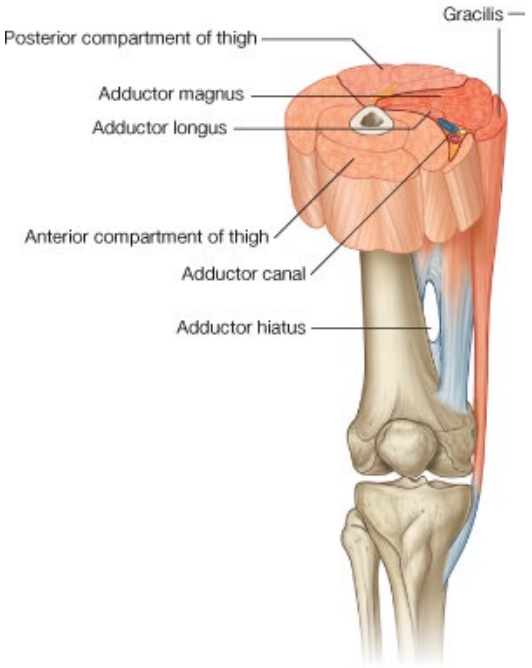
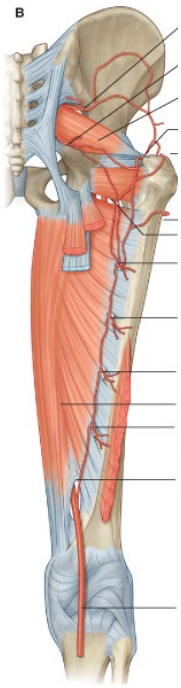
BACK OF THE THIGH, POPLITEAL FOSSA & KNEE JOINT:

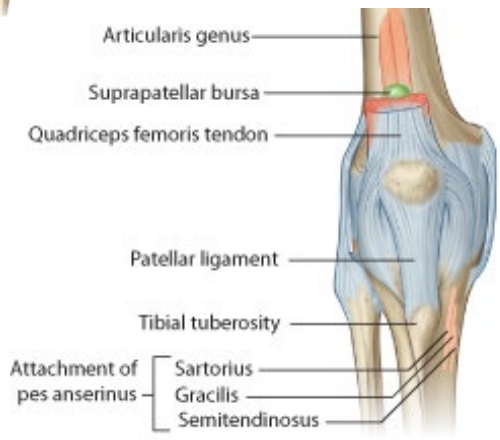
- Back of thigh:
    - Distal to the gluteal area & hip joint

- Back of the thigh consists of the **flexor muscles of the knee**
- All the flexor muscles of the knee:
    - Arise from the **ischial tuberosity**
    - Insert into **medial, posterior & lateral aspects of the knee**
    - Are innervated by the ***sciatic nerve***





- 3 main muscles of the back of the thigh:
    - **Semitendinosus**
    - **Semimembranosus**
    - **Biceps femoris**
- Arise from **ischial tuberosity** (except short head of biceps)
- Pass down back of thigh as flesh mass in "gutter" formed from:
    - Posterior surface of adductor magnus
    - Lateral intermuscular septum.

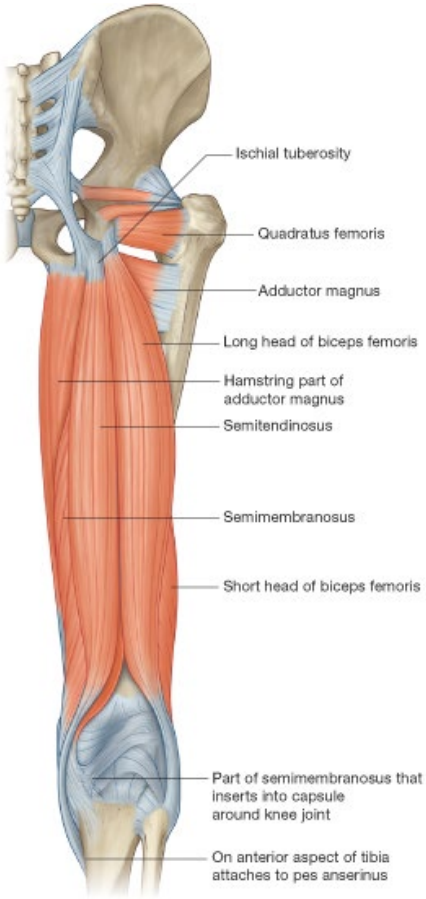


Semitendinosus:

- Origin: **ischial tuberosity**
- Insertion: **medial side of knee**
    - This insertion is *behind* the insertions of **gracilis** and **sartorius** on the **medial tibia** (below the knee)

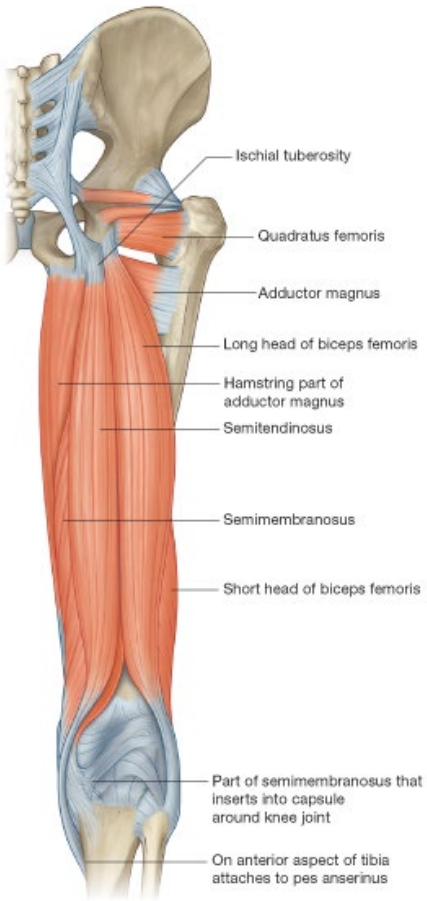
- Innervated by: ***tibial part*** of **sciatic nerve**

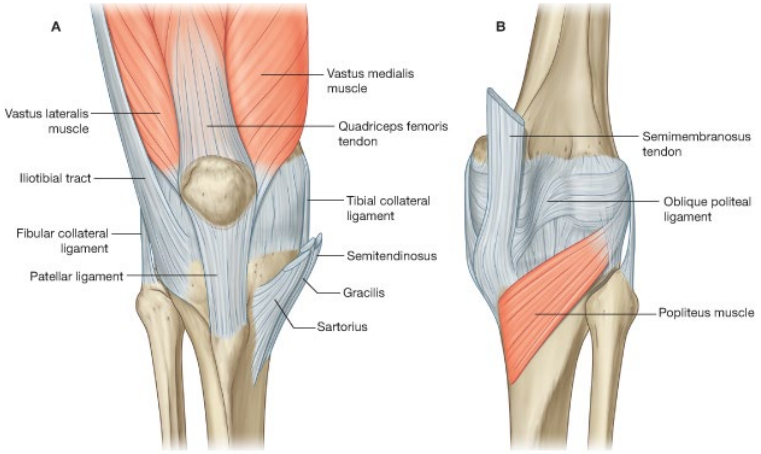
- Action:
    - **Flexion** of knee joint
    - **Weak extension** of hip



Semimembranosus:

- Origin: **ischial tuberosity**
- Passes down back of thigh with semitendinosus (deep to semitendinosus)
- **Insertion**: tendon fans out into **aponeurotic expansions** at back of knee joint:
    1. **Tendon**: inserts into back of medial condyle of tibia
    - **Aponeurotic expansions**:
    2. Blends with the **capsule of the knee joint - *posterior oblique ligament***
    3. Attaches to the **soleal line** on back of tibia.
- The thickening of the back of the knee joint capsule formed by the insertion of the aponeurotic expansion of semimembranosus, is called the ***posterior oblique ligament***
- The expansion which inserts into the soleal line of the tibia covers over a small muscle – **popliteus**
- Innervated by: ***tibial part*** of **sciatic nerve**
- Action:
    - **Flexion** of knee joint
    - **Weak extension** of hip





- NOTE: the ***semimembranosus lies deep to the semitendinosus***

Biceps femoris:

- Origin:
  - *Long head*: ischial tuberosity
  - *Short head*: lower part of linea aspera of femur
- Insertion: Lateral aspect of knee – **head of the fibula + lateral tibia**

- Innervation:
  - Long head: ***tibial part*** of **sciatic nerve**
  - Short head: ***common peroneal part*** of **sciatic nerve**

- Lower ends of:
  - Semitendinosus, semimembranosus
  - Biceps femoris

  make an **inverted 'V' shape.**

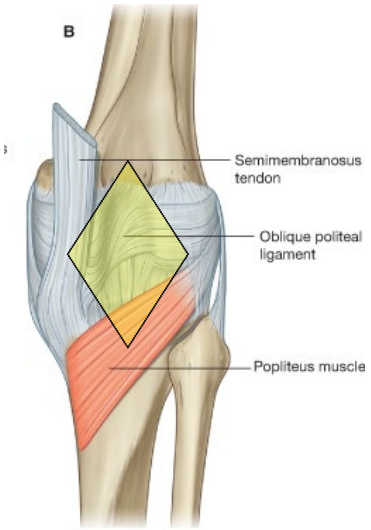
POPLITEAL FOSSA:

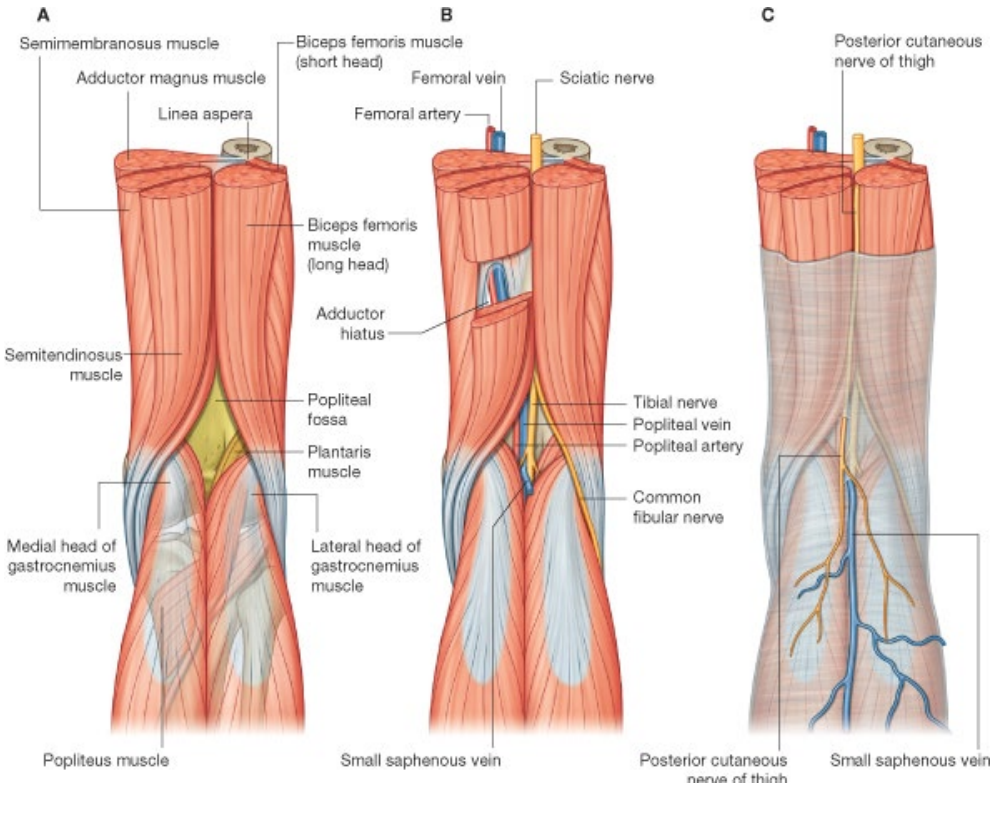
- The insertions of the 3 muscles on the back of the thigh make an inverted 'V' shape.

- The muscles of the lower leg – the **gastrocnemius** – arises as 2 heads from the back of the femoral condyles, thus making a 'V' shape.

- Seperating the muscles of the back of the thigh exposes a ◊ - the **popliteal fossa**.

- The popliteal fossa is a hollow on the posterior aspect of the knee.
- It is in this region that the knee joint capsule is thickened by **posterior oblique ligament** (aponeurotic expansion of semimembranosus).
- The aponeurotic expansion of the semimembranosus which covers the popliteus muscle, can also be seen in the popliteal fossa.
- The fossa contains considerable **fat**.





Sciatic nerve in the popliteal fossa region:

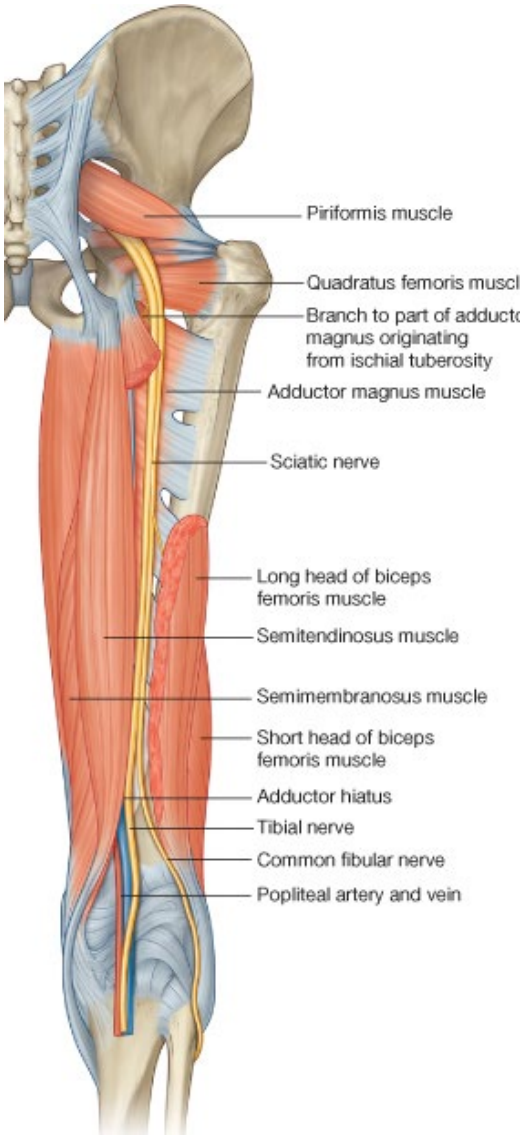
- Emerges from greater sciatic foramen
- → passes beneath piriformis, <u>over small lateral rotators</u> of the hip joint, <u>beneath the gluteus maximus</u>.

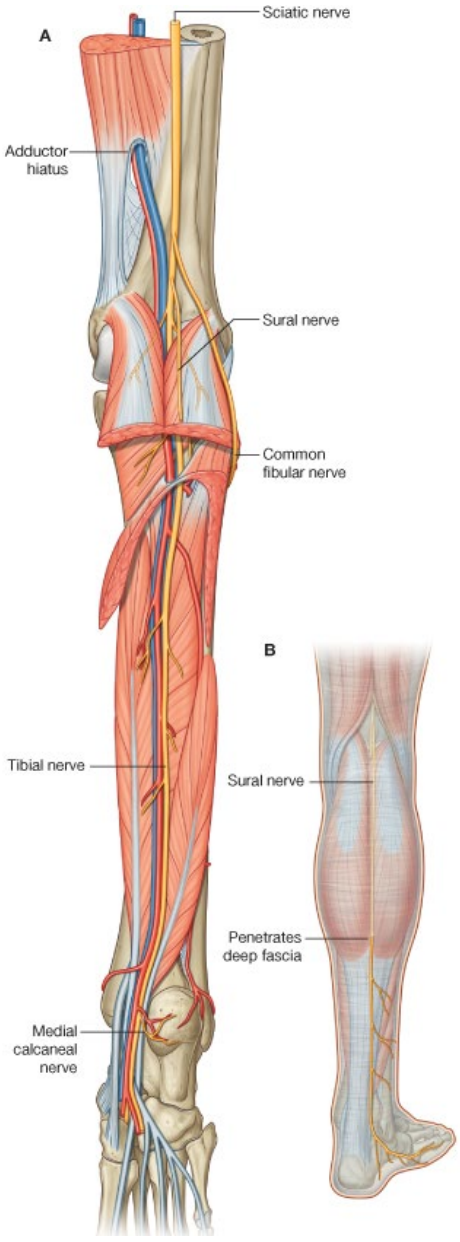
- Continues down posterior compartment of the thigh, **<u>beneath the biceps femoris</u>**
- At some point during this course it <u>divides</u> into <u>tibial & common peroneal nerves</u>.

<u>Tibial nerve</u>:

- Enters popliteal fossa at upper angle
- Tibial nerve is the *most superficial structure* in the popliteal fossa
- Then passes out of lower angle of fossa.

- In its course through back of thigh and popliteal fossa, the **tibial nerve** supplies:
    - Semitendinosus
    - Semimembranosus
    - <u>Long head</u> of biceps femoris
- Also gives off:
    - Articular twigs to the knee joint
    - **<u>Sural branch</u>**: a small cutaneous branch of the <u>tibial nerve</u>, which descends in subcutaneous fat down midline on back of leg.





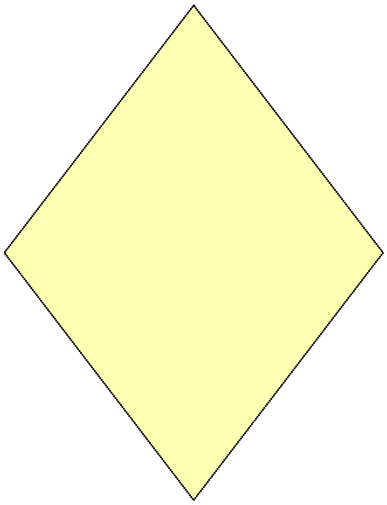
Note: in Grays diagrams, 'common peroneal nerve' is termed 'common fibular nerve'.

Common peroneal nerve *(aka common fibular nerve):*

- Enters popliteal fossa with the tibial nerve at the upper angle
- Quickly leaves the fossa by curling over lateral edge of fossa → reaches neck of fibula (can be palpated here)

- Common peroneal nerve supplies:
  - Short head of biceps femoris
  - Articular & cutaneous twigs.

- Common peroneal nerve divides into:
  - **Superficial peroneal nerve** (supplies peroneus mucles)
  - **Deep peroneal nerve** (supplies muscles of anterior lower leg)



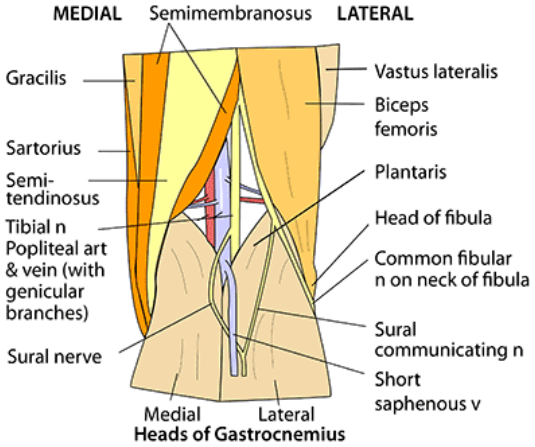
D&P p.120

Superficial ---------- → ***Deep***

Tibial nerve ---------- > ***Vein*** ---------- > ***Artery***

RIGHT POPLITEAL FOSSA
SUPERFICIAL DISSECTION

- Diamond shaped
- Borders:
  - Upper medial - Semimembranosus (& semitendinosus)
  - Upper lateral - Biceps femoris
  - Lower medial - Gastronemius (medial head)
  - Lower lateral - Plantaris & gastrocnemius (lateral head)
  - Floor - Popliteus, capsule, femur
  - Roof - Short saphenous & communicating veins
    - Lateral sural cutaneous nerve
    - Sural communicating nerve
    - End of posterior femoral cutaneous nerve
    - Fascia lata



Note that the popliteal artery is the deepest structure in the fossa and hence the popliteal artery is often difficult to palpate

Anterior to artery are back of femur, capsule of knee joint and popliteus

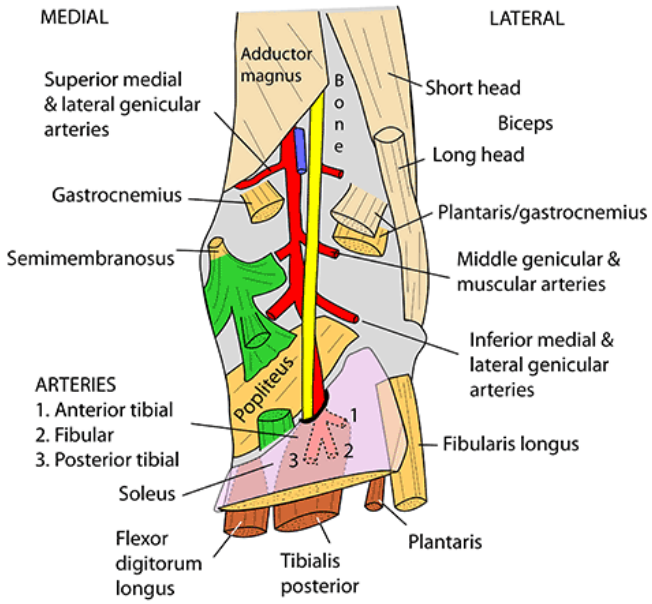
RIGHT POPLITEAL FOSSA
DEEP DISSECTION

CONTENTS

- Popliteal artery & vein
- Tibial nerve
- Common fibular nerve
- Fat
- Lymph nodes

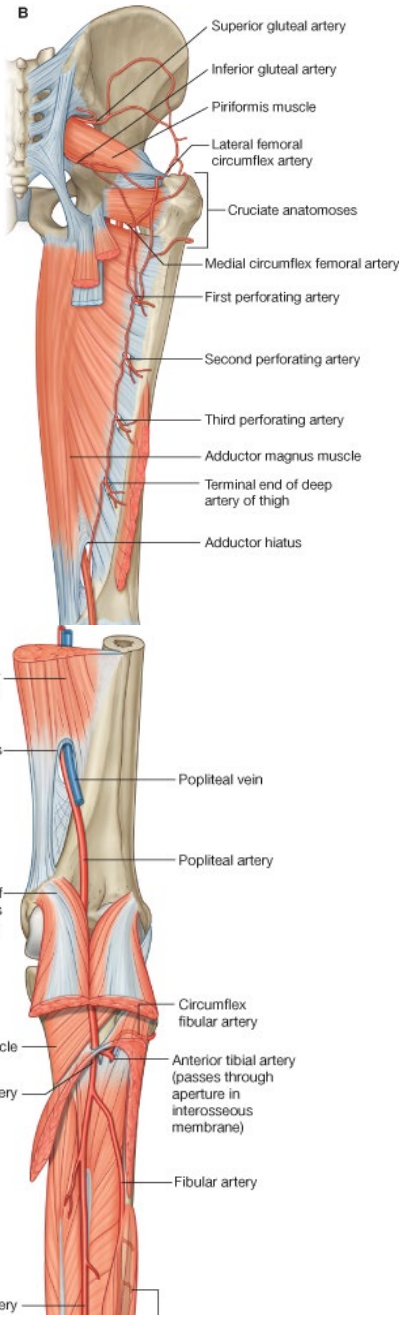
NOTE ON POPLITEAL ARTERY

- 8" long
- Starts medial to tibial nerve
- Ends lateral to tibial nerve
- Vein always between two



BLOOD SUPPLY OF THE BACK OF THE THIGH:

- Upper thigh: comes from the **perforating branches of the profunda femoris**



- The femoral artery then passes through adductor hiatus in the adductor magnus to form the **popliteal artery**.

- The popliteal artery is the *deepest* structure in the popliteal fossa (the tibial nerve is the most superficial).
- The popliteal artery sits on the posterior aspect of the knee capsule, and the aponeurotic expansions of the semimembranosus.

- Whilst in the fossa, the popliteal artery gives several ***genicular branches*** to the knee joint.

- At the lower angle of the fossa the popliteal artery terminates by dividing into:
    - **Anterior tibial artery** (supplies anterior compartment of lower leg)
    - **Posterior tibial artery** (supplies posterior compartment of lower leg)

- The popliteal artery is accompanied by the **popliteal vein**.

- The popliteal vein is formed distally by the **venae commitantes** of the tibial arteries.

- In the popliteal fossa, the popliteal vein lies intermediate between the deep popliteal artery and the superficial tibial nerve.

- The popliteal vein recieves the **short saphenous vein**
- The short saphenous vein drains blood from:
    - Lateral aspect of ankle
- (*Great saphenous vein drains the medial aspect*)
- It follows the course of the **sural nerve** up through the subcutaneous fat on the midline on the back of the leg.
- On reaching the popliteal fossa, it dips deeply → through the deep fascia → enters the popliteal vein.

- The popliteal vein leaves the popliteal fossa by passing through the hiatus in the adductor magnus along with the popliteal artery.
- The popliteal vein lies *lateral* to the artery as it passes through the hiatus (will become medial by the time it reaches the inguinal ligament)
- On reaching the front of the thigh it is renamed the **femoral vein**

DEEP FASCIAL COVERINGS OF THE THIGH:

- Thigh is surrounded by dense sleeve of **deep fascia** – the **fascia lata**

Proximal region of the fascia lata:

- Attachment of fascia lata at root of lower limb:

  - Iliac crest → inguinal ligament → pubic arch → ischial tuberosity

- Posteriorly it is <u>continuous with the **deep fascia over the gluteal muscles**</u>, by which it is attached to the sacrum, coccyx & sacrotuberous ligaments.

- Just below inguinal ligament – **saphenous opening**.
- Plugged with areolar tissue – **cribiform fascia**.
- Outer edge of saphenous opening = **falciform margin**.
- Medial edge of saphenous opening blends with fascia of underlying tissue.

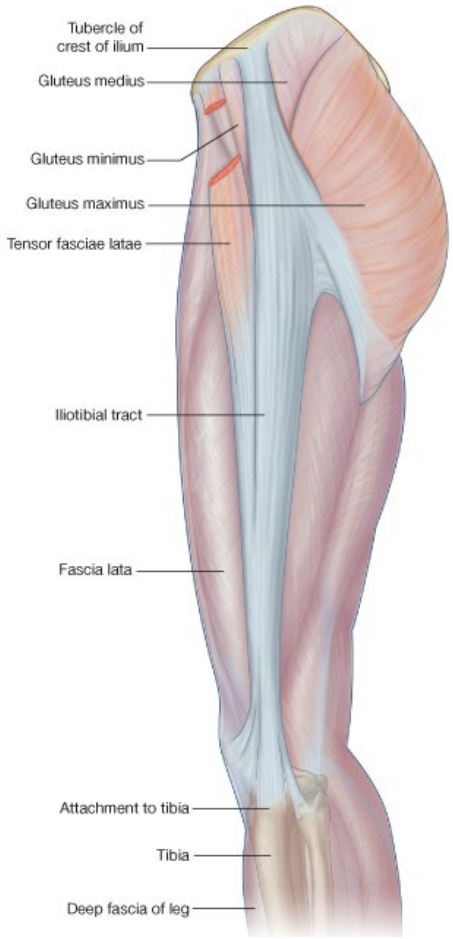
- The great saphenous vein pierces the saphenous opening to reach the deeper femoral vein.
- Some lymphatics also pierce the cribiform fascia.
- (see "the front and sides of the thigh" notes).

Distal region of the fascia lata:

- *Distally* the **fascia lata is attached** *anteriorly* to the:
  - Patella
  - Margins of the tibia
  - Head of fibula
- *Posteriorly (behind the knee joint)*:
  - It covers the popliteal fossa – it is known as the **popliteal fascia**

- The **small saphenous vein** pierces the popliteal fascia to gain access to the popliteal vein.

- **Iliotibial tract** is a strap-like <u>thickening of the fascia lata</u> on the lateral side of the thigh:
  - **Tubercle of iliac crest** → lateral aspect of the tibia
- 2 muscles insert into the iliotibial tract:
  - Tensor fasciae latae (ant)
  - Gluteus maximus (post)
- These 2 muscles and the tract work to ***steady the hip and knee joints***.



- The deep fascia of the thigh is covered by an outer sleeve of <u>**subcutaneous fat**</u>.

Fatty layers of the <u>proximal 2 inches of the thigh</u>:

- The proximal subcutaneous fat is arranged in the same way as that of the lower anterior abdominal wall, scrotum and perineal regions:
  - <u>Deepest layer of subcutaneous fat</u> is condensed to <u>**membranous layer**</u>.

- This membranous layer is only present in proximal few inches of the thigh, and distally it quickly fuses with the fascia lata.

- Because the membranous layer of this superficial fascia quickly fuses with the fascia lata, urine cannot track down the thigh if the urethra ruptures in the perineal region.

- Instead it tracks upwards between the deep fascia and membranous layer of the anterior abdominal wall.

Superficial Fascia – Membranous layer

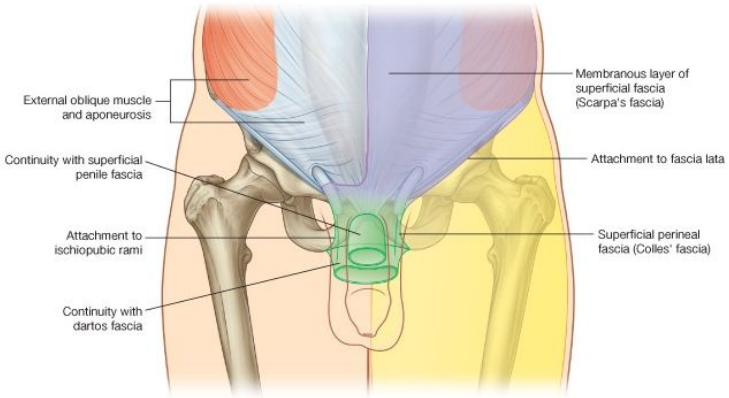
Scarpa's fascia is thin membranous layer & has the following relations

Laterally, continuous with superficial fascia of the back.

Superiorly, continuous with superficial fascia of the thorax.

Inferiorly, fuses with the deep fascia of thigh (fascia lata) one fingerbreadth below the inguinal ligament.

In the midline inferiorly, the membranous layer of fascia is not attached to the pubis but forms a tubular sheath for the penis (or clitoris).



THE KNEE JOINT:

- Synovial joint
- Hinge:
  - **Flexion**
  - **Extension**
- BUT a **small amount of rotation** of tibia & fibula is possible, esp. if *leg is in flexed position*.

Articular surfaces:

- Lateral & medial condyles of the femur
- Flat upper surface of the **tibial** condyles – the **tibial plateaux**
- (note, the *fibula does not directly contribute an articular surface to the knee joint*).

- The articular surfaces are covered with **articular cartilage**.

Tibial articular surface:

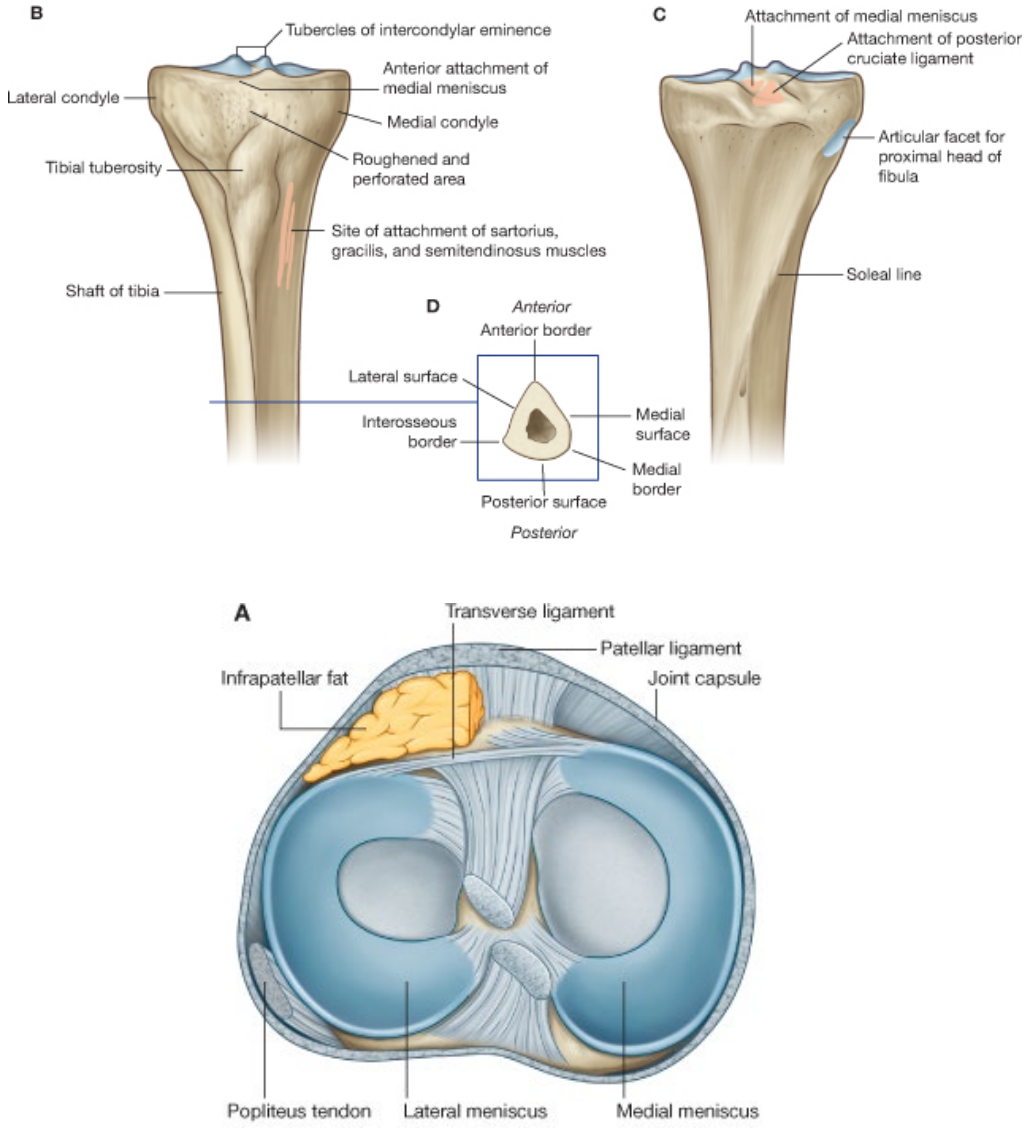
- The tibial condyles are seperated from each other by a midline ridge – **intercondylar eminence**.
- Lying on the flat tibial condyles are 2 'C'-shaped **fibrocartilages**:
  - **Lateral meniscus**
  - **Medial meniscus**
- The open ends of these menisci point towards the intercondylar eminence – they are call the **horns of the menisci**.
- The menisci are attached to the condyles of the tibia both at the horns and the crescentic margins by fibrous tissue.

- Lateral meniscus: **circular**
- Medial meniscus: **oval**

- The inner edges of the minisci are thin – means the minisci present a ‘saucer-shape’ articular surface for each femoral condyle.

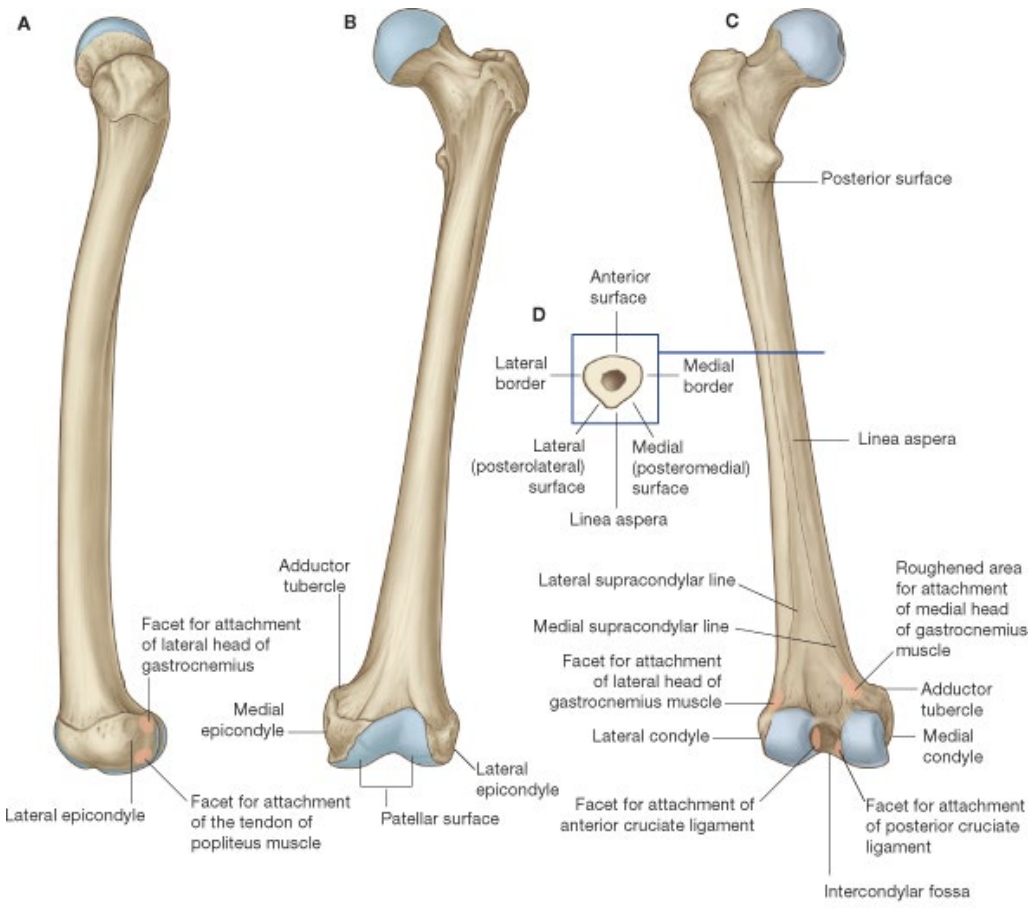
- The two menisci are united **anteriorly** by the **transverse ligament**.
- Prevents the minisci moving apart, and allows interaction between them.

- Despite being attached to the tibia condyles, the menisci can move to some degree – such that they can fill in the joint space during movement.



Medial = Oval (MO, medical officer)

Line on back of femur = linea aspera
Line on back of tibia = soleal line



The front of the knee joint:

- Fibrous capsule of <u>front</u> of knee joint is incomplete
- Replaced with:
    - Tendon of quadriceps
    - Patella
    - Ligamentum patellae

- **Patella** <u>articulates with the front of the femur</u> at all times.
- **<u>Patella *never* articulates with the tibia</u>**

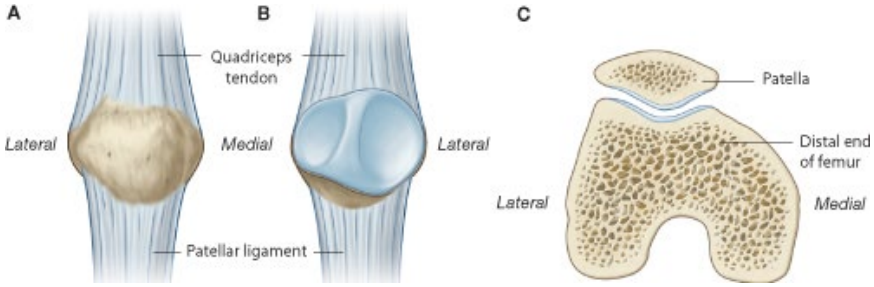
Articular surface of patella:

- Articular cartilage on the deep surface of the patella
- Seperated by slight vertical crest into 2 regions
- Seperated by horizontal lines into upper, middle & lower facet:
    - On flexion, upper facet in contact with femur
    - On extension, all patella facets slide onto femoral surface

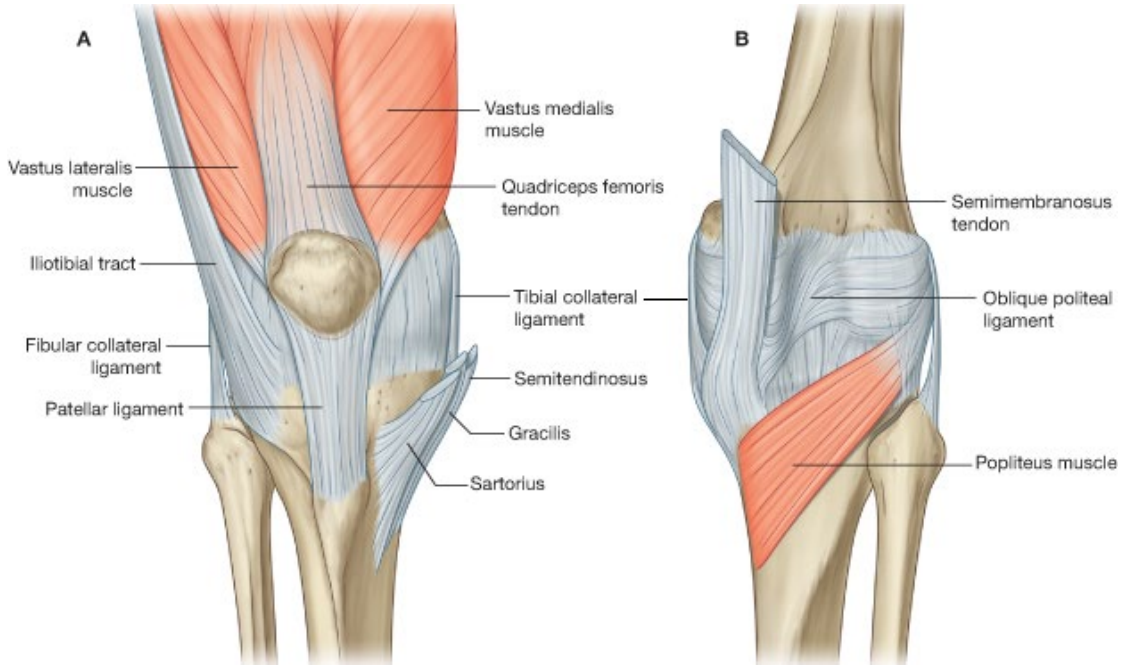
Articular surface of femur (for patella):

- Articular cartilage on:
    - Midline of femur

- Cresentic area on medial femoral condyle.



- On either side of the extensor apparatus (quadriceps, patella, ligamentum patellae) the <u>fibrous capsule is thin</u>.
- Capsule on either side extends from: edges of femoral condyles → front of tibia
- The capsule here is not far beneath the skin, but is strengthed the **<u>patella retinacula</u>**, composed of:
    - **Fascia lata**
    - **Fibrous expansions from vastus lateralis & medialis**



Back of knee joint

- Fibrous capsule extends from: femoral condyles → back of tibia
- Strengthened by **posterior oblique ligament** (aponeurotic expansion of semimembranosus)
- There are deficiencies in the posterior capsule through which **bursa** protrude:
    - <u>Beneath semimembranosus</u>
    - <u>Beneath medial head of gastrocnemius</u>

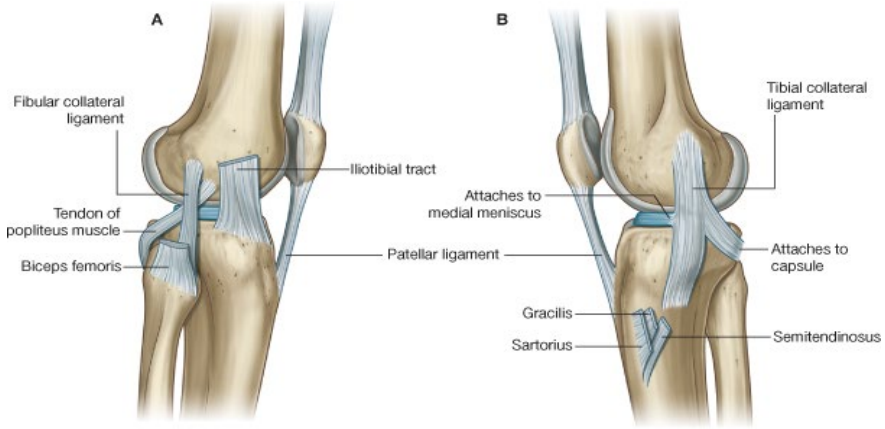
Sides of knee joint

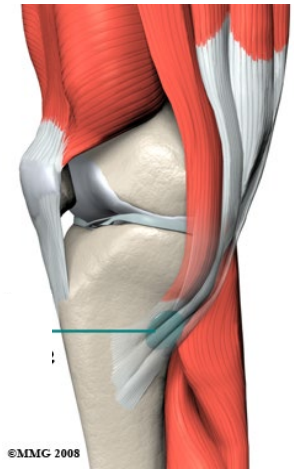
- As with all hinge joints, the sides of the fibrous capsule are very strong
- Strengthened by strong:
    - **Fibular collateral ligament**
        - Lateral side of joint

- Femur → head of fibula
- At insertion into head of fibula, it <u>splits the tendon of the biceps</u>.

- **Tibial collateral ligament**
  - Medial side of joint
  - Flat triangular sheet of fibrous tissue
  - <u>Adductor tubercle</u> of femur → fans out to tibia
  - Some deep fibres of the ligament <u>pass through the capsule into the medial meniscus</u> – making the medial meniscus *slightly less mobile* than the lateral one.

  - A <u>bursa</u> seperates the 3 medial tendons (sartorius, gracilis & semiteninosus) from the tibial collateral ligament.





Medial meniscus:

- **Oval**
- **Less mobile due to attachment to tibial collateral ligament**

THE CRUCIATE LIGAMENTS:

- Unlike most other joints, the knee joint has <u>2</u> ligaments <u>within</u> the joint itself – these are the **cruciate ligaments**.

- They arise from the **intercondylar region** of the <u>tibia</u>
  - **Anterior cruciate ligament:** anterior part of intercondylar region
  - **Posterior crucuiate ligament:** posterior part of intercondylar region

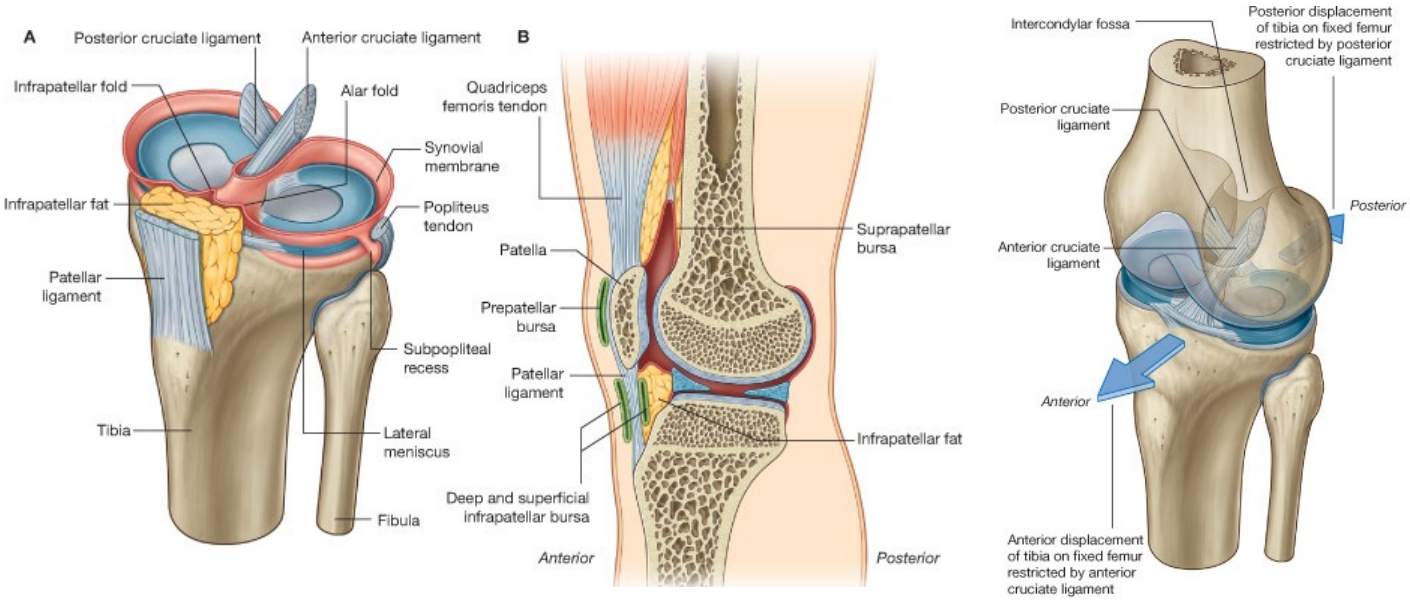
- They twist around one another in their course, and <u>insert into inner surface of femoral condyles</u>
  - **ACL**: inserts into **<u>lateral</u>** femoral condyle
  - **PCL**: inserts into **<u>medial</u>** femoral condyle

- Δ prevent the femoral and tibial articular surfaces from slipping over one another <u>anteroposteriorly</u>:
  - **Posterior ligament:** prevents femur slipping *forwards* on the tibia (e.g. weight bearing on flexed knee)
  - **Anterior ligament:** prevents femur slipping *backwards* on *extension* of the knee (walking / kicking)

- Also prevent <u>excessive rotation between femur & tibia</u>.

- The cruciate ligaments are v. thick and strong

- Sometimes fibres pass from back of <u>lateral meniscus</u> → <u>PCL</u> → <u>femoral condyles</u>; these are **meniscofemoral ligaments.**



Synovial membrane of the knee joint:

- Lines all surfaces of the knee joint, except those covered with articular catilage:
  - **Inside of capsule**
  - **Cruciate ligaments**
    - Covered on all sides <u>except *posteriorly*</u> where they are bare
  - **Infrapatellar fat pad** (in front of joint)

- The synovial membrane largely follows the attachment & contours of the joint capsule, but it <u>runs free of capsule</u>:
  - <u>Between femoral condyles</u>
  - <u>In front of cruciate ligaments</u>

Bursa:

a. Many are ballooning of SM through holes in capsule - Δ continuous with the SM of the joint.
b. Others are separate synovial balloons positioned at places prone to frictional rubbing of tendons & bone.

- Type a. – continuous with SM of joint capsule:
  - **Suprapatellar bursa:**
    - SM continues up over surface of femur, to a level <u>above</u> the patella.
    - If accumilates with synovial fluid → fullness above the patella
    - Muscle fibres of <u>vastus intermedius</u> insert into upper part of suprapatellar bursa – **<u>articularis genu</u>**: prevent pinching of bursa into knee joint during movement.
  - **Bursa deep to semimembranosus & medial head of gastrocnemius**
    - SM of joint capsule bulges out through hole in posterior capsule

- Type b. – separate synovial balloons:
  - **Prepatellar bursa**
    - Found just deep to the skin in front of lower patella.
    - Allows movemement of skin over patella bone

        - Frequent kneeling → ***housemaid's knee*** – chronic enlargement of the prepatellar bursa

    - **Infrapatellar bursa**
        - ***Subcutaneous infrapatellar bursa***: lies deep to the skin on upper part of tibia
        - ***Deep infrapatellar bursa***: lies between ligamentum patellae & upper tibia
        - Allows movement of ligamentum patella over tibia – preventing friction during knee movement.

➢ **NOTE** the neurovascular structures of the popliteal fossa are closely related to the posterior joint capsule.

MOVEMENTS OF THE KNEE:

- Hinge joint:
    - Flexion
        - Max: calf contacts back of thigh
    - Extension
        - Max: leg is straight

- It is the strong ligaments which surround the knee, and the cruciate ligaments within the knee, which resist movements other than flexion/extension.

- BUT there are some limited **rotational** movements of the knee joint

Locking the knee: medial rotation during extension

- When extending the knee to full straightness, there is at the last moment a slight **medial rotation** of the femur on the tibia.
- Due to the medial articular surfaces of the femur and tibia.
- On extension, once the lateral femoral condyle has used up all of its articular surface, the medial femoral condyle continues to slide a little:
    - This rotation is round axis of *centre of the lateral tibial condyle*
    - Lateral meniscus is circular, so rotation about this axis is no problem.

- This "last minute" medial rotation of the femur during extension places the knee under **ligament tension.**
- Note: this is movement of the **femur** *on the* **tibia**
- The knee is said to be ***locked*** *in the* ***close packed position***.
- There is tension in all of:
    - **ACL**
    - **Collateral ligaments**
    - **Posterior capsule**
    - **Oblique ligament**
- This allows the knee stability to bear the weight of the upright body with minimal energy expenditure.

Unlocking the knee: flexing the knee from position of complete extension

1. Knee must be unlocked by ***lateral rotation of the femur on the tibia***.
    - The small **popliteus muscle** is responsible for this.
2. Flexion is then possible by action of:
    - Biceps femoris

  - Semitendinosus
  - Semimembranosus
- In flexion the fibular and tibial collateral ligaments are *slack*.

- **Popliteus**:
  - Origin: **posterior tibia**
  - Insertion: passes upwards and laterally to insert into **lateral femoral condyle**.
  - It **enters knee joint through a hole in the joint capsule**
  - It gives a few fibres to the lateral meniscus – increasing the mobility of this meniscus.
  - **On posterior tibia, it is covered by expansion of semimembranosus.**
  - Action: can laterally rotate the femur on the tibia (to unlock the knee from complete extension)

- **The 4 muscles which insert into the medial tibia, can also bring medial rotation of the tibia:**
  1. Sartorius
  2. Gracilis
  3. Semitendinosus
  - Semimembranosis

- The biceps femoris (which inserts into the fibula) is the only muscle with can produce **lateral rotation of the lower leg at the knee joint**.

APPLIED ANATOMY OF THE KNEE JOINT:

- Knee joint injuries are common, especially:
  - **Ligaments**
  - **Menisci**
- On injury, there is an outpouring of synovial fluid → swelling of knee
- Synovial fluid also tracks up the continuous suprapatellar bursa → diffuse swelling above knee.

- **Tibial collateral ligament** is often injured:
  - Twisting sprains at knee
  - Often combined with injury to **medial meniscus**

Injury to the medial meniscus:

- The **medial meniscus** is more often injured than the lateral:
  - Not as mobile as lateral meniscus
  - Not as circular as lateral meniscus
- Immediately after injury, the split medial meniscus prevents full extension of the knee.
- → joint is locked due to torn fibrocartilage caught between articulating surfaces.

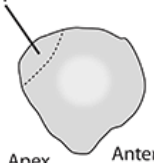
Injury to anterior cruciate ligament (ACL):

- More severe injury
- Results in 'unhappy triad'of damge to:
  - Tibial collateral ligament
  - Medial meniscus
  - ACL

RIGHT PATELLA

Largest sesamoid bone in body
Mobile from side to side

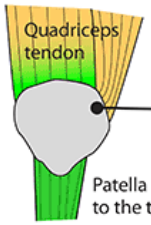
Upper lateral part is site of bipartite patella



Apex

Anterior view

Anterior/posterior is obvious



Lateral/posterior surface is: Larger, longer, more steeply sloped

Patella tendon attaches to the tibial tubercle

Posterior view

ARTICULATION WITH FEMUR

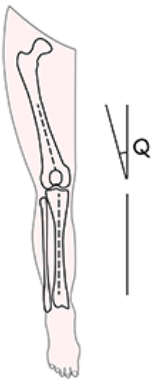
1. In extension
2. In slight flexion
3. In flexion
4. In full flexion

Lateral Medial

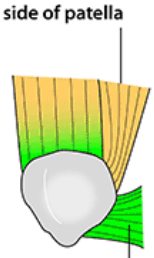
OSSIFICATION

Several centres between 3 & 6 years that fuse at puberty (they appear as child starts running). Sometimes a separate centre superior/lateral at 6 years - fuses at puberty

Deviation from the vertical (the tibia) to a line along the femur (pull of quadriceps). Wider the pelvis, the greater Q angle (F > M)
Offset tends to pull patella laterally. 3 factors avoid dislocation

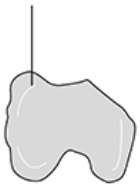


1. Insertion of lower fibres of vastus medialis into medial side of patella



2. Stronger medial retinacular fibres of knee capsule

3. More anteriorly protuberant lateral condyle of lower femur. Note that lateral condyle is smaller than medial one but it protrudes further anteriorly

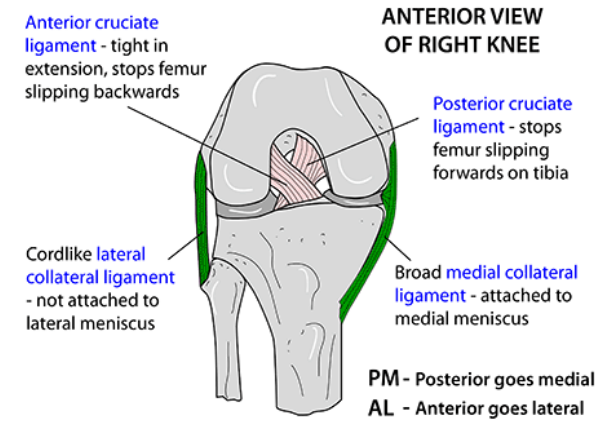


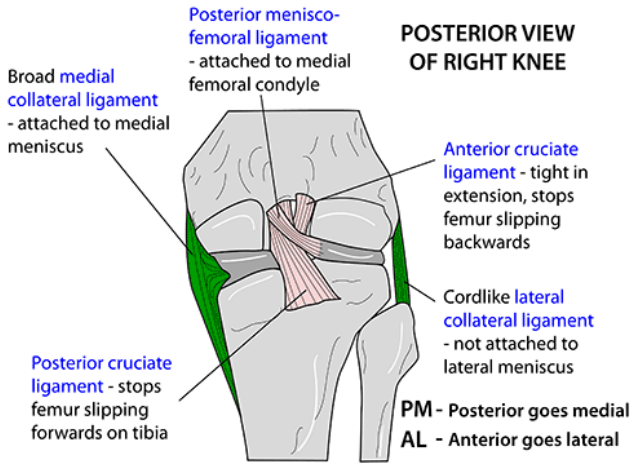
THE Q ANGLE AND PATELLA DISLOCATION

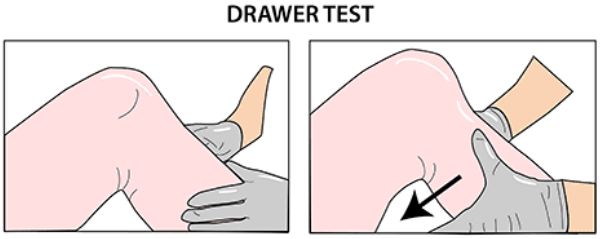
KNEE JOINT 3

ANTERIOR CRUCIATE LIGAMENT
From: Anterolateral tibia
To: Posterior on medial side of lateral femoral condyle
Limits: Extension & anterior draw & is taut on locking
Test: Pull tibia forwards on femur

POSTERIOR CRUCIATE LIGAMENT
From: Posteromedial tibia
To: Anterior on lateral side of medial femoral condyle
Limits: Posterior slide of tibia on femur.
Used: Down stairs & on hills
Test: Push tibia back on femur



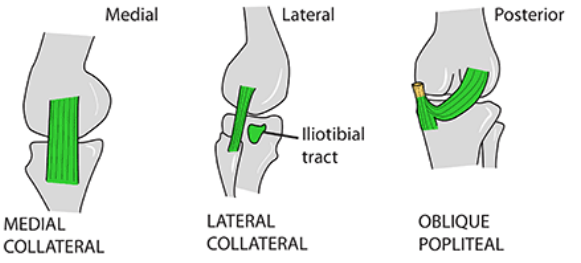




DRAWER TEST
Positive posterior drawer test showing a ruptured posterior cruciate ligament.
BUT beware - if the dip below the patella is not noticed this might appear as a false positive anterior drawer test when the tibia is pulled anteriorly

KNEE JOINT 5

LIGAMENTS OF RIGHT KNEE



MEDIAL COLLATERAL

- Broad, long, thick, strong
- Attached to capsule & medial meniscus
- Limits full extension & thus aids locking

LATERAL COLLATERAL

- Thick, cordlike.
- Not attached to joint structures.
- Limits full extension & thus aids locking

OBLIQUE POPLITEAL

- Upward extension of semimembranosus tendon.
- Limits extension & thus aids knee locking

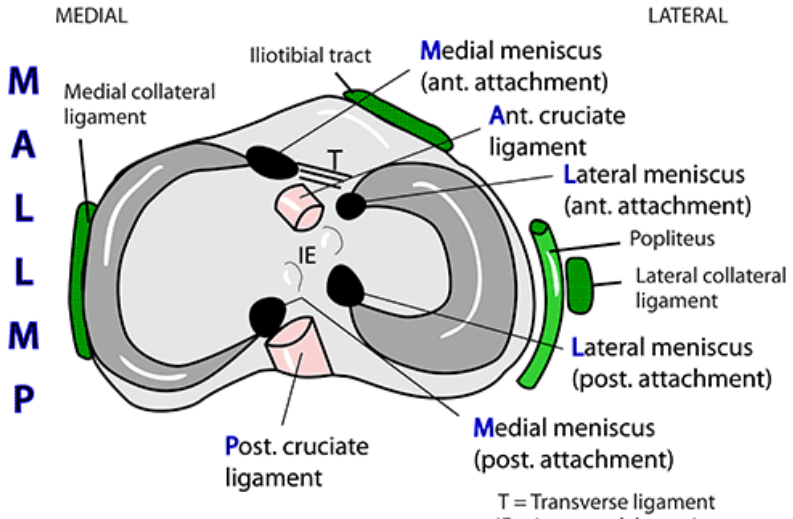
NOTE

- Knee is largest joint in body
- It is a modified hinge joint
- The line of the body weight is anterior to the knee

KNEE JOINT 2

ORDER OF STRUCTURES ON TIBIAL PLATEAU (anterior to posterior)

UPPER SURFACE OF RIGHT TIBIA



T = Transverse ligament
IE = Intercondylar eminence with medial & lateral intercondylar tubercles

MENISCI

Liable to tears when flexed knee is twisted
Function: transfers forces, keep bones together, helps locking

MEDIAL MENISCUS

- Wider C
- Medial lip slopes up
- Attaches as shown but also to medial collateral ligament
- More liable to damage than lateral meniscus

LATERAL MENISCUS

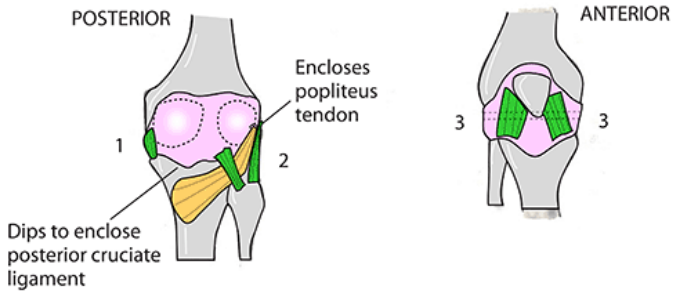
- Smaller, tighter C
- Lateral lip slopes down
- Not attached to lateral collateral ligament
- Attached as shown
- Lightly attached to popliteus & is retracted by it on flexion

KNEE JOINT 4

RIGHT CAPSULE

Capsule is attached to the bony margins of the tibia and femur
It has several thickenings shown below called internal ligaments

1. Thickened medially to make the Short Internal (medial) Ligament which attaches to medial collateral ligament outside & to the medial meniscus inside as the coronary ligaments
2. Arcuate Popliteal Ligament. This is Y shaped and the lateral part of it is often known as the Short External (lateral) ligament. Popliteus tendon passes medially to it
3. Medial and lateral Patellar Retinacular Fibres. These reinforce the capsule anteriorly. The medial ones are important as they help to prevent the patella dislocating laterally

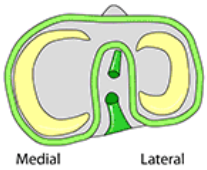


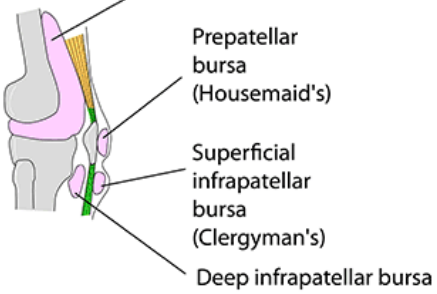
KNEE JOINT 6

BURSAE AND SYNOVIUM

Synovium lines the inside of the capsule and is attached to the bony edges. It extends into the suprapatellar bursa. The cruciate ligaments and popliteus tendon lie out side it (see figure below)

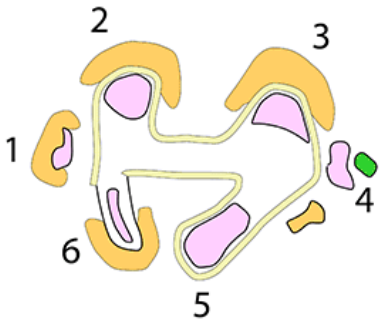
Tibial plateau showing attachment of synovium to its edges. The cruciate ligaments lie outside it but the menisci within it





Bursae associated with tendons and muscles

1. Under sartorius, gracilis, semitendinosus
2. Under medial head of gastrocnemius (often into joint)
3. Under lateral head of gastrocnemius (sometimes into joint)
4. Under lateral collateral ligament
5. Under popliteus (into joint)
6. Under semimembranosus



<u>Iliotibial tract extends the knee</u>

KNEE JOINT 8

PHYSIOLOGICAL LOCKING OF KNEE