

Knee joint

Type:

Synovial

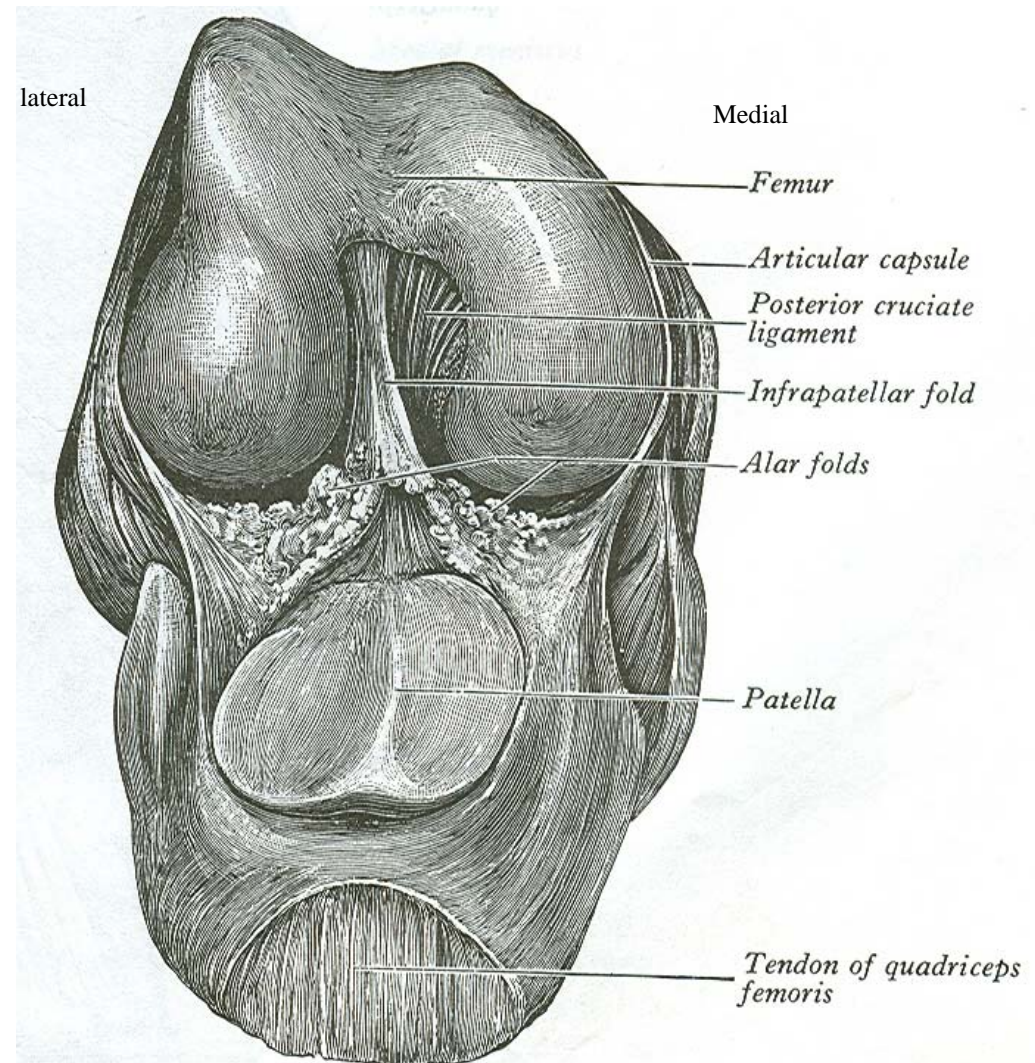
compound

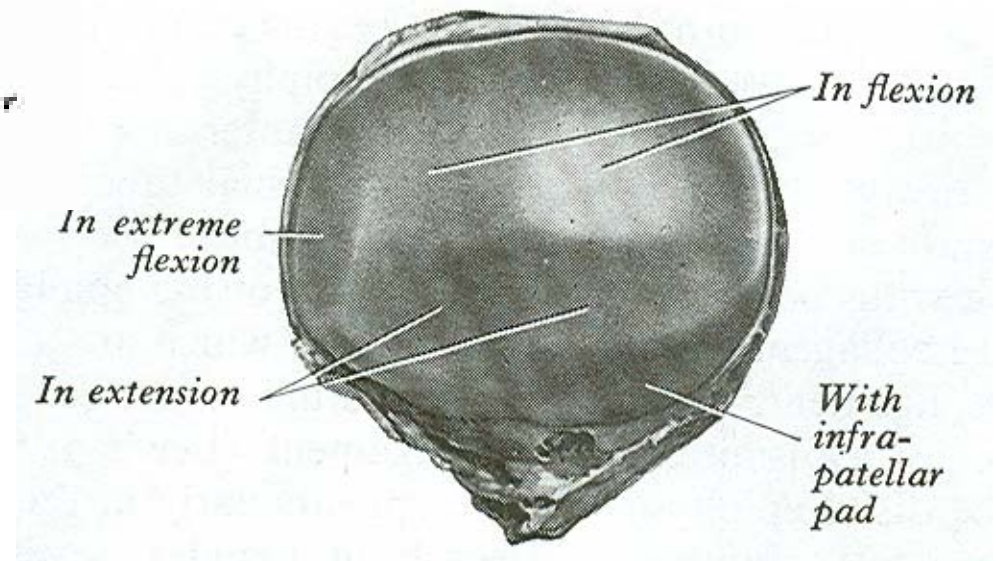
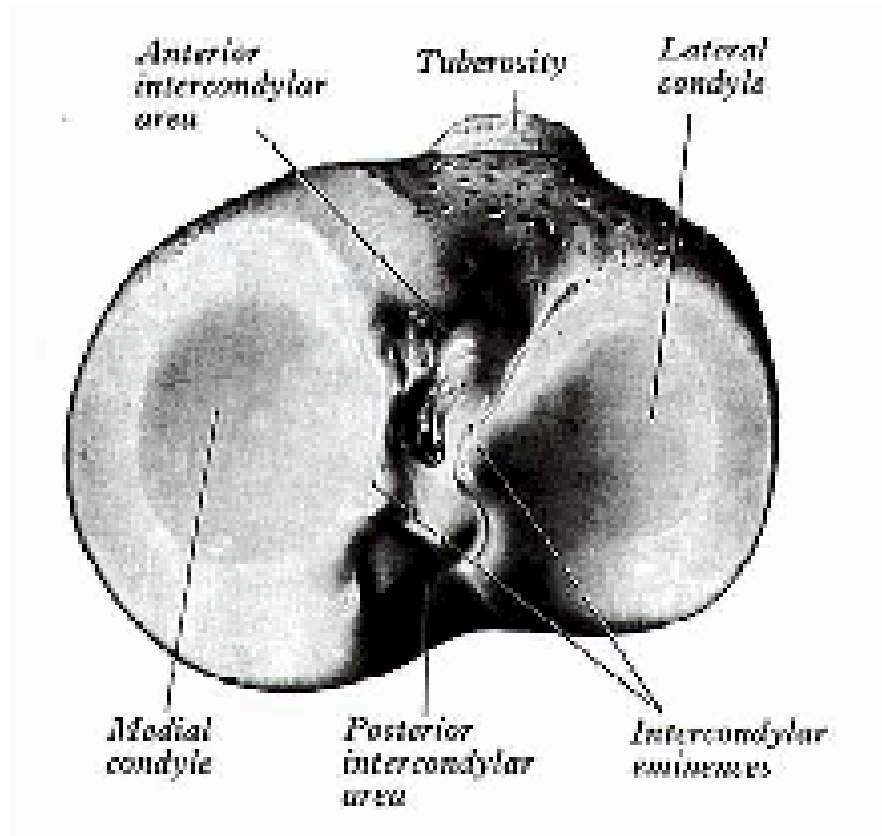
complex

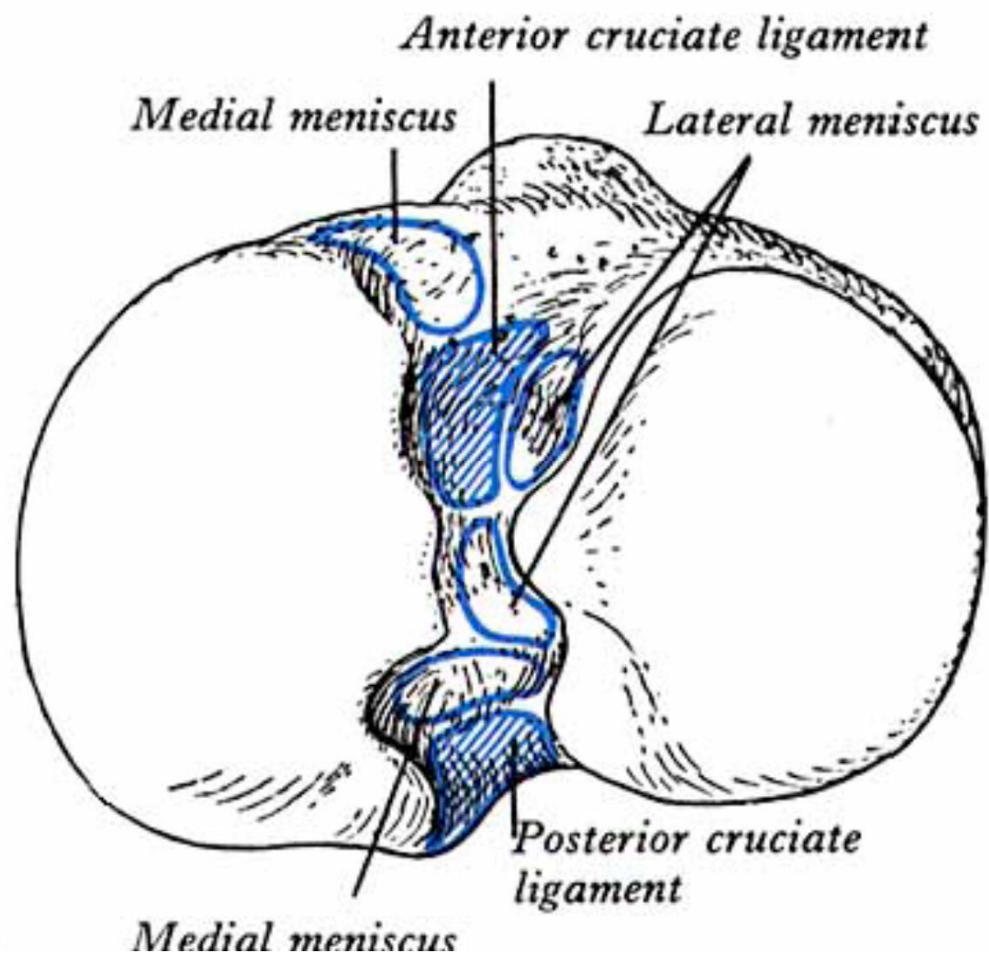
?hinge/ condyloid/ saddle

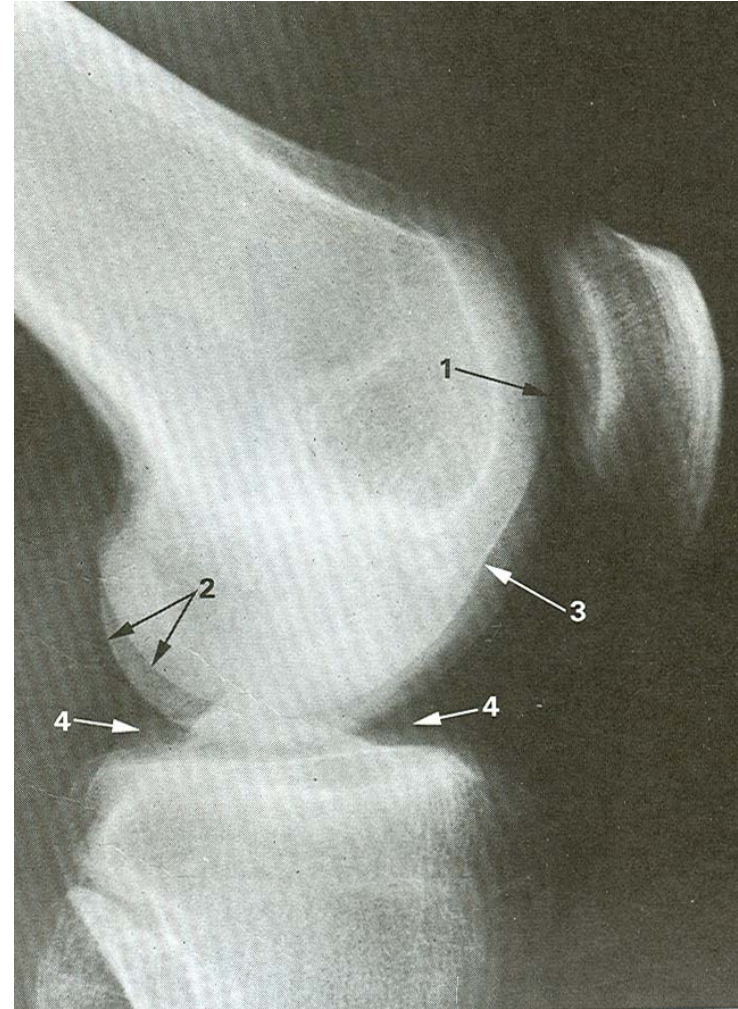
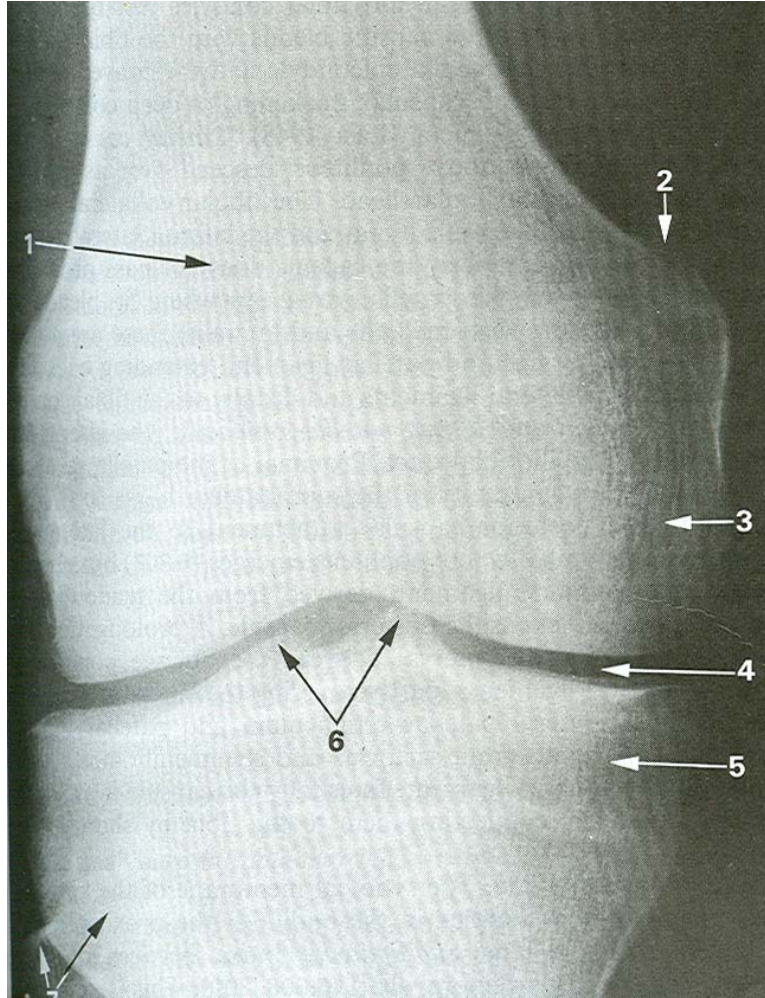
Knee joint- articular surfaces

Condyles of femur,
Condyles of tibia
patella







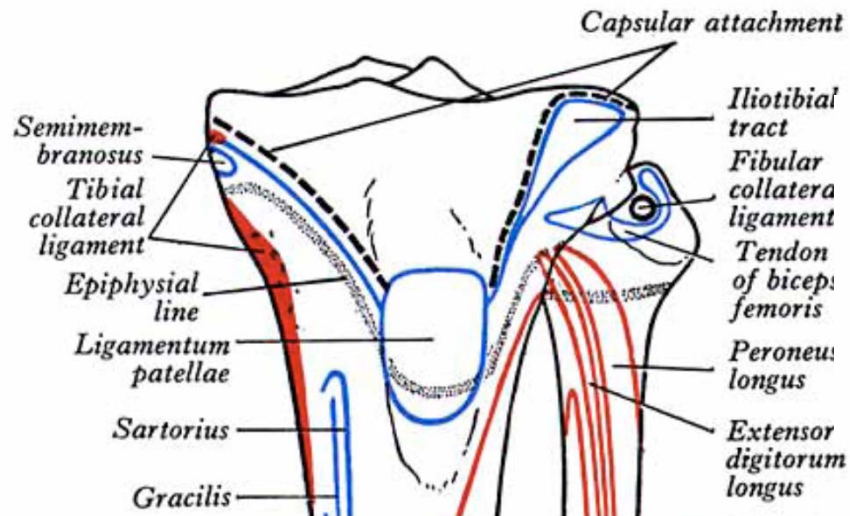
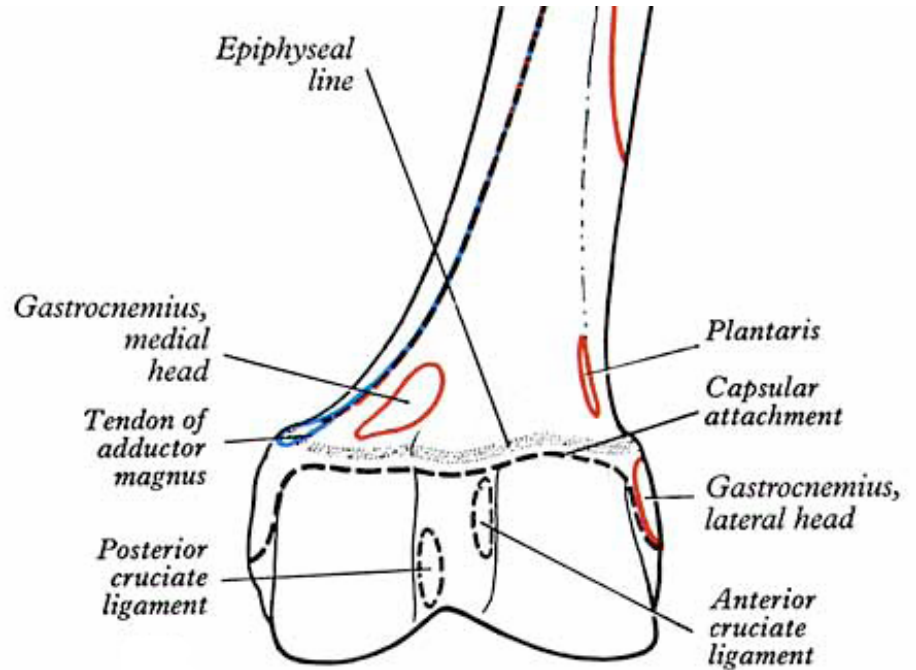
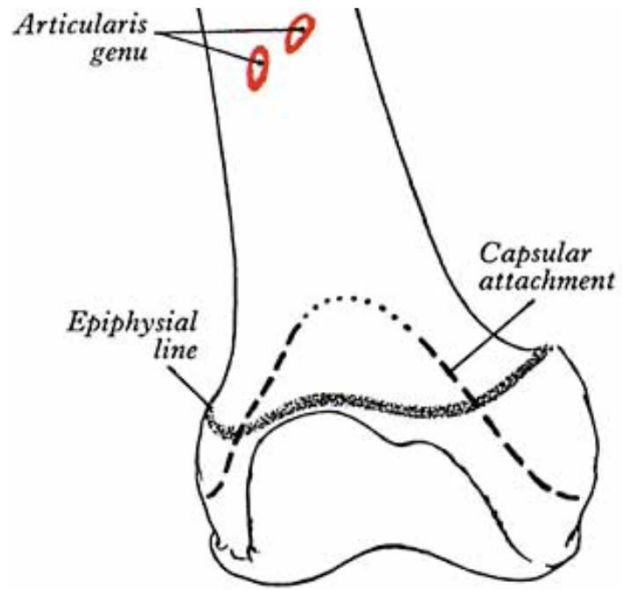


Ligaments and cartilages

- Fibrous capsule
- Ligamentum patellae
- Oblique popliteal ligament
- Arcuate popliteal ligament
- Tibial collateral ligament
- Fibular collateral ligament

contd.

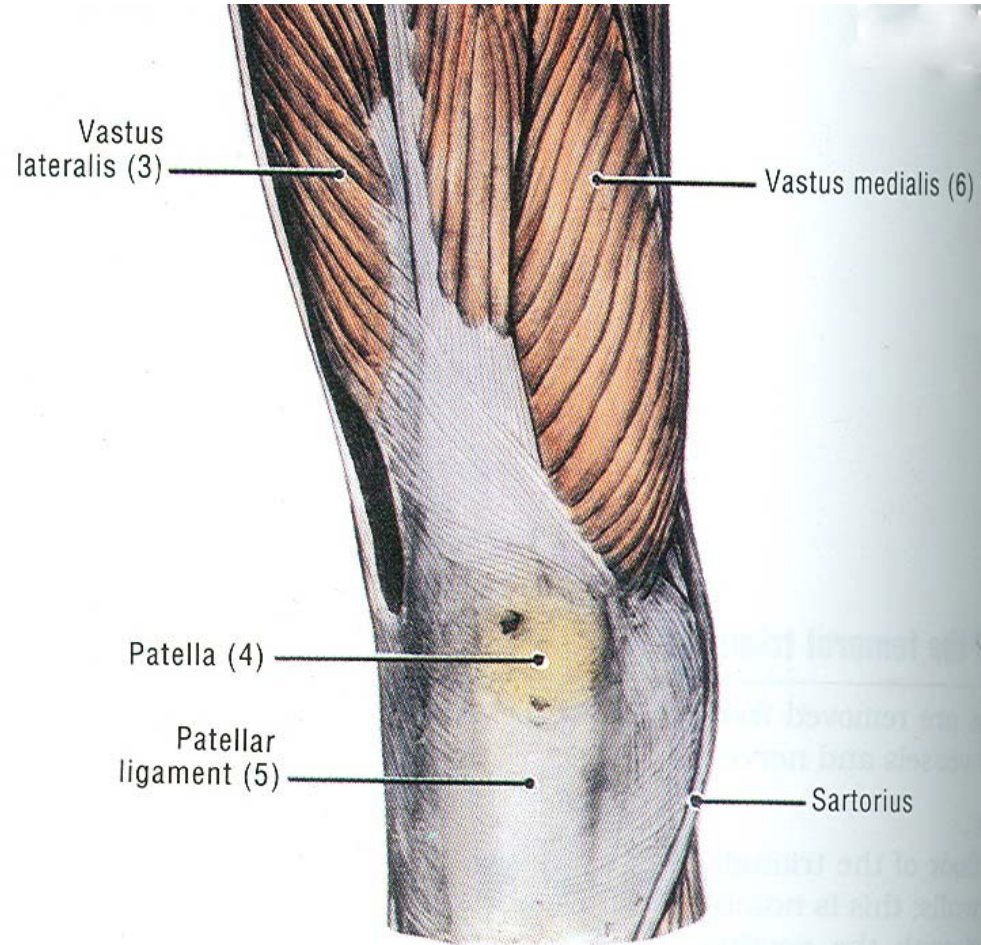
- Cruciate ligaments: Anterior &
Posterior
- Menisci: Medial &
Lateral
- Transverse ligament
- Menisiofemoral ligament



- Patellar ligament

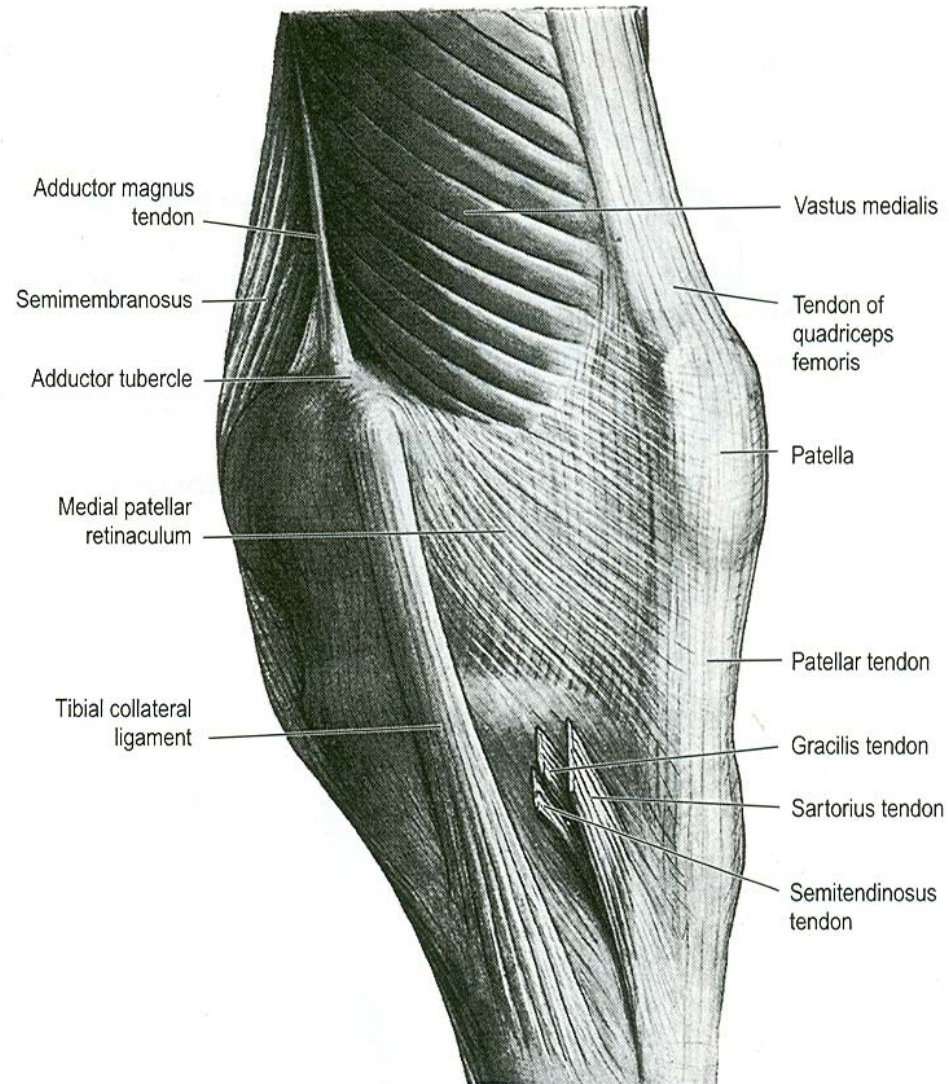
Continuation of quadriceps femoris tendon

Extends from apex of patella to tibial tuberosity



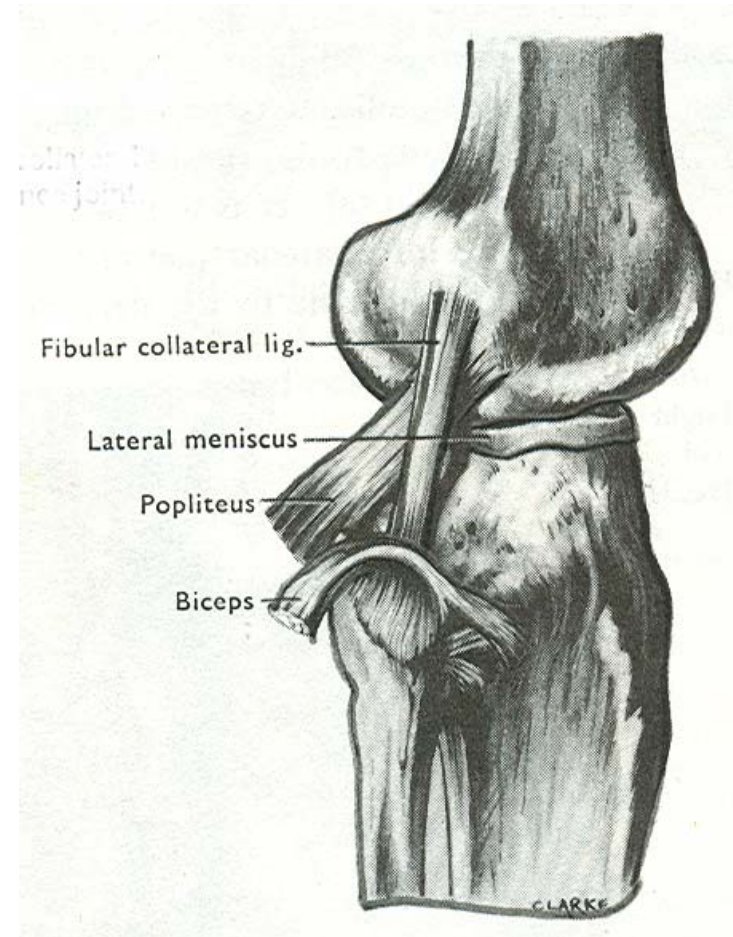
Tibial collateral ligament

- extends from medial femoral epicondyle to medial tibial condyle.
- Firmly attached to medial lemniscus
- Prevents medial dislocation
- Taut on extension



Fibular Collateral ligament

- extends from lateral femoral epicondyle to Head of fibula.
- Separated from lateral lemniscus by popliteus tendon
- Taut on extension
- Limits extension and adduction

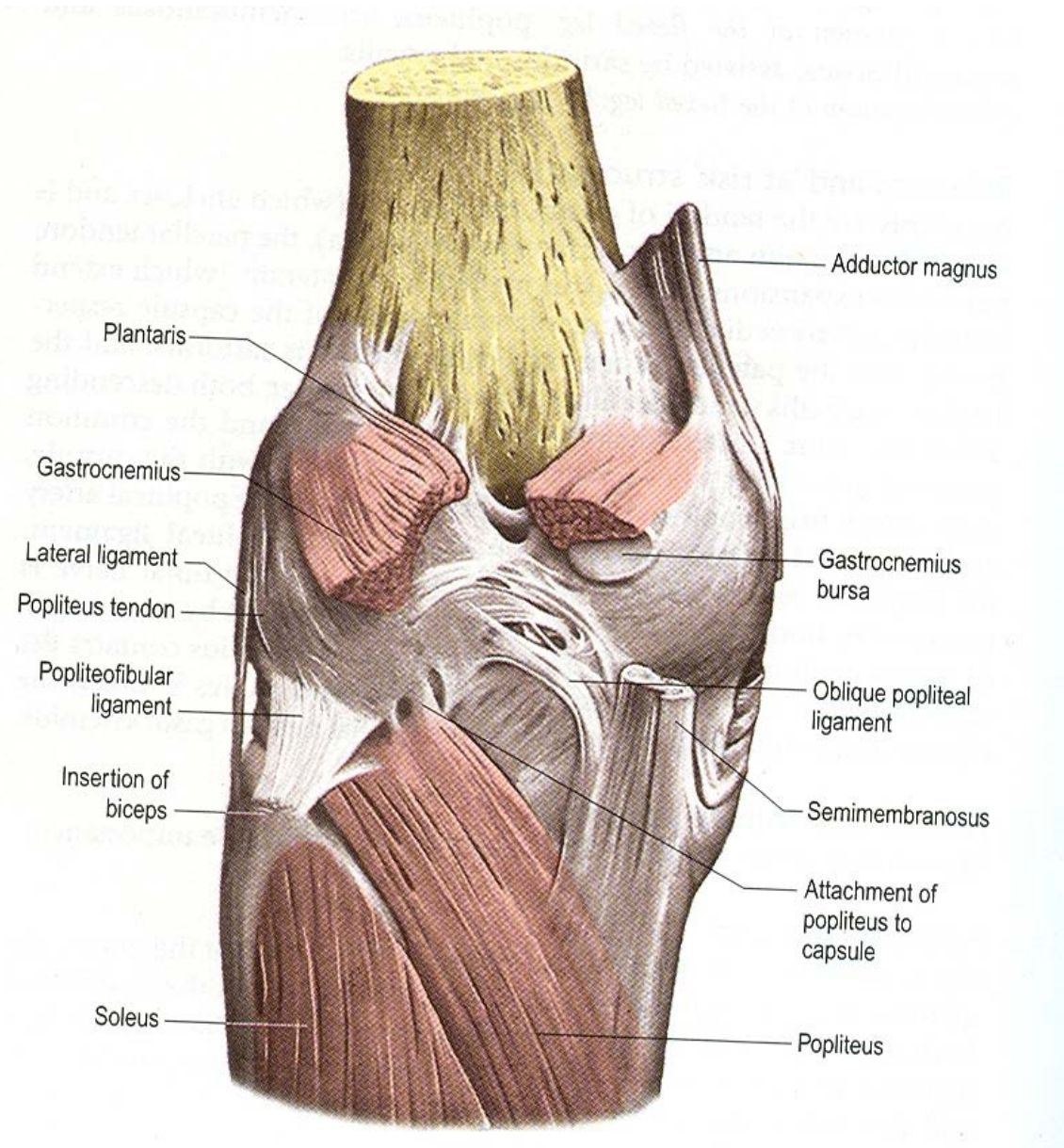


Oblique popliteal

- Expansion of semimembranosus tendon
- Passes upwards obliquely from medial condyle of tibia.

Arcuate popliteal

- from head of fibula, arches sup. and med. To fuse with articular capsule



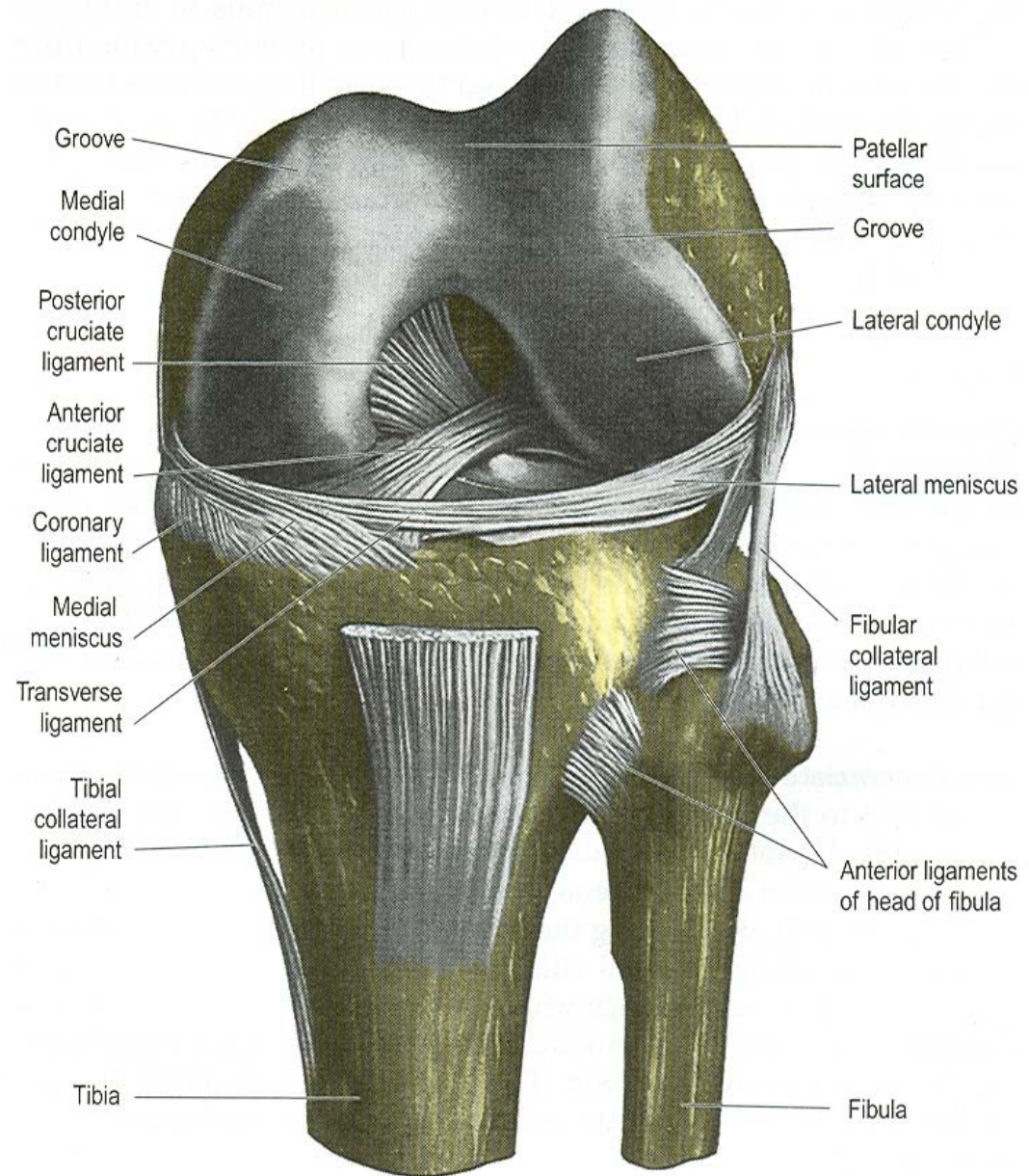
Cruciate ligaments (intracapsular)

Anterior:

- From ant inter condylar area of tibia up to lateral femoral condyle

- Prevents forward sliding of tibia on femur

- Taut during extension



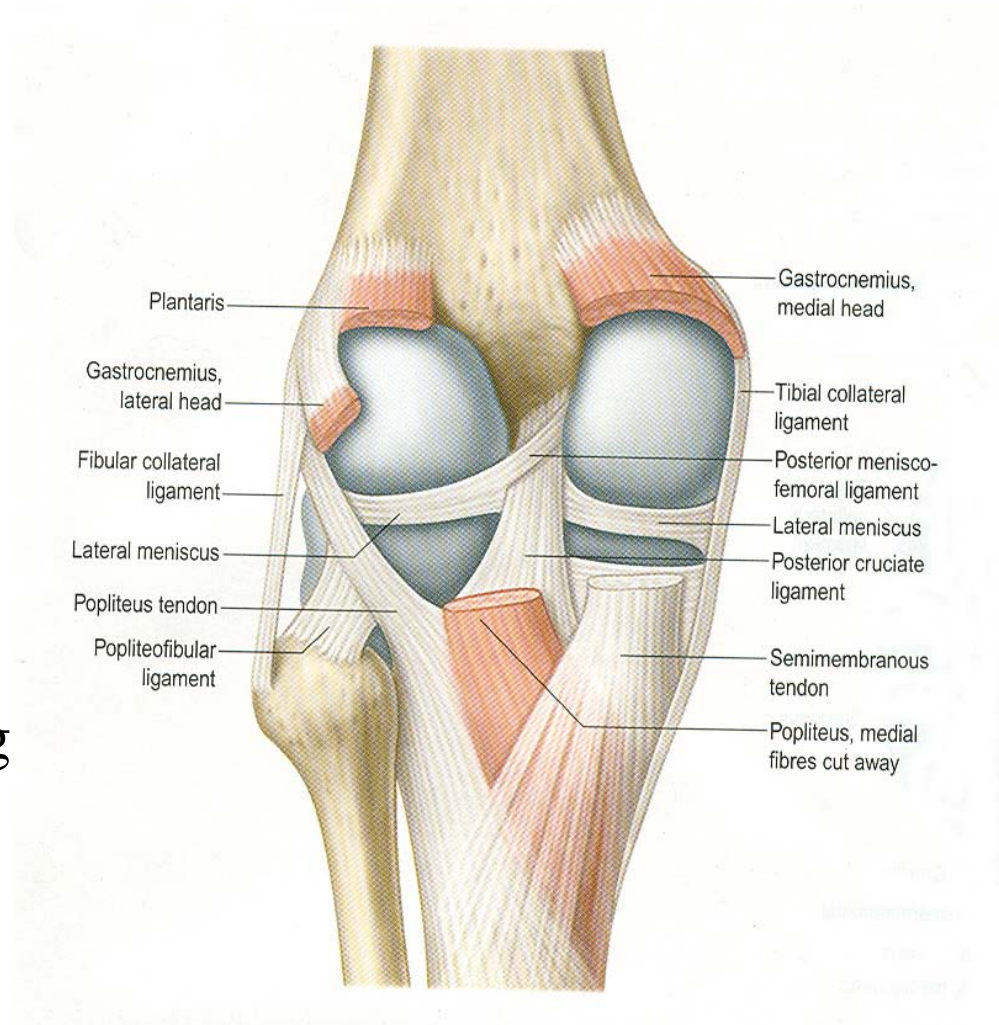
Cruciate ligaments:

- posterior:

- From posterior inter condylar area of tibia up to medial femoral condyle

- Prevents backward sliding of tibia on femur

- Taut during flexion



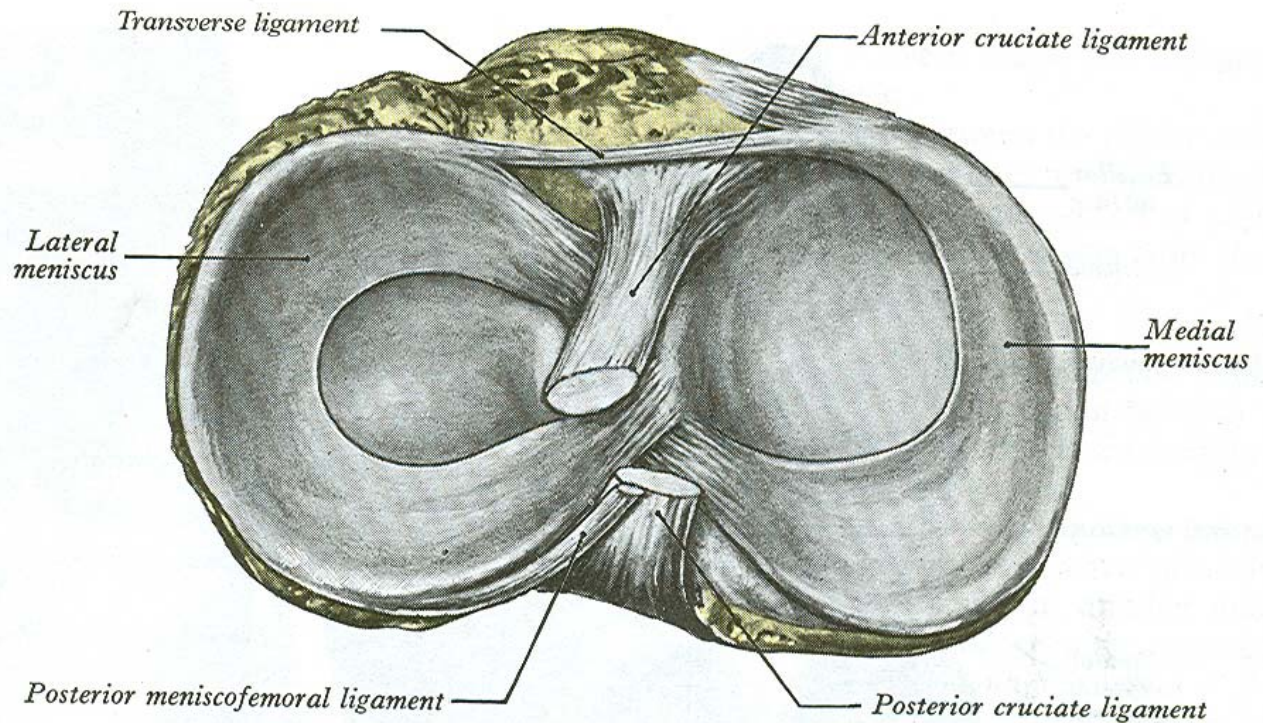
Menisci, transverse ligament & meniscofemoral ligaments:

Medial

Is C-shaped

Is attached to
medial collateral
ligament.

And interarticular
area of the tibia



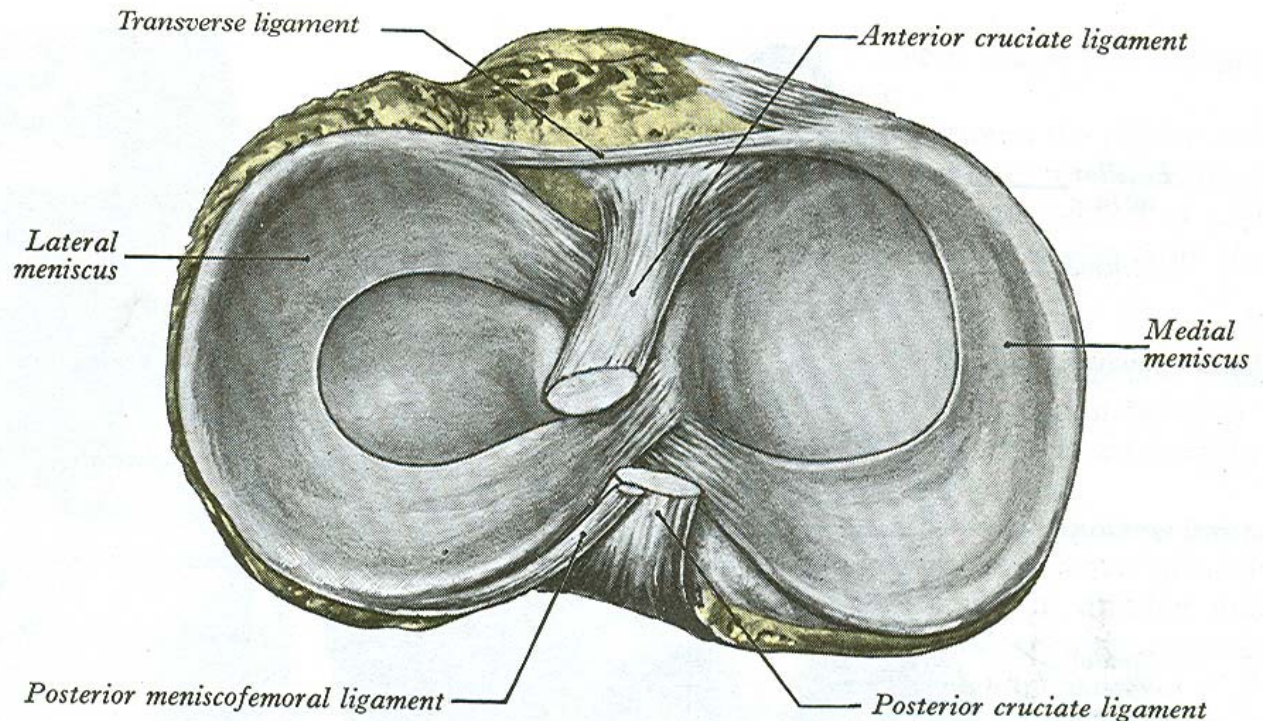
Menisci, transverse ligament & meniscofemoral ligaments:

lateral

Is nearly circular

Is separated from fibular collateral ligament by the tendon of popliteus muscle.

Transverse ligament : binds the anterior horns of the lateral & medial menisci



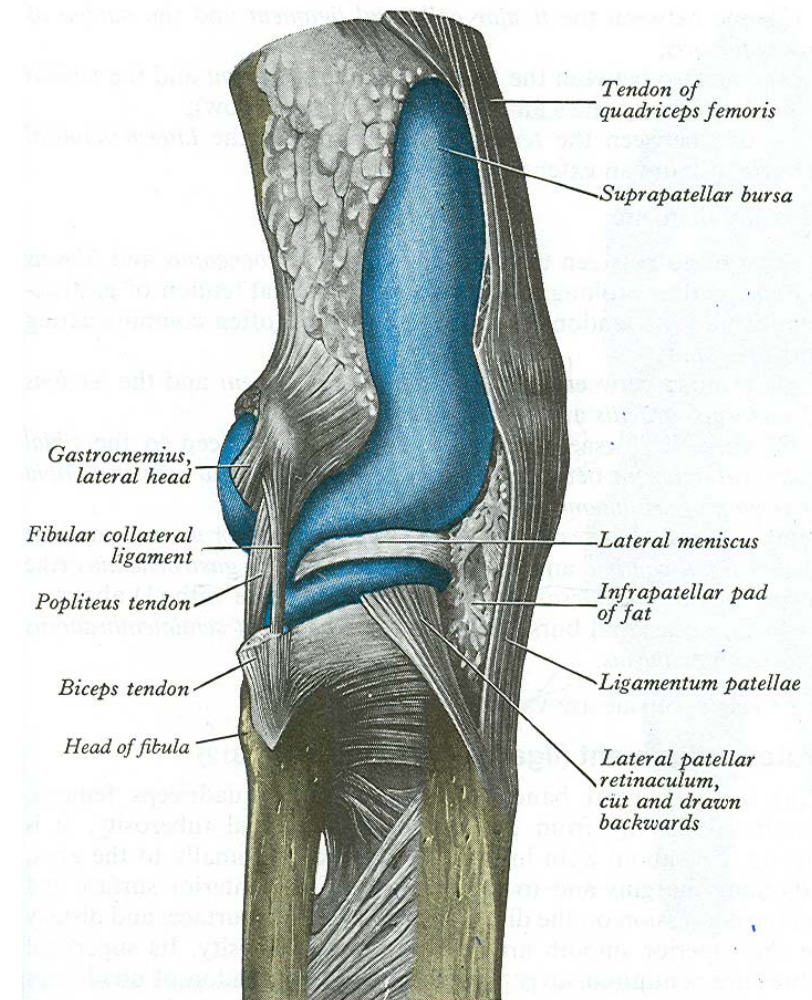
Synovial membrane

Lines the
intracapsular part,

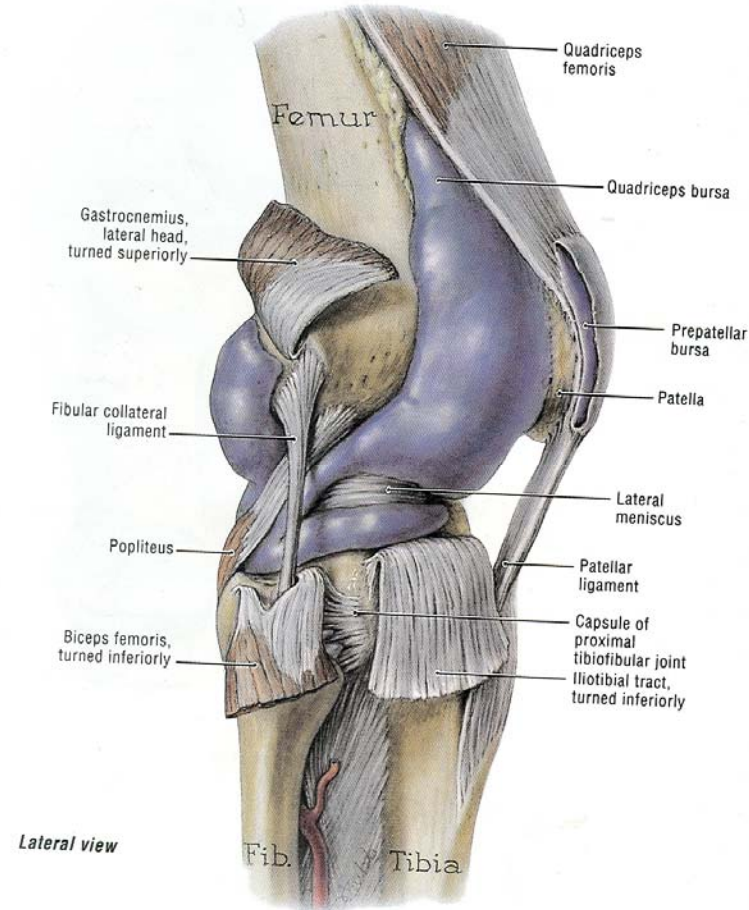
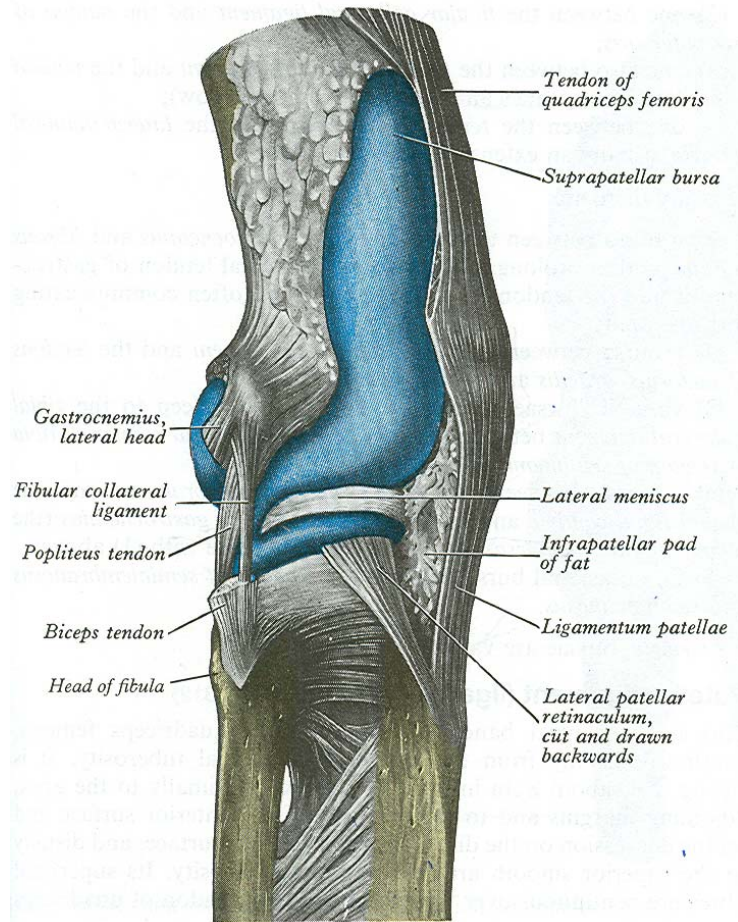
Attaches to patella
and menisci.

Reflects on cruciate
ligaments

Ant. Covers the
infrapatellar pad of
fat



Synovial membrane and bursae:



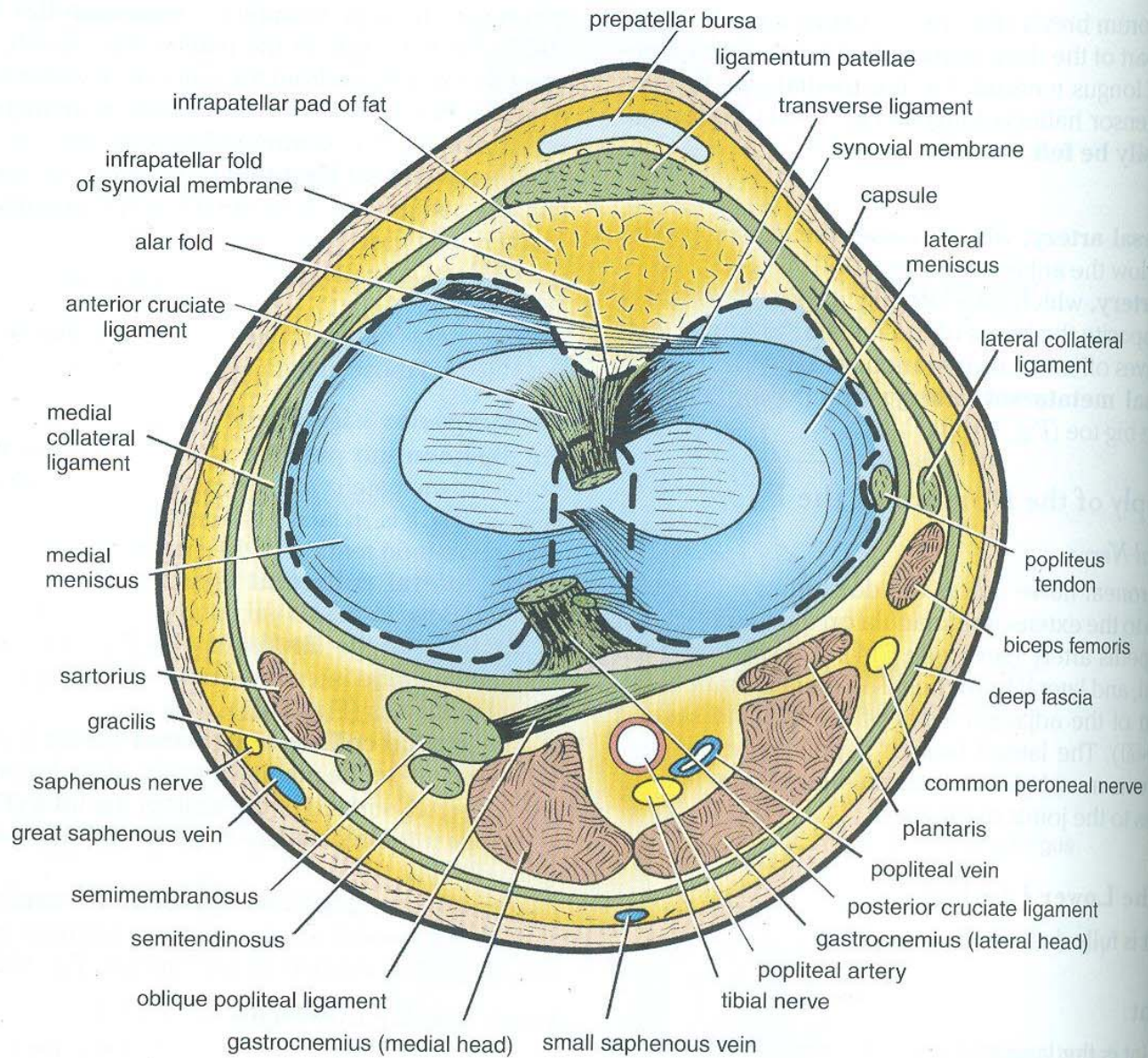
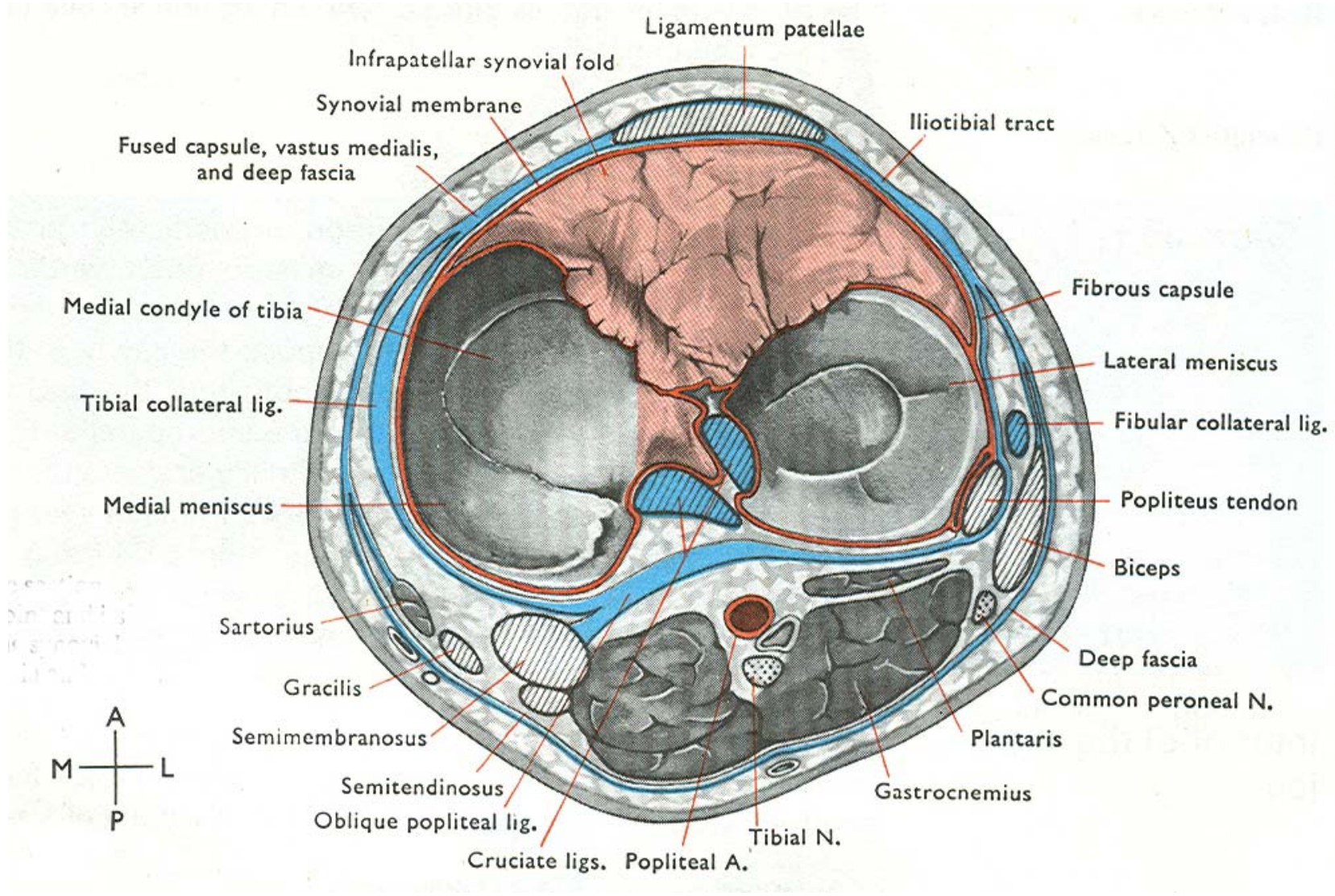


Figure 10-61 Relations of the right knee joint.

Relations:

- Anterior-
tendon of quadriceps along with ligamentum patellae and patellar retinacula
- Posteromedial-
sartorius and tendon of gracilis
- Posterolateral-
tendon of biceps, common peroneal nerve
- Posterior-
popliteal vessels, lymph nodes;
tibial nerve posterior to the vessels;
both heads of gastrocnemius and plantaris



- Bursae around knee joint

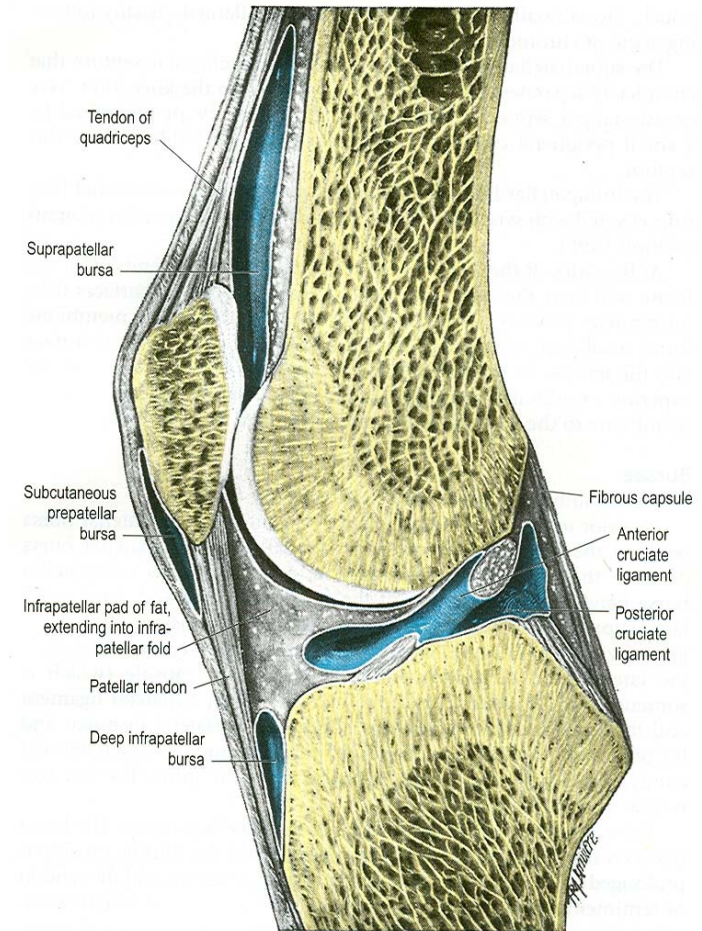
- a) ANTERIOR

1) Suprapatellar (between femur & quadriceps)

2) Subcutaneous prepatellar (between patella & skin)

3) Deep infrapatellar (between tibia & patellar ligament)

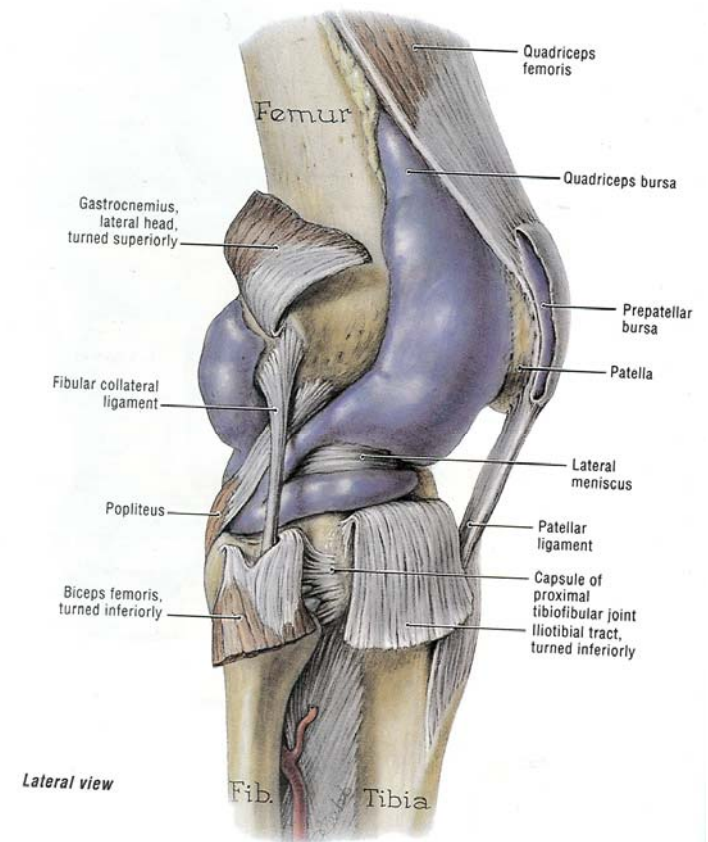
4) Subcutaneous infrapatellar (between tibial tuberosity & skin)



B) LATERAL

between

- 1) lateral head of gastrocnemius & capsule
- 2) fibular collateral ligament & biceps
- 3) fibular collateral ligament & popliteus
- 4) popliteus & lateral femoral condyle



B) MEDIAL

between

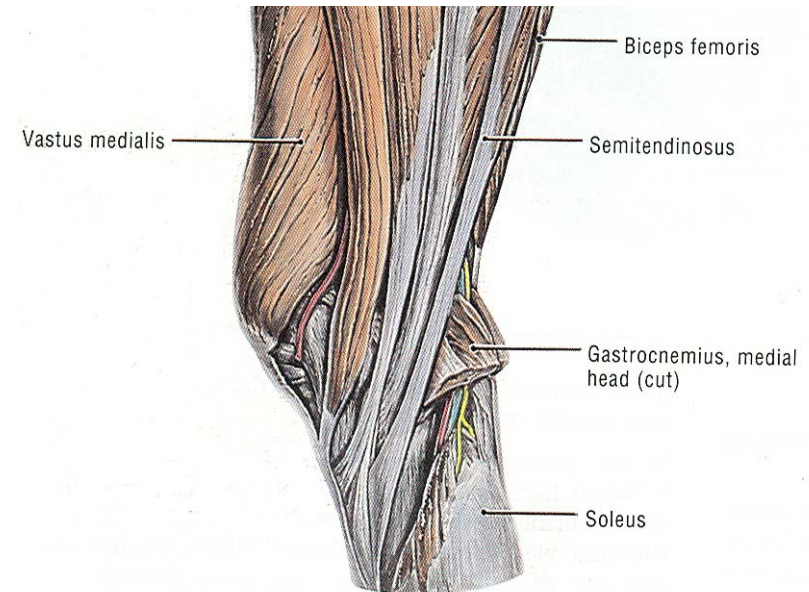
1) medial head of gastrocnemius
& capsule

2) tibial collateral ligament &
tendons of sartorius,
semimembranosus and gracilis

3) deep to tibial collateral
ligament & between
femur/capsule/medial
meniscus/tibia/semimembranosus

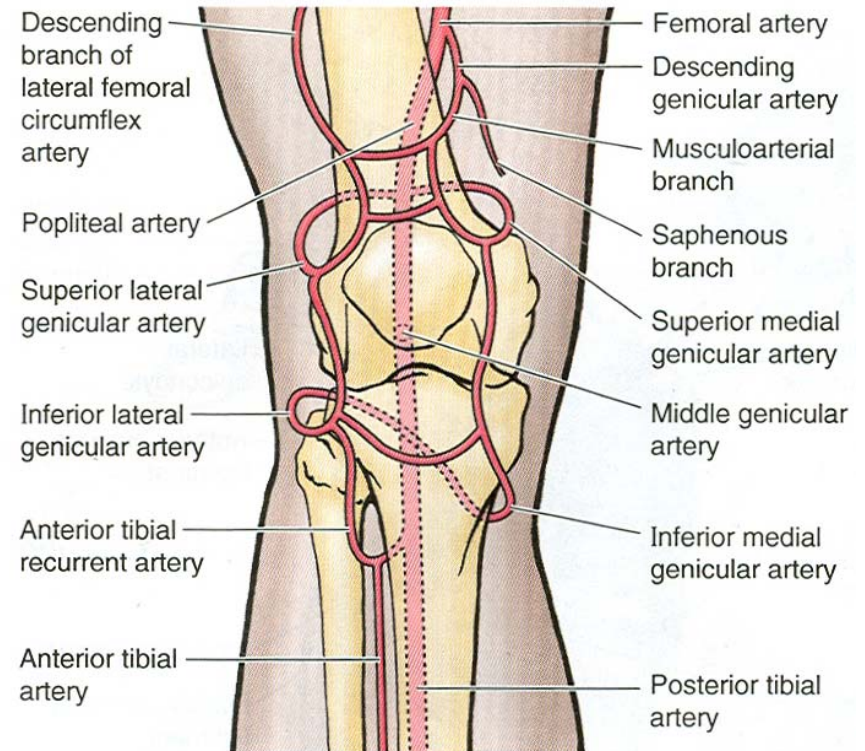
4) tendon of semimembranosus
& medial tibia condyle

5) tendons of semimembranosus
& semitendinosus



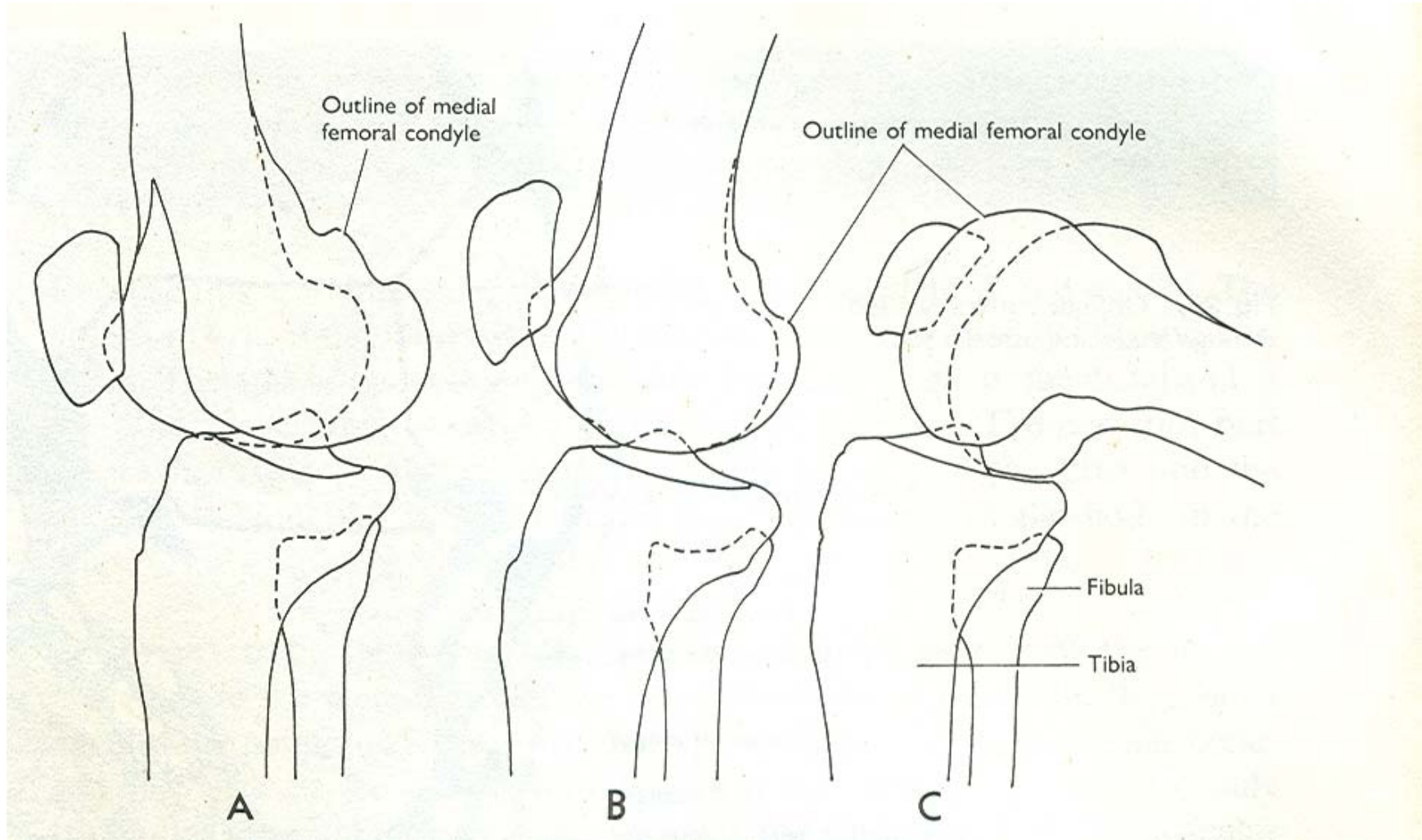
Blood supply:

- Descending genicular br. of femoral
- Superior, middle and inferior genicular br. of popliteal
- Anterior and posterior recurrent genicular br. of anterior tibial
- Circumflex fibular and descending br. of lateral circumflex femoral



Nerve supply:

- Posterior division of obturator
- Femoral through nerves to vasti
- Tibial through superior & inferior medial genicular and middle genicular
- Common peroneal through superior & inferior lateral genicular and recurrent genicular



Movements:

- Flexion-

biceps femoris/ semimembranosus/
semitendinosus/ gracilis/ sartorius/
popliteus/ gastrocnemius/ plantaris

- Extension-

quadriceps

tensor fasciae latae

movements (contd.)

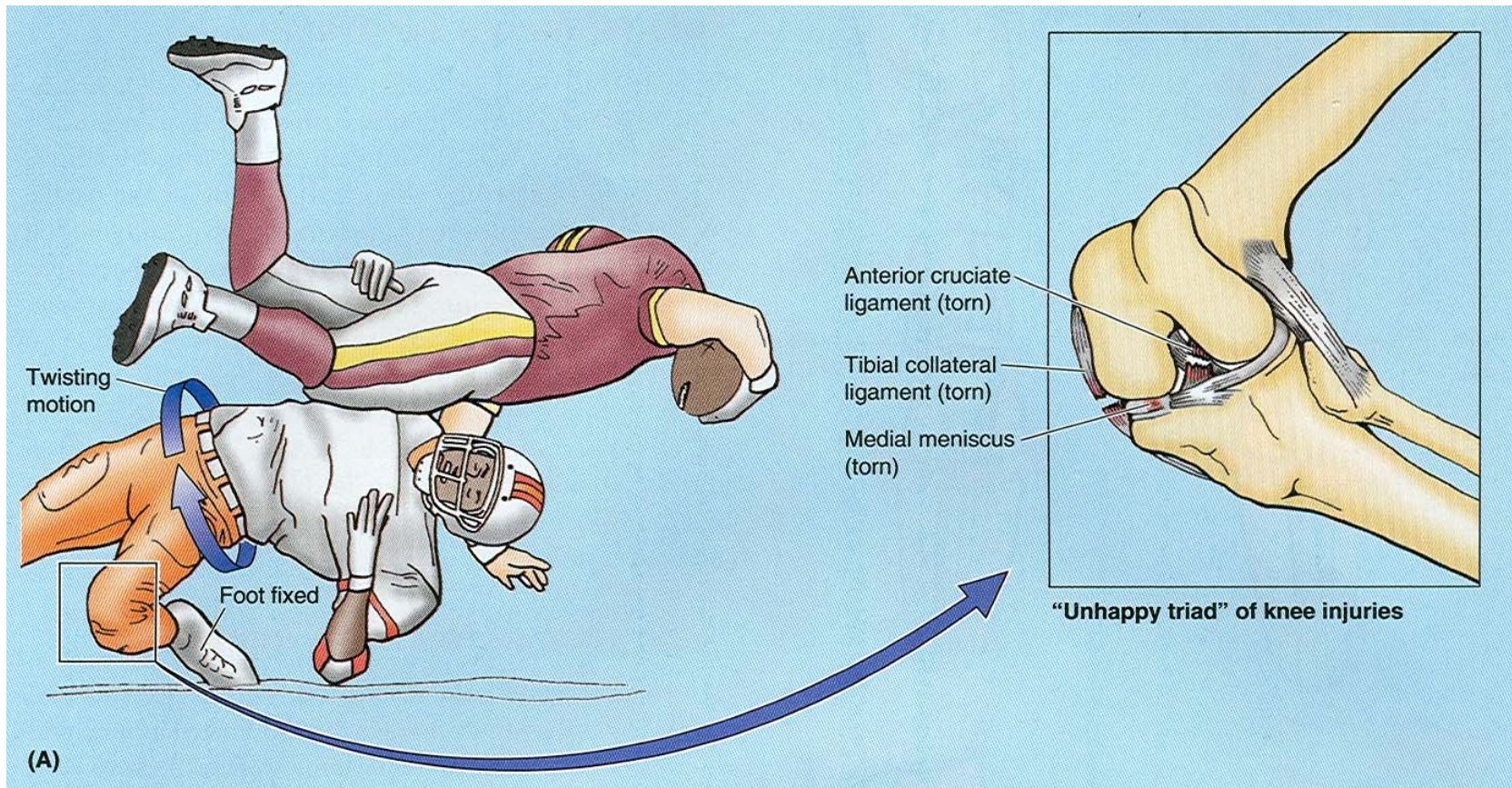
- Lateral rotation (with foot on the ground)-
popliteus (unlocking)/
semimembranosus
semitendinosus/ gracilis/ sartorius
- Medial rotation (with foot on the ground)-
biceps
tensor fasciae latae

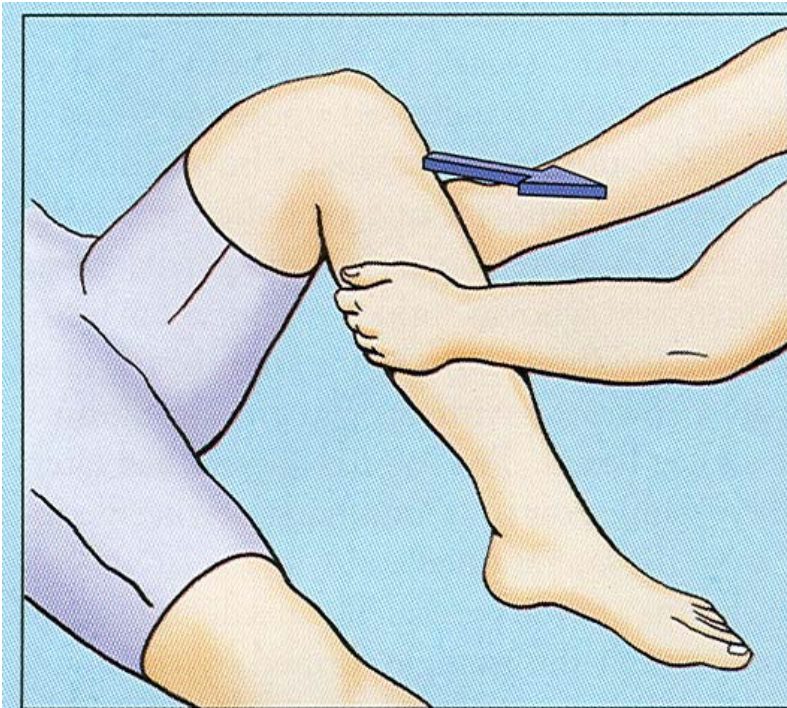
Locking and unlocking

- Locking:
In full extension: A slight medial rotation of femur on tibia (screw home position)
- Unlocking: A slight lateral rotation of femur on tibia (Popliteus acts as key; contraction has helped the rotation of lateral femoral condyle, pulls lateral lemniscus backwards.)

Applied anatomy

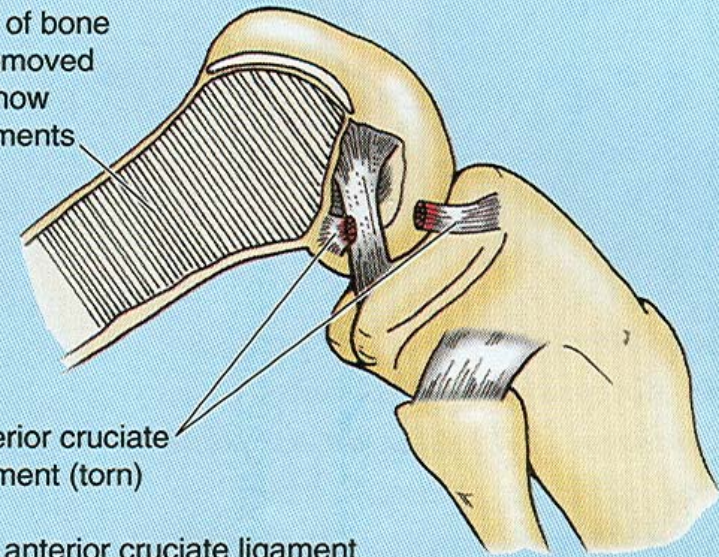
- Ligament sprains





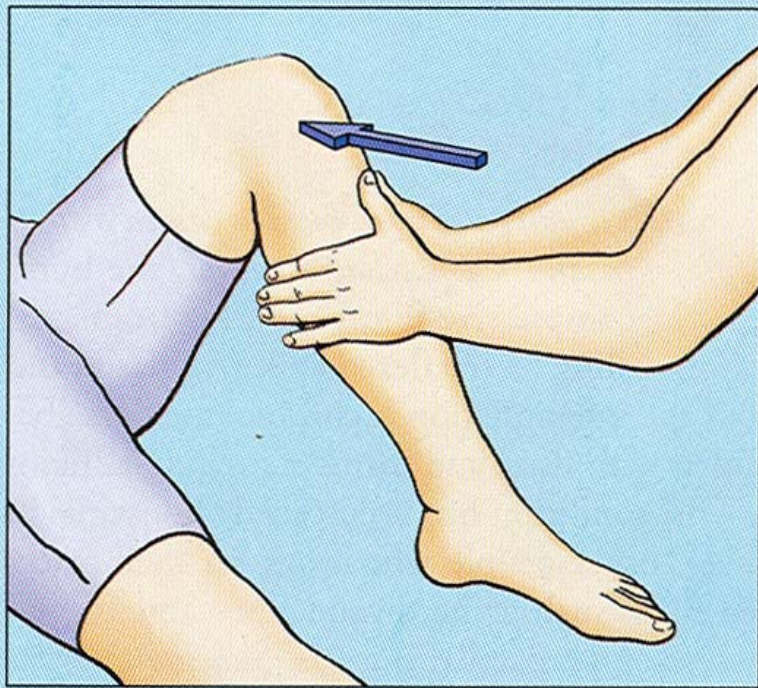
(B) Anterior drawer sign (ACL)

Half of bone
is removed
to show
ligaments

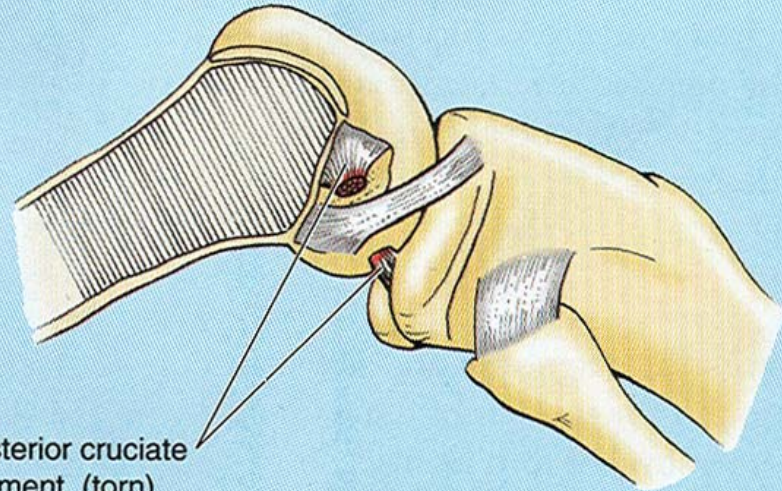


Anterior cruciate
ligament (torn)

The anterior cruciate ligament prevents the femur from sliding posteriorly on the tibia and hyperextension of the knee and limits medial rotation of the femur when the foot is on the ground, and the leg is flexed.



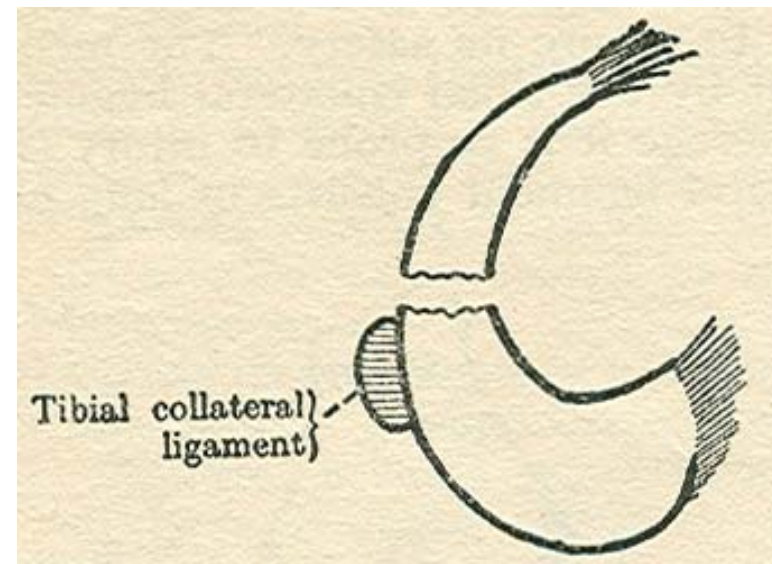
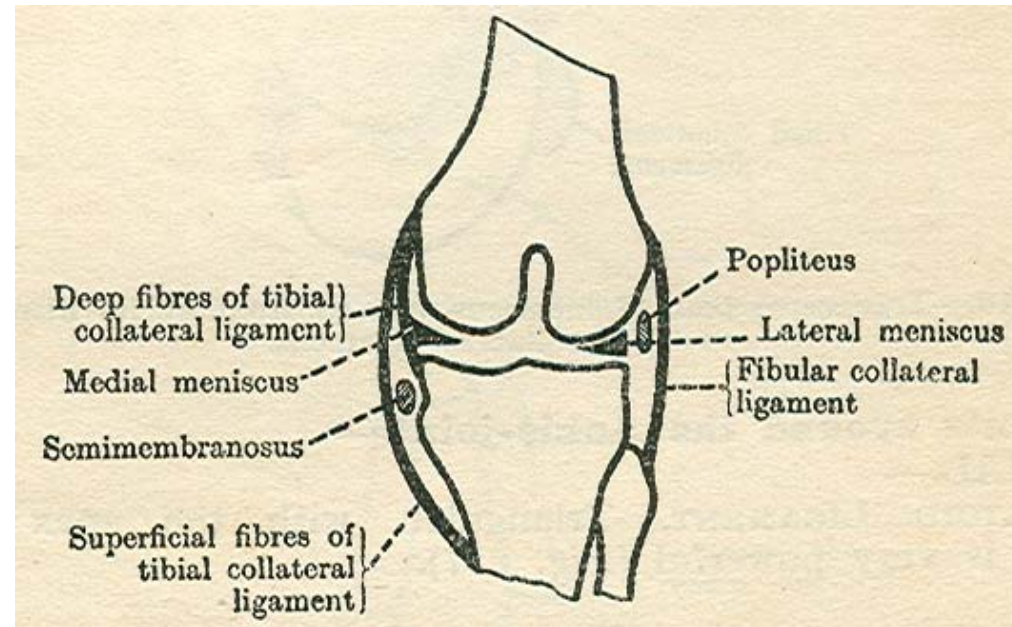
(C) Posterior drawer sign (PCL)



Posterior cruciate
ligament (torn)

The posterior cruciate ligament prevents
the femur from sliding anteriorly on the tibia,
particularly when the knee is flexed.

- Meniscal tears:



- Bursitis

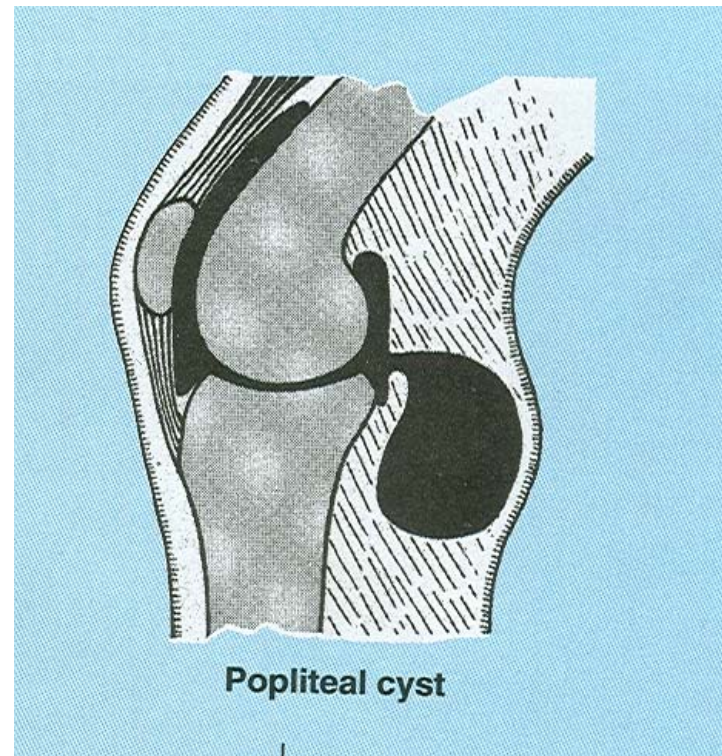
Housemaid's knee (prepatellar)

Clergyman's knee (subcutaneous
infrapatellar)

Deep infrapatellar

Suprapatellar

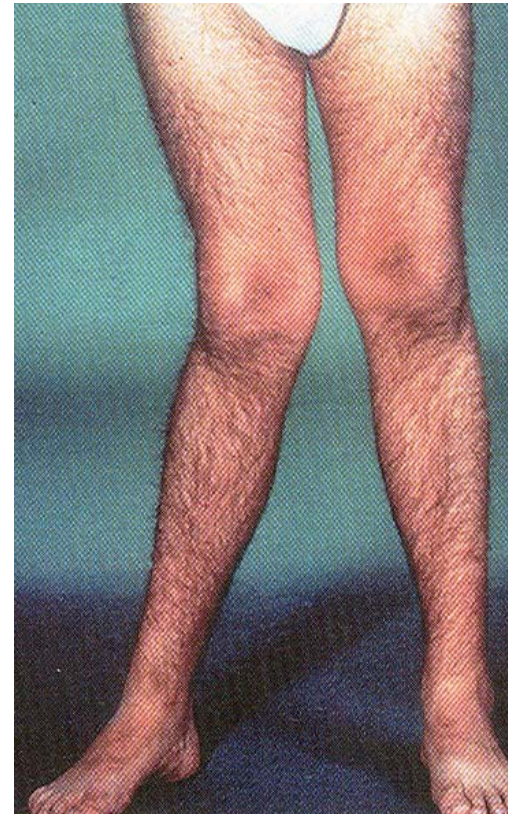
Popliteal cysts

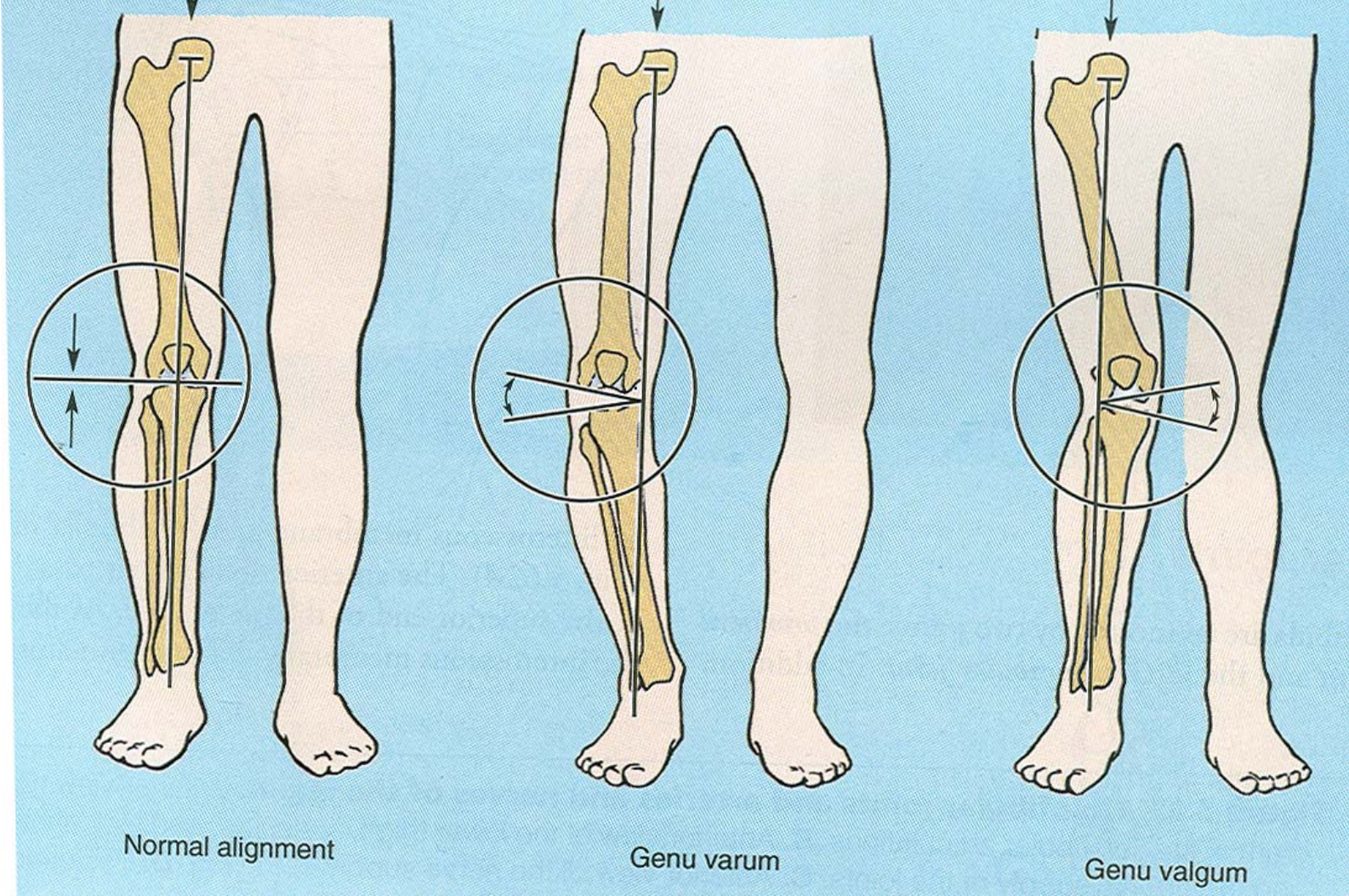


- Deformities

Genu varum (adduction deformity)

Genu valgum (abduction deformity)





- Aspiration
- Arthroscopy
- Replacements

