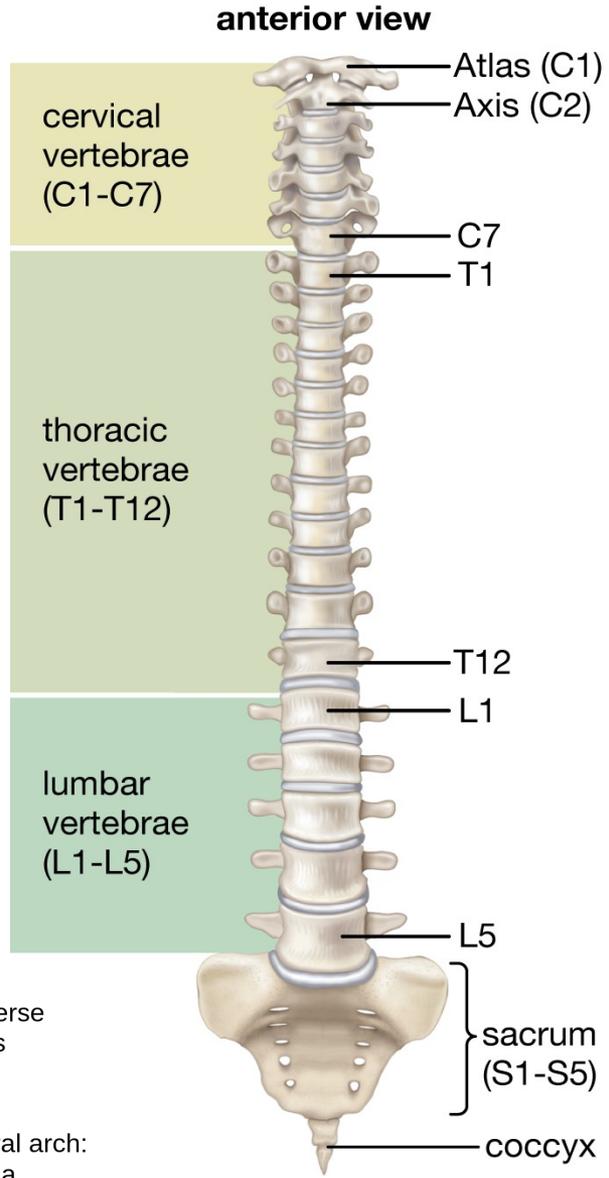
Is made up of the 80 bones within the central core of your body. This includes bones in your skull (cranial and facial bones), ears, neck, back (vertebrae, sacrum and tailbone) and ribcage (sternum and ribs)

- Skull
- Vertebrae
- Sternum
- Ribs



Vertebral column

- 1- Cervical 7
- 2- Thoracic 12
- 3- Lumbar 5
- 4- Sacrum 5
- 5- Coccyx 3-5



Ribs

Sternum

Thoracic Cage

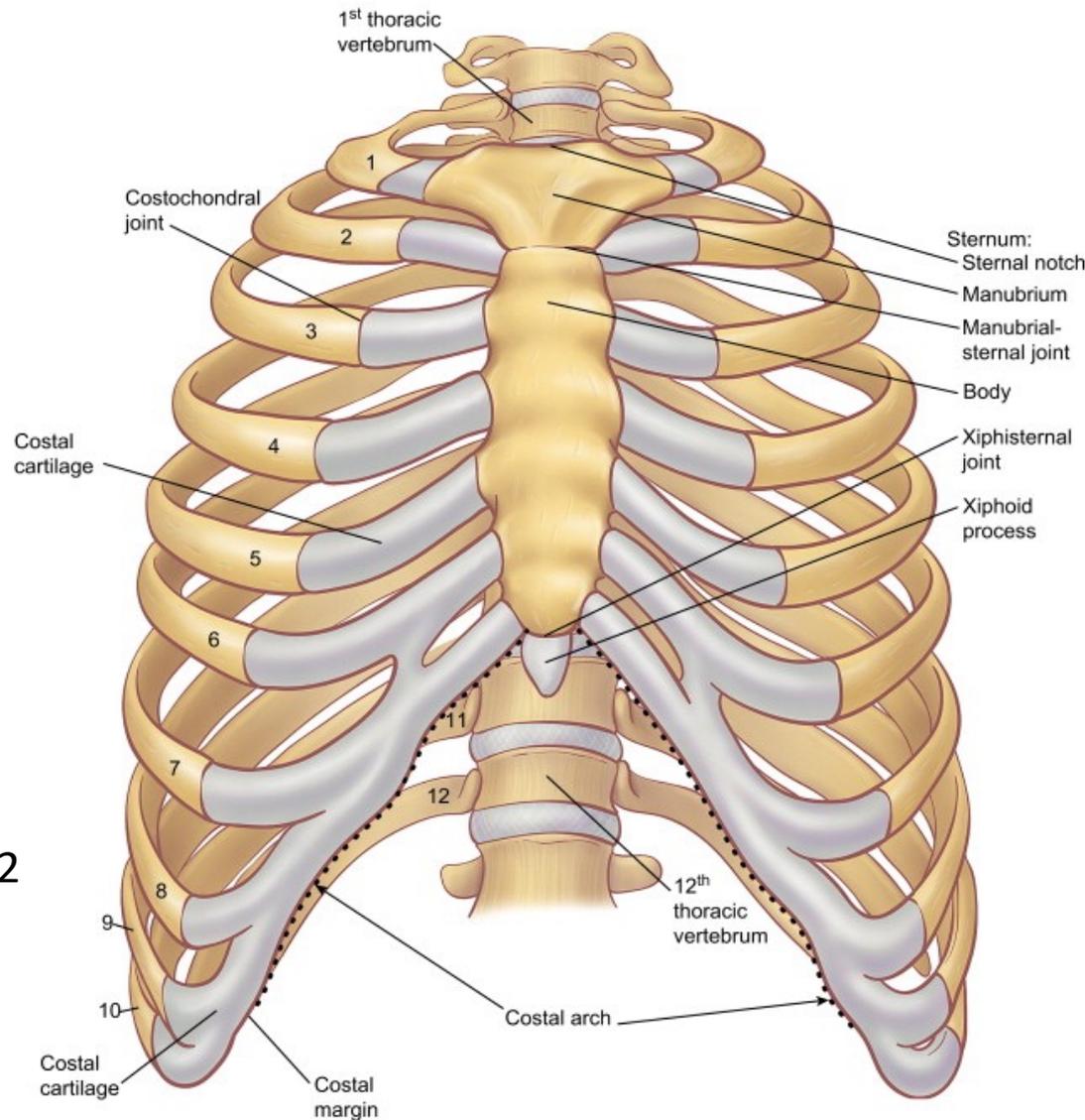
The thoracic cage is formed by the **A- sternum** and **B- 12 pairs of ribs** with their costal cartilages.

The ribs are anchored posteriorly to the 12 thoracic vertebrae.

The **sternum** consists of the manubrium, body, and xiphoid process.

The **ribs** are classified as **true ribs** (1–7) and **false ribs** (8–12).

The last two pairs of false ribs are also known as **floating ribs** (11–12).



Syndesmology (Arthrology)

Is the studying of joint and ligaments.

Joint or articulation; the union of two or more bones or cartilages by other tissue.

The uniting medium is chiefly composed of;

1-Fibrous tissue or

2-Cartilage or

3-Mixture of these

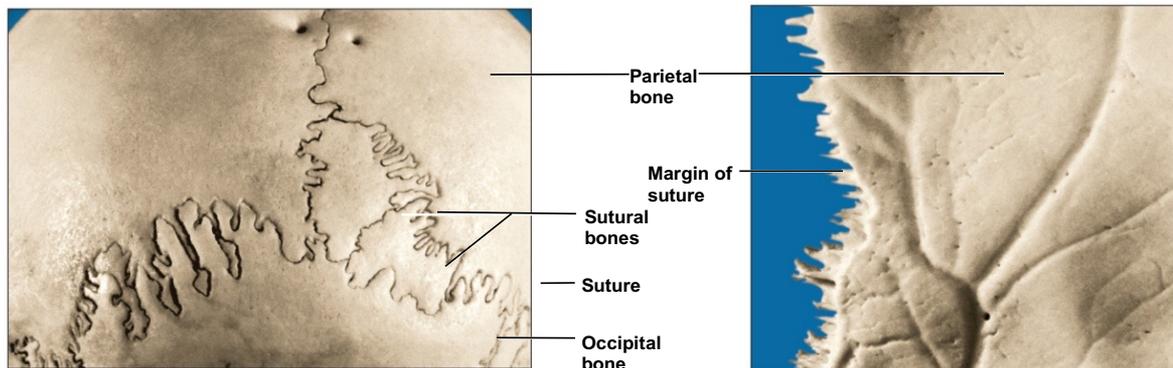
Classification of joints

The joints are classified according to the nature of uniting medium into;

A-Fibrous joint (synarthrosis); the uniting medium are fibrous tissue in such a manner that can not be able the joint to move, there fore called Fixed joint or immovable joint

The chief classes of fibrous joints are;

1-Suture joint; the term suture is applied to those joints in the skull (suture ligaments)



Types of suture joints are;

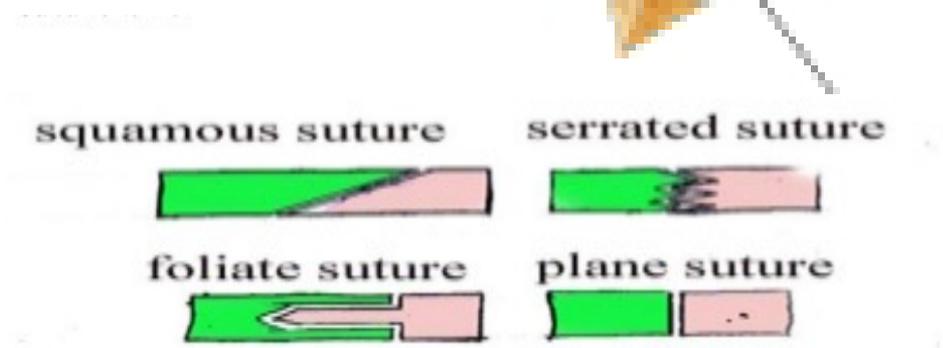
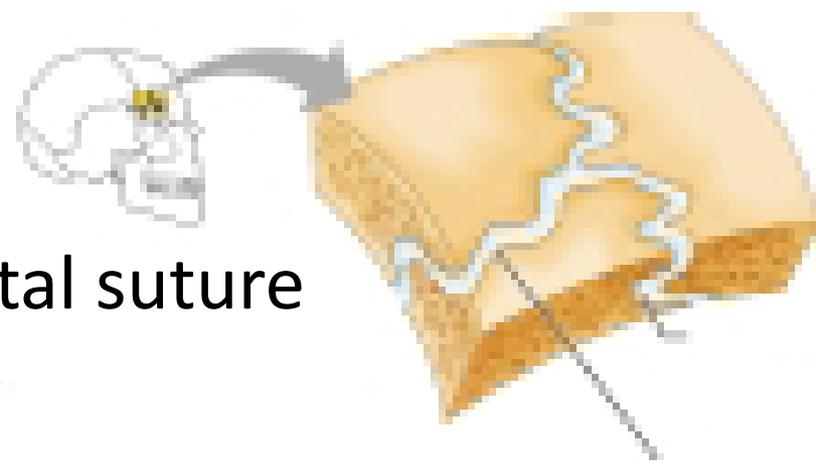
a- Serrated suture like inter-frontal suture

b- Squamous suture the joint between squamous parts of temporal and parietal bones

c- plane suture; the edges of the articulated bones are straight either smooth or rough like inter-nasal suture

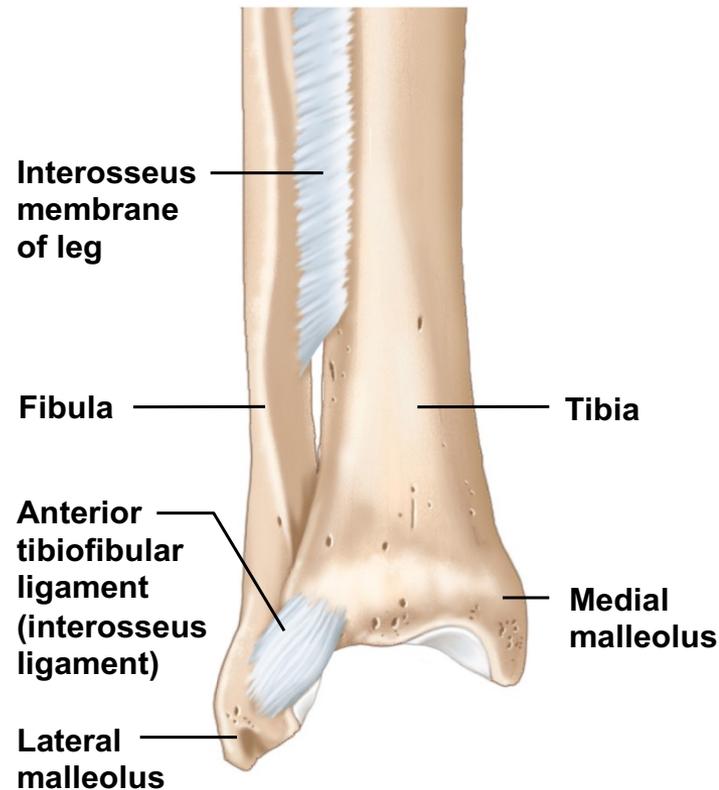
d- Foliate suture;

in which the edge of one bone fits or enters a fissure or recess of an adjacent bone.



2- Syndesmosis; in this type the uniting medium is white fibrous or elastic tissue or a mixture in a form of ligament called interosseous ligament like articulation between metacarpal bones or between radius and ulna.

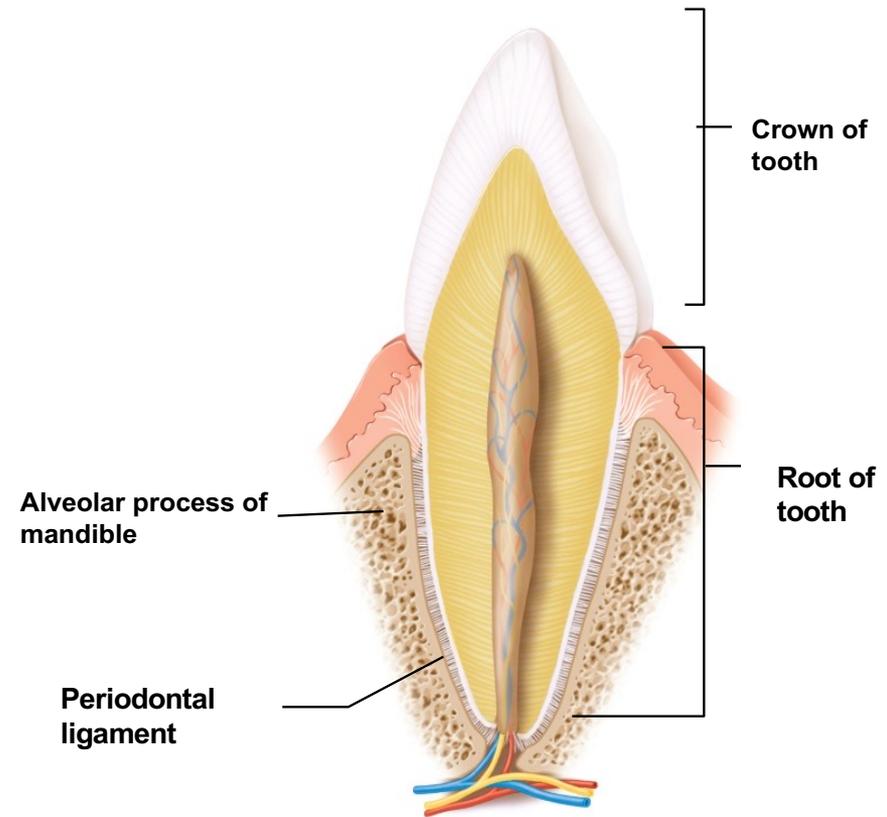
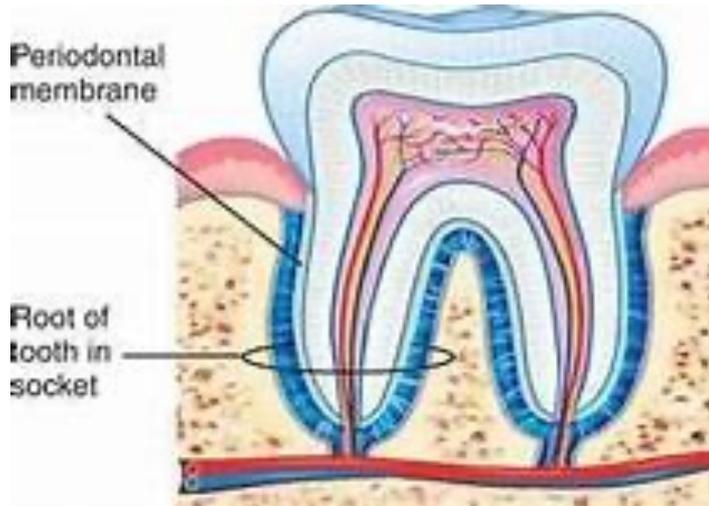
- **Syndesmosis:**
 - A sheet or bundle of fibrous tissue connecting bones
 - Lies between tibia and fibula (interosseous membrane)



3- Gomphosis

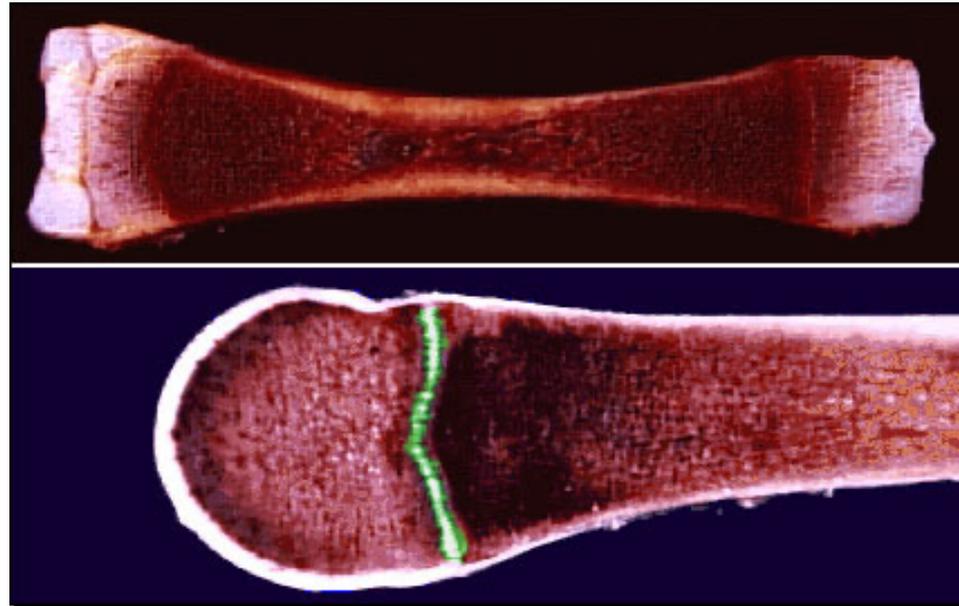
Cone-shaped bony process in a socket

The implantation of teeth in the alveoli.



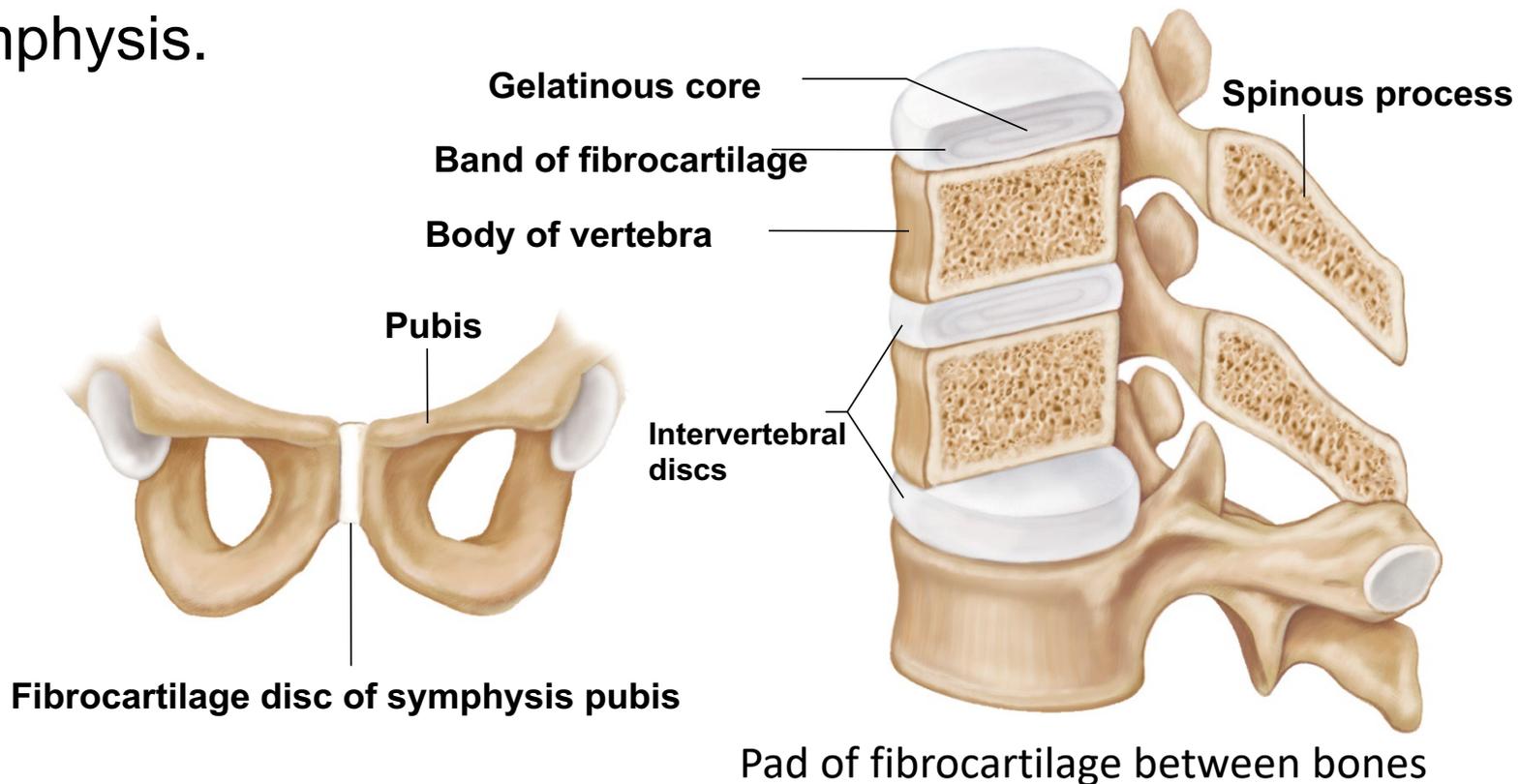
B-Cartilaginous joint (Amphiarthrosis); the uniting medium are fibro cartilage or hyaline cartilage or a mixture of both.

1-Primary cartilaginous joints; these are temporary joint because the uniting medium (hyaline cartilage) is converted into bone before adult life, like the union of epiphysis with diaphysis.



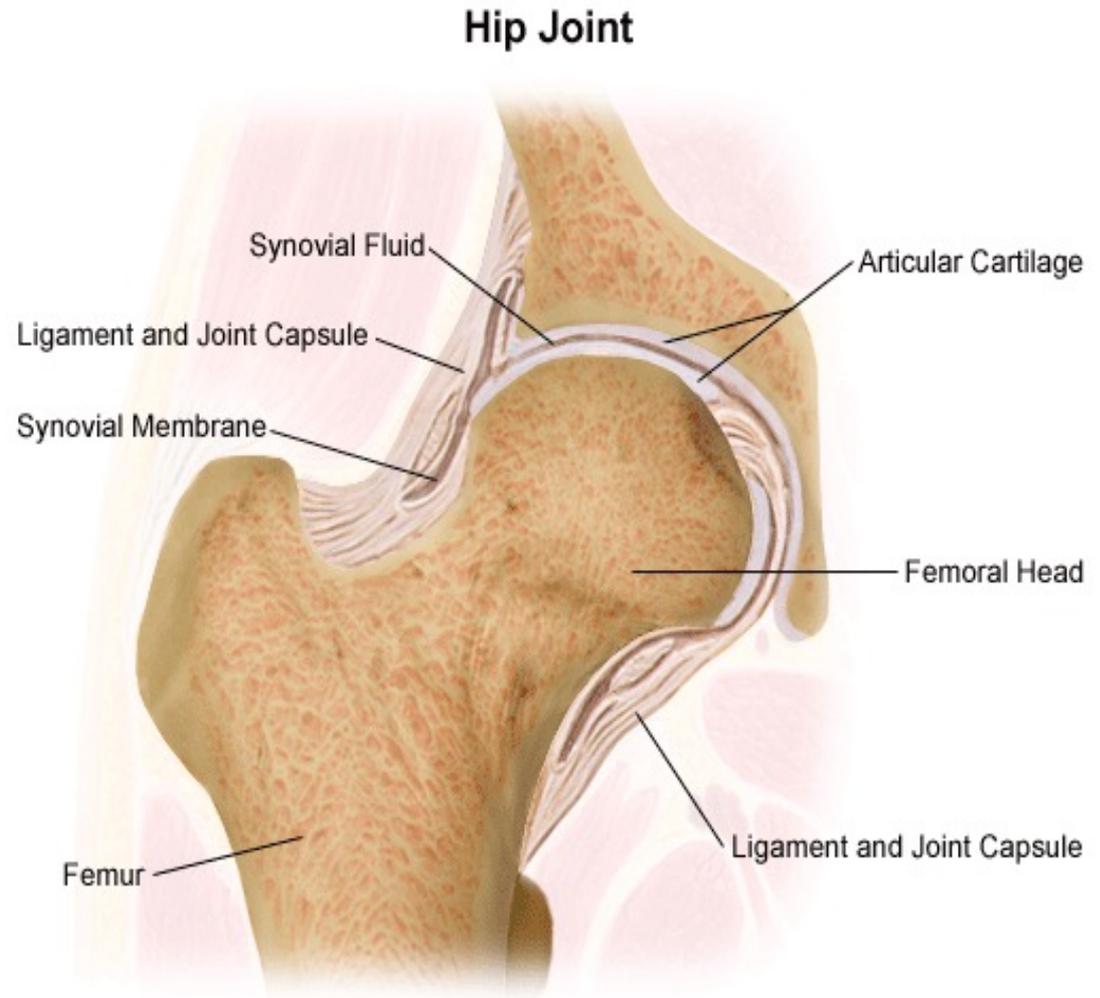
2-Secondary cartilaginous joint or Fibrocartilagenous joint or symphysis;

this type are permanent joint located in the median plane of the body, the uniting medium is fibrocartilage it is have a limited movement, like fibrocartilagenous intervertebral disc and the pelvic symphysis.



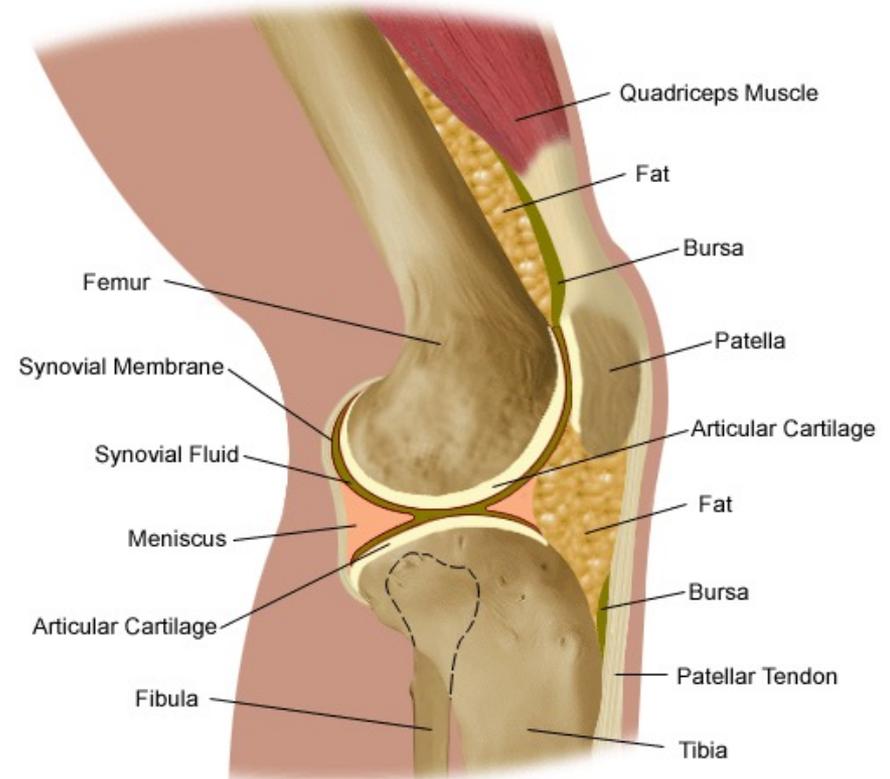
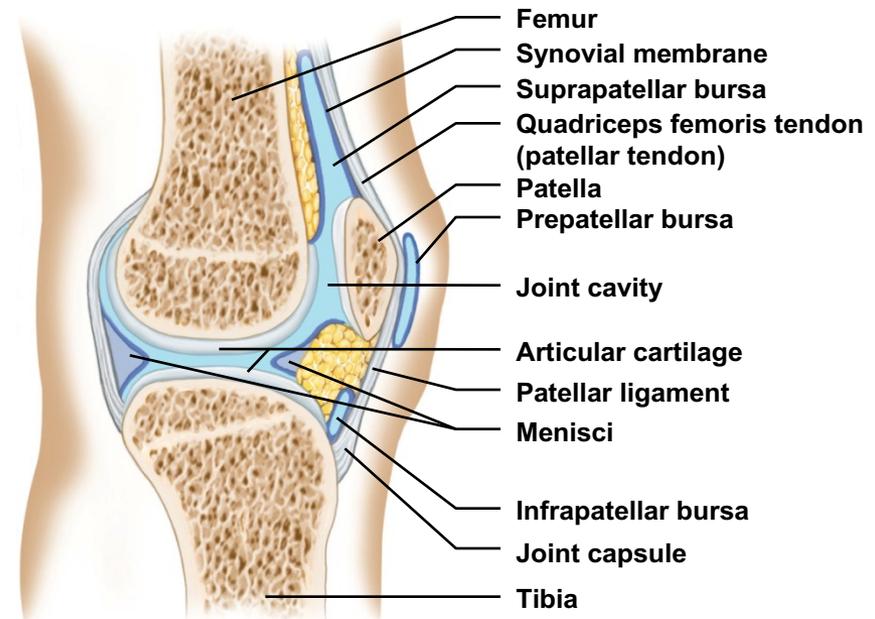
C-Synovial joint (Diarthrosis); called movable or true joint.

- 1-Articular surface
- 2-Articular cartilage
- 3-Articular capsule
 - a- Fibrous layer
 - b- Synovial layer
- 4-Ligaments



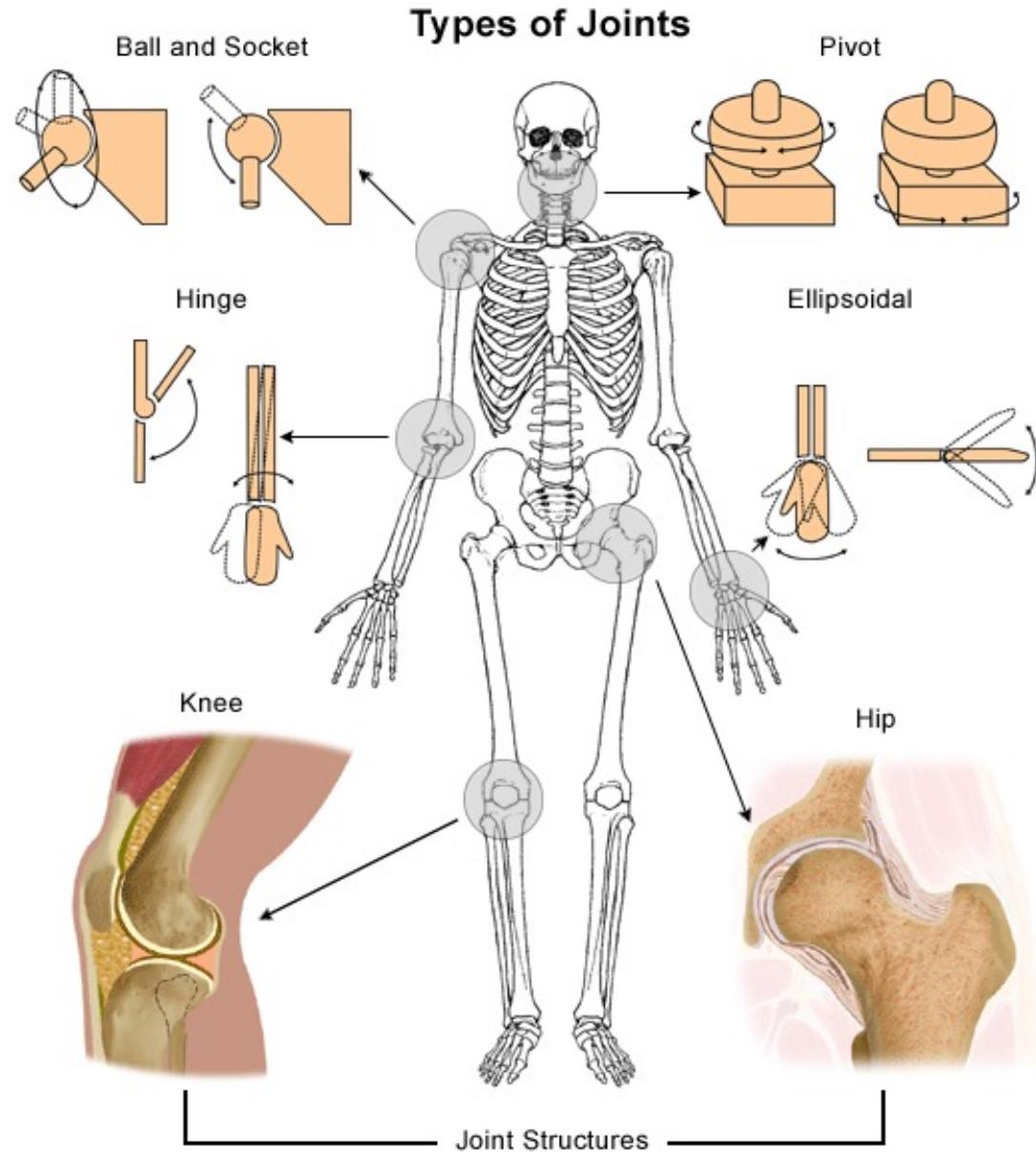
Knee Joint

- Largest joint
- Most complex
- Medial and lateral condyles of distal end of femur and
- Medial and lateral condyles of proximal end of tibia and
- Femur articulates anteriorly with patella
- Strengthened by many ligaments and tendons
- Menisci separate femur and tibia
- Bursae



Movement of synovial joint:

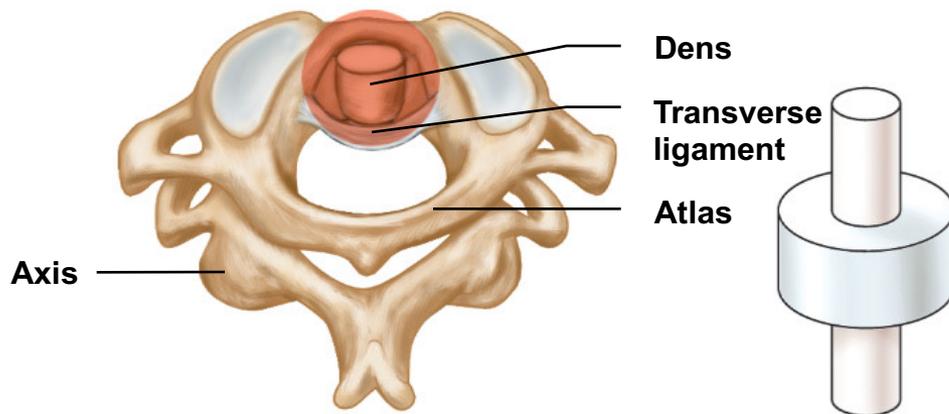
- 1-Gliding movement
- 2-Angular movement
 - a- Flexion
 - b- Extension
 - c- Adduction
 - d- Abduction
- 4-Circumduction
- 5-Rotation
- 6- Supination/pronation



Types of Synovial Joints

- **Pivot Joint**

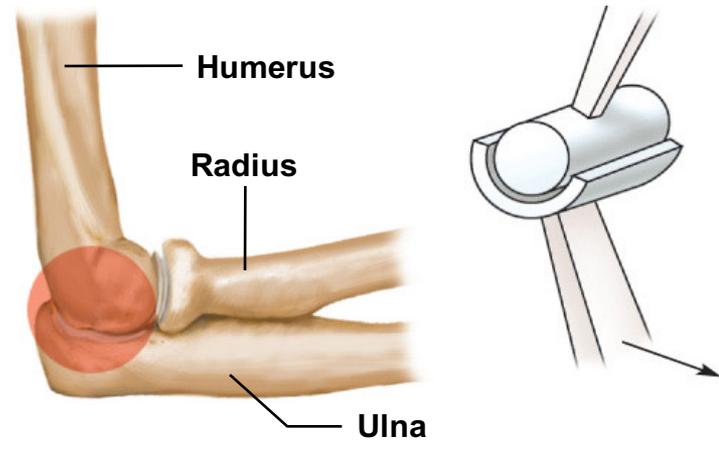
- Between atlas (C1) and the dens of axis (C2)



(e) Pivot joint

- **Hinge Joint**

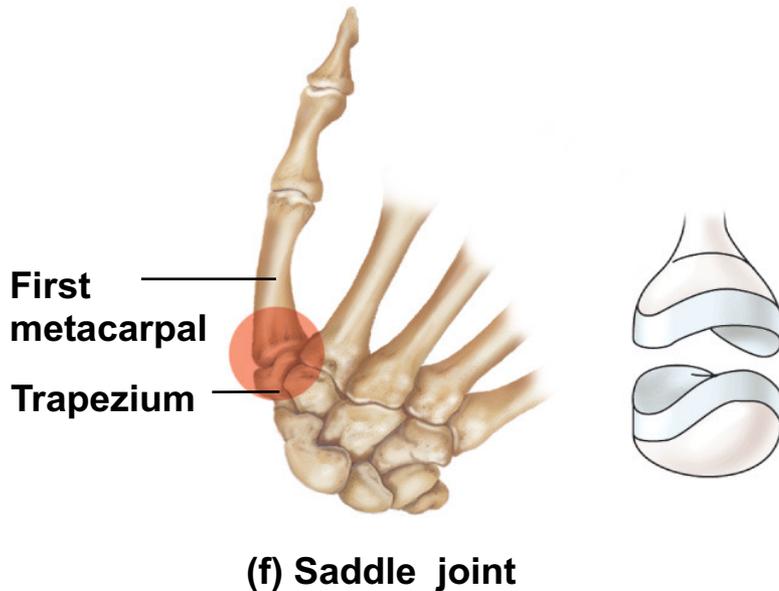
- Elbow joint
- Between phalanges



(d) Hinge joint

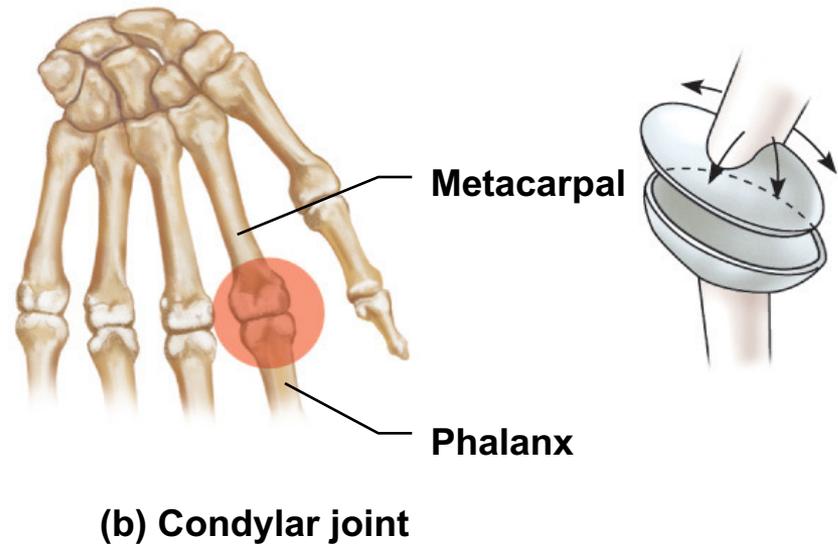
- **Saddle Joint**

- Between carpal and 1st metacarpal (of thumb)



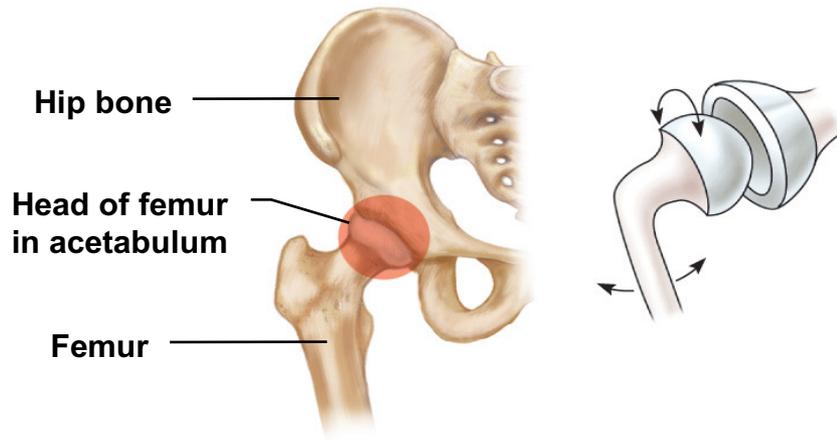
- **Condylar Joint**

- Between metacarpals and phalanges
- Between radius and carpals



- **Ball-and-Socket Joint**

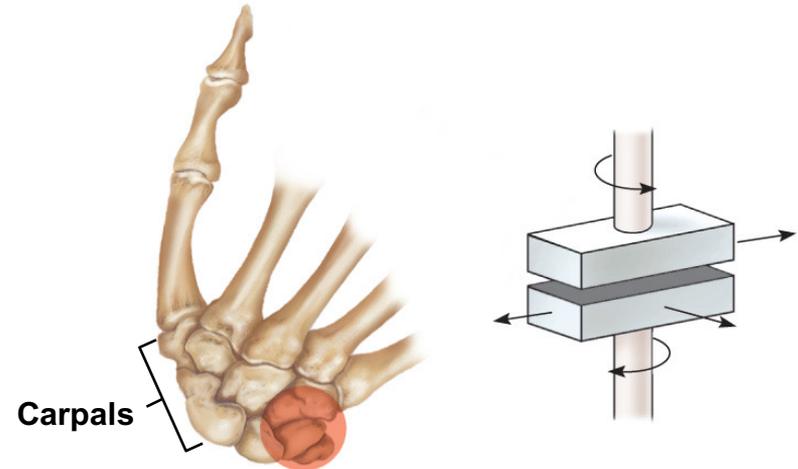
- Hip joint
- Shoulder joint



(a) Ball-and-socket joint

- **Gliding Joint**

- Between carpals
- Between tarsals
- Between facets of adjacent vertebrae



(c) Plane joint

Classification of synovial joint;

A-Numerical classification;

1-Simple joint

2-Composite or compound joint

B- Anatomical classification;

1-Ball and socket joint

2-Ellipsoidal joint, antibrachiocarpal and atlanto-occipital joint

3-Saddle joint, carpometacarpal and interphalangeal joint

4-Hing or ginglymus joint; cylindrical in shape, like elbow joint

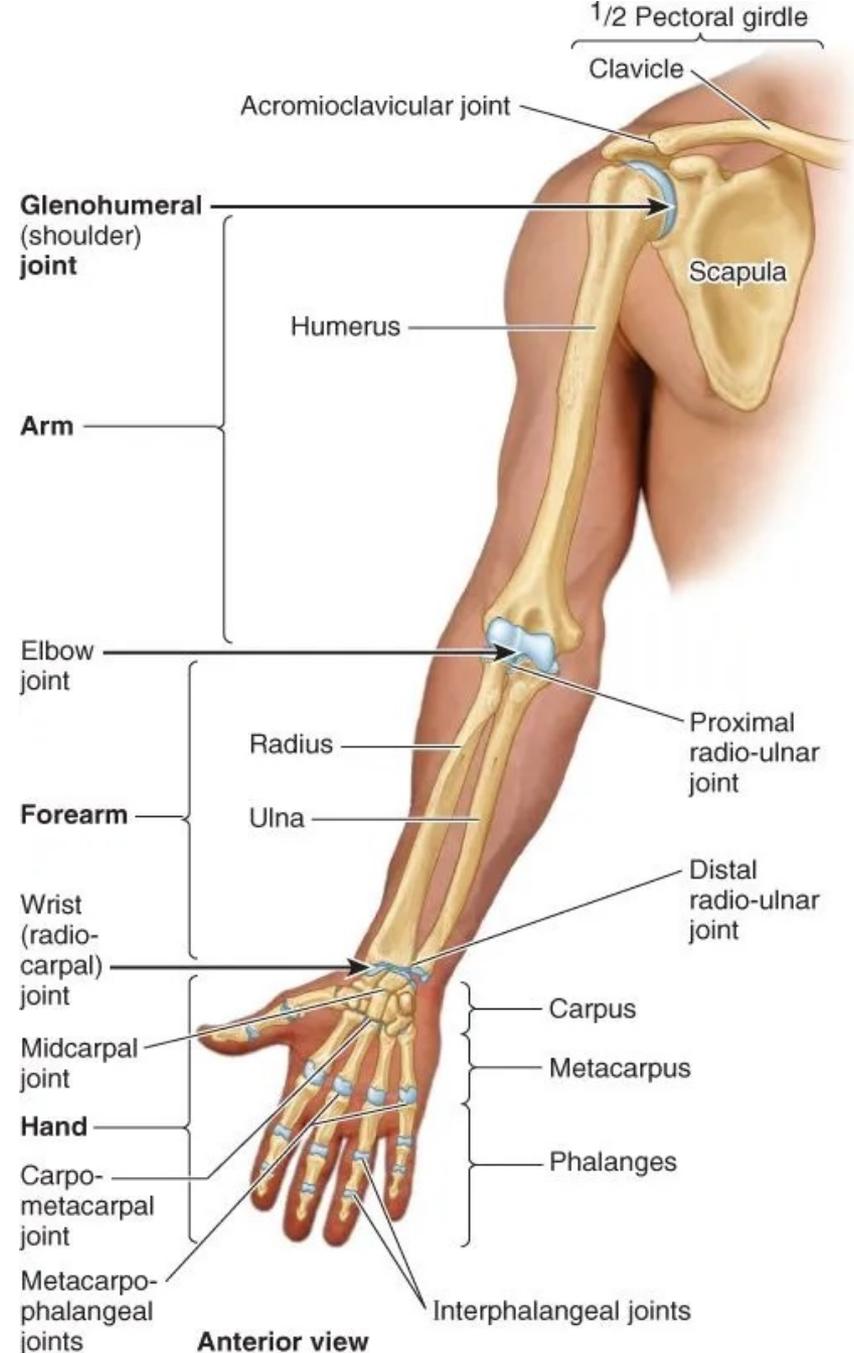
5- Condylar joint , stifle, knee

6-Trochoid joint , atlantoaxial joint

7-Plane joint, the articular surface is flat like carpal and tarsal joint

Joints of thoracic limb

- 1- Shoulder joint or Glenohumeral joint
- 2- Acromioclavicular joint
- 3- Elbow joint
 - Proximal radio-ulnar joint
- 4- Radio- carpal joint or Wrist
 - Distal radio-ulnar joint
- 5- Midcarpal joint
- 6-Carpo-metacarpal joint
- 7- Metacarpo-phalangeal joint
- 8- Interphalangeal joint



Joints of pelvic limb

1- Sacro-iliac joint

2- Hip joint

3- Knee joint

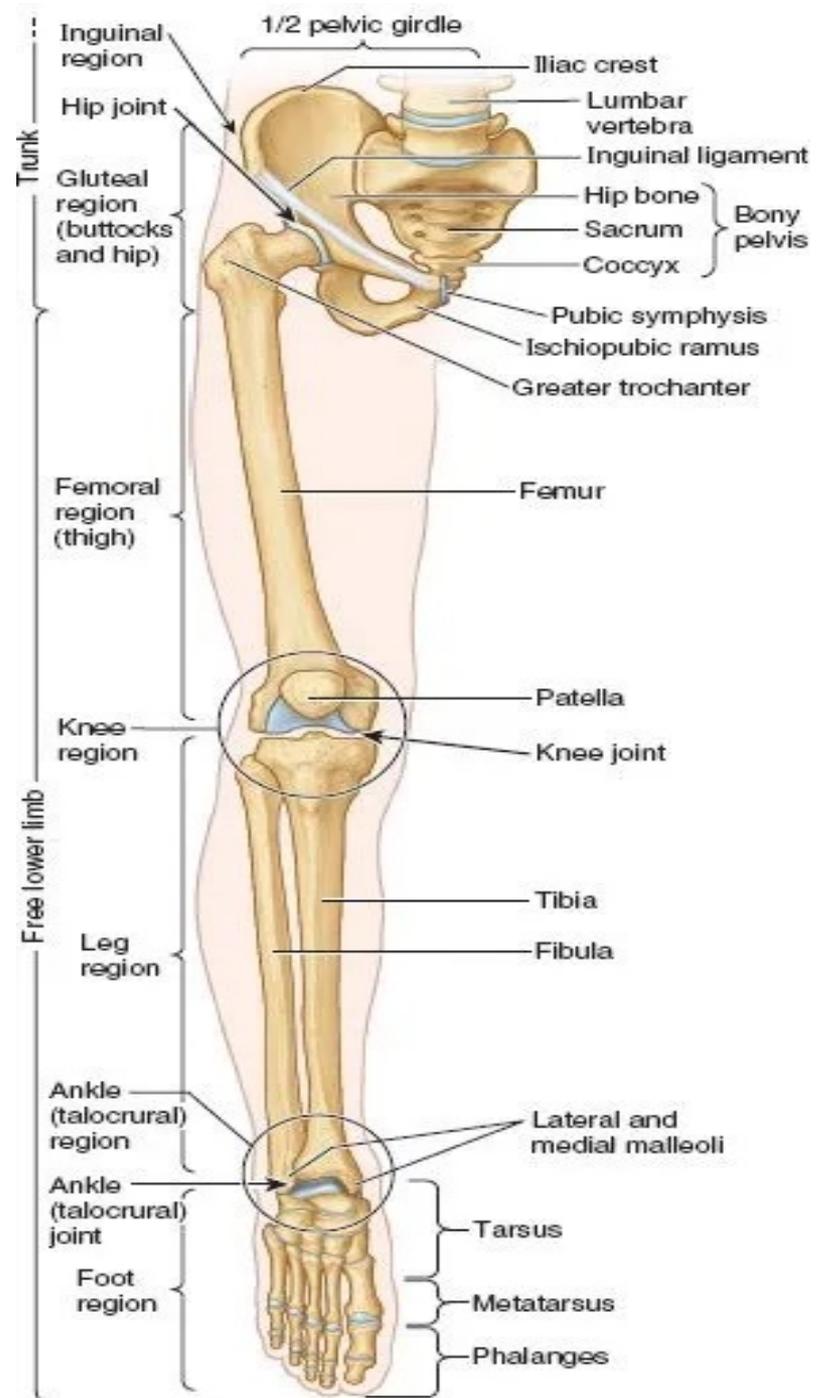
- Tibiofemoral joint
- patellofemoral joint

4- Tarsal joint

- Tibiotarsal joint
- Inter-tarsal joint(s)
- Tarsometatarsal joints

5-Metatarsophalangeal joint

6- Interphalangeal joint



Anesthesia/ Skeletal system

- General anesthesia
- Regional anesthesia
- Neuraxial or nerve plexus block with or without sedation.
- Hematoma block - local anesthetic agent injected directly in to the hematoma of the fractured bone