

## CONNECTIONS OF THE UPPER AND LOWER EXTREMITY

(juncturae ossium membri superioris et inferioris)

### Remembrance event for those who donated their bodies to the Department of Anatomy

Monday 11/4/2019 – 6 PM

Augustinian Abbey

Mendlovo náměstí 157/1  
603 00 Brno



### Articulatio cubiti (elbow joint)

Articulatio composita:

**1. Articulatio humeroradialis (articulatio spherioidea)**

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

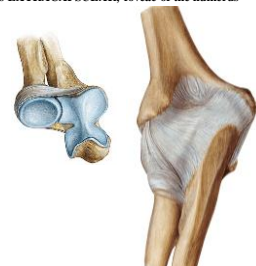
recessus sacciformis

**Apparatus:**

lig. anulare radii

lig. collaterale radiale

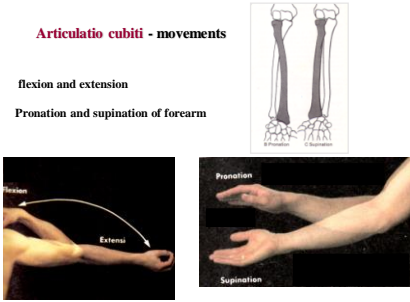
lig. collaterale ulnare



**Articulatio cubiti - movements**

flexion and extension

Pronation and supination of forearm



The diagram shows the elbow joint in two positions: flexion and extension. The photograph shows the forearm in two positions: pronation (palm down) and supination (palm up).

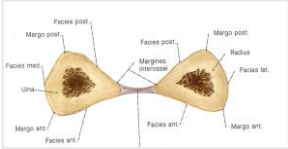

**Juncturae radioulnares**

**Membrana interossea antebrachii**

Fixation of the radius and ulna, origin of the muscles

Limitation of supination

chorda obliqua

The diagram labels the following structures: Facies post., Margo post., Facies med., Ulna, Margo ant., Facies ant., Margines interossei, Facies post., Margo post., Radius, Facies lat., Facies ant., and Margo ant.

**Articulatio radioulnaris distalis**

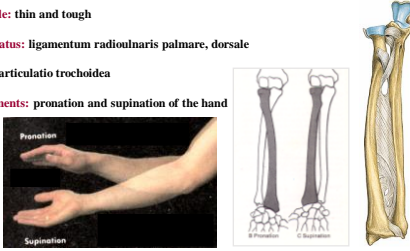
**Facets:** incisura ulnaris radii, circumferentia articularis capitis ulnae

**Capsule:** thin and tough

**Apparatus:** ligamentum radioulnaris palmare, dorsale

**Type:** articulatio trochoidea

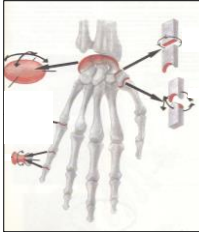
**Movements:** pronation and supination of the hand



The diagram shows the distal radioulnar joint in two positions: pronation and supination. The photograph shows the hand in two positions: pronation (palm down) and supination (palm up).

**Articulationes manus**

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



The diagram shows the bones of the hand and wrist with red circles highlighting the locations of the various articulations listed.

**Articulatio radiocarpalis**

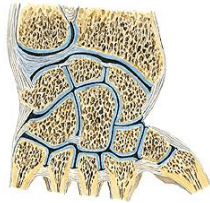
**Facets:**  
 facies articularis carpalis radii, discus articularis  
 os scaphoideum, os lunatum, os triquetrum (lig. intercarpalia interossea)

**Morphologic and functional unit with articulatio mediocarpea**

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

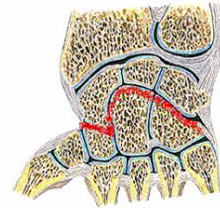
**Radial:**

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. radiocarpeum dorsale et palmare
- lig. ulnocarpeum palmare et dorsale
- lig. carpi radiatum

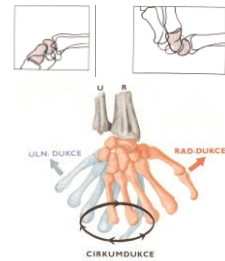


**Articulatio mediocarpalis**

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:**

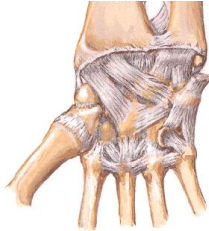
Margins of the art. facets

**Apparatus:**

lig. pisohamatum

lig. pisometacarpeum

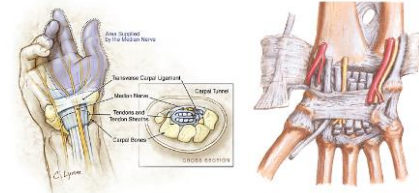
(m. flexor carpi ulnaris)



**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:** margines of the facets

**Apparatus:**

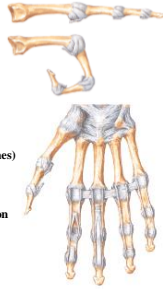
laminae fibrocartilagineae palmares  
(thumb - 2 ossa sesamoidea)

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:** margines of the facets

**Apparatus:**

lamina fibrocartilaginea palmaris

lig. collaterale radiale et ulnare

**Type:** articulatio trochlearis

**Movements:** flexion and extension

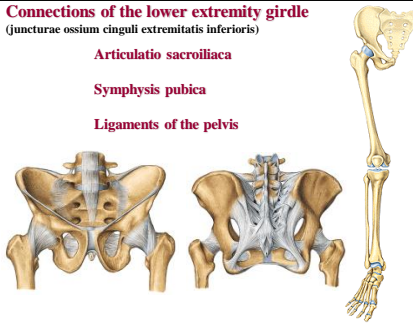


### Connections of the lower extremity girdle (juncturae ossium cinguli extremitatis inferioris)

**Articulatio sacroiliaca**

**Symphysis pubica**

**Ligaments of the pelvis**



### Articulatio sacroiliaca

**Facets:** facies auricularis ossis sacri  
facies auricularis ossis ilii

**Capsule:** tough, margines of the facets

**Apparatus:**

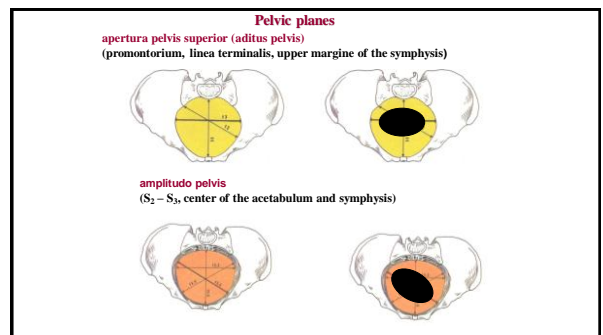
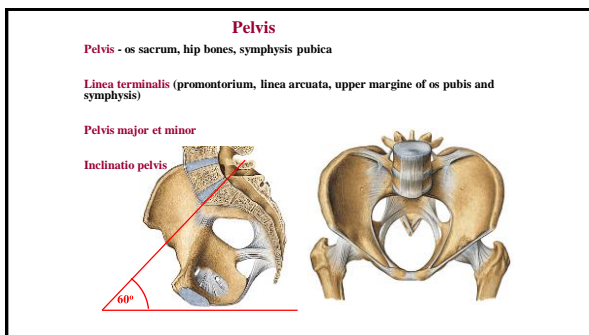
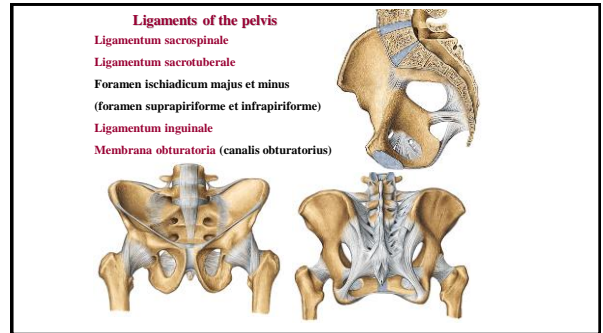
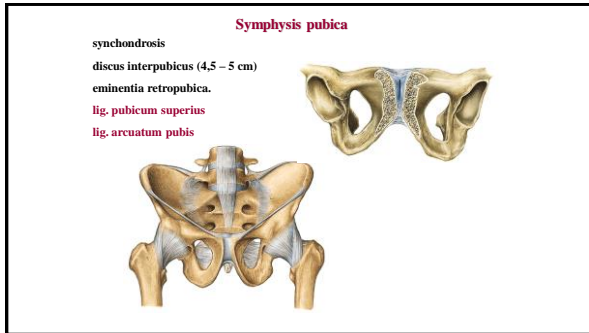
ligg. sacroiliaca ventralia, dorsalia, interossea

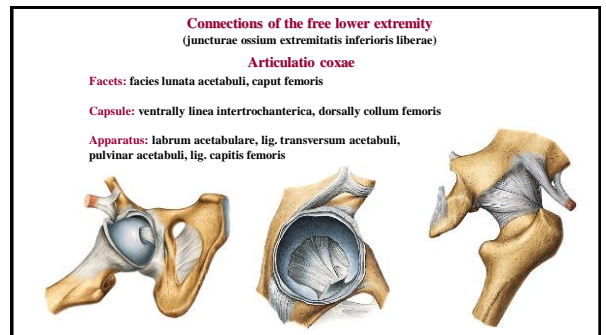
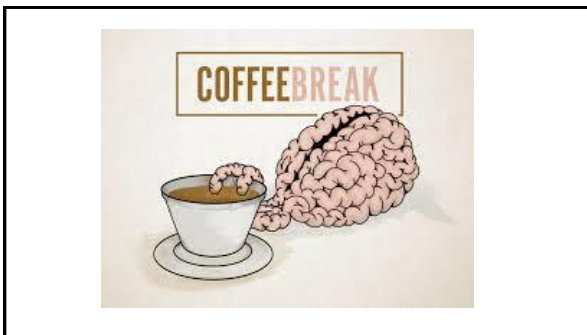
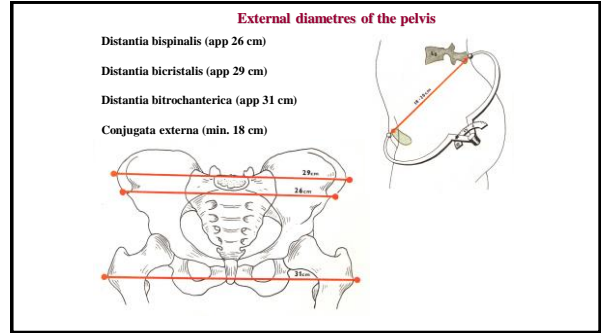
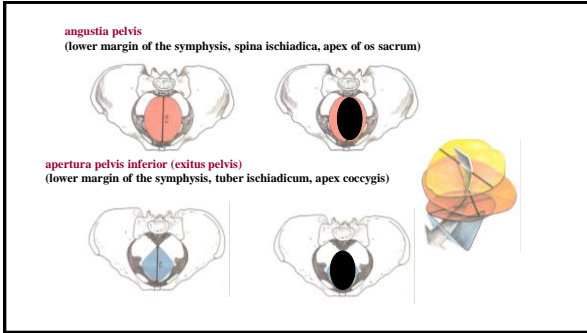
lig. iliofemorale

**Type:** amfiarthrosis

**Movements:** limited







**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**

**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 genium)



**Ligamenta cruciata genus**

**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 genus - 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 genus**

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 fibula

**Syndesmosis tibiofibularis**

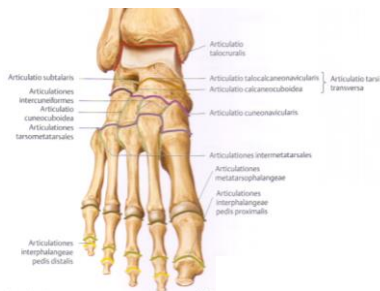
**Connection:** distal end of fibula and tibia

**Ligg.:** Lig. tibiofibulare anterius et posterius

**Movements:** springy



**Articulaciones pedis**



**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 tibio calcanea

**Lig. collaterale laterale:** lig. talofibulare ant. et post., lig. calcaneofibulare

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



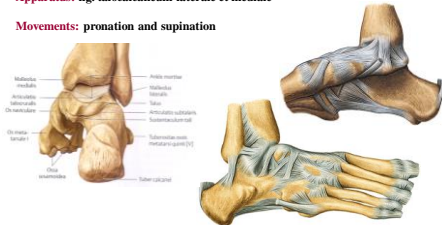
**Articulatio subtalaris**

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

**Capsule:** margins of the facets

**Apparatus:** lig. talocalcaneum laterale et mediale

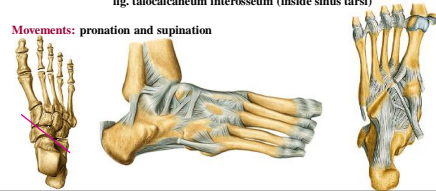
**Movements:** pronation and supination

**Articulatio talocalcaneonavicularis**

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

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

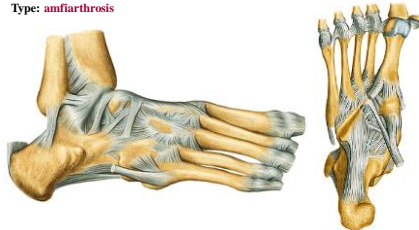
**Movements:** pronation and supination

**Articulatio calcaneocuboidea**

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

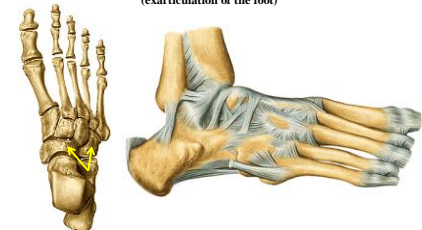
**Apparatus:** lig. calcaneocuboideum plantare, lig. plantare longum, lig. bifurcatum = lig. calcaneocuboideum (dorsale)

**Type:** amphiarthrosis

**Articulatio tarsi transversa (Chopart's joint)**

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

**Apparatus:** lig. bifurcatum: lig. calcaneocuboideum dor. and lig. calcaneonavicularare 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

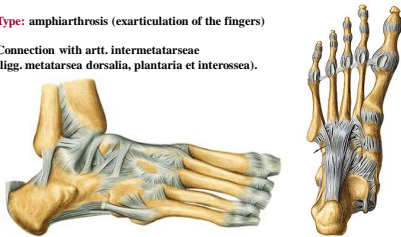
**Articulationes tarsometatarsales (Lisfranc's joint)**

**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 art. intermetatarsae  
(ligg. metatarsae dorsalia, plantaria et interossea).

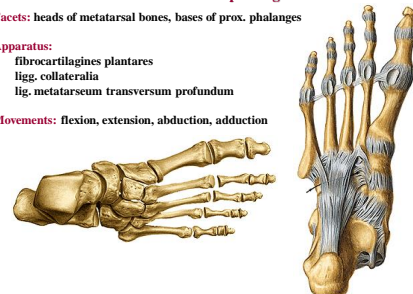
**Articulationes metatarsophalangeae**

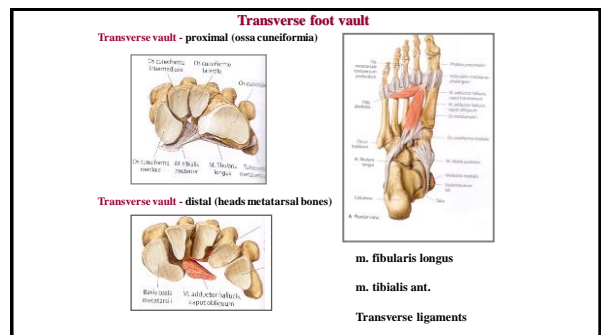
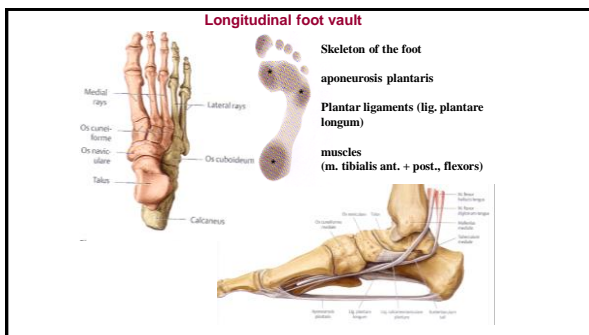
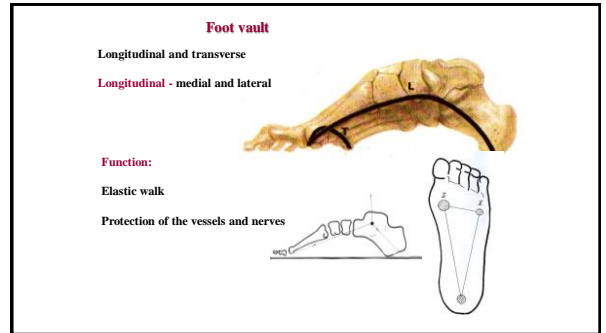
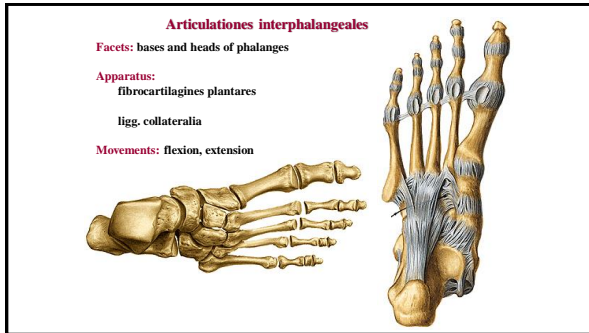
**Facets:** heads of metatarsal bones, bases of prox. phalanges

**Apparatus:**

fibrocartilagine plantares  
ligg. collateralia  
lig. metatarsae transversum profundum

**Movements:** flexion, extension, abduction, adduction





**References:**

Moore, K. L. (1992): Clinical oriented anatomy. Third edition.  
Williams&Wilkins, A Waverly Company.

Gilroy, A. M. et al. (2009): Atlas of Anatomy. Thieme New York, Stuttgart.

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

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.