

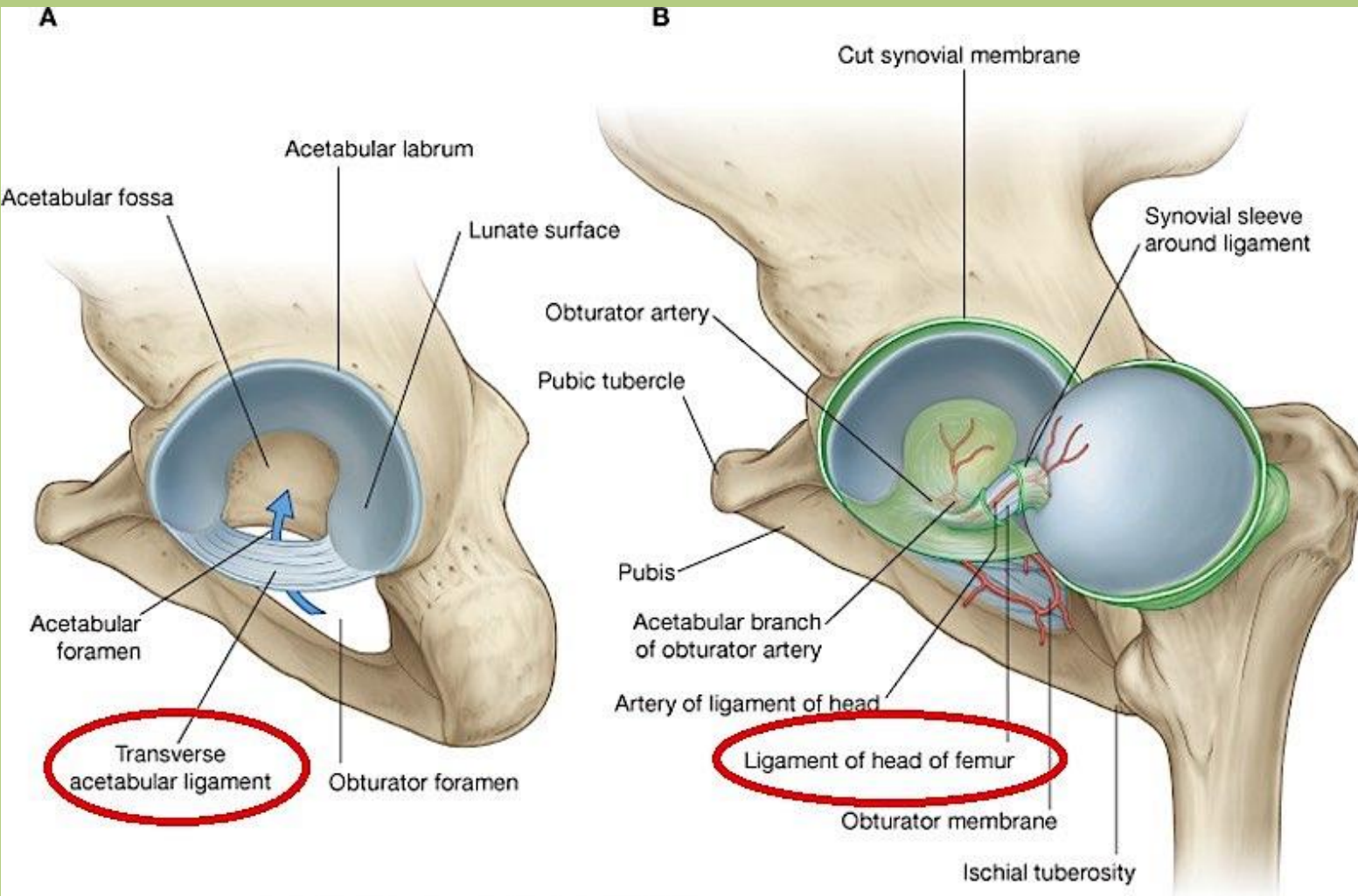


Joints of the lower limb

Sándor Katz M.D.,Ph.D.

Hip joint

type: ball-and-socket



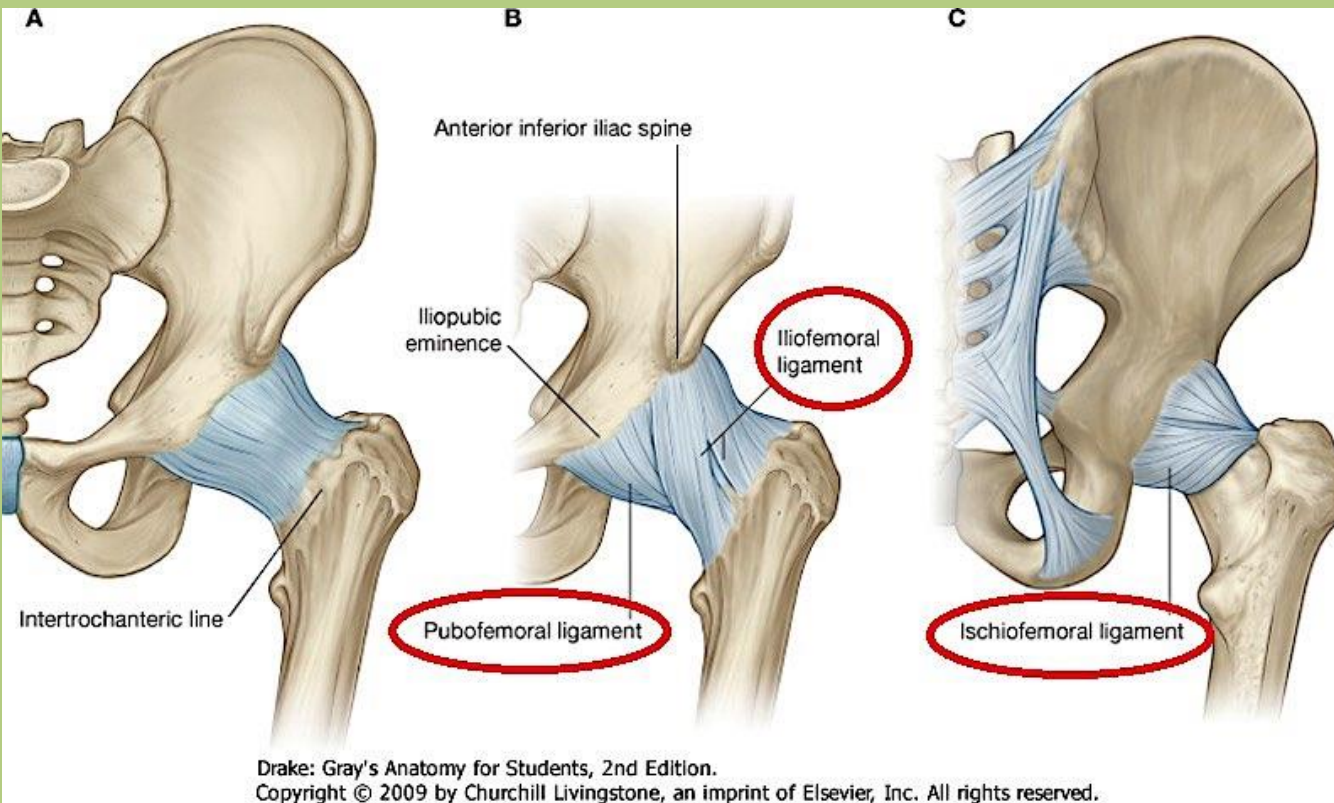
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Articular surfaces:
acetabulum
and head of
femur

Intracapsular ligaments

Optional articular component:
acetabular
labrum

Hip joint



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Extracapsular ligaments:

When the hip is extended, these ligaments become twisted upon themselves, pushing the femoral head more firmly into the acetabulum (joint-stabilizing function). During flexion the ligament fibers are relaxed.
(4th ligament: zona orbicularis)

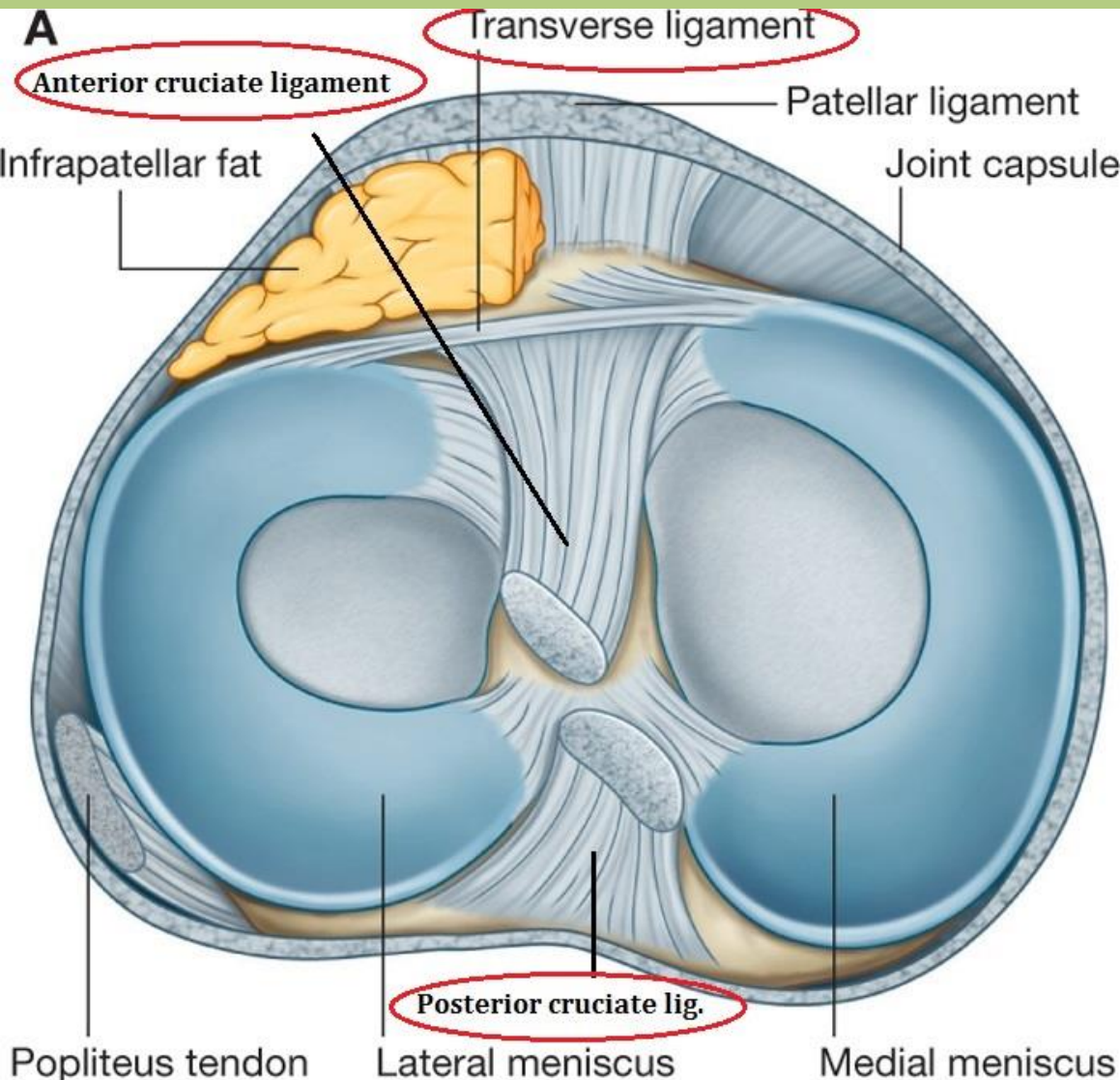
Hip joint - movements

- Flexion: 120°
- Extension: 20°
- Abduction: 40°
- Adduction: 30°
- Rotation: 90°

Circumduction

Knee joint

type: trochoginglimus (hinge and pivot)



Articular surfaces: femoral condyles and tibial condyles; patellar surface and patella.

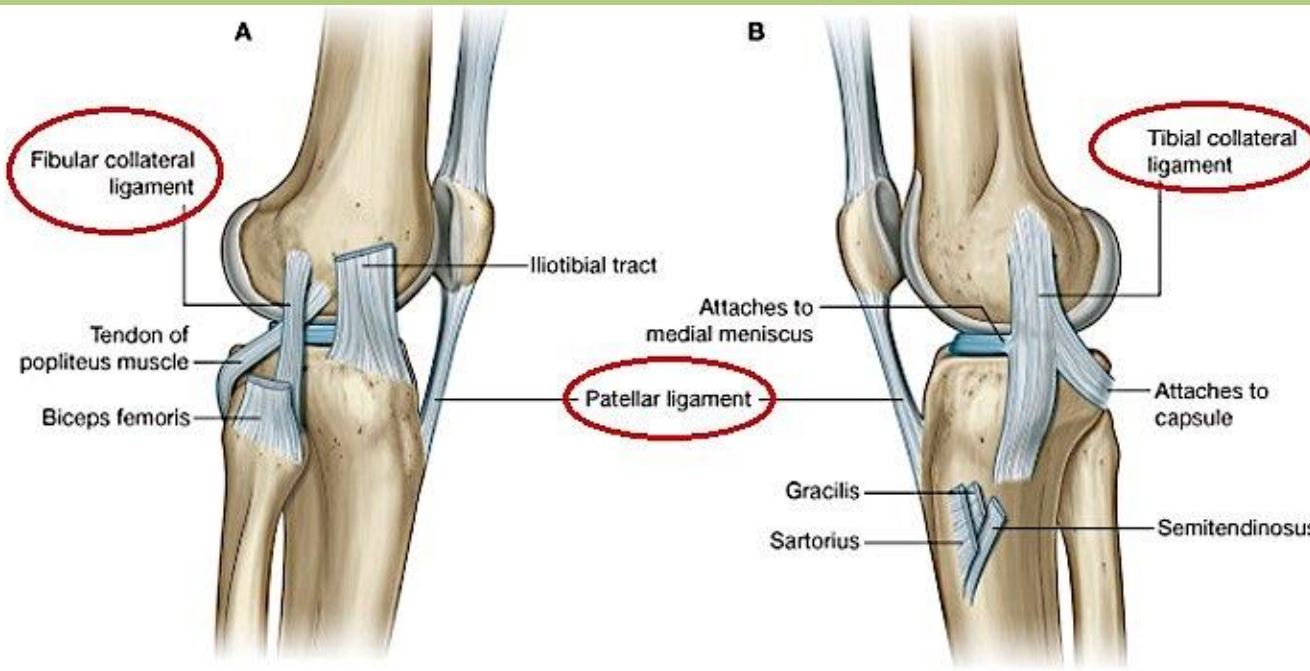
Intracapsular ligaments:

- *Anterior cruciate lig.*
- *Posterior cruciate lig.*
- *Transverse lig.*
- *Posterior meniscofemoral lig.*

Medial meniscus: C-shaped.

Lateral meniscus: almost a complete ring.

Knee joint



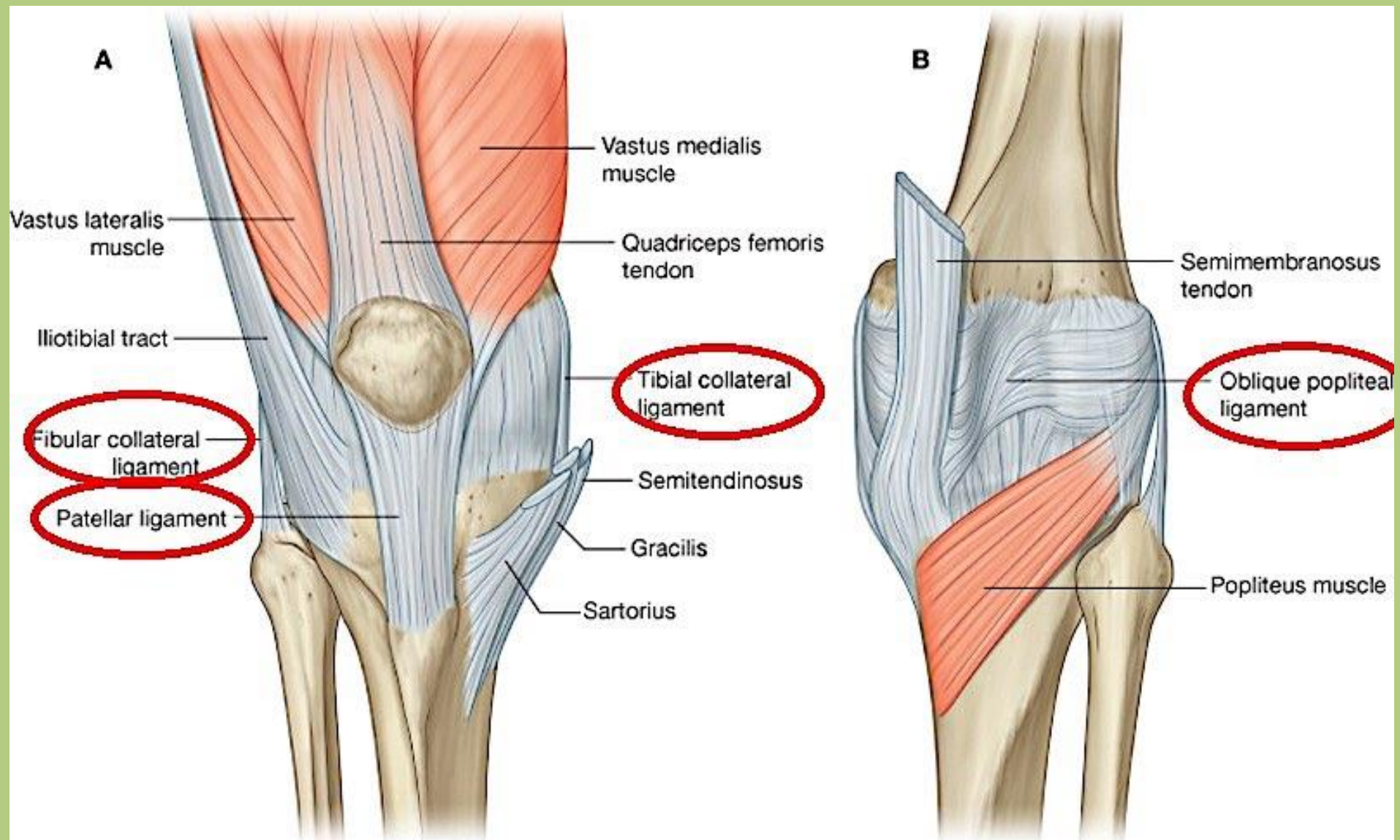
Extracapsular ligaments:

Tibial collateral lig. is broader and fuses with the articular capsule and medial meniscus.

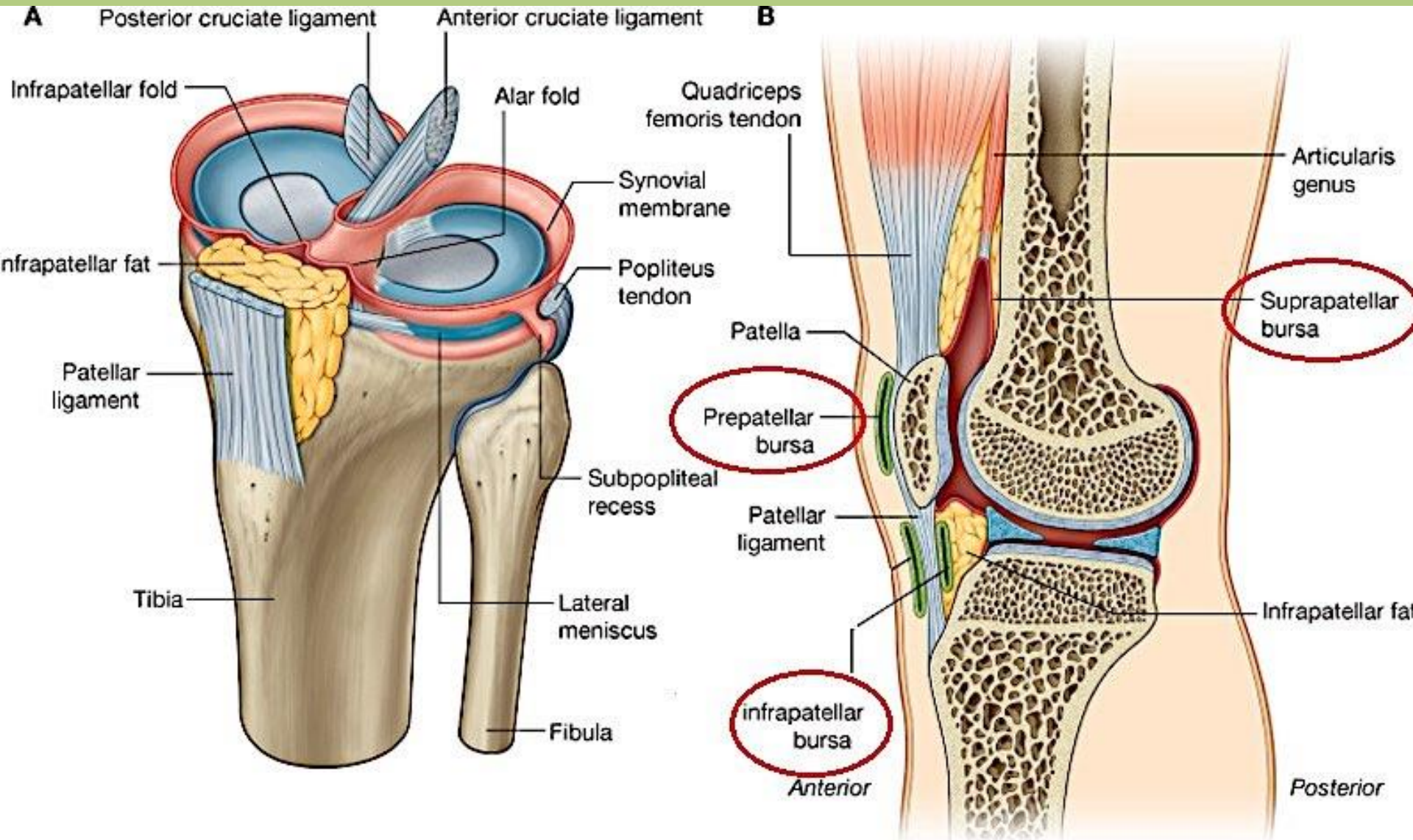
Fibular collateral lig. is cord-like and separates from the articular capsule.

Patellar ligament: tendon of the quadriceps femoris muscle

Knee joint - extracapsular ligaments



Knee joint - bursae

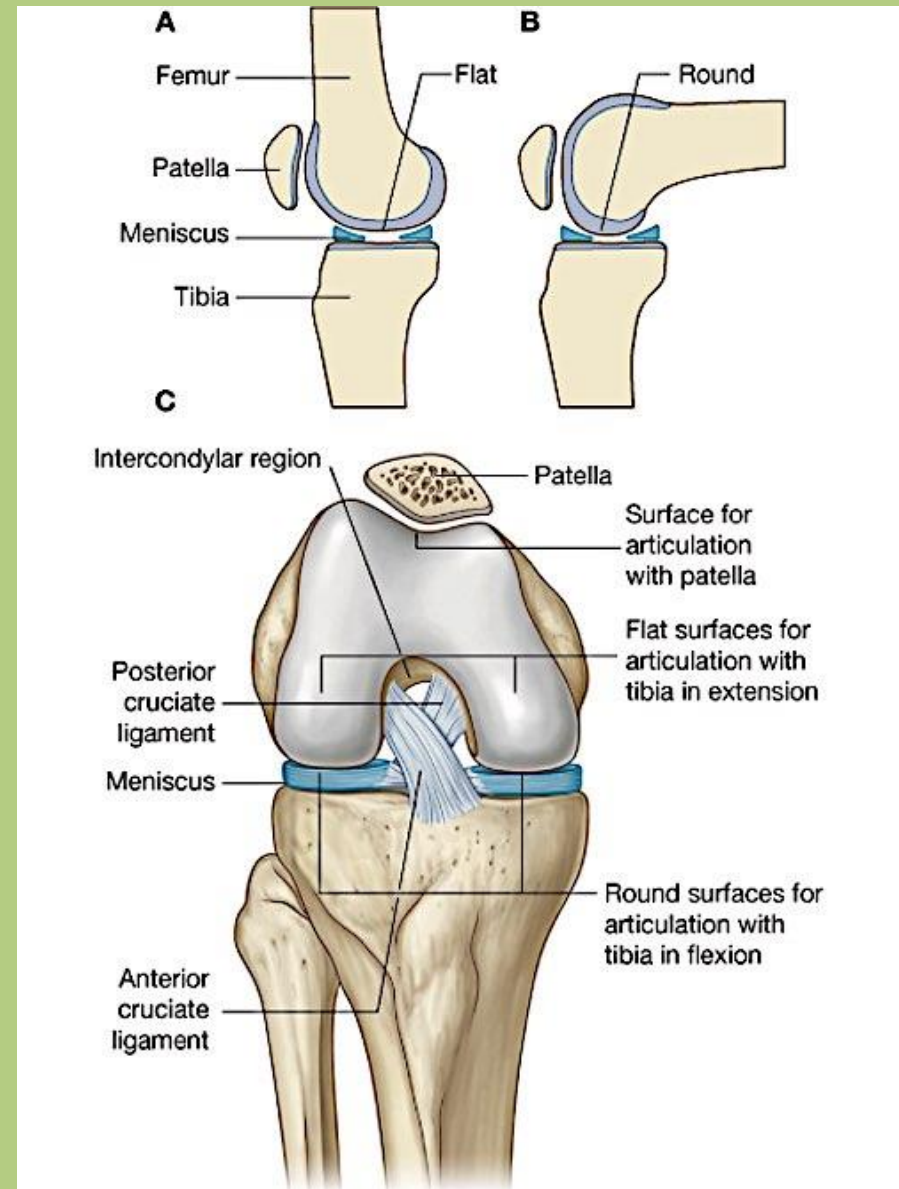


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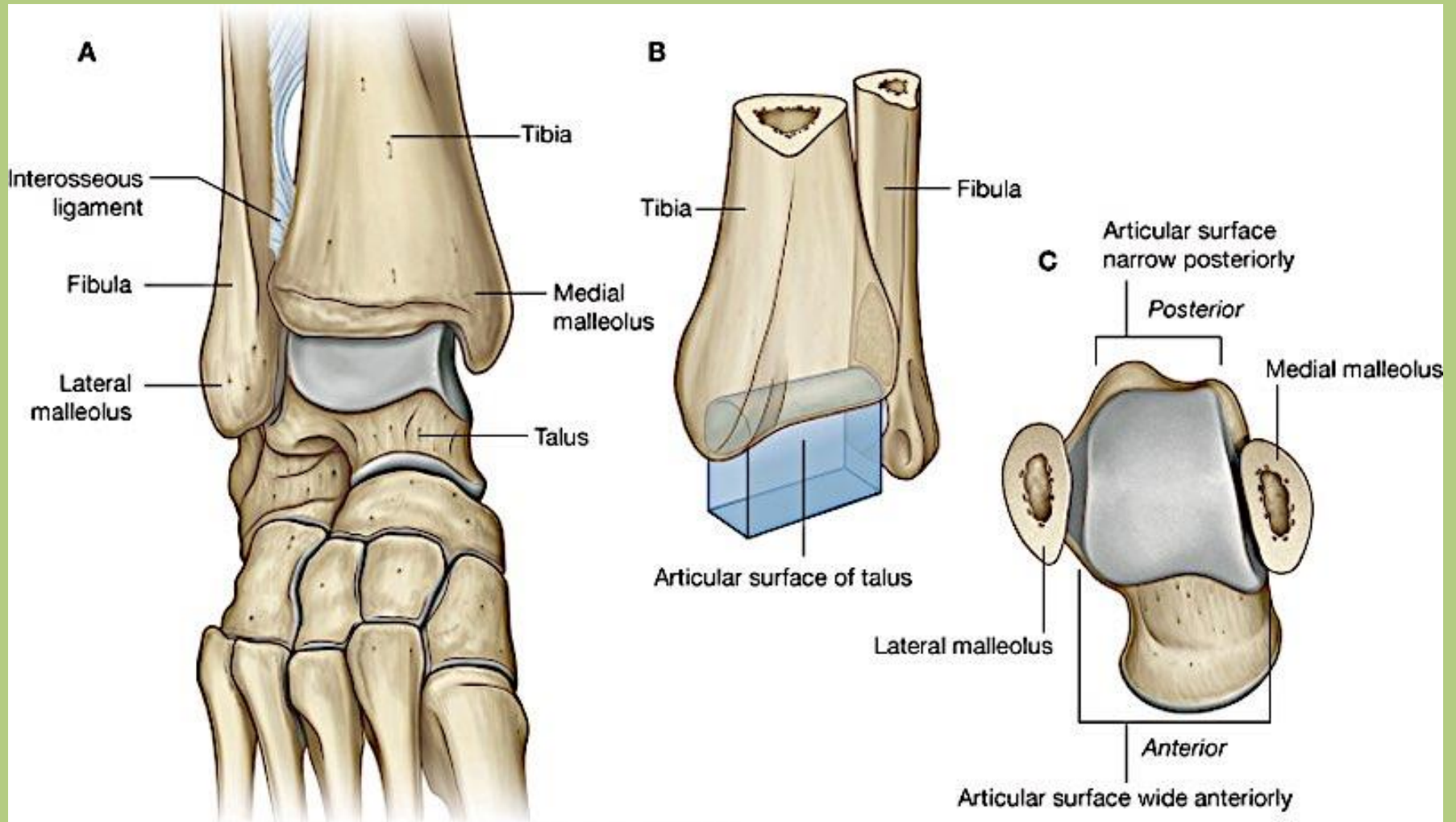
Knee joint - movements

- Flexion: 120-130°
- Hyperextension: 5°
- Voluntary rotation (knee is flexed):
medially: 10°,
laterally: 30-40°
- Terminal rotation (knee is extended): 10°



Ankle (talocrural) joint

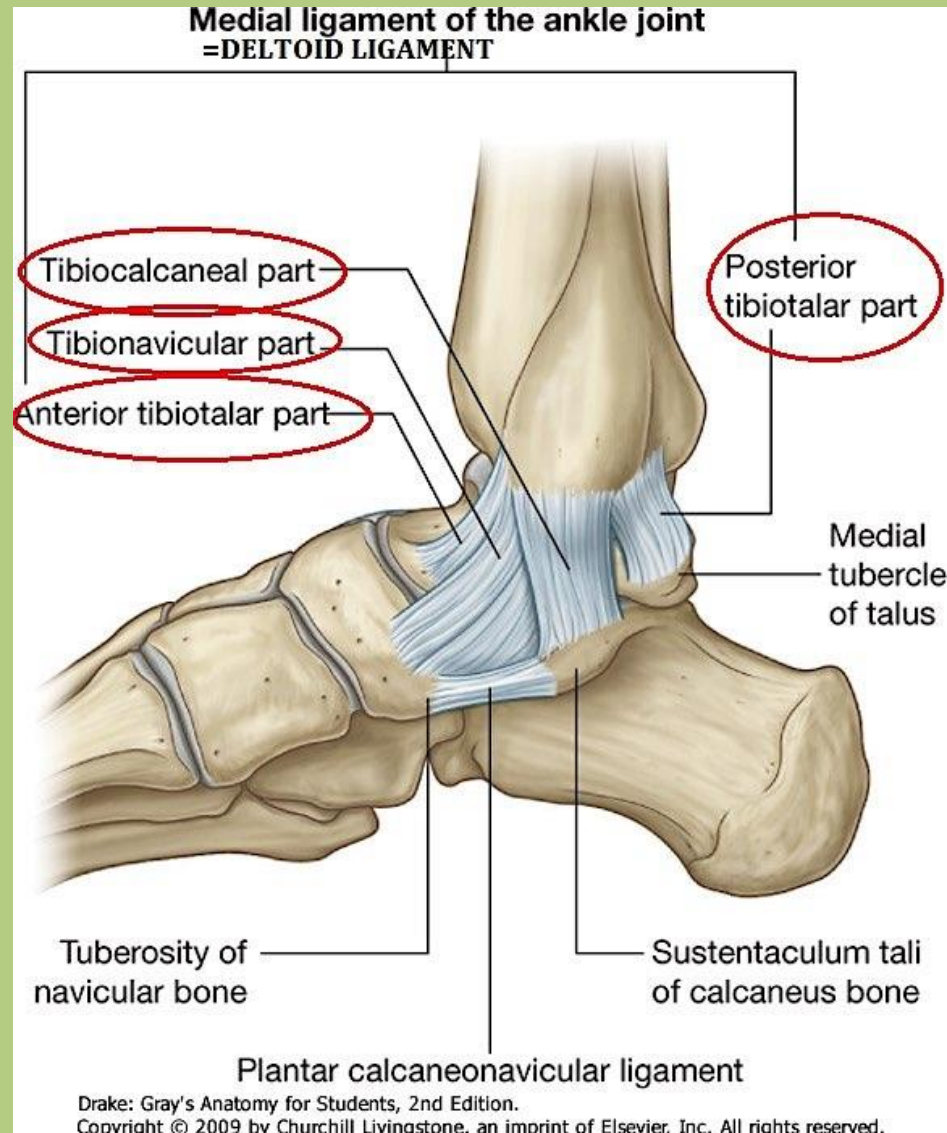
type: hinge



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Articular surfaces: malleolar mortise and trochlea tali

Talocrural joint - medial collateral ligament



Medial collateral = deltoid ligament

Tibionavicular part (1)

(partly covers the anterior tibiotalar part)

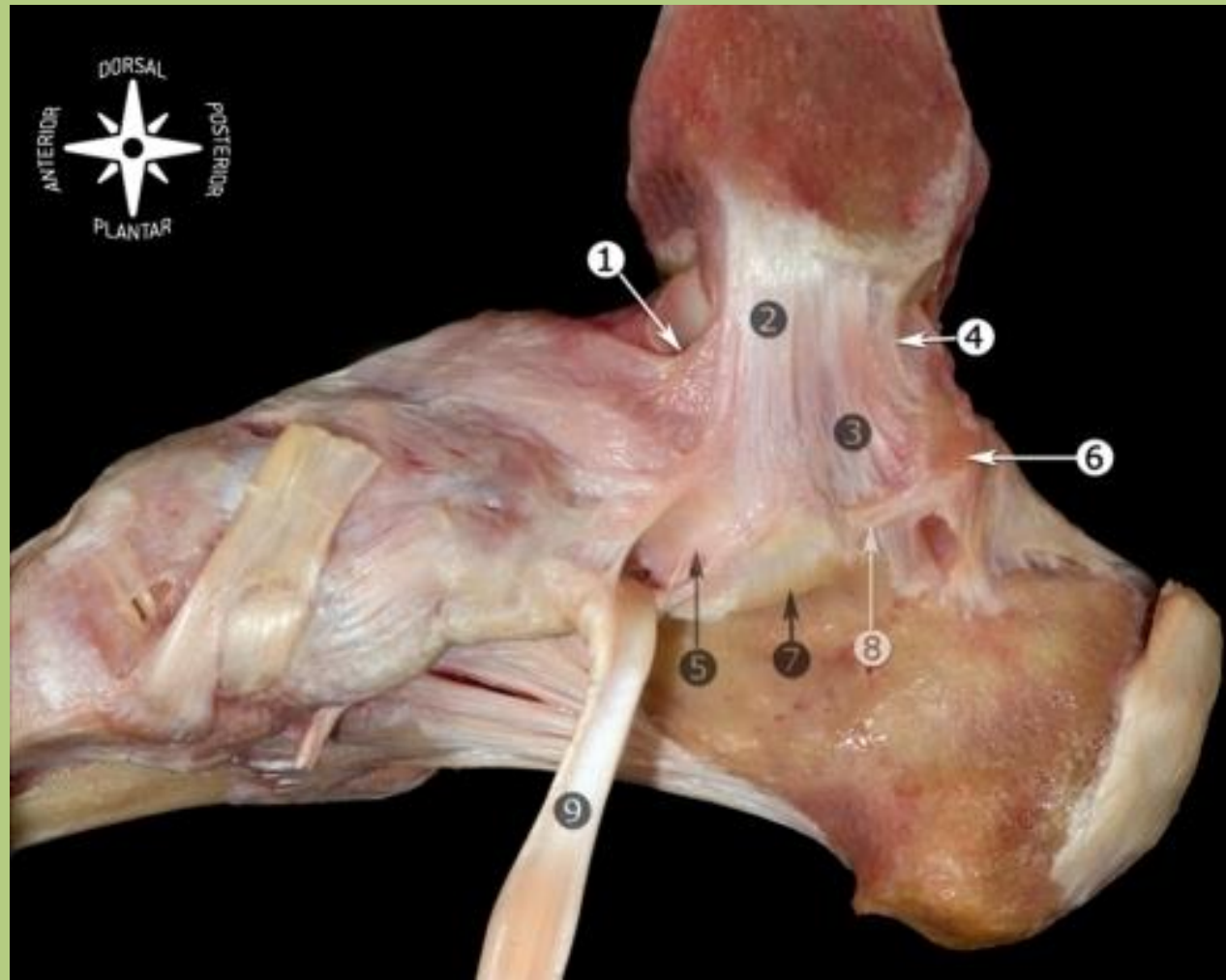
Tibiocalcaneal part (2-3)

Posterior tibiotalar part (4)

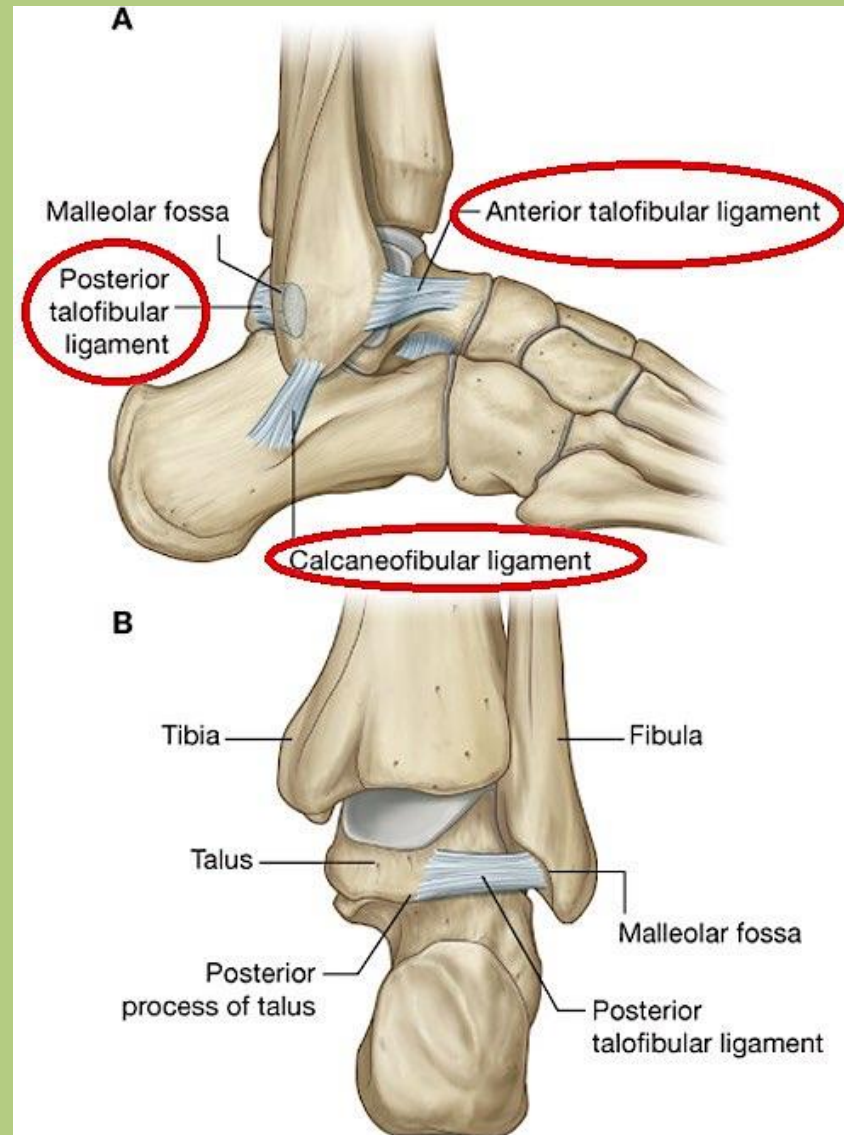
Medial process (6)

Sustentaculum tali (7)

Tendon of tibialis posterior muscles (9)



Talocrural joint - lateral collateral ligament



Lateral collateral ligament

Anterior talofibular ligament (5, 6)

Calcaneofibular ligament (10)

Lateral malleolus (1)

Tibia (2)

Syndesmosis tibiofibularis (3, 4)

Talus (7)

Collum tali (8)

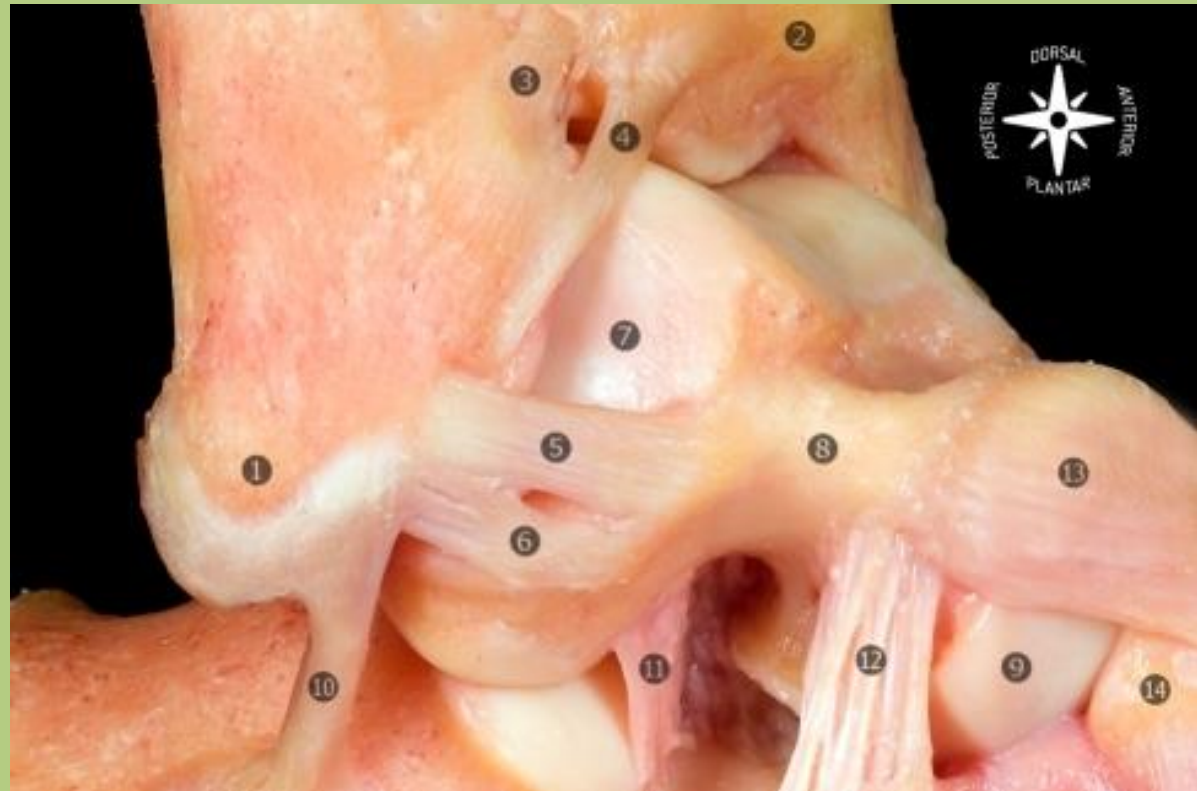
Caput tali (9)

Interosseous talocalcaneal ligament (11)

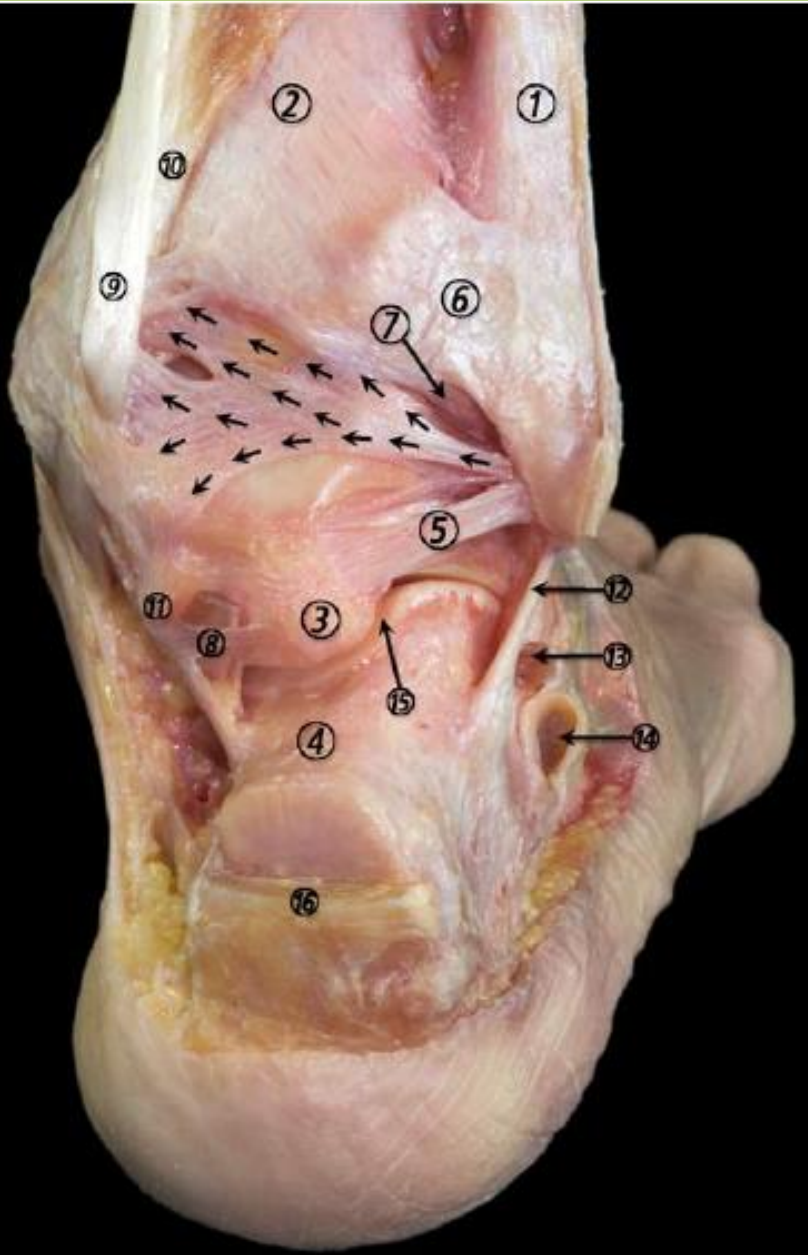
Cervical ligament (12)

Talonavicular ligament (13)

Navicular bone (14)



Lateral collateral ligament



Posterior talofibular ligament (5)

Fibula (1)

Tibia (2)

Proc. tali, tuberculum laterale (3)

Proc. tali, tuberculum mediale (11)

Tendo, musculus flexor hallucis longus (8)

Lig. calcaneofibulare (12)

Tendo, musculus peroneus brevis (13)

Tendo, musculus peroneus longus (14)

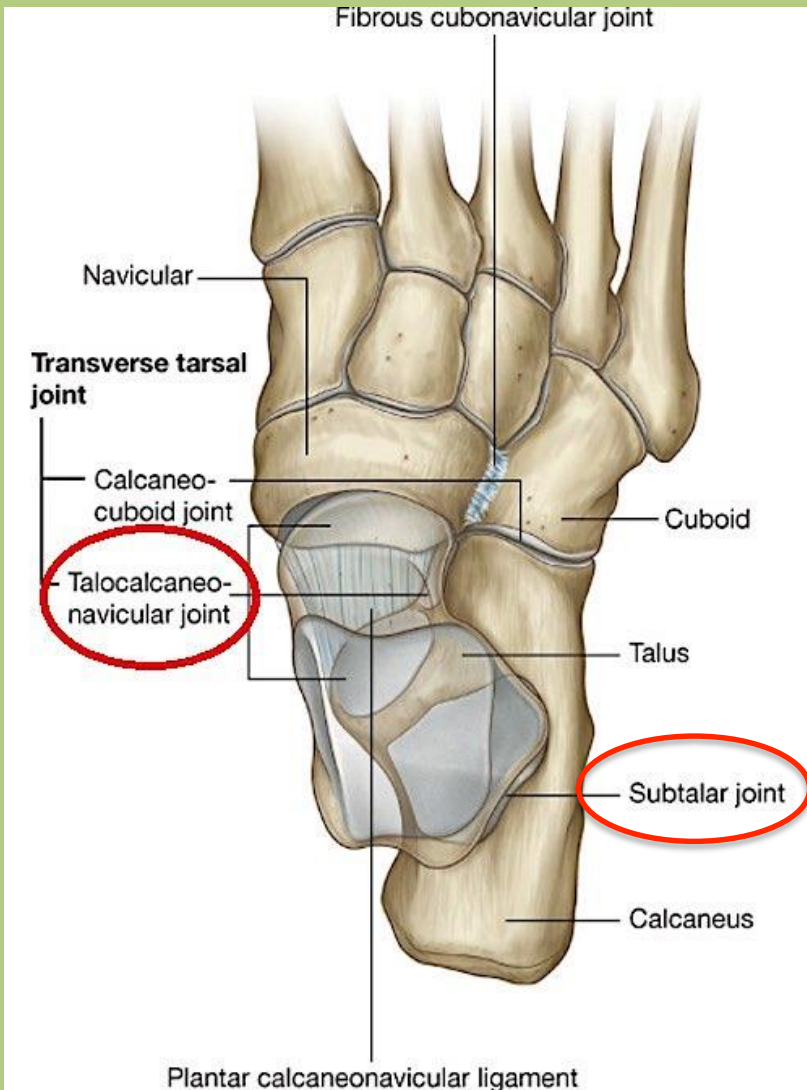
Art. subtalaris (15)

Talocrural joint - movements

Dorsiflexion: 15°

Plantarfelxion: 40°

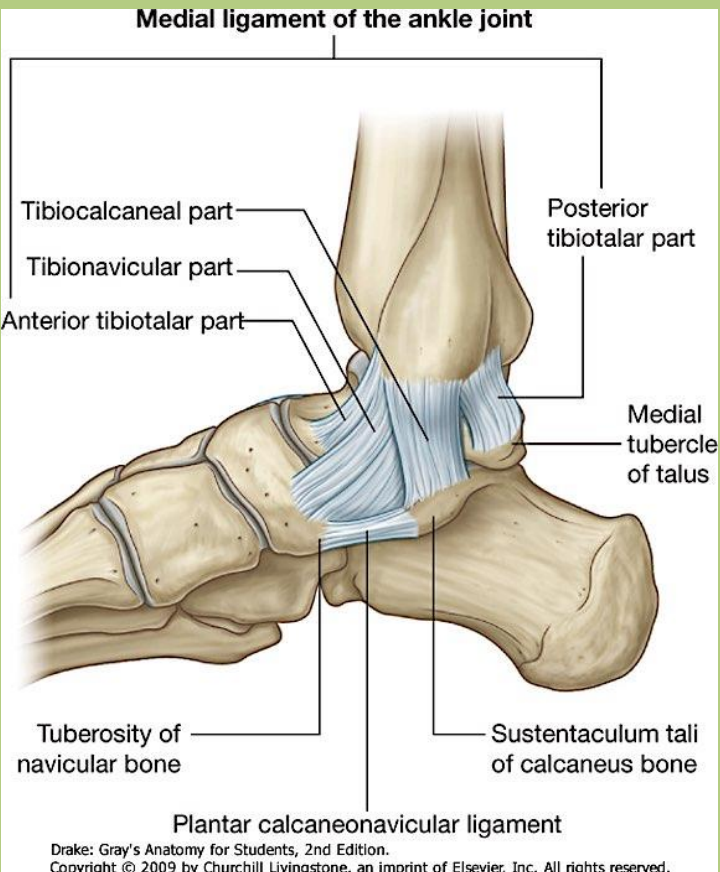
Talotarsal joint (lower ankle joint): *talocalcaneonavicular joint* and subtalar joint



Talocalcaneonavicular joint:
Articular surfaces: anterior and middle talar articular surfaces and head of the talus
+
anterior and middle calcaneal articular surfaces, navicular.

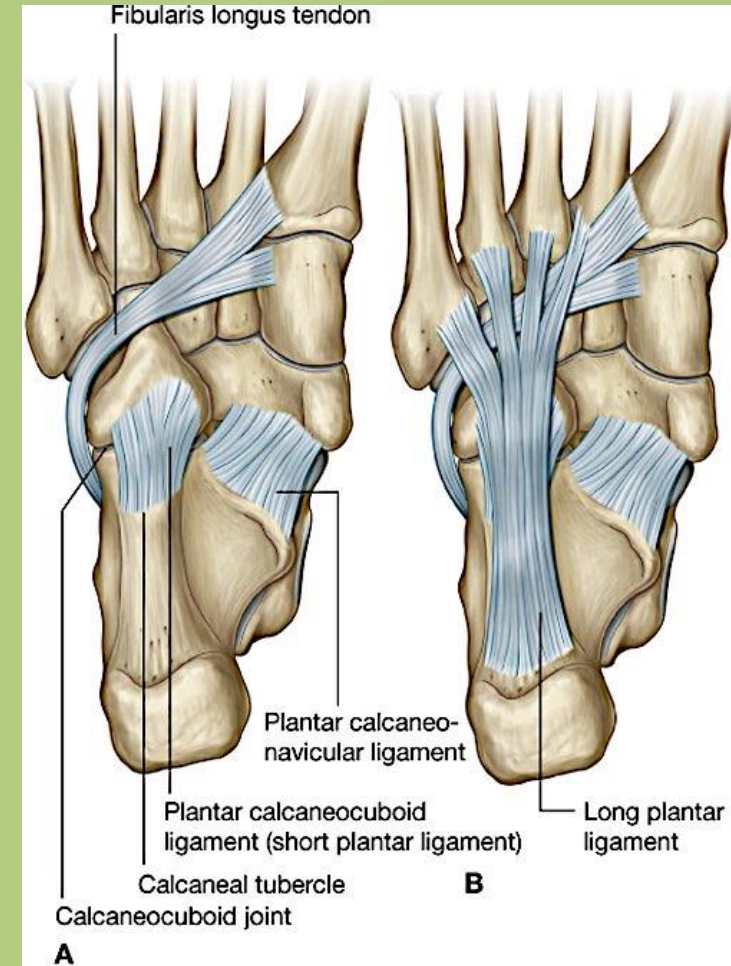
Type: restricted ball-and-socket

Talotarsal joint (lower ankle joint): *talocalcaneonavicular joint* and subtalar joint



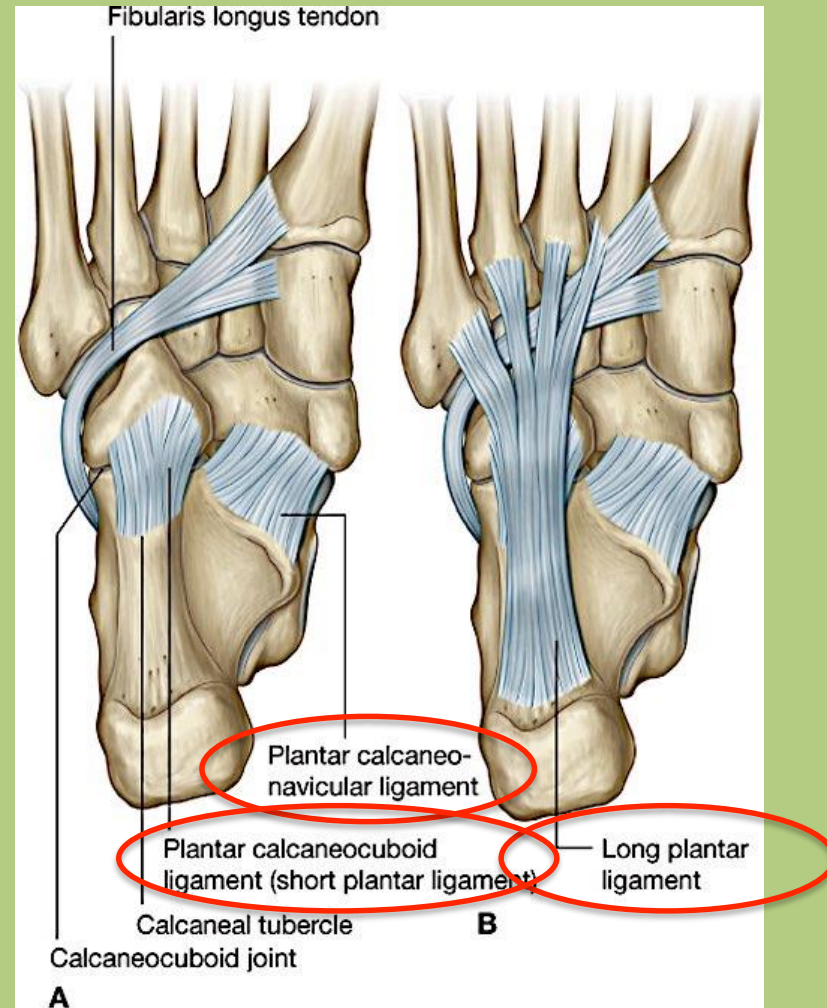
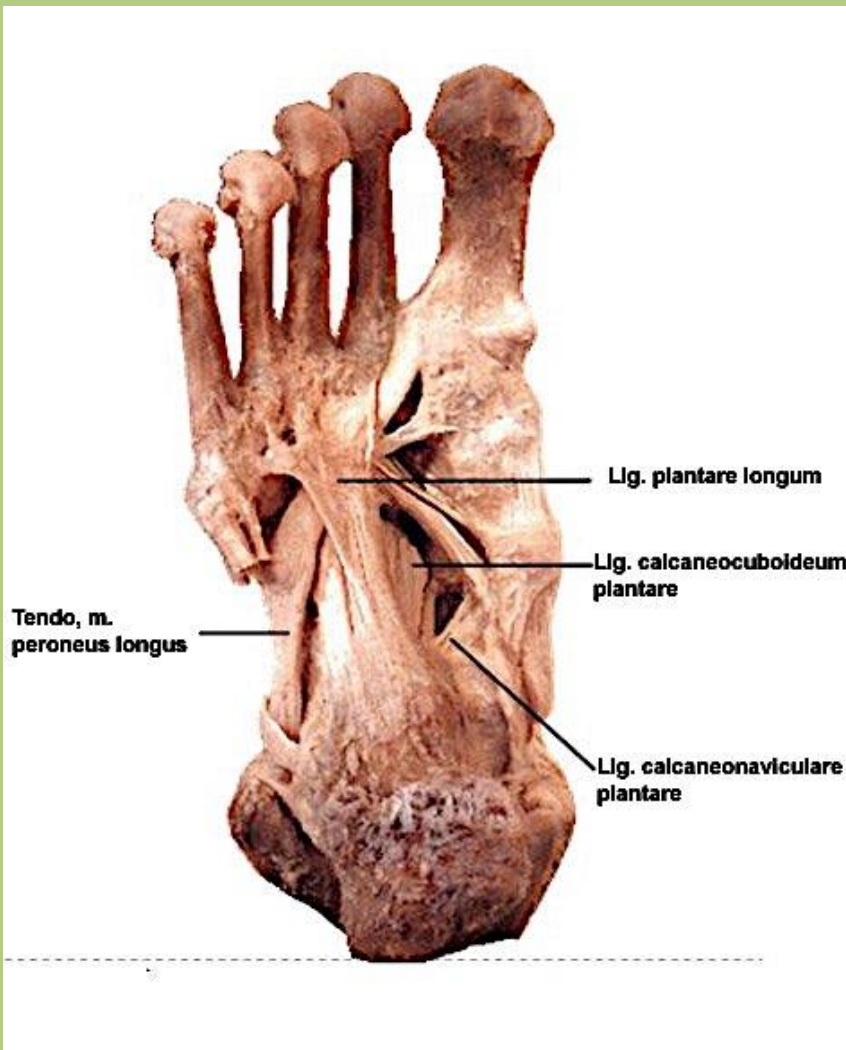
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Plantar calcaneonavicular liament=spring ligament:
connects calcaneus to the navicular and keeps an articulating surface for the head of talus. *This is the main stabilizer of the medial longitudinal arch.*

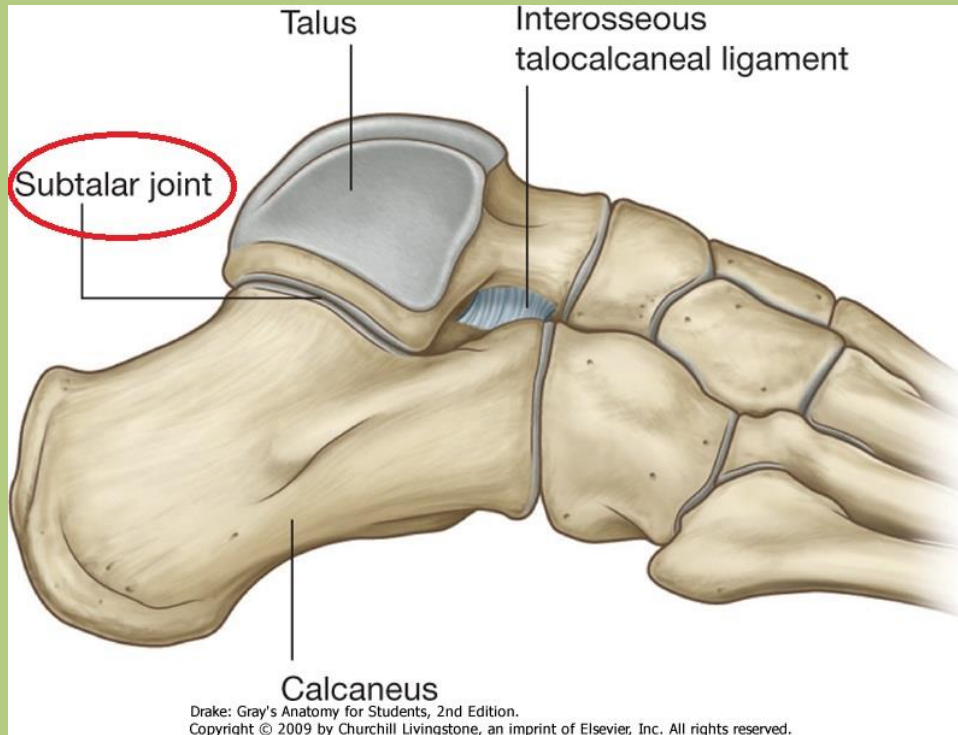


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Talotarsal joint (lower ankle joint): *talocalcaneonavicular joint and subtalar joint*



Talotarsal joint: talocalcaneonavicular joint and **subtalar joint**



Subtalar joint:

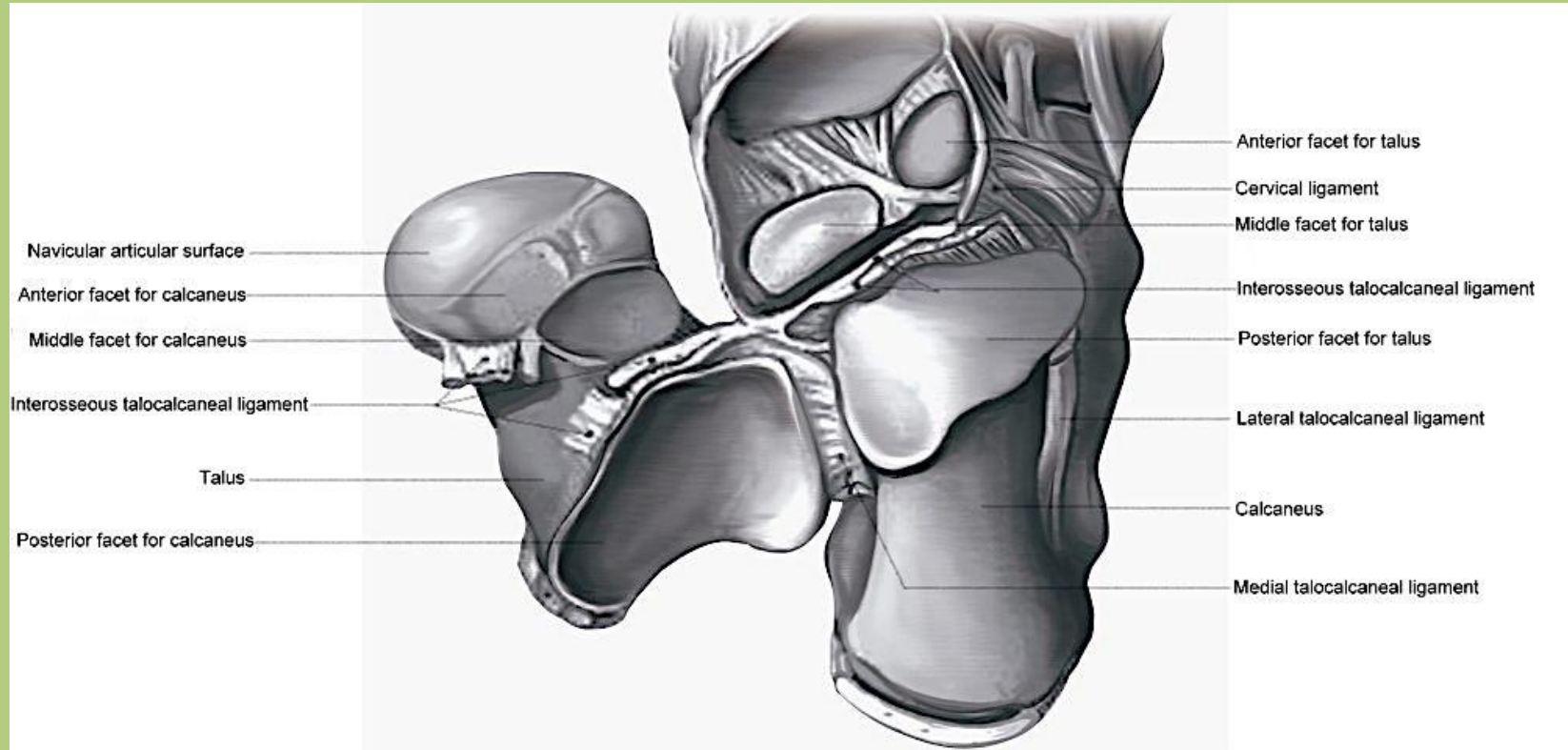
Articular surfaces:

posterior talar articular surface
and

posterior calcaneal articular
surface

Type: functionally pivot joint

Talotarsal joint: talocalcaneonavicular joint and subtalar joint

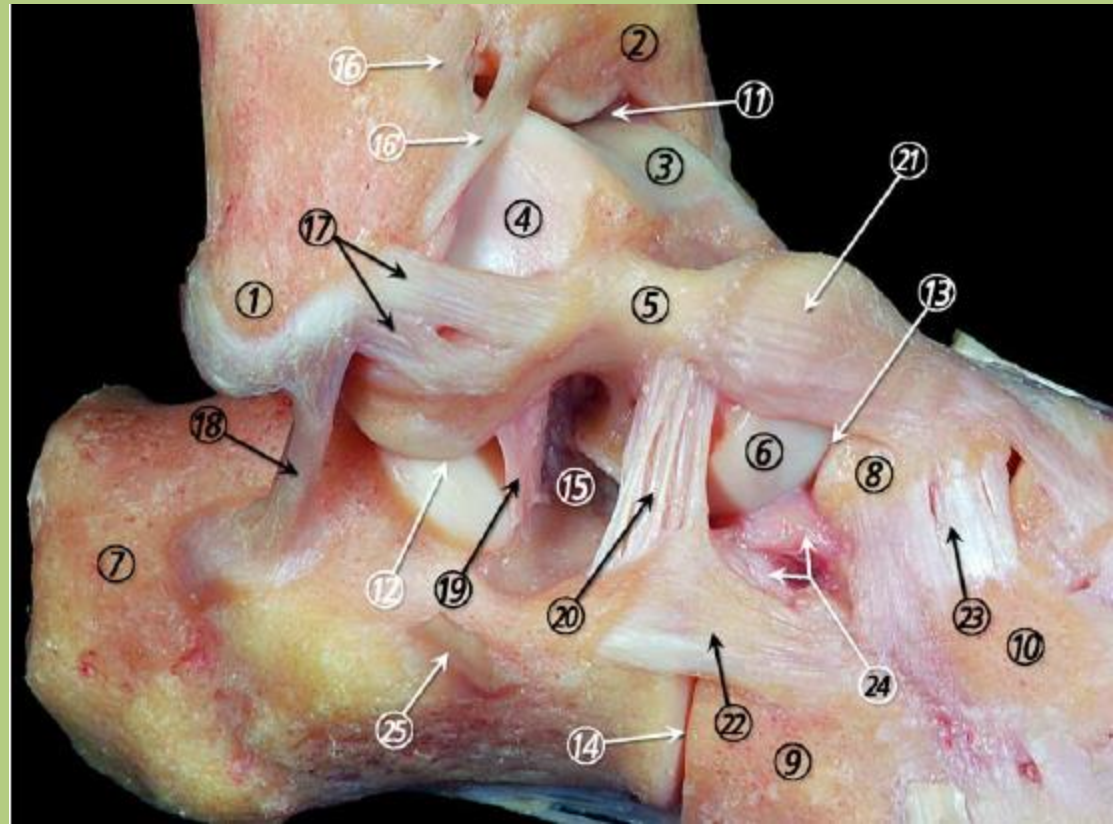


Lateral, medial and posterior talocalcaneal ligaments reinforce the articular capsule.
Interosseous talocalcaneal ligament

Subtalar joint

- **Interosseous talocalcaneal ligament (19) – in the sinus tarsi (15)**

- Lig. talofibulare anterius (17)
- Lig. calcaneofibulare (18)
- Lig. cervicale (20)
- Lig. talonaviculare (21)
- Lig. calcaneocuboideum laterale (22)
- Lig. cuneonaviculare dorsale (23)



Talotarsal joint - movements

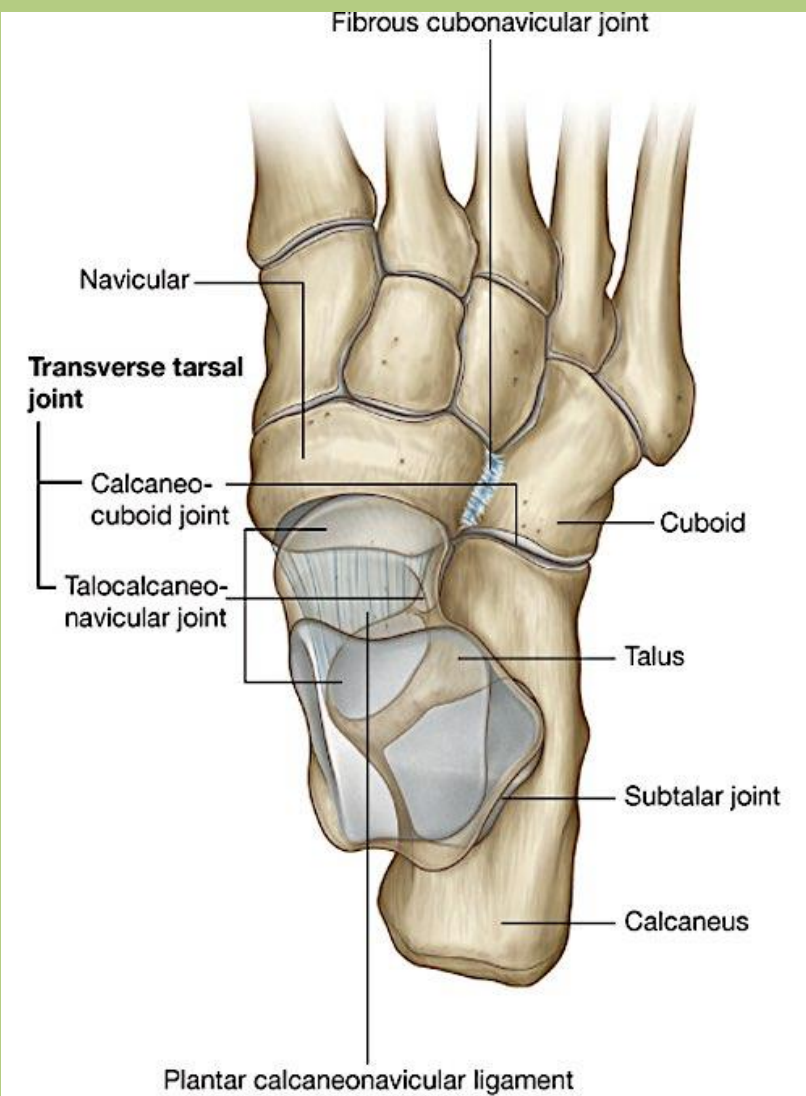


„PADS“:
plantarflexion+adduction+supination (inversion)



„DABP“:
dorsiflexion+abduction+pronation (eversion)

Transverse tarsal (Chopart's) joint: *talonavicular joint* and *calcaneocuboid joint*



Type: amphiarthrosis.

Minimal plantar and dorsal movements and rotation.

Supports the longitudinal arch of the foot.

Chopart's amputation.

Transverse tarsal (Chopart's) joint

- **Bifurcate ligament (24):**
calcaneonavicular lig. + calcaneocuboid lig.

Lig. talofibulare anterius (17)

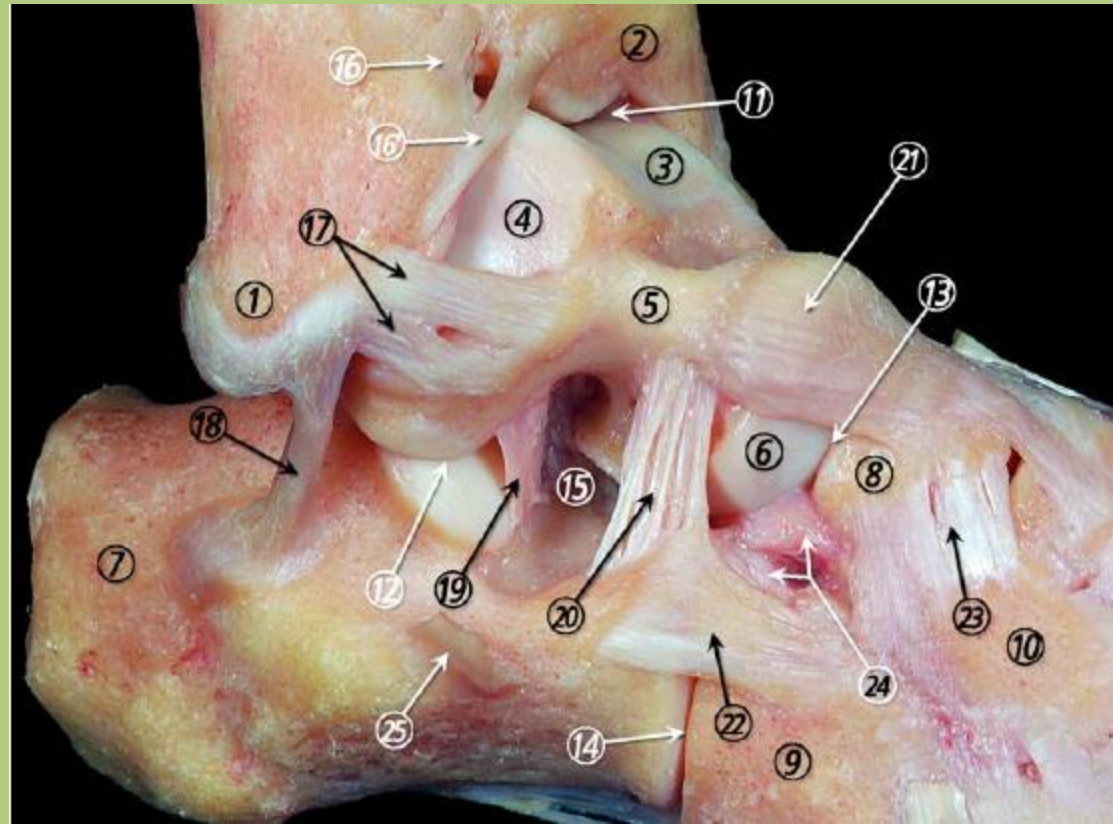
Lig. calcaneofibulare (18)

Lig. cervicale (20)

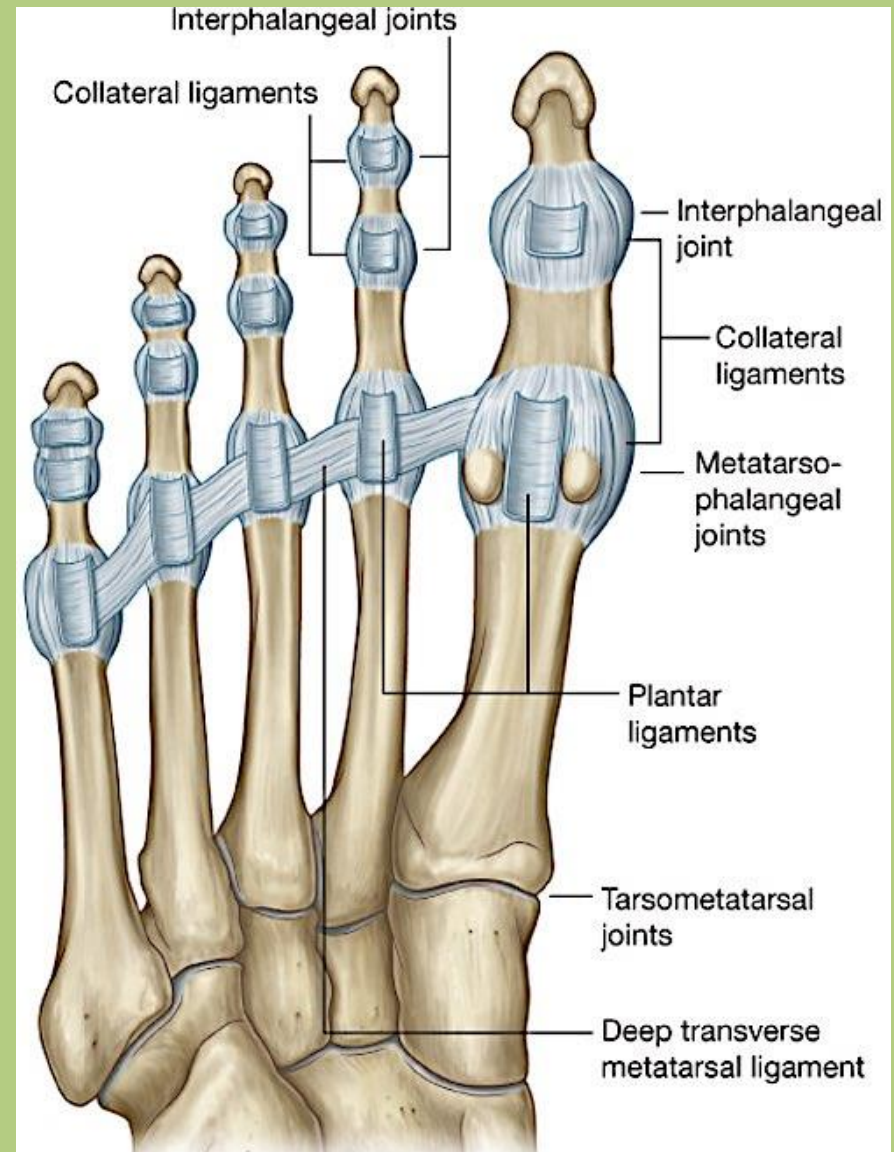
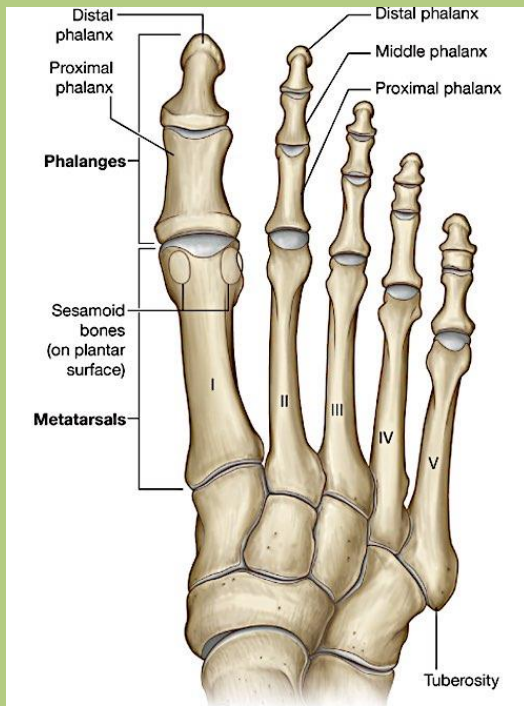
Lig. talonaviculare (21)

Lig. calcaneocuboideum laterale (22)

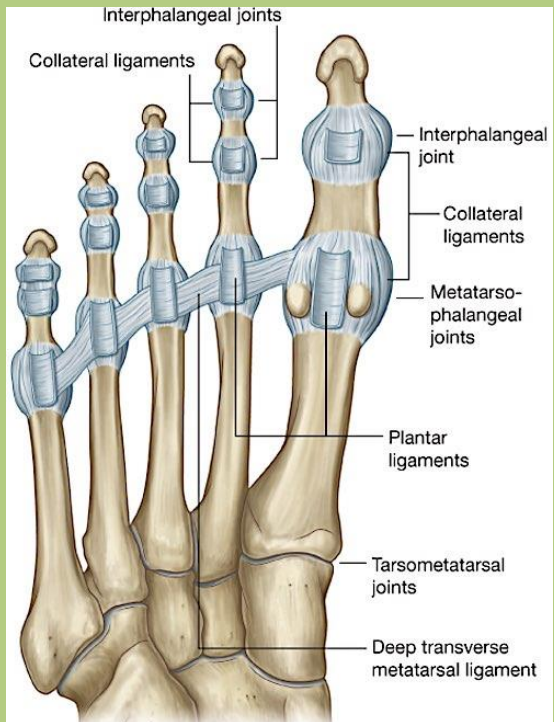
Lig. cuneonaviculare dorsale (23)



- **Intertarsal joints:** Amphiarthroses.
- **Tarsometatarsal (Lisfranc's) joints:** Amphiarthrosis. Lisfranc's amputation.
- **Metatarsophalangeal joints:** Restricted ball-and-socket. Collateral and plantar ligaments and deep transverse metatarsal ligaments.
- **Interphalangeal joints:** Hinge. Collateral ligaments.



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Thank you for your attention.



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