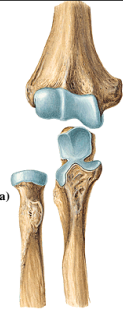


CONNECTIONS OF THE UPPER AND LOWER EXTREMITY
(juncturae ossium membri superioris et inferioris)

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

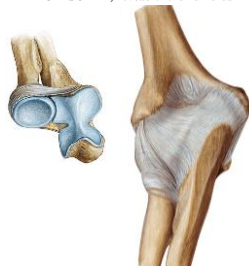
recessus sacciformis

Apparatus:

lig. anulare radii

lig. collaterale radiale

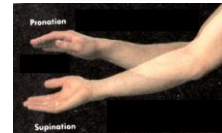
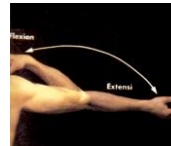
lig. collaterale ulnare



Articulatio cubiti - movements

flexion and extension

Pronation and supination of forearm



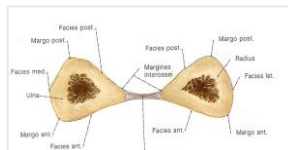
Juncturae radioulnares

Membrana interossea antebrachii

Fixation of the radius and ulna, origin of the muscles

Limitation of supination

chorda obliqua



Articulatio radioulnaris distalis

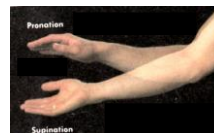
Facets: incisura ulnaris radii, circumferentia articularis capitis ulnae

Capsule: thin and tough

Apparatus: ligamentum radioulnaris palmare, dorsale

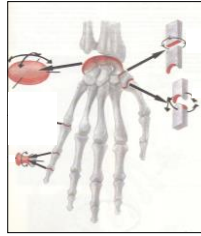
Type: articulatio trochoidea

Movements: pronation and supination of the hand



Articulaciones manus

- Articulatio radiocarpalis
- Articulatio mediocarpalis
- Articulatio ossis pisiformis
- Articulatio carpometacarpalis pollicis
- Articulaciones carpometacarpales II.-V.
- Articulaciones metacarpophalangeales
- Articulaciones interphalangeales



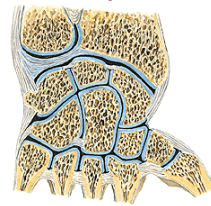
Articulatio radiocarpalis

- Facets:**
 - facies articularis carpalis radii, discus articularis
 - os scaphoideum, os lunatum, os triquetrum (lig. intercarpalia interossea)

Morphologic and functional unit with articulatio mediocarpalis

Common with mediocarpal joint:

- capsule
- apparatus
- movements
- Type - articulatio elipsoidea



Articulatio mediocarpalis

Facets: proximal and distal row of the carpal bones except for os pisiforme

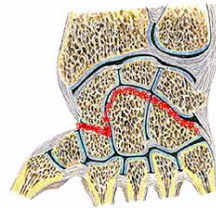
Radial:

- head: os scaphoideum
- pit: os trapezium, trapezoideum, capitatum

Ulnar:

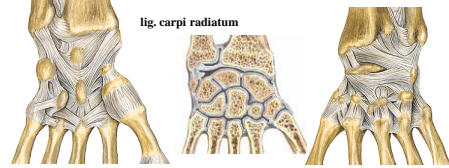
- head: os capitatum, hamatum
- pit: os scaphoideum, lunatum, triquetrum

Communication with art. carpometacarpalis II.-V.
(between os trapezium and trapezoideum)



Articulatio mediocarpalis - apparatus

- ligg. intercarpea dorsalia, palmaria et interossea
- lig. radiocarpum dorsale et palmare
- lig. ulnocarpum palmare et dorsale
- lig. carpi radiatum



Articulatio mediocarpalis

Functional unit with **articulatio radiocarpalis** – ellipsoid joint

Movements:

- palmar and dorsal flexion
- radial and ulnar duction
- circumduction



Articulatio ossis pisiformis

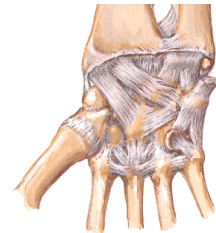
- Facets:**
 - os pisiforme, os triquetrum

Capsule:

Margins of the art. facets

Apparatus:

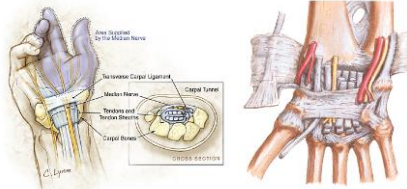
- lig. pisohamatum
- lig. pisometacarpum
- (m. flexor carpi ulnaris)



Canalis carpi

Canalis carpi: tendons of flexors and nervus medianus

Canal of Guyon: nervus et vasa ulnaria (between hamulus ossis hamati and os pisiforme, above retinaculum flexorum)



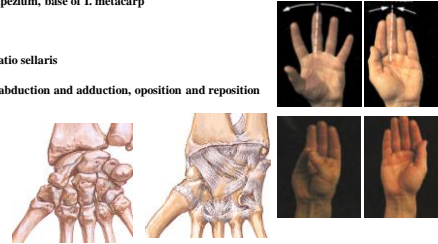
Articulatio carpometacarpalis pollicis

Facets: os trapezium, base of I metacarp

Capsule: free

Type: articulatio sellaris

Movements: abduction and adduction, opposition and reposition



Articulationes carpometacarpales II. - V.

Facets: base of the II. - V. metacarpal bones with distal row of the carpal bones adjacent metacarpal bones

Capsule: tough, communication with mediocarpal joint

Apparatus:

ligg. metacarpea palmaria, dorsalia et interossea,

ligg. carpometacarpea palmaria, dorsalia et interossea

Type: amphiarthrosis



Articulationes metacarpophalangeae

Facets: head of the metacarpal bones, base of proximal phalanges

Capsule: margins of the facets

Apparatus:

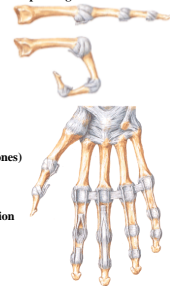
laminae fibrocartilagineae palmares (thumb - 2 ossa sesamoidea)

lig. collaterale radiale et ulnare

lig. metacarpeum transversum profundum (palmar side of the heads of II. - V. metacarpal bones)

Type: articulatio ellipsoidea

Movements: flexion, extension, abduction, adduction



Articulationes interphalangeae manus

Facets: trochlea phalangis of the proximal and base of the distal phalanges

Capsule: margins of the facets

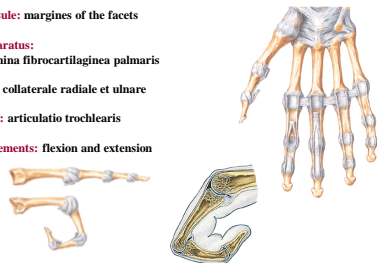
Apparatus:

lamina fibrocartilaginea palmaris

lig. collaterale radiale et ulnare

Type: articulatio trochlearis

Movements: flexion and extension



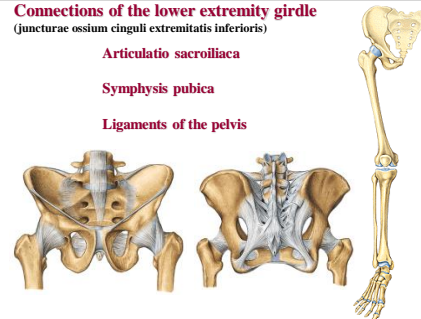
Connections of the lower extremity girdle

(juncturae ossium cinguli extremitatis inferioris)

Articulatio sacroiliaca

Symphysis pubica

Ligaments of the pelvis



Articulatio sacroiliaca


Facets:
 facies auricularis ossis sacri
 facies auricularis ossis ilii

Capsule: tough, margins of the facets

Apparatus:
 ligg. sacroiliaca ventralia, dorsalia, interossea
 lig. iliolumbale

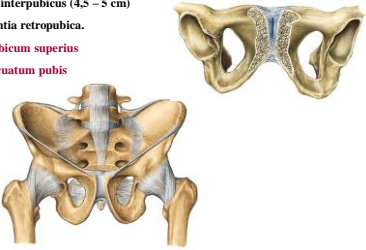
Type: amphiarthrosis

Movements: limited



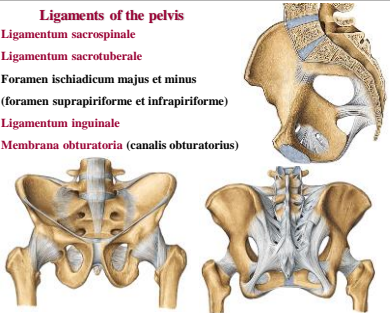
Symphysis pubica

synchondrosis
 discus interpubicus (4,5 – 5 cm)
 eminentia retropubica.
 lig. pubicum superius
 lig. arcuatum pubis



Ligaments of the pelvis

Ligamentum sacrospinale
 Ligamentum sacrotuberale
 Foramen ischiadicum majus et minus
 (foramen suprapiriforme et infrapiriforme)
 Ligamentum inguinale
 Membrana obturatoria (canalis obturatorius)



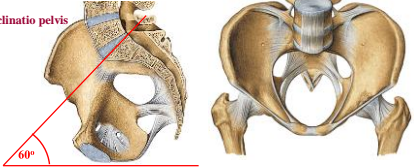
Pelvis

Pelvis - os sacrum, hip bones, symphysis pubica

Linea terminalis (promontorium, linea arcuata, upper margine of os pubis and symphysis)


Pelvis major et minor

Inclinatio pelvis




Pelvic planes


apertura pelvis superior (aditus pelvis)
 (promontorium, linea terminalis, upper margine of the symphysis)




amplitudo pelvis
 (S₂ – S₅, center of the acetabulum and symphysis)



angustia pelvis
 (lower margin of the symphysis, spina ischiadica, apex of os sacrum)



apertura pelvis inferior (exitus pelvis)
 (lower margin of the symphysis, tuber ischiadicum, apex coccygis)



External diametres of the pelvis

Distantia bispinalis (app 26 cm)

Distantia bicristalis (app 29 cm)

Distantia bitrochanterica (app 31 cm)

Conjugata externa (min. 18 cm)

Connections of the free lower extremity
(juncturae ossium extremitatis inferioris liberae)

Articulatio coxae

Facets: facies lunata acetabuli, caput femoris

Capsule: ventrally linea intertrochanterica, dorsally collum femoris

Apparatus: labrum acetabulare, lig. transversum acetabuli, pulvinar acetabuli, lig. capitis femoris

Articulatio coxae (hip joint)

Apparatus:
lig. iliofemorale, lig. pubofemorale, lig. ischiofemorale, (zona orbicularis), bursa iliopectinea

Type: art. spheroida - enarthrosis

Movements: flexion, extension, abduction, adduction, supination, pronation

Articulatio genus (knee joint)

Articulatio composita: femur, tibia, patella

Facets:
condyli femoris, facies patellaris femoris, facies articularis patellae, facies articularis superior medialis et lateralis tibiae

Meniscus medialis et lateralis

(lig. transversum genus)

Articulatio genus - capsula articularis

Attachment: margins of the facets, femur app 1cm proximally

Capsula fibrosa

Capsula synovialis - plica synovialis patellaris, plicae alares (ligg. cruciata - EXTRACAPSULAR)

Meniscus medialis et lateralis

Meniscus medialis - „C“, area intercondylaris ant. et post. (connected with lig. collaterale med.)

Meniscus lateralis - „O“, anteriorly and posteriorly from tuberculum intercondylare laterale (connected with m. popliteus)

(lig. transversum genus)

Ligamenta cruciata genis

Lig. cruciatum anterius: condylus lat. femoris – area intercondylaris ant. tibiae
(Limitation of extension and medial rotation)

Lig. cruciatum posterius: condylus med. femoris – area intercondylaris post. tibiae
(Limitation of extension and keep the stability of the joint)

Articulatio genis - ligaments

lig. patellae
retinaculum patellae mediale et laterale
lig. collaterale mediale et laterale
lig. popliteum obliquum

Bursae synoviales

Bursa suprapatellaris (mm. articulares)
Bursa praepatellaris (subcutanea)
Bursa infrapatellaris

Bursae mucosae under insertion of the muscles
(m. biceps femoris, m. semitendinosus, m. semimembranosus, m. popliteus, m. gastrocnemius)

Articulatio genis

Type: trochoginglimus

Movements: flexion and extension, in flexion limited rotatory movements (50-60°), patella moves proximally and distally

Middle position: mild flexion

Articulatio tibiofibularis

Facets: facies articularis fibularis tibiae, facies articularis capitis fibulae

Capsule: margins of the facets

Apparatus: lig. capitis fibulae ant. et post.

Type: art. plana

Movements: sliding

Membrana interossea cruris

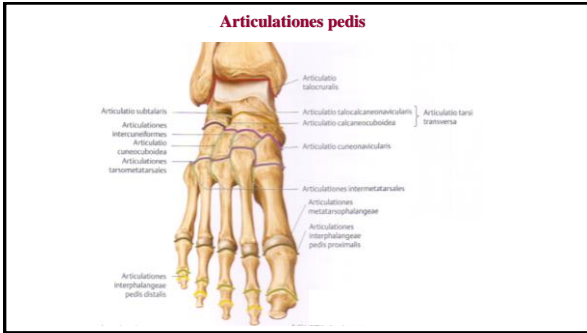
margo interosseus tibiae and fibulae

Syndesmosis tibiofibularis

Connection: distal end of fibula and tibia

Ligg.: Lig. tibiofibulare anterius et posterius

Movements: springy



Articulatio talocruralis

Facets: facies articularis inf. tibiae, facies articularis malleoli med. et lat.

Capsule: margins of the facets

Apparatus:
Lig. collaterale mediale (lig. deltoideum): pars tibionavicularis, pars tibiotalaris ant. et post., pars tibiocalcanea
Lig. collaterale laterale: lig. talofibulare ant. et post., lig. calcaneofibulare

Type and movements: art. trochlearis, plantar and dorsal flexion, movements to the side

Articulatio subtalaris

Facets: facies art. calcanea posterior + facies art. talaris post.

Capsule: margins of the facets

Apparatus: lig. talocalcaneum laterale et mediale

Movements: pronation and supination

Articulatio talocalcaneonavicularis

Facets: facies art. calcanea media + ant. tali, facies art. talaris media + ant. calcanei, caput tali + proximal facet on os naviculare

Apparatus: lig. calcaneonaviculare plantare (fibrocartilago navicularis), lig. calcaneonaviculare (dorsale) – part of lig. bifurcatum, lig. talonaviculare, lig. talocalcaneum interosseum (inside sinus tarsi)

Movements: pronation and supination

Articulatio calcaneocuboidea

Facets: facies art. cuboidea calcanei, facies art. os cuboideum

Apparatus: lig. calcaneocuboideum plantare, lig. plantare longum, lig. bifurcatum = lig. calcaneocuboideum (dorsale)

Type: amfiarthrosis

Articulatio tarsi transversa (Chopart's joint)

Facets: caput tali + os naviculare + os cuboideum and calcaneus

Apparatus: lig. bifurcatum: lig. calcaneocuboideum dor. and lig. calcaneonaviculare dor. (exarticulation of the foot)

Articulatio cuneonavicularis

Facets: ossa cuneiformia and os naviculare

Apparatus:
ligg. cuneonavicularia plantaria et dorsalia
ligg. intercuneiformia dorsalia, plantaria et interossea

Type: amfiarthrosis

Articulatio cuneocuboidea

Facets: os cuneiforme laterale and os cuboideum

Apparatus: ligg. cuneocuboidea (dorsale, plantare et interosseum)

Type: amfiarthrosis

Articulationes intercuneiformes

Facets: cuneiform bones

Apparatus: ligg. intercuneiformia dorsalia, plantaria, interossea

Type: amfiarthrosis

Articulationes tarsometatarsales (Lisfranc's joint)

Facets: bases of the metatarsal bones, ossa cuneiformia, os cuboideum

Apparatus: ligg. tarsometatarsae dorsalia, plantaria et interossea

Type: amphiarthrosis (exarticulation of the fingers)

Connection with artt. intermetarsaeae (ligg. metatarsae dorsalia, plantaria et interossea).

Articulationes metatarsophalangeae

Facets: heads of metatarsal bones, bases of prox. phalanges

Apparatus:
fibrocartilagine plantares
ligg. collateralia
lig. metatarsae transversum profundum

Movements: flexion, extension, abduction, adduction

Articulationes interphalangeales

Facets: bases and heads of phalanges

Apparatus:
fibrocartilagine plantares
ligg. collateralia

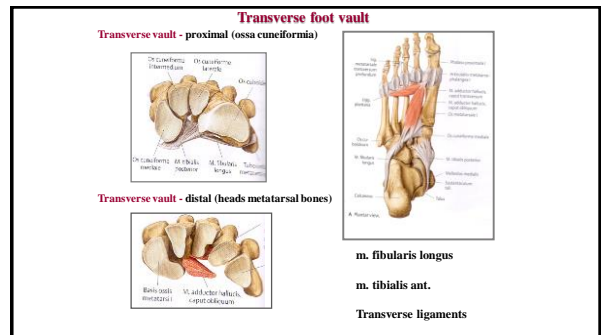
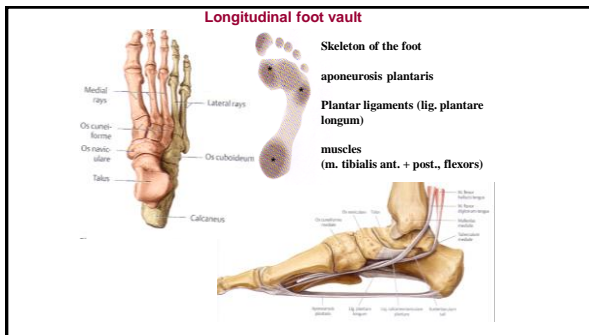
Movements: flexion, extension

Foot vault

Longitudinal and transverse

Longitudinal - medial and lateral

Function:
Elastic walk
Protection of the vessels and nerves



References:

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