



General Anatomy

Lecture 10: Muscles of lower Limb

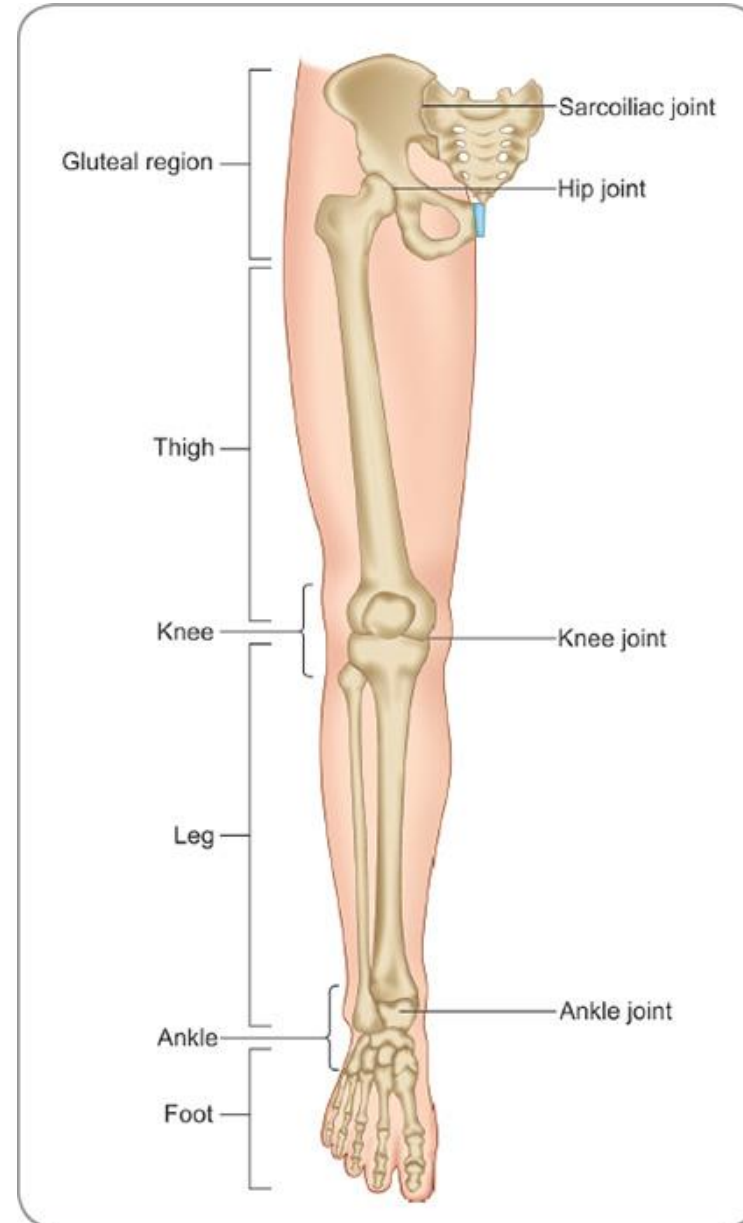
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Parts of the lower limb

- **Gluteal region** (covers the sides and back of the pelvis.)
- **Thigh** (from hip to knee)
- **Knee joint**
- **Leg** (Extends from knee to ankle)
- **Ankle joint**
- **Foot** Extends from heel to toes.

Divided into →

dorsum of foot & sole of foot (plantar surface)



Gluteal muscles

Three in number

1. **Gluteus maximus**

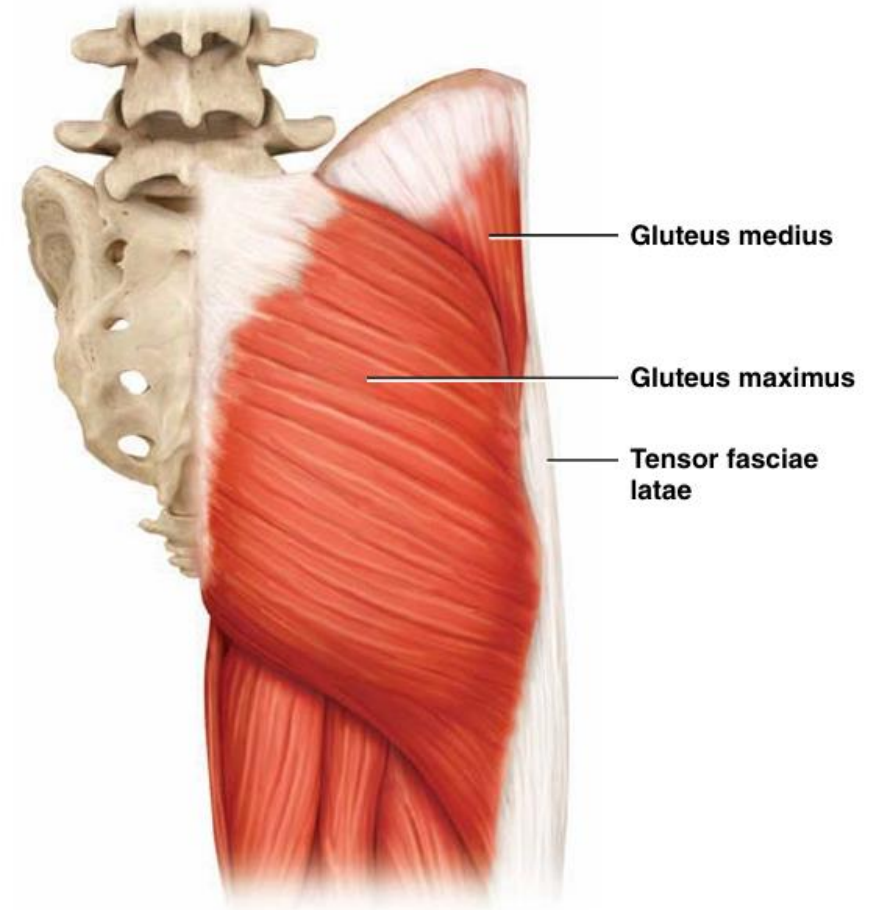
One of the largest muscles in the body.

Origin → Gluteal surface of ilium + Back of sacrum.

Insertion → gluteal tuberosity

Nerve supply → inferior gluteal nerve.

Action → Main extensor of hip



(b) Posterior superficial view

Gluteus medius & Gluteus minimus:

The gluteus medius is deep to the gluteus maximus and is a powerful abductor of the hip joint. It is a common site for an intramuscular injection.

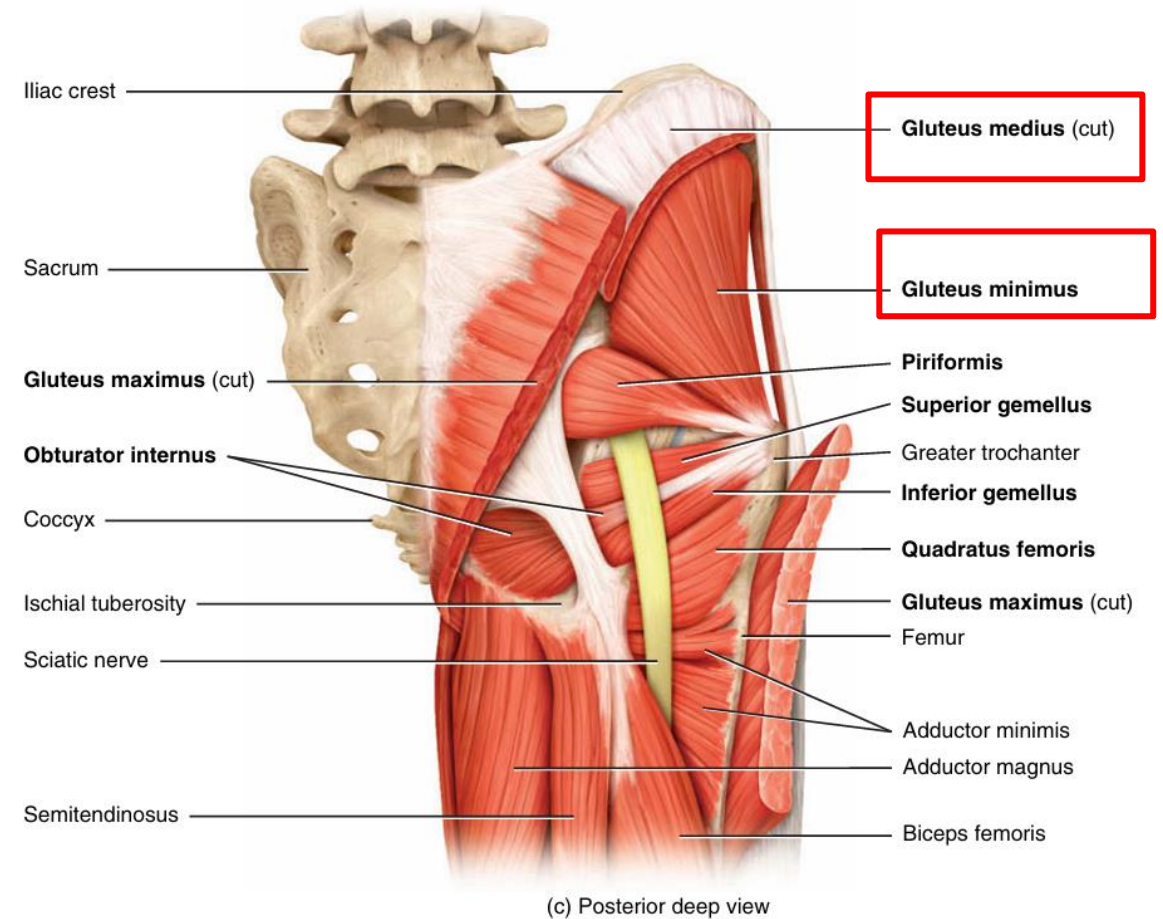
The gluteus minimus is the smallest of the gluteal muscles and lies deep to the gluteus medius.

Origin → Gluteal surface of ilium.

Insertion → greater trochanter of femur. *

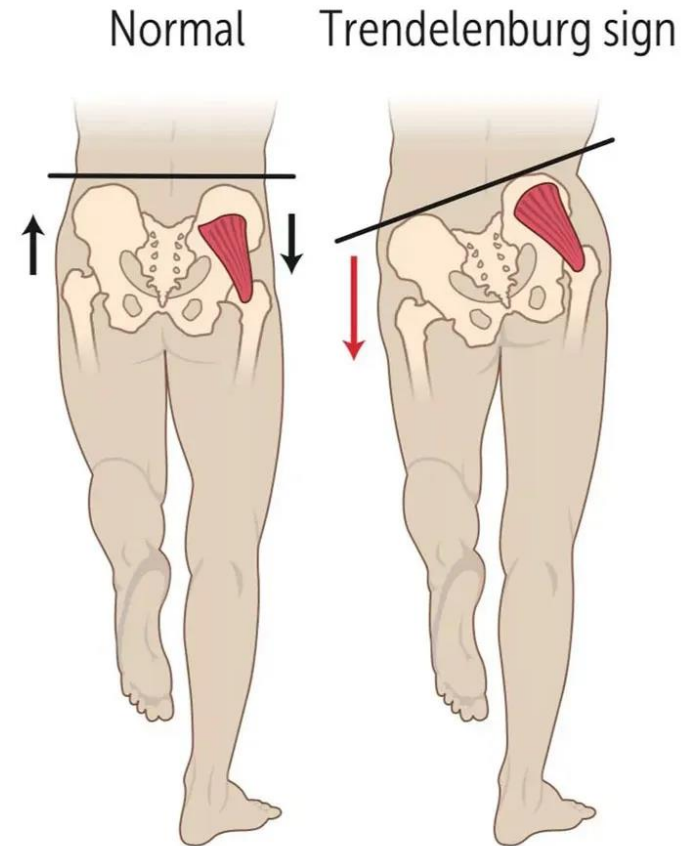
Nerve supply → superior gluteal nerve. *

Action → Abduction of hip



Trendelenburg sign

- When one foot is raised off the ground, gluteus Medius and minimus abduct the hip joint of the supported limb (limb on the ground) and the RMA abducts the pelvic bone toward the greater trochanter.
- Weakness in the hip abductor muscles consisting of the gluteus medius and gluteus minimus.

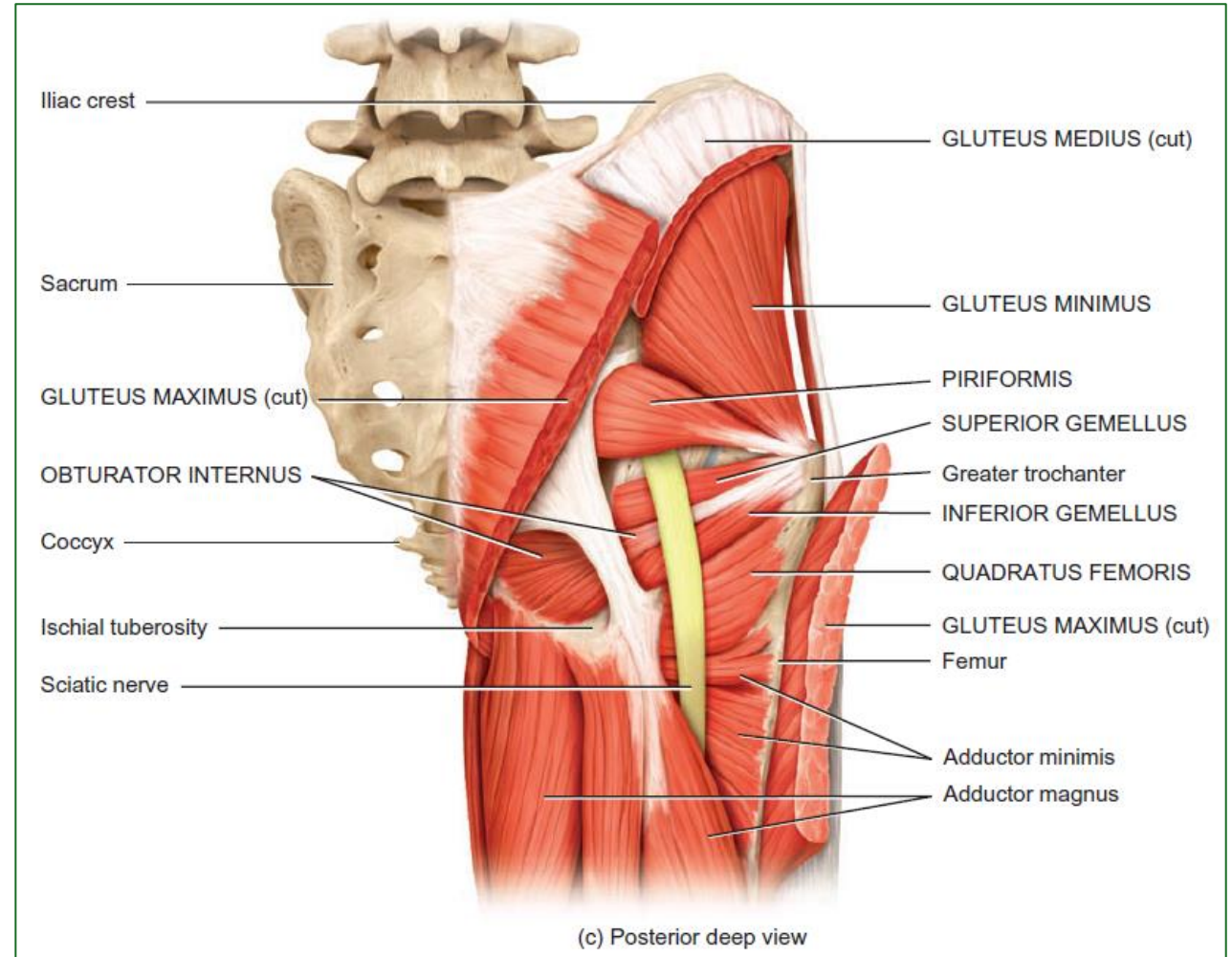


Lateral rotators of Hip

1. Piriformis.
2. Obturator internus.
3. Superior gemellus.
4. Inferior gemellus.
5. Quadratus femoris.
6. Obturator externus.

Origin: from hip bone except piriformis → takes origin from sacrum. **Insertion:** into **greater trochanter of femur.**

Nerve supply: branches of sacral plexus. *
Action: lateral rotation of hip



Muscles of the Gluteal region (Buttocks)

Muscle	Action	Notes
Gluteus maximus	Powerful Extensor	With fat forms the buttocks
Gluteus Medius (IM)	Powerful Abductor	Tilts pelvis when walking to permit opposite leg to clear ground initiating walking
Gluteus minimus	Abduct thigh	
Piriformis	Lateral rotators of the thigh	Between these two muscles is a small space through which pass the Sciatic nerve
Gemellus superior		
Obturator internus		
Gemellus inferior		
Quadratus femoris		

Main muscles of the Thigh

Three fascial septa pass from the inner aspect of the deep fascial sheath of the thigh to the linea aspera of the femur divide them into:

1. Anterior Compartment:

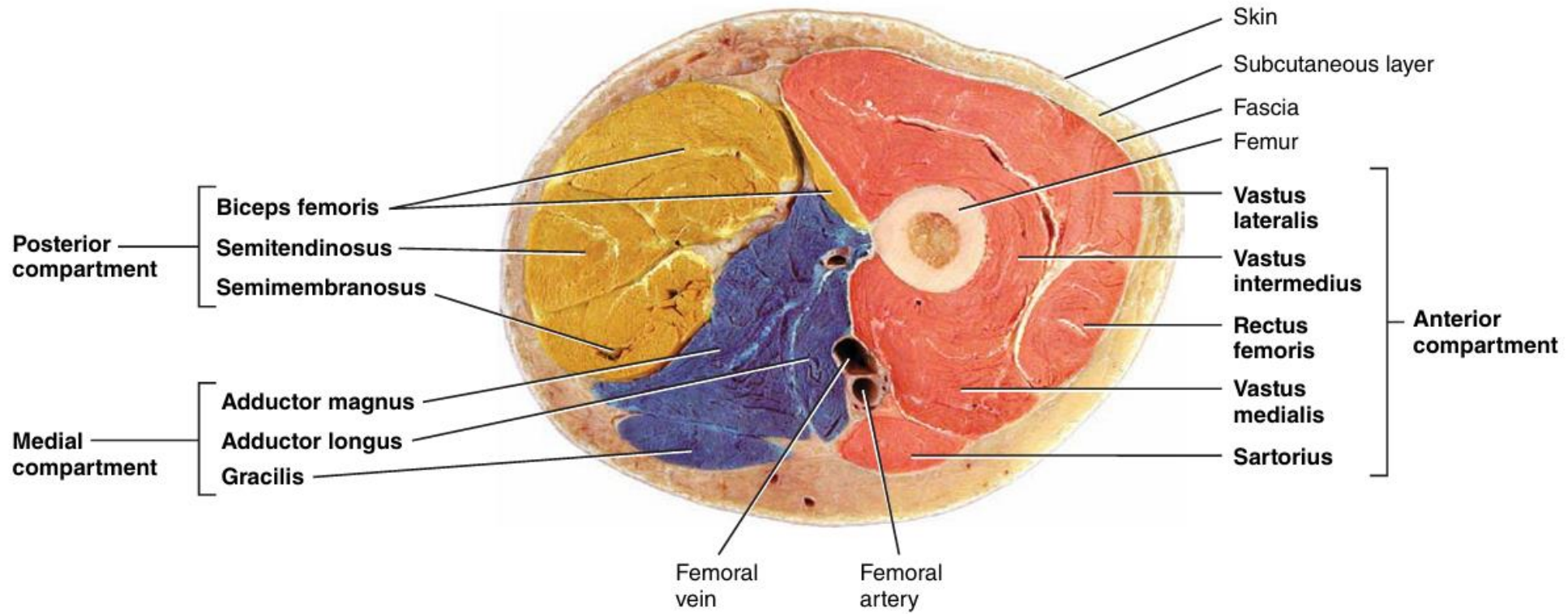
- Sartorius (**flex thigh & flex knee**)
- Quadriceps femoris (4 muscles): **main extensor of knee also part of it flex thigh**
- Nerve supply: Femoral nerve

2. Medial Compartment: (adductors of thigh)

- Gracilis, adductor longus, adductor brevis, adductor magnus
- Nerve supply: Obturator nerve

3. Posterior Compartment: (extend thigh & flex knee)

- **Hamstring muscles:** (1- Biceps femoris 2- Semitendinosus 3- Semimembranosus)
- Nerve supply: Sciatic nerve



(h) Superior view of transverse section of thigh

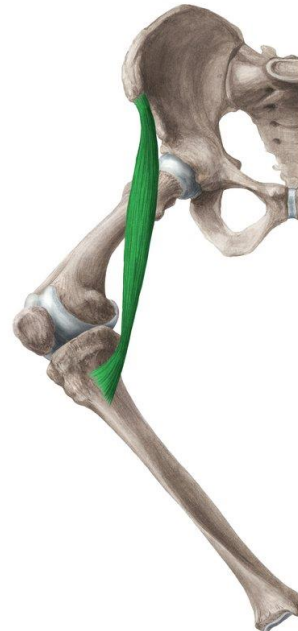
Muscles of front of thigh

- Muscles of anterior compartment

1. Sartorius.

2. Quadriceps femoris.

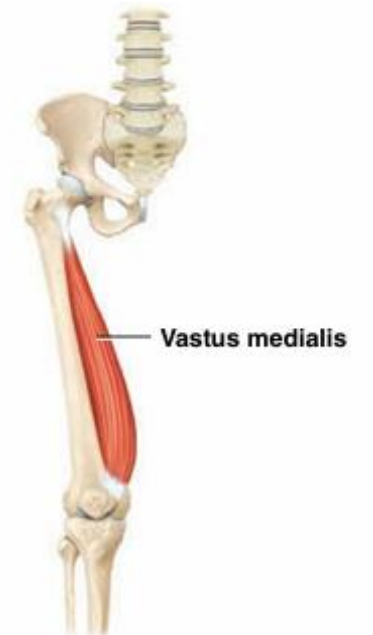
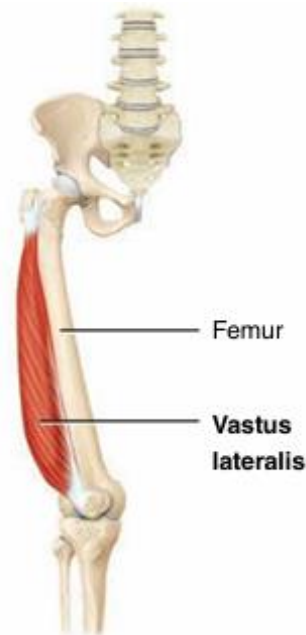
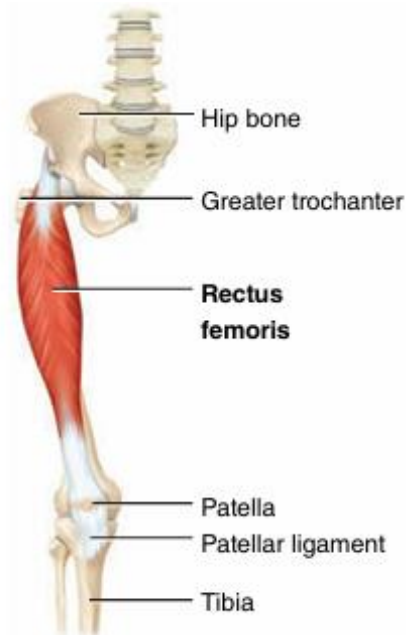
- The 2 muscles are supplied by **Femoral nerve**
- Sartorius is a strap-like muscle with parallel fibers.
- **The longest muscle in the body.** *
Origin : ASIS. **Insertion**: upper end of tibia.
- **Action**: On hip → **flexion, abduction & lat. rotation** (tailor's position = cross leg position). On knee → **flexion**



Quadriceps Femoris

It has 4 heads:

1. **Rectus femoris**, 2. **Vastus lateralis**. 3. **Vastus medialis**. 4. **Vastus intermedius**. **Origin:** Rectus femoris takes origin from hip bone & the 3 vasti take origin from femur. **Insertion:** They form a common tendon that encloses the patella & gets inserted into tibial tuberosity. **Nerve supply:** Femoral nerve. **Action:** Extension of knee.



Muscles of Medial Side of Thigh

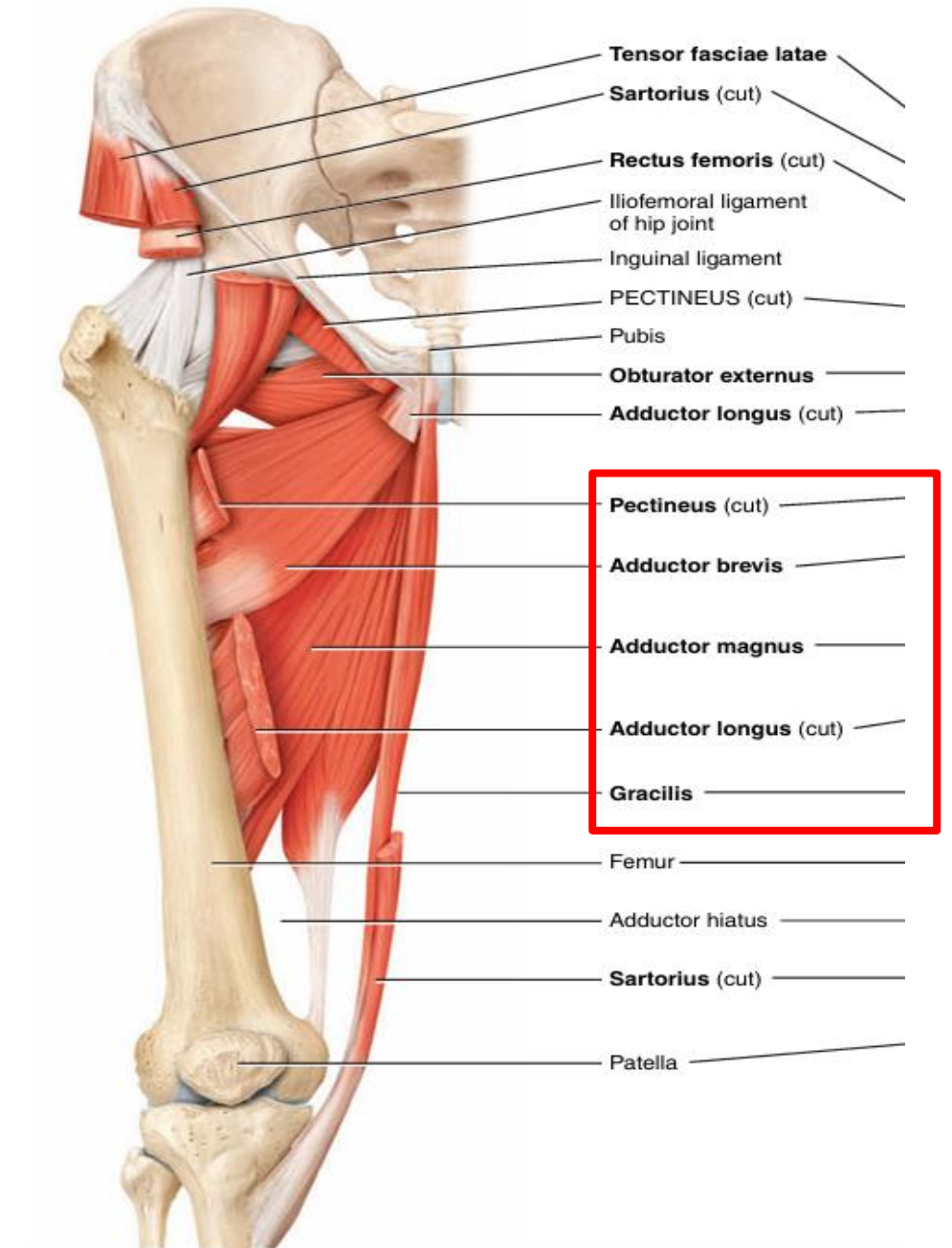
- They include 5 muscles:

1. **Pectineus** (adducts & flex thigh).
2. **Gracilis**.
3. **Adductor longus**.
4. **Adductor brevis**.
5. **Adductor magnus**

Origin: pubis (adductor magnus has both pubic and ischial origins)

Insertion: back of femur (except gracilis, medial surface of tibia)

Nerve supply: obturator nerve (except pectineus: femoral)



Muscles of Back of thigh

1. Semitendinosus.

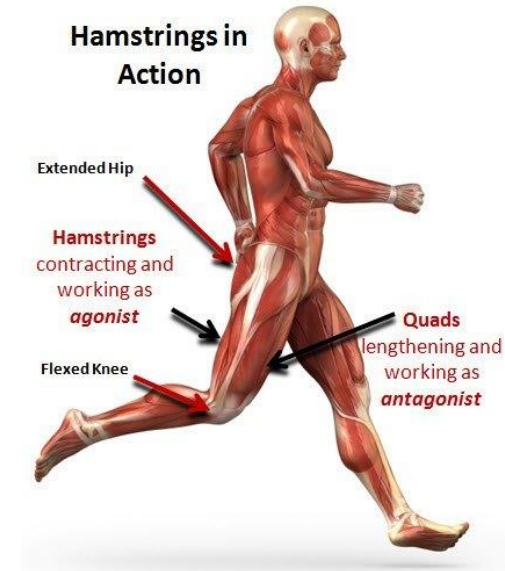
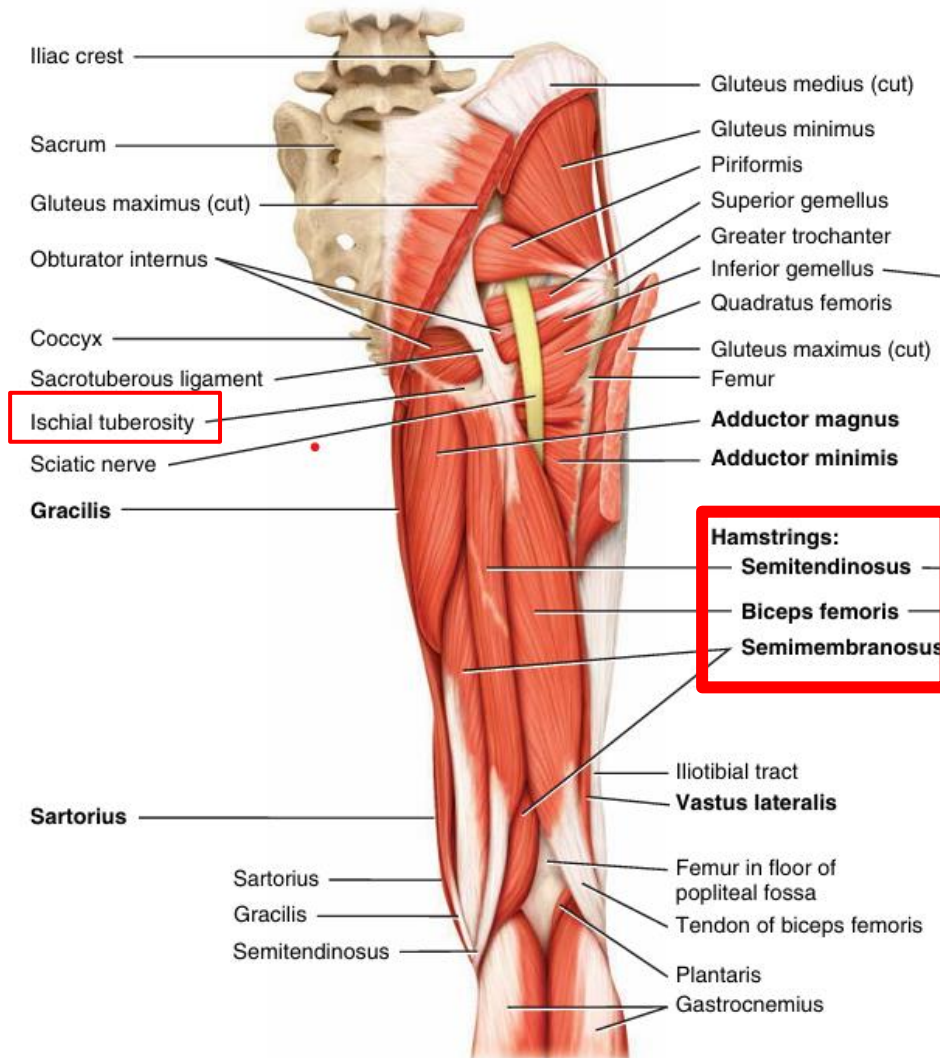
2. Semimembranosus.

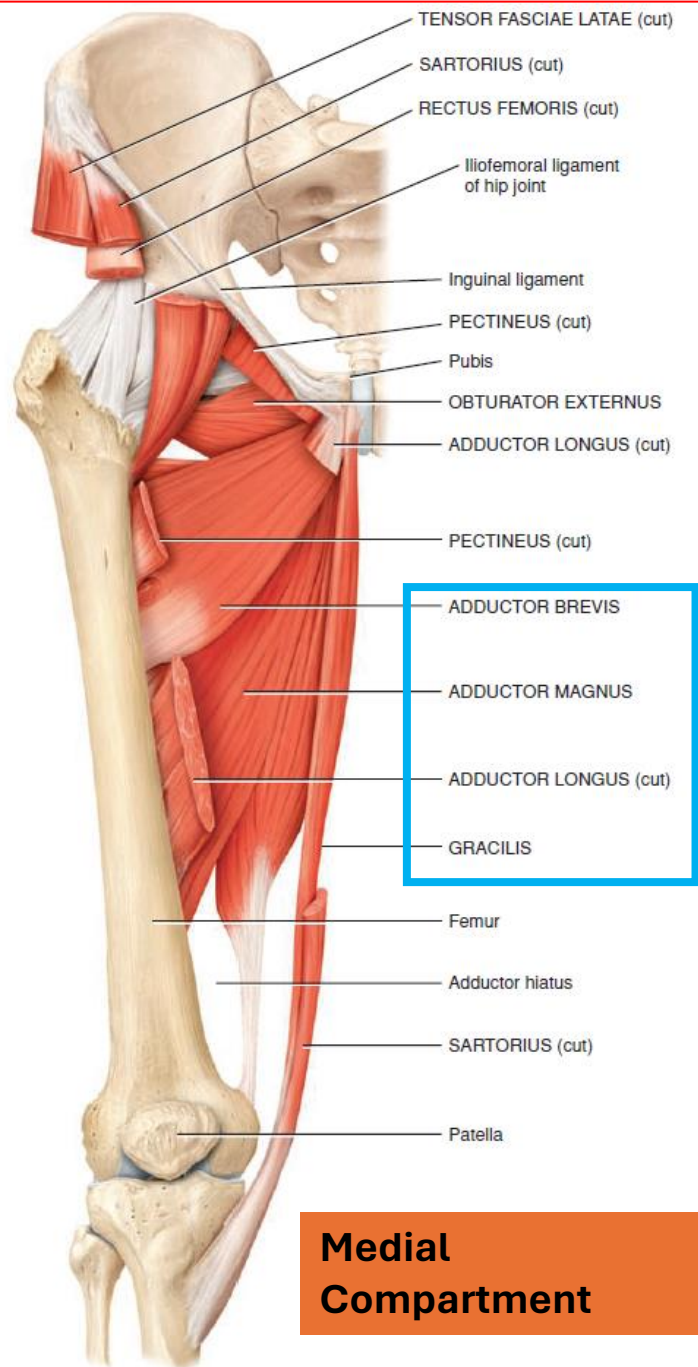
3. Biceps femoris.

Origin: from ischial tuberosity of hip bone except short head of biceps → takes origin from linea aspera of femur. **Insertion:** Upper end of tibia except biceps → upper end of fibula.

Nerve supply: Sciatic N.

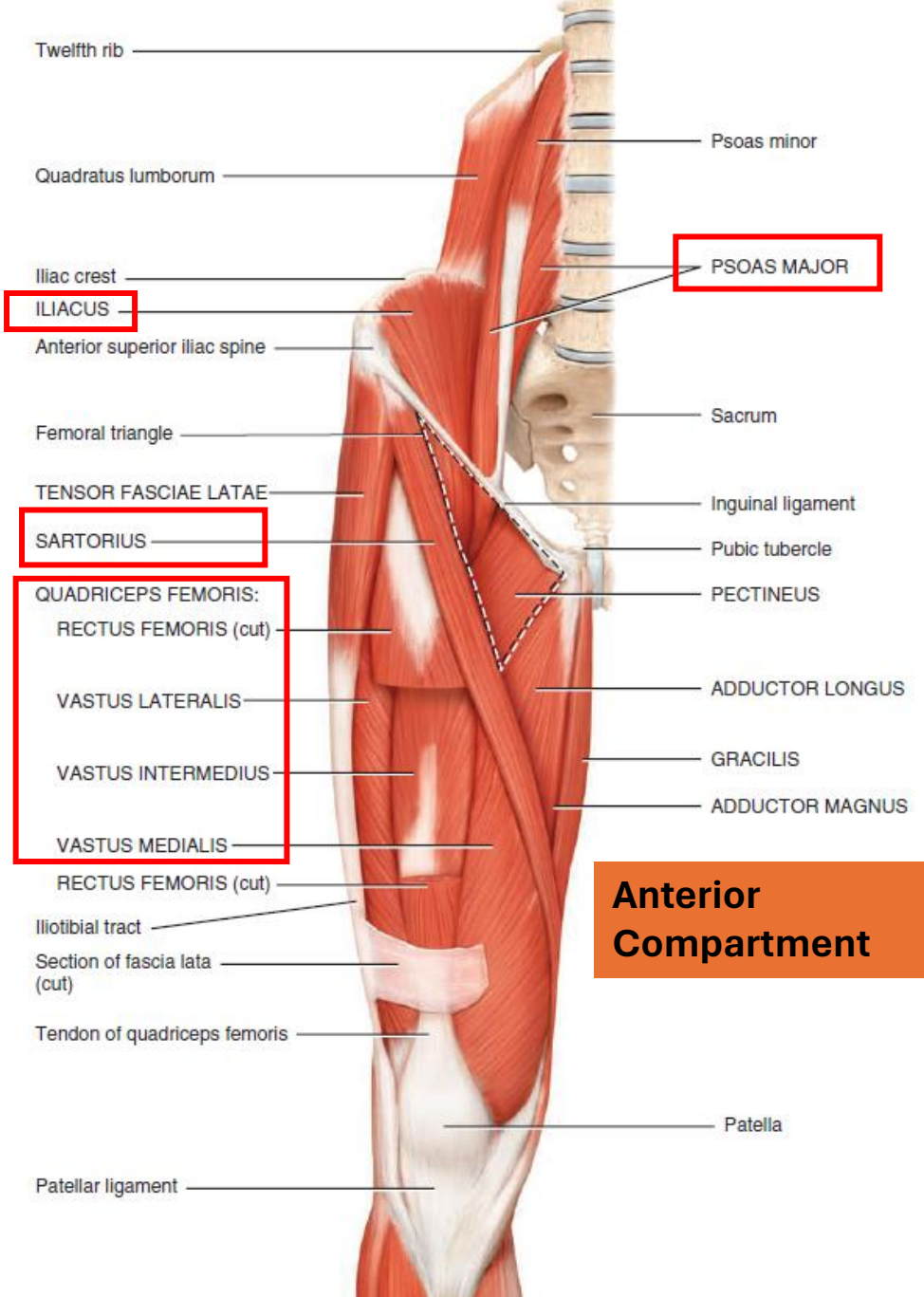
Action: 1. Extension of hip. 2. Flexion of knee.





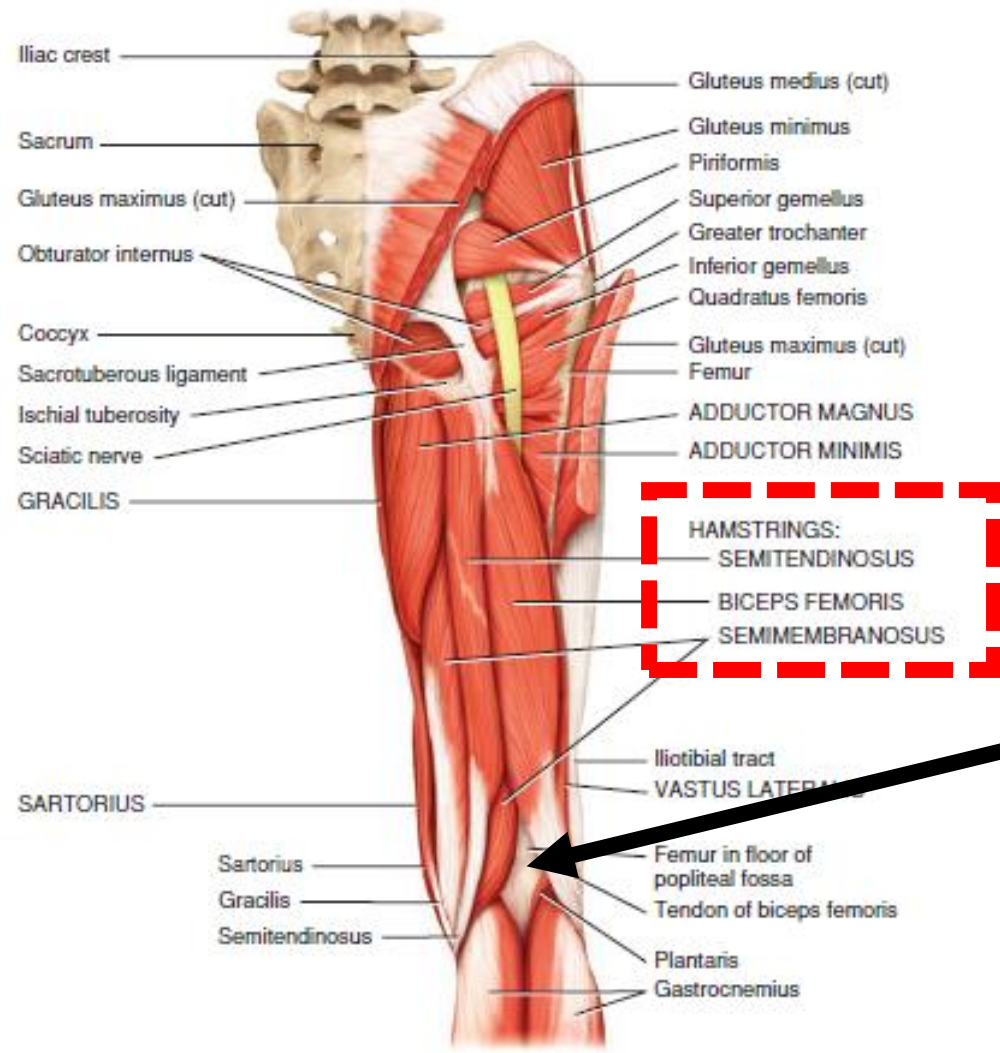
Medial Compartment

(b) Anterior deep view (femur rotated laterally)



PSOAS MAJOR

Anterior Compartment



Popliteal fossa

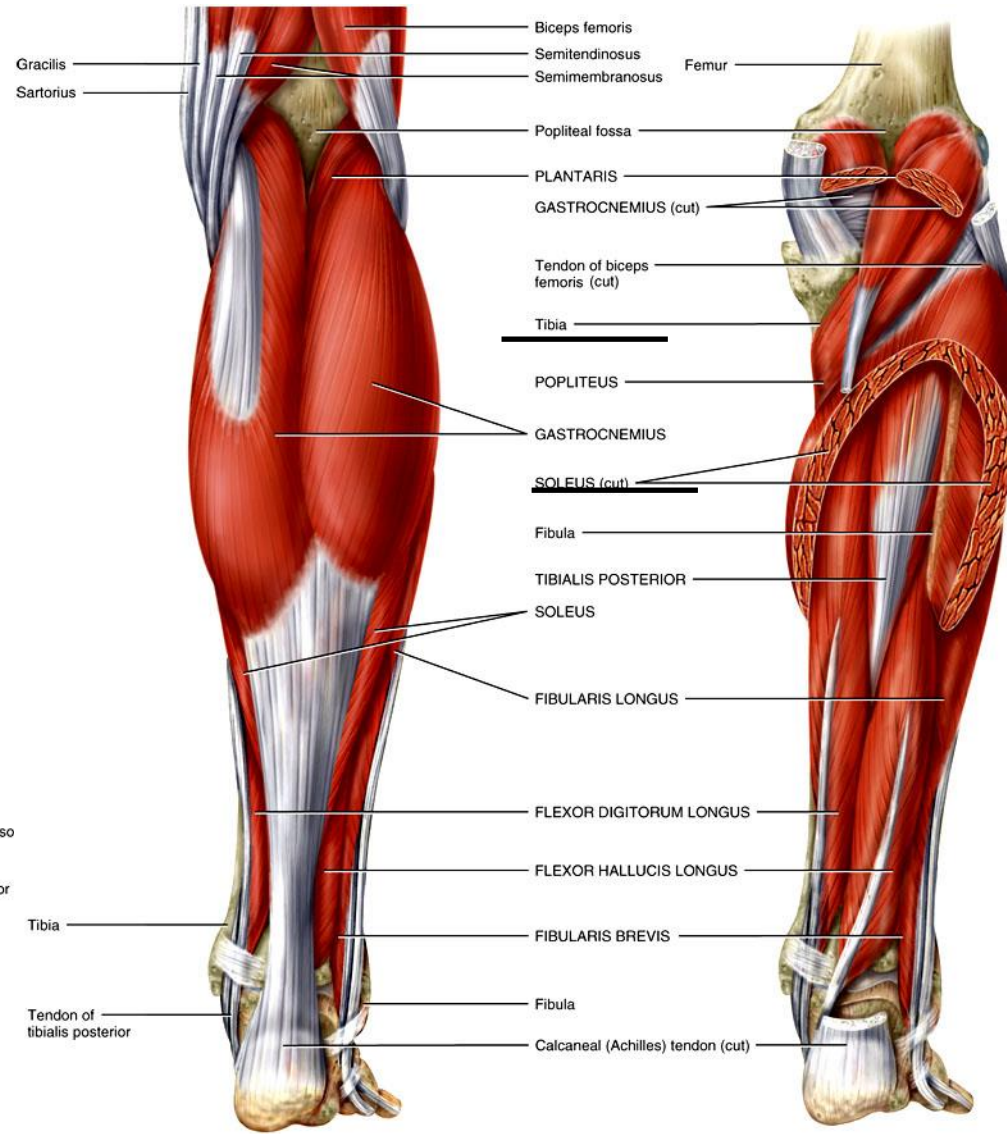
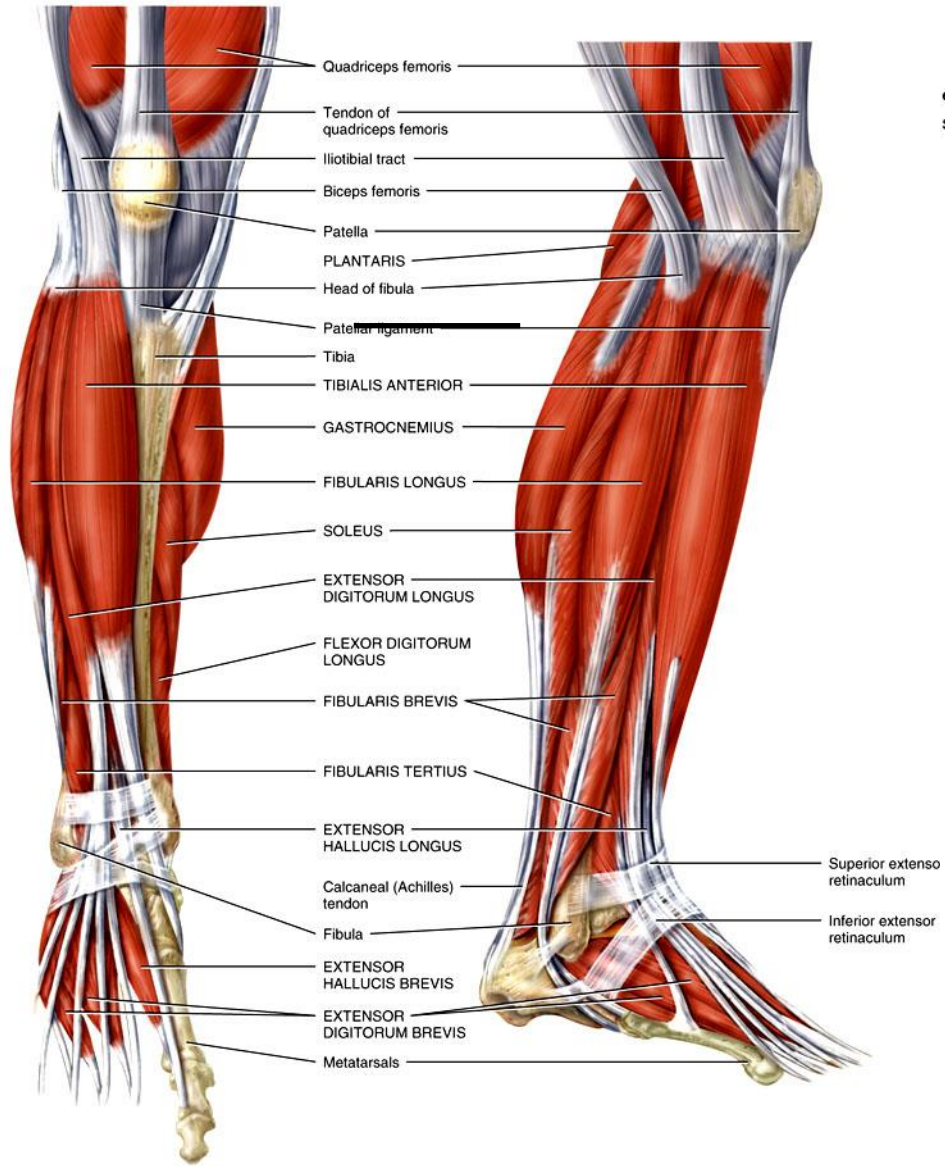
HAMSTRINGS:
 SEMITENDINOSUS
 BICEPS FEMORIS
 SEMIMEMBRANOSUS

(d) Posterior superficial view of thigh and deep view of gluteal region

Posterior Compartment

Muscles of the Leg

- Leg muscles, like those of the thigh, are divided by deep fascia into three compartments: anterior, lateral, and posterior.
 - **Anterior compartment** muscles: **Dorsiflex** the foot (e.g., **tibialis anterior**).
 - **Lateral compartment** muscles **plantarflex** & **Eversion** the foot. (**Peroneus longus and brevis**)
 - **Posterior compartment** muscles are split into two groups:
 - 1. Superficial group: (Calf muscles)**
1) Gastrocnemius 2) Soleus 3) Plantaris. All share a common tendon of insertion, the calcaneal tendon (or Achilles tendon). They **Plantarflex** the foot and the gastrocnemius also **flexes** the leg at knee.
 - 2. Deep group: Plantar flex** the foot (e.g., **tibialis posterior**):
Inversion of foot by Tibialis anterior and Tibialis posterior supports medial longitudinal arch of foot



(a) Anterior superficial view

(b) Right lateral superficial view

(c) Posterior superficial view

(d) Posterior deep view

Muscles of Front of Leg

- They include:

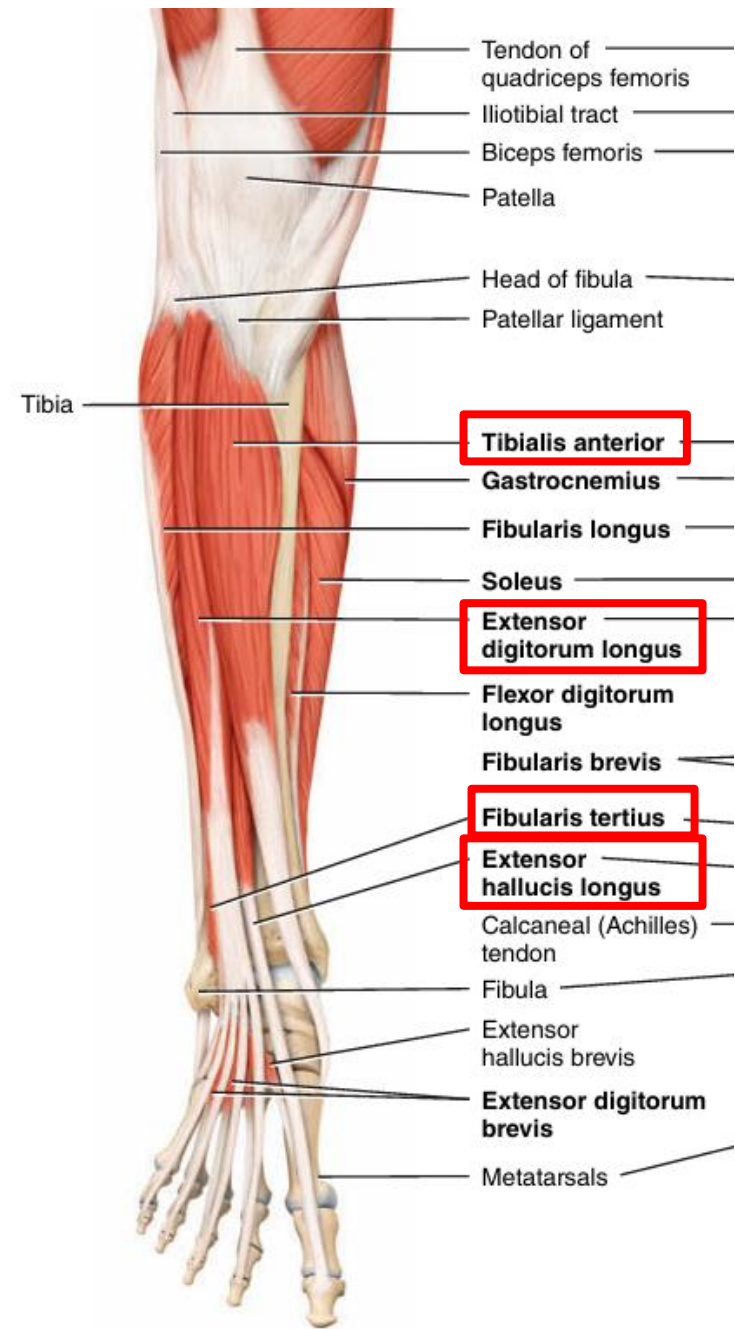
1. **Tibialis anterior.**
2. **Extensor hallucis longus.**
3. **Extensor digitorum longus.**
4. **Peroneus (fibularis) Tertius.**

Origin: from front of tibia & fibula

Insertion: Bones of foot.

Nerve supply: Anterior tibial N.

Action: 1. All muscles → **Extension (dorsiflexion)** of ankle joint. 2. Extensor hallucis longus → extension of big toe. 3. Extensor digitorum longus → extension of lateral 4 toes. 4. Tibialis anterior → **inversion of foot.**



(a) Anterior superficial view

Muscles of Lateral side of Leg

- They include:

1. Peroneus longus.

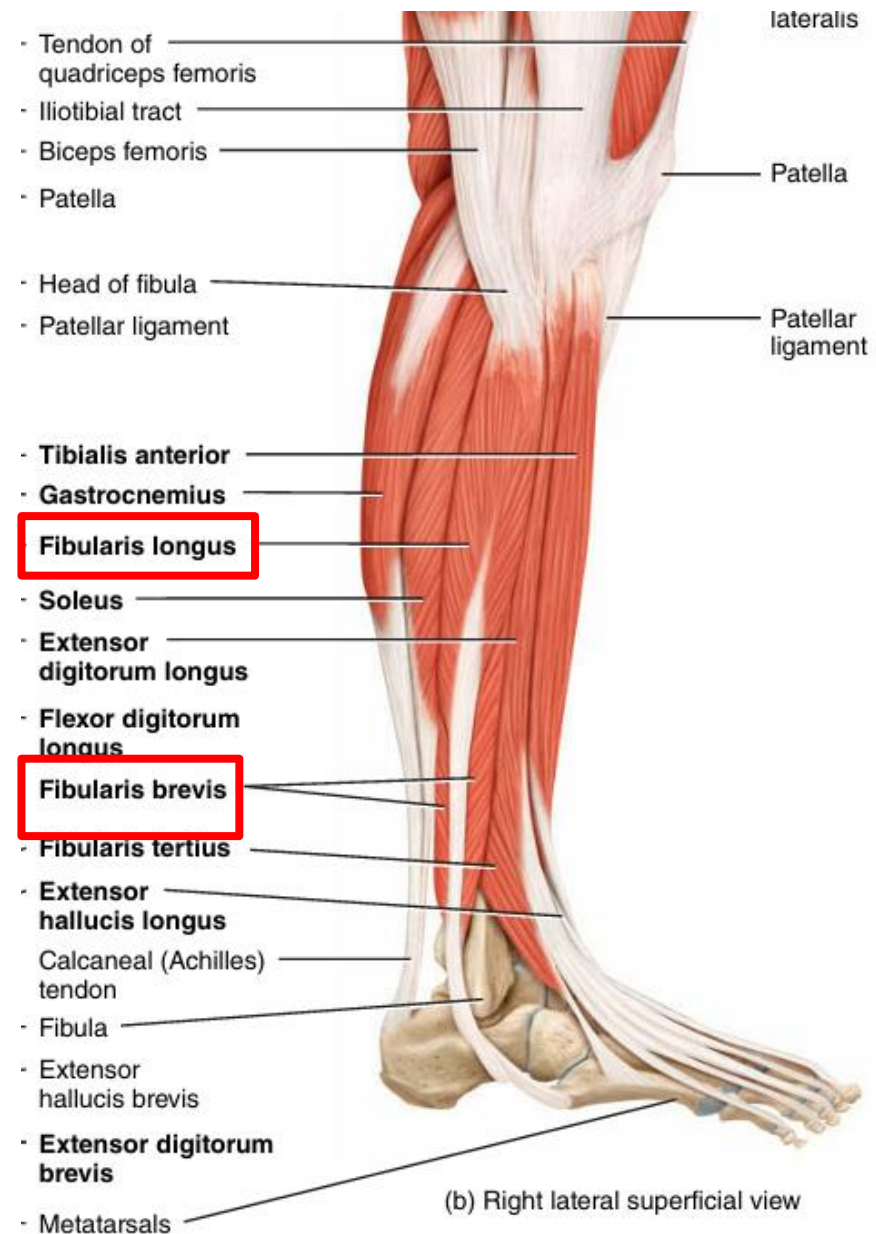
2. Peroneus brevis.

Origin: lateral surface of fibula.

Insertion: Bones of foot.

Nerve supply: Superficial Peroneal N.

Action: Eversion of foot.



Muscles of Back of Leg

- They include:

A. Superficial Group:

1. Gastrocnemius.

2. Soleus.

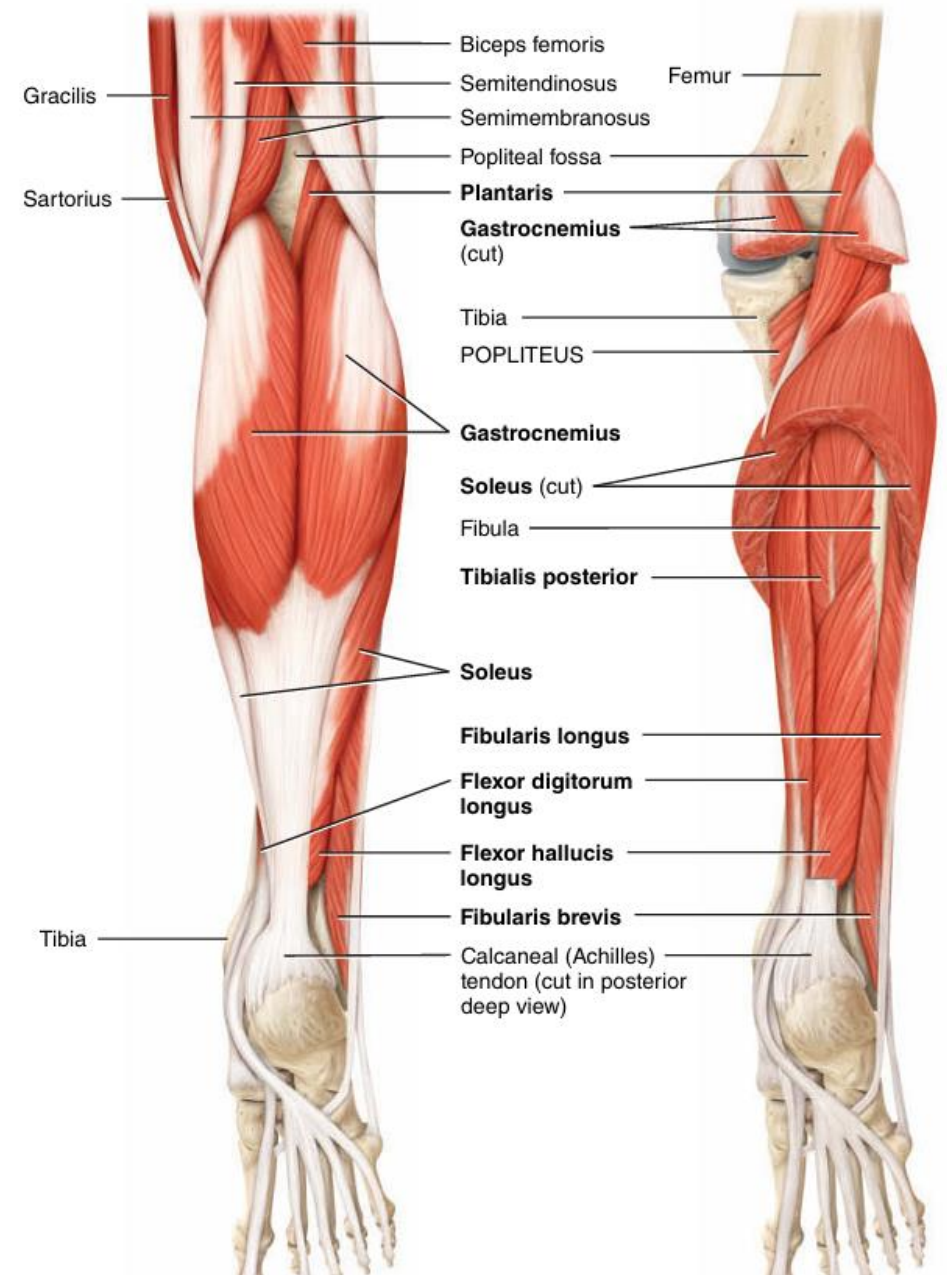
3. Plantaris.

Origin: from femur except soleus which takes origin from back of tibia & fibula.

Insertion: Back of calcaneus

Nerve supply: Tibial N.

Action: Plantar flexion of foot at ankle joint and flexion of leg at knee joint (except soleus)



Deep Group

• Includes:

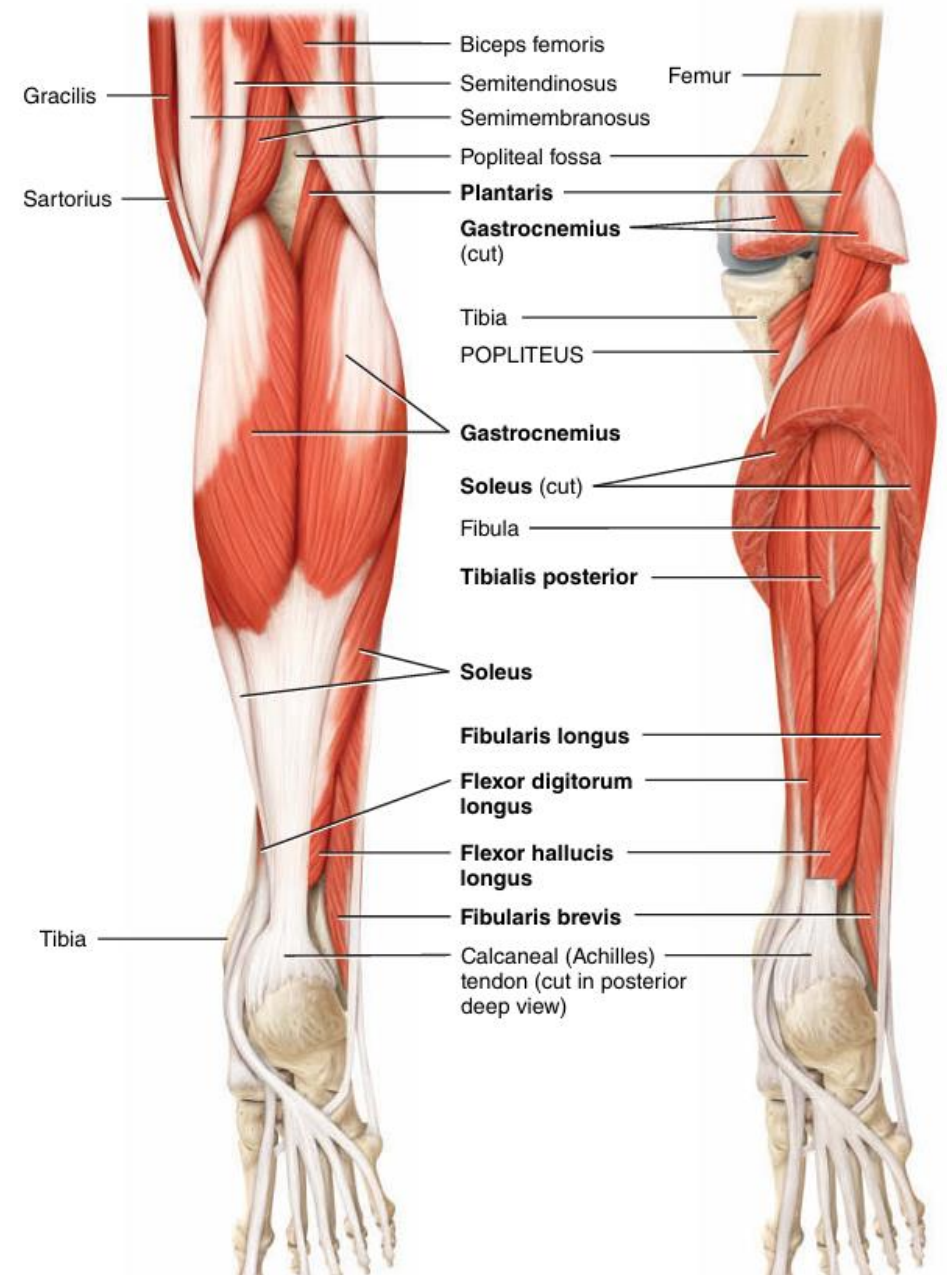
1. **Flexor hallucis longus.**
2. **Flexor digitorum longus.**
3. **Tibialis posterior**
4. **Popliteus**

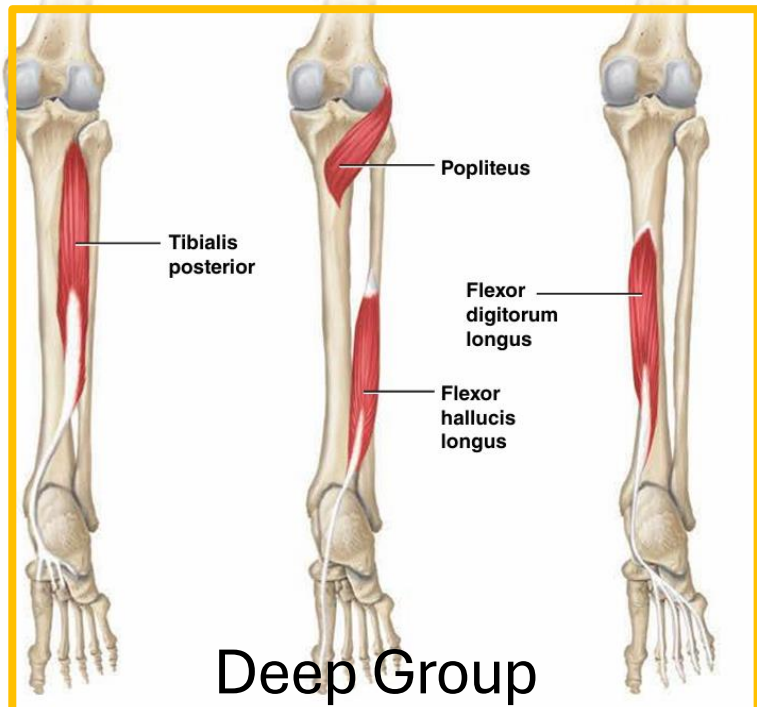
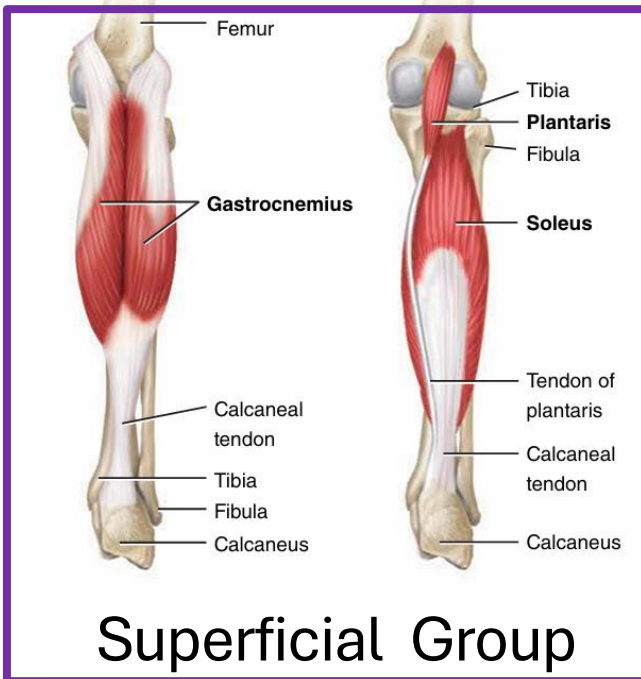
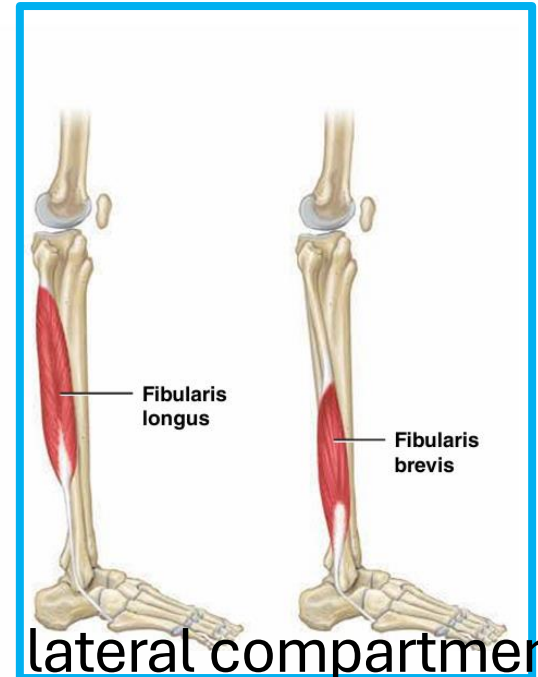
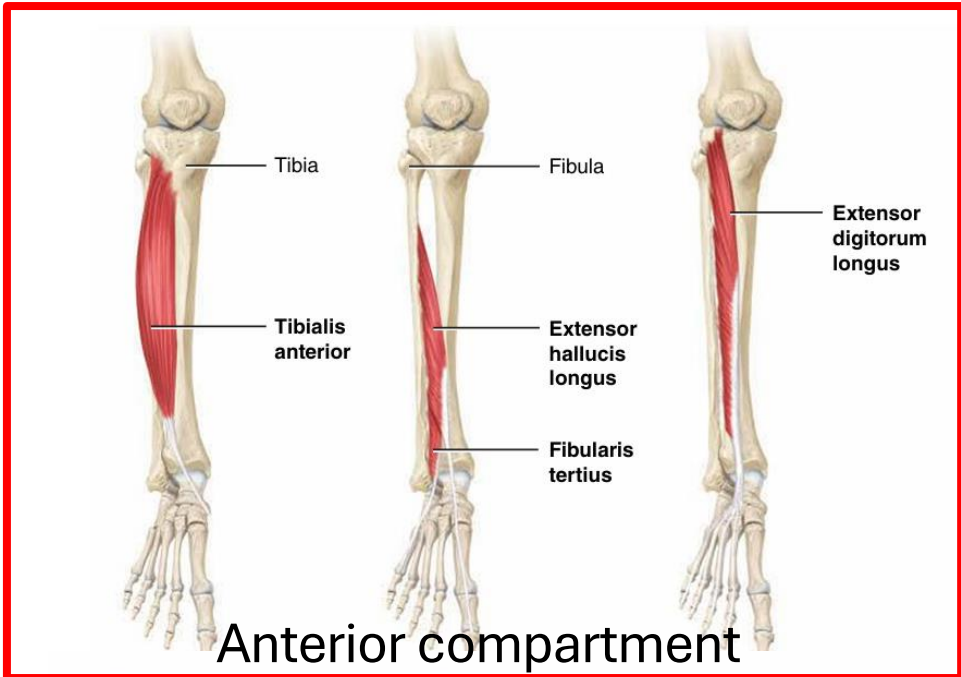
Origin: from back of tibia & fibula.

Insertion: Bones of foot (except popliteus, inserts in tibia).

Nerve supply: **Tibial N.**

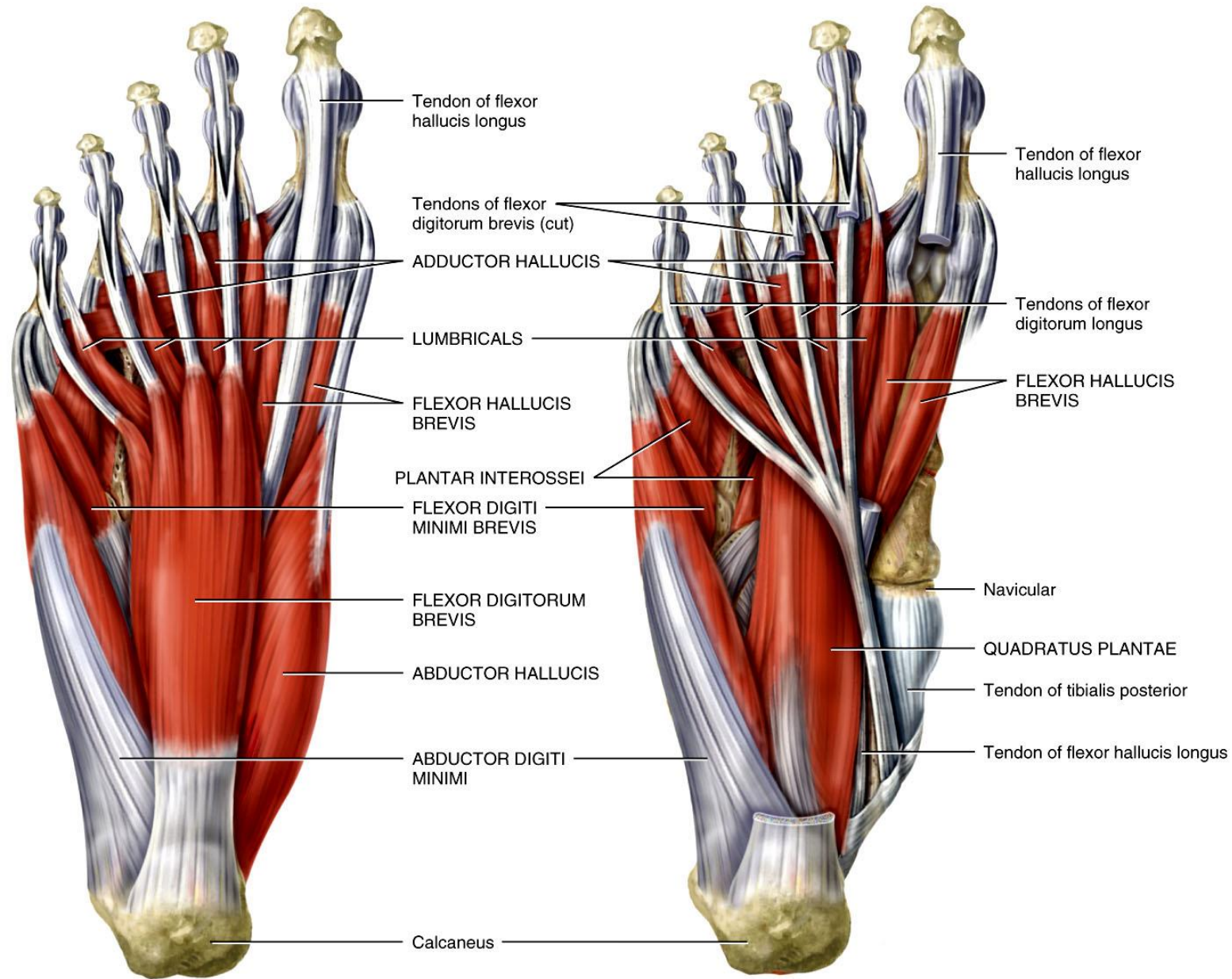
Action: Plantar flexion of foot & flexion of toes (except Popliteus which helps in rotation of knee)





Intrinsic Muscles of the Foot

- These muscles are termed **intrinsic** because they originate & insert *within* the foot.
- These muscles are limited in action. They're designed for **support and locomotion**, and are split into:
 - A. Dorsal muscles (2) Extensor digitorum brevis and Extensor Hallucis brevis** which extend toes and **big toe (hallux)**.
 - B. Plantar muscles** are arranged in four layers (various actions):
 - 1st layer (most superficial) (3 muscles)
 - 2nd layer (lumbricals and 1 muscle)
 - 3rd layer (3 muscles).
 - 4th layer (deepest) contain 4 dorsal and 3 plantar interossei



(a) Plantar superficial view

(b) Plantar intermediate view

- Thanks !