


ARTHROLOGY

Bone connections

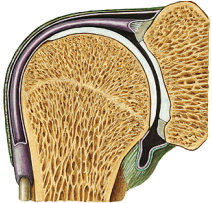
Synarthrosis – connection provided with connective tissue



Fibrous tissue (**syndesmosis**) Cartilage (**synchondrosis**) Bone (**synostosis**)


Diarthrosis – joint

- moveable connection of two or more bones
- connection – articulation facets
- Special joint apparatus




Syndesmosis (articulatio fibrosa)

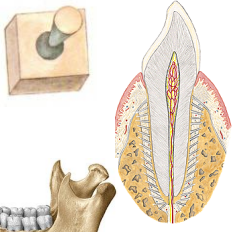
Ligamenta



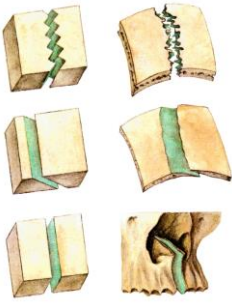
Membranae



Gomphosis



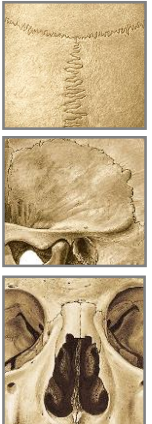
Syndesmosis – suturae

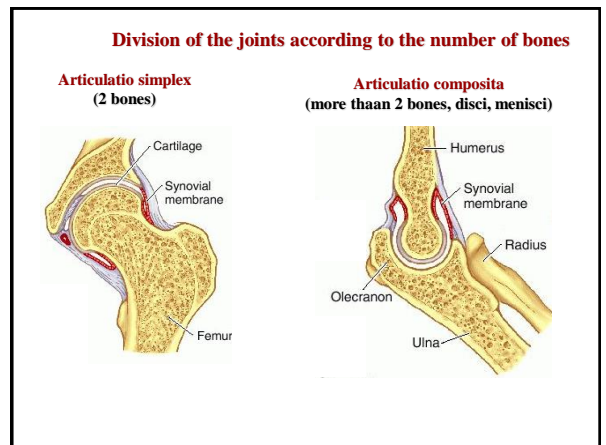
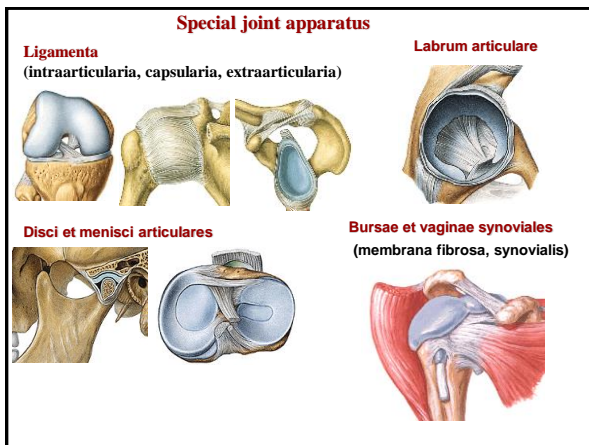
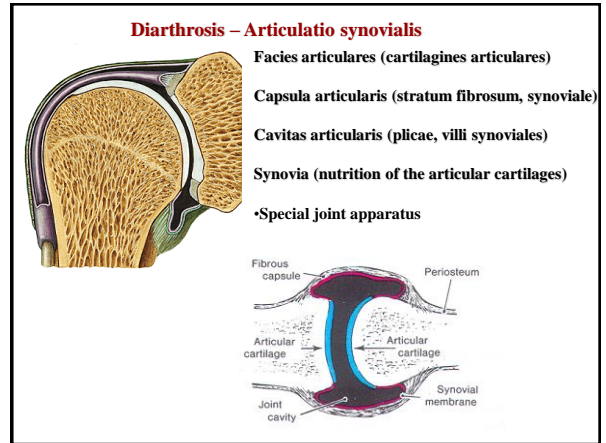
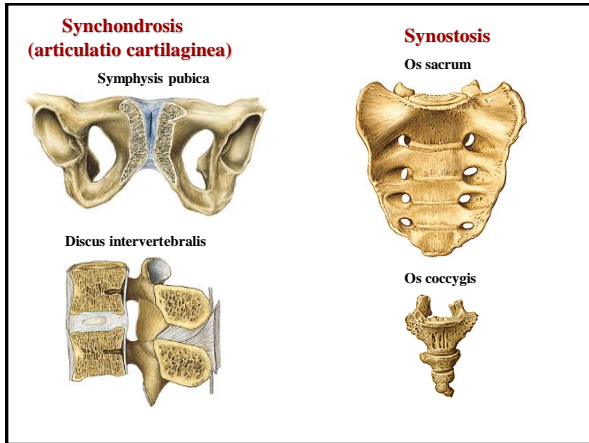


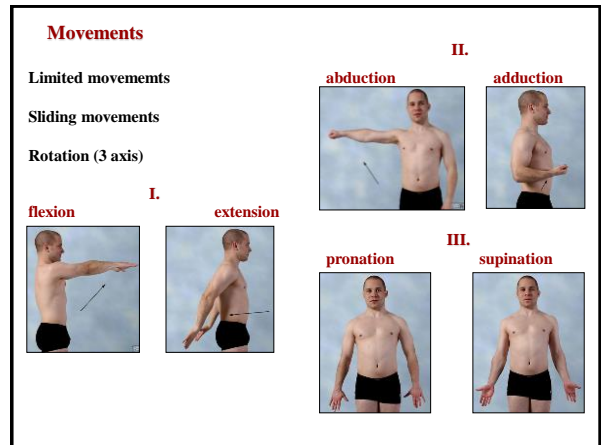
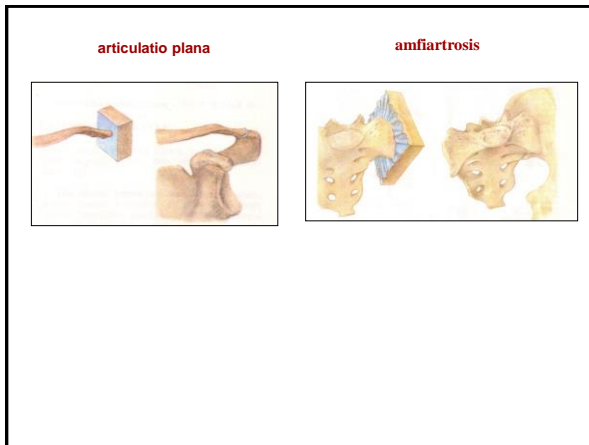
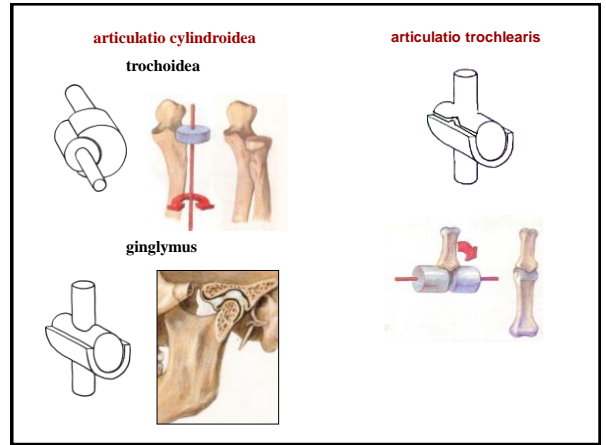
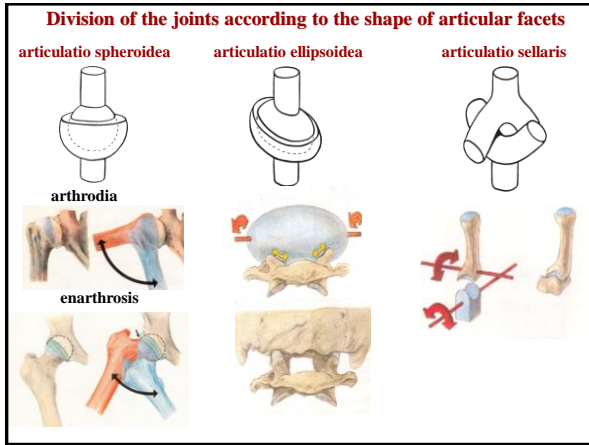
Sutura serrata

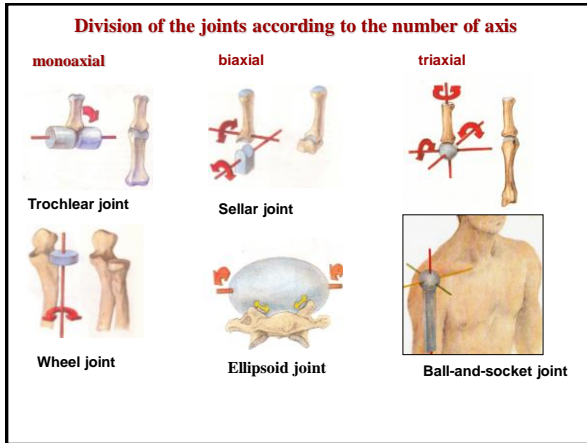
Sutura squamosa

Sutura plana





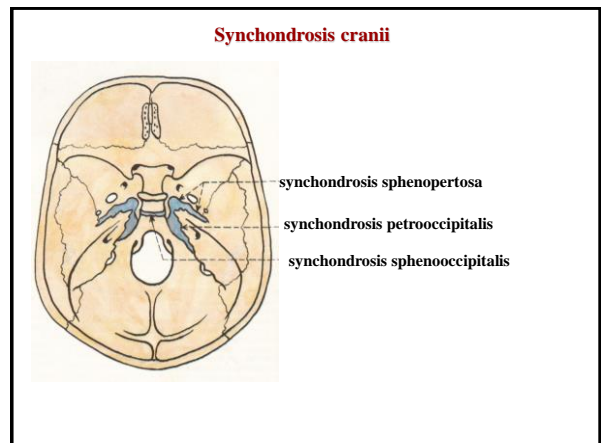
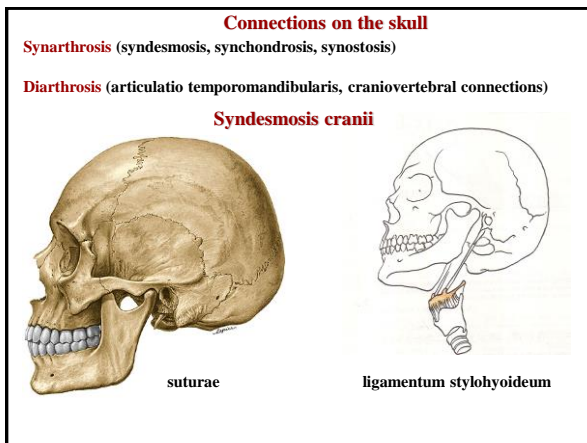


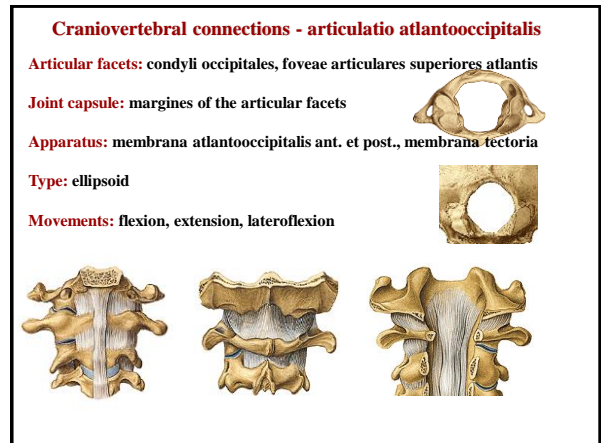
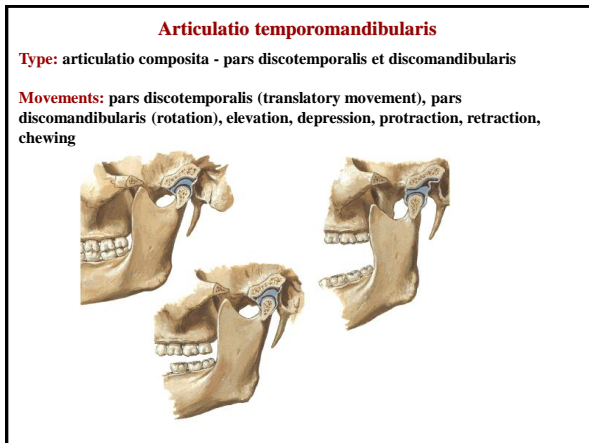
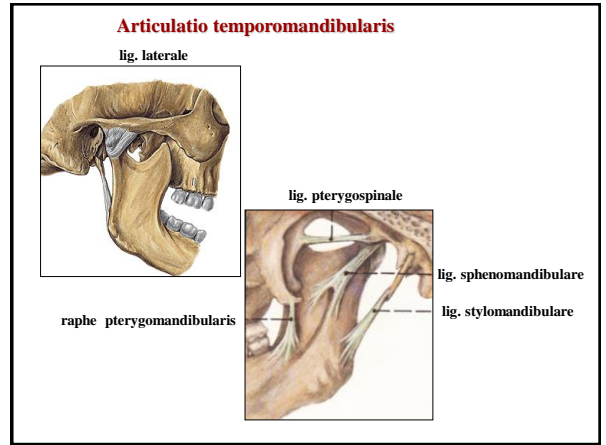
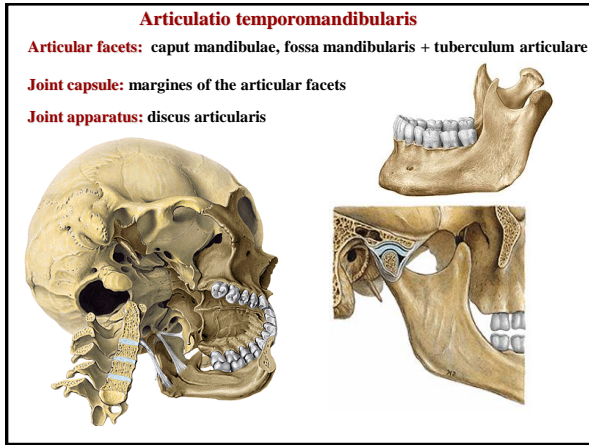


Special arthrology

Joint description

1. name
2. Articular facets
3. Joint capsule
4. Joint apparatus
5. Type of the joint, movements





Craniovertebral connections - articulatio atlantoaxialis

Articulatio atlantoaxialis mediana

- facies articularis ant. et fovea dentis
- facies articularis post. et lig. transversum atlantis

Articulatio atlantoaxialis lateralis

- facies articulares inferiores atlantis
- proc. articulares sup. axis

Articulatio atlantoaxialis mediana et lateralis

Apparatus:

- lig. apicis dentis
- ligg. alaria
- lig. cruciforme atlantis (lig. transversum atlantis, fasciculi longitudinales)
- membrana tectoria

Type:
articulatio composita, mechanical unit

Movements:
Rotation of the atlas around the dens app. 60°

Juncturae columnnae vertebralis

Disci intervertebrales – connection between the bodies of vertebrae

number: 23

app ¼ length of column

anulus fibrosus

nucleus pulposus

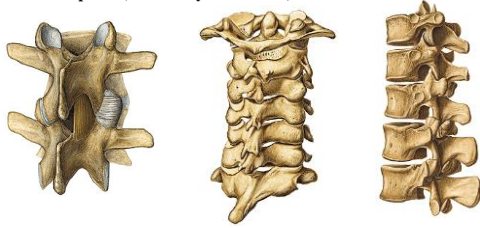
Articulationes intervertebrales

Articular facets: processus articulares sup. et inf. of adjacent vertebrae

(position of the facets - C oblique, Th front, L sagittal)

Joint capsule: margines of the articular facets

Type: articulatio plana (translatory movements)



Short ligaments of the spine:

ligamenta flava (arches)

ligamenta interspinalia (proc. spinosi)

ligamenta intertransversalia (proc. transversi)

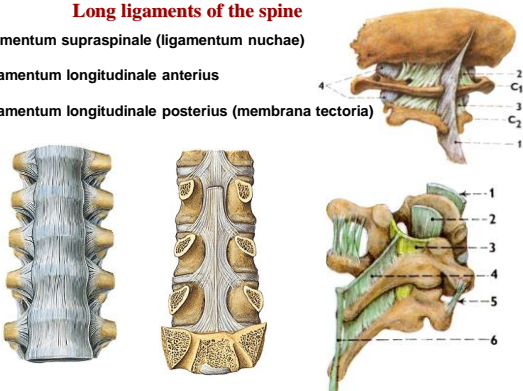


Long ligaments of the spine

ligamentum supraspinale (ligamentum nuchae)

Ligamentum longitudinale anterius

Ligamentum longitudinale posterius (membrana tectoria)



Shape of the spine:

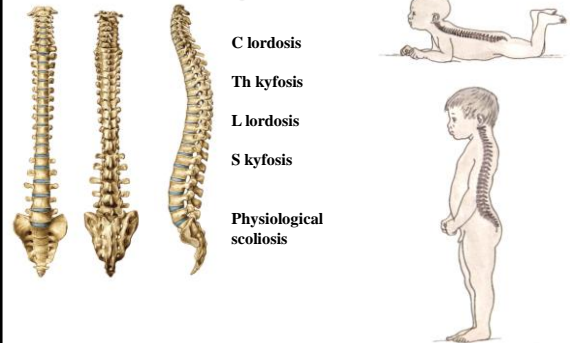
C lordosis

Th kyfosis

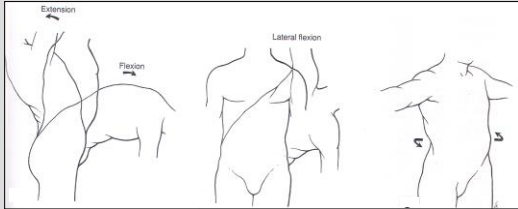
L lordosis

S kyfosis

Physiological scoliosis



Movements of the spine



anteflexion till 135°

lateroflexion till 70°

rotation 90-95°

retroflexion till 105°

Springy movements

Juncturae thoracis – articulationes costovetrales

Articulatio capitis costae

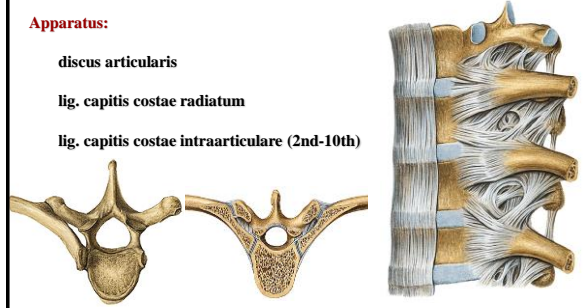
Articular facets: facies articularis capitis costae, foveae costales sup. et inf.

Apparatus:

discus articularis

lig. capitis costae radiatum

lig. capitis costae intraarticulare (2nd-10th)



Articulatio costotransversaria

Articular facets: facies articularis tuberculi costae, fovea costalis proc. transversi

Apparatus:

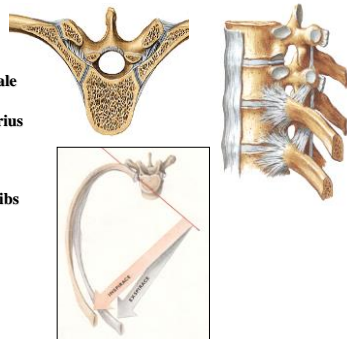
lig. costotransversarium

lig. costotransversarium laterale

lig. costotransversarium superius

lig. lumbocostale

Movements: elevation of the ribs



Juncturae sternocostales

Synchondrosis sternocostalis (1st, 6th and 7th)

Articulationes sternocostales (2nd – 5th)

Articular facets:

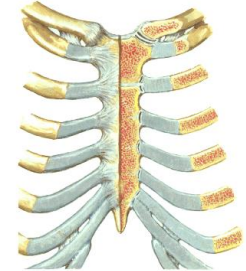
Rib cartilages, incisurae costales sterni

Apparatus:

ligg. sternocostalia radiata

membrana sterni externa

membrana sterni interna



Juncturae intercostales

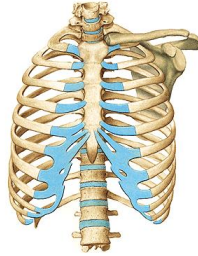
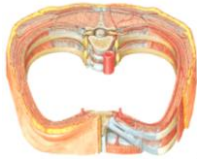
Articulationes interchondrales

Articular facets: cartilages 5th – 9th rib

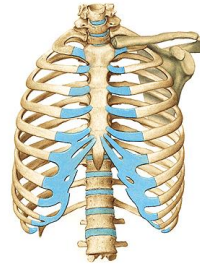
Membranae intercostales

membrana intercostalis externa

membrana intercostalis interna



Rib cage shape



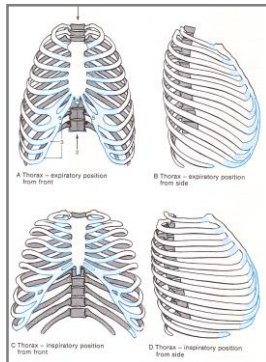
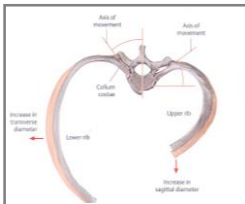
Apertura thoracis superior

Spatia intercostalia

Cavum thoracis

Apertura thoracis inferior

Movements of the rib cage

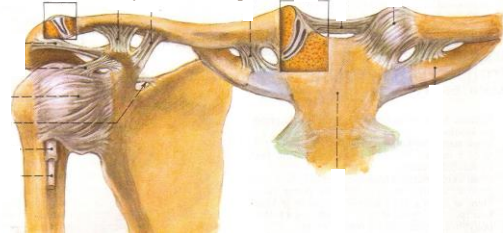


**Connections of the girdle of the upper extremity
(juncturae ossium cinguli extremitatis superioris)**

Articulatio sternoclavicularis

Articulatio acromioclavicularis

Syndesmosis scapulae



Articulatio sternoclavicularis

Articular facets: incisura clavicularis sterni, facies articularis sternalis claviculae

Joint capsule: tough

Apparatus:
discus articularis

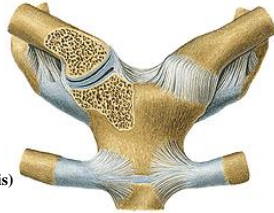
lig. sternoclaviculare ant. a post.

lig. interclaviculare (incisura jugularis)

lig. costoclaviculare

Type: composed, spheroid

Movements: limited,
depends on movements of scapula



Dysostosis cleidocranialis

Articulatio acromioclavicularis

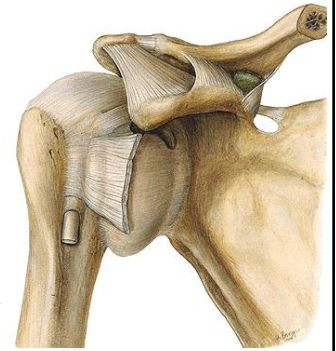
Articular facets: facies articularis acromialis claviculae, facies articularis acromii

Joint capsule: tough

Apparatus:
discus articularis
lig. acromioclaviculare
lig. coracoclaviculare

Type:
composed, limited

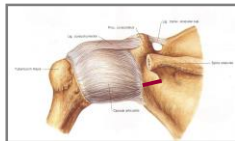
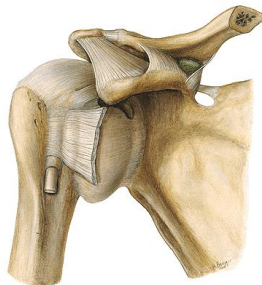
Depends on movements of scapula and shoulder



Syndesmosis scapulae

Lig. transversum scapulae superius et inferius

Lig. coracoacromiale (fornix humeri)

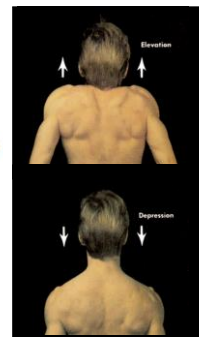
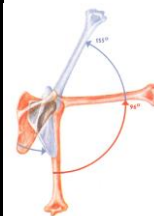
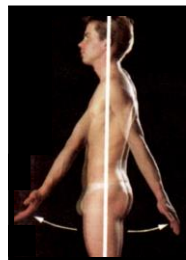


Movements of the scapula

protraction (lateroventral, during ante flexion)

retraction (dorsomedial, during retro flexion)

elevation



Connections of the free upper extremity

(juncturae ossium extremitatis superioris liberae)

Articulatio humeri (shoulder joint)

Articular facets:

caput humeri, cavitas glenoidalis + labrum glenoidale

Joint capsule:

margines, med. on collum anat. humeri – distally

vagina synovialis intertubercularis



Articulatio humeri – articular apparatus

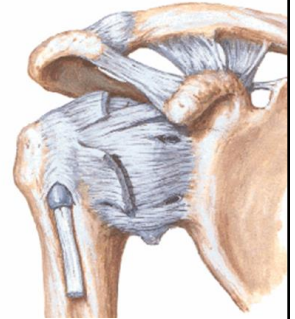
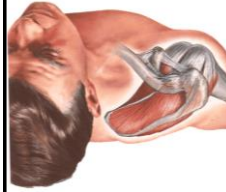
labrum glenoidale

ligg. glenohumeralia (sup., inf., ant.)

lig. coracohumerale

lig. coracoacromiale

Firmed by tendons
(rotator cuff)



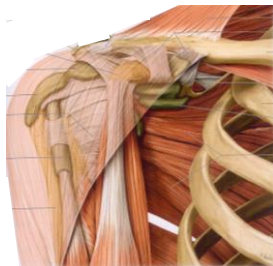
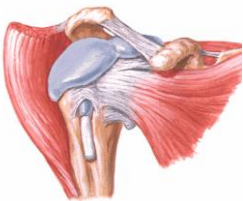
Articulatio humeri - bursae synoviales

Bursa subdeltoidea

Bursa subcoracoidea

Bursa subacromialis,

Bursa m. subscapularis subtendinea

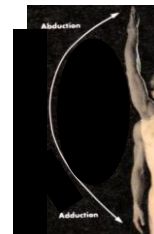
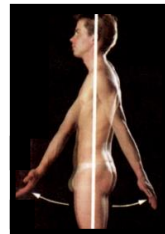
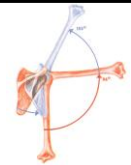


Articulatio humeri

Type: spheroid (arthrodia)

Movements: triaxial

The middle position: flexion + abduction app 45°



Articulatio cubiti (elbow joint)

Articulatio composita:

1. Articulatio humeroradialis (articulatio spheroida)

capitulum humeri, fovea capitis radii

2. Articulatio humeroulnaris (articulatio trochlearis)

trochlea humeri, incisura trochlearis ulnae

3. Articulatio radioulnaris proximalis (articulatio trochoidea)

circumferentia articularis capitis radii,
incisura radialis ulnae



Articulatio cubiti

Articulation capsule:

Epicondyles of the humerus EXTRACAPSULAR, foveae of the humerus INTRACAPSULAR

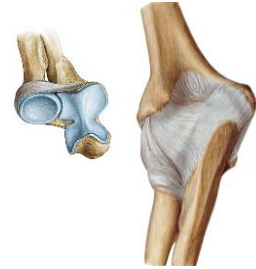
recessus sacciformis

Apparatus:

lig. anulare radii

lig. collaterale radiale

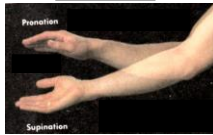
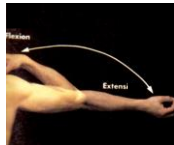
lig. collaterale ulnare



Articulatio cubiti - movements

flexion and extension

Pronation and supination of forearm



References:

Putz, R. (2008):

Atlas of Human Anatomy Sobotta. Elsevier Books.

Keith L. Moore, Arthur F. Dalley (2005):

Clinically Oriented Anatomy. Williams and Wilkins.

Platzer, W., Kahle, W., Leonhardt H. (1992):

Locomotor system. Georg Thieme Verlag, Stuttgart, New York, 4th edition.

Čihák, R. (1987):

Anatomie 1. Avicenum, Zdravotnické nakladatelství.

Netter, F. H. (1997):

Interactive Atlas of Clinical Anatomy. Novartis, USA.