

General arthrology

Connections of bones (juncturae ossium)

1. SYNARTHROSIS:

- Bones are connected with some connective tissue
- Articular surfaces are missing, mobility is minimal
- Differentiation according to the type of connective tissue

a) ART. FIBROSA- SYNDESMOSIS

b) ART. CARTILAGINEA (SYNCHONDROSIS, SYMPHYSIS)

c) SYNOSTOSIS

2. DIARTHROSIS: articulatio synovialis

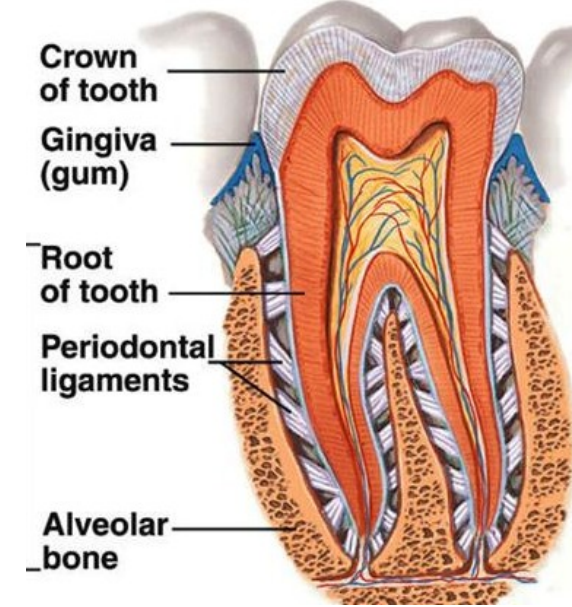
- Joint connection with contact

a) ART. FIBROSA- SYNDESMOSIS

Connection using fibrous tissue

wedging (gomphosis):

- fixation of the tooth into dental alveolus in the jaw



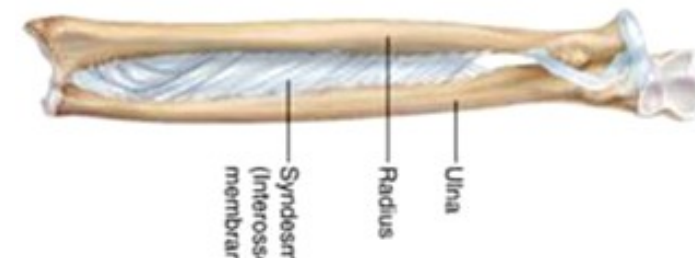
suture (sutura):

- connection of the skull plane bones
- smooth- plana
serrated- serrata
squamous- squamosa



ligament (ligamentum):

- band of collagenous connective tissue, it can have form of membrane



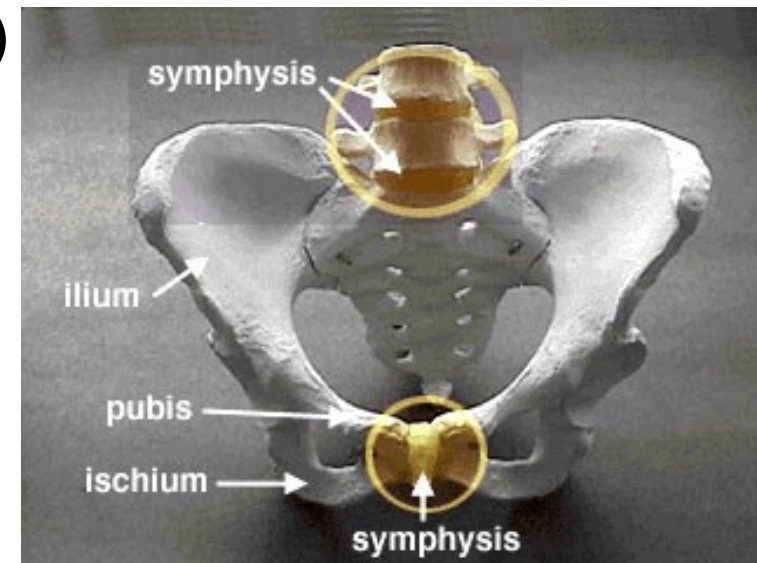
b) ART. CARTILAGINEA

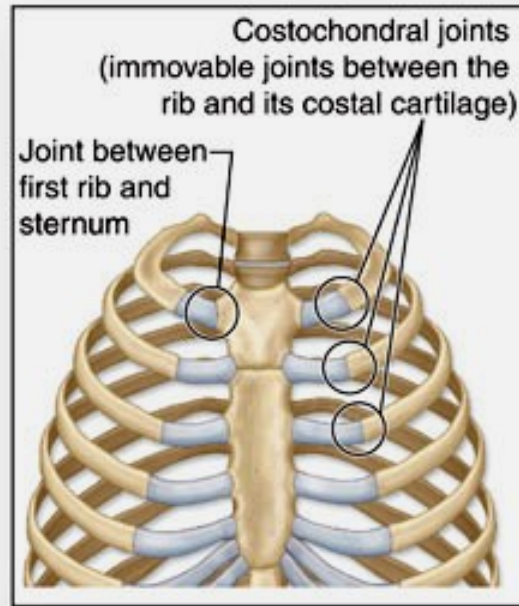
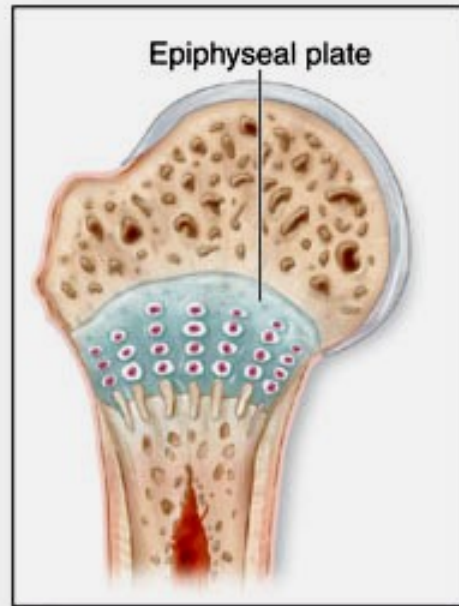
SYNCHONDROSIS

- Connection using hyaline cartilage (between ribs and sternum, between bones of base of the skull)
- During development between epiphysis and diaphysis of long bones

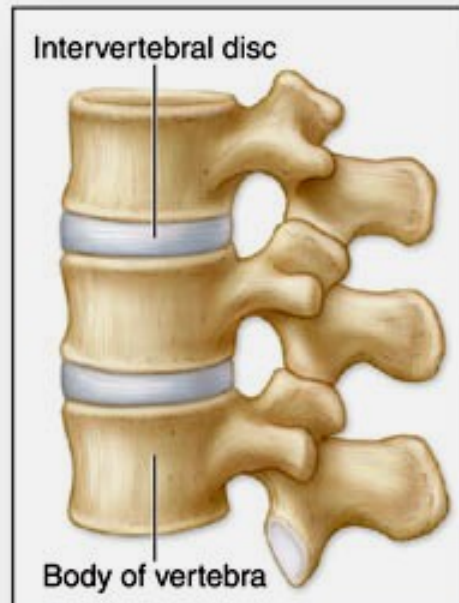
SYMPHYSIS

- Connection using fibrous cartilage (intervertebral disc, symphysis pubica)





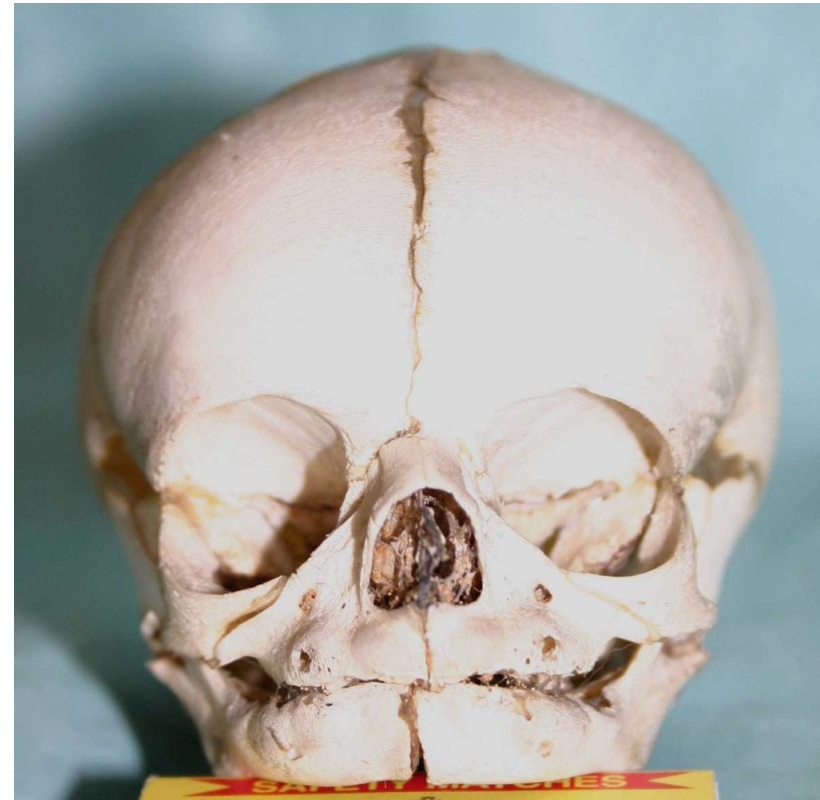
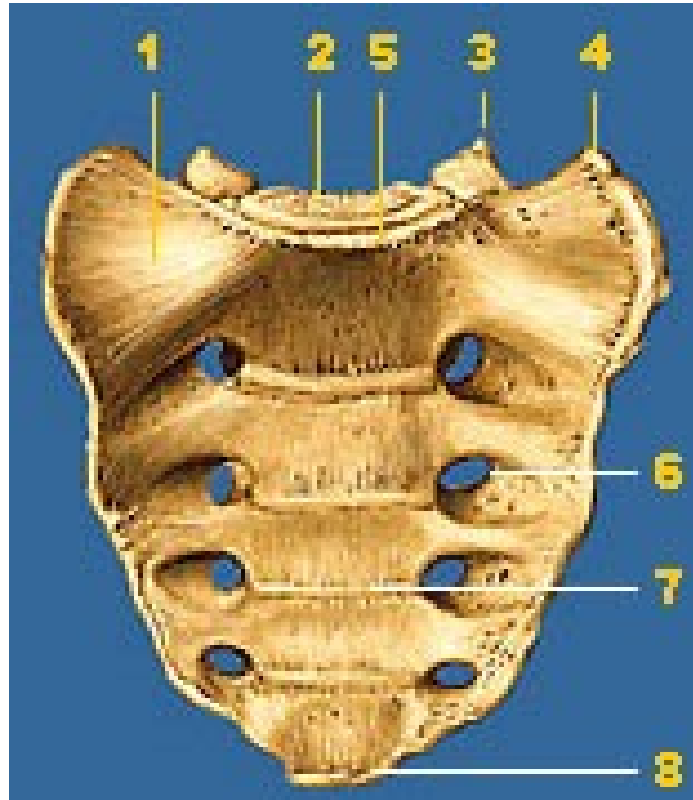
(a) Synchondroses (contain hyaline cartilage)



(b) Symphyses (contain fibrocartilage)

c) SYNOSTOSIS

- Connection using bone tissue, originally independent bones grow together
- For example sacral bone, coccygeal bone, bones of pelvis, some bones of skull

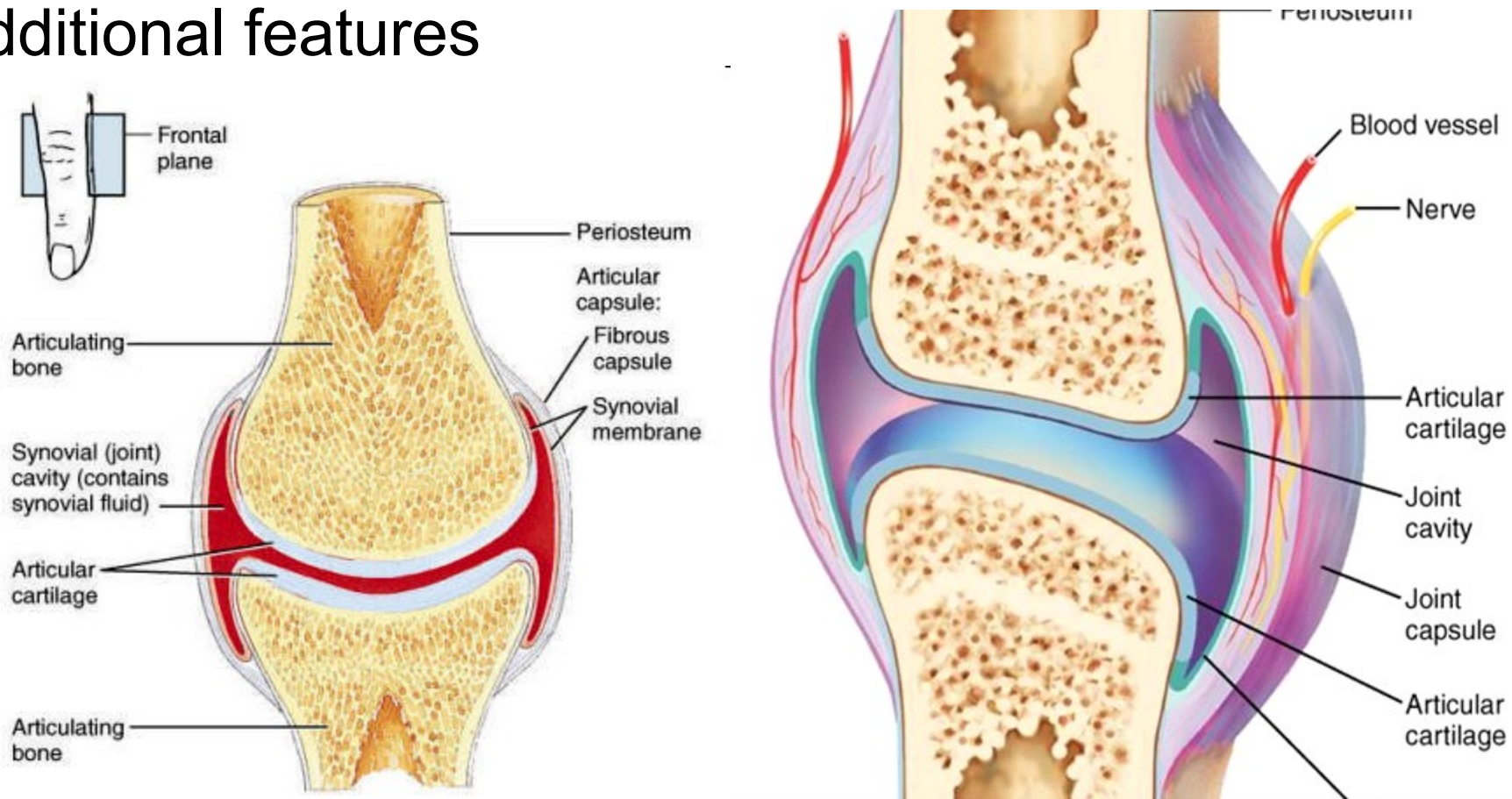


2. DIARTHROSIS

- joint– **articulatio**, usually movable

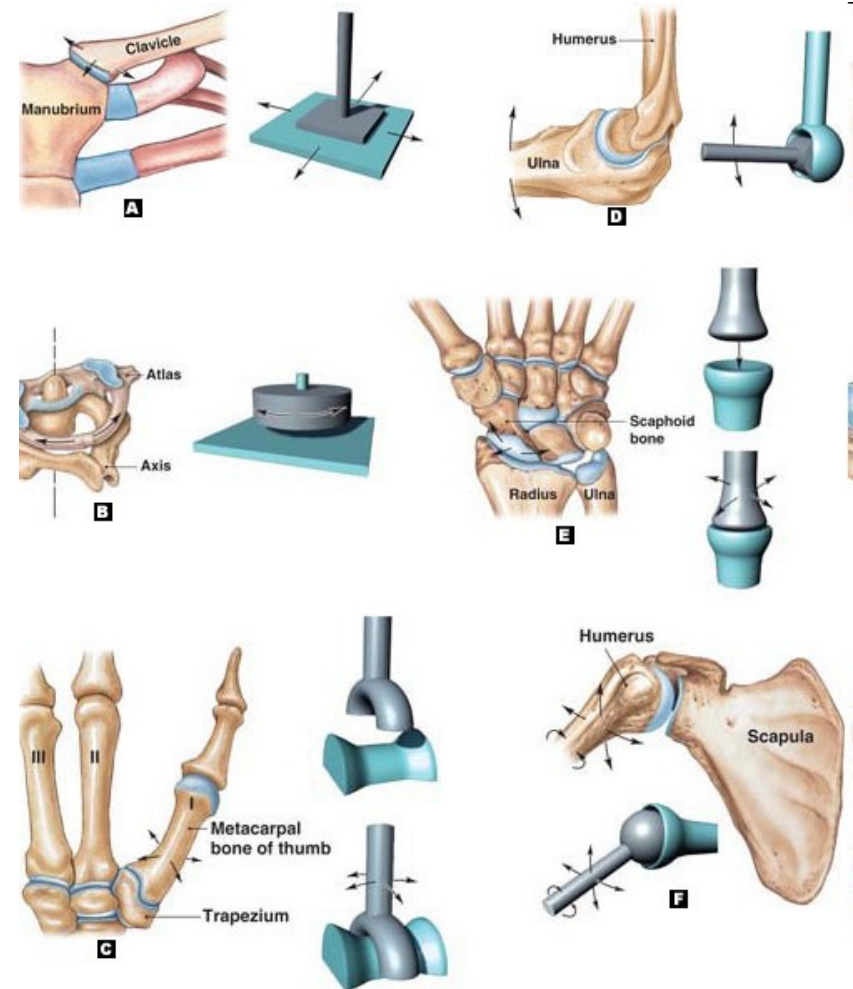
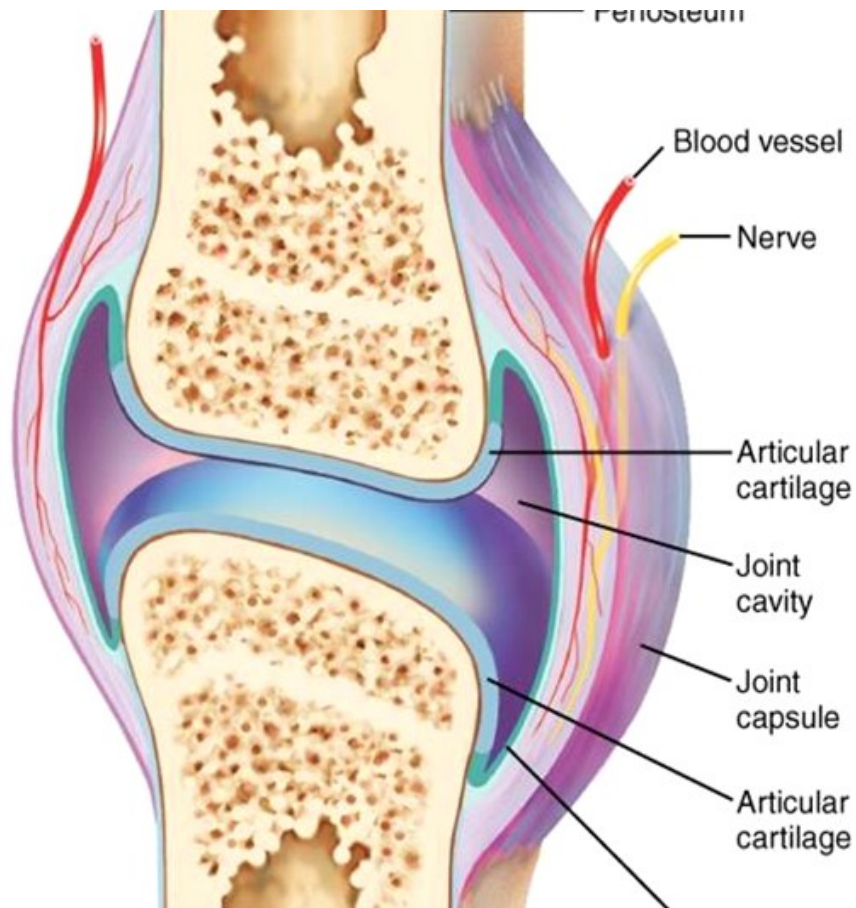
Description of the joint

- Articular surfaces - **facies articulares**
- Articular cavity - **cavitas articularis**
- Articular capsule - **capsula articularis**
- Additional features



a) Articular surface(facies articularis):

- is covered by hyaline cartilage
- has various shape, articular head(caput)- convex, articular fovea (fossa)- concave



b) Articular capsule(capsula articularis):

- **covering of the joint, has two layers**

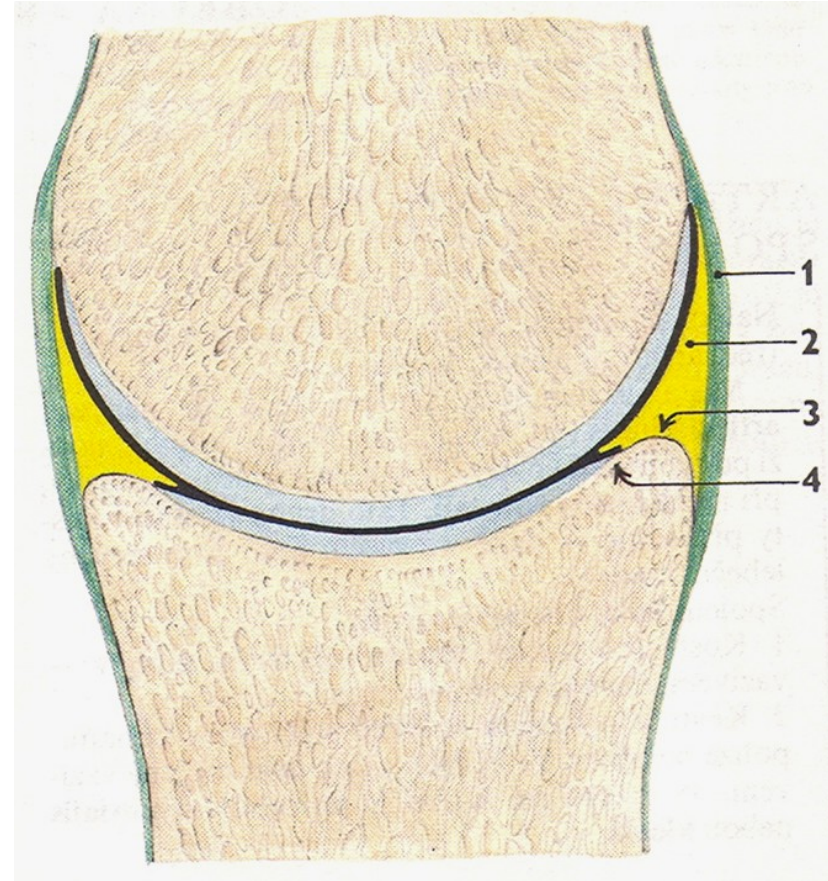
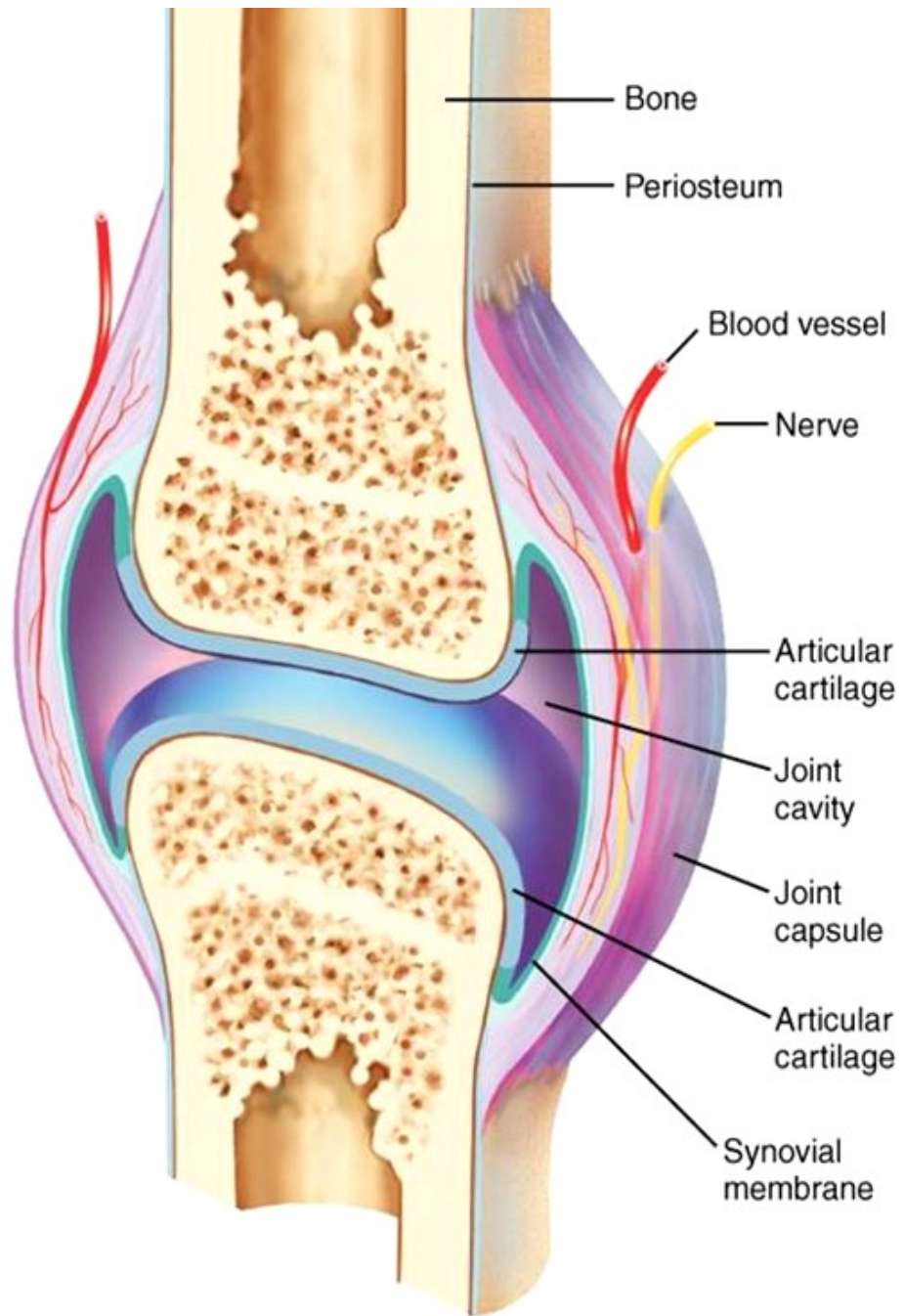
-**stratum fibrosum**- external layer is created by fibrous connective tissue, is firming up the joint connection

- **stratum synoviale**- internal layer is created by thin fibrous tissue with vessels and nerves, forms folds -

plicae synoviales, and villi- **villi synoviales**, produces synovial fluid - **synovii** (significance for joint movement and for nourishment of joint cartilages)

c) Articular cavity (cavum articulare):

- cavity (fissure) inside the joint between articular surfaces and articular capsule, its content is synovial fluid



d) Additional features:

- only in some joints
- provide better function

Articular ligaments (ligamenta articularia):

- (intraarticular, extraarticular)

Cartilaginous plates (disci et menisci):

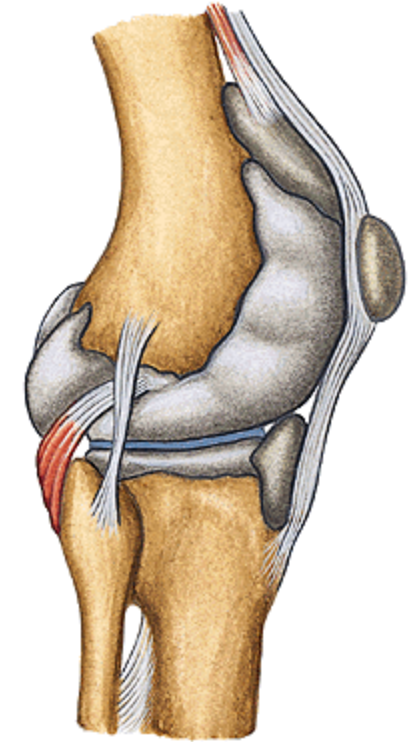
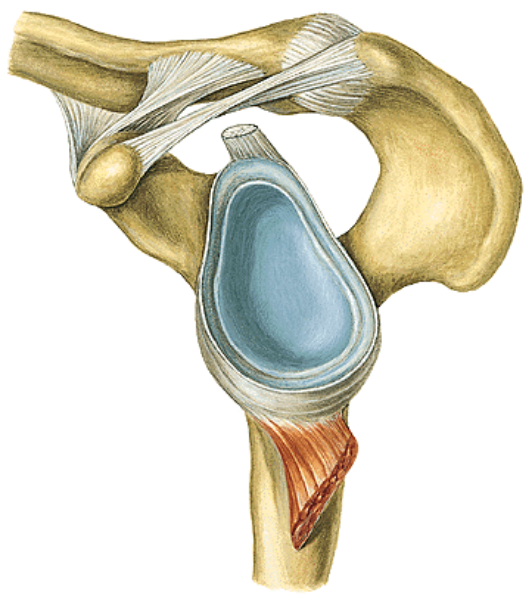
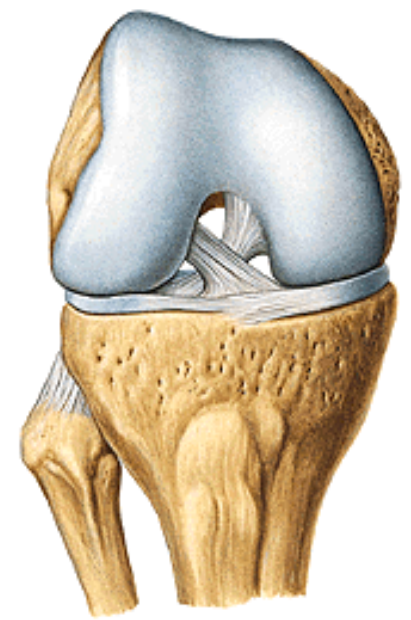
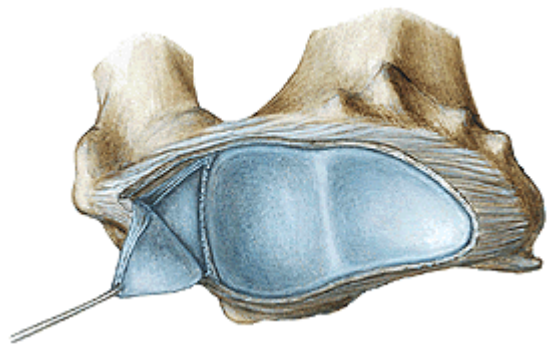
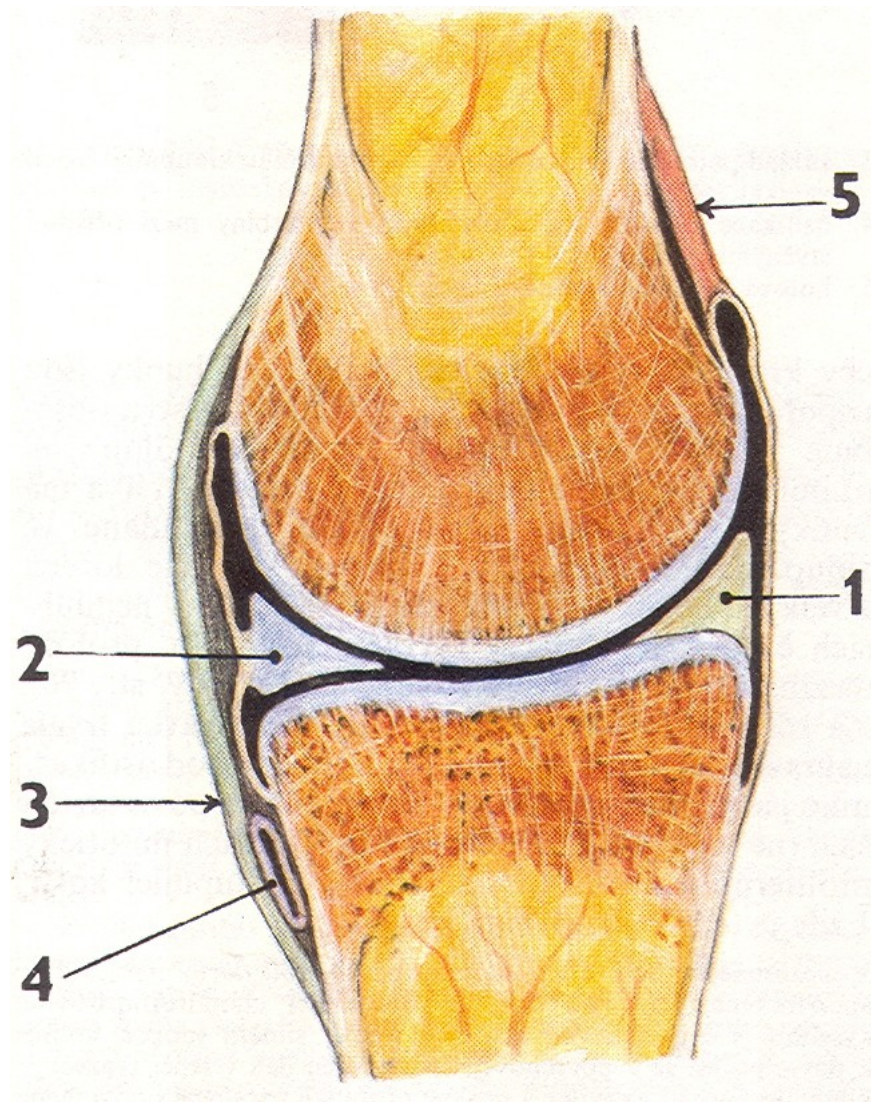
- Fibrous cartilage, intraarticularly,
- discus articularis- completely septates the articular cavity
- meniscus articularis- doesn't separate the entire articular cavity

Articular labra (labra articularia):

- Bands of cartilaginous tissue, enlarge and deepen articular pit

Synovial bursae (bursae synoviales):

- Cavities of various size, are bordered by fibrous capsule and filled by synovia, in places, where muscles or tendons lie directly on bones



Types of joints

A. Classification of joints according to the shape of articular surfaces:

joint with irregular surfaces - AMPHIARTROSIS

flat joint - ART. PLANA

Spherical joint (ball and socket)- ART. SPHAEROIDEA

- spherical free - **ARTHRODIA**

- spherical restricted - **ENARTHROSIS**

cylindrical joint - ART. CYLINDROIDEA

- **GINGLYMUS**- axis of movement is perpendicular to the longitudinal axis of bone

- wheel joint - **TROCHOIDEA**- axis of movement is parallel to the longitudinal axis of bone

elipsoidal joint - ART. ELLIPSOIDEA

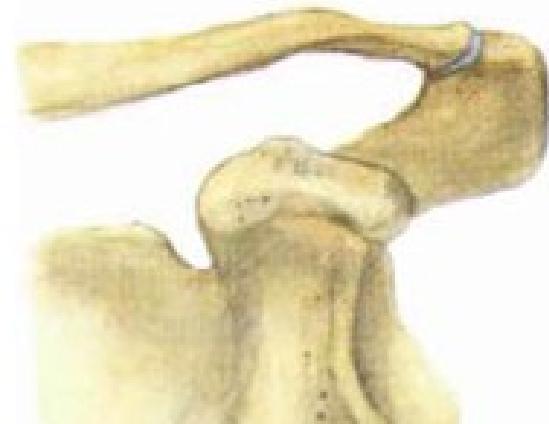
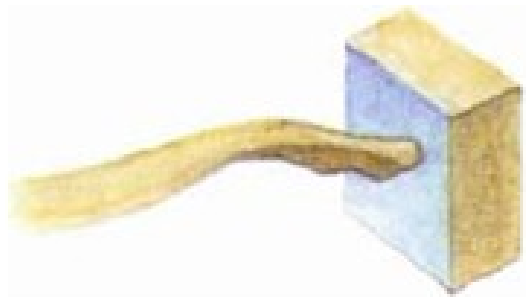
sellar joint- ART. SELLARIS

trochlear (hinge) joint - ART. TROCHLEARIS

AMPHIARTROSIS

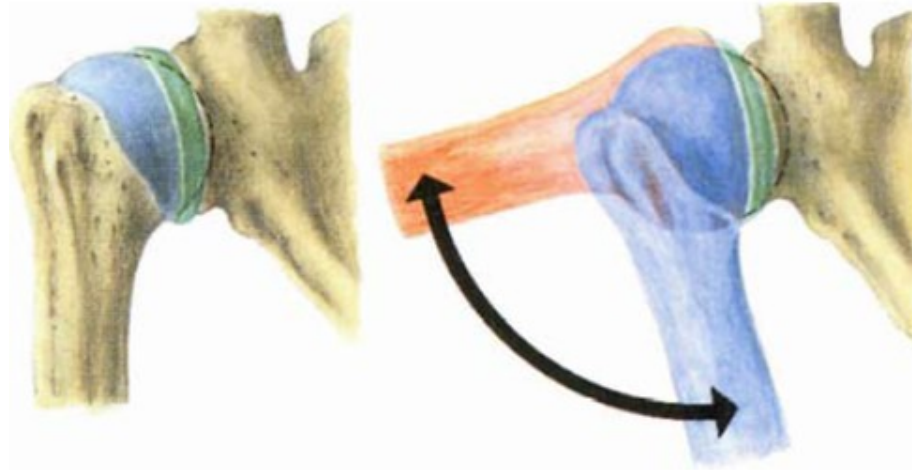


ART. PLANA

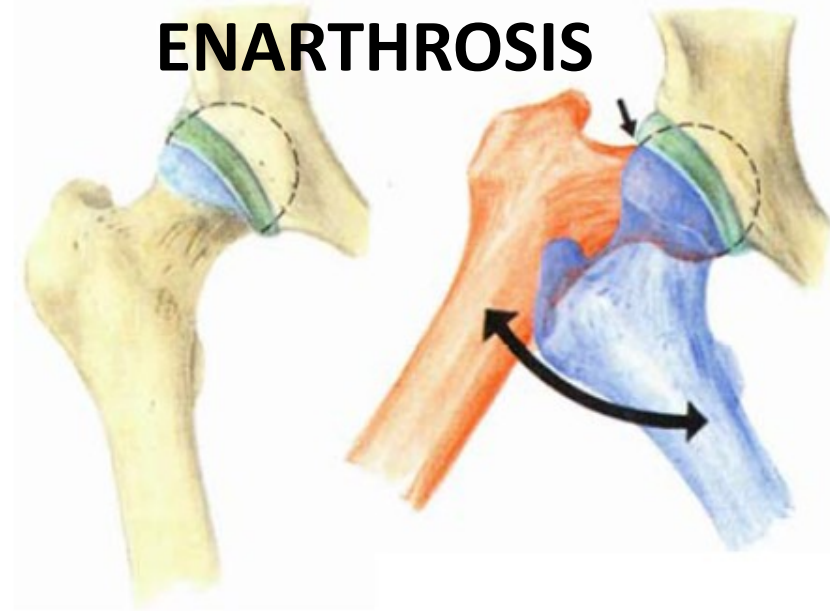


ART. SPHAEROIDAE

ARTHRODIA

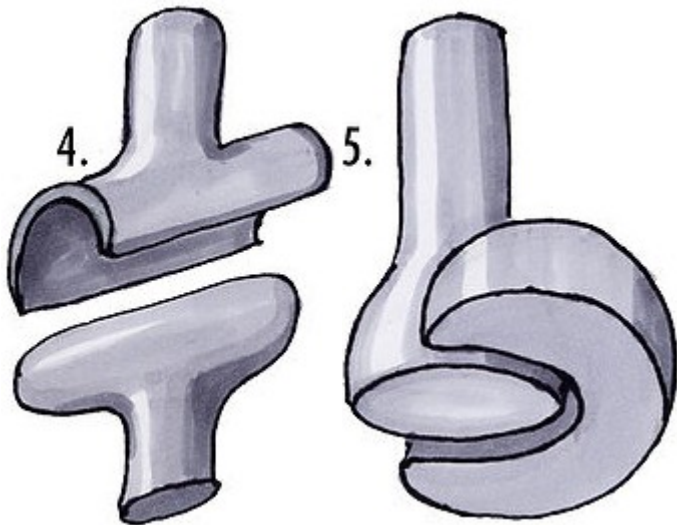


ENARTHROSIS

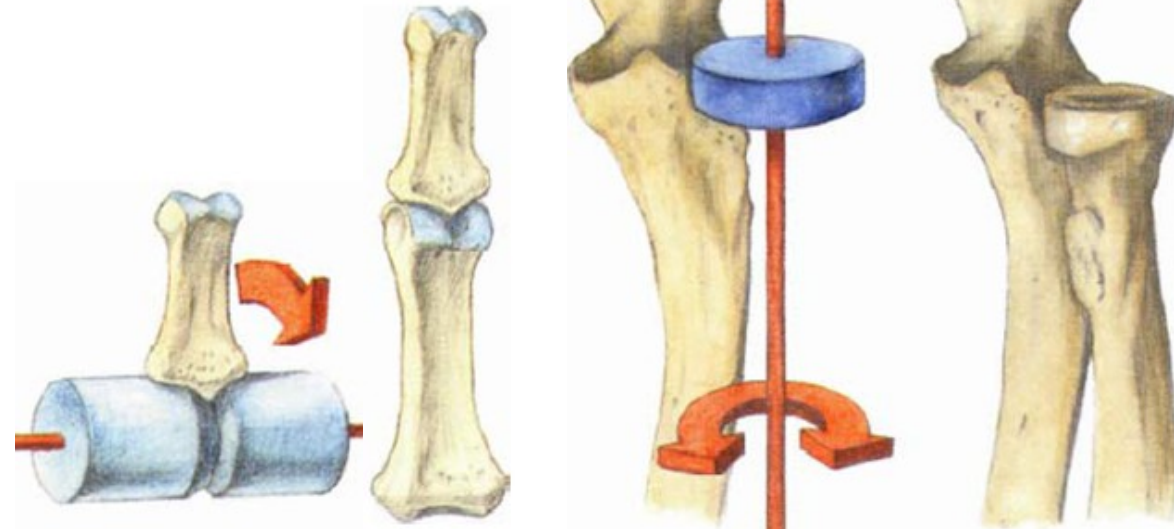


ART. CILINDROIDAE:

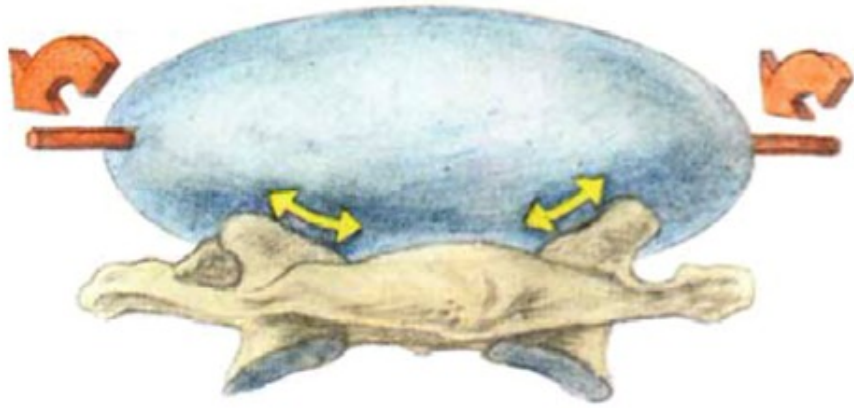
GINGLIMUS



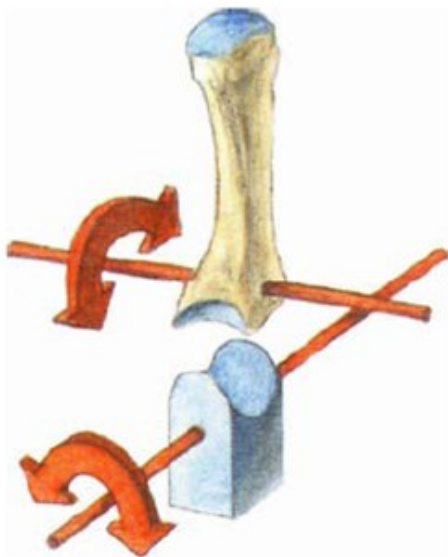
TROCHOIDAE



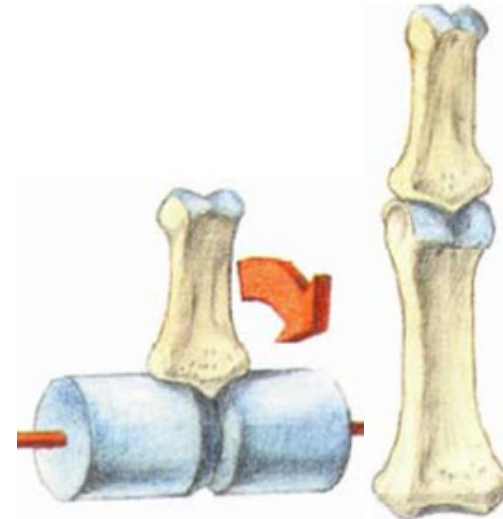
ART. ELLIPSOIDAE



ART. SELLARIS



ART. TROCHLEARIS



B. Classification of joints according to the level of movability and number of axis of movements:

Joints with minimal movements:

- amphiartrosis

Joints with sliding movements:

- articulatio plana

Joints with rotational movements:

- Rotation is possible around one, two or three axes
- One-axis joints (art. Cylindroidea, art. trochlearis)
- Two-axis joints (art. Ellipsoidea, art. sellaris)
- Three-axis joint (art. sphaeroidea)

C. Classification of joints according to number of connecting bones

Simple joint - art. simplex- two bones are connecting

Composed joint - art. composita- more than two bones are connecting, or discus or meniskus is inserted into the joint

