


# ARTHROLOGY

## Bone connections

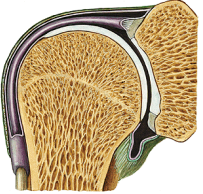
**Synarthrosis** – connection provided with connective tissue



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

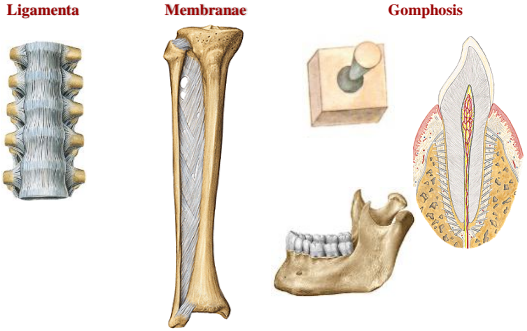
**Diarthrosis** – joint

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



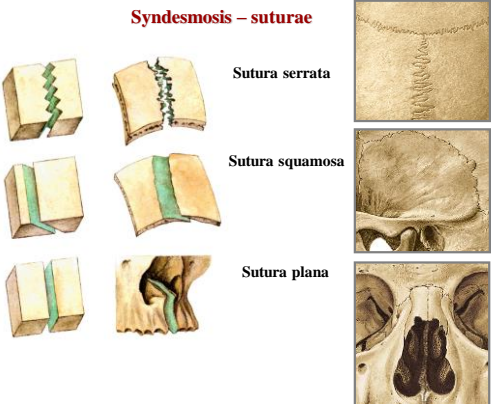
## Syndesmosis (articulatio fibrosa)

**Ligamenta**      **Membranae**      **Gomphosis**




## Syndesmosis – suturae

**Sutura serrata**      **Sutura squamosa**      **Sutura plana**

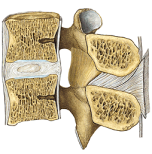


## Synchondrosis (articulatio cartilaginea)

**Symphysis pubica**




**Discus intervertebralis**




## Synostosis

**Os sacrum**



**Os coccygis**



## Diarthrosis – Articulatio synovialis

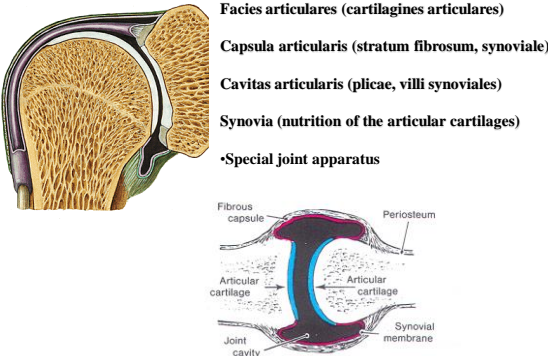
**Facies articulares (cartilaginee articulares)**

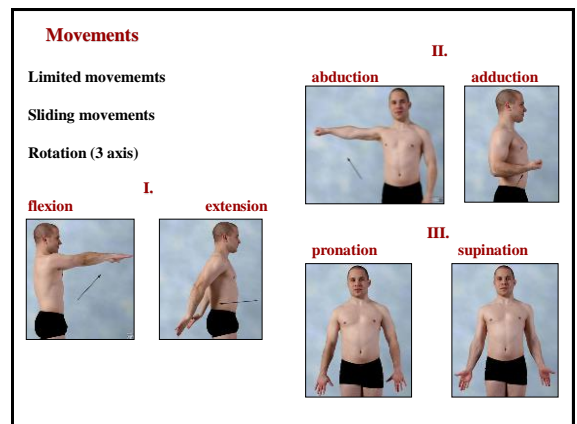
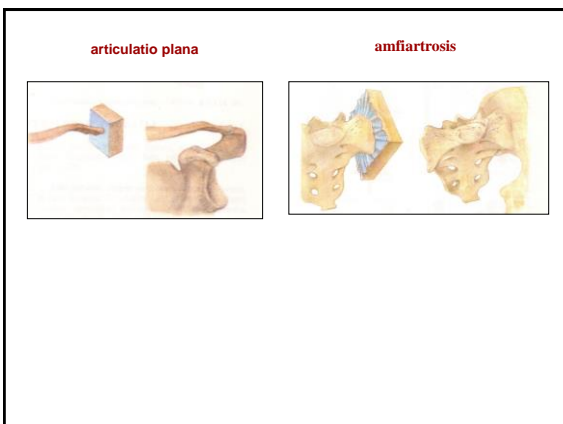
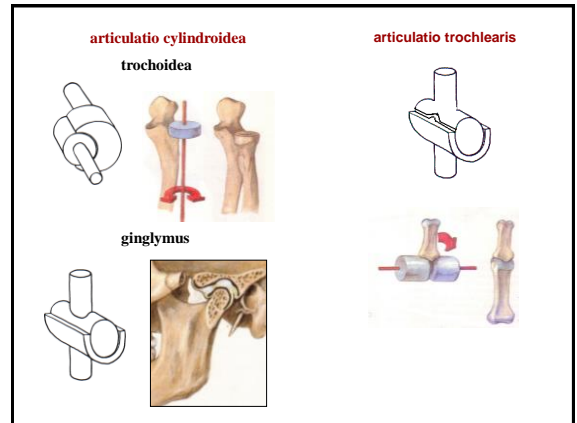
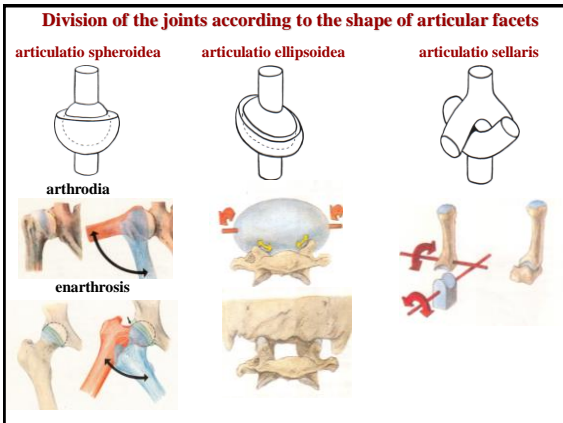
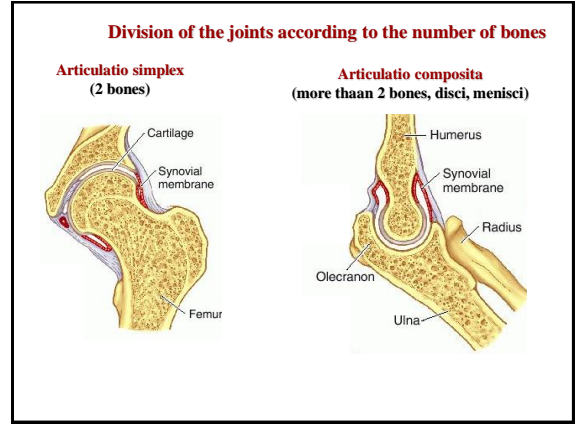
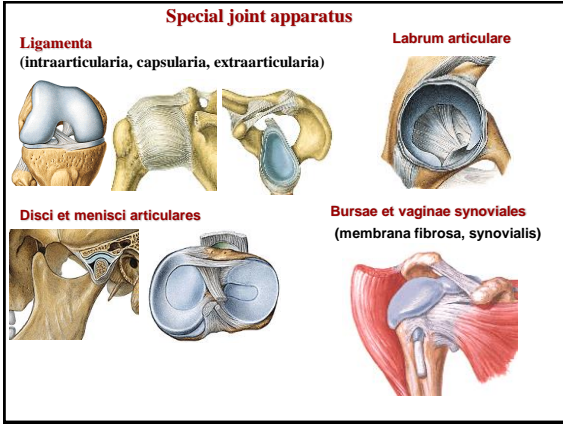
**Capsula articularis (stratum fibrosum, synoviale)**

**Cavitas articularis (plicae, villi synoviales)**







**Synovia (nutrition of the articular cartilages)**

- Special joint apparatus





**Division of the joints according to the number of axis**

<b>monoaxial</b>	<b>biaxial</b>	<b>triaxial</b>
		
<b>Trochlear joint</b>	<b>Sellar joint</b>	
		
<b>Wheel joint</b>	<b>Ellipsoid joint</b>	<b>Ball-and-socket joint</b>

**Special arthrology**

**Joint description**

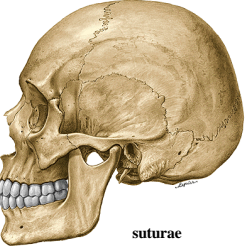
1. name
2. Articular facets
3. Joint capsule
4. Joint apparatus
5. Type of the joint, movements

**Connections on the skull**

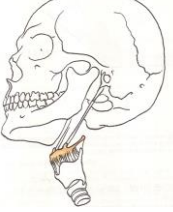
**Synarthrosis** (syndesmosis, synchondrosis, synostosis)

**Diarthrosis** (articulatio temporomandibularis, craniovertebral connections)

**Syndesmosis cranii**

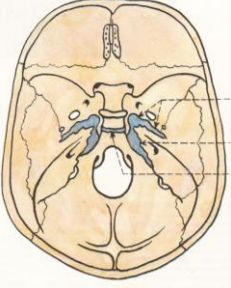


suturae



ligamentum stylohyoideum

**Synchondrosis cranii**



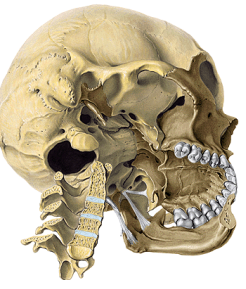
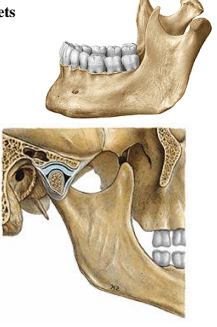
- synchondrosis sphenopertosa
- synchondrosis petrooccipitalis
- synchondrosis sphenoccipitalis

**Articulatio temporomandibularis**

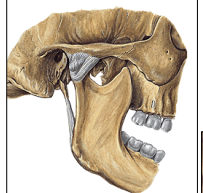
**Articular facets:** caput mandibulae, fossa mandibularis + tuberculum articulare

**Joint capsule:** margins of the articular facets

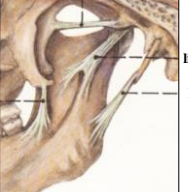
**Joint apparatus:** discus articularis

**Articulatio temporomandibularis**



lig. laterale



lig. pterygospinale

raphe pterygomandibularis

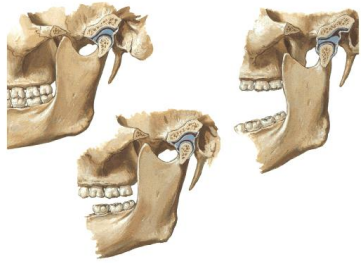
lig. sphenomandibulare

lig. stylomandibulare

**Articulatio temporomandibularis**

**Type:** articulatio composita - pars discotemporalis et discomandibularis

**Movements:** pars discotemporalis (translatory movement), pars discomandibularis (rotation), elevation, depression, protraction, retraction, chewing



**Craniovertebral connections - articulatio atlantooccipitalis**

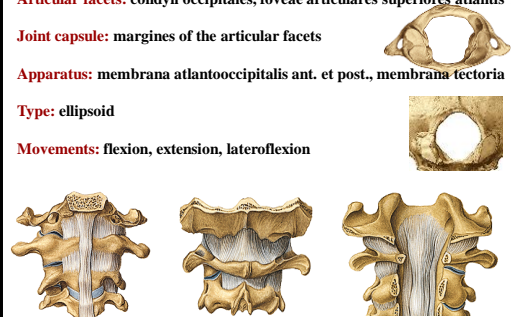
**Articular facets:** condyli occipitales, foveae articulares superiores atlantis

**Joint capsule:** margins of the articular facets

**Apparatus:** membrana atlantooccipitalis ant. et post., membrana tectoria

**Type:** ellipsoid

**Movements:** flexion, extension, lateroflexion



**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

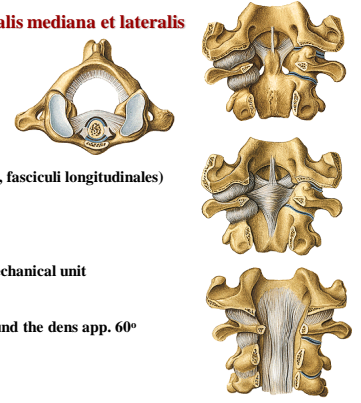
ligg. alaria

lig. cruciforme atlantis  
(lig. transversum atlantis, fasciculi longitudinales)

membrana tectoria

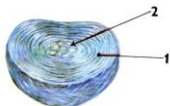
**Type:**  
articulatio composita, mechanical unit

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



**Juncturae columnnae vertebralis**

**Disci intervertebrales** – connection between the bodies of vertebrae

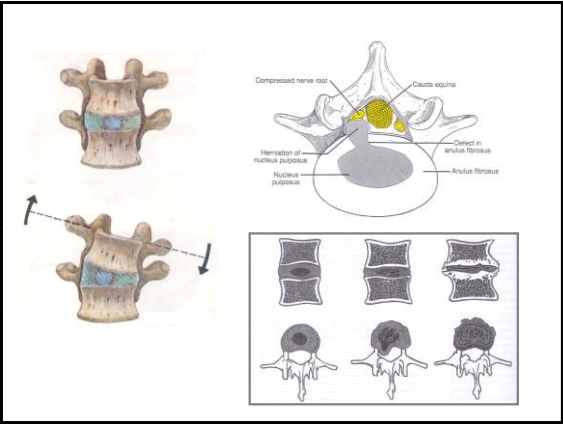
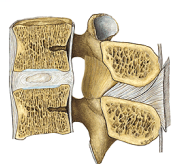
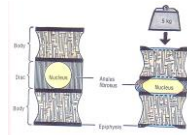


number: 23

app 1/4 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)

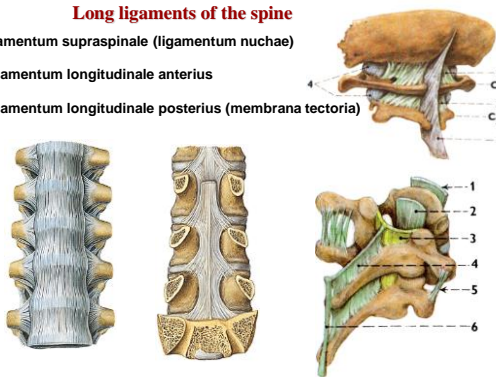


**Long ligaments of the spine**

ligamentum supraspinale (ligamentum nuchae)

Ligamentum longitudinale anterius

Ligamentum longitudinale posterius (membrana tectoria)



**Shape of the spine:**

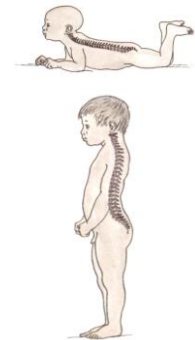
C lordosis

Th kyfosis

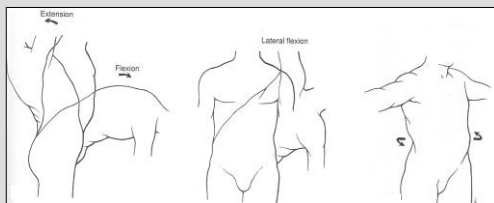
L lordosis

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 costovetebrales**

Articulatio capitis costae

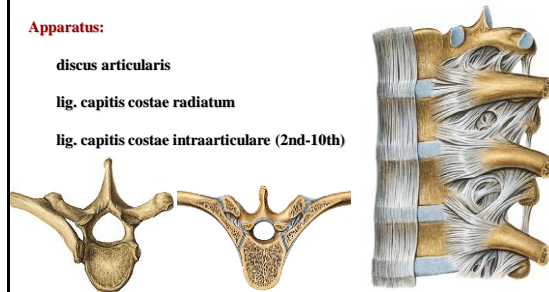
**Articular facets:** facies articularis capitis costae, foveae costales sup. et inf.

**Apparatus:**

discus articularis

lig. capitis costae radiatum

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



**Articulatio costotransversaria**

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

**Apparatus:**

- lig. costotransversarium
- lig. costotransversarium laterale
- lig. costotransversarium superius
- lig. lumbocostale

**Movements:** elevation of the ribs

**Juncturae sternocostales**

**Symphondrosis 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

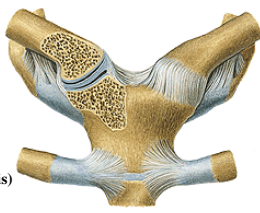

**Joint capsule:** tough

**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

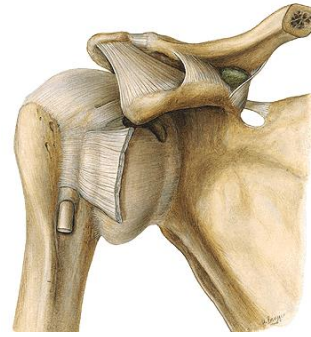
**Joint capsule:** tough

**Apparatus:**

- discus articularis
- lig. acromioclaviculare
- lig. coracoclaviculare

**Type:** composed, limited

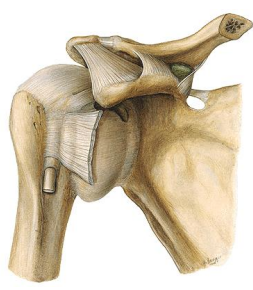
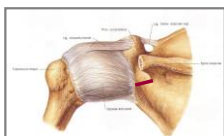
**Depends on movements of scapula and shoulder**



**Syndesmosis scapulae**

Lig. transversum scapulae superius et inferius

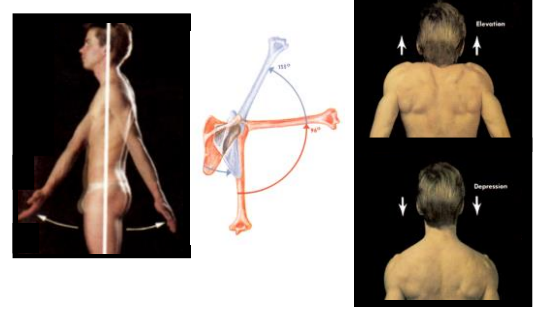
Lig. coracoacromiale (fornix humeri)

**Movements of the scapula**

protraction (lateroventral, during ante flexion)      elevation

retraction (dorsomedial, during retro flexion)





**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**

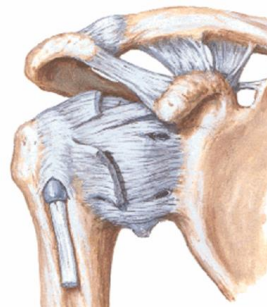

labrum glenoidale

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

lig. coracohumerale

lig. coracoacromiale

**Firmed by tendons (rotator cuff)**

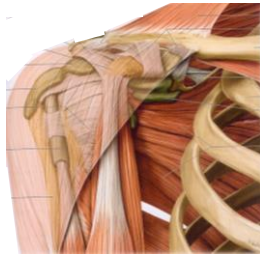
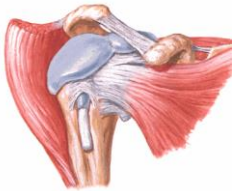
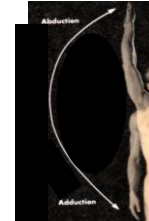
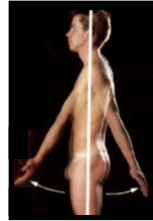
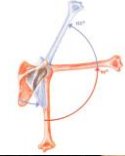
**Articulatio humeri - bursae synoviales**

Bursa subdeltoidea

Bursa subcoracoidea

Bursa subacromialis,

Bursa m. subscapularis subtendinea

**Articulatio humeri****Type:** spheroid (arthrodia)**Movements:** triaxial**The middle position:** flexion + abduction app 45°**References:**

**Putz, R. (2008):**  
Atlas of Human Anatomy Sobotta. Elsevier Books.

**Keith L. Moore, Arthur F. Dalley (2005):**  
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**Platzer, W., Kahle, W., Leonhardt H. (1992):**  
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New York, 4th edition.

**Čihák, R. (1987):**  
Anatomie 1. Avicenum, Zdravotnické nakladatelství.

**Netter, F. H. (1997):**  
Interactive Atlas of Clinical Anatomy. Novartis, USA.