بنام
مهربانترین

گروه علوم تشریحی
دانشکده پزشکی شیراز
سعید کربلایی دوست

Introduction to joint

اهداف یادگیری

در انتهای این مبحث از یادگیرنده انتظار می رود:

- مفصل را تعریف کند، انواع ان را از نظر دامنه حرکت و ساختمان شرح دهد.
- ساختمان های مفاصل فیبری ،غضروفی و سینوویال را توضیح داده وانواع ان را بیان کند
- حرکات مفصلی را نام ببرد

Joint

Functional classification

Structural classification

Functional classification

- Synarthrosis – immovable
- Amphiarthrosis - partially movable
- Diarthrosis - freely movable

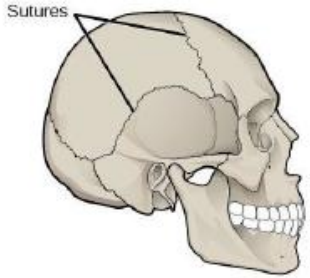
Structural classification

- Fibrous : bones joined by fibrous connective tissue
- Cartilaginous: bones joined by cartilage
- Synovial: synovial cavity present; bones are surrounded by articular capsule and often by accessory ligaments.

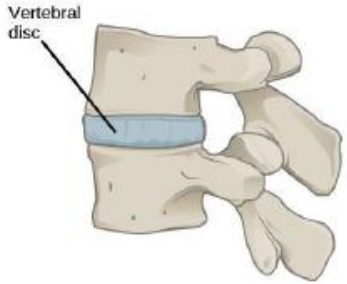
Classification of joints:

They are classified according to:
tissues that lie between the articulating bones

- A. Fibrous
- B. Cartilaginous
- C. Synovial



A



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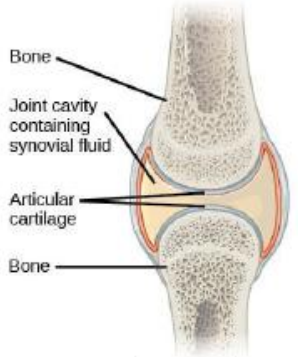
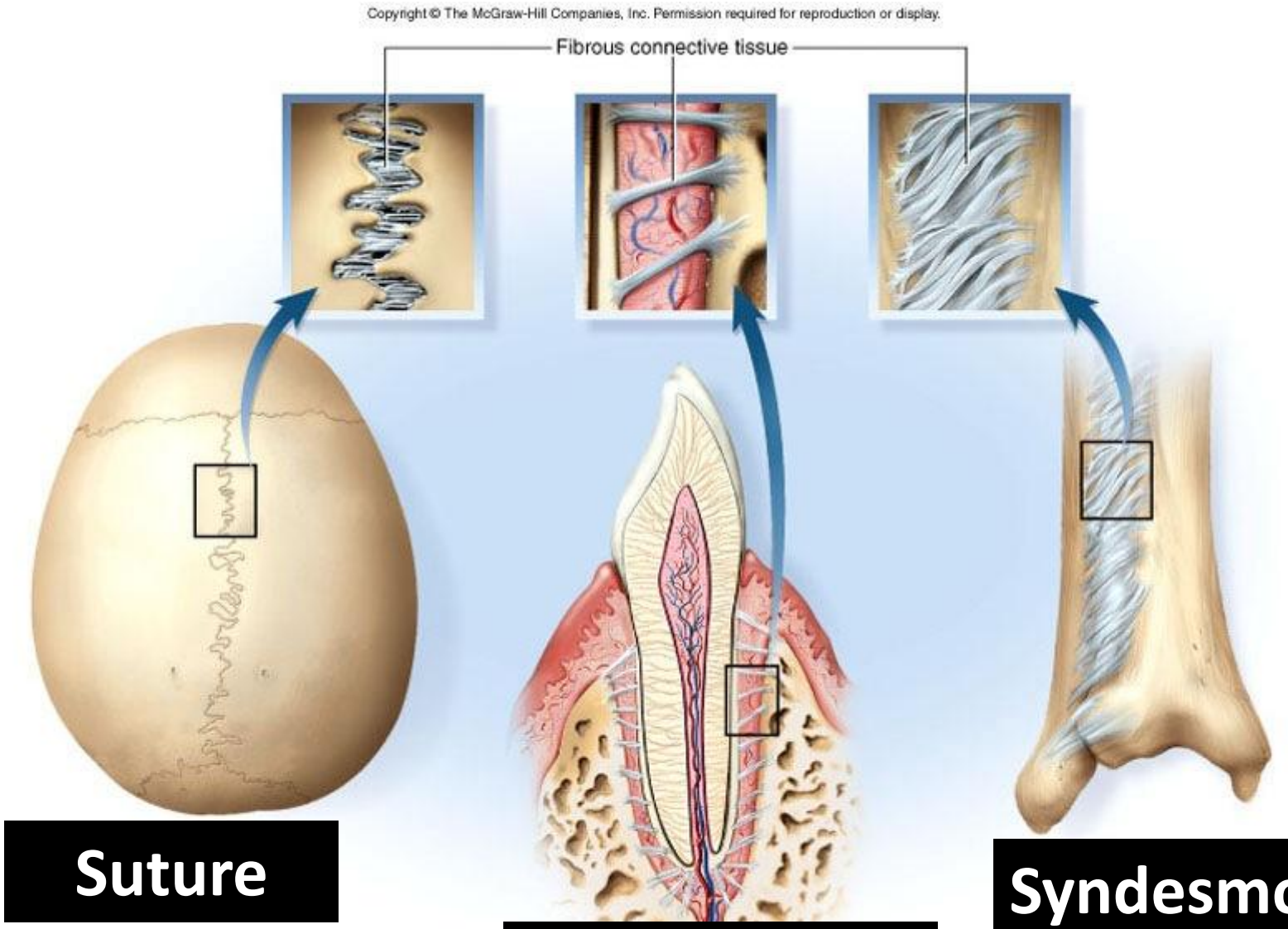


C

Fibrous Joints

Fibrous connective tissue



Cartilaginous Joints

Primary cartilaginous joints (Synchondrosis)

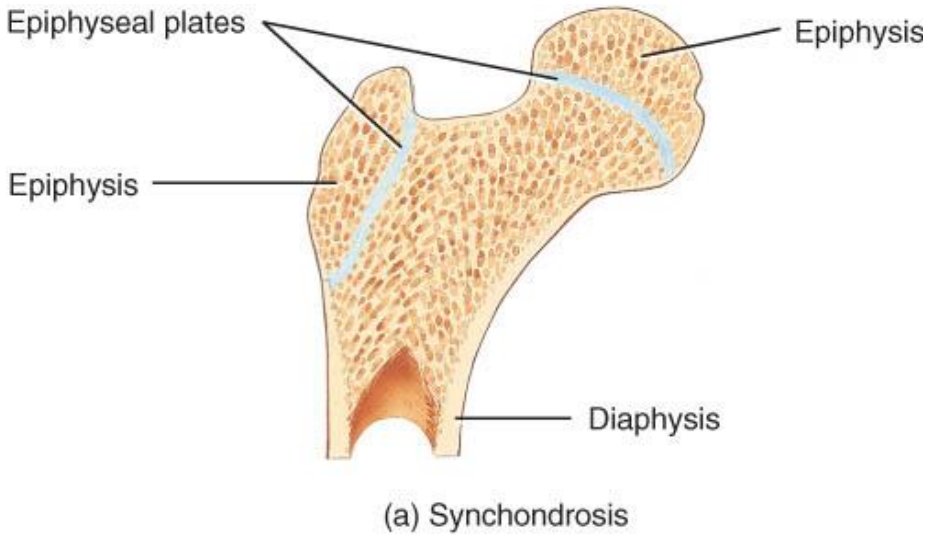
Bones are joined by hyaline cartilage

1st rib attachment to sternum

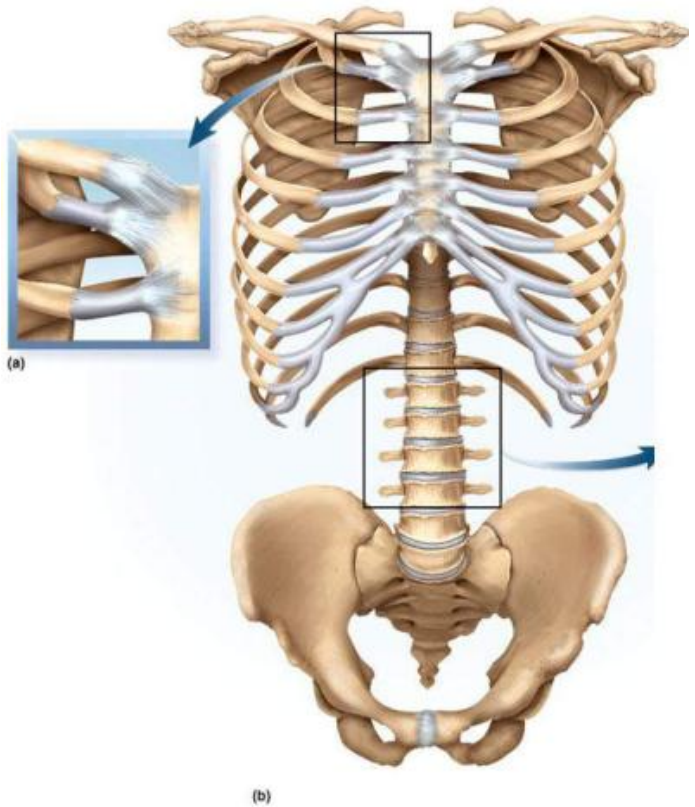
Epiphyseal plate in children binds epiphysis and diaphysis

- junctions of ribs with their costal cartilage.

Immovable



(a) Synchondrosis



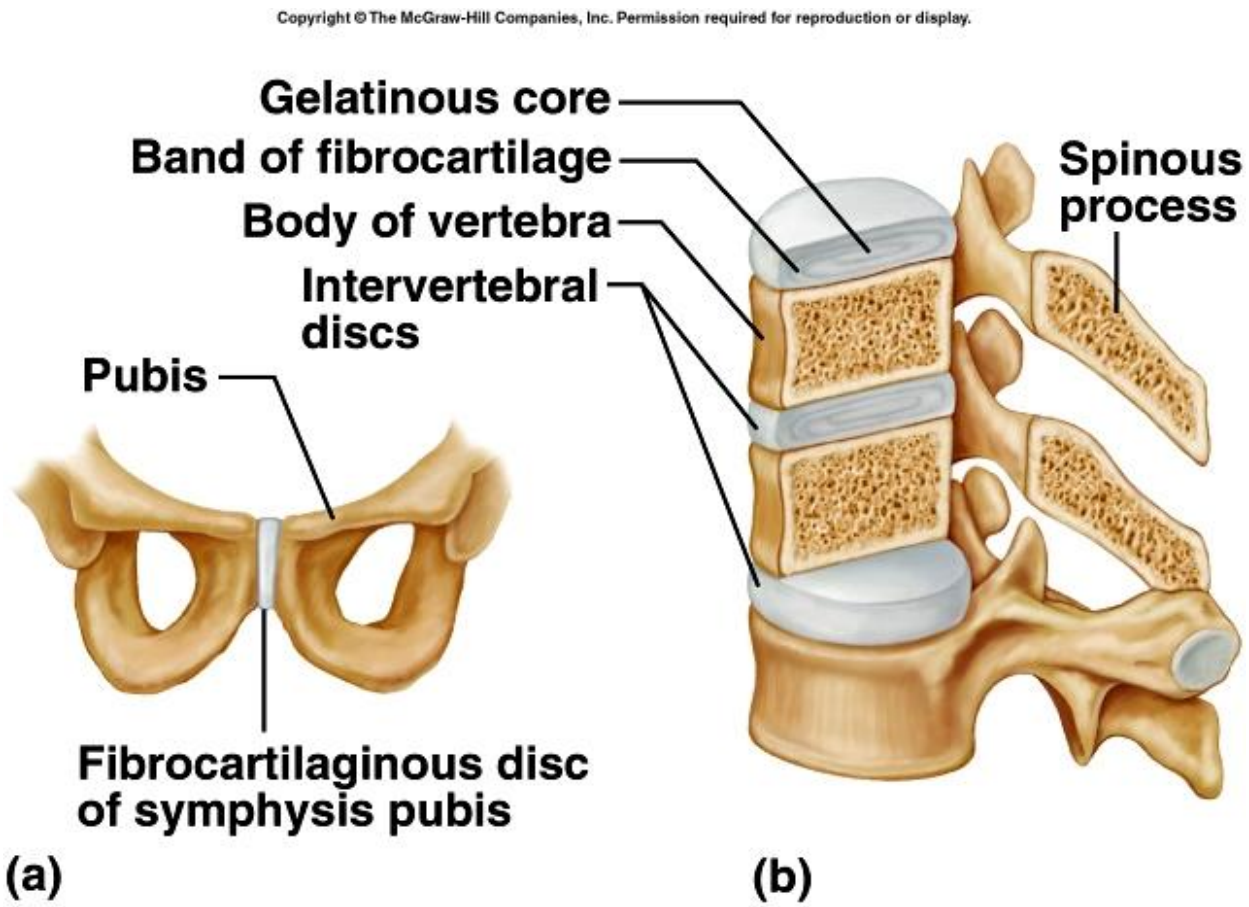
Secondary cartilaginous joints (Symphysis)

a)Pubic symphysis

b)Intervertebral discs (between body of vertebra)

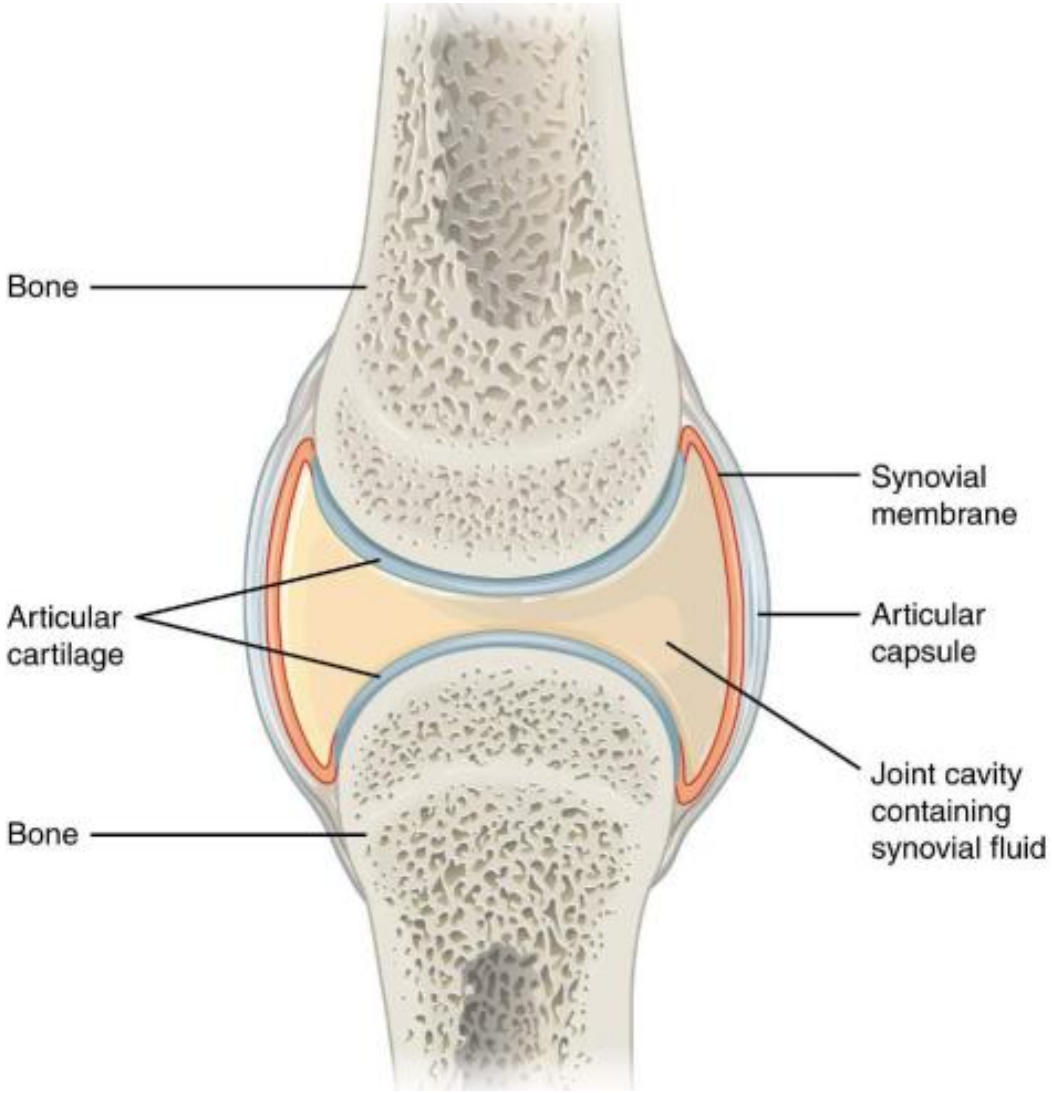
Only slight amount of movement is possible

➢Mostly all midline joints are symphysis except symphysis menti



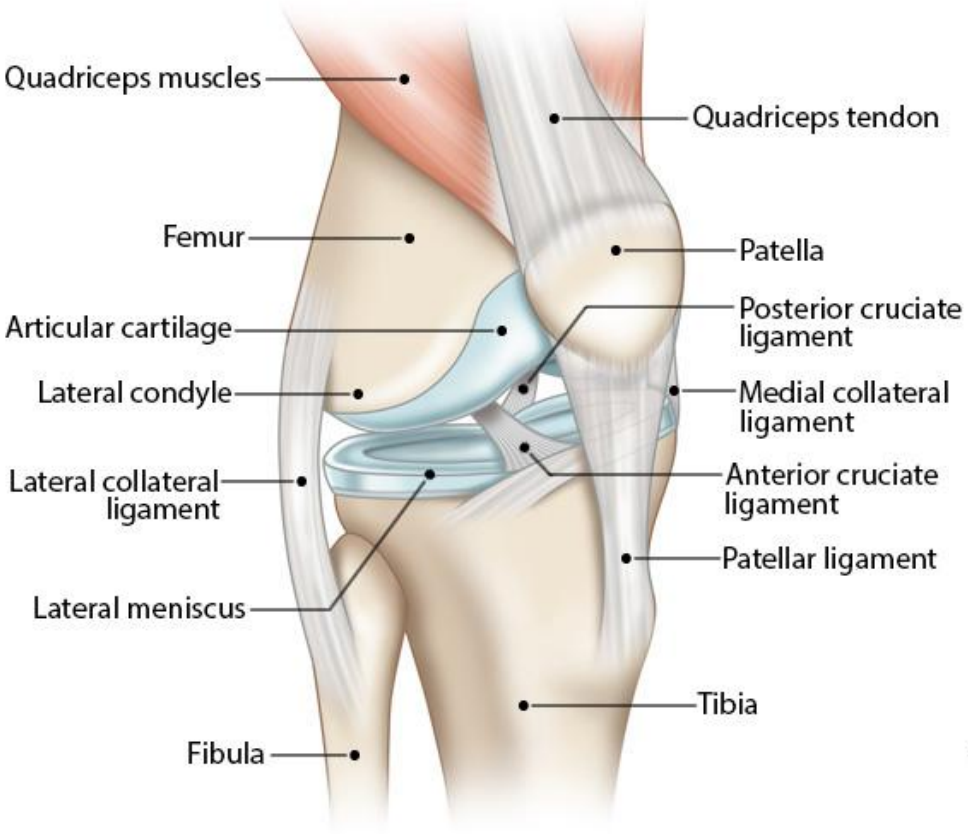
Synovial Joints

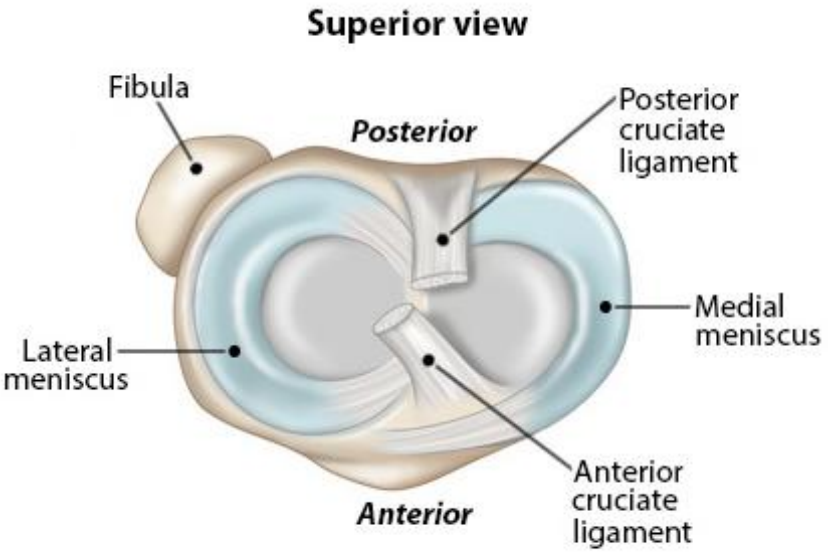
- Components Of Synovial Joints :
  - Articular surface
  - Articular cartilage
  - Fibrous capsule
  - Synovial membrane
  - Joint cavity
    - -Ligaments



Synovial Joints

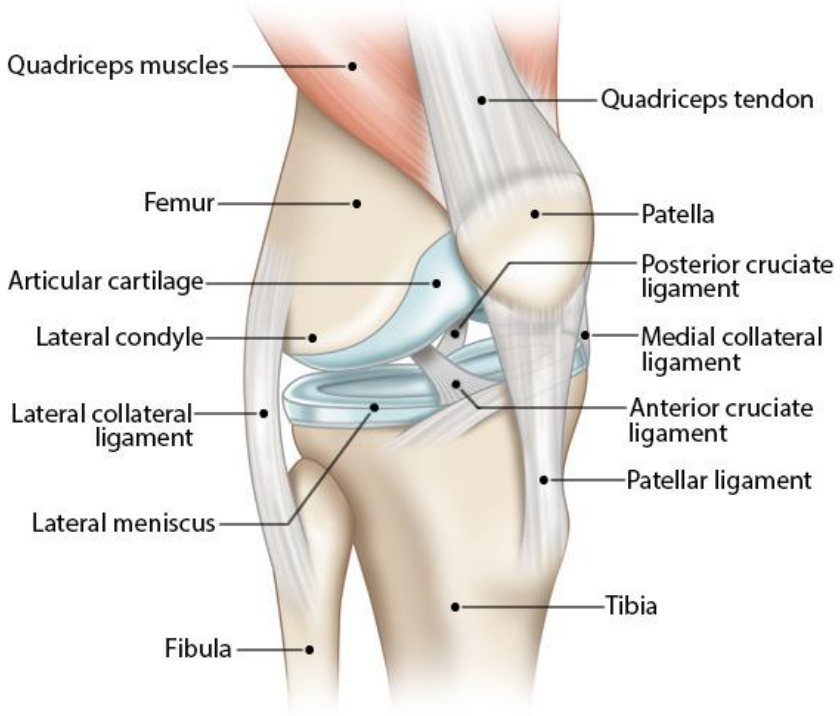
- **Articular discs (menisci)**

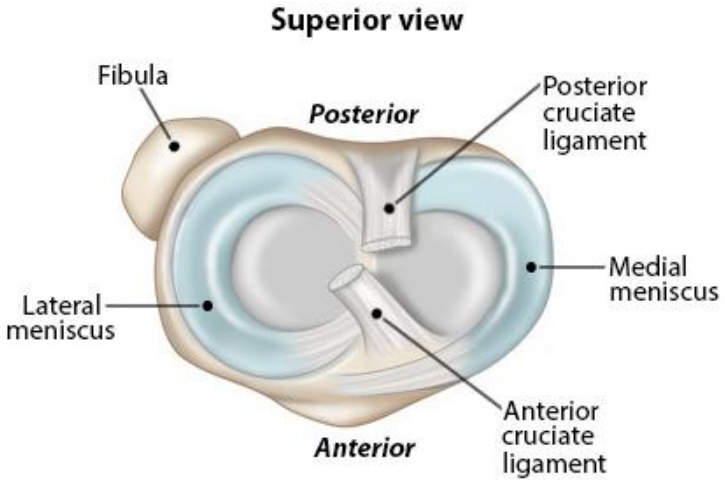




Synovial Joints

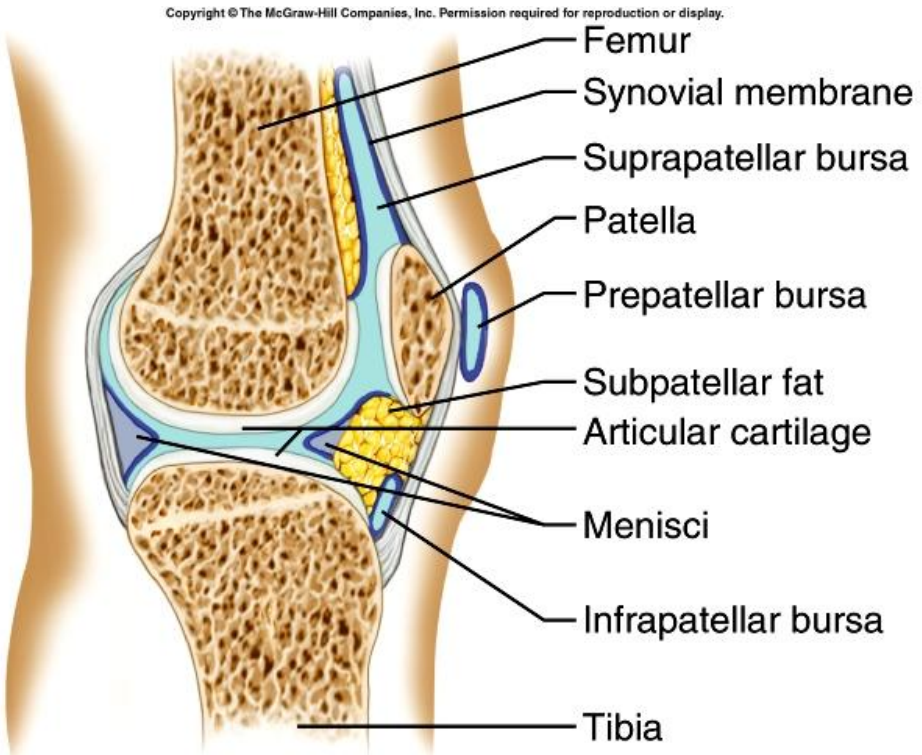
- **Ligaments :** thickened band of connective tissue that attaches bone to bone
  Extracapsular ligaments
  - Intracapsular ligaments





Synovial Joints

- **Bursae**
  - Saclike structures
  - Alleviate friction
  - Lined with synovial membrane
  - Between skin and bones ; tendons and bones; ligaments and bones
  - Bursitis



Movements of synovial joints

- Gliding or slipping
- Angular movements
- Rotary or circular movements

Movements occur along axes

1-Transverse (flexion & extension)

2-antero-posterior (abduction & adduction)

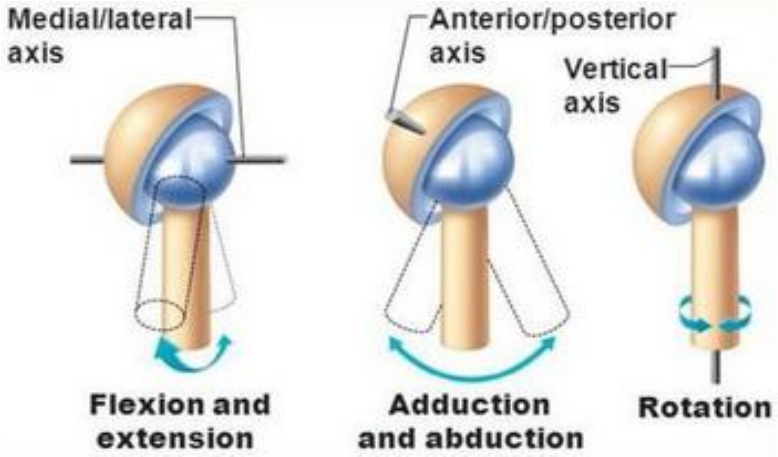
3-Longitudinal (rotation)

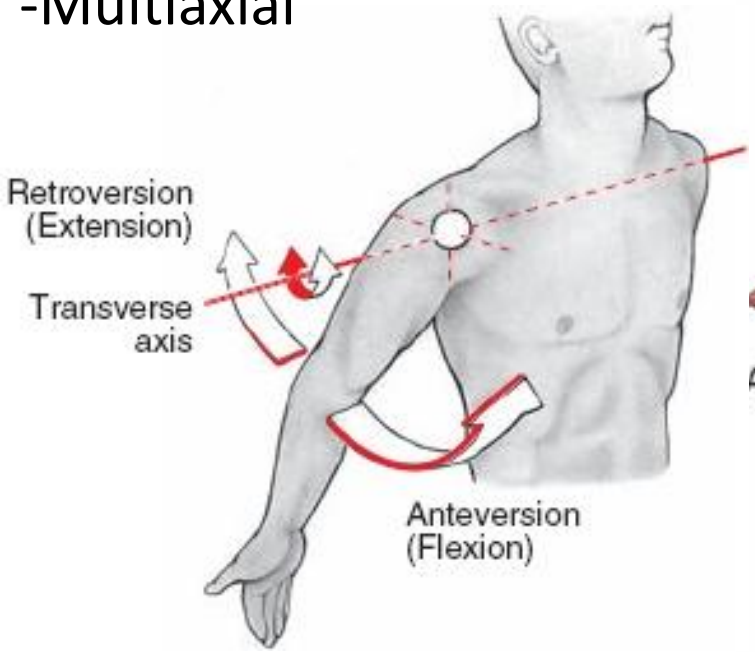
Axial joint are divided into:

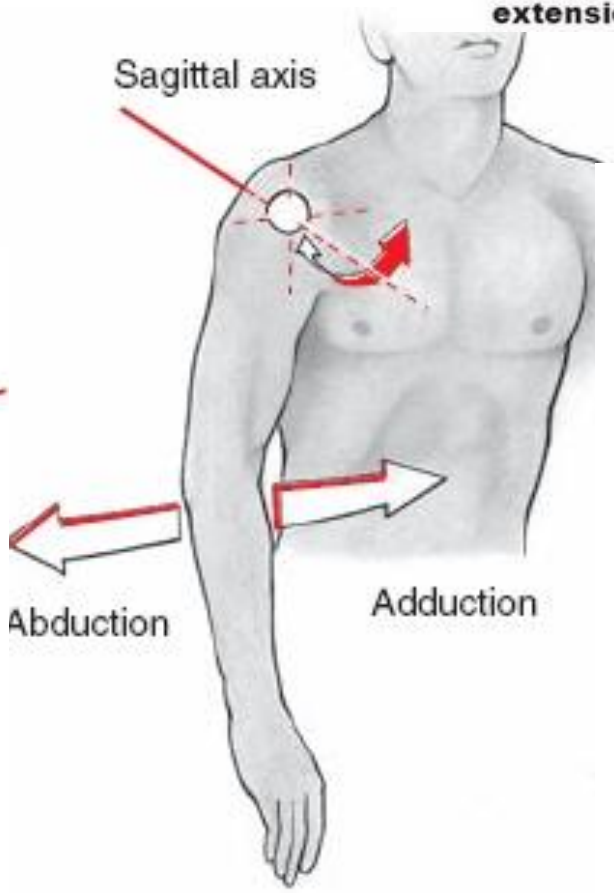
-Uniaxial

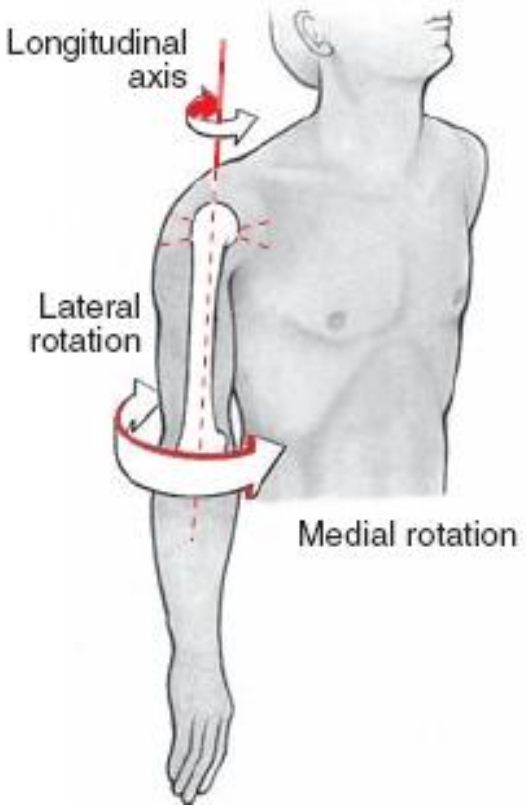
-Biaxial

-Multiaxial

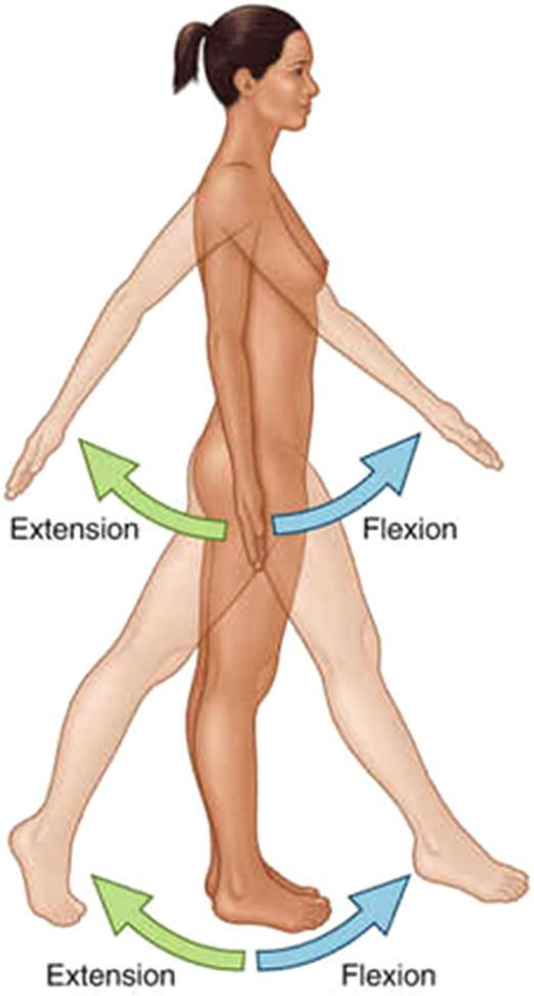


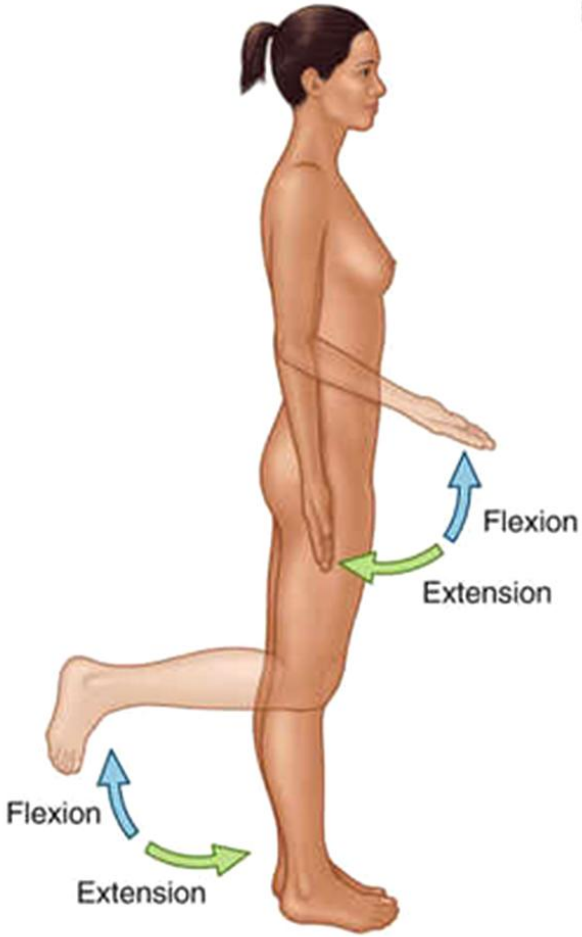


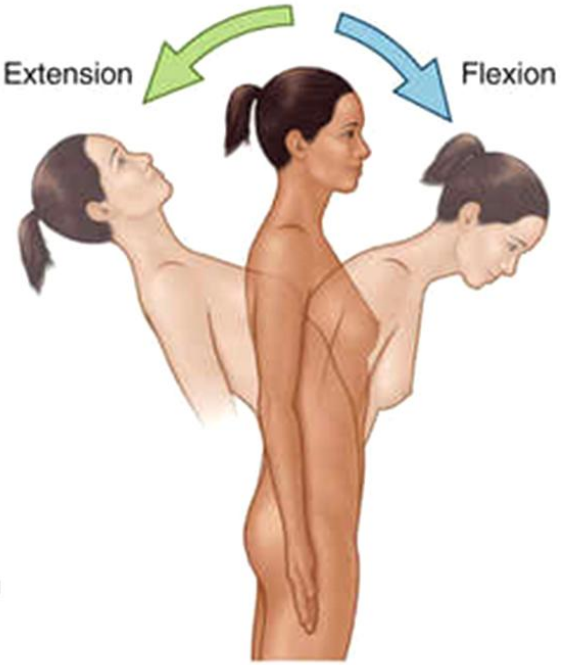




Movement in the synovial joints

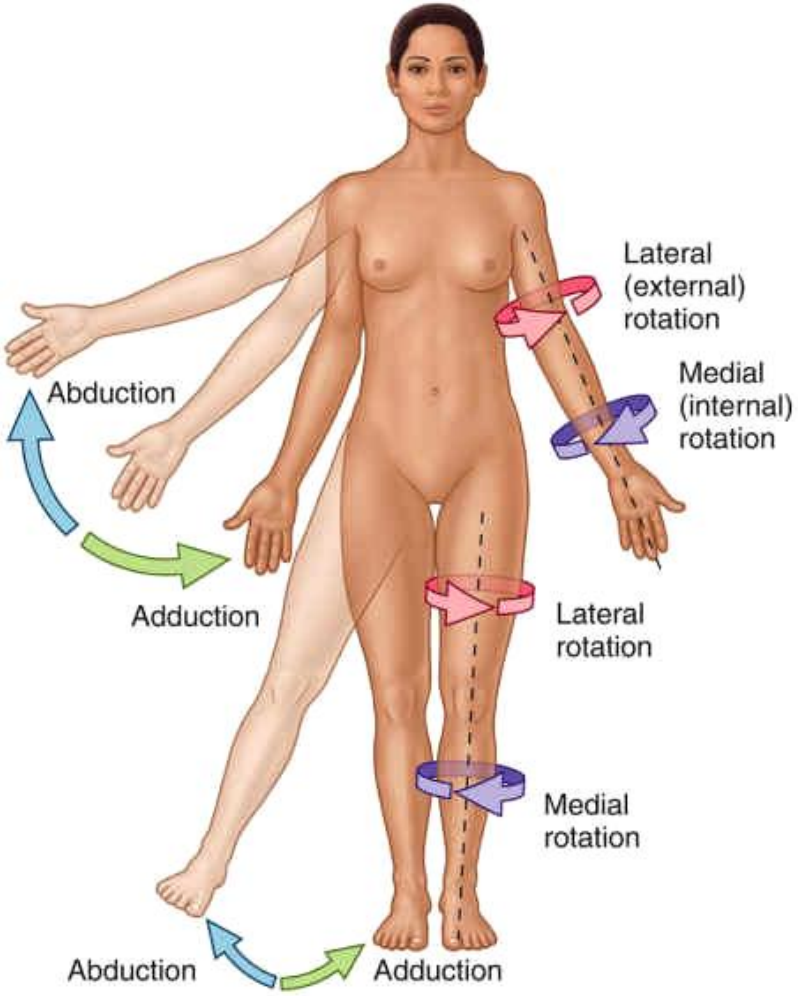


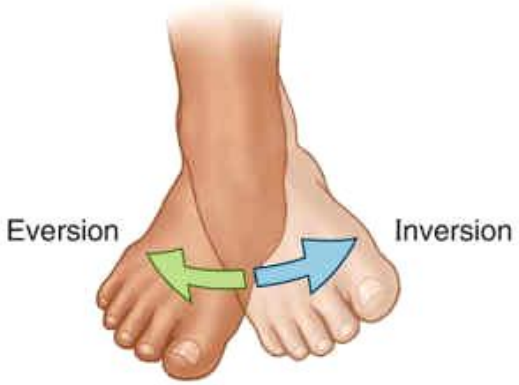




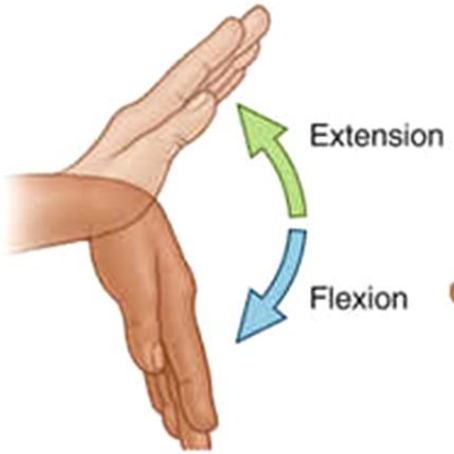
Flexion and extension of vertebral column at intervertebral joints

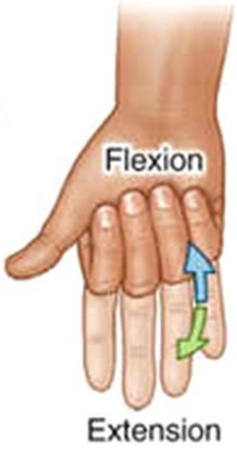
Movement in the synovial joints

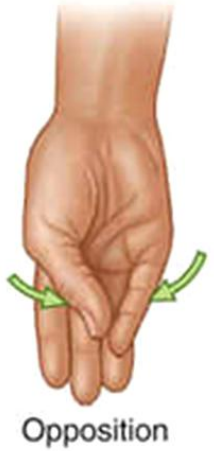


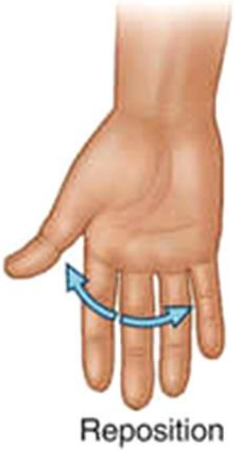


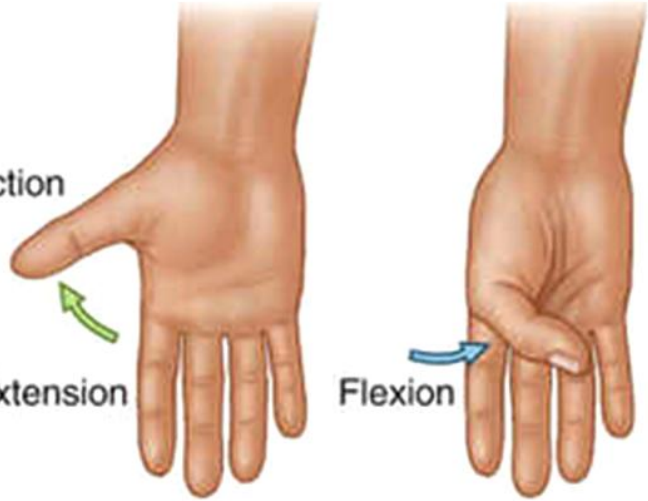
Movement in the synovial joints



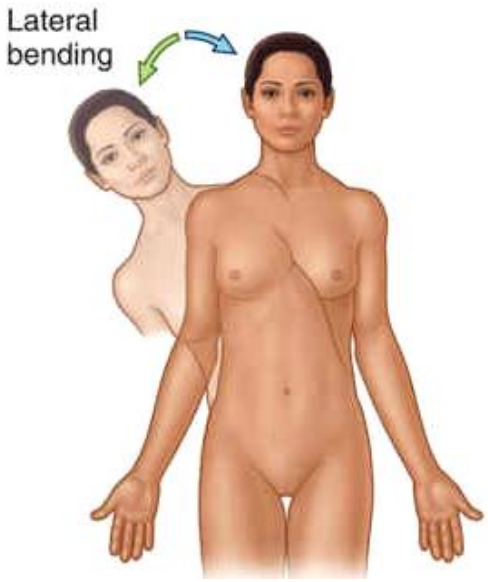


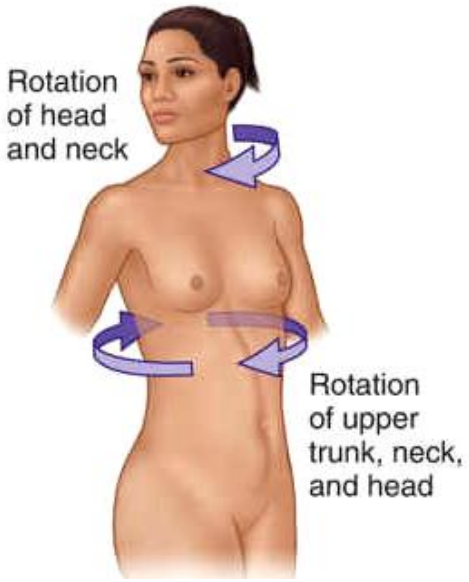


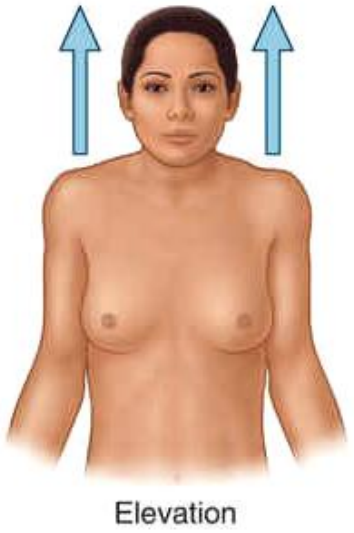


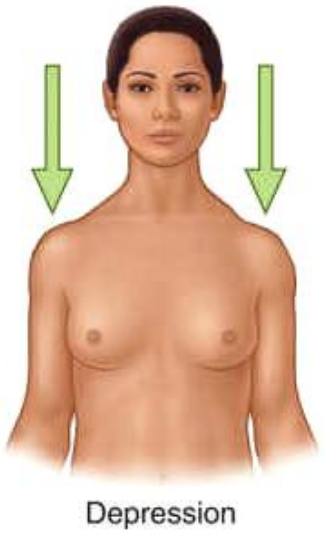


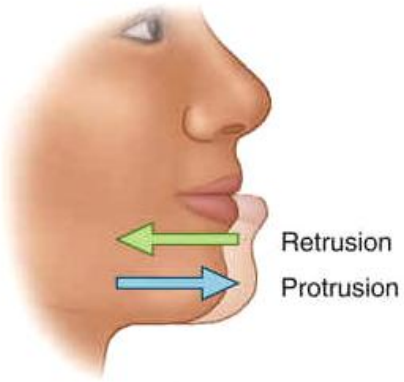
Movement in the synovial joints











Protraction and Retraction

(a) Protraction

(b) Retraction

Types of synovial joint

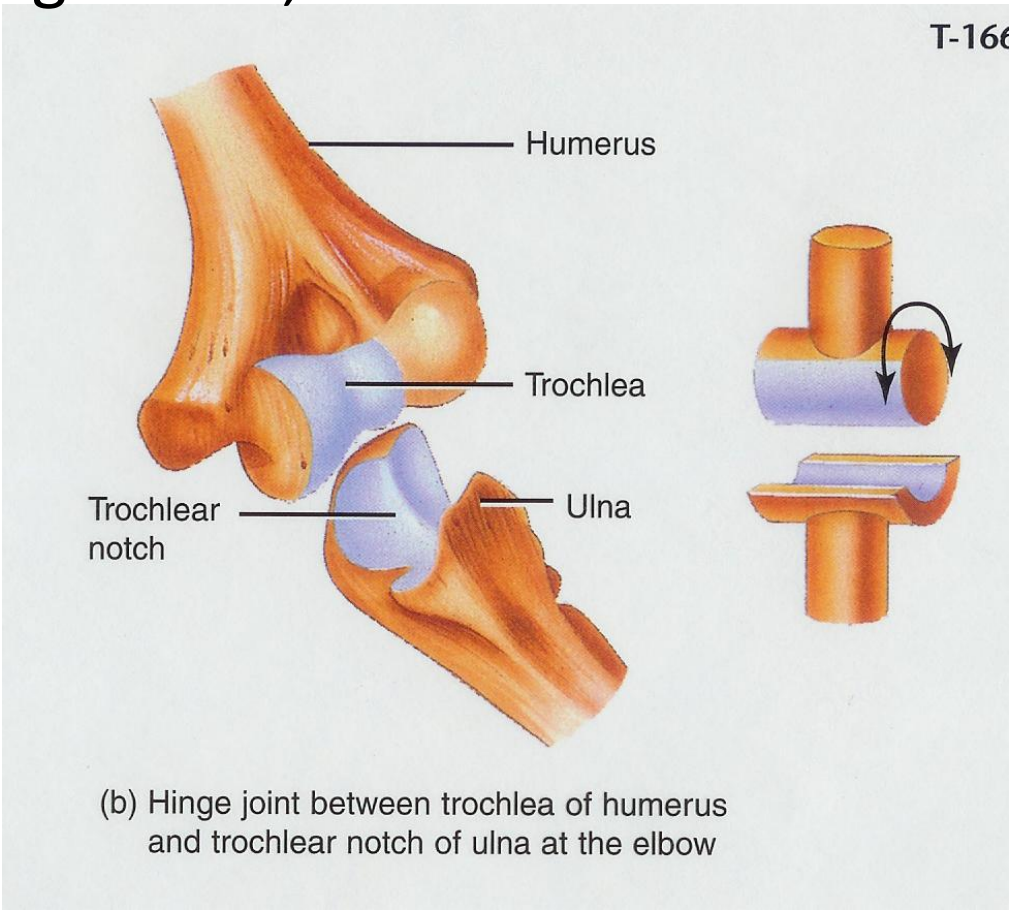
Hinge joint

Articular surfaces are pulley shaped

Uniaxial

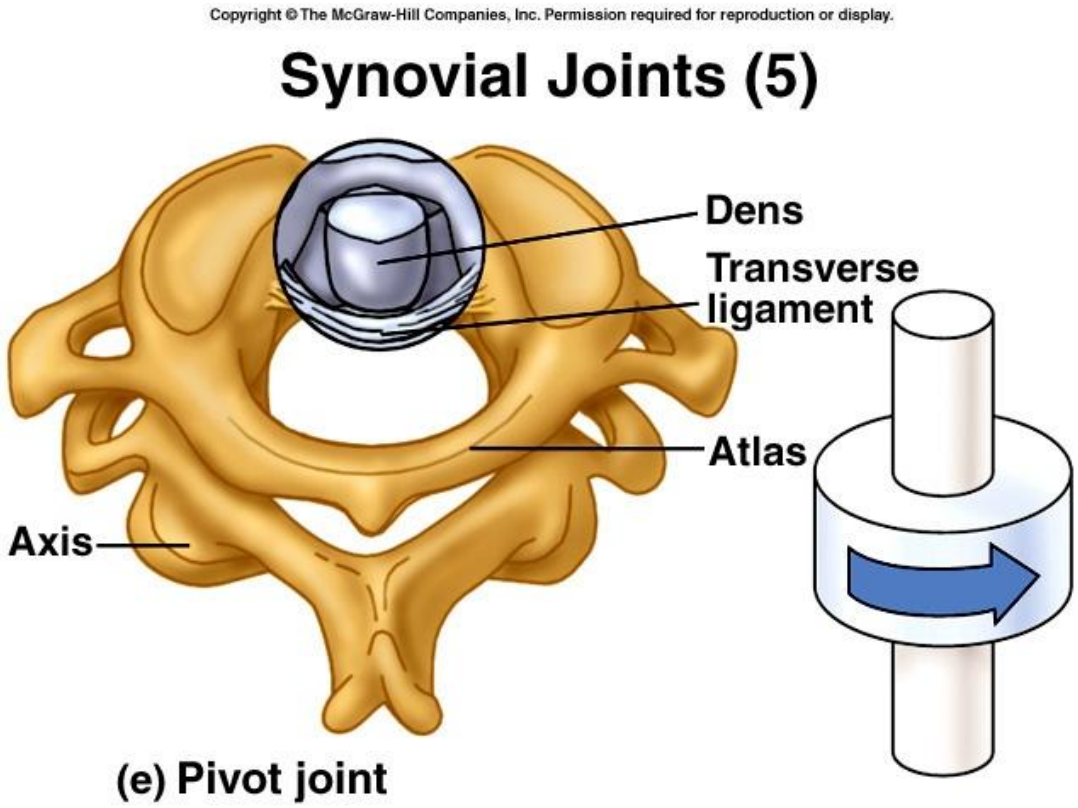
Flexion & Extension

Most common joints. ➢ e.g. elbow, ankle and interphalangeal joints



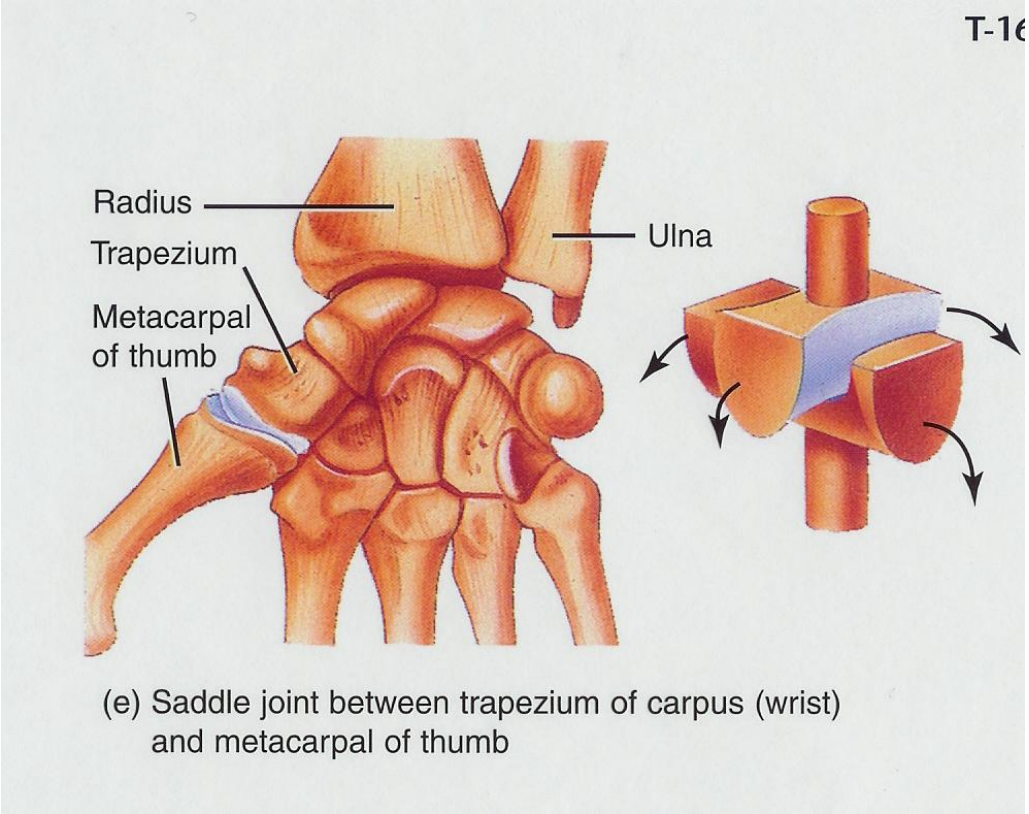
Pivot join

- Rounded end of one bone fits into the concavity of another bone.
  - ➢ The rounded part surrounded by a ligament
  - ➢ rotation
  - ➢ e.g. superior radio-ulnar and median atlanto-axial joints



Saddle joint

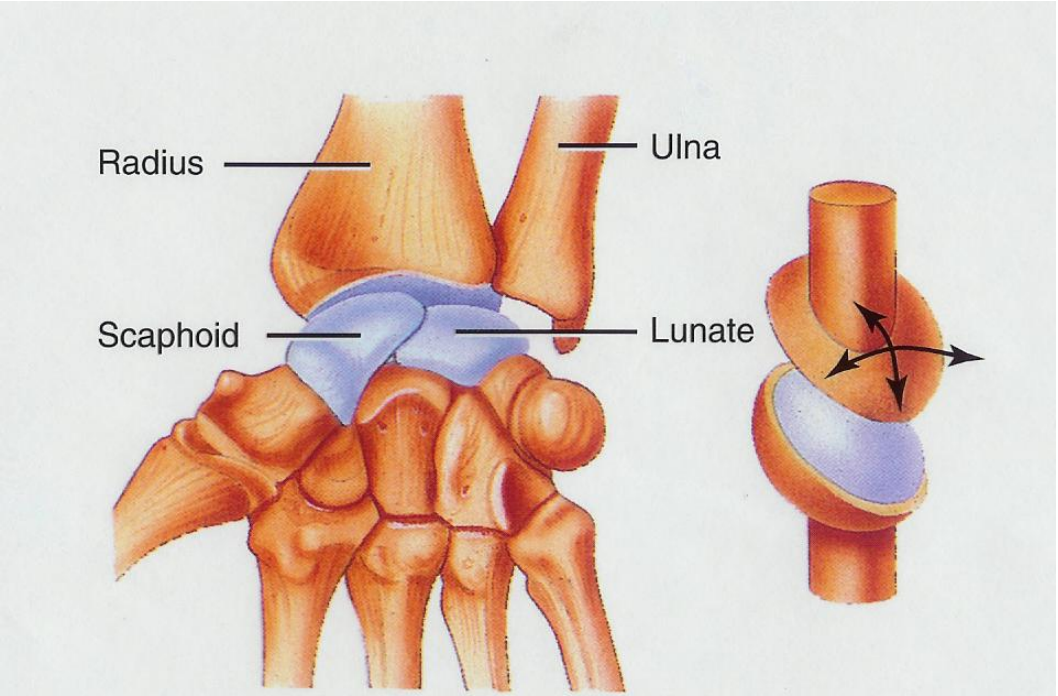
- Articular surfaces are reciprocally saddle shaped i.e. concavo-convex.
  Biaxial
- e.g. first carpo-metacarpal joint.
- Flexion, Extension ,Adduction ,Abduction, opposition of thumb



(e) Saddle joint between trapezium of carpus (wrist) and metacarpal of thumb

Ellipsoid joint

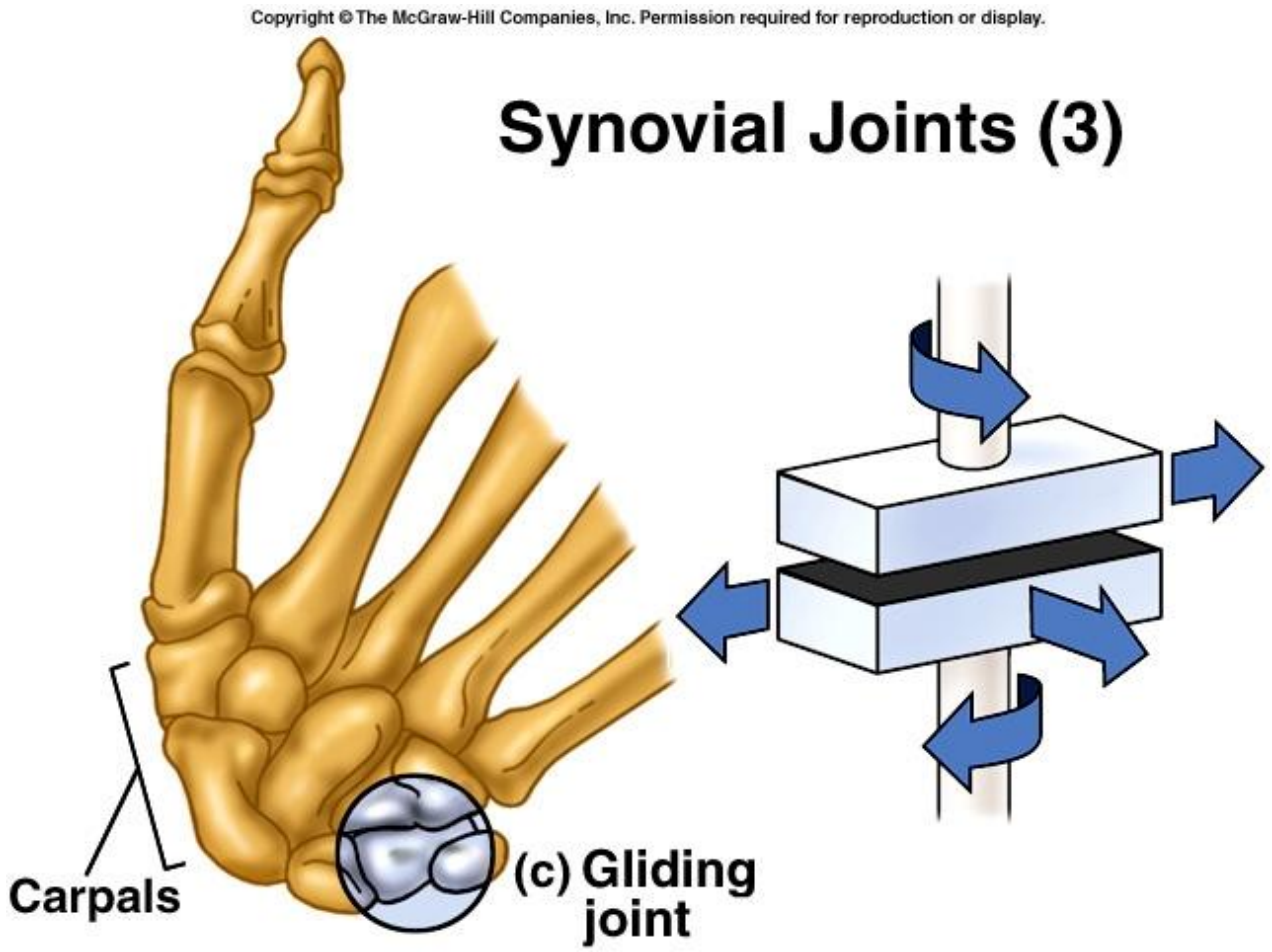
- Elliptical convex surface of one bone articulates with elliptical concave surface of another.
  ➢ Biaxial
  ➢ e.g. wrist (radiocarpal), atlanto-occipital and metacarpophalangeal joint s
  Flexion,Extension ,Adduction ,Abduction ,Circumduction



(d) Condyloid joint between radius and scaphoid and lunate bones of the carpus (wrist)

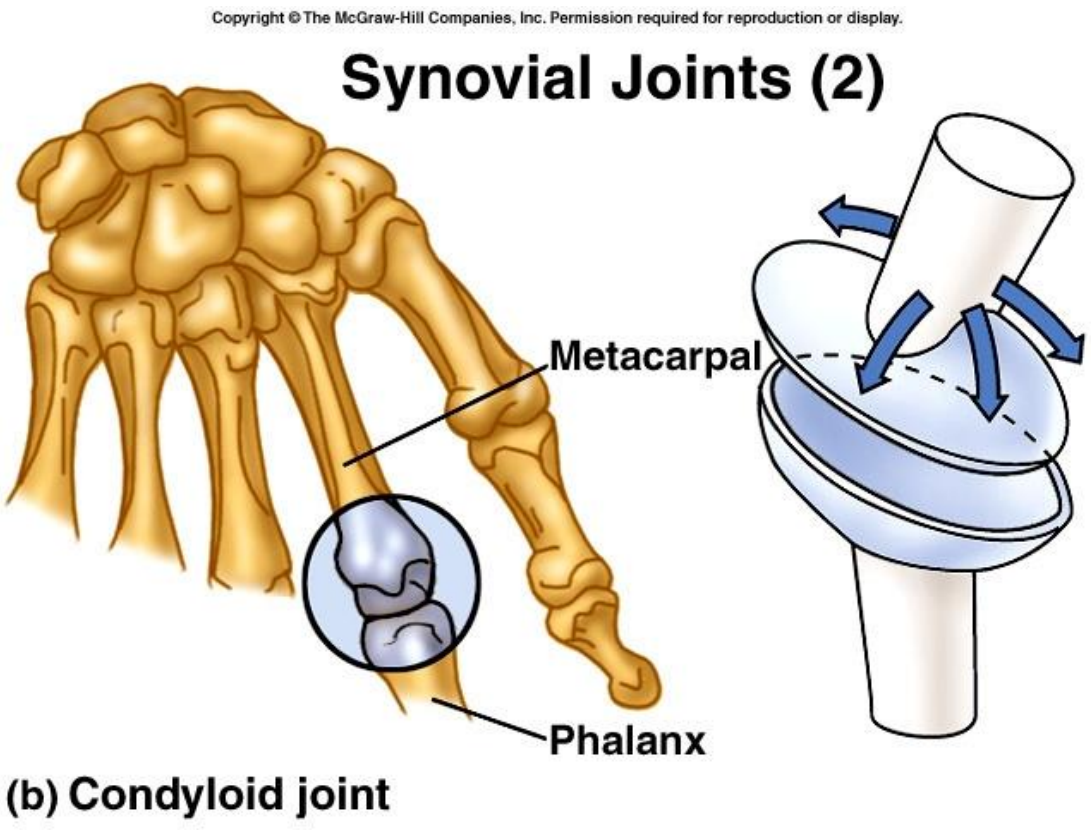
Plane joints (gliding joints)

- Articular surfaces are nearly flat.
  - ➢ Allow gliding movements.
  - ➢ e.g. intercarpal and intertarsal joints.



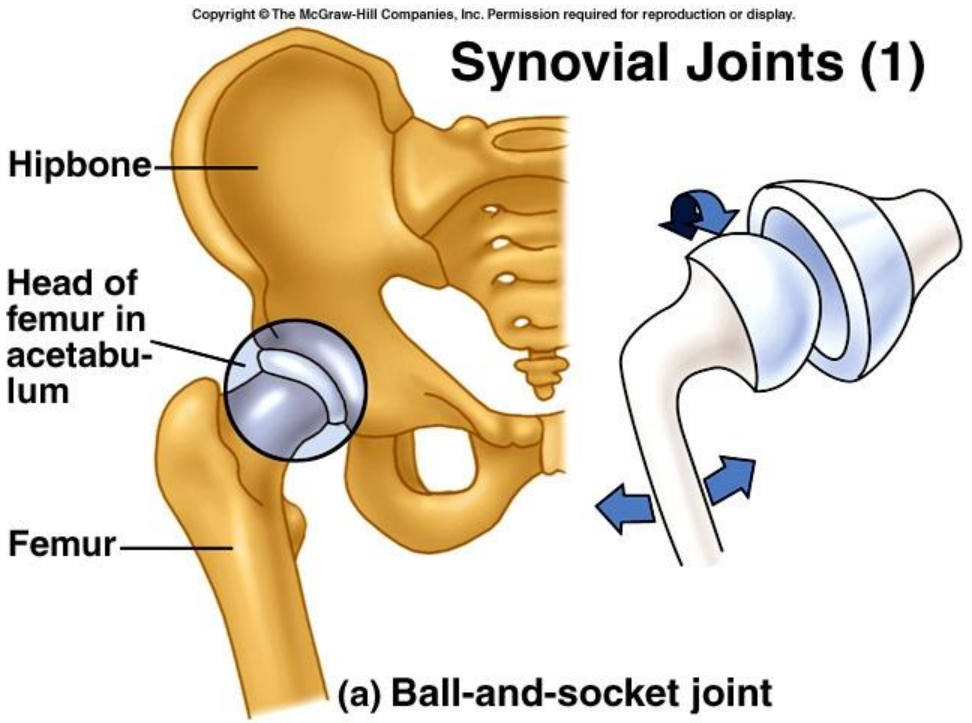
Condyloid joint

- An oval-shaped bone end which fits into a correspondingly
- shaped bone end.
- ➢ e.g.temporomandibular joints
- Biaxial
- Flexion ,Extension,Adduction,Abduction,Circumduction

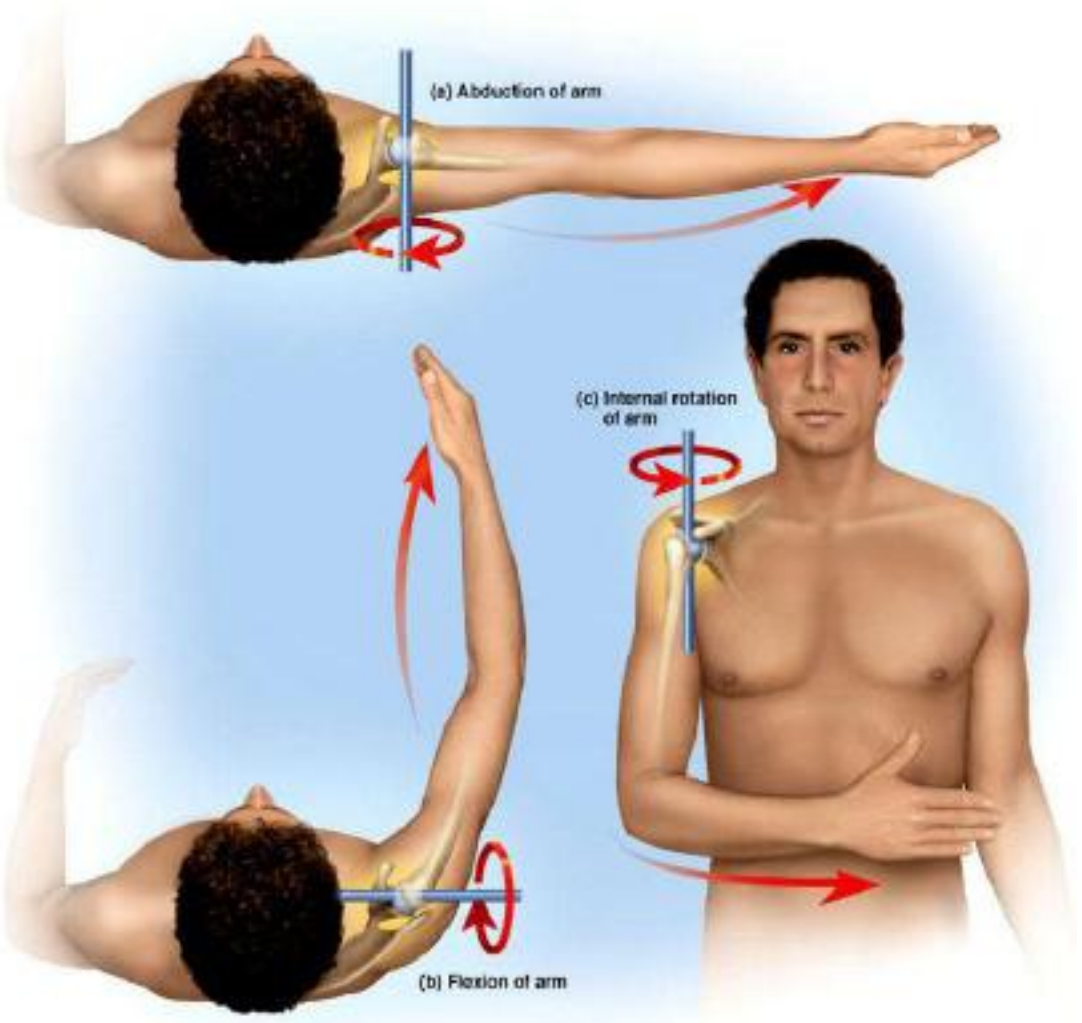


Ball and Socket joint

- Rounded convex surface of one bone fits into the cup-like socket of another bone.
- ➢ e.g. shoulder, hip
- Multiaxial
- Flexion ,Extension,Abduction,Adduction,Circumduction
- Rotation

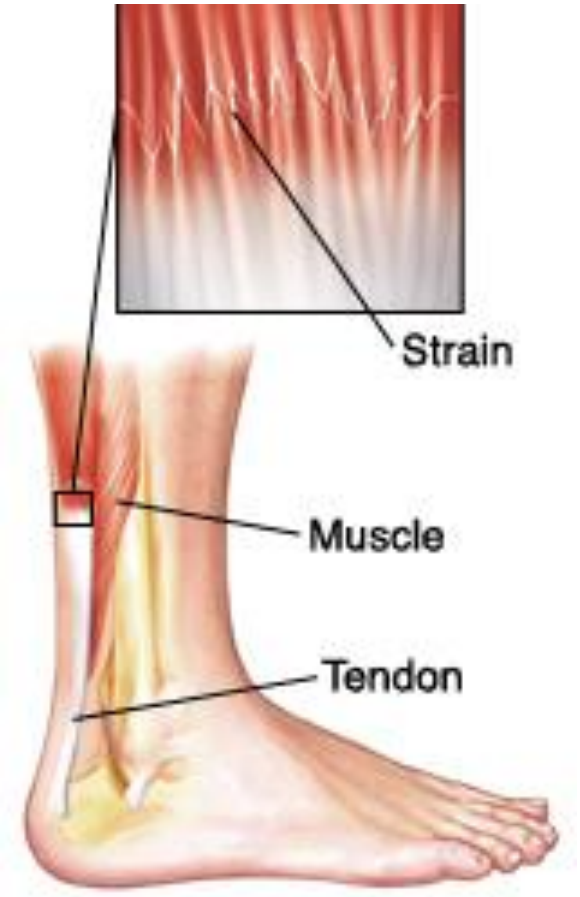


Shoulder joint has 3 degrees of freedom : multiaxial joint



Strain ,Sprain

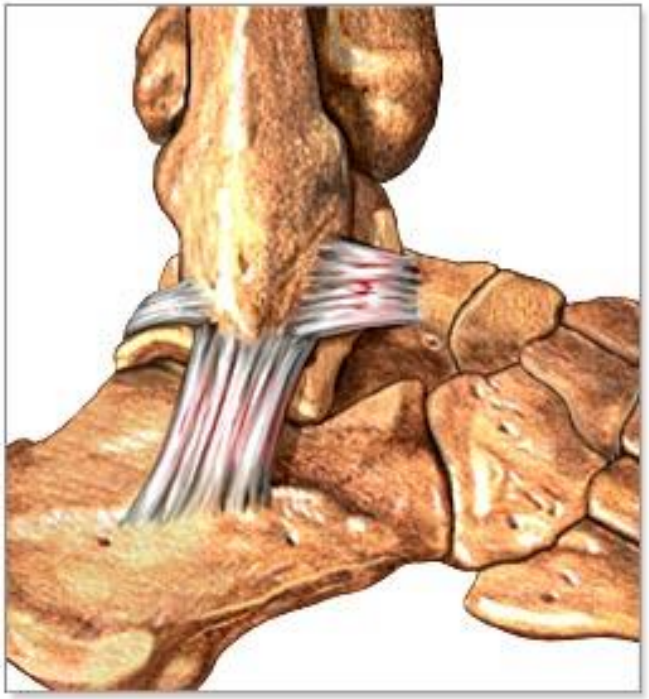
Strain: Tendon or muscle tear



Ankle Sprain: ligament tear

Type I Sprain

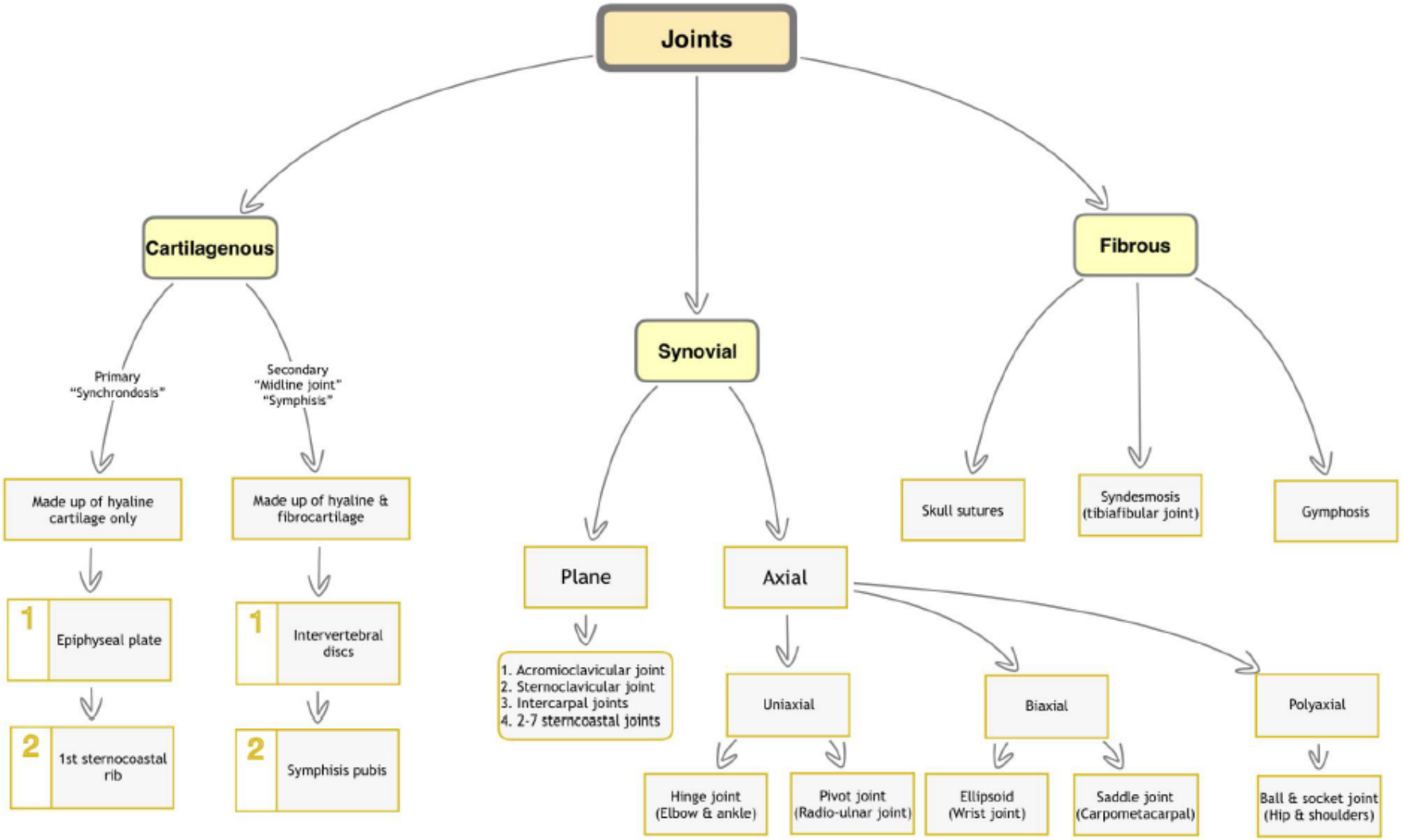
- ligaments stretched



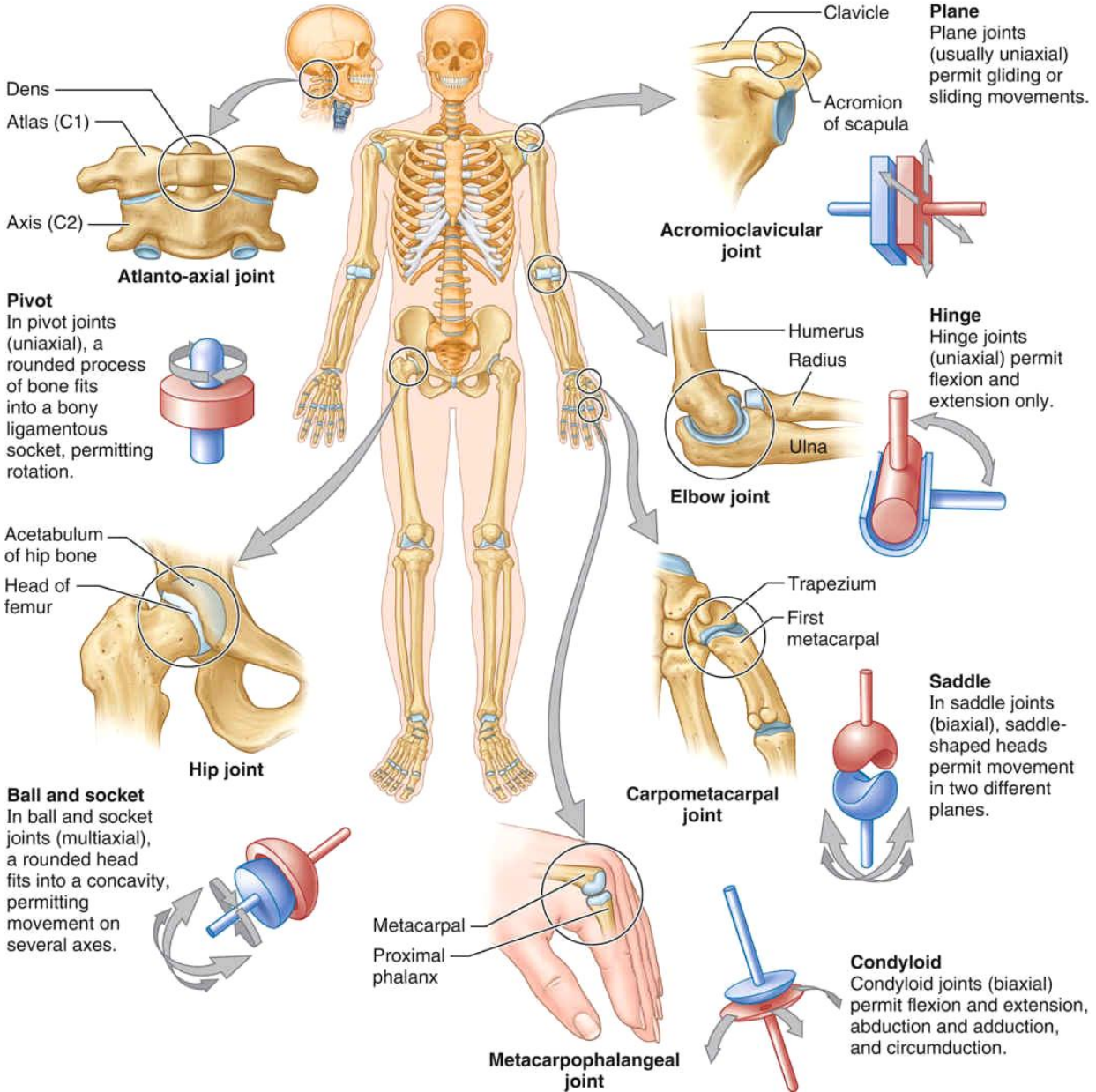
A.D.A.M.

خلاصه


Swivel Joint
Ellipsoidal Joint
Saddle Joint
Ball-and-
Socket Joint
Hinge Joint
Plane Joint


Joints
Cartilagenous
Synovial
Fibrous
Primary
"Synchrondosis"
Secondary
"Midline joint"
"Symphisis"
Made up of hyaline cartilage only
Made up of hyaline & fibrocartilage
1
Epiphyseal plate
2
1st sternocoastal rib
1
Intervertebral discs
2
Symphisis pubis
Plane
Axial
1. Acromioclavicular joint
2. Sternoclavicular joint
3. Intercarpal joints
4. 2-7 sterncoastal joints
Uniaxial
Biaxial
Polyaxial
Hinge joint
(Elbow & ankle)
Pivot joint
(Radio-ulnar joint)
Ellipsoid
(Wrist joint)
Saddle joint
(Carpometacarpal)
Ball & socket joint
(Hip & shoulders)
Skull sutures
Syndesmosis
(tibiafibular joint)
Gymphosis

خلاصه


Dens
Atlas (C1)
Axis (C2)
Atlanto-axial joint
Pivot
In pivot joints (uniaxial), a rounded process of bone fits into a bony ligamentous socket, permitting rotation.
Clavicle
Acromion of scapula
Acromioclavicular joint
Plane
Plane joints (usually uniaxial) permit gliding or sliding movements.
Humerus
Radius
Ulna
Elbow joint
Hinge
Hinge joints (uniaxial) permit flexion and extension only.
Acetabulum of hip bone
Head of femur
Hip joint
Ball and socket
In ball and socket joints (multiaxial), a rounded head fits into a concavity, permitting movement on several axes.
Trapezium
First metacarpal
Carpometacarpal joint
Saddle
In saddle joints (biaxial), saddle-shaped heads permit movement in two different planes.
Metacarpal
Proximal phalanx
Metacarpophalangeal joint
Condyloid
Condyloid joints (biaxial) permit flexion and extension, abduction and adduction, and circumduction.

منابع

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2-Gray's Anatomy for Students, 3rd Edition, 2017

3-Clinical Oriented Anatomy, KL Moore, 2017

4-Human Anatomy,S.Fakhrodin mesbah A, sixth Edition,2017

ازمون

1-درز (Suture) جز کدام مفاصل میباشد ؟

A-Fibrous
B-Cartlaginous
C-Synovial
D-Diarthrosis

2- در مفصل مچ دست چه حرکتی وجود ندارد؟

•

ازمون

Question 1: What is the classification of **gomphosis**?

A. Fibrous

B. Cartilaginous

C. Axial Synovial

D. Plane Synovial

Question 2: Which of the following allows **free range of movement**?

A. Fibrous joints

B. Cartilaginous joints

C. Synovial joints

D. Syndesmosis

ازمون

Question 3: Which of the following is a **primary cartilaginous joint**?

A. Epiphyseal plate

B. Symphysis Pubis

C. Joints between the vertebrae

D. Hip joint

Question 4: **Wrist joints** are considered which of the following:

A. Hinge joint

B. Pivot joint

C. Ellipsoid joint

D. Saddle joint

شاد وسلامت باشید

گروه علوم تشریحی

دانشکده پزشکی شیراز

سعید کربلایی دوست