

Hip Joint - Ligaments

Anterior View

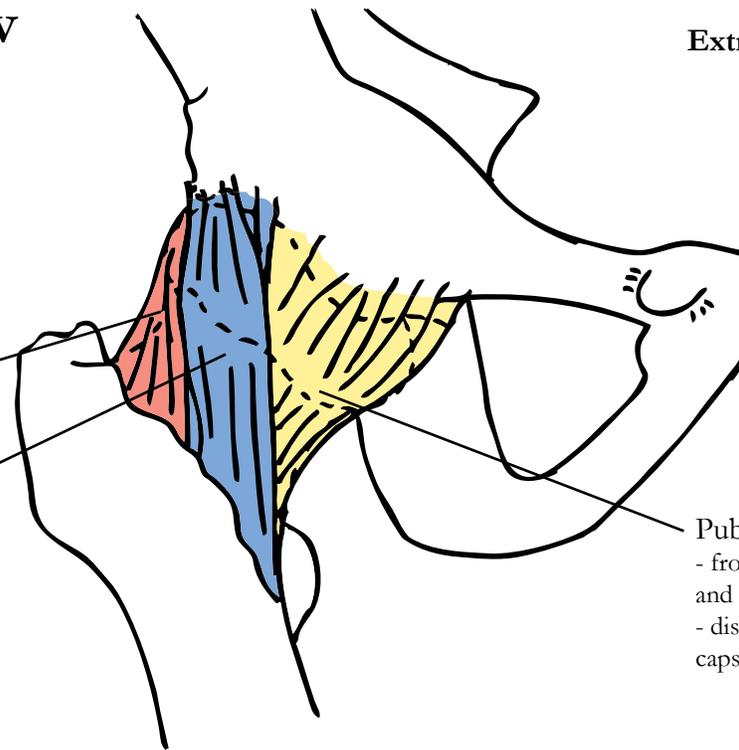
Iliofemoral ligament
(Ligament of Bigelow)
 - from inferior part anterior
 inferior iliac spine and iliac part of
 acetabular rim
 - one of strongest ligaments in
 body

- Upper Band
 - to superior part femoral intertro-
 chanteric line

- Lower Band
 - to inferior part femoral intertro-
 chanteric line

Extracapsular Ligaments

Pubofemoral Ligament
 - from pubic part of acetabular rim
 and lateral superior pubic ramus
 - distally blends with hip joint
 capsule medially



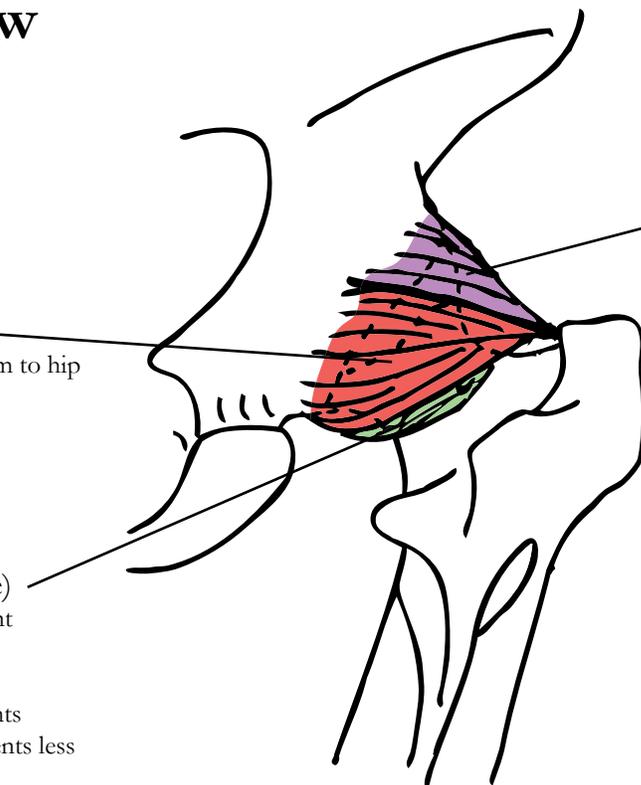
Posterior View

Ischiofemoral Ligament
 - from ischial part of acetabular rim to hip
 joint capsule posteriorly

Iliofemoral Ligament
 - from the iliac part of acetabular
 rim to superior part of femoral
 intertrochanteric line

Intracapsular Ligaments

Zona Orbicularis (of capsule)
 - thickened constricted area of joint
 around femoral neck
 - fibers pass circularly
 - ligament with no bony attachments
 - visible posteriorly because ligaments less
 prominent



Hip Joint - Cross Section

Acetabular Labrum

- pad of fibrocartilage attached to acetabular rim
- function - deepens the joint to allow better fit between the bone ends

Fibrous Joint Capsule

- from exterior rim of acetabulum to femoral neck, anteriorly at intertrochanteric line

Zona Orbicularis

- thickened circular fibers of joint capsule at neck of femur

Retinacula

- longitudinal capsular fibers that reflect superiorly along the femoral neck
- allow passage of blood vessels from capsule and synovium to femoral head

Synovium (dashed lines)

- lines all structures within joint capsule except bony articular surfaces
- part that lines retinacula are raised into folds and vessels pass through these

Medial (*lateral*) Femoral Circumflex Artery (not pictured)

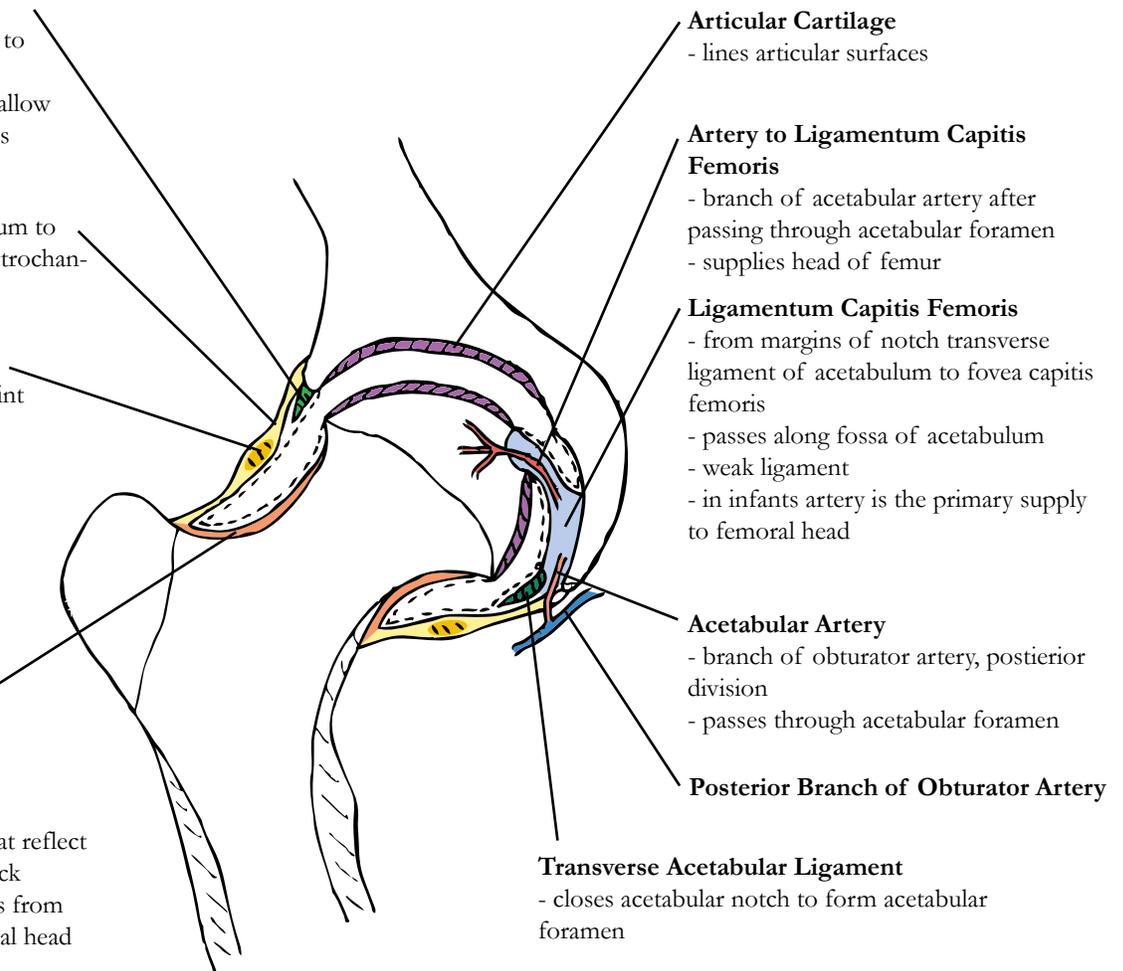
- ascending branch passes along the femoral intertrochanteric crest (*line*) and gives rise to branches which pass through the retinacula to supply the femoral head and neck
- anastomose with branches in the femoral head

Superior Gluteal Artery (not pictured)

- branch that arise from the deep branch and continue laterally and inferiorly to supply the hip joint

Inferior Gluteal Artery (not pictured)

- branch(es) which pass laterally and inferiorly to supply the piriformis and superior gemellus muscles then continue to the hip joint



Articular Cartilage

- lines articular surfaces

Artery to Ligamentum Capitis Femoris

- branch of acetabular artery after passing through acetabular foramen
- supplies head of femur

Ligamentum Capitis Femoris

- from margins of notch transverse ligament of acetabulum to fovea capitis femoris
- passes along fossa of acetabulum
- weak ligament
- in infants artery is the primary supply to femoral head

Acetabular Artery

- branch of obturator artery, posterior division
- passes through acetabular foramen

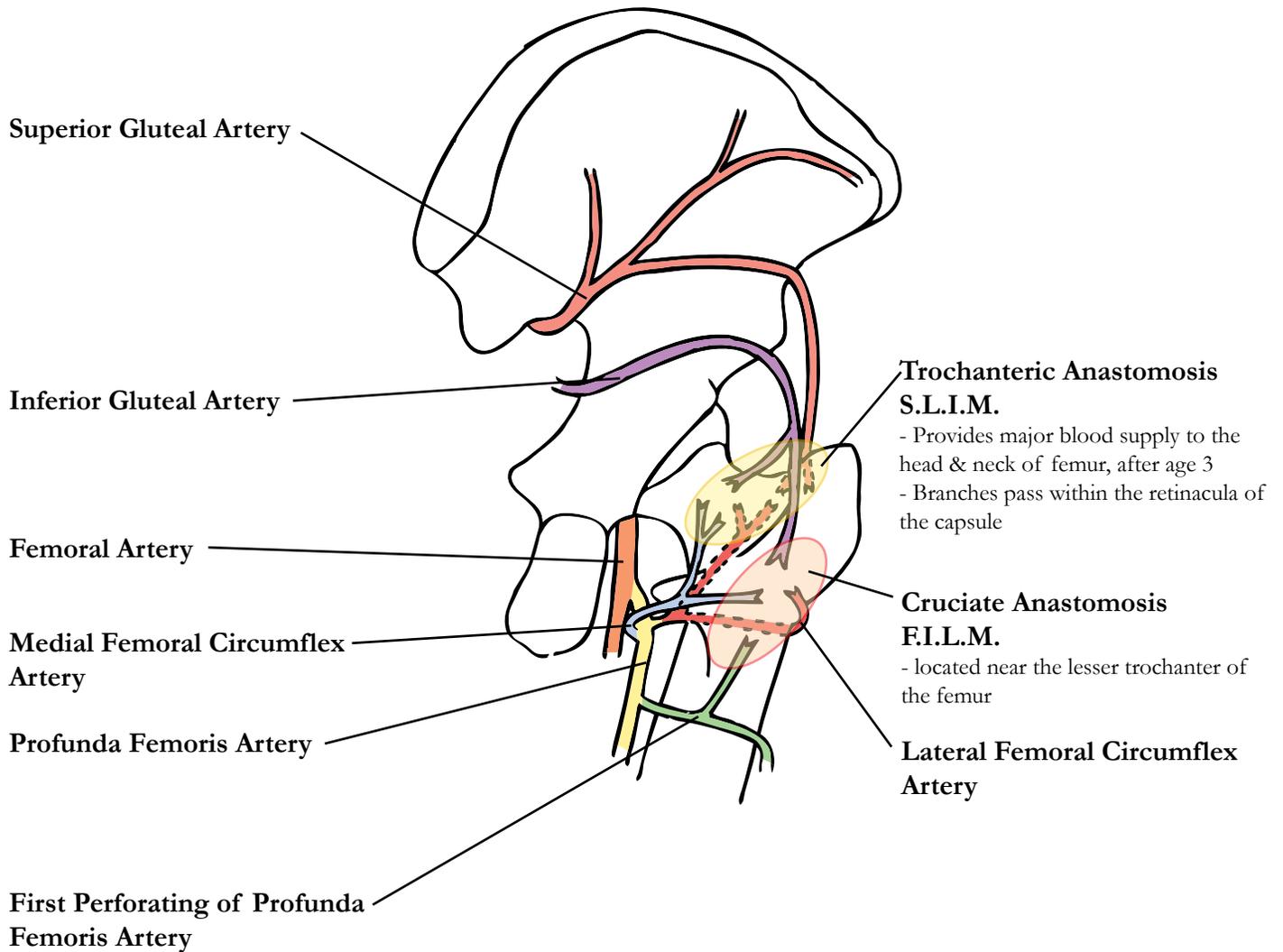
Posterior Branch of Obturator Artery

Transverse Acetabular Ligament

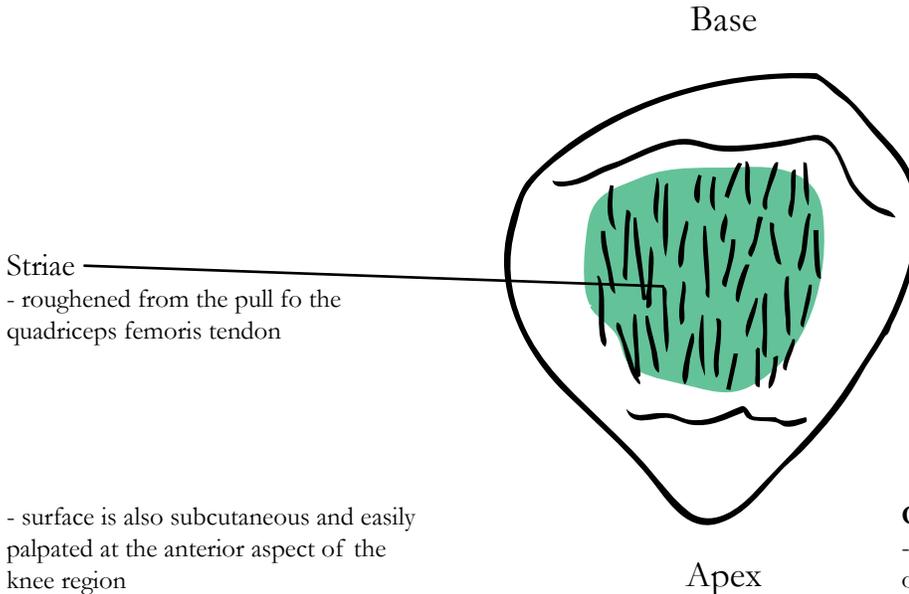
- closes acetabular notch to form acetabular foramen

Hip Anastamoses

Posterior View



Patella - Anterior View



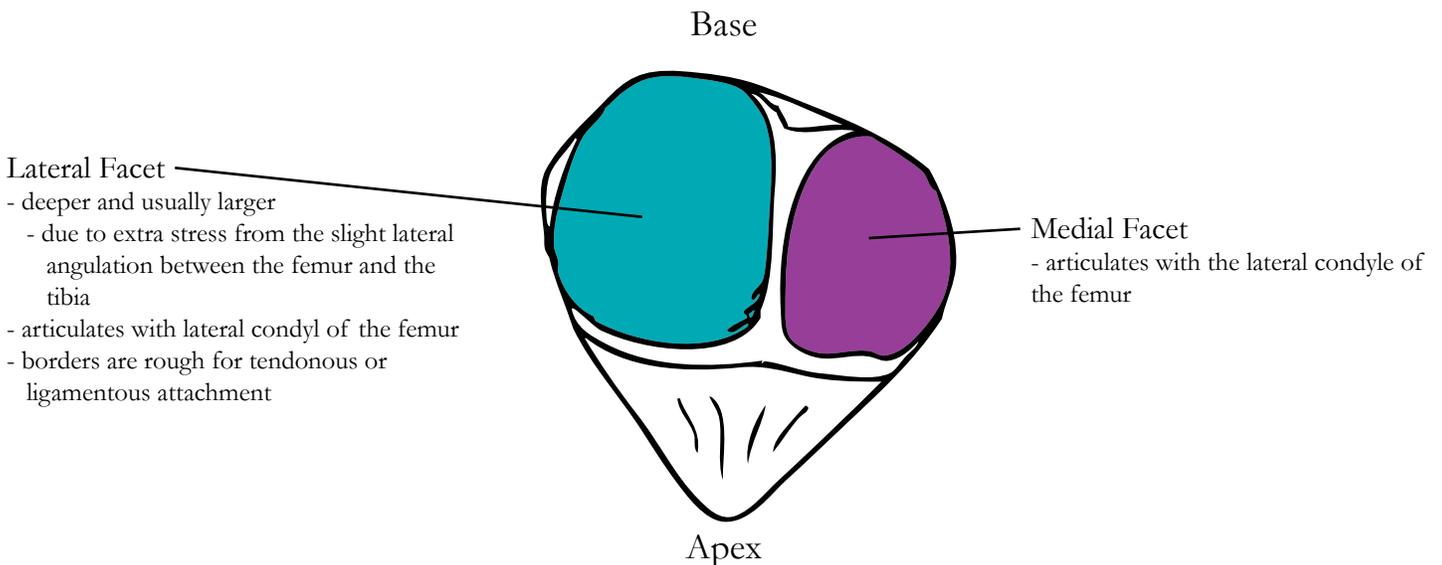
- roughened from the pull fo the quadriceps femoris tendon

- surface is also subcutaneous and easily palpated at the anterior aspect of the knee region
 - subcutaneous means that the deep fascia attaches to this surface.

Ossification of the Patella

- develops form a single or several centers of ossification
 - center(s) appear between **3 and 6 years** and are fused by puberty
 - if centers do not fuse, get a bipartite patella

Patella - Posterior View



- deeper and usually larger
 - due to extra stress from the slight lateral angulation between the femur and the tibia
 - articulates with lateral condyl of the femur
 - borders are rough for tendonous or ligamentous attachment

- articulates with the lateral condyle of the femur

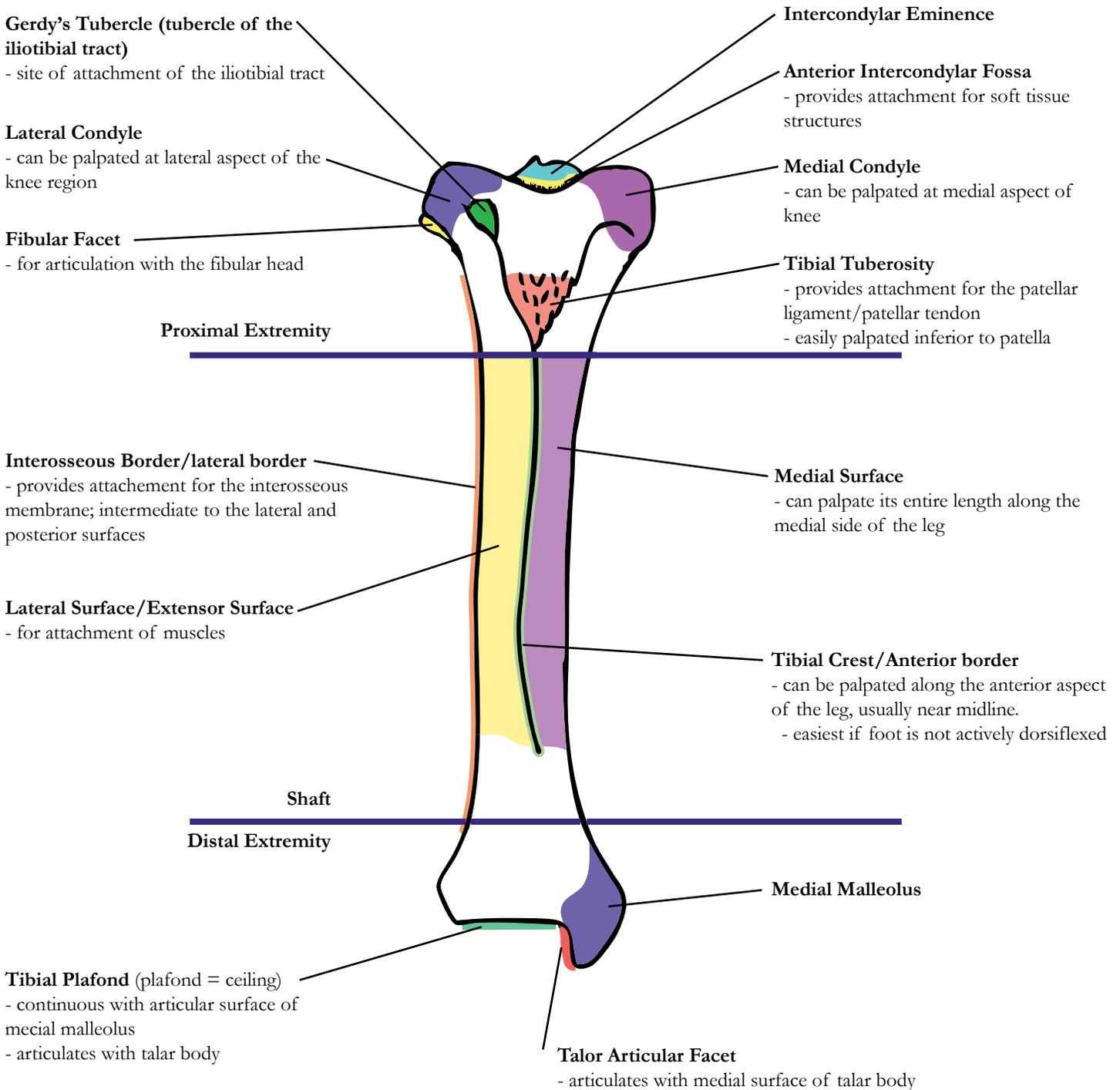
- most of this surface is smooth for articulation with the femoral condyles
 - the medial, lateral and superior edges are rough for attachment of the quadriceps femoris tendon

Patella

- aka: knee cap
 - largest sesmoid bone in the body
 - articulates only with the femur
 - provides leverage for the quadriceps femoris muscle
 - know left from right (this is left)

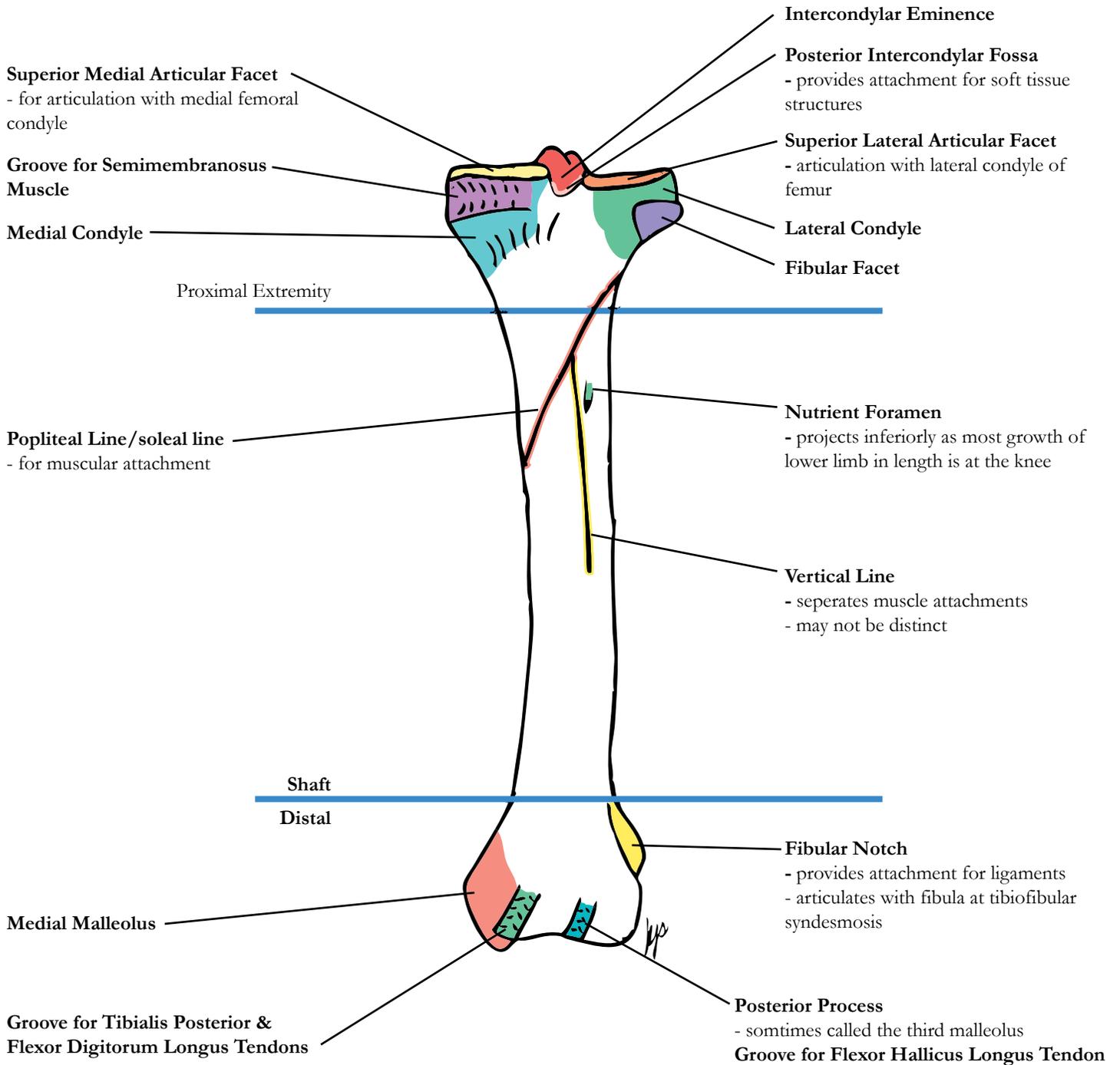
Tibia

Anterior View



Tibia

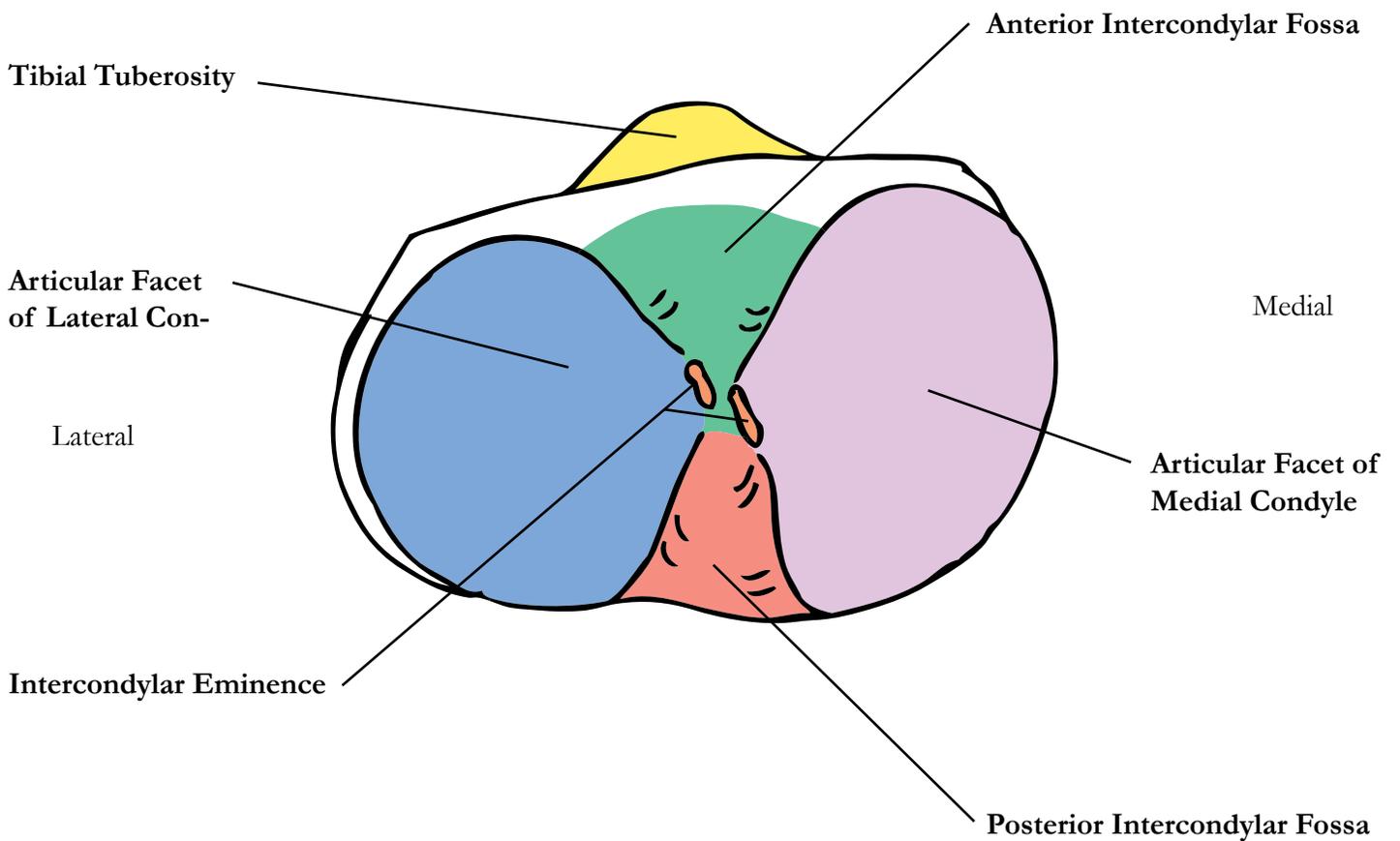
Posterior View



Tibia

Superior View

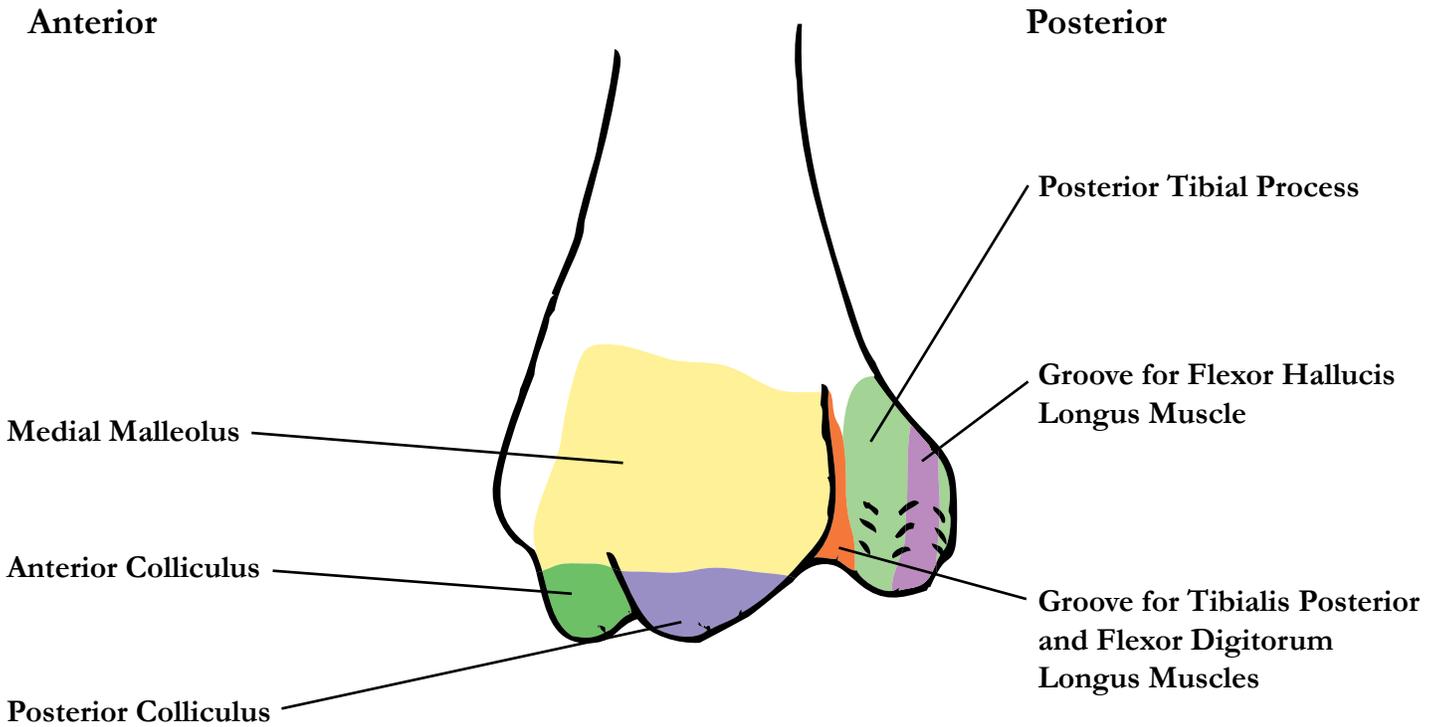
Anterior



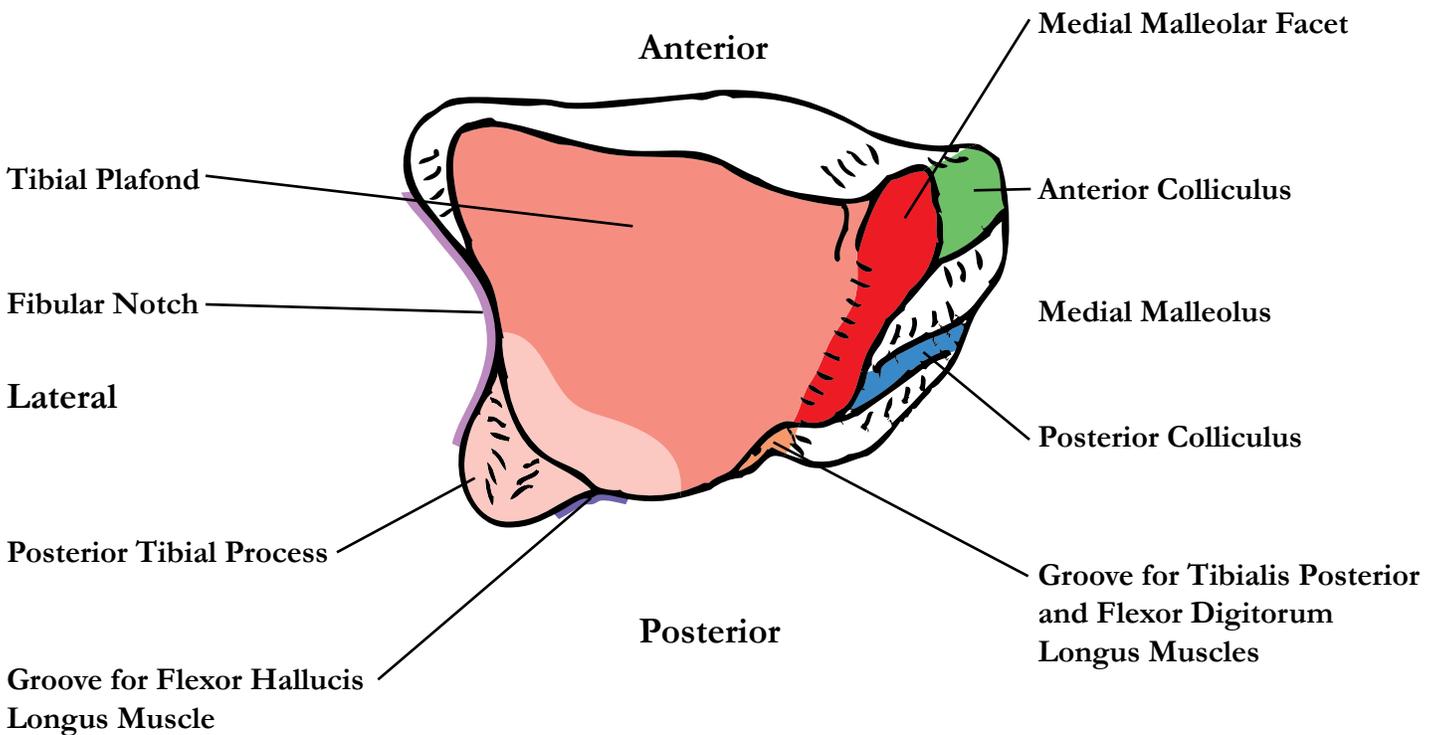
Posterior

*Left Tibia

Tibia - Medial View

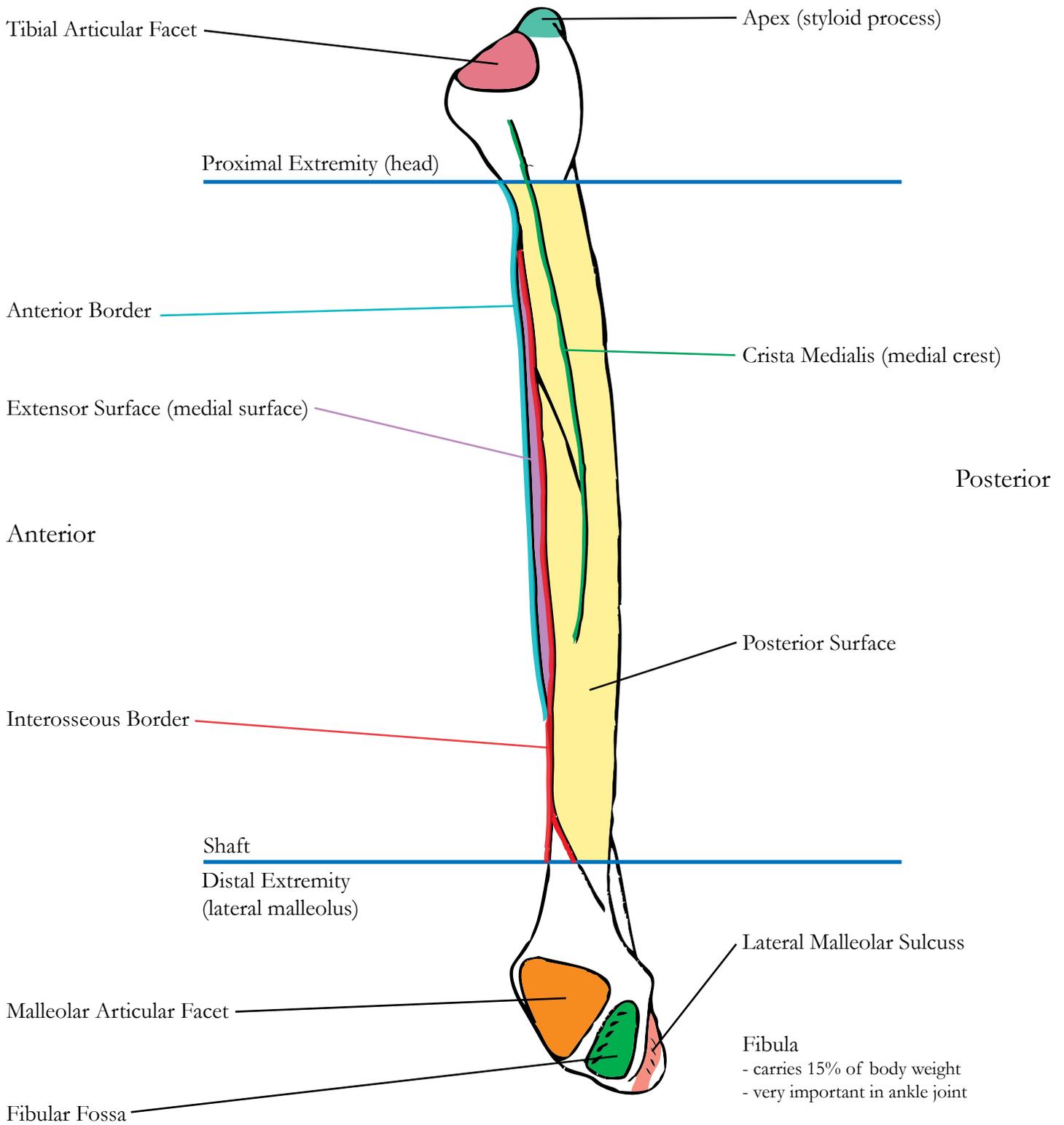


Tibia - Inferior View



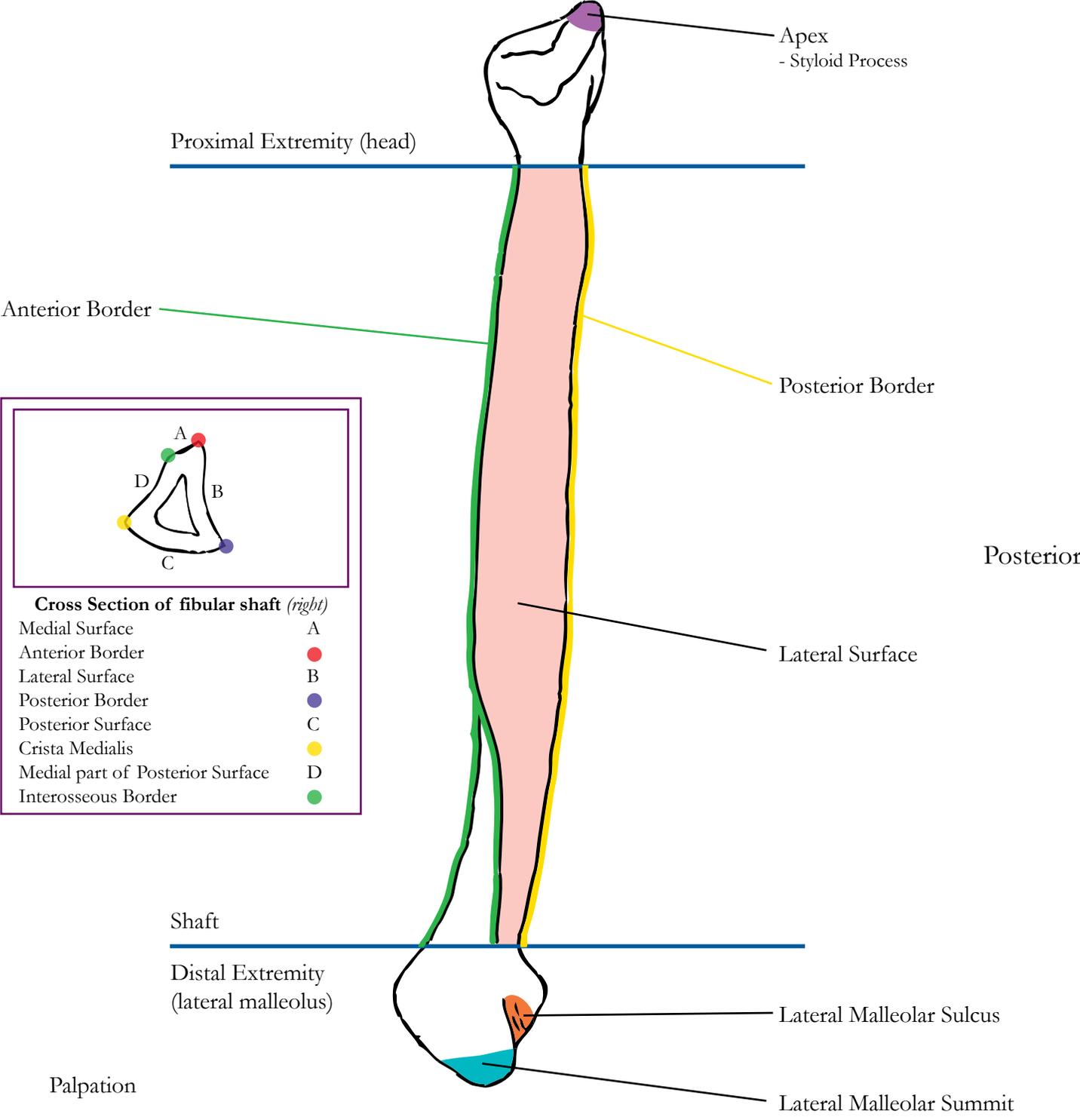
Fibula

Medial View

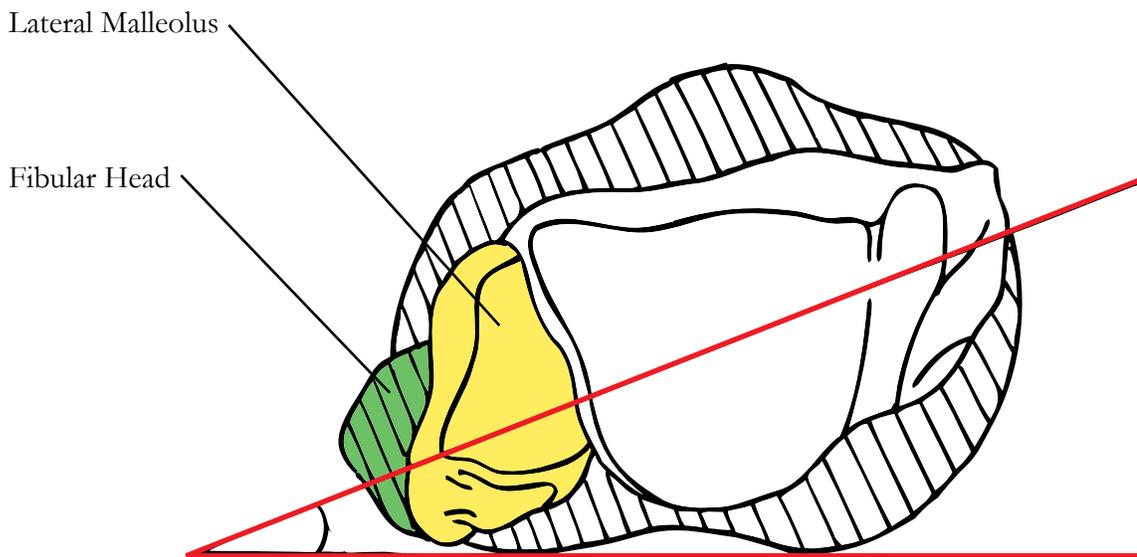


Fibula

Lateral View

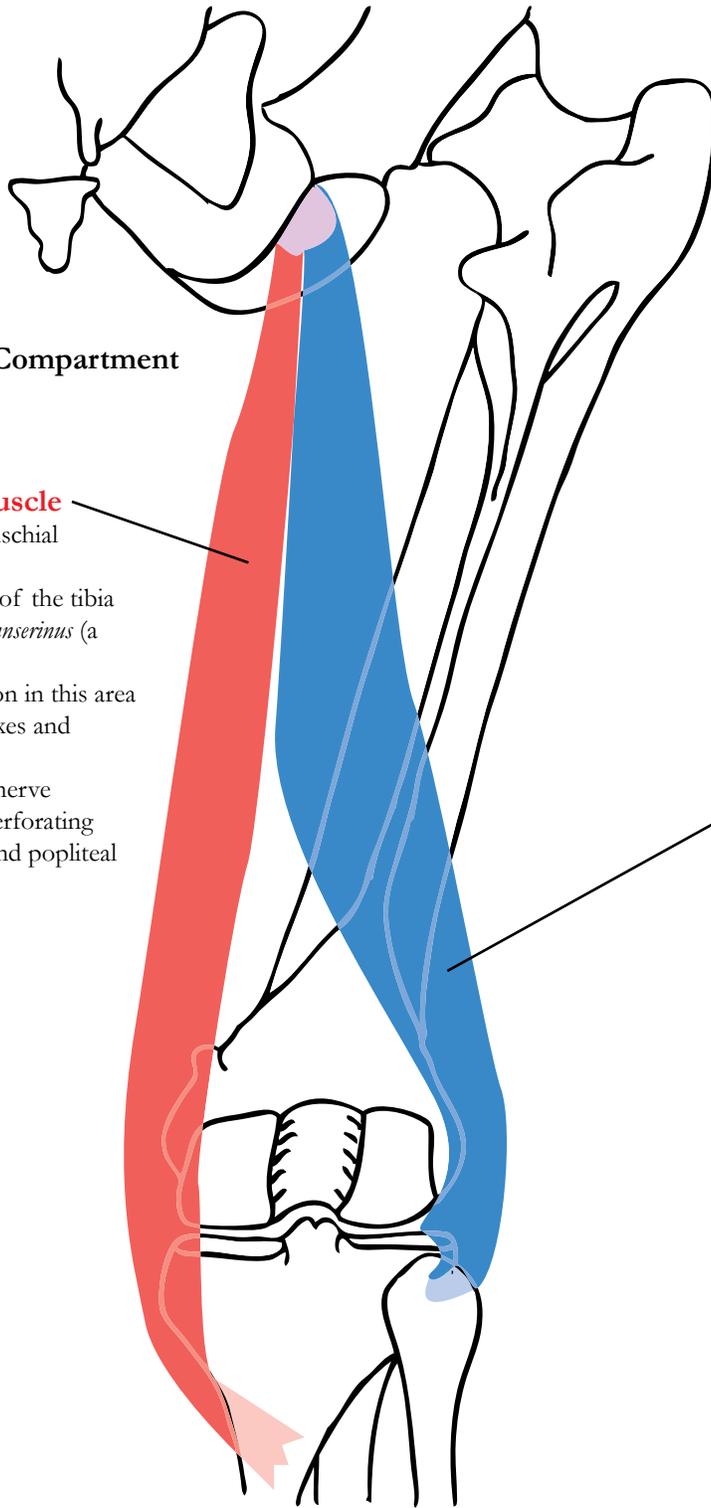


Tibiofibular Torsion



18 - 23 external in adults
decreased in children (0 at birth)

Thigh - Posterior View



Posterior Femoral Compartment Superficial layer

Semitendinosus Muscle

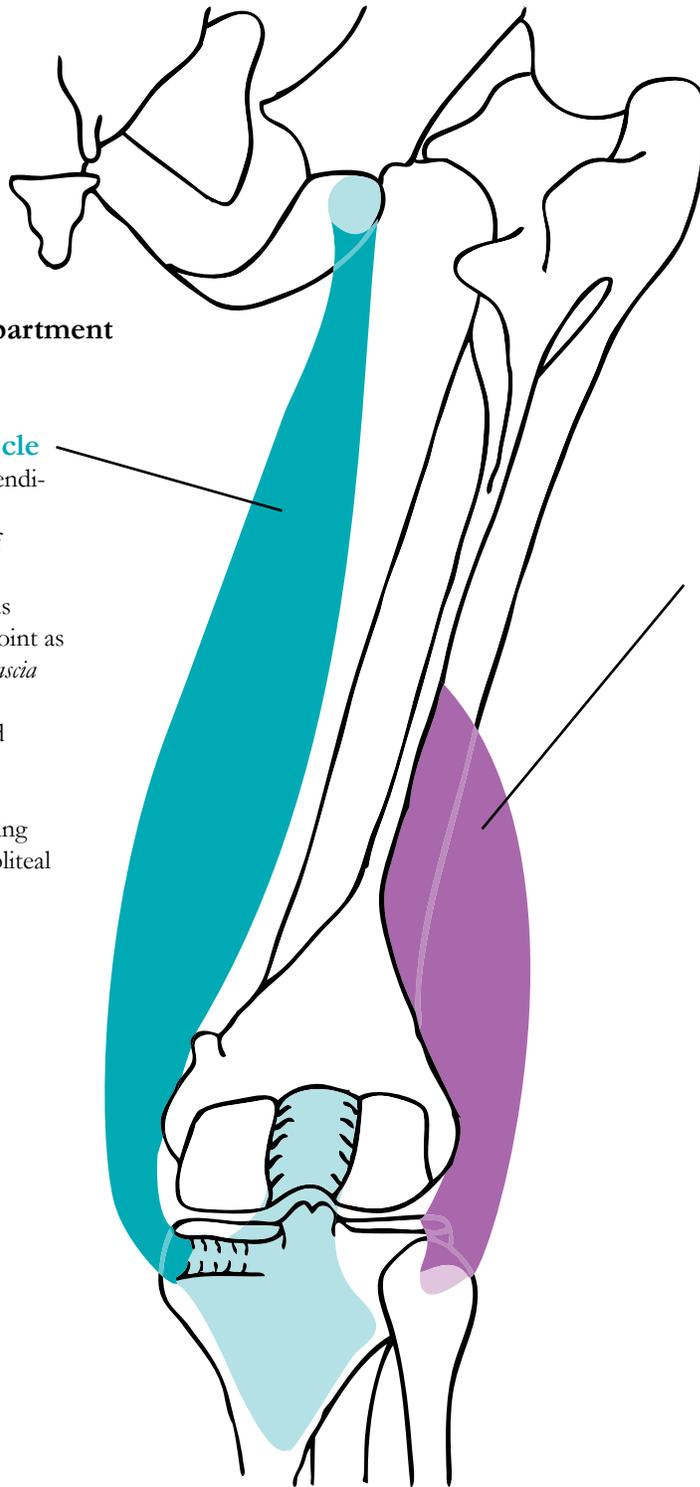
O: posteroinferomedial ischial tuberosity
 I: proximal medial shaft of the tibia
 - forms part of the *pes anserinus* (a tendinous structure)
 - more prominent tendon in this area
 A: extends the thigh; flexes and **medially** rotates the leg
 NS: tibial part of sciatic nerve
 AS: profunda femoral perforating arteries, inferior gluteal and popliteal arteries

Biceps Femoris Muscle

- long head

O: posteroinferomedial ischial tuberosity (squared posterior part)
 I: Lateral aspect of the fibular head and the anterior edge of the lateral tibial condyle; shared with short head of biceps femoris muscle
 A: Extends the thigh; flexes and **laterally** rotates the leg
 NS: Tibial part of sciatic nerve
 AS: profunda femoral perforating arteries, inferior gluteal and popliteal arteries

Thigh - Posterior View



Posterior Femoral Compartment Deep Layer

Semimembranosus Muscle

- located anteromedial to semitendinous muscle

O: posterosuperolateral part of ischial tuberosity

I: groove for semimembranosus muscle and the posterior knee joint as the *oblique popliteal ligament* and *fascia over the popliteus muscle*

A: extends the thigh; flexes and **medially** rotates the leg

NS: tibial part of sciatic nerve

AS: profunda femoral perforating arteries, inferior gluteal and popliteal arteries

Biceps Femoris Muscle

- short head

O: lateral lip of the linea aspera and lateral supracondylar line (also the posterior femoral intermuscular septum)

I: Lateral aspect of the fibular head and lateral tibial condyle; shared with long head of biceps femoris muscle

A: flexes and **laterally** rotates the leg

NS: common fibular part of sciatic nerve

AS: profunda femoral perforating arteries and popliteal arteries

Hamstring Muscles

O: ischial tuberosity

A: extend the thigh and flex the leg

NS: sciatic nerve

1. Biceps femoris muscle
2. Semitendinosus muscle
3. Semimembranosus muscle

Thigh - Anterior View

Anterior Femoral Compartment Superficial Layer

Tensor Fascia Lata Muscle

O: Lateral lip of iliac crest, anterior to iliac tubercle (and fascia lata)

I: iliotibial band which attaches at Gerdy's tubercle

A: flex and abduct the thigh
- this stabilizes hip during gait;
extend the leg

- stabilizes the knee during gait

NS: superior gluteal nerve

AS: lateral femoral circumflex artery and superior gluteal artery

Iliotibial band

Sartorius Muscle

- longest muscle in body; strap-like
O: anterior superior iliac spine (and fascia lata)

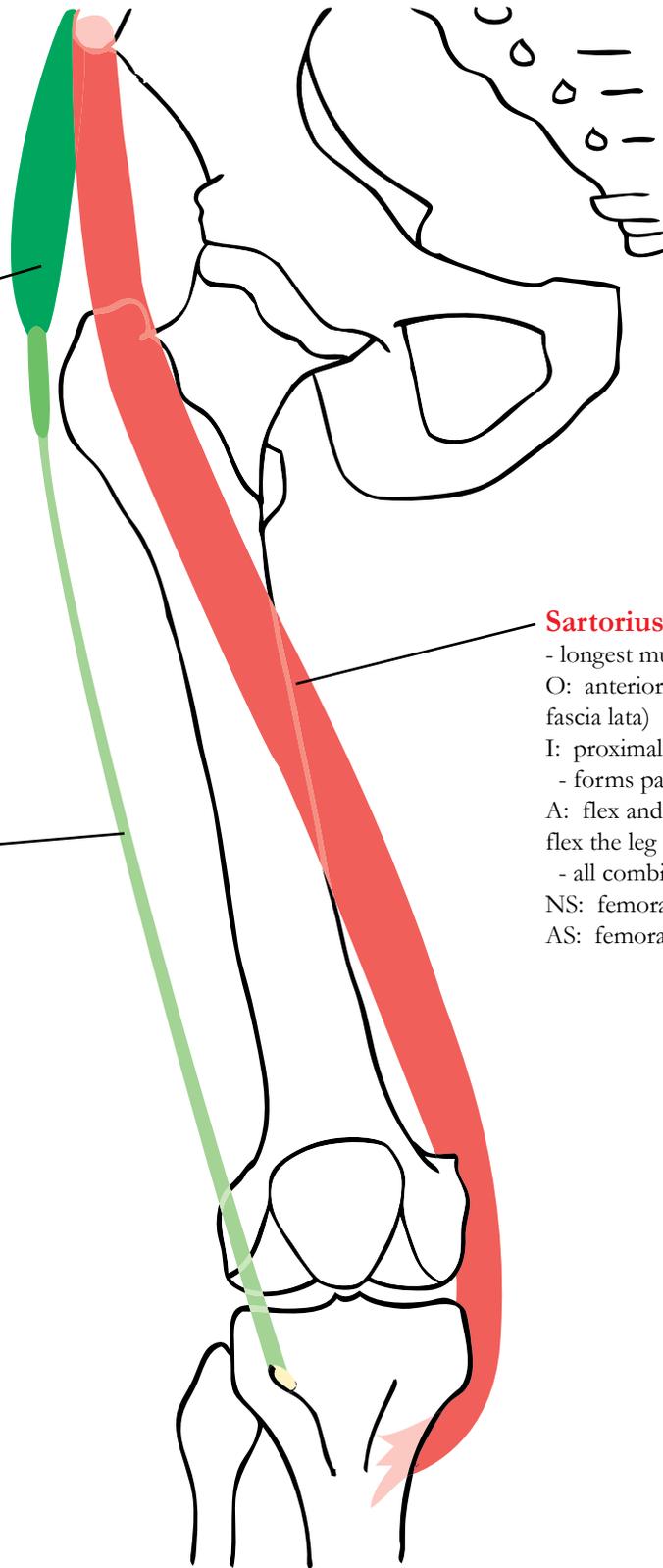
I: proximal medial shaft of tibia
- forms part of the *pes anserinus*

A: flex and laterally rotate the thigh;
flex the leg

- all combined is the tailor position

NS: femoral nerve

AS: femoral artery



Thigh - Anterior View

Anterior Femoral Compartment
Intermediate Layer

Rectus Femoris Muscle

O: *Straight Head/ Anterior Head*

- anterior inferior iliac spine

Reflected Head/ Posterior Head

- iliac part of acetabular rim, externally

I: base of patella forming part of the quadriceps tendon, and then to the tibial tuberosity via the patellar tendon

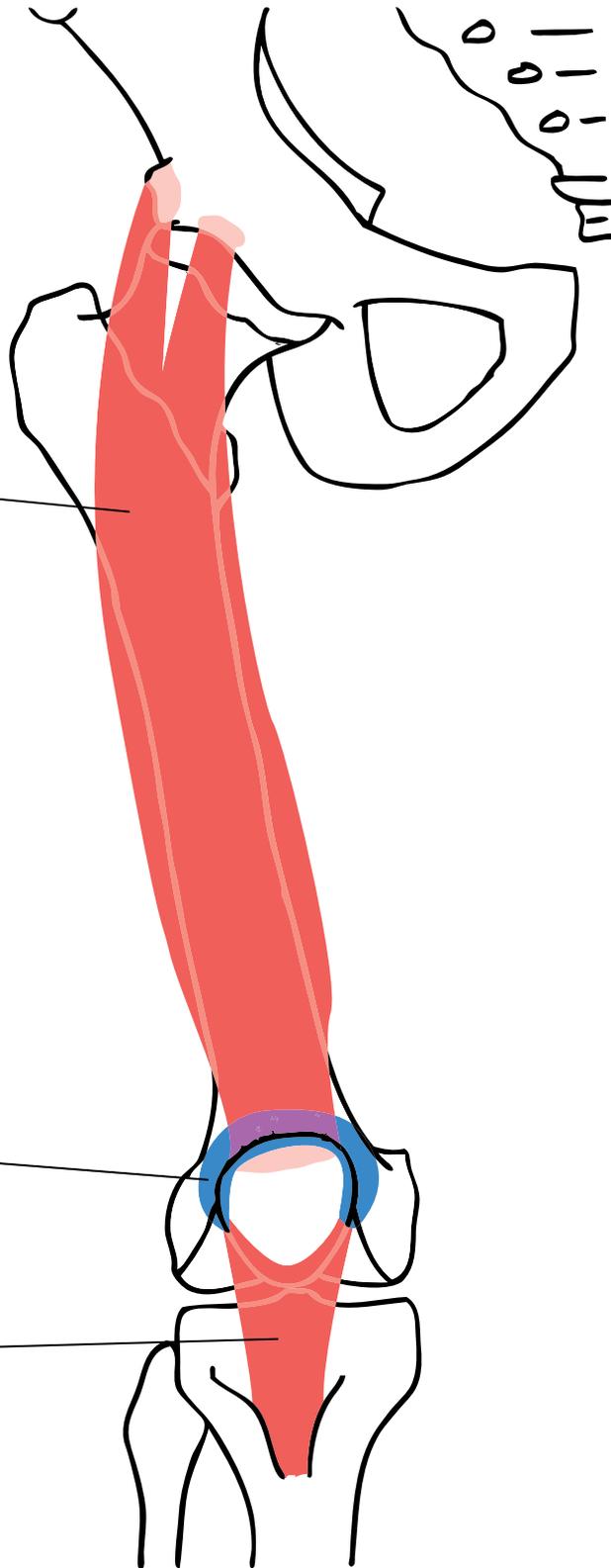
A: extend the knee; assist with flexion of the thigh

NS: femoral nerve

AS: descending branch of lateral femoral circumflex artery

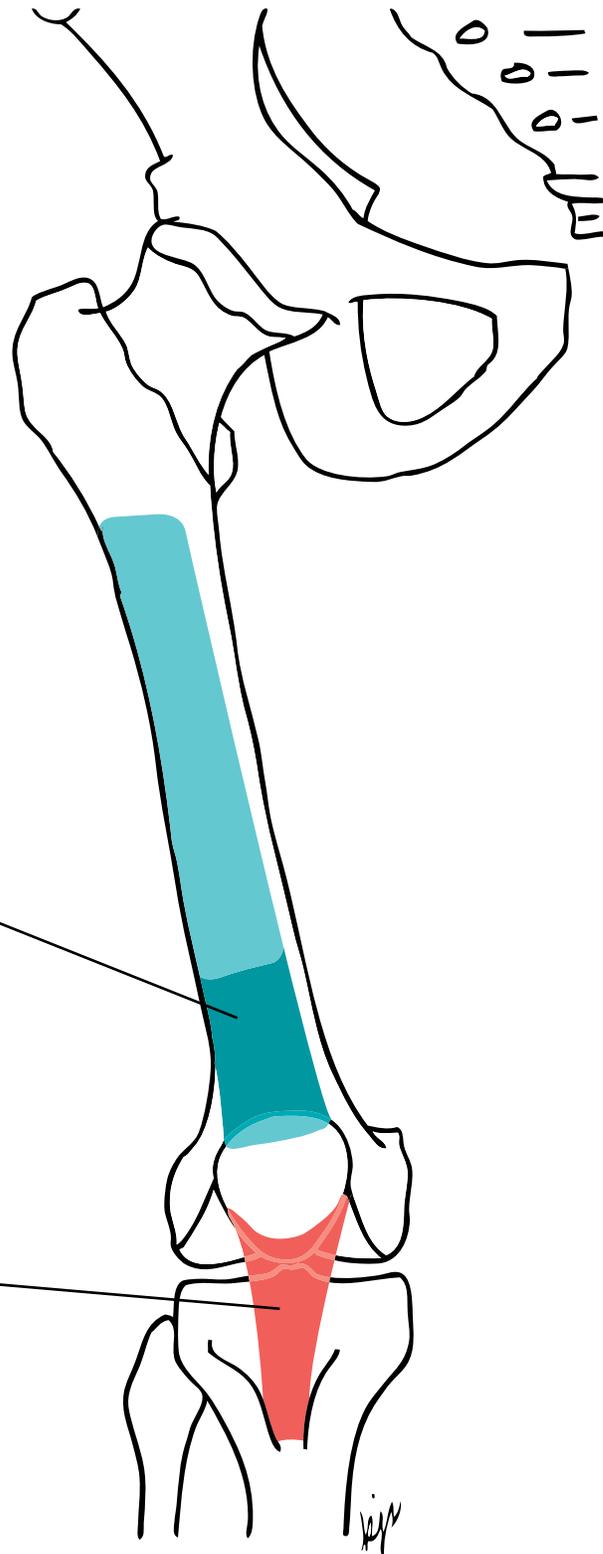
Quadriceps tendon

Patellar Tendon



Thigh - Anterior View

Anterior Femoral Compartment Deep Layer



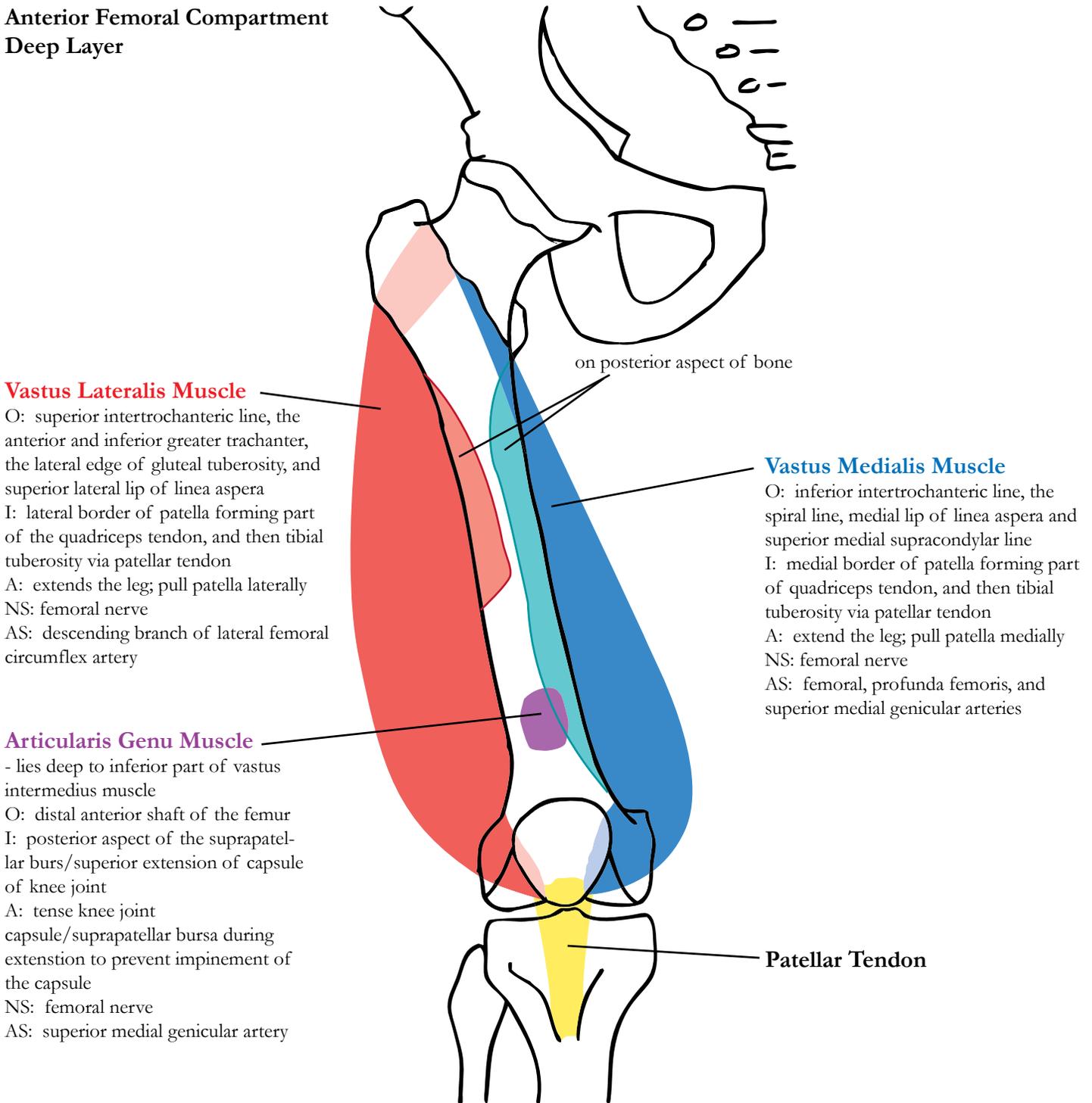
Vastus Intermedius Muscle

- directly deep to rectus femoris muscle
- O: superior 2/3 of the femoral shaft (anterior and lateral surfaces)
- I: base of the patella forming part of the quadriceps tendon, and the tibial tuberosity via the patellar tendon
- A: extends the leg
- NS: femoral nerve
- AS: descending branch of lateral femoral circumflex artery

Patellar Tendon

Thigh - Anterior View

Anterior Femoral Compartment Deep Layer



Vastus Lateralis Muscle

O: superior intertrochanteric line, the anterior and inferior greater trochanter, the lateral edge of gluteal tuberosity, and superior lateral lip of linea aspera
 I: lateral border of patella forming part of the quadriceps tendon, and then tibial tuberosity via patellar tendon
 A: extends the leg; pull patella laterally
 NS: femoral nerve
 AS: descending branch of lateral femoral circumflex artery

Vastus Medialis Muscle

O: inferior intertrochanteric line, the spiral line, medial lip of linea aspera and superior medial supracondylar line
 I: medial border of patella forming part of quadriceps tendon, and then tibial tuberosity via patellar tendon
 A: extend the leg; pull patella medially
 NS: femoral nerve
 AS: femoral, profunda femoris, and superior medial genicular arteries

Articularis Genu Muscle

- lies deep to inferior part of vastus intermedius muscle
 O: distal anterior shaft of the femur
 I: posterior aspect of the suprapatellar bursa/superior extension of capsule of knee joint
 A: tense knee joint capsule/suprapatellar bursa during extension to prevent impingement of the capsule
 NS: femoral nerve
 AS: superior medial genicular artery

Patellar Tendon

Quadriceps Femoris Muscle

- four of the anterior compartment thigh muscles, considered as one - together they form the *quadriceps tendon*. The quadriceps tendon attaches the quadriceps femoris muscle to the patella. The quadriceps tendon also envelops the patella and forms the *patellar tendon* which inserts onto the tibial tuberosity. (the patellar tendon is also called the patellar ligament or ligamentum patellae

I: base of patella, then the tibial tuberosity through the patellar tendon

A: extend the leg; aid in flexion of the hip

NS: femoral nerve

1. Rectus Femoris Muscle

2. Vastus Medialis Muscle

3. Vastus Lateralis Muscle

4. Vastus Intermedius Muscle