

Joints of the upper extremity

JOINTS OF THE UPPER EXTREMITY

Joints of girdle bones:

scapula + clavicle – **art. acromioclavicularis**

clavicle + sternum – **art. sternoclavicularis**

Joints of bones of free upper extremity:

humerus + scapula – **art. humeri**

humerus + radius + ulna – **art. cubiti**

radius + ulna – **membrana interossea antebrachii**
– **art. radioulnaris distalis**

radius + carpal bones – **art. radiocarpea**

carpal bones between themselves – **art. mediocarpea**

carpal + metacarpal bones – **art. carpometacarpea**

metacarpal bones + proximal phalanges – **art.**

metacarpophalangea

phalanges between themselves – **art. interphalangea manus**

Joins of girdle bones

I. Articulatio sternoclavicularis

Type: composed joint- discus articularis is inserted

Type of joint: spherical joint (is bound to movements of scapula)

Articular head: facies articularis sternalis claviculae

articular pit: incisura clavicularis manubrii sterni

articular capsule: tough, short

Ligaments:

lig. sternoclaviculare anterius

lig. sternoclaviculare posterius

lig. interclaviculare

lig. costoclaviculare

Movements: in all directions but in a small range

II. Articulatio acromioclavicularis

Type: **spherical joint, sometimes discus articularis is inserted**

articular surfaces: **facies art. acromialis (clavicula) + facies art. acromii**

articular capsule: **touhg, short**

Ligaments:

lig. acromioclavulare

lig. coracoclavulare

lig. trapezoideum

lig. conoideum

lig. coracoacromiale - fornix humeri

lig. transversum scapulae

Movements: **restricted**

Syndesmoses:

lig. transversum scapulae

lig. coracoacromiale- fornix humeri

Movements of scapula:

Retraction

Protraction

Elevation

Depression

Rotation

Joins of bones of free upper extremity

Articulario humeri (shoulder joint)

Type: **spherical, free**

articular head: **caput humeri**

articular pit: **cavitas glenoidalis , enlarged by labrum glenoidale**

articular capsule: **collum anatomicum humeri**

On the ventral side of the capsule, there appears the tendon of long head of biceps.

Ligaments:

lig. coracohumerale

ligg. glenohumeralia

lig. coracoacromiale

Bursa subacromialis, subcoracoidea, subdeltoidea

movements: **flexion and extension**

abduction (from horizontal line only together with movement of scapula)

adduction

rotation- supination, pronation

Articulario cubiti (elbow joint)

Type: **composed joint**

Articulatio humeroulnaris

Type: **trochlear joint**

articular head: **trochlea humeri**

Articular pit: **incisura trochlearis ulnae**

Articulatio humeroradialis

Type: **spherical joint**

articular head : **capitulum humeri**

Articular pit : **fovea articularis radii**

Articulatio radioulnaris proximalis

Type: **wheel joint**

articular head : **circumferentia articularis radii**

Articular pit : **incisura radialis ulnae**

Articular capsule: **it covers all three articulations**

It is attached to the margins of articular surfaces, on radius reaches to collum- recessus sacciformis

Ligaments:

lig. collaterale radiale

lig. collaterale ulnare

lig. obliquum

lig. anulare radii

Movements: **flexion, extension**

Art. radioulnaris proximalis together with art. radioulnaris distalis - pronation, supination

Syndesmosis radioulnaris

membrana interossea antebrachii

**Fibrous membrane which is stretched between
margo interosseus radii
and margo interosseus ulnae**

chorda obliqua

Articulatio radioulnaris distalis

Type: **wheel joint**

Articular head: **caput ulnae**

Articular pit: **incisura ulnaris radii**

Articular capsule: **free, it allows rotation of radius around caput ulnae**

movements: **together with rotation in art. radioulnaris proximalis supination and pronation**

pronatio dolorosa – common injury in childhood–
Radial head subluxation, the head falls out from lig.
anulare radii through a stroke in pronation

Joins of the hand Articulationes manus

ARTICULATIO RADIOCARPALIS

Between radius and carpal bones

ARTICULATIO MEDIOCARPALIS

between proximal and distal row of carpal bones

ARTICULATIONES INTERCARPALES

between single carpal bones

ARTICULATIONES CARPOMETACARPALES

between distal row of carpal bones and metacarpal bones

ARTICULATIONES INTERMETACARPALES

between bases of neighbouring metacarpal bones

ARTICULATIONES METACARPOPHALANGEALES

heads of metacarpal bones with proximal phalanges

ARTICULATIONES INTERPHALANGEALES

Between phalanges

retinaculum musculorum flexorum

(lig. carpi transversum)

between eminentia carpi radialis et ulnaris -> canalis carpi

Articulatio radiocarpalis

Type: **composed, elipsoidal**

articular head: **os scaphoideum, os lunatum, os triquetrum**

articular head: **facies articularis carpalis radii, discus articularis**

articular capsule: **tough and short**

Ligaments: **are common with articulatio mediocarpalis**

movements: **functional unit with mediocarpal, intercarpal and**

carpometacarpal joints

palmar and dorsal flexion

radial and ulnar deviation

circumduction

Articulatio mediocarpalis

Type: elipsoidal, composed,

articular head on ulnar side: os hamatum, os capitatum

articular head on radial side : os scaphoideum

*articular pit on ulnar side : os scaphoideum, os lunatum,
os triquetrum*

articular pit on radial side : os trapezium, os trapezoideum

articular capsule : tough and short

Ligaments:

lig. intercarpea dors., ventr., interossea

lig. radiocarpale palmare et dorsale

lig. ulnocarpale palmare et dorsale

lig. carpi radiatum

lig. collaterale carpi radiale et ulnare

movements: **functional unit with mediocarpal, intercarpal and carpometacarpal joints**

**palmar and dorsal flexion,
radial and ulnar duction, cirkumduction**

Articulatio ossis pisiformis: tough joint between os pisiforme
and os triquetrum - amfiarthrosis
lig. pisohamatum
lig. pisometacarpeum
(both are continuation of tendon of m. flexor carpi ulnaris)

Articulationes intercarpales

- **Connections between the single carpal bones**
 - ligg. intercapalia dorsalia**
 - ligg. intercarpalia palmaria**
 - ligg. intercarpalis interossea**

Articulationes carpometacarpales II.-V.

Type: **composed joint, amphiarthrosis**

articular surfaces: **basis of 2nd metacarpal bone - os trapezium, os trapezoideum a os capitatum
basis of 3rd metacarpal bone - os capitatum
bases of 4th and 5th metacarpal bone - os hamatum**

Bases of metacarpal none between themselves

articular capsules: **tough, short**

Ligaments:

ligg. carpometacarpea dorsalia

ligg. carpometacarpea palmaria

ligg. carpometacarpea interossea

ligg. metacarpea palm., dors., interossea

movements: **minimal**

Articulatio carpometacarpalis pollicis

Type: **seller joint**

articular head: **basis ossis metacarpale I**

articular pit: **os trapezium**

articular capsule: **free**

movements: **abduction, adduction
opposition, reposition**

Articulationes intermetarpales

Ligg.intermetarpalia

Art. metacarpophalangeales

Type: intermediate between cylindroidal and **spherical joint**

articular head: **caput ossis metacarpalis**

articular pit: **basis phalangis**

articular capsule: **free**

Ligaments:

ligg. collateralia

fibrocartilago palmaris

lig. metacarpale transversum profundum

movements: **flexion and extension**

abduction and adduction- only in straightened finger

Articulationes interphalangeales

Type: **trochlear**

articular head: **caput (trochlea) phalangis**

articular pit: **basis phalangis**

articular capsule: **free**

Ligaments:

ligg. collateralia

fibrocartilaginea palmares

movements: **flexion and extension**

Thank you for your attention!

Pictures:

Atlas der Anatomie des Menschen/Sobotta. Putz,R., und Pabst,R. 20. Auflage.

München:Urban & Schwarzenberg, 1993

Netter: Interactive Atlas of Human Anatomy.

Naňka, Elišková: Přehled anatomie. Galén, Praha 2009.

Čihák: Anatomie I, II, III.

Drake et al: Gray's Anatomy for Students. 2010