Joints of the lower limb

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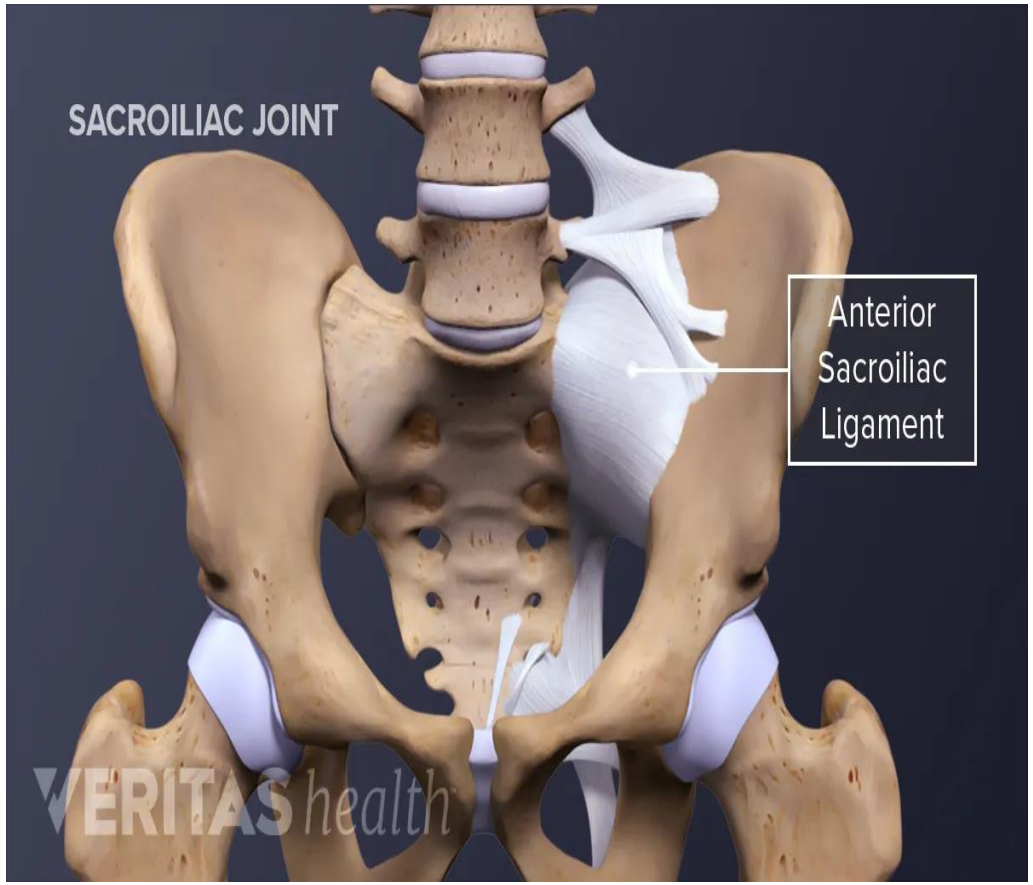
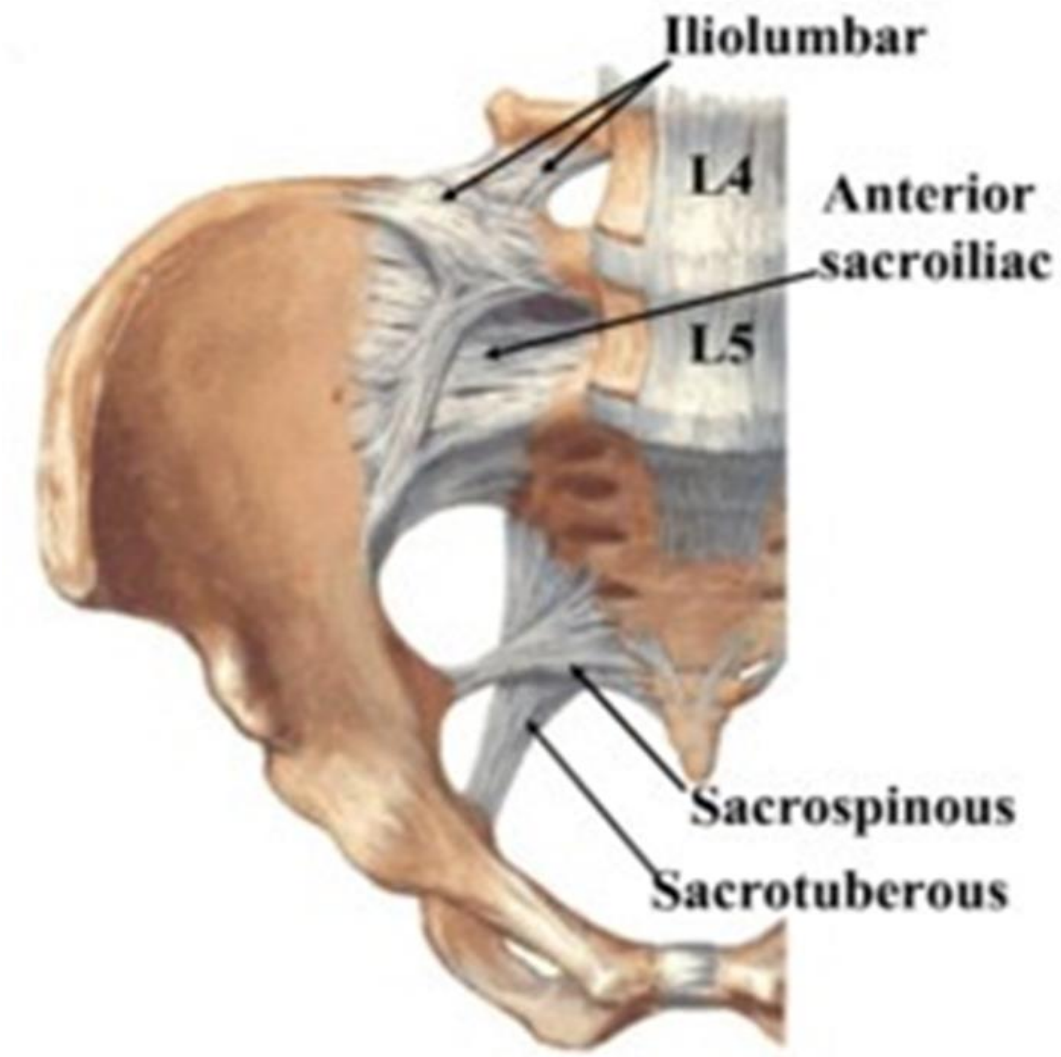
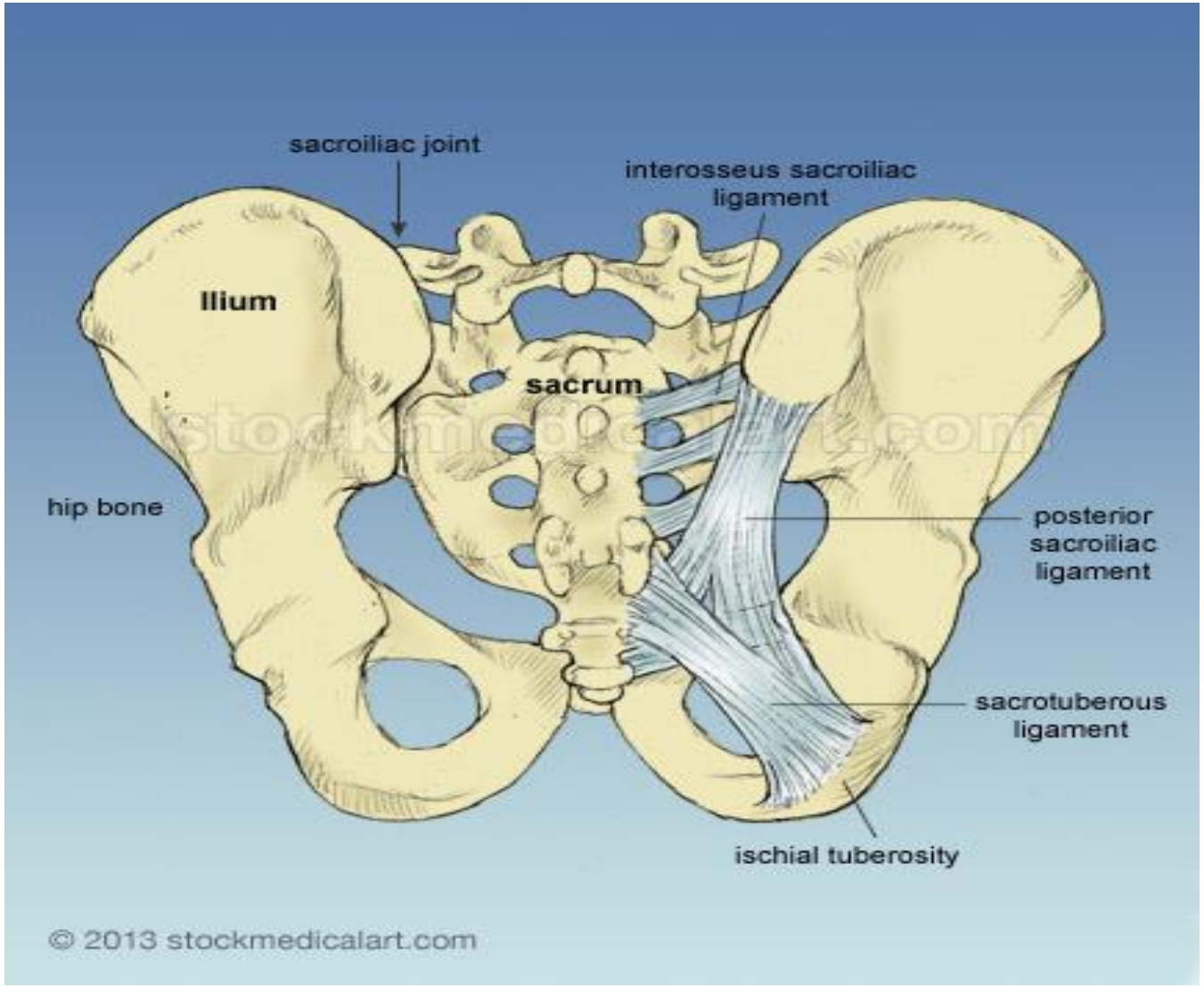
Sacroiliac Joint (Read Only)

- **Type:** plane synovial joint
- **Articular surfaces :** between sacral and iliac auricular surfaces.
- **Ligaments:**
  - The ventral sacroiliac ligament
  - The interosseous sacroiliac ligaments .
  - The dorsal sacroiliac ligament.
- **Functions:**
  - It transmits the body weight from lumbar spine to the hip bones.




Iliolumbar
L4
Anterior
sacroiliac
L5
Sacrospinous
Sacrotuberous


sacroiliac joint
interosseus sacroiliac
ligament
Ilium
sacrum
hip bone
posterior
sacroiliac
ligament
sacrotuberous
ligament
ischial tuberosity
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Hip Joint

Type : ball and socket synovial joint.

Articular Surfaces : Acetabulum and head of the femur

Ligaments:

1- Iliofemoral Ligament :

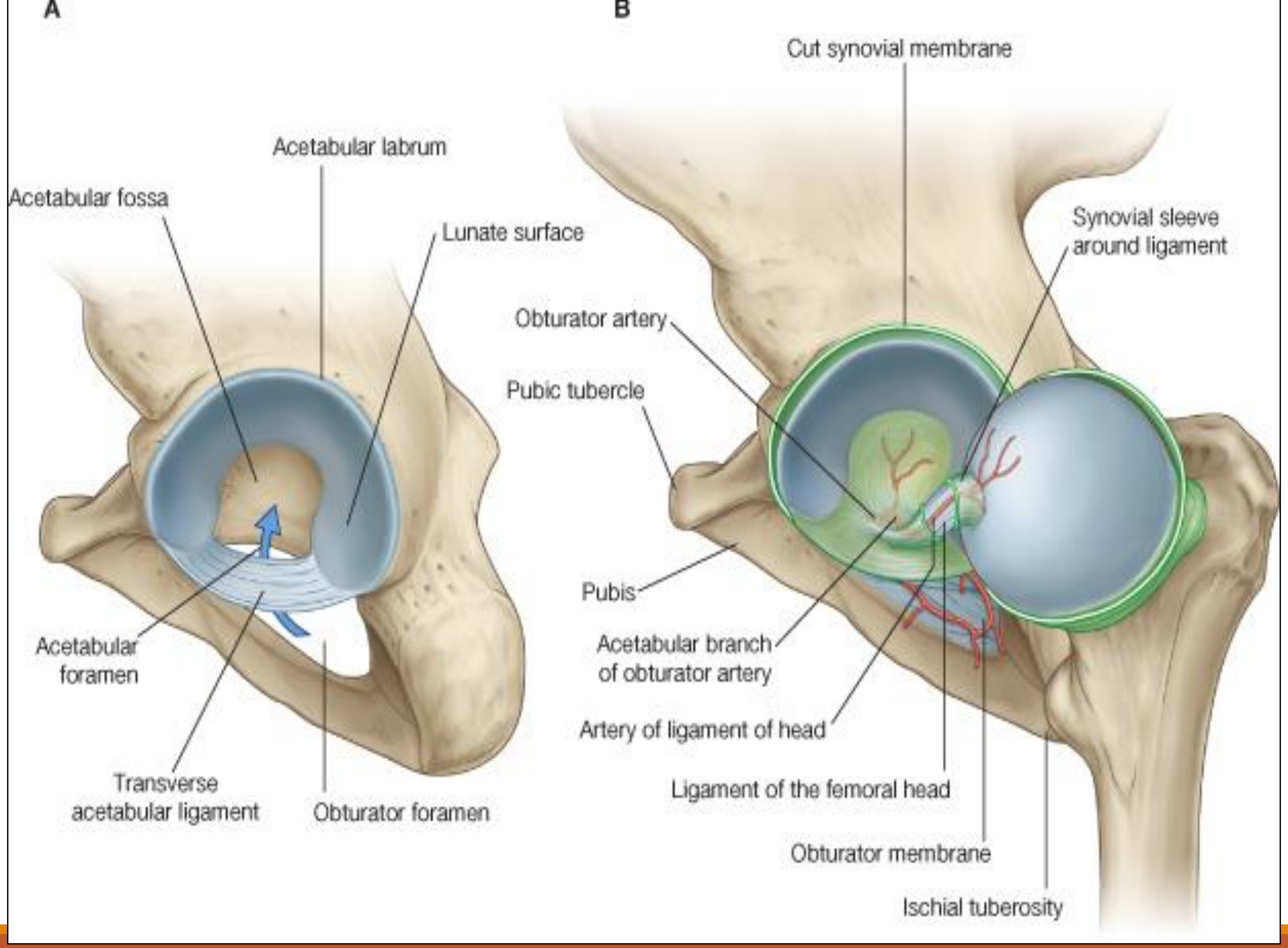
- It is Y shaped ligament
- It attached to **anterior inferior iliac spine** and **intertrochanteric line.**
- It prevent overextension of the hip during standing

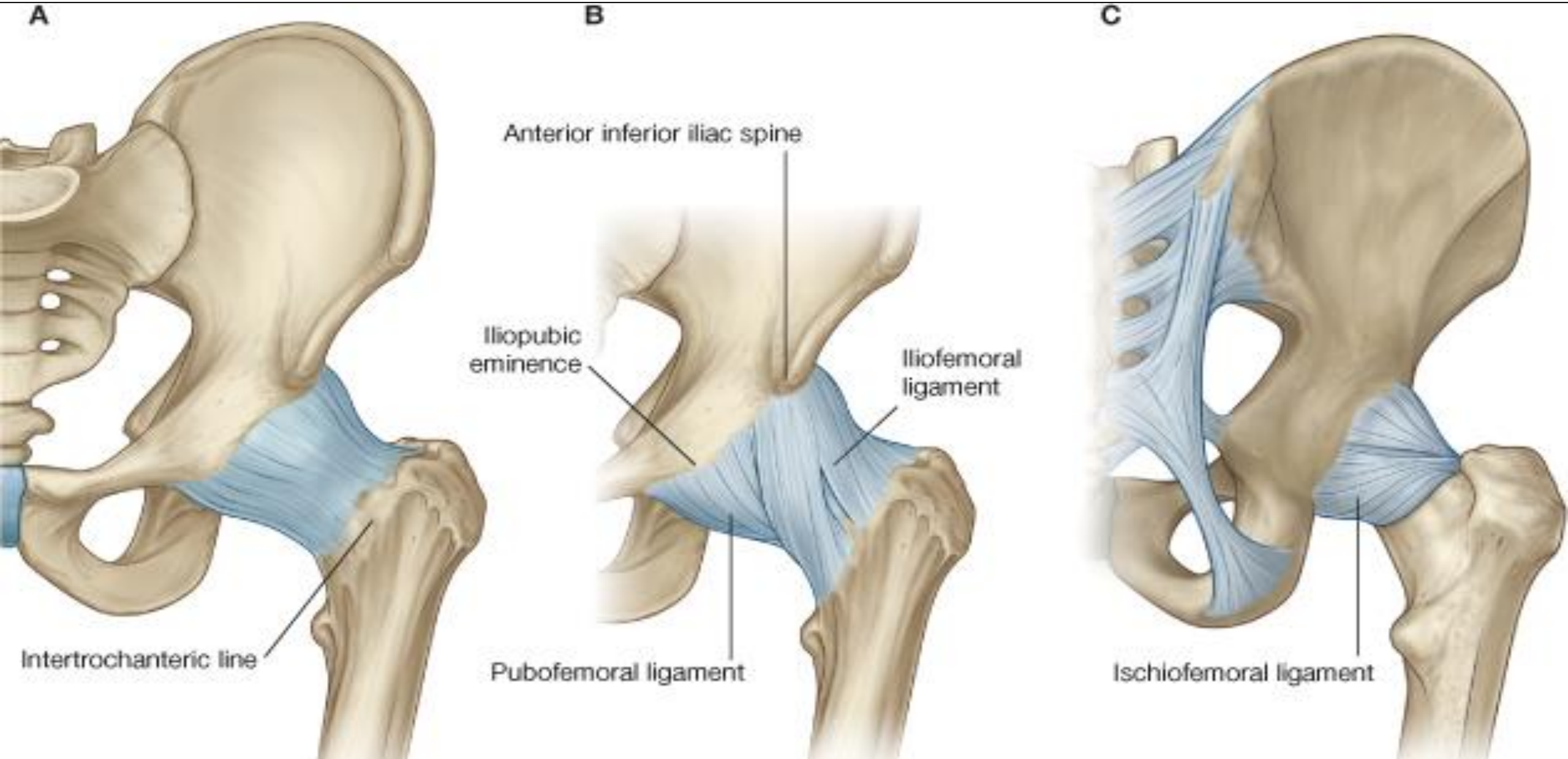
2-Pubofemoral Ligament : is attached above to the **iliopubic eminence** and **intertrochanteric line.**

3-Ischiofemoral Ligament: is attached to **ischium** to **intertrochanteric crest**.

4- Ligament of the head of the femur : is attached to a fovea on the head of the femur and sides of the acetabular notch. It transmits blood supply for the head

5- Labrum acetabular : A fibrocartilaginous rip to deepens the concavity of acetabulum


A
Acetabular labrum
Acetabular fossa
Lunate surface
Acetabular foramen
Transverse acetabular ligament
Obturator foramen
B
Cut synovial membrane
Synovial sleeve around ligament
Obturator artery
Pubic tubercle
Pubis
Acetabular branch of obturator artery
Artery of ligament of head
Ligament of the femoral head
Obturator membrane
Ischial tuberosity


A
B
C
Anterior inferior iliac spine
Iliopubic eminence
Iliofemoral ligament
Intertrochanteric line
Pubofemoral ligament
Ischiofemoral ligament

Movements of the Hip Joint :

1. Flexion:

- Mainly by ilio- psoas.
- Assisted by rectus femoris, sartorius .

2. Extension :

- Mainly by gluteus maximus.

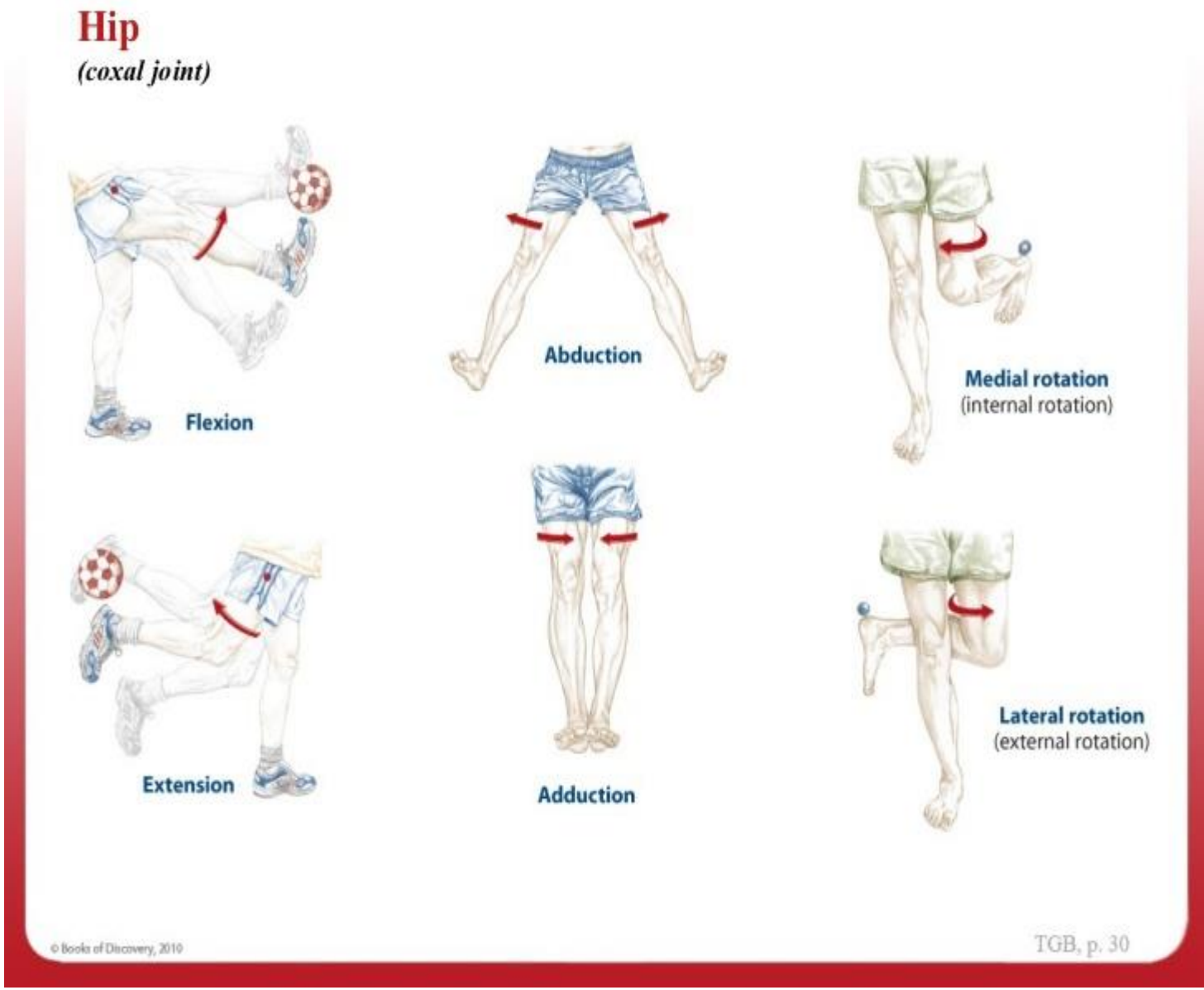
Assisted by hamstrings.

3. Adduction :

- Adductors (longus, brevis, Magnus)
- Assisted by gracilis.

4.Abduction :

- Gluteus medius and minimus.



Knee Joint

Type : Modified hinge synovial joint.

Articular Surfaces : Condyles of the femur , condyles of tibia and the Patella.

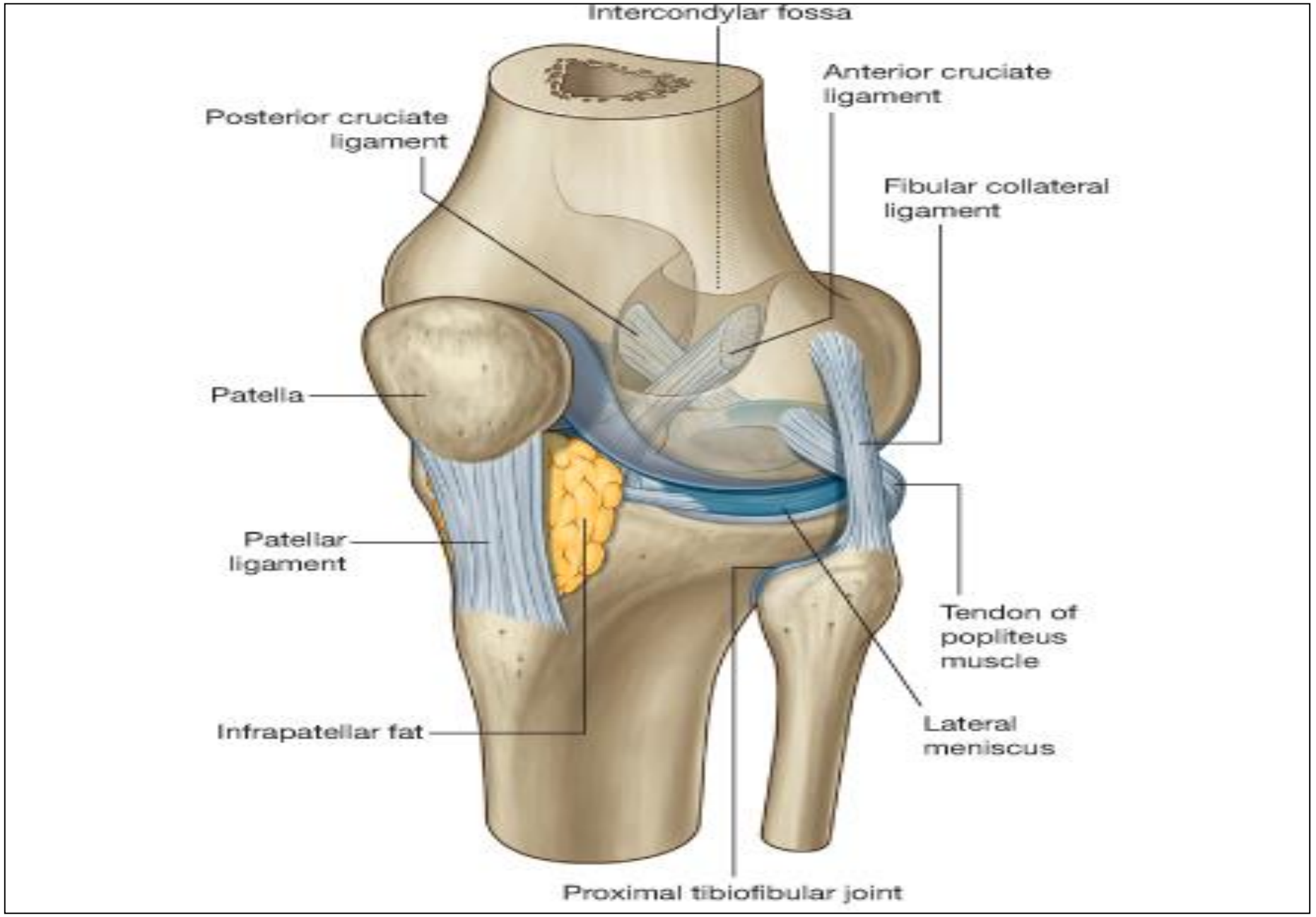
Ligaments of the knee

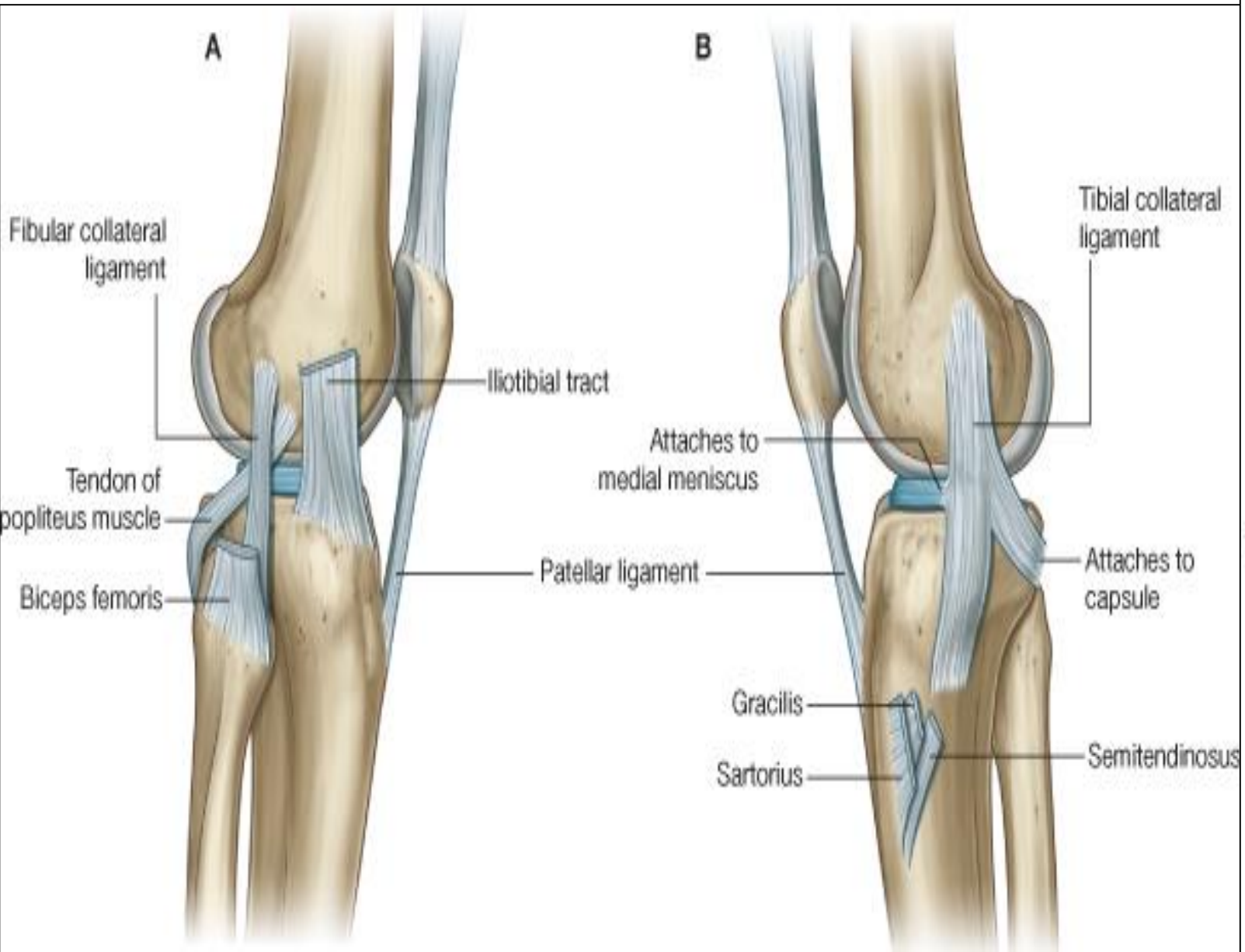
Extracapsular

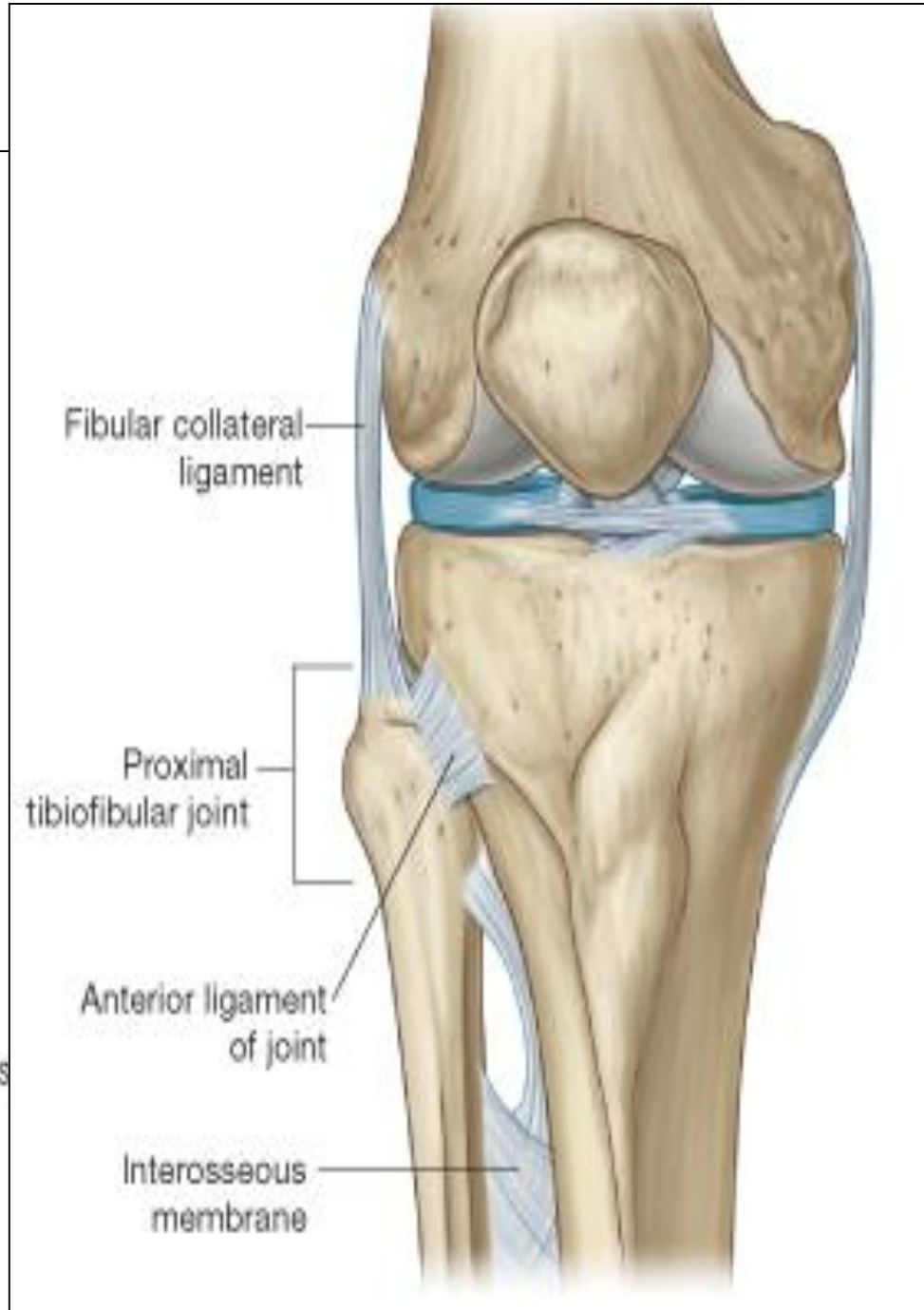
1. Tibial collateral ligament
2. Fibular collateral ligament
3. Ligamentum patellae

Intracapsular

Medial and lateral menisci
Anterior and posterior cruciate ligaments


Intercondylar fossa
Anterior cruciate ligament
Posterior cruciate ligament
Fibular collateral ligament
Patella
Patellar ligament
Tendon of popliteus muscle
Infrapatellar fat
Lateral meniscus
Proximal tibiofibular joint


A
Fibular collateral ligament
Iliotibial tract
Tendon of popliteus muscle
Patellar ligament
Biceps femoris
B
Tibial collateral ligament
Attaches to medial meniscus
Attaches to capsule
Gracilis
Semitendinosus
Sartorius


Fibular collateral ligament
Proximal tibiofibular joint
Anterior ligament of joint
Interosseous membrane

1. Ligamentum patellae :

- It extends from the apex of the patella to tibial tuberosity.

2. Tibial (medial) collateral ligament:

- It Lies on the medial side of the joint.
- Attachments: above to the medial femoral epicondyle and Below to medial condyle of the tibia.

It is firmly attached to joint capsule.

3. Fibular (lateral) collateral ligament:

- It Lies on the lateral side of the joint
- Attachments: above to the lateral femoral epicondyle and to the head of fibula
- It is separated from the joint capsule by the tendon of popliteus.

The 2 collateral ligaments are responsible for the side to side stability of the extended knee.

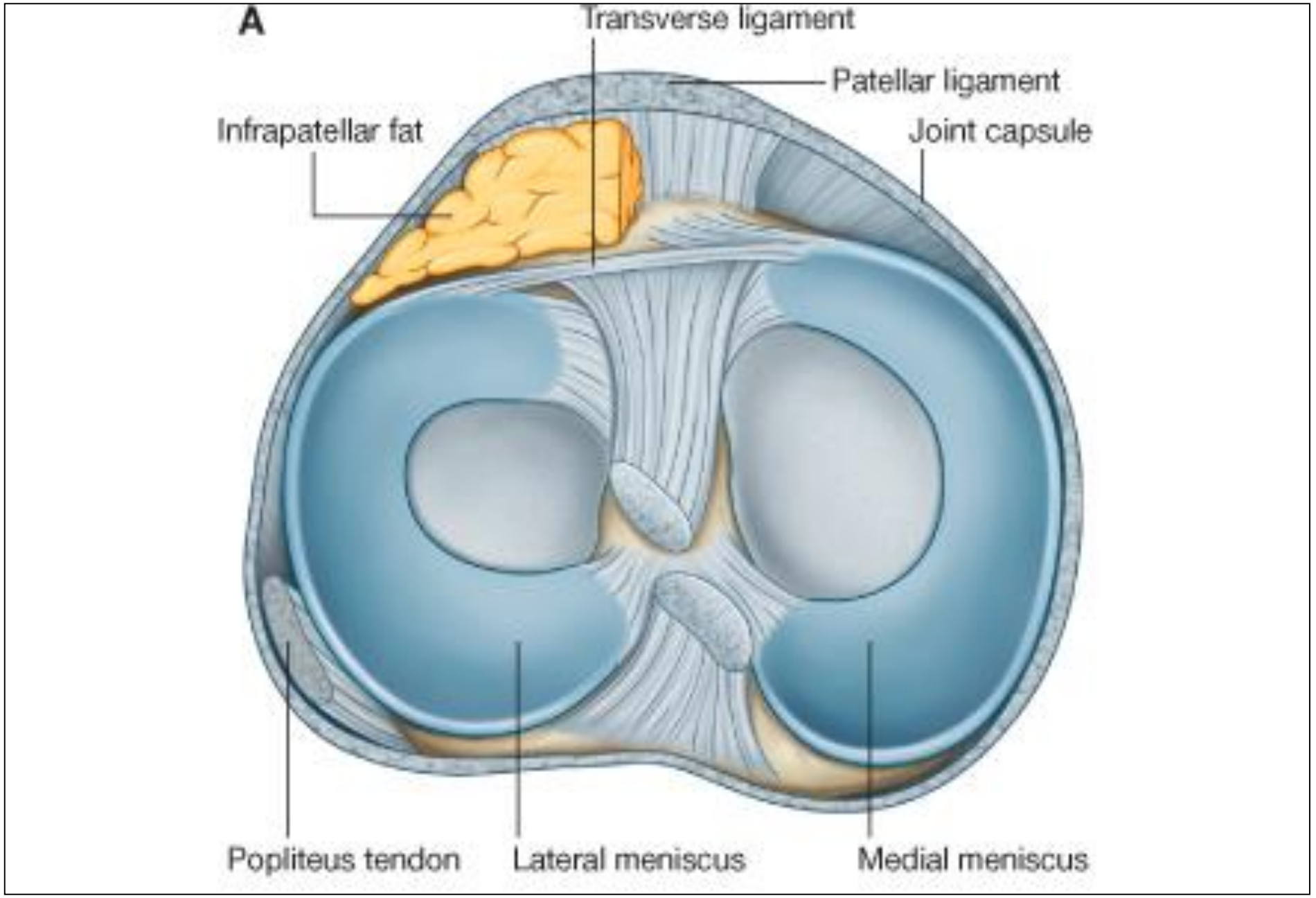
The two menisci (medial and lateral)

Function :

- They facilitate rotation of the femur on the tibia
- They are shock absorption.

Difference between the two meniscus

Lateral meniscus	Medial menisus
O shaped	C shaped
It is separated from the fibular collateral ligament by the tendon of popliteus.	It is attached to tibial collateral ligament.
It is free to move on the tibia, so that it is less susceptible to injury.	It is relatively fixed, so that is **more susceptible to injury.**

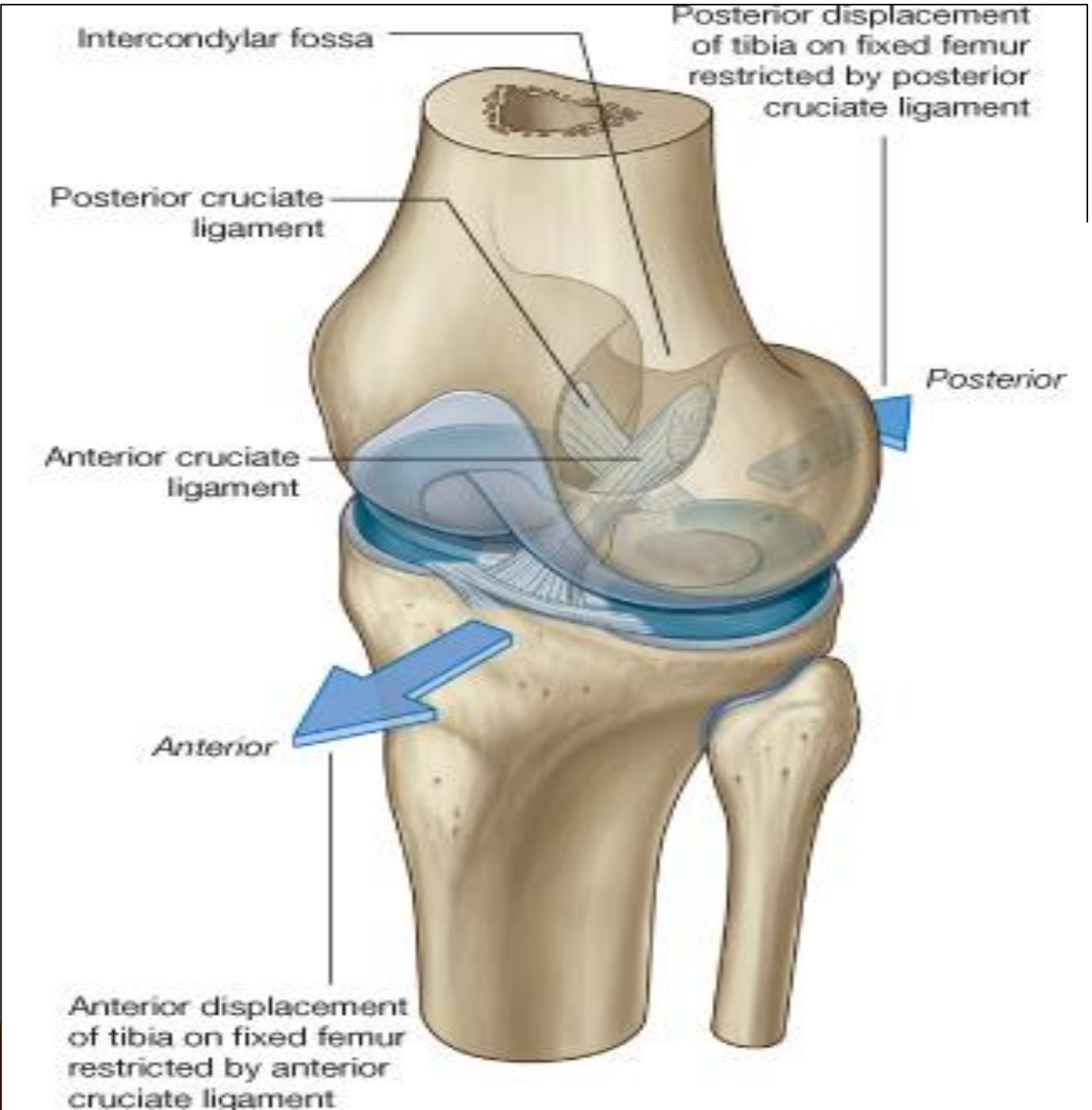

A
Transverse ligament
Patellar ligament
Infrapatellar fat
Joint capsule
Popliteus tendon
Lateral meniscus
Medial meniscus

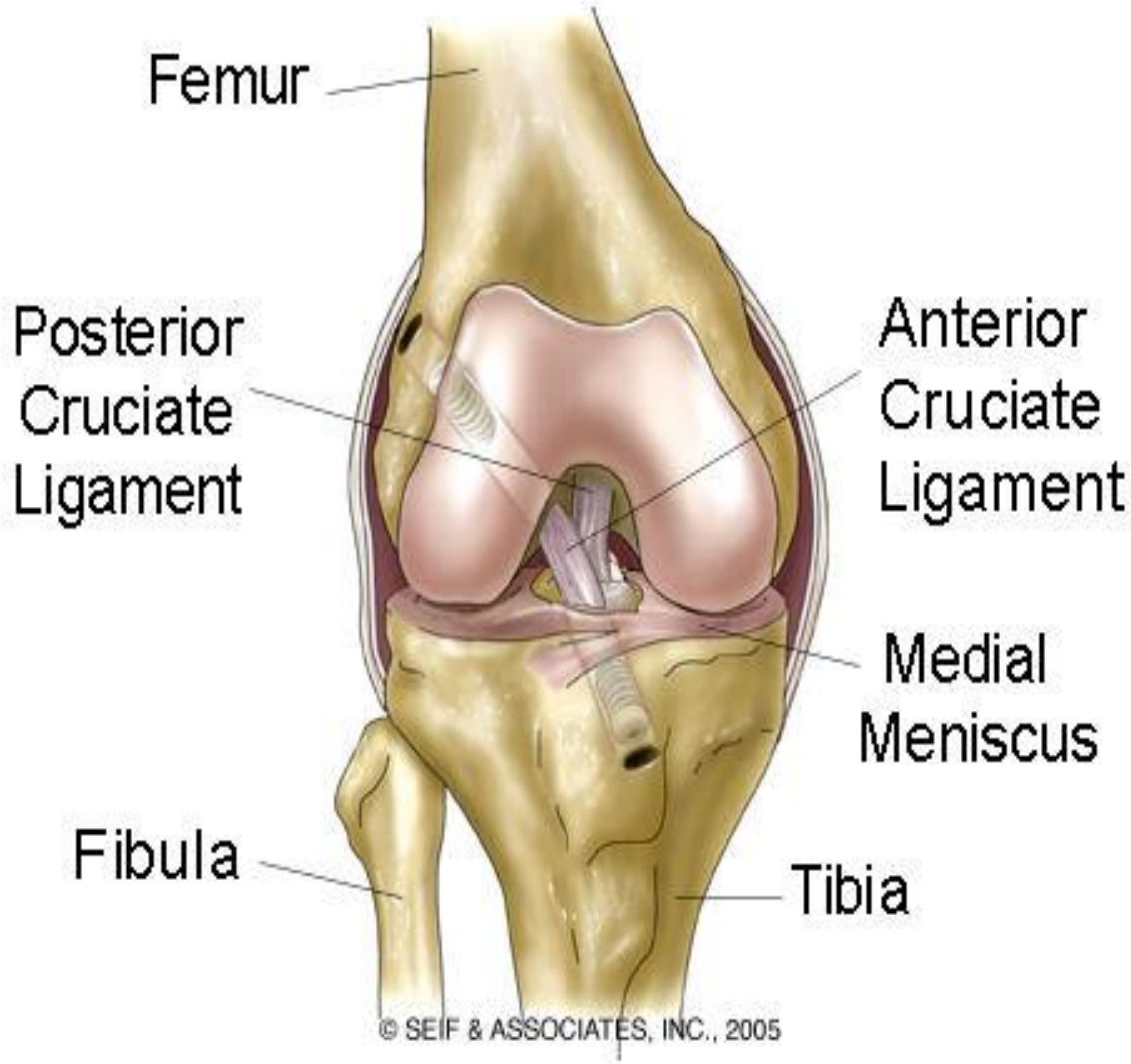
The two cruciate ligaments (anterior and posterior)

Function : provide antero-posterior stability of the knee joint.

Difference between anterior and posterior cruciate ligaments

	Anterior cruciate ligament	Posterior cruciate ligament
Attachments	**Anterior** part of intercondylar area to the **lateral** femoral condyle.	**Posterior** part of intercondylar area to the medial femoral condyle.
Functions	• Prevents ***Anterior*** displacement of the **tibia.** • It becomes tense near full ***extension***.	•Prevents ***Posterior*** displacement of the **tibia.** • It becomes tense ***in full flexion***
	It prevent **Posterior** displacement of the **femur**	It prevent **Anterior** displacement of the **femur** It is the main stabilizer of the femur during walking down stairs


Intercondylar fossa
Posterior displacement of tibia on fixed femur restricted by posterior cruciate ligament
Posterior cruciate ligament
Posterior
Anterior cruciate ligament
Anterior
Anterior displacement of tibia on fixed femur restricted by anterior cruciate ligament


Femur
Posterior Cruciate Ligament
Anterior Cruciate Ligament
Medial Meniscus
Fibula
Tibia
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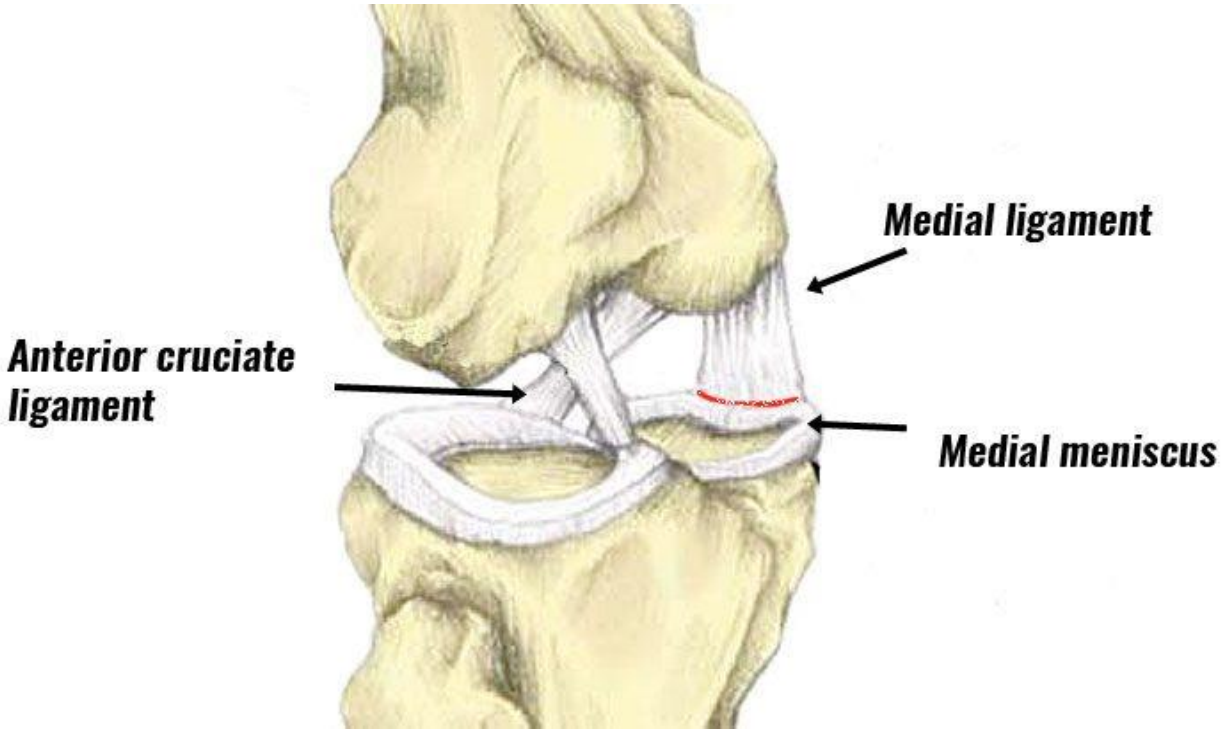
Unhappy Triad

Injury of :

1. Medial menisus
2. Tibial (medial) collateral ligament
3. Anterior cruciate ligament



Movements of the joint

Flexion	Extension
Mainly by the hamstring Assisted by gracilis and sartorius	Quadriceps femoris. Assisted by muscle attached to Iliotibial tract
Medial rotation	**Lateral rotation**
Semimembranosus and semitendinosus. Assisted by gracilis	Biceps femoris

Tibiofibular Articulations (read only)

1) Superior tibiofibular joint :

Type: plane synovial joint

Articular surfaces : Fead of fibula and the fibular facet at inferolateral aspect of the lateral tibial condyle.

2) Inferior tibiofibular joint:

Type: Fibrous (syndesmosts)

Articular surfaces : Fibular notch of the tibia and the lower end of the fibular shaft.

Movement of the tibiofibular joints :

They allow movement of fibula during movement of the ankle.

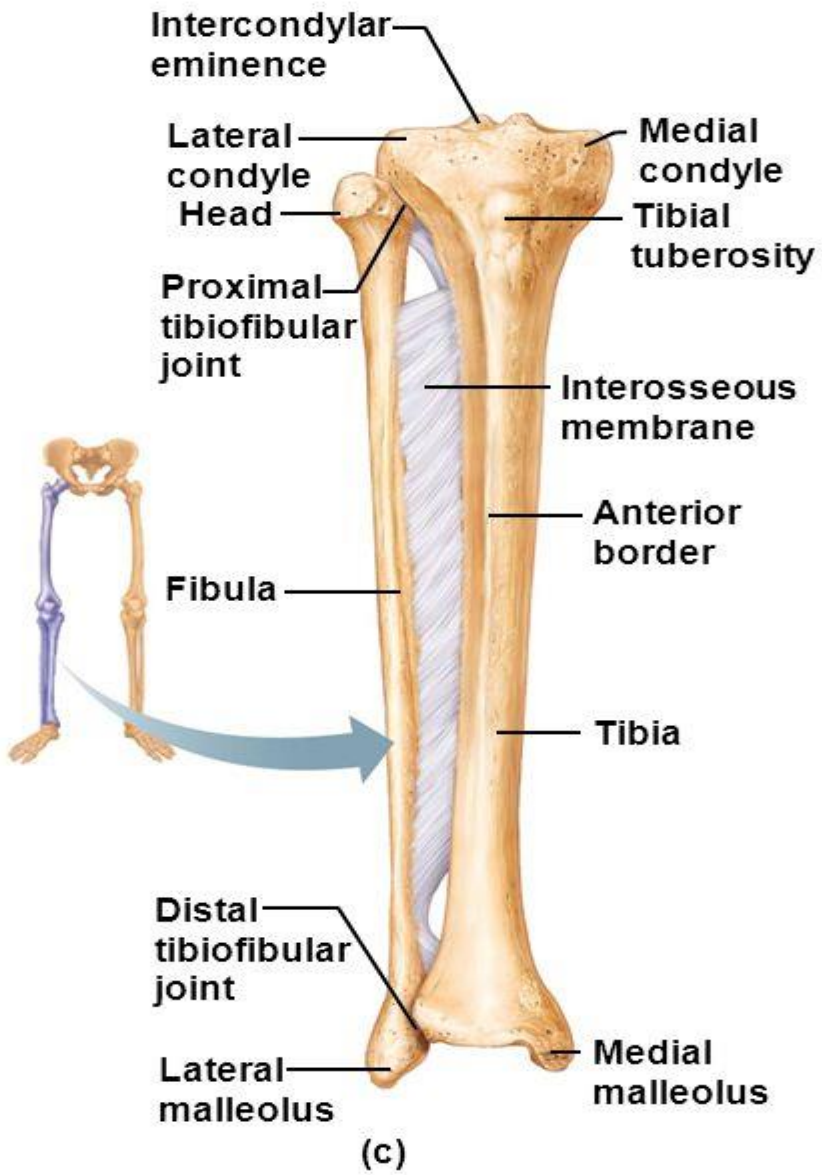
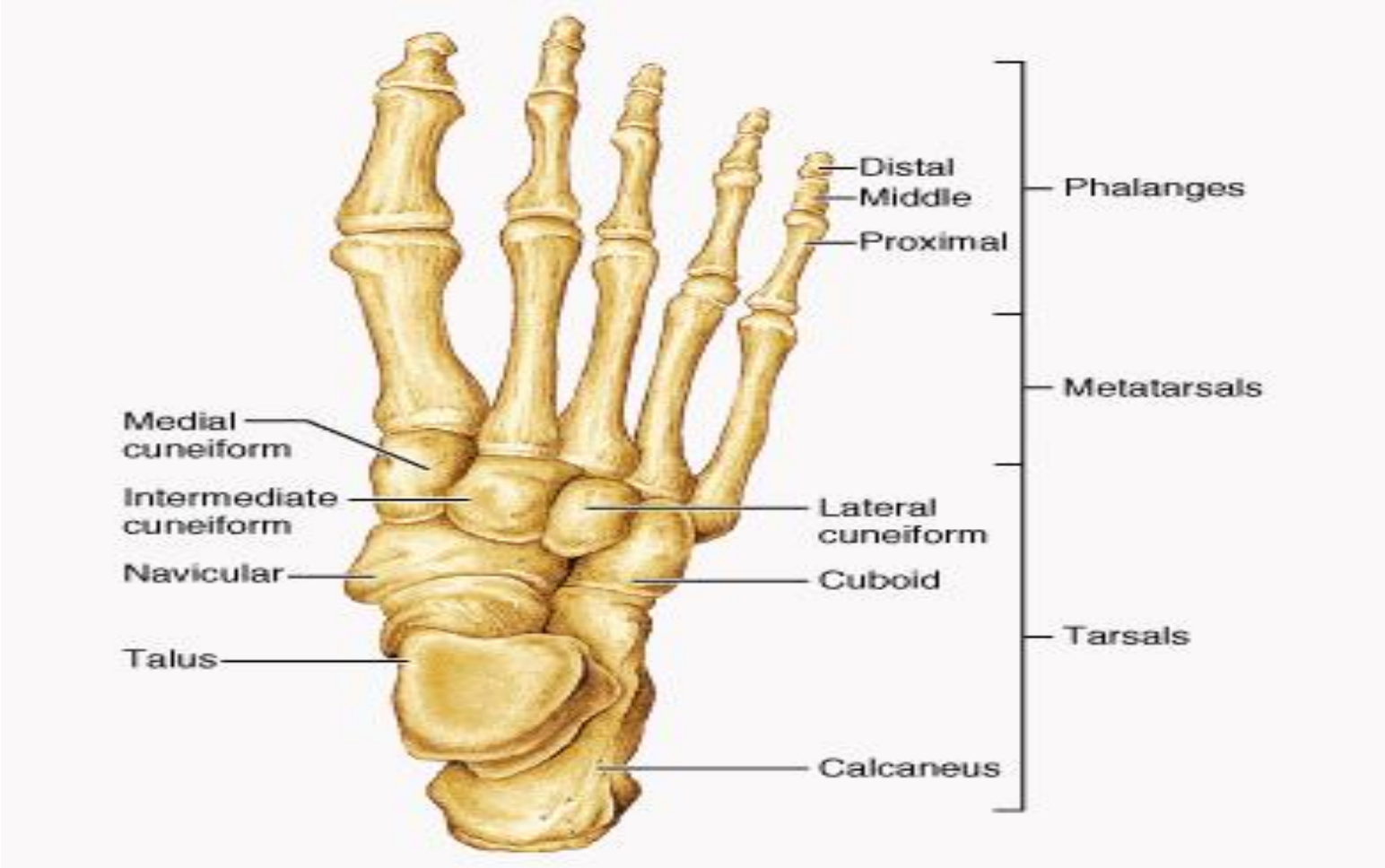

Intercondylar eminence
Lateral condyle
Head
Proximal tibiofibular joint
Medial condyle
Tibial tuberosity
Interosseous membrane
Anterior border
Fibula
Tibia
Distal tibiofibular joint
Lateral malleolus
Medial malleolus
(c)

Figure 5.27c

Bones of the Foot



Ankle Joint

Type: Hinge synovial joint.

Articular surfaces :

- Above: lower end of tibia and the medial malleolus, lateral malleolus of fibula .
- Below: the trochlear surface of the body of the talus.

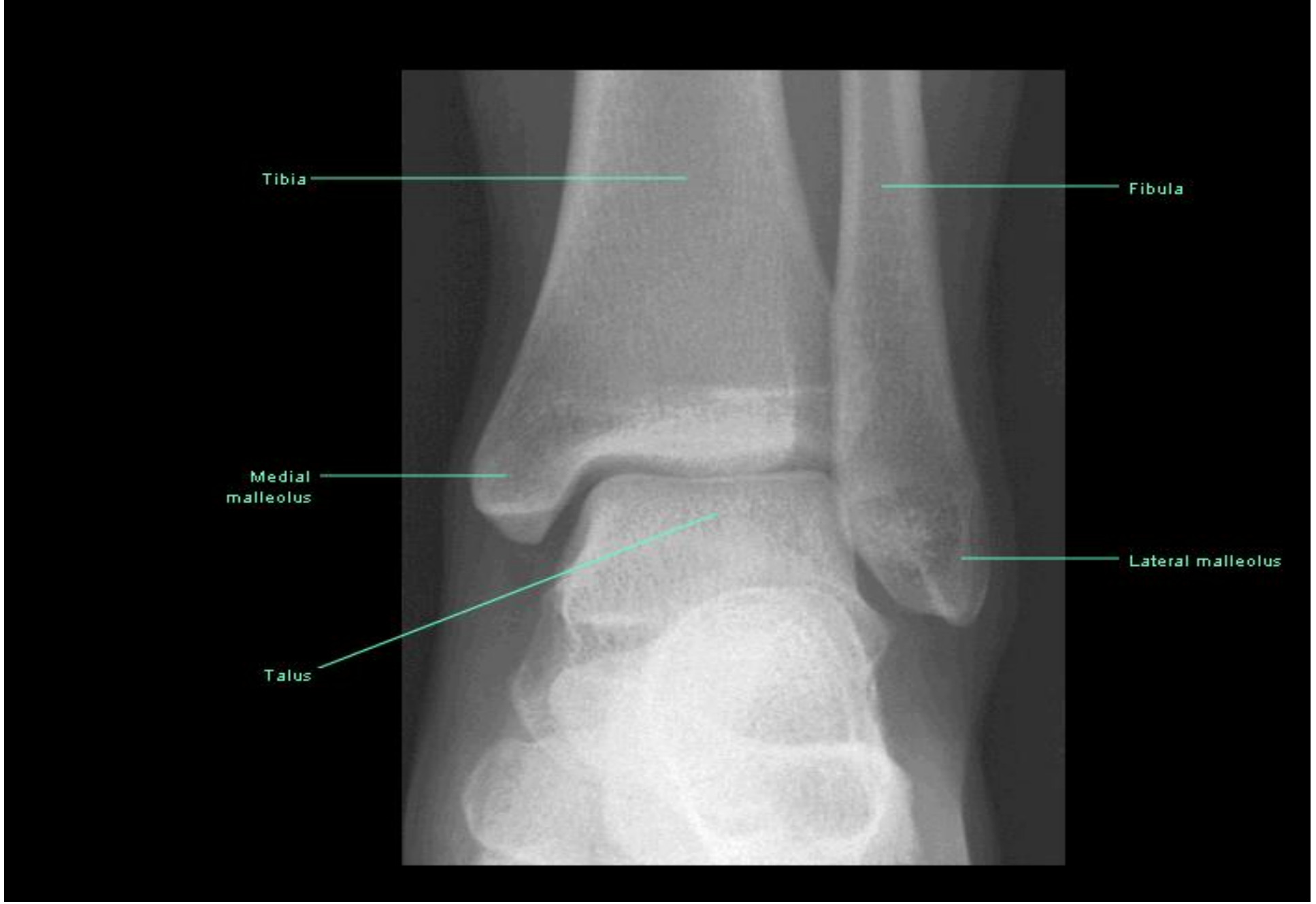
Supporting ligaments:

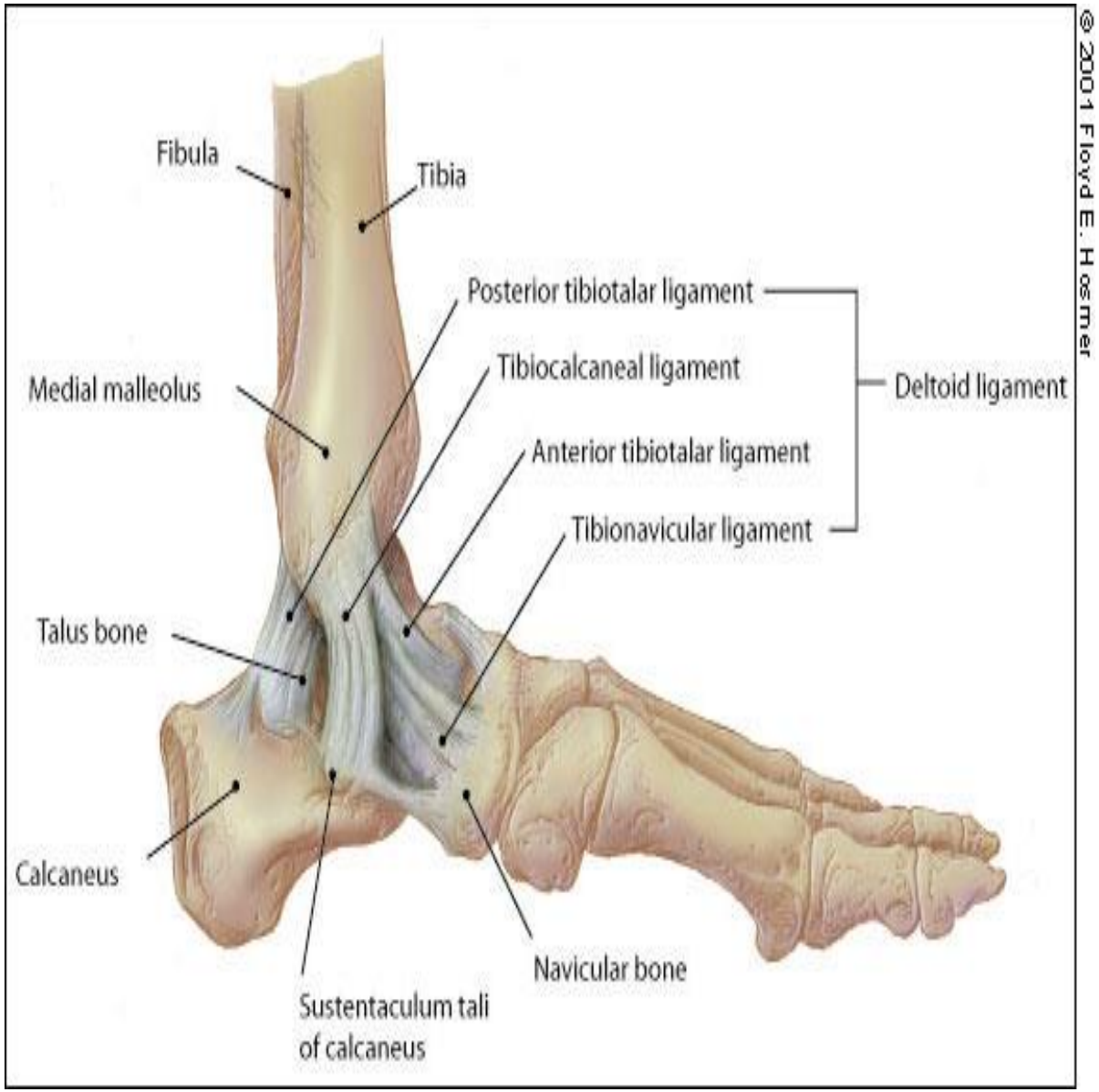
(1) Medial (deltoid) ligament

Attachment : Medial malleolus to navicular bone, talus and plantar calcaneo-navicular (spring) ligament.

(2) Lateral ligament: has 3 bands :

- Anterior talofibular ligament
- Posterior talofibular ligament
- Calcaneofibular ligament:


Tibia
Fibula
Medial malleolus
Lateral malleolus
Talus


Fibula
Tibia
Posterior tibiotalar ligament
Tibiocalcaneal ligament
Medial malleolus
Deltoid ligament
Anterior tibiotalar ligament
Tibionavicular ligament
Talus bone
Calcaneus
Navicular bone
Sustentaculum tali
of calcaneus
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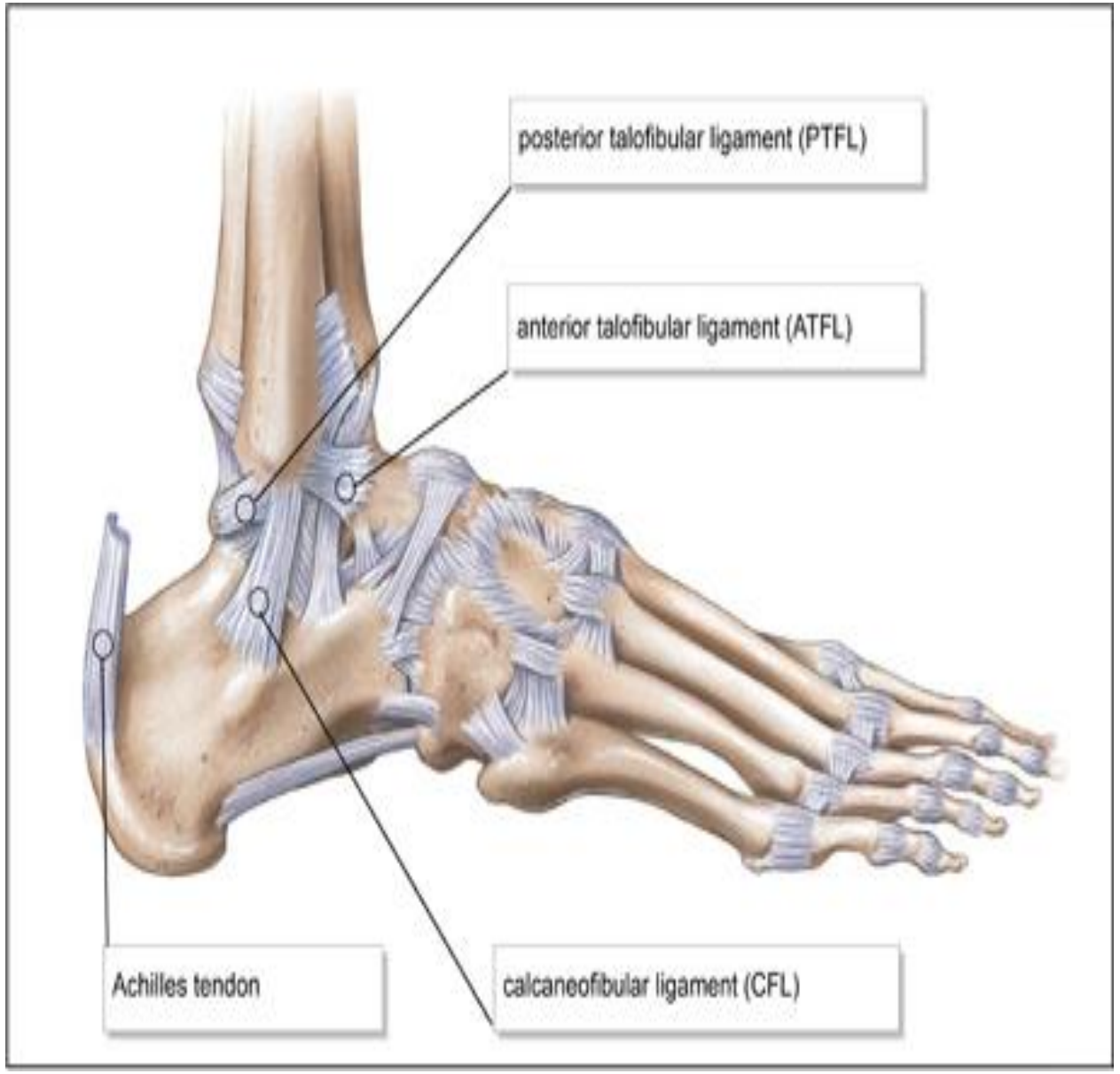
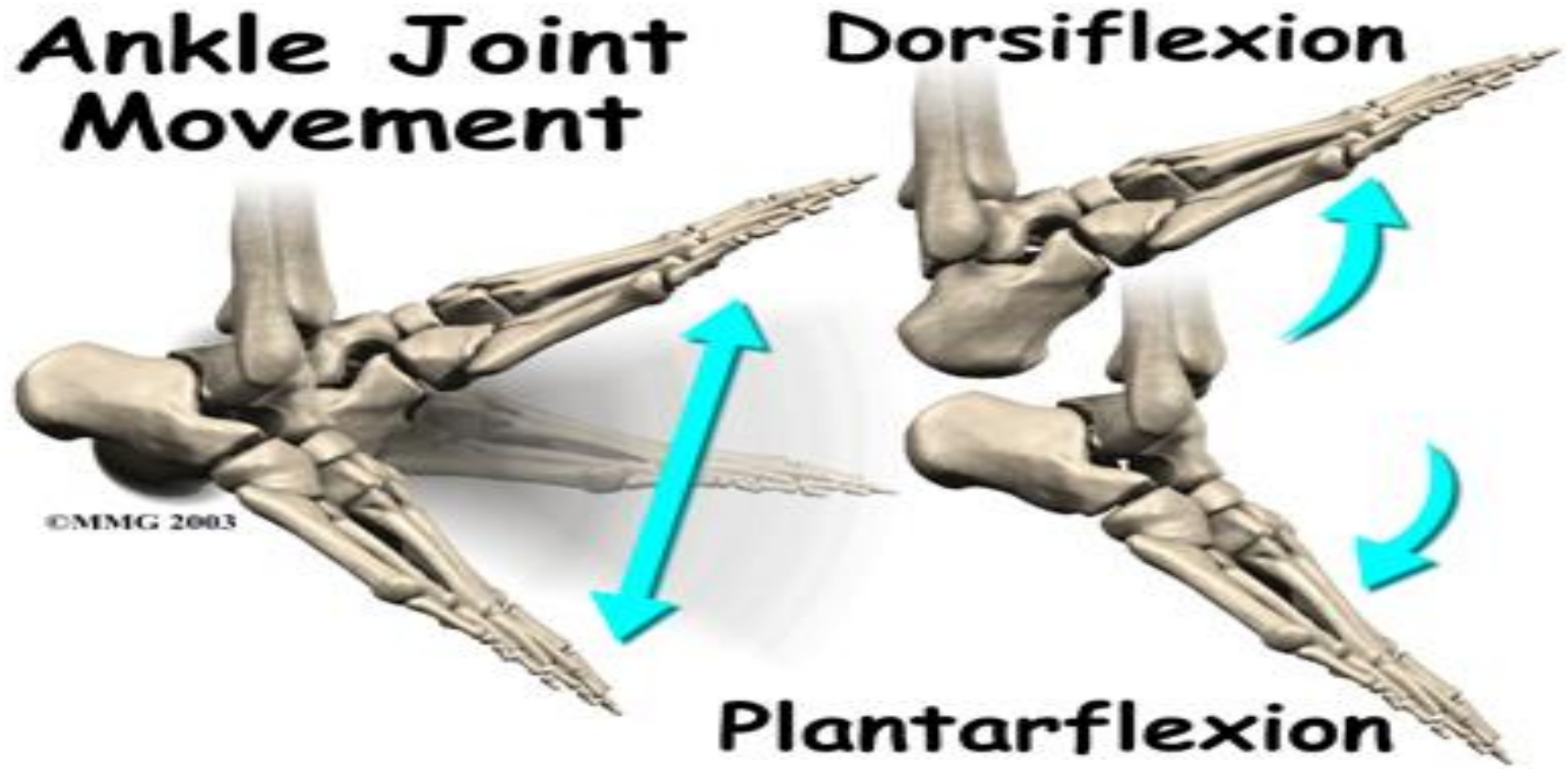

posterior talofibular ligament (PTFL)
anterior talofibular ligament (ATFL)
Achilles tendon
calcaneofibular ligament (CFL)

Movements

Dorsiflexion: Anterior muscles of the leg

Plantar flexion : Lateral and posterior group of leg muscles



Joints of the Foot

Subtalar (between the talus and the calcaneum) **and Mid tarsal joints** (talocalcaneonavicular and the calcaneocuboid)

Type : Plane Synovial

Movements :

Inversion and eversion

Inversion is much more free than eversion why ?

(L. malleolus is lower than the M. malleolus).

Thank you