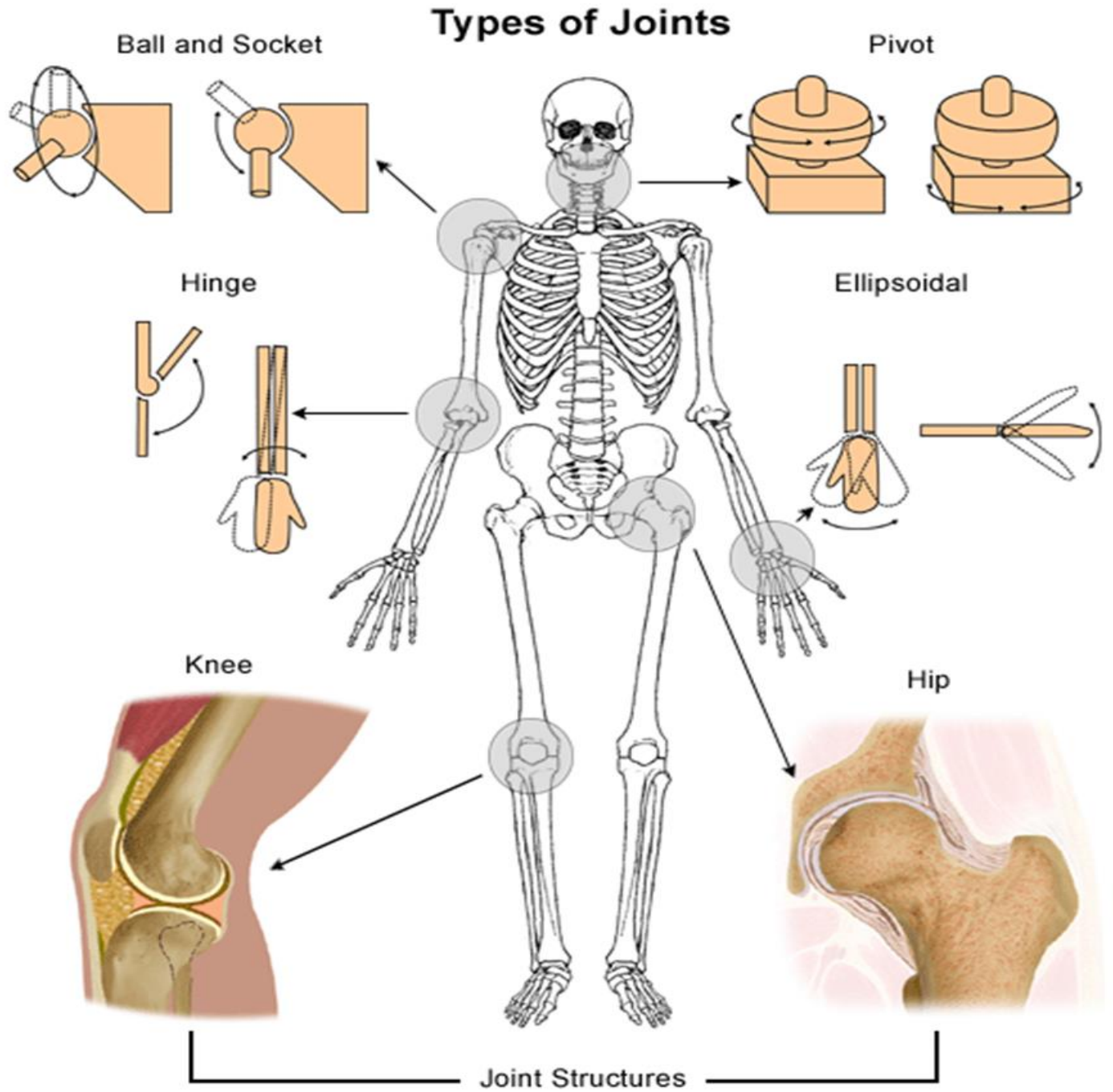
joints



By

DR. DALIA M. BIRAM

JOINTS

★ **Definition**: The joint is the point of meeting of two or more bones or cartilages.

STRUCTURAL classification of joints

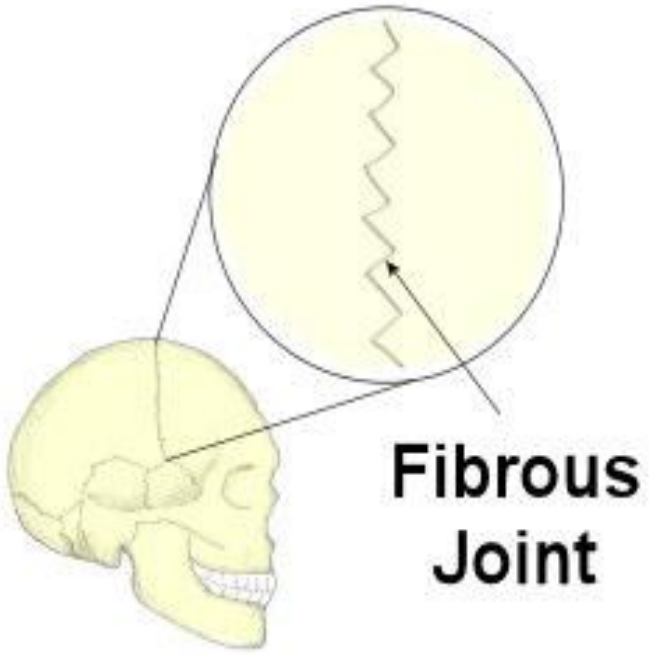
According to the substance between the articulating bons they are classified to:

I.Fibrous Joints

II. Cartilaginous Joints

III. Synovial Joints

A- Fibrous joints:



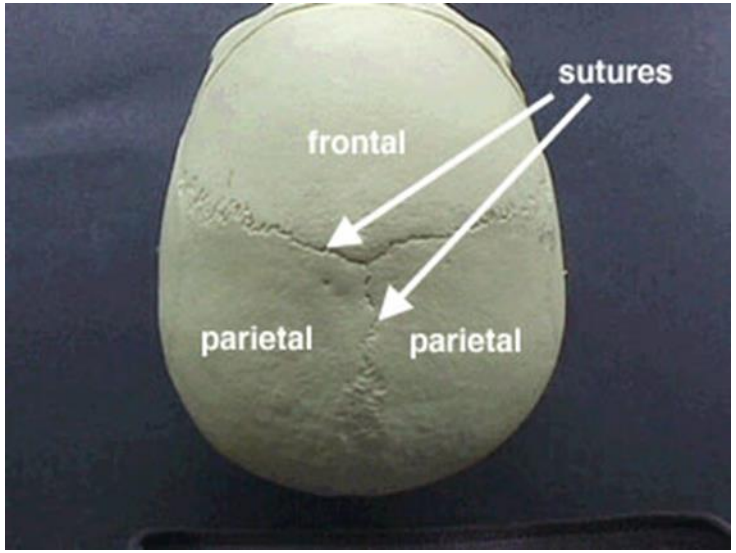
Fibrous joints connect bones without allowing any movement This type of joint is held together by fibrous tissue

Types of Fibrous joints

1-Sutures

The bones are separated by minimal amount of fibrous tissue (sutural ligament)

They are obliterated in **old age**

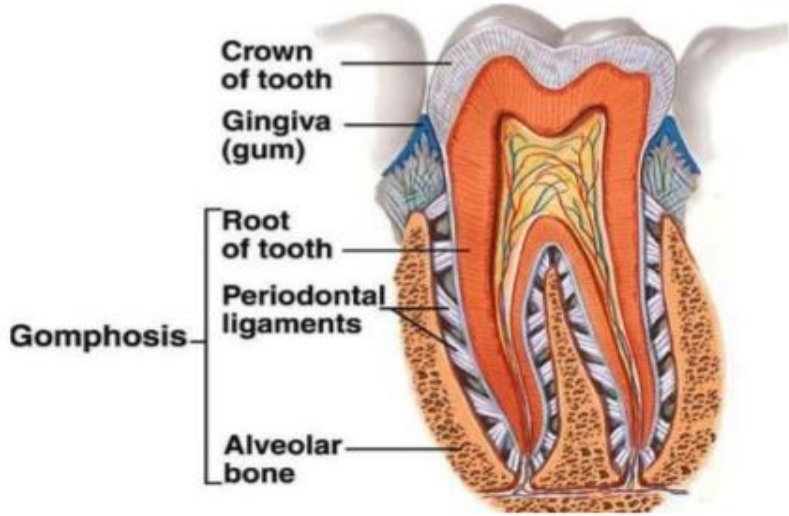


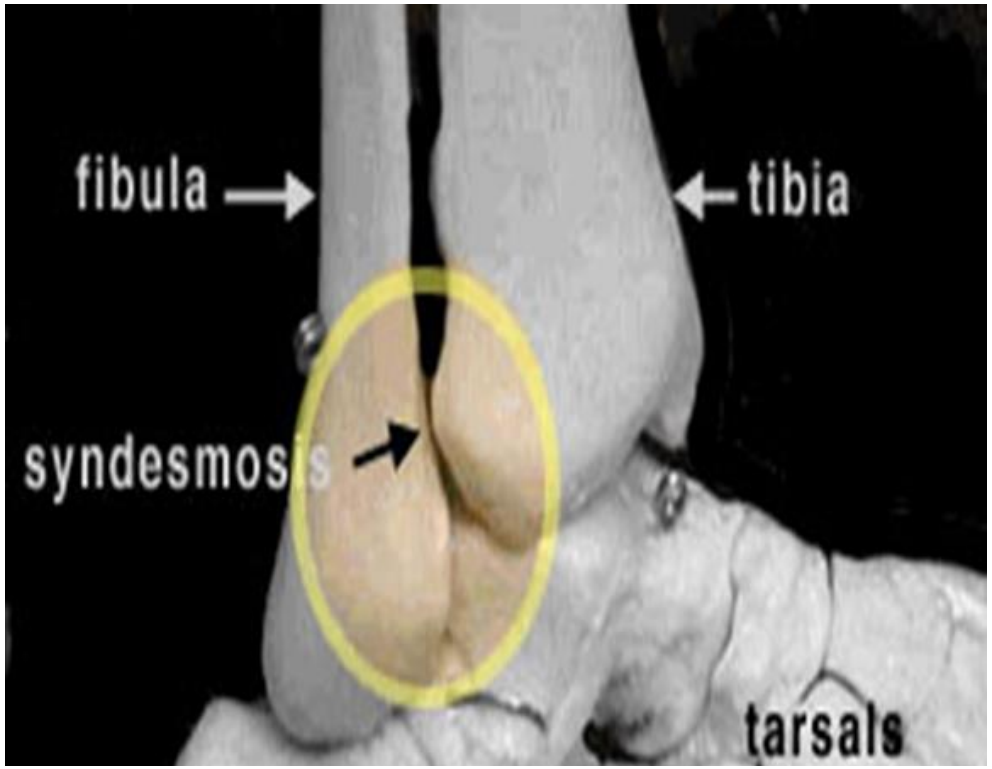
2-Gomphosis The bones are peg & socket. The bones are separated by **moderate** amount of fibrous tissue (**periodontal ligament**). Example: root of teeth & the alveolar margin of maxilla

3-syndesmosis

Bones are rough . The bones are separated by big amount of fibrous tissue (interosseous ligament).
Example:
inferior tibio-fibular joint
No movement is allowed

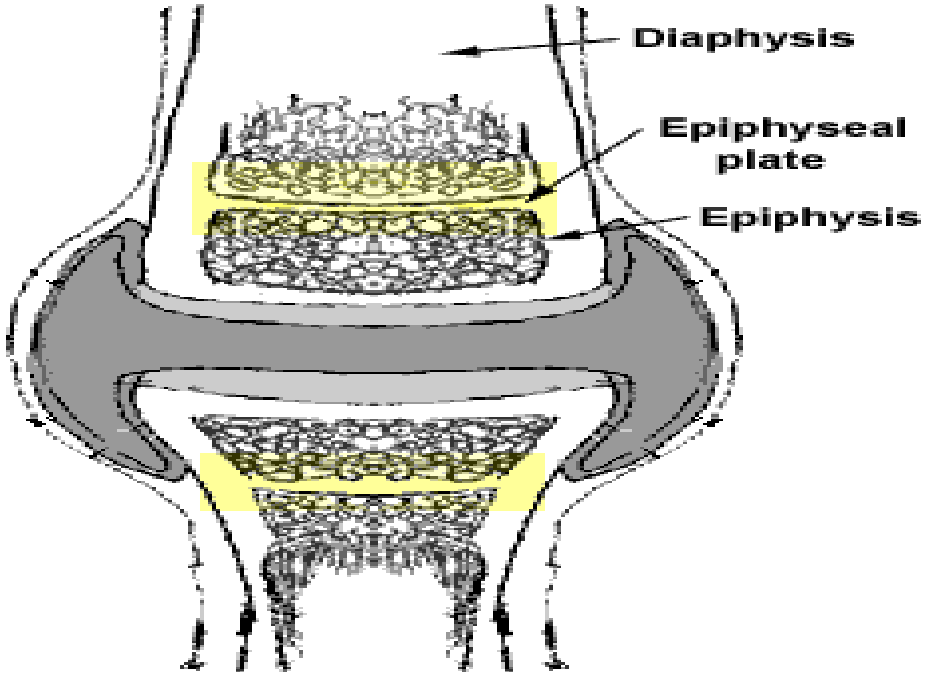
Peg & socket joints between tooth & its socket

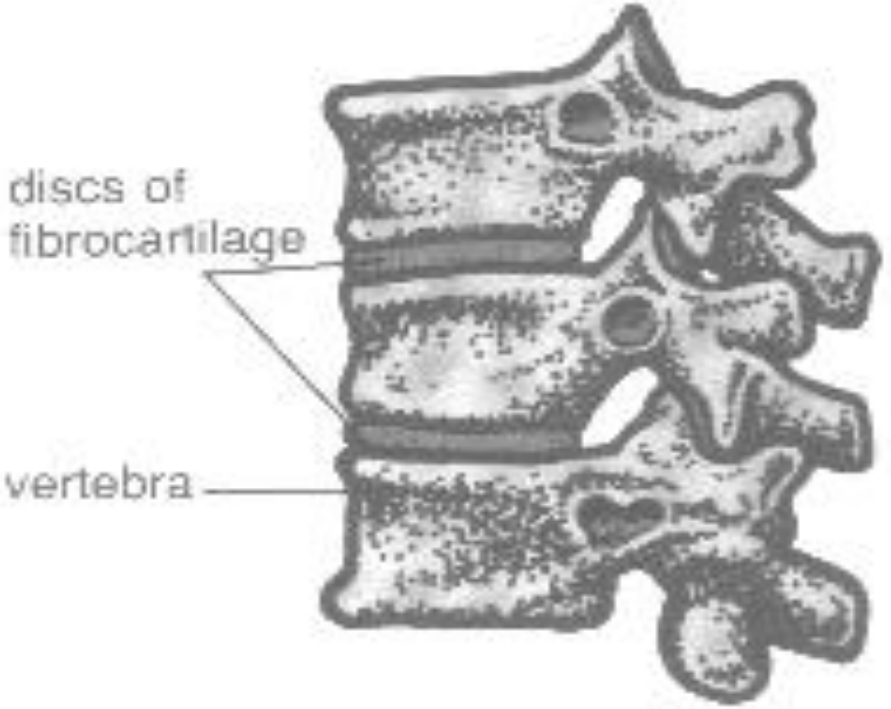




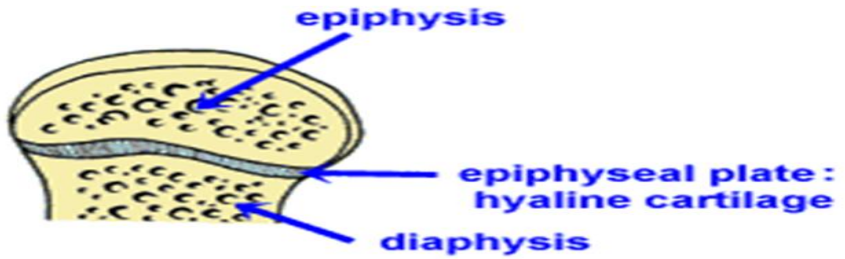
Cartilagenous joints

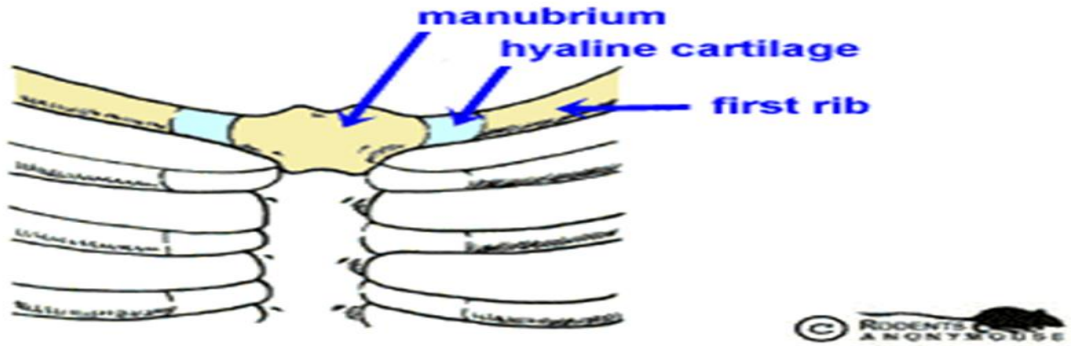
The bones are separated by cartilage.
It is divided to
1-Primary cartilaginous (SYNCHONDROSES)
2-Secondary cartilaginous (SYMPHYSES)

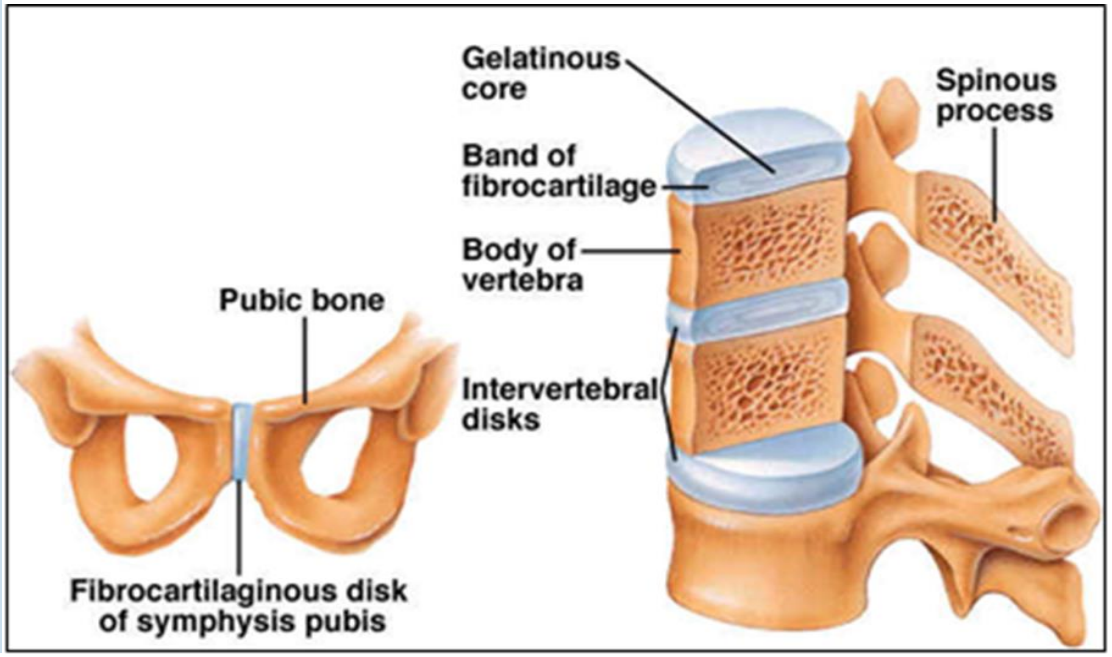




1-Primary cartilaginous joint	2- Secondary cartilaginous joint
Temporary joint disappears by ossification of epiphyseal cartilage. Site: at the ends of long bones. Fixed joint. Structure :Epiphyseal plate of hyaline cartilage between the epiphysis and metaphysis in the developing long bones in children.	Permanent joint. Present in the midline e.g. inter-vertebral discs & symphysis pubis . limited movement which is allowed by the elasticity of the fibrocartilaginous disc. The articulating bone is covered by a thin layer of hyaline cartilage and are separated by white fibrocartilaginous disc..







C- Synovial Joints:

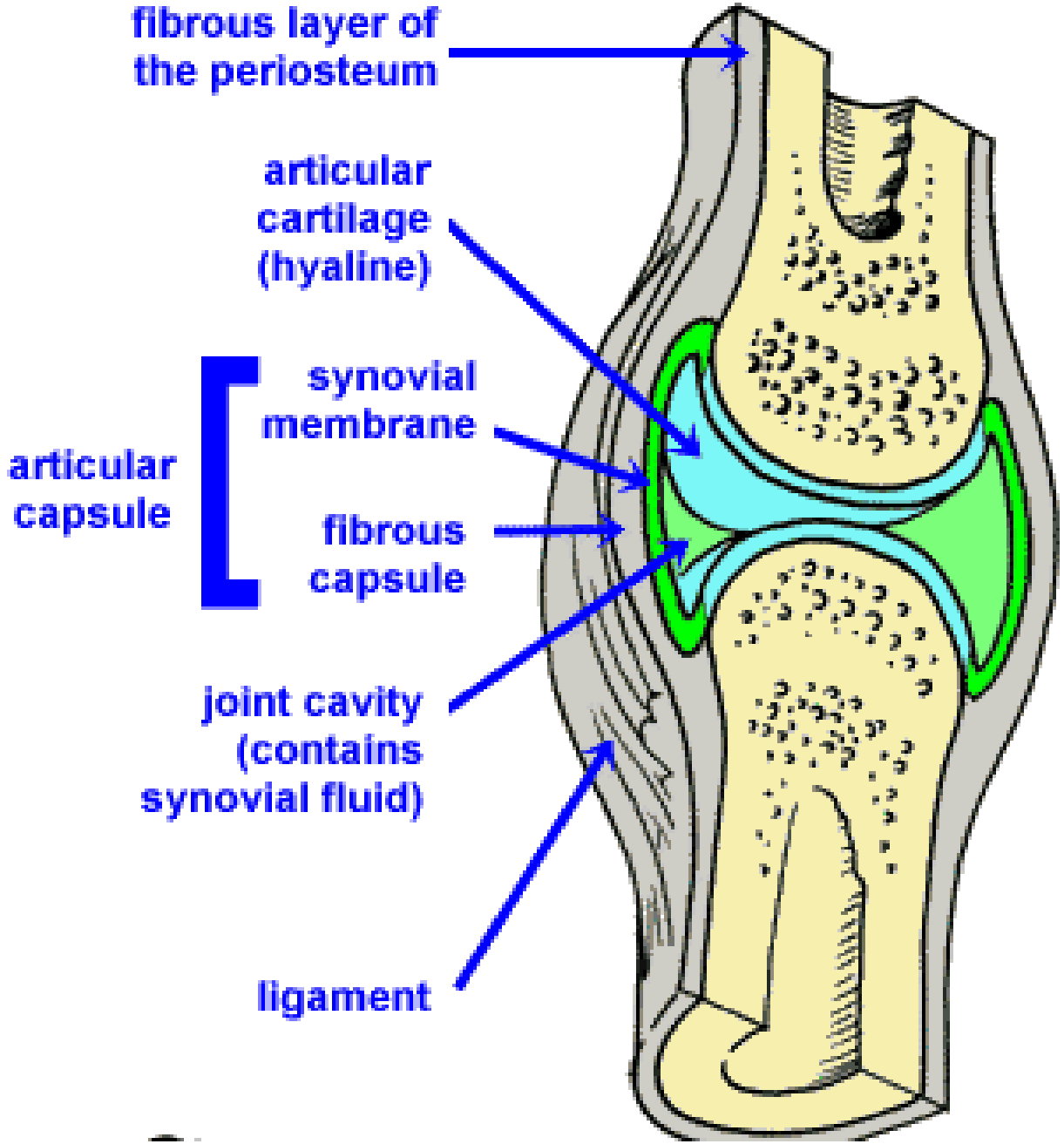
The bones are separated by synovial fluid.

General Features of Synovial Joints:

- **The bones are covered with hyaline cartilage.**
- **The bones are separated by a cavity filled with synovial fluid.**
- **There is a capsule that covers the joint.**
- This capsule is **supported** and strengthened by **ligaments .**
- **There is a synovial membrane that lines the capsule and covers all intracapsular structures except the articular surfaces It** secretes and absorbs the **synovial fluid.**

•Inside the joint, there may be other structures as:

Cartilaginous structures which may be in the form of a disc (sternoclavicular joint) or a meniscus (knee)



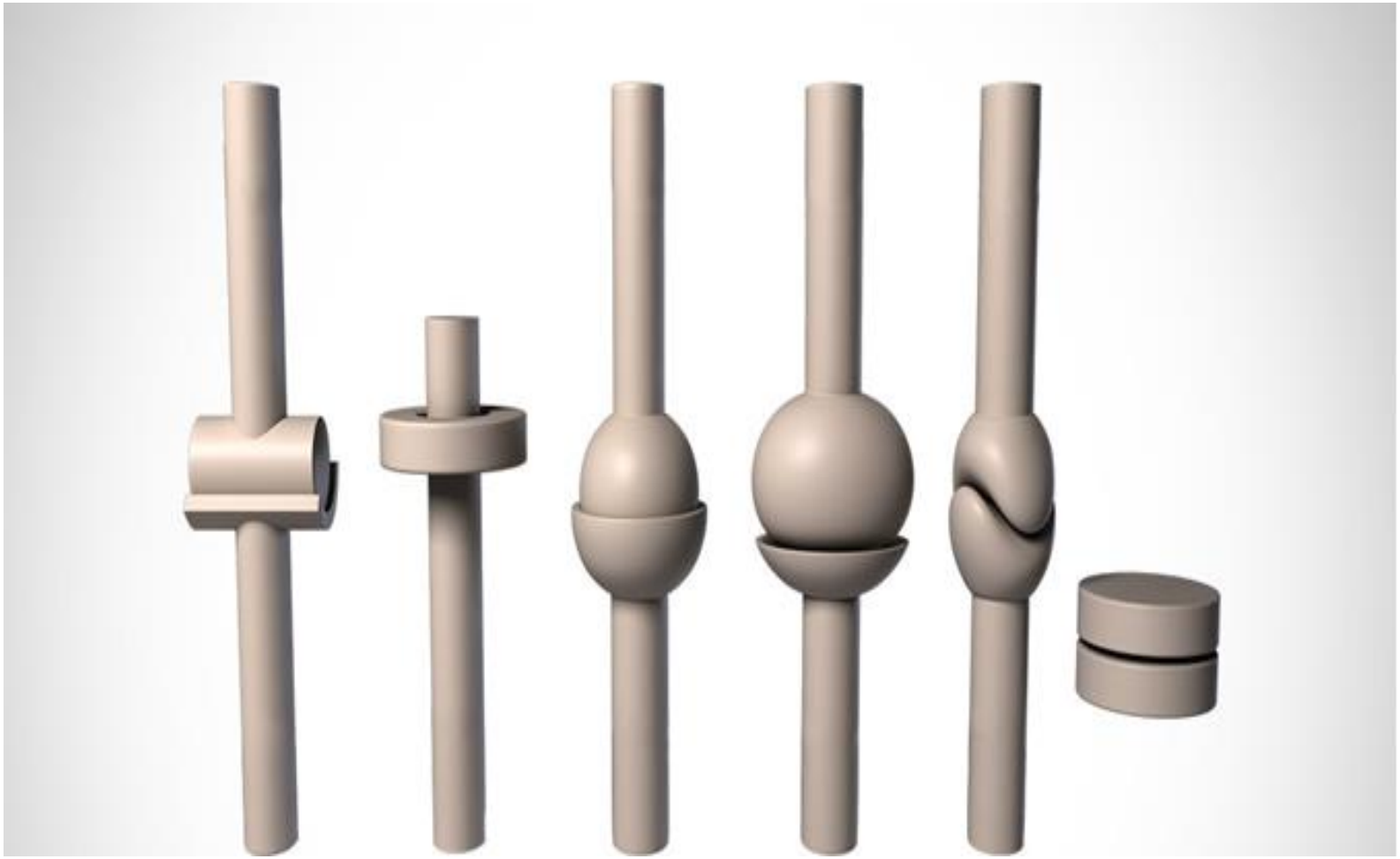
Classification of joints according to the number of axes and actions

1-Uniaxial

2-Biaxial

3-Polyaxial

4- Plane (nonaxial)



A-Uniaxial joint

The joint moves around one axis

1-hinge joint

The joint moves around a horizontal axis.

Example: Elbow joint.

It allows flexion and extension

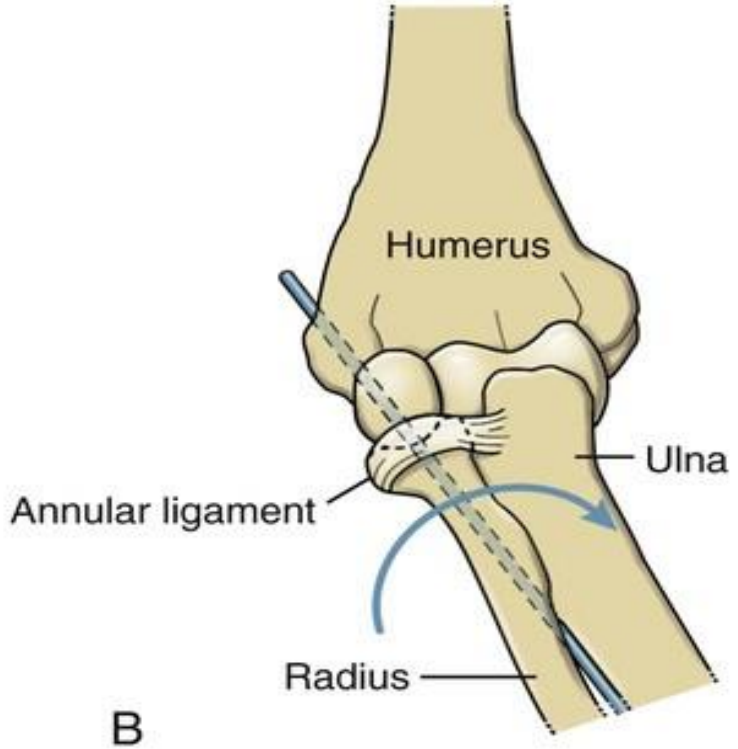
2-pivot joint

The movement occur between a rod and a ring i.e. the axis is longitudinal (i.e. along the bone).

Example: Superior radio-• ulnar joint.

It allows pronation, supination

A



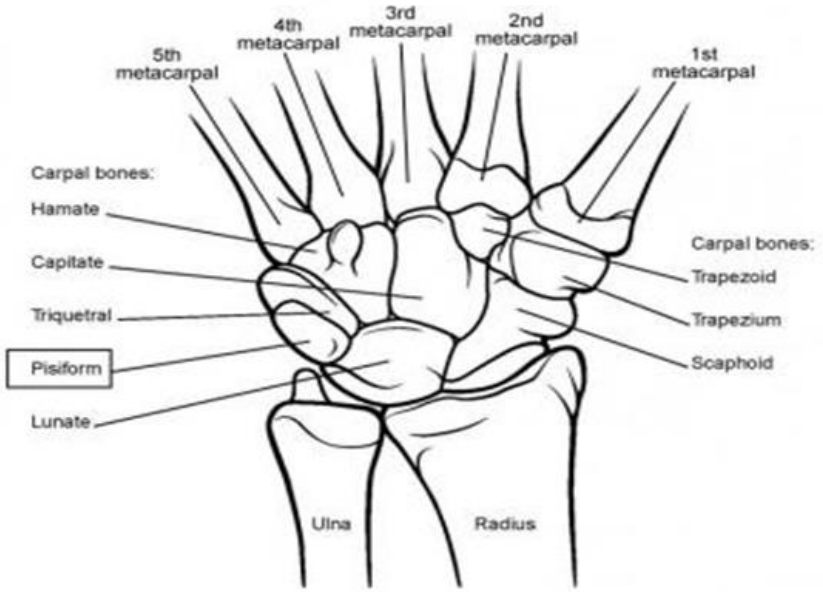
B

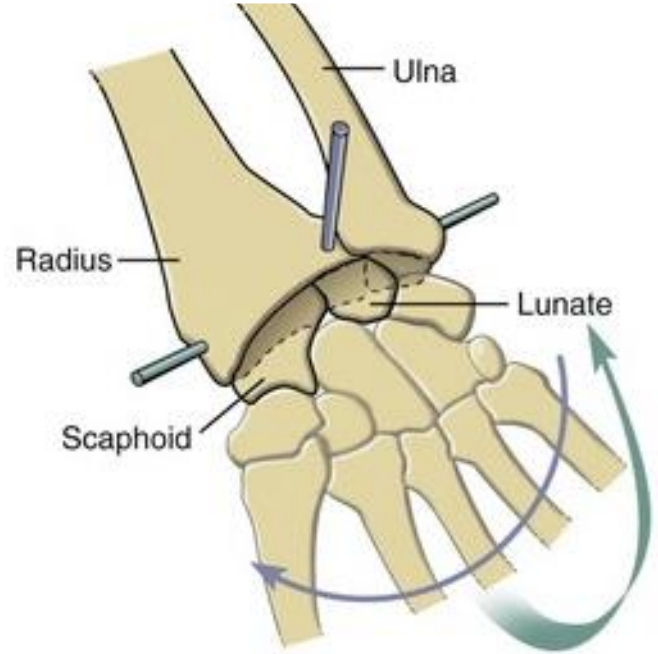
b-Biaxial joint

The moves around two axes.It is classified according to the shape of articulating bones to:

1-Ellipsoid joint.

-oval convex articular surface with elliptical concavity.
-Example: Wrist joint.
-Movement:
flexion extension
adduction abduction

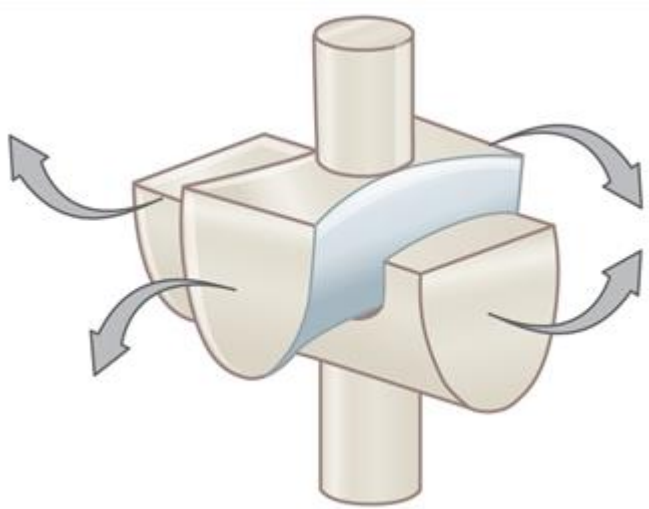


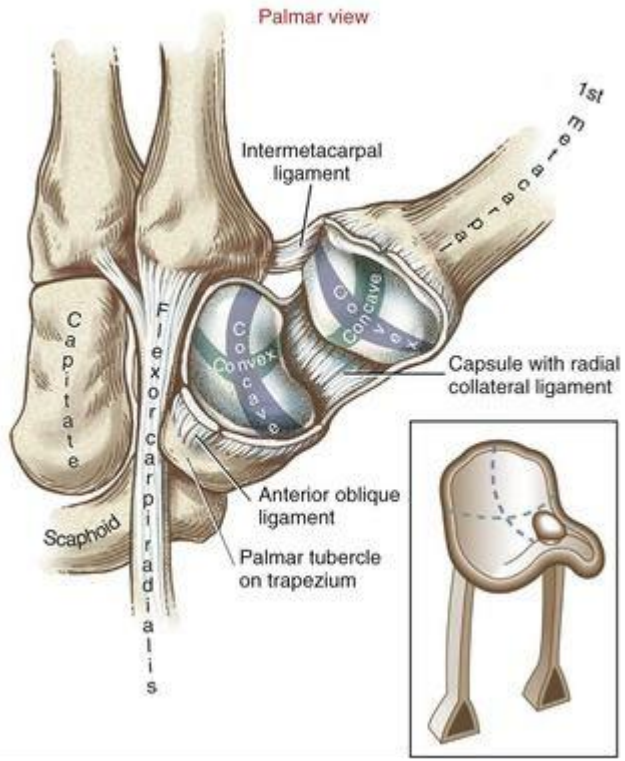


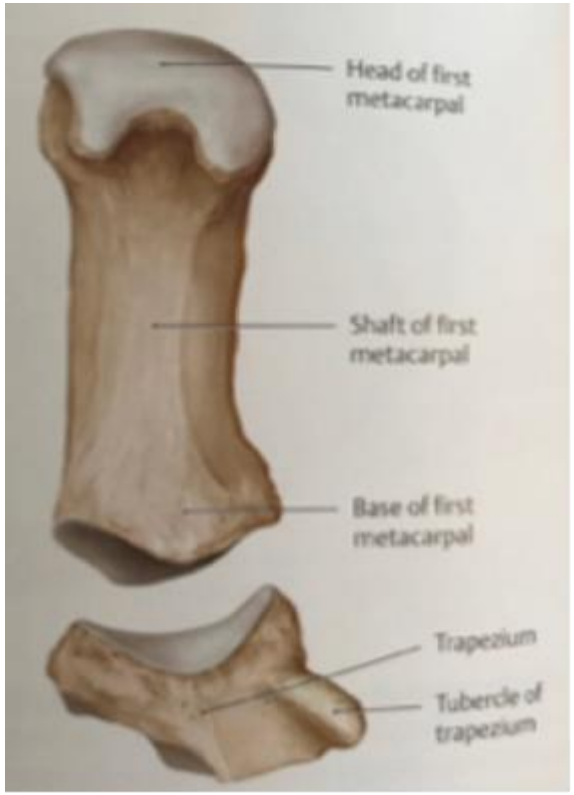
B

Saddle Joint

- Saddle Joint: The articular surfaces are reciprocally saddle shaped i.e .concavo -convex.this unique artiulation is modified condyloid joint that allows a wide range of movement.
- An example would be the joint between the trapezium and the metacarpal bones of the thumb,sternoclavicular joint.





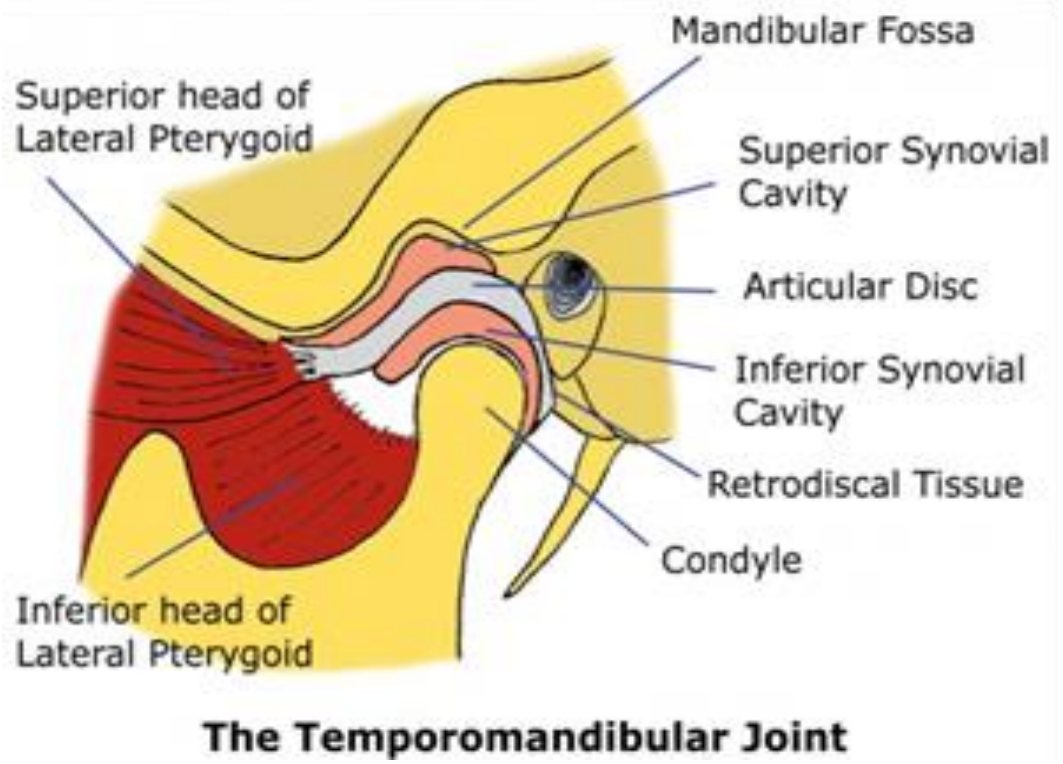


3. Condyloid joint:

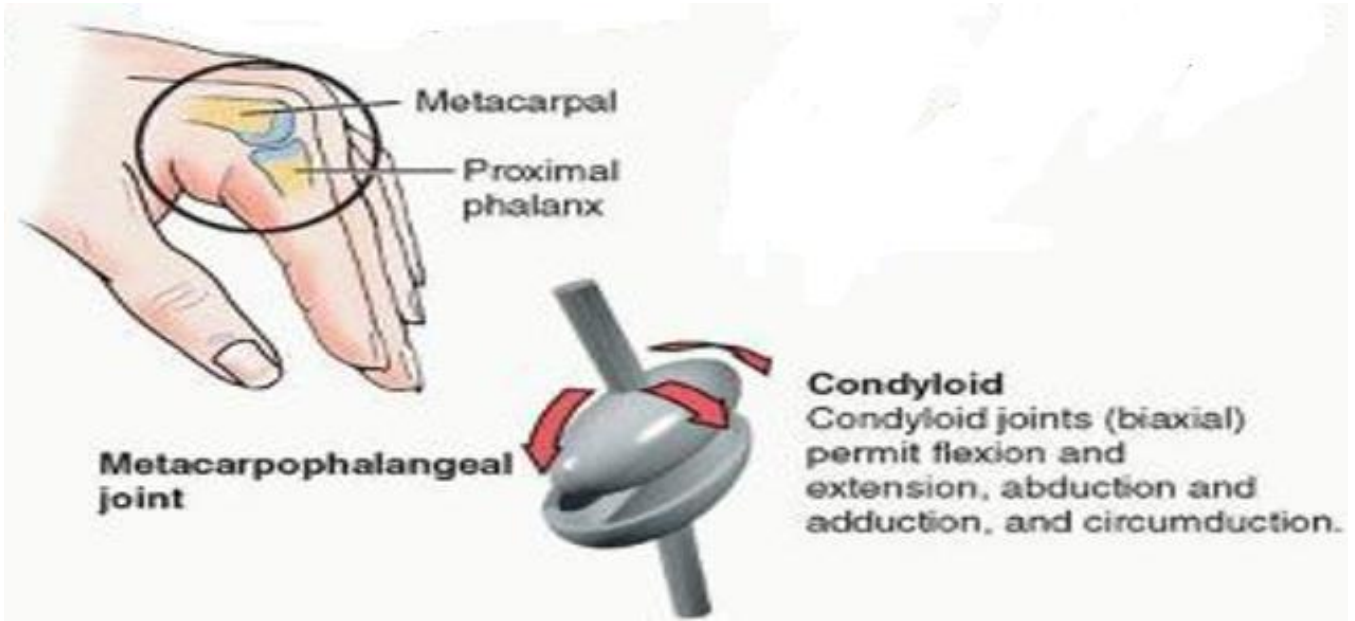
- **It consists of convex surface (condyle) articulate with concave surface, e.g. Condyloid joints permit flexion and extension as well as abduction and adduction. However, movement in one plane (sagittal) is usually greater (freer) than in the other. Circumduction, more restricted than that of saddle joints, is also possible.**

The metacarpophalangeal joints (knuckle joints), temporo-mandibular joint.

are condyloid joints.



The Temporomandibular Joint

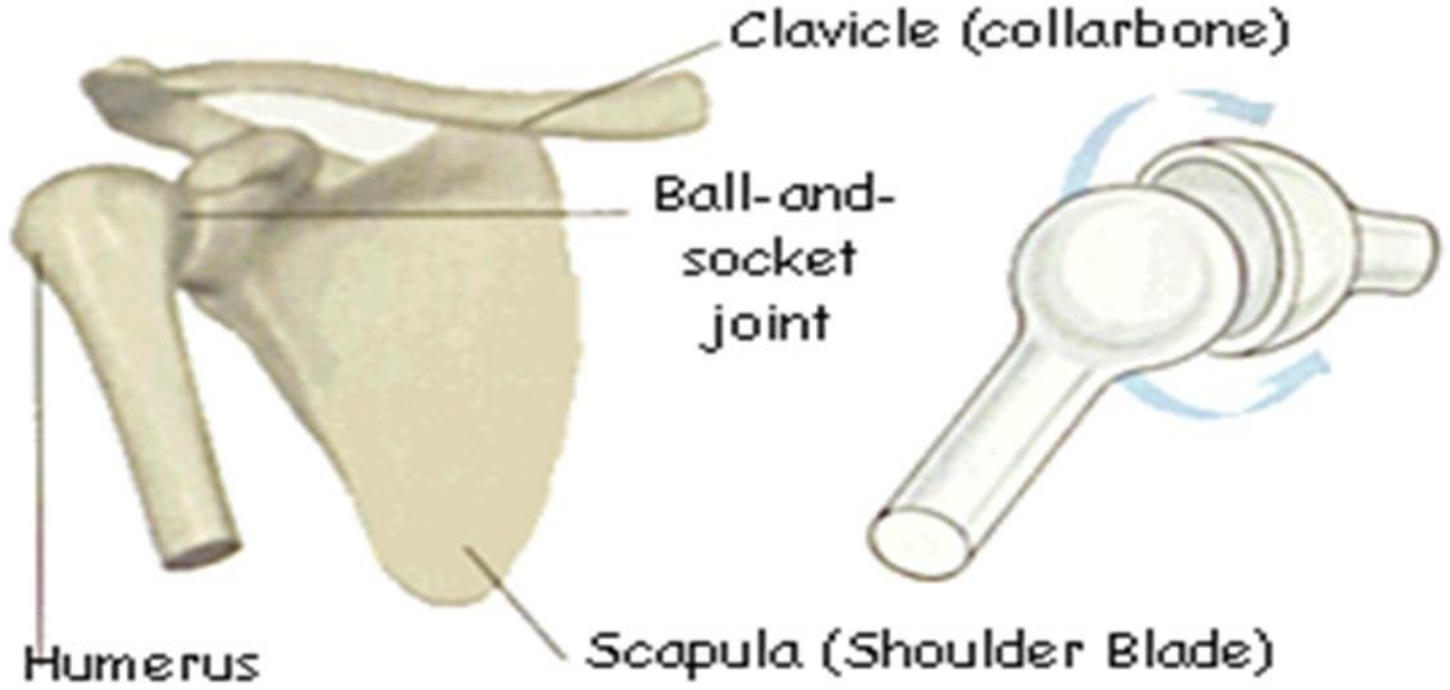


3- Polyaxial

ball articulates with a socket

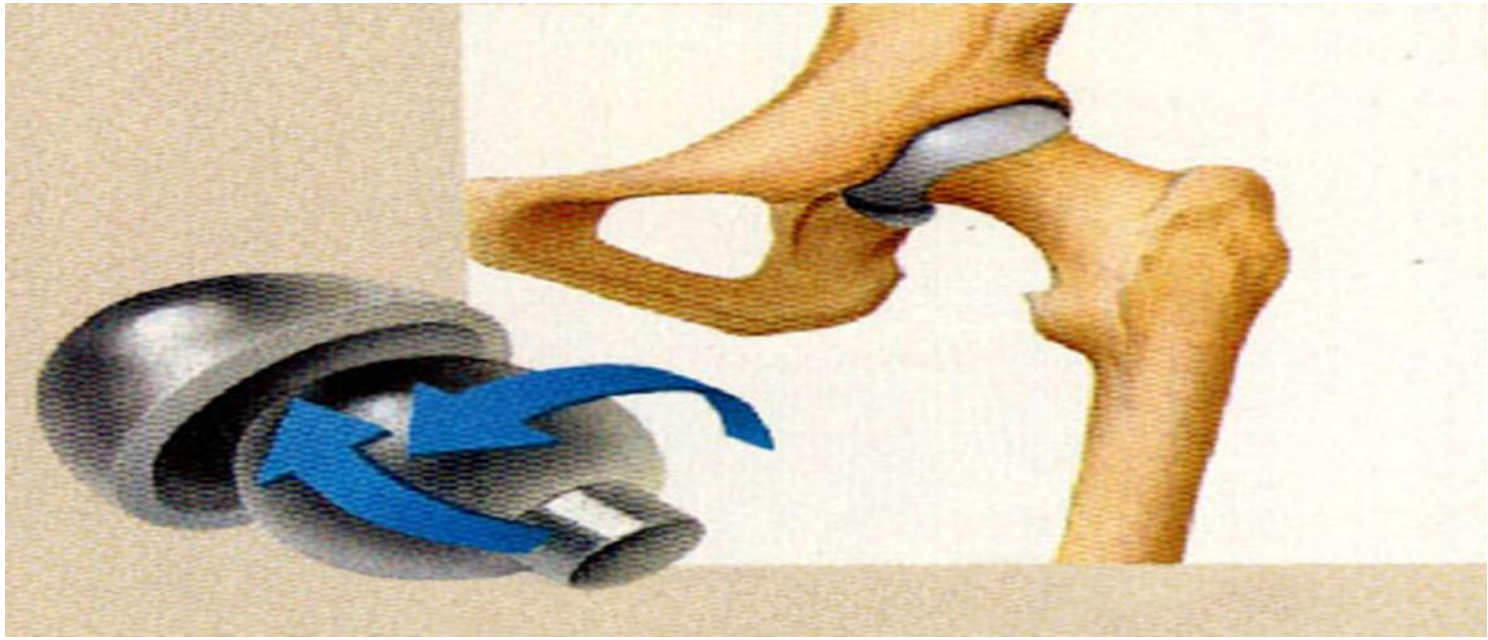
They are the most freely mobile joints in the body

-example: hip -shoulder joints



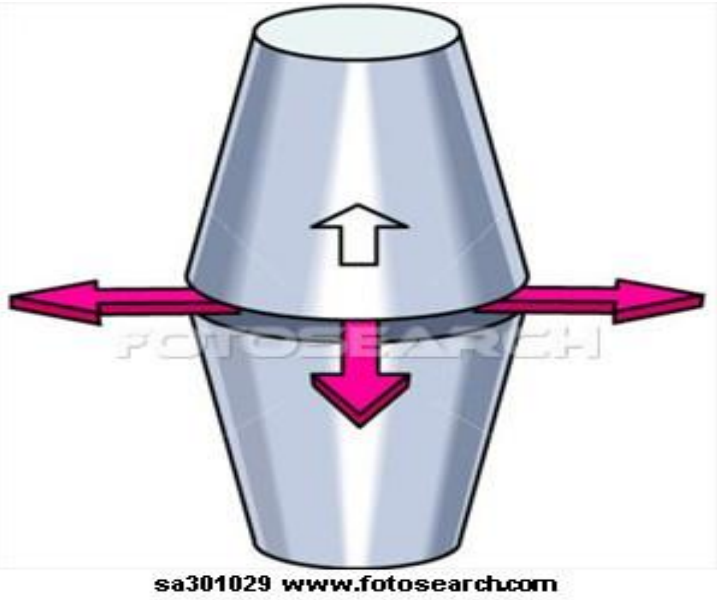
-movements:

(flexion –extension – abduction –adduction medial and lateral rotation and circumduction)



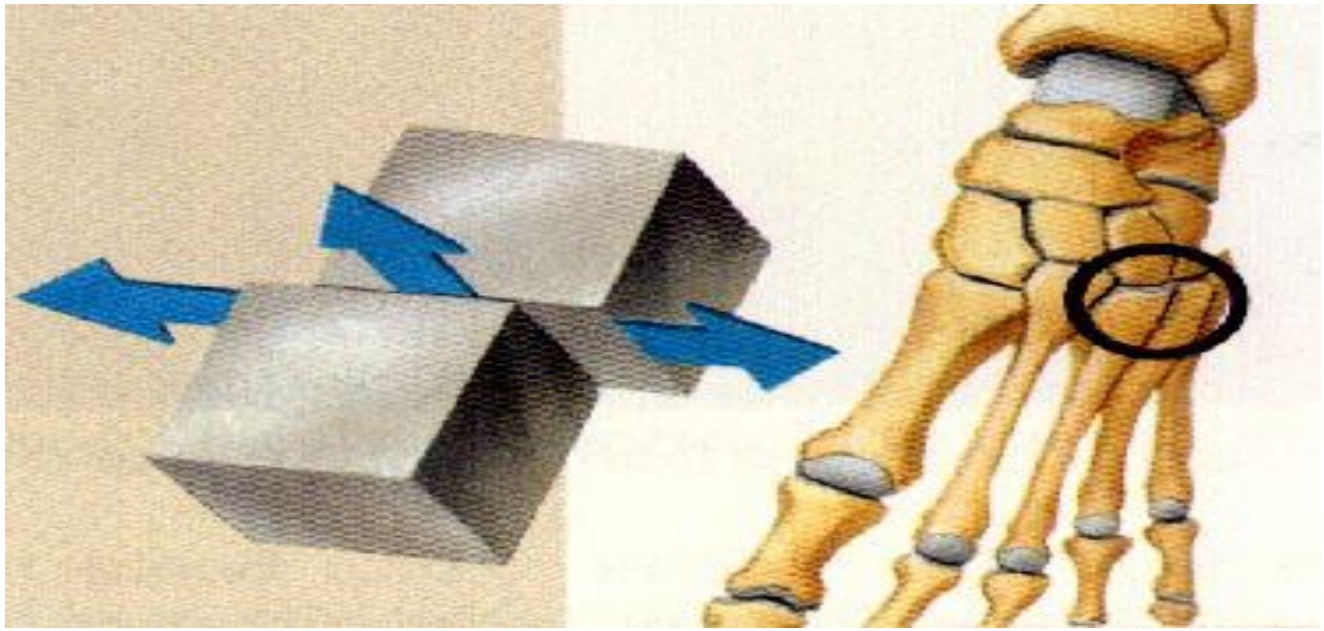
4-Plane (nonaxial) joint:-

The articular surfaces of these joints are **flat,** and the movement is **gliding** without any axis of movement



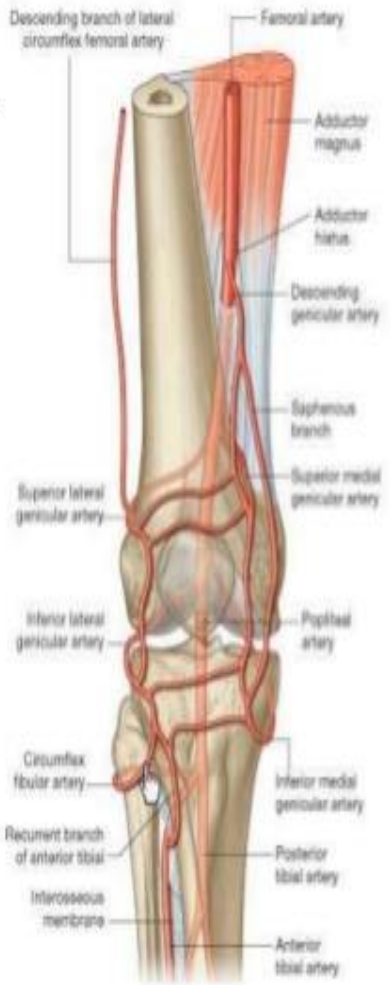
Example :-

Intercarpal , intertarsal joints



BLOOD SUPPLY

- Periarticular arterial plexuses– circulus articularis vasculosus
- Articular cartilage: avascular
- Fibrous capsule & ligaments: **poor** blood supply
- Synovial membrane: **rich** blood supply

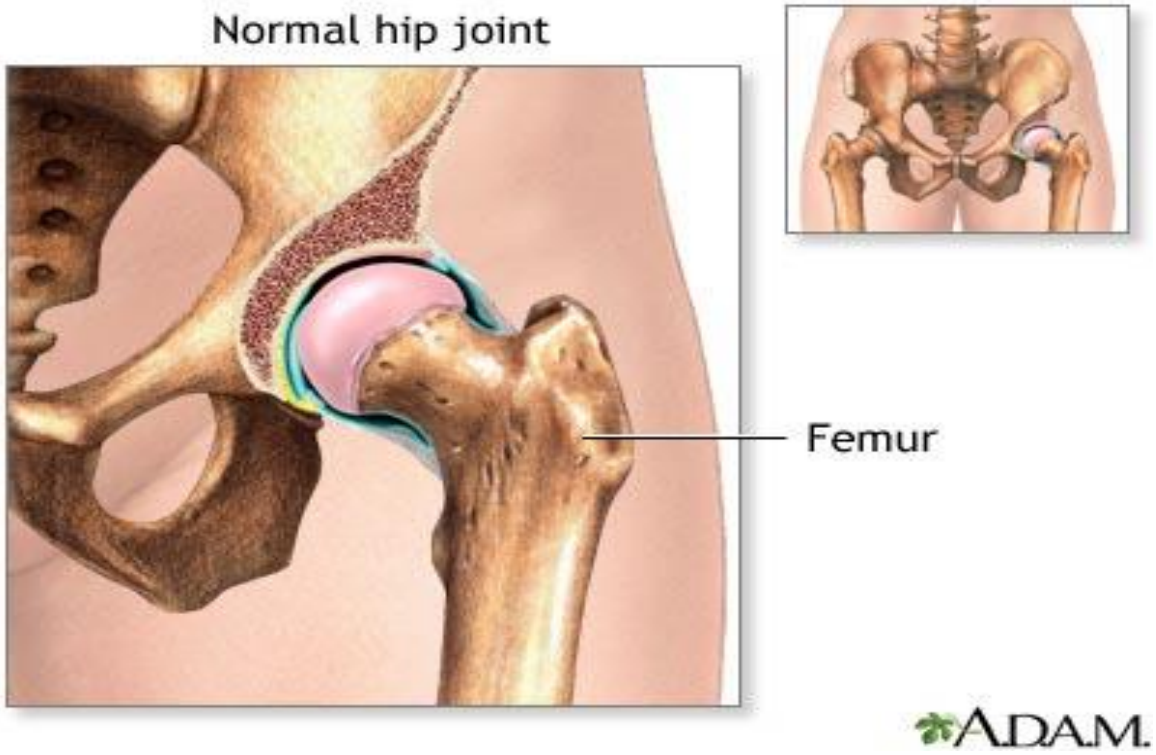


NERVE SUPPLY OF JOINTS

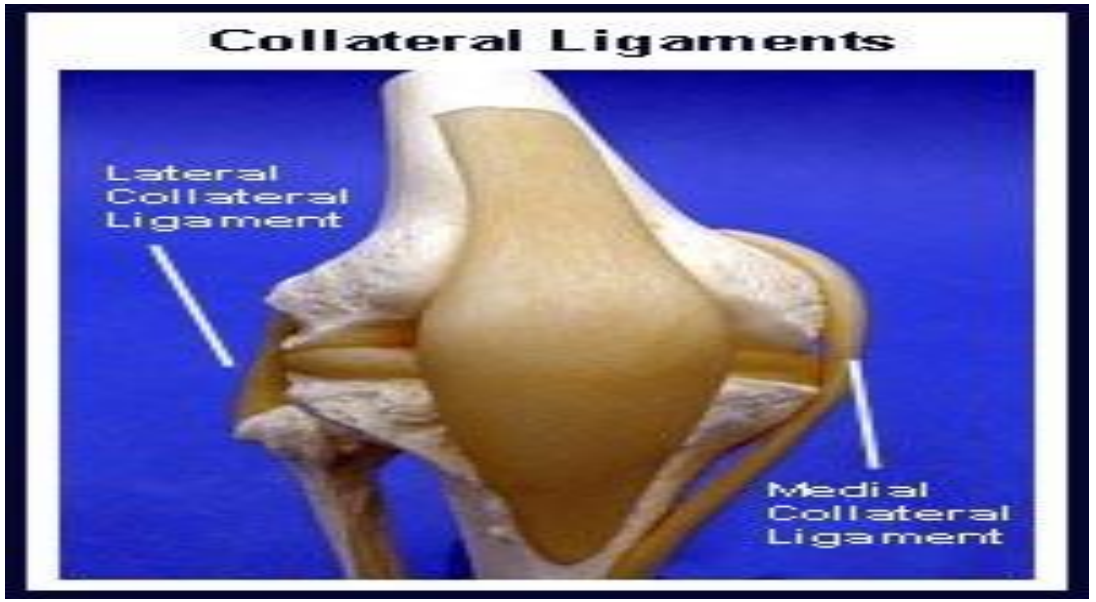
The nerve supply of any joint comes from the nerves that supply the muscles acting on that joint. This is called "Hilton's Law

Factors affecting the stability of joints

1. Shape and fitting of **articulating surfaces**.
2. Thickness and strength of the **capsule**.
3. Position and strength of **ligaments**.
4. Strength of **muscles** surrounding the joint.



The shoulder joint




Thank You!