

# JOINTS



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# LEARNING OUTCOMES

- DEFINITION OF JOINTS
- FIBEROUS JOINTS
- CARTILAGINOUS JOINTS
- SYNOVIAL JOINTS

FEATURES

CLASSIFICATION

FACTORS AFFECTING THE STABILITY

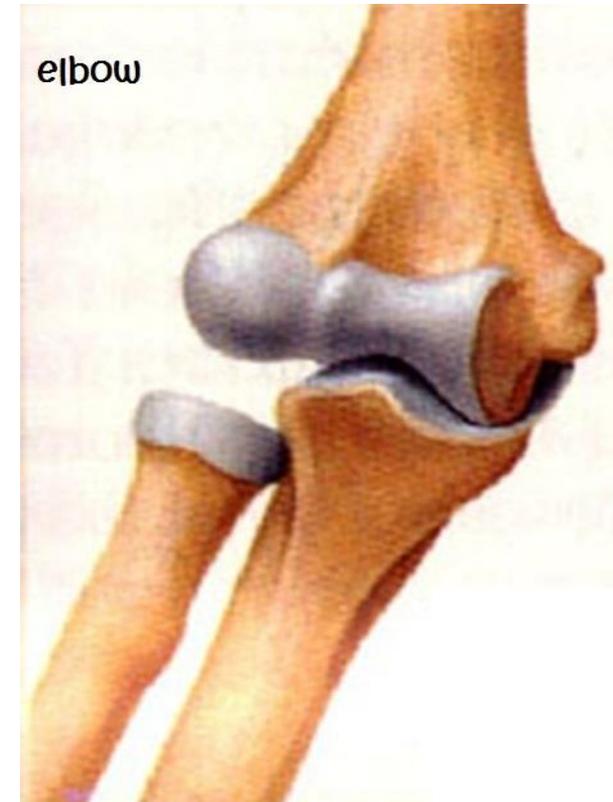
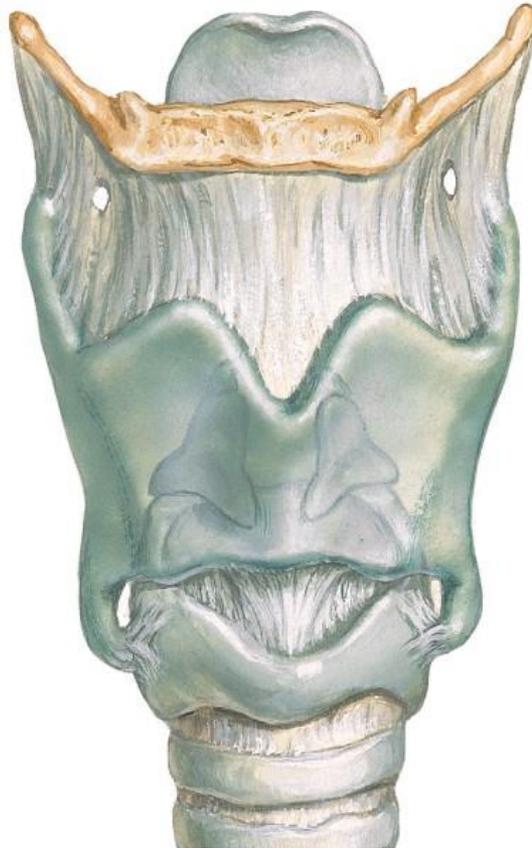
NERVE SUPPLY

# DEFINITION

**Def.:** site of meeting of - 2 or more bones

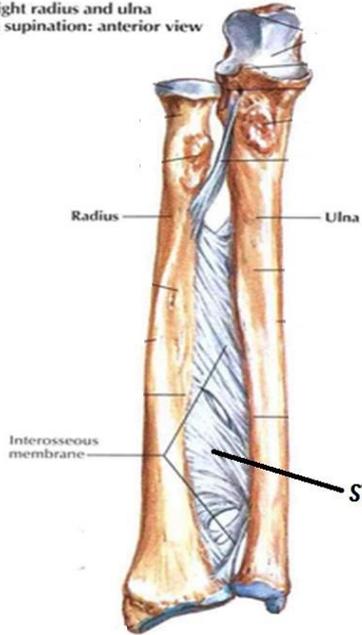
-bone & cartilage

- cartilage & cartilage as in larynx



# TYPES OF JOINTS

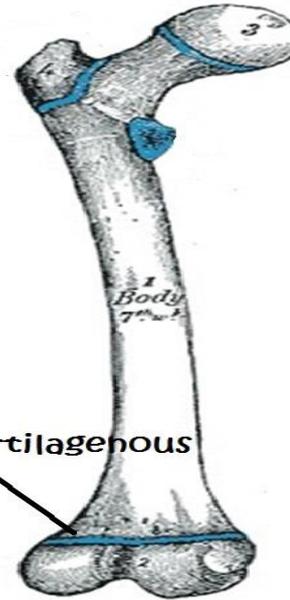
Right radius and ulna in supination: anterior view



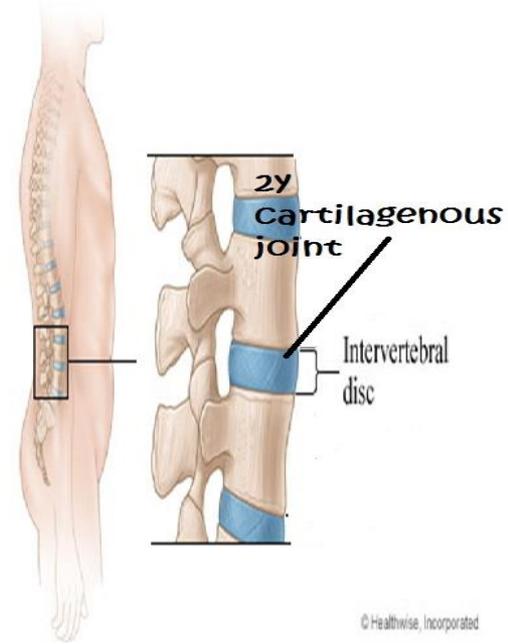
Right radius and ulna in pronation: anterior view



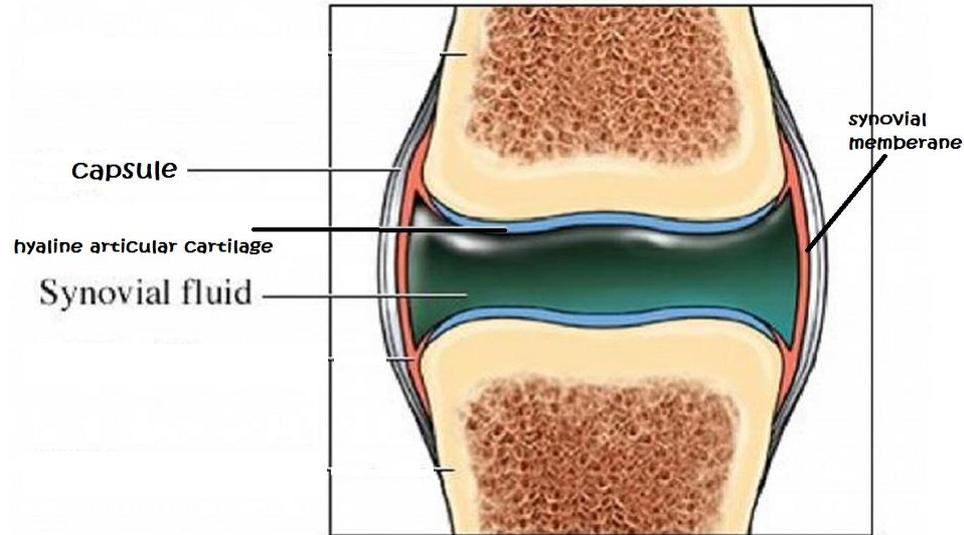
syndesmosis



1ry Cartilaginous joint



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synovial joints

# TYPES OF JOINTS

according to the tissue that connects the bones.

**1- Fibrous joints:** bone connected by fibrous tissue

## Sutures

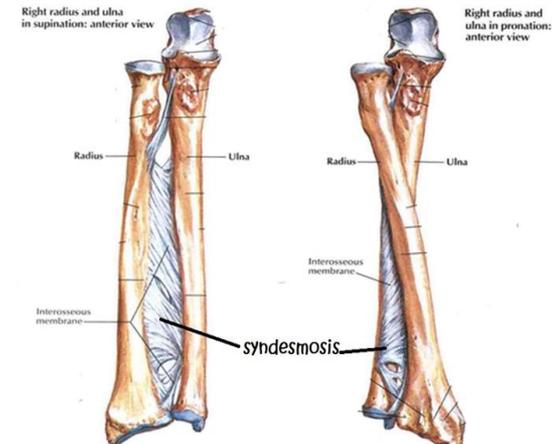
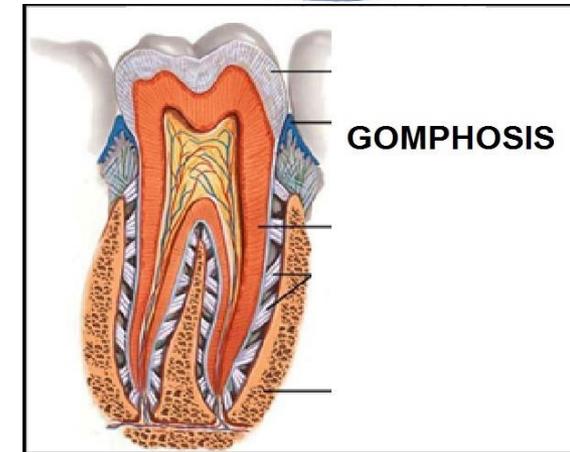
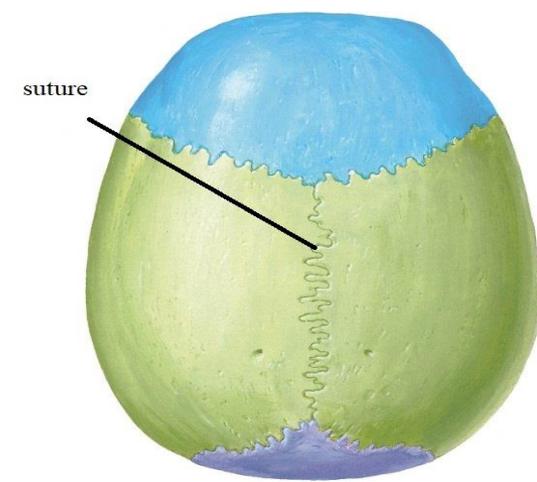
- minimal amount of fibrous tissue ( ) the bones
- present in the skull
- immobile ?

## Gomphoses

- moderate amount of fibrous tissue ( ) the bones
- present ( ) the tooth & its socket
- immobile

## Syndesmoses

- large amount of fibrous tissue ( ) the bones
  - present ( ) widely separated bones
- e.g. interosseous membrane ( ) radius & ulna  
slightly mobile



# TYPES OF JOINTS

## Cartilaginous joints

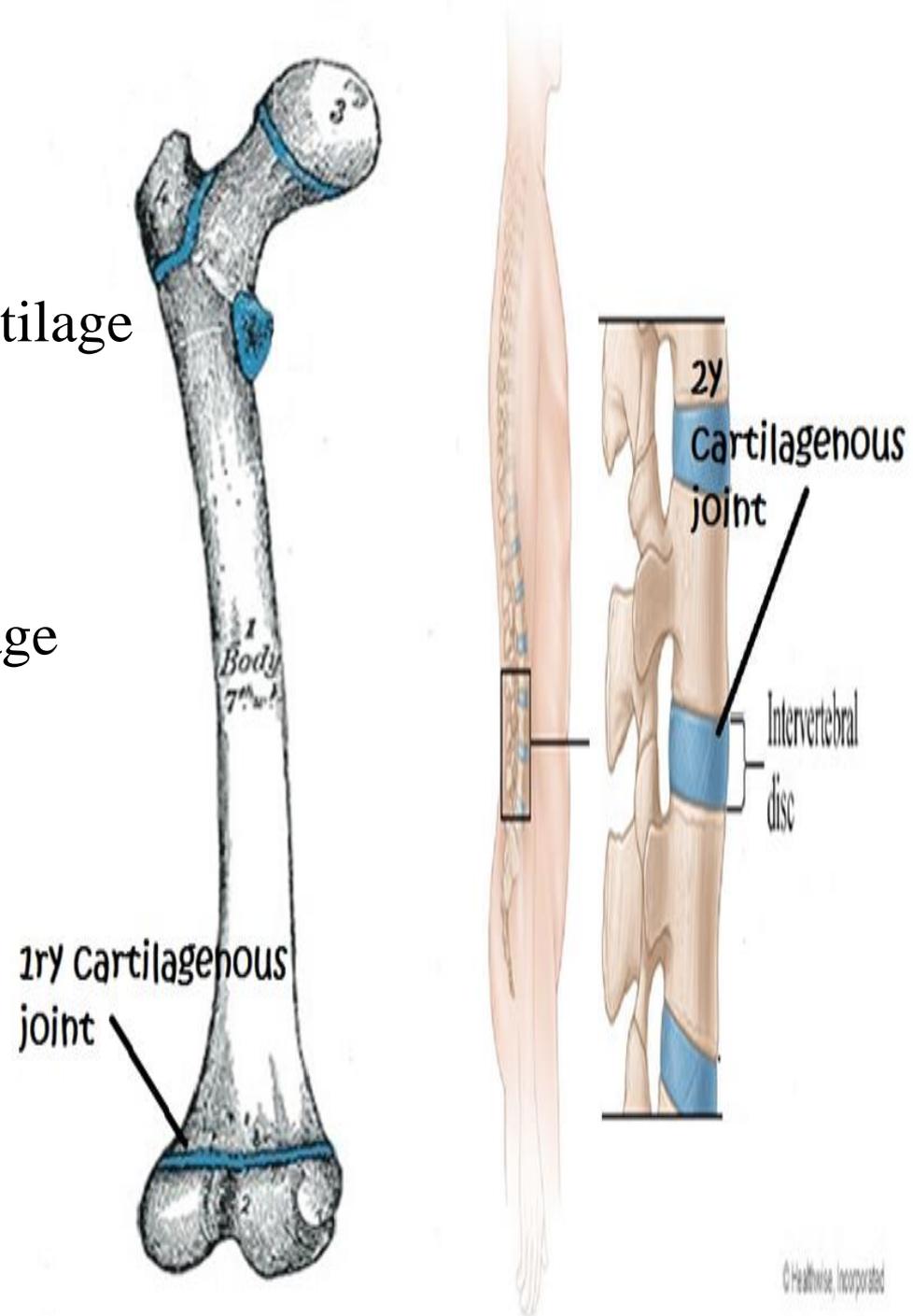
### Primary cartilaginous

- Bones are connected by hyaline cartilage
- Immobile
- E.G. epimetaphyseal junction

### Secondary cartilaginous

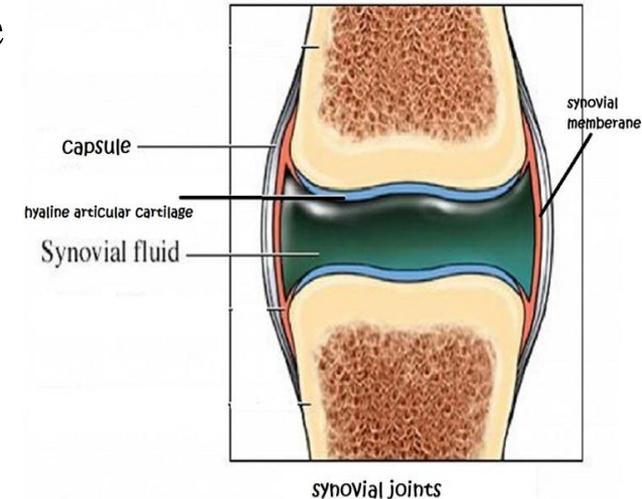
- Bones are connected by fibrocartilage
- slightly mobile
- Lie in median plane

E.G. 1-IVD



# FEATURES OF SYNOVIAL JOINTS

- 1- the bones are covered by hyaline cartilage that not appear in X- ray
- 2- the bones are separated by a Joint cavity contains synovial fluid
- 3- the bones are held together by fibrous capsule
- 4- the capsule is strengthened by ligaments
- 5- the capsule is lined by Synovial membrane that secretes synovial fluid



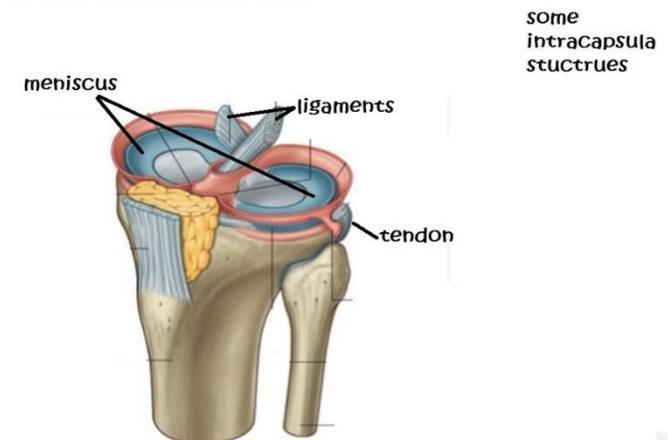
## **N.B.: the synovial membrane:-**

a highly vascular Membrane lines the capsule and reflected to cover all the intracapsular structures except the articular cartilages

## **N.B.: -other intracapsular structures:**

- menisci to absorb compression forces
- intracapsular ligaments

-tendon of muscle - pads of fat ( ) the capsule and synovial memb.

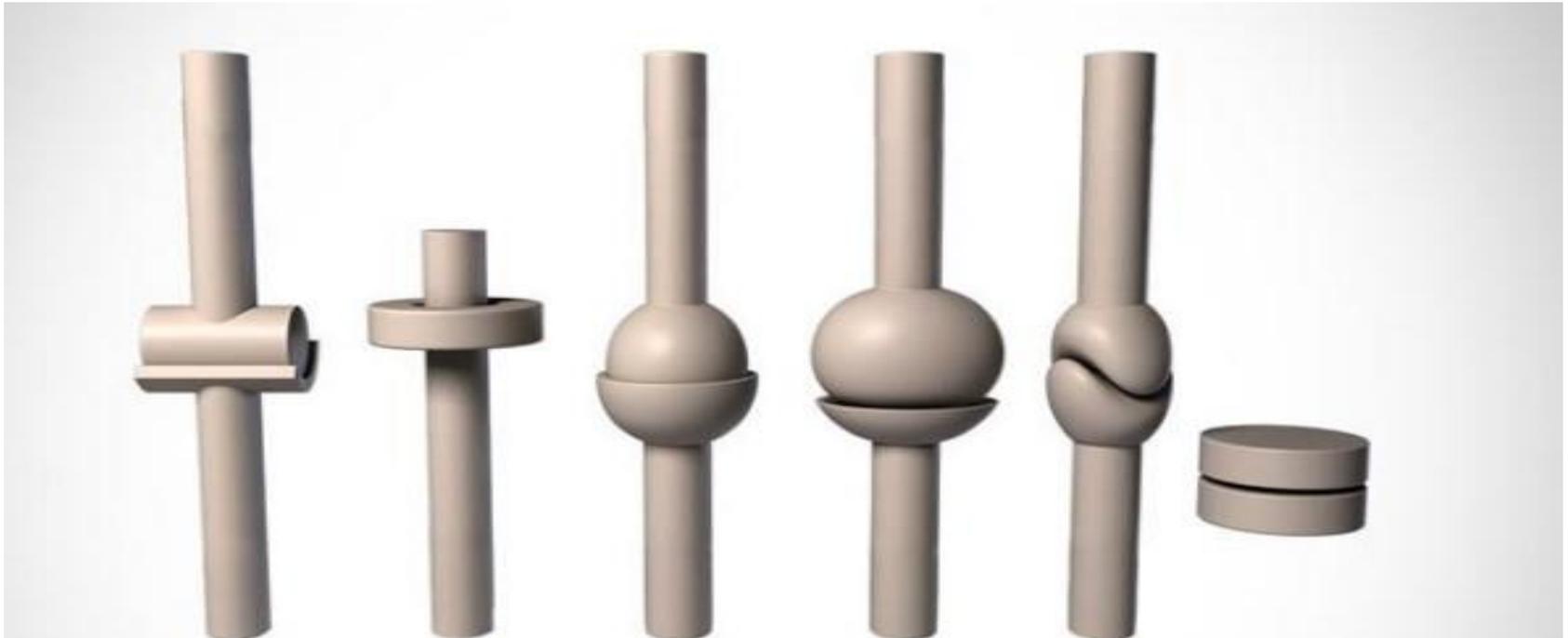


# CLASSIF. OF THE SYNOVIAL JOINTS

According to possible movements that are determined by number of axis that are determined by the shape of articulating bone

N.B: axes of body and movements around them:

- 1- Vertical : for rotation.
- 2- Transverse : for flexion and extension.
- 3- Anteroposterior : for abduction and adduction.



# CLASSIF. OF THE SYNOVIAL JOINTS

## 1- Uniaxial joints

### Hinge joint

**Articular surface:** one convex surface articulate with one concave surface

**axis & movements:** Transverse for flexion & extension

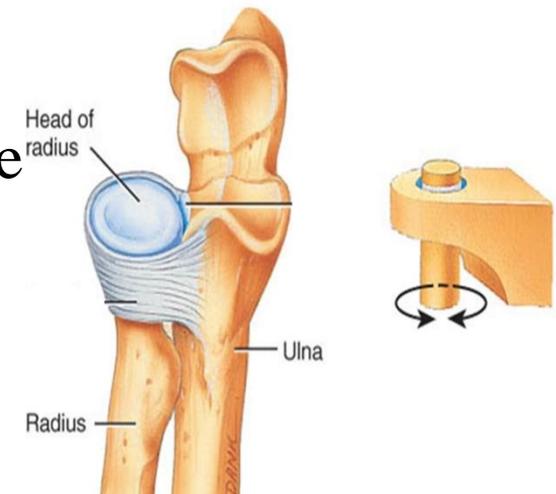
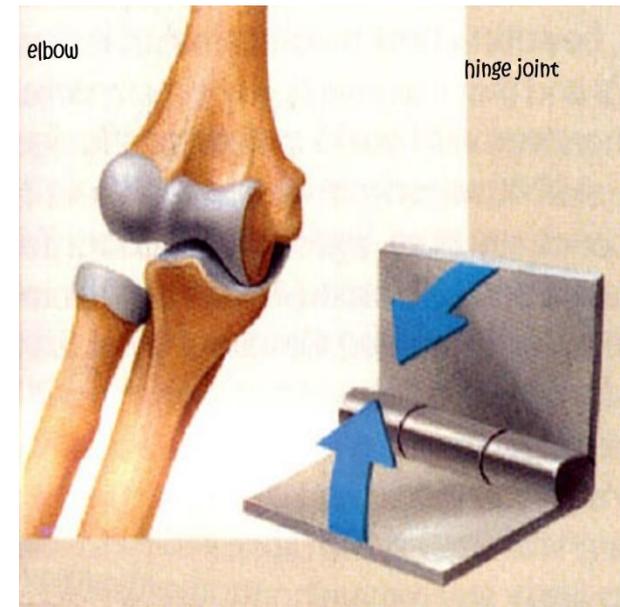
**E.G.:** elbow & interphalangeal joints

### Pivot joint

**Articular surface:** Central bony pivot surrounded by osteofibrous ring one is fixed & the other is mobile

**Axis & movements :** Vertical for rotation

**E.G.:-** superior & inferior radio ulnar joints for pronation & supination



(c) Pivot joint between head of radius and ulna

# CLASSIF. OF THE SYNOVIAL JOINTS

## 2- Biaxial joints

### Ellipsoid

**Articular surface:** oval convex surface articulate with oval concave surface

**axis & movements:-** Transverse for flexion, extension  
antero- posterior for abduction & adduction

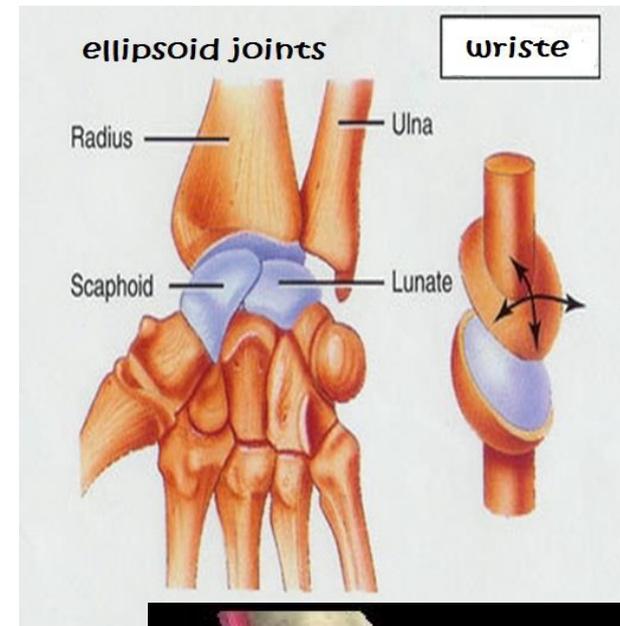
**E.G.:-** wrist

### Bicondylar joints

**Articular surface:** 2 convex surface articulate with 2 concave surfaces

**axis & movements:-** Transverse for flexion, extension  
Vertical for rotation

**E.G.:-** knee joint (it may be considered as modified hinge due to its limited rotation)



# CLASSIF. OF THE SYNOVIAL JOINTS

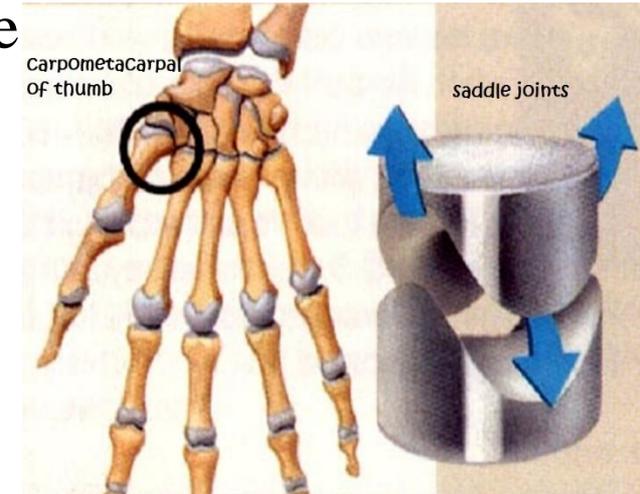
## 2- Biaxial joints:

### Saddle joint

**Articular surface:** concavo convex surface articulate with convexo- concave surface

**axis & movements:-** Transverse for flexion, extension  
Antero- post. for abduction & adduction

**E.G.:** Carpometacarpal of thumb



# CLASSIF. OF THE SYNOVIAL JOINTS

## 3- Poly axial joints:

**Articular surface** : Ball fitting in cup shaped socket.

**axis & movements**: 3 axis:

transverse for flexion, extension

Vertical for rotation

Antero- posterior for abduction & adduction

Circumduction.

**E.G.:**-shoulder & hip joints.

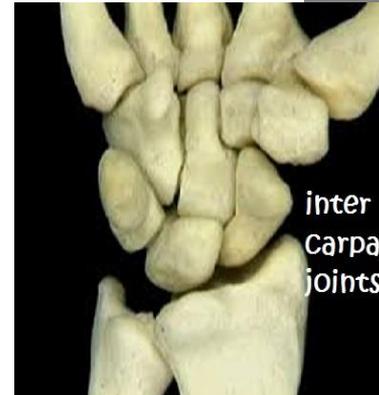
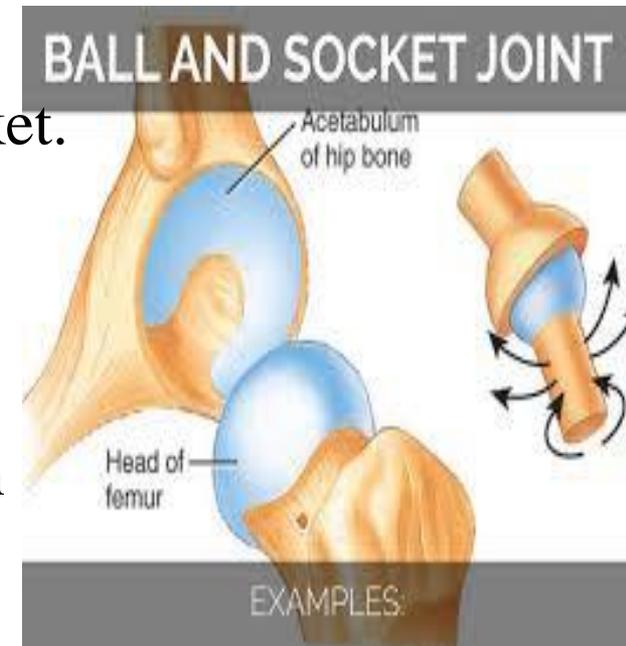
## 4- Non axial (plane) joints

**articular surfaces**: flat

**axis & movements**: no axis and so there is no angular movement but there is only gliding (sliding)

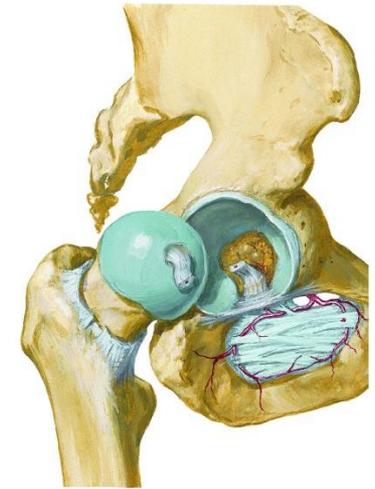
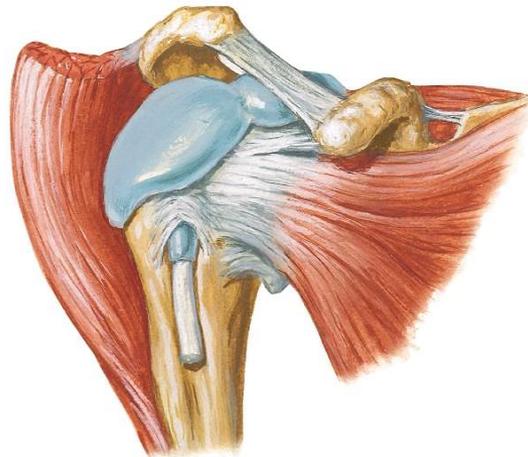
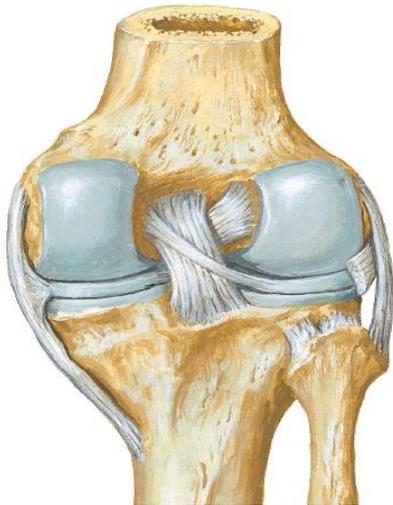
in variable directions that accompany movements of near joints

**E.g.** intercarpal joints



# FACTORS AFFECTING JOINT STABILITY

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



# NERVE SUPPLY OF JOINT

**-capsule & its close ligaments**

are richly innervated and contain pain & stretch receptors

**-synovial membrane**

is less innervated and contains few pain receptors

**N.B:- Hilton's law:**

The nerve supplying a muscle, also supply the joint moved by that muscle & also supply the area of skin over the joint and insertion of the muscle

THANQ