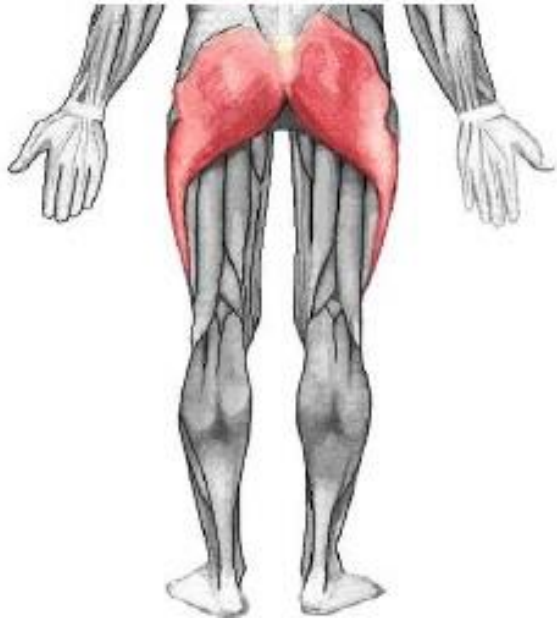


# Gluteal region



**DR. GITANJALI KHORWAL**

# Gluteal region

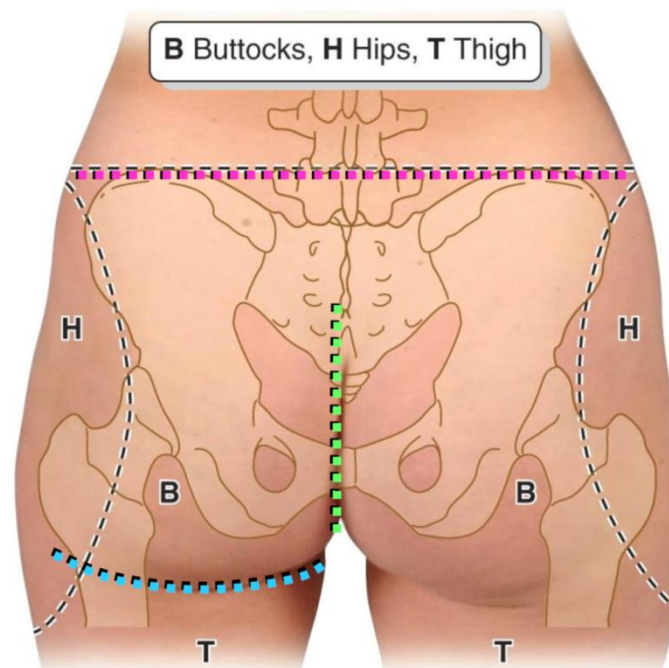
- The transitional area between the trunk and the lower extremity.
- The gluteal region includes the rounded, posterior buttocks and the laterally placed hip region.

Surface anatomy  
GLUTEAL REGION

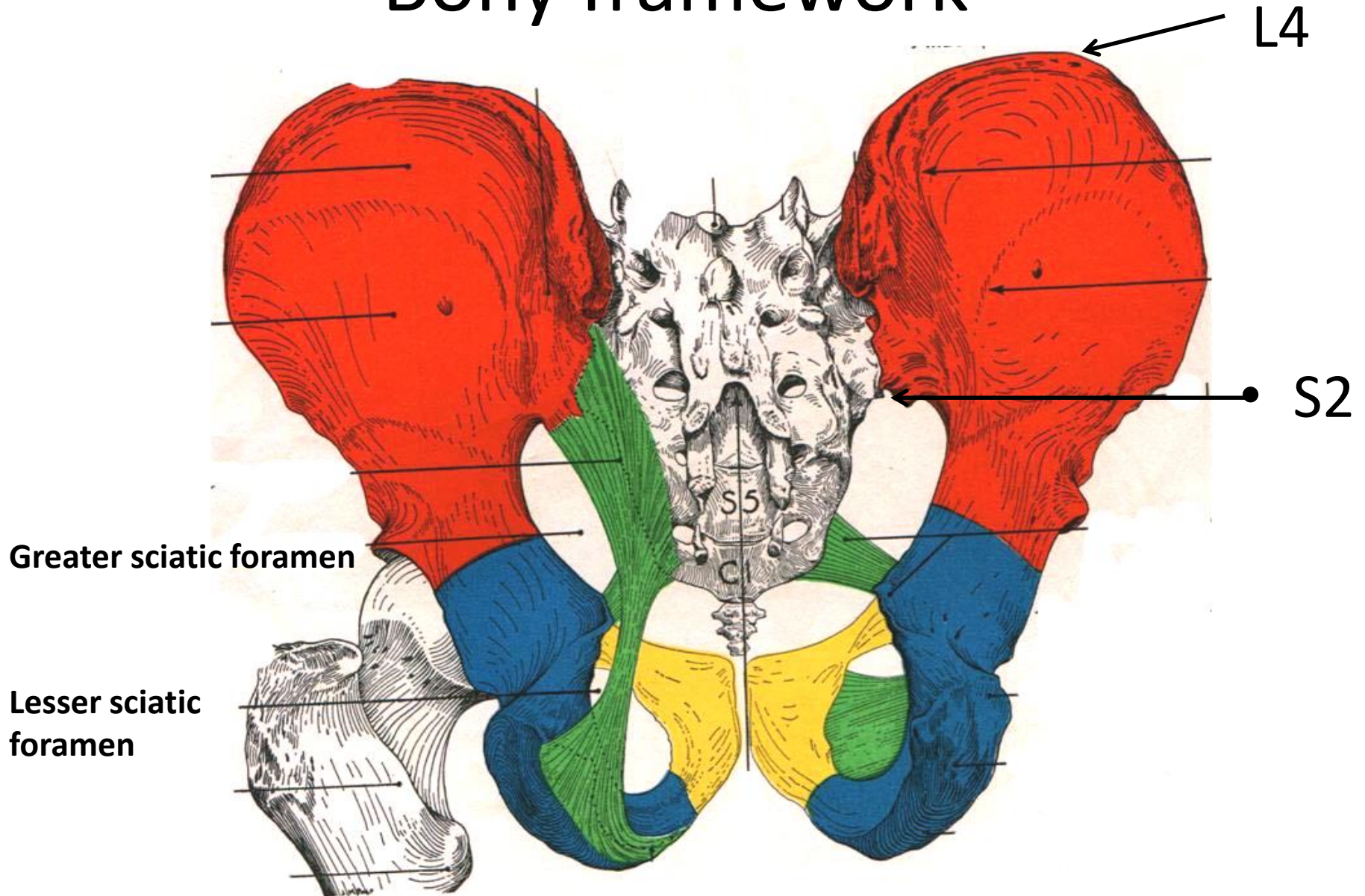
L4 level—iliac crests

Intergluteal cleft

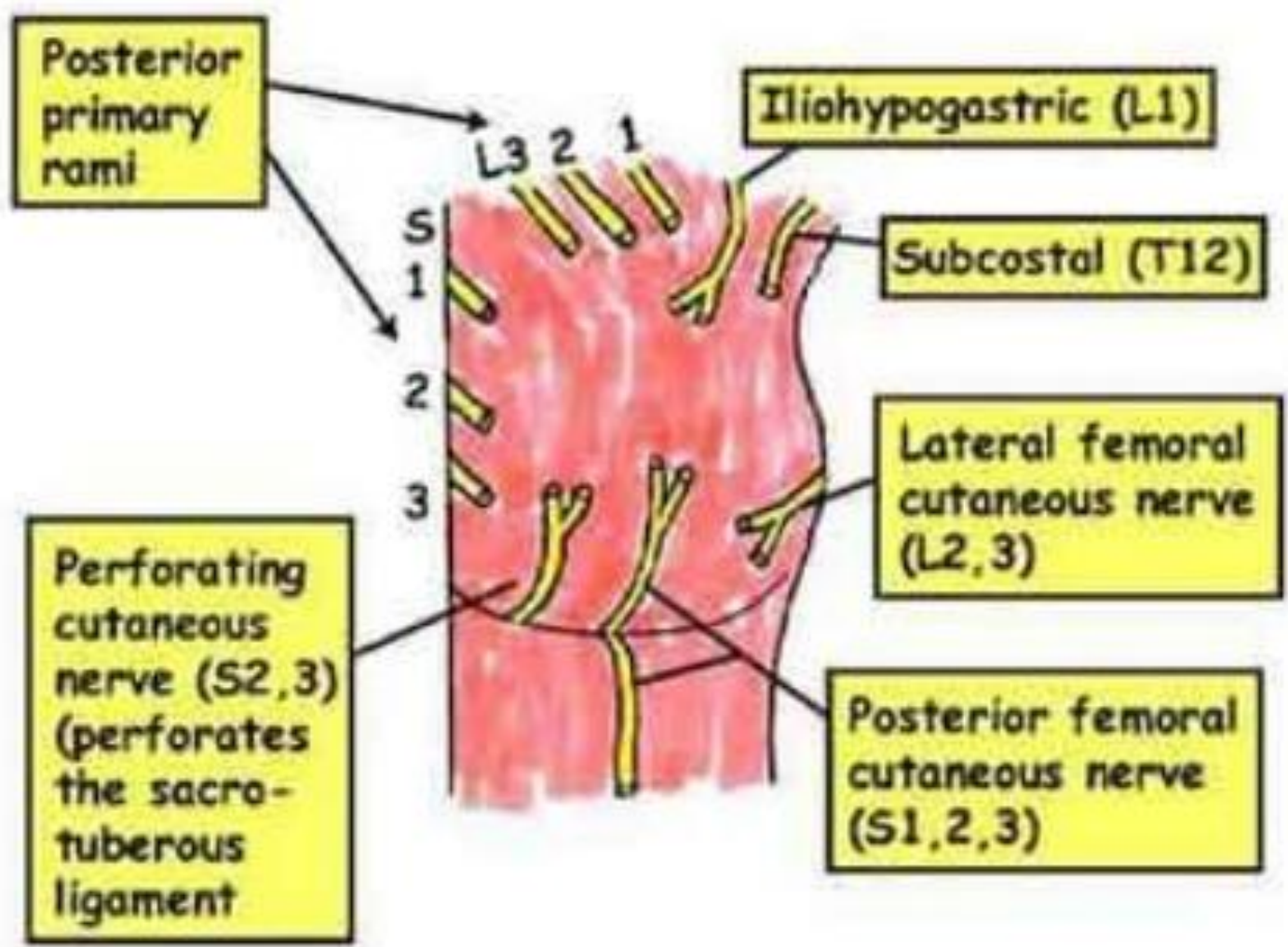
Gluteal sulcus



# Bony framework

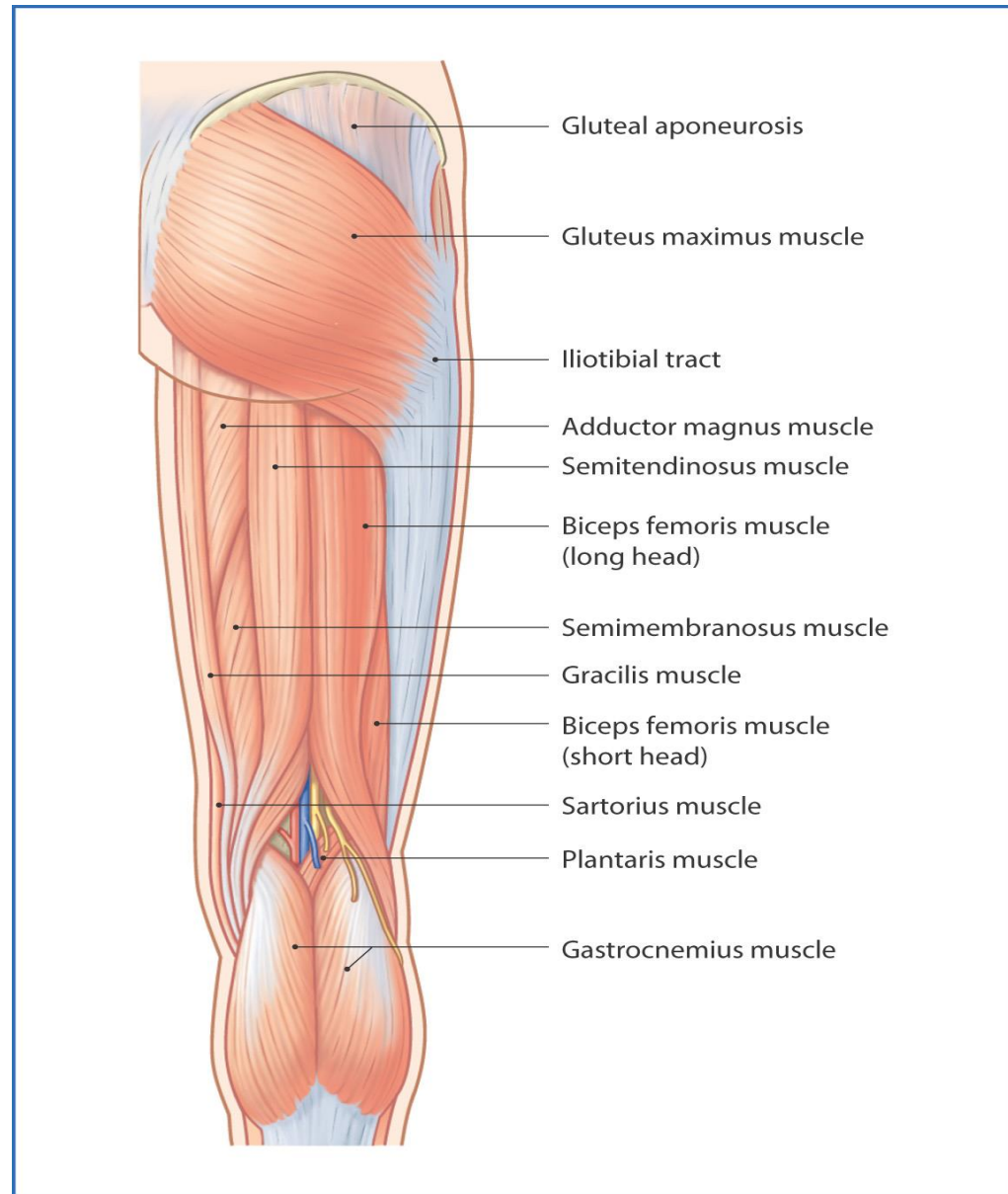


# CUTANEOUS NERVE SUPPLY OF BUTTOCKS



# Gluteal Aponeurosis

- This is attached to the lateral border of the iliac crest superiorly, and
- splits anteriorly to enclose tensor fasciae latae and posteriorly to enclose gluteus maximus.



Superficial | Deep  
← | →

Iliac crest

Gluteus medius

Sacrum

Gluteus maximus

Coccyx

Ischial tuberosity

Gluteus minimus

Lateral rotators:

Piriformis

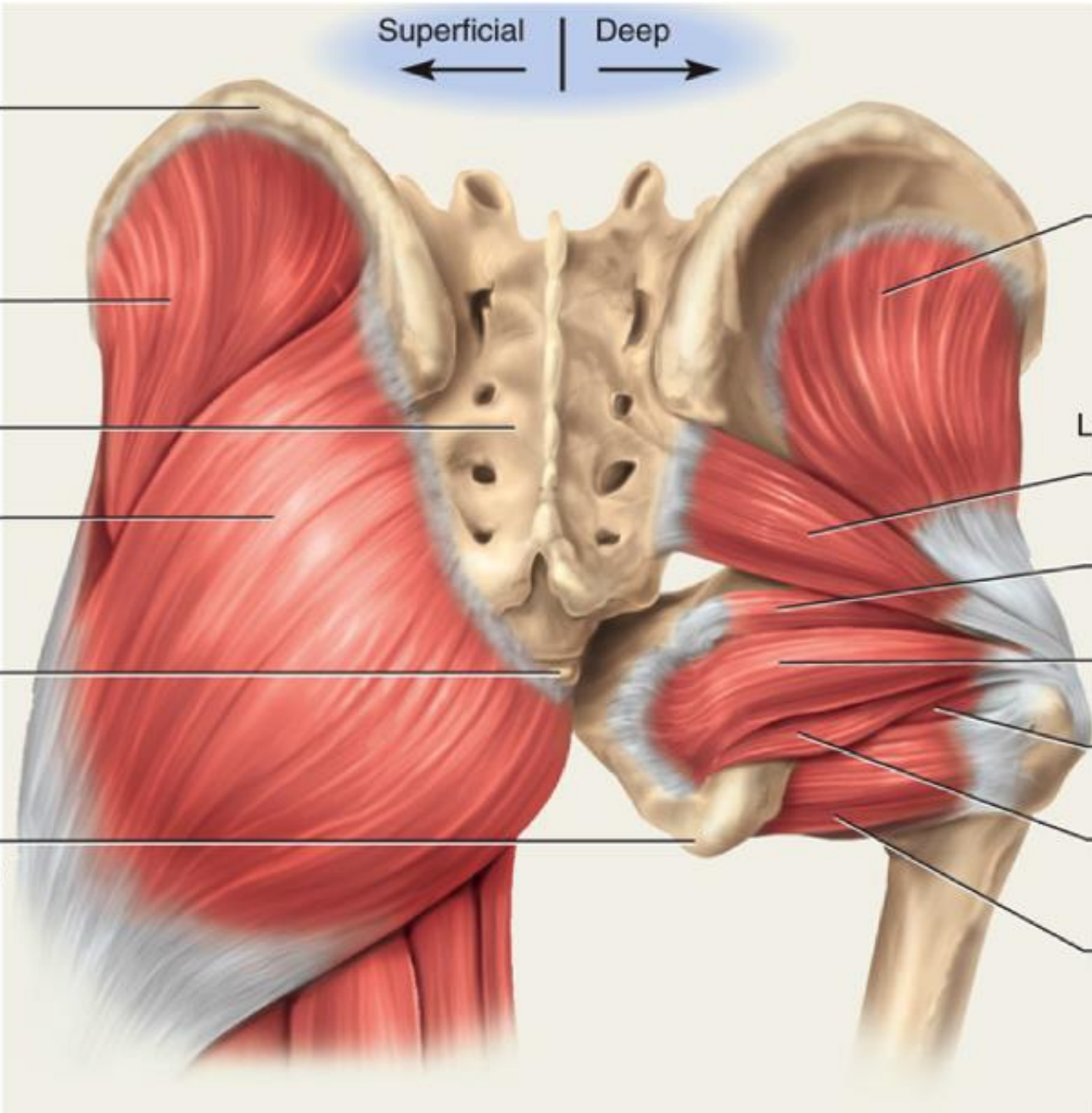
Gemellus superior

Obturator internus

Obturator externus

Gemellus inferior

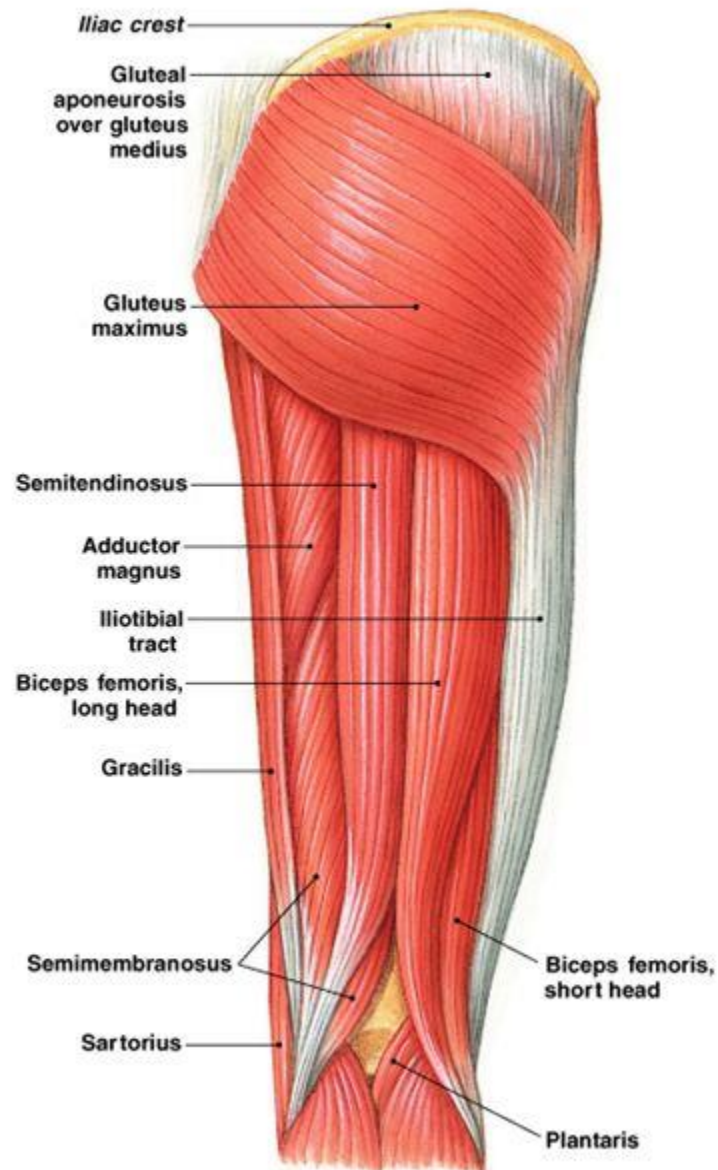
Quadratus femoris



# Muscles of Gluteal region

## Superficial Layer

- Gluteus maximus
- Tensor fasciae latae

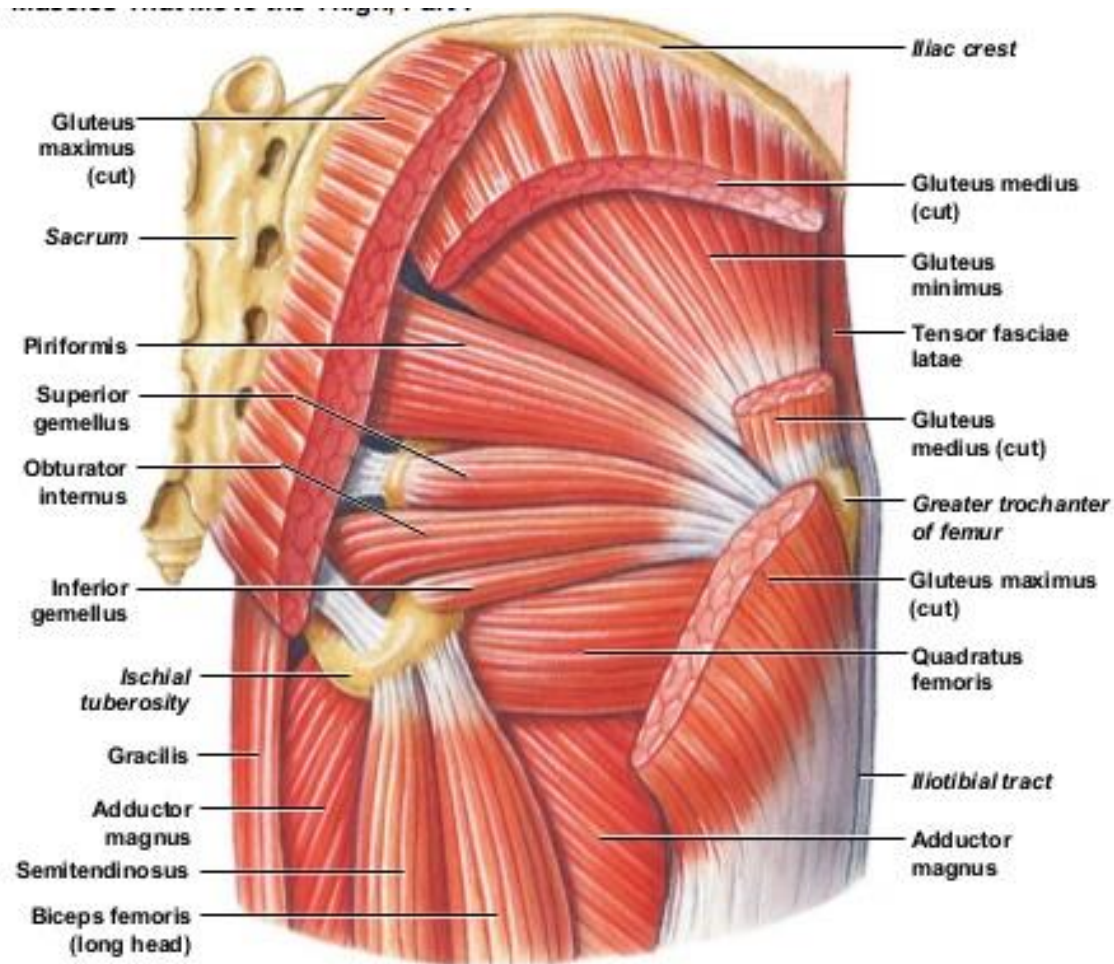


(a) Posterior view of right thigh

# Muscles of Gluteal region

## Intermediate layer

- Gluteus medius
- Piriformis
- Superior gemellus.
- Tendon of obturator internus.
- Inferior gemellus
- Quadratus femoris
- Upper part of Adductor magnus
- And Hamstrings

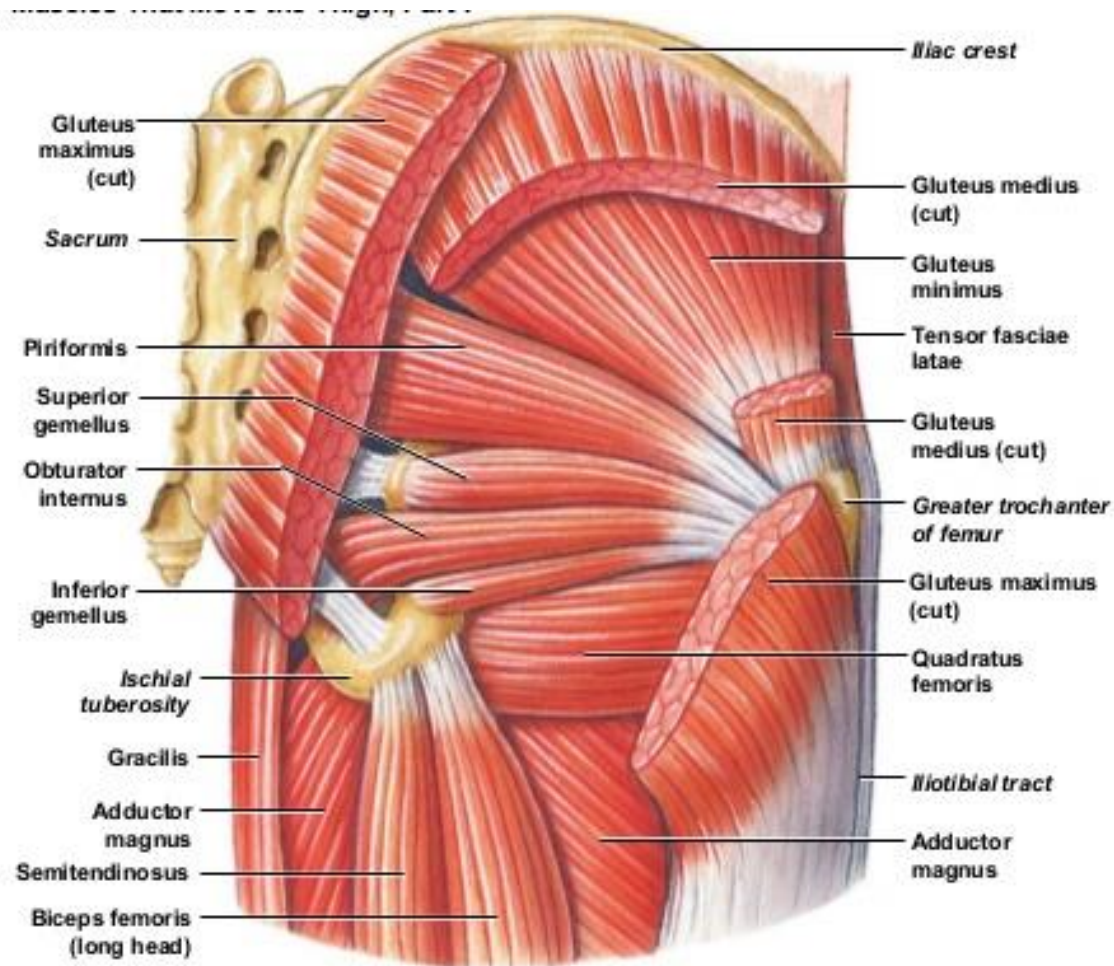




# Muscles of Gluteal region

## Deep layer

- Gluteus minimus
- Reflected head of rectus femoris
- Tendinous insertion of obturator externus



# Gluteus Maximus

**Origins:** posterior end of the iliac crest, posterior surface of the sacrum, coccyx and sacrotuberous ligament.

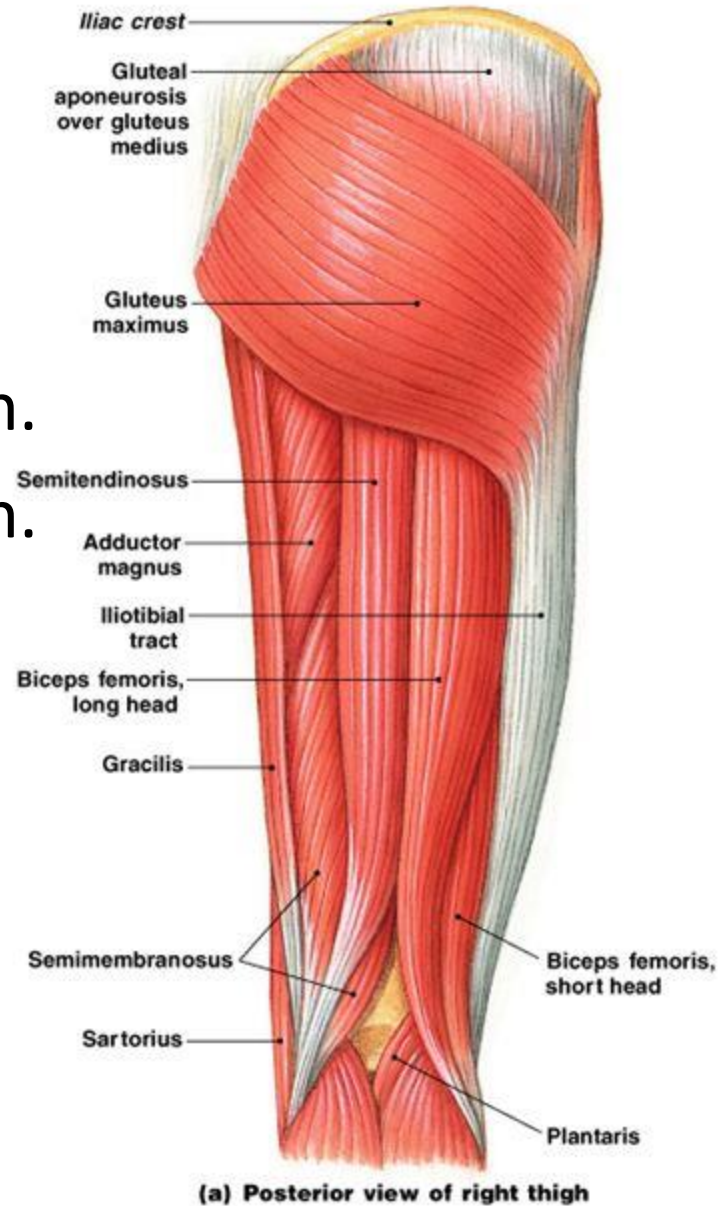
**Insertions:** ilio-tibial tract( 3/4)and gluteal tuberosity.(1/4 )

**Innervation:** inferior gluteal nerve - [ Ventral rami of L5, S1,2] - emerges below the piriformis muscle to penetrate the deep surface of the gluteus maximus with accompanying vessels.



## ❖ Actions

- **Extensor** at hip joint during running and climbing upstairs.
- Chief antigravity muscle in the standing up from a seated position.
- Strong **lateral rotation** of the thigh. Its upper fibres are active in powerful **abduction** of the thigh.
- It is a tensor of the fascia lata, and through the iliotibial tract it **stabilizes the femur on the tibia** when the extensor muscles of the knee are relaxed.



# Tensor Fascia Lata

Small muscle close to the anterior border of the gluteus medius, at the dorsal surface of the ASIS.

**Origin:** outer lip of iliac crest from ASIS to tubercle of iliac crest.

**Insertion:** ilio-tibial tract.

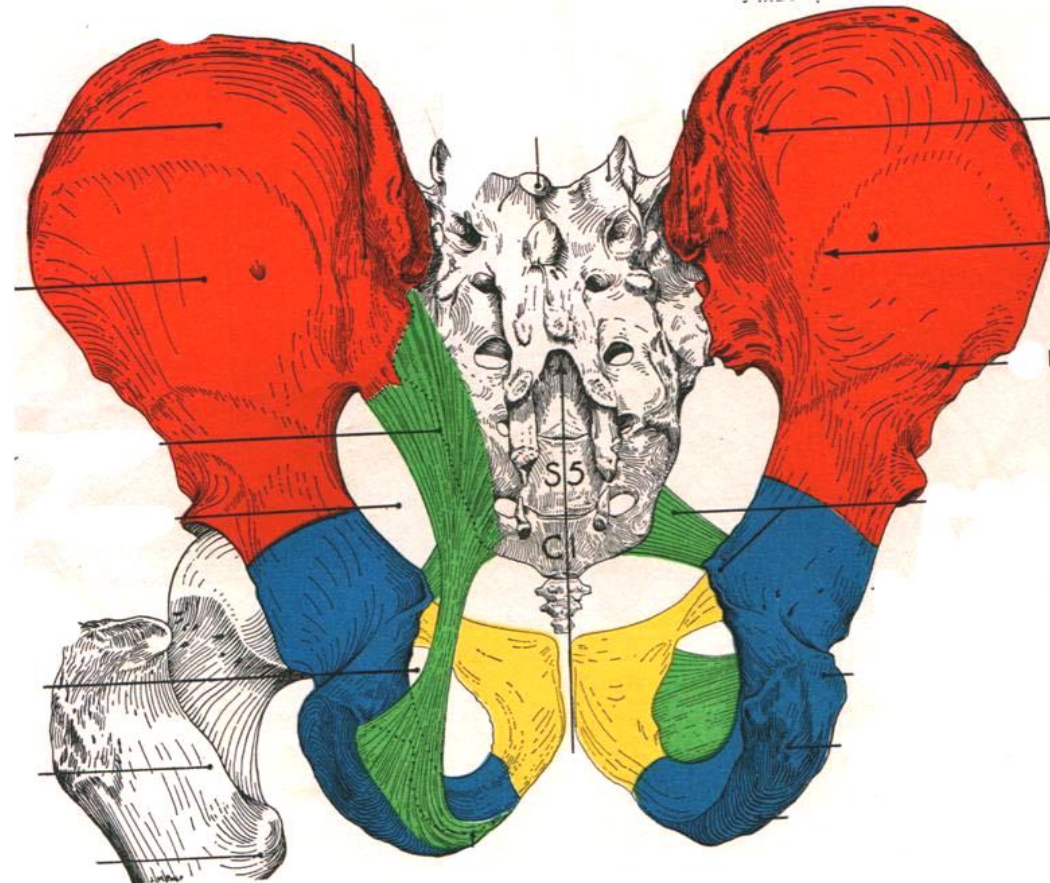
**Innervation** - superior gluteal nerve.

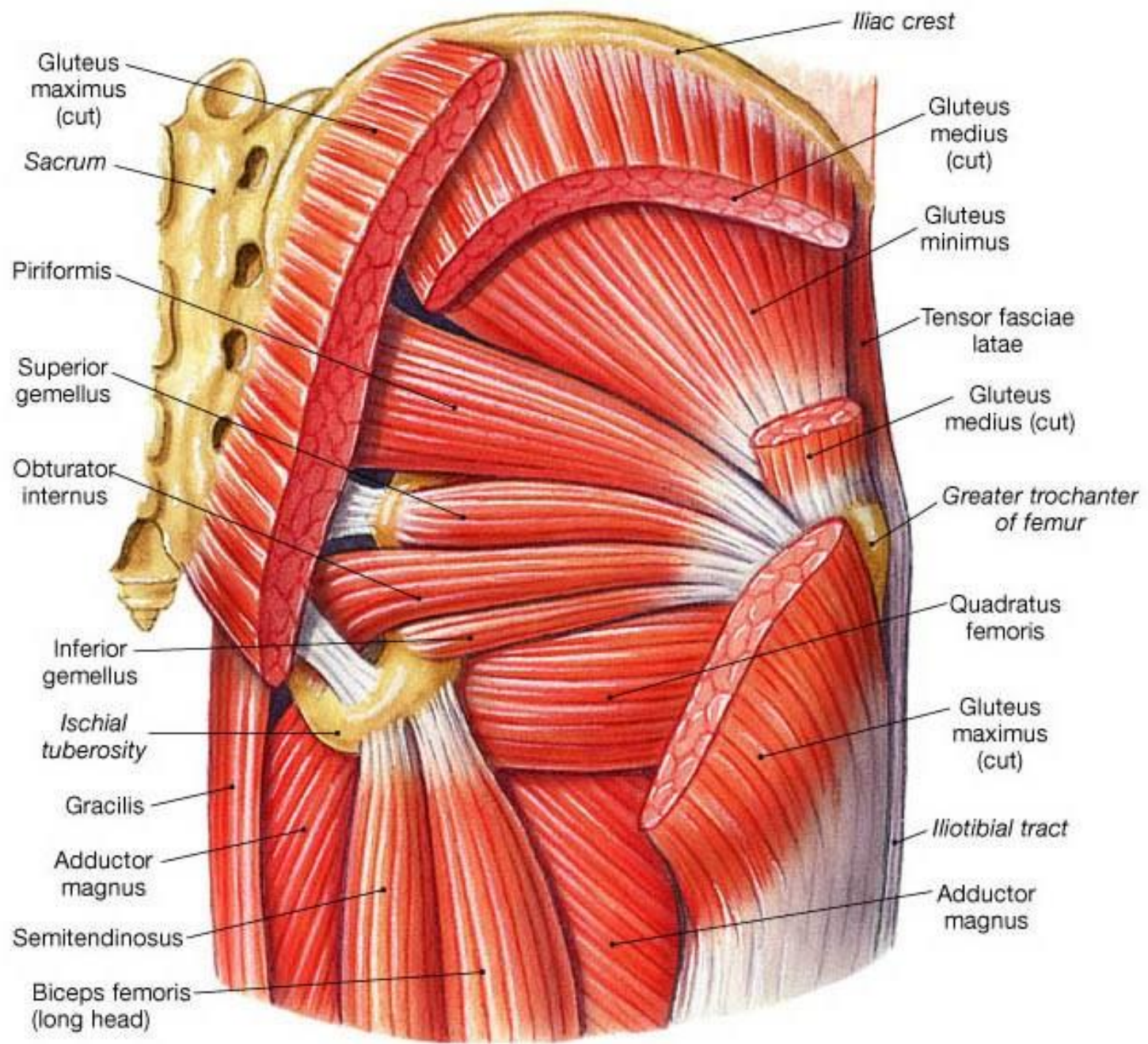
**Action** - helps in flexion and abduction of the thigh. Maintains extension of knee joint.



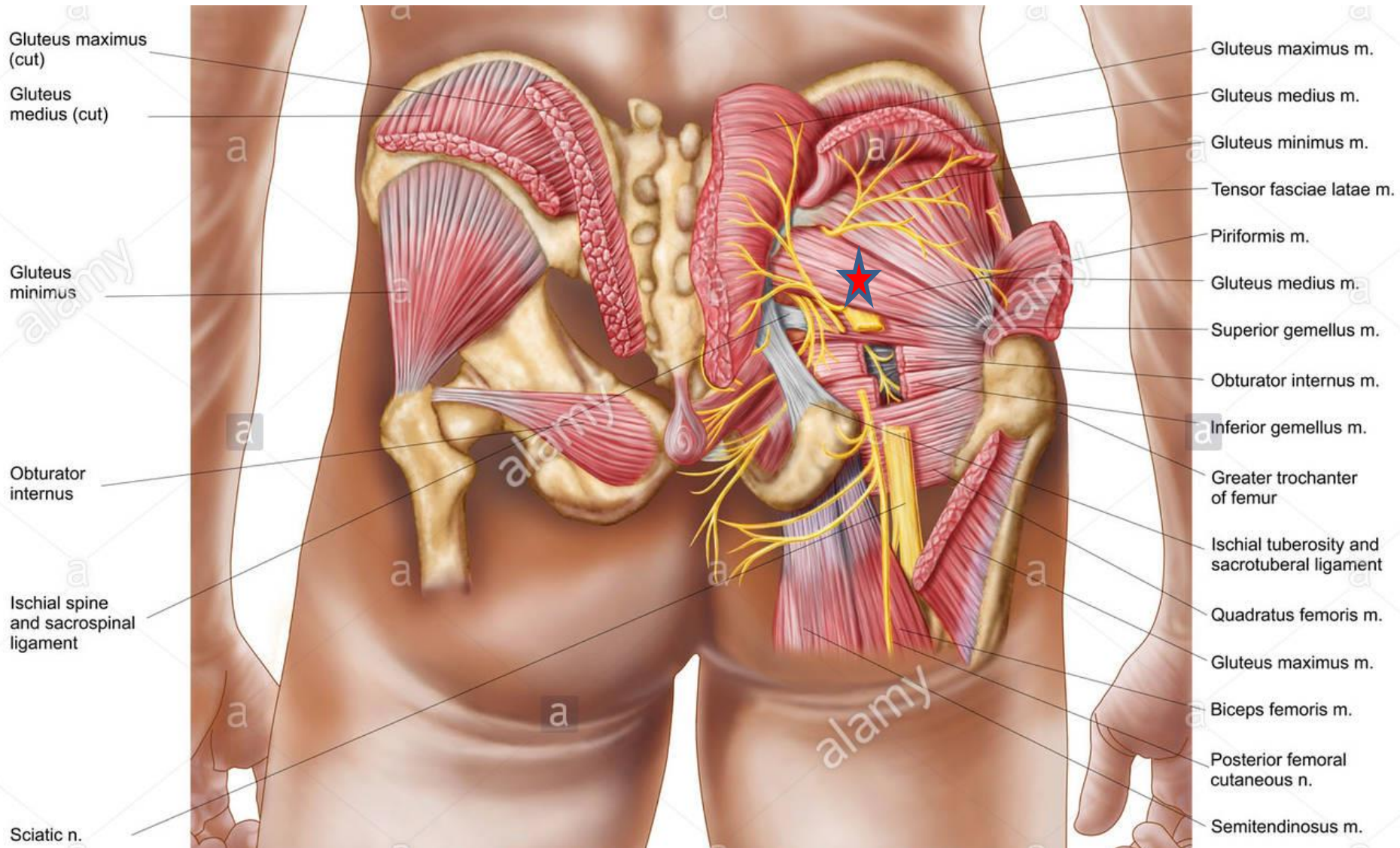
# Structures under cover of gluteus maximus

- Bones
  - Trochanteric
  - Gluteofemoral
  - Ischial
- Ligaments
  - Trochanteric
  - cruciate
- Muscles
- Blood vessels and
- Nerves
- Arterial Anastomosis





(a) Posterior view, deep muscles



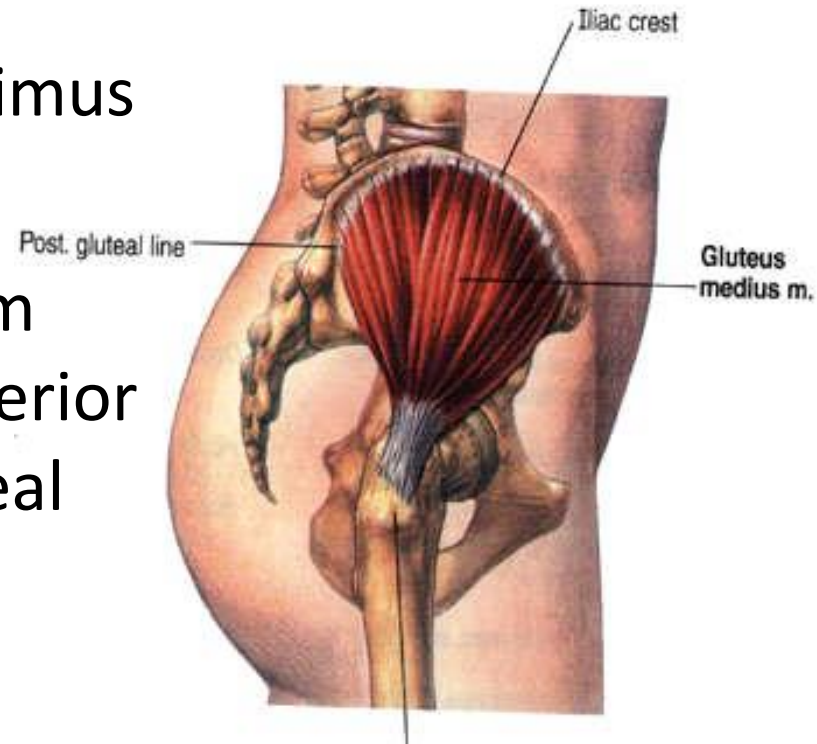
PIN structures

# GLUTEUS MEDIUS

Covered partially by Gluteus maximus

**Origins:** dorsal surface of the ilium between the anterior and posterior gluteal lines and from the gluteal aponeurosis.

**Insertion:** lateral surface of the greater trochanter on an oblique ridge.

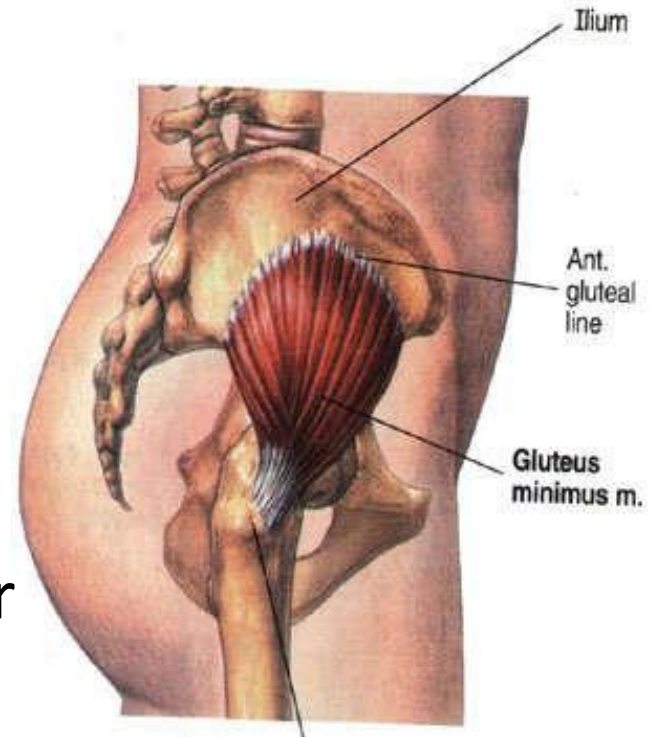




# GLUTEUS MINIMUS

Covered completely by Gluteus medius.

**Origins:** gluteal surface of the ilium between the anterior and inferior gluteal lines upto margin of greater sciatic notch.



**Insertion:** lateral part of anterior surface of the greater trochanter.

- **Innervation of Gluteus medius and minimus:** superior gluteal nerve [L4, 5, S1] – that emerges above the piriformis muscle, with accompanying vessels, to penetrate the deep surface of the muscle.
- **Actions**  
Abduction of the thigh and medial rotation.

**Preventing the unsupported side of pelvis from sagging downward during locomotion.**

**Lurching Gait**

# The Trendelenburg's Sign

- ***Trendelenburgs sign is positive in***
  - ***paralysis of gluteus medius & minimus,***
  - ***congenital dislocation of hip joint,***
  - ***fracture of the neck of femur***

# Piriformis

**Origin:** antero-lateral surface and border of the sacrum.

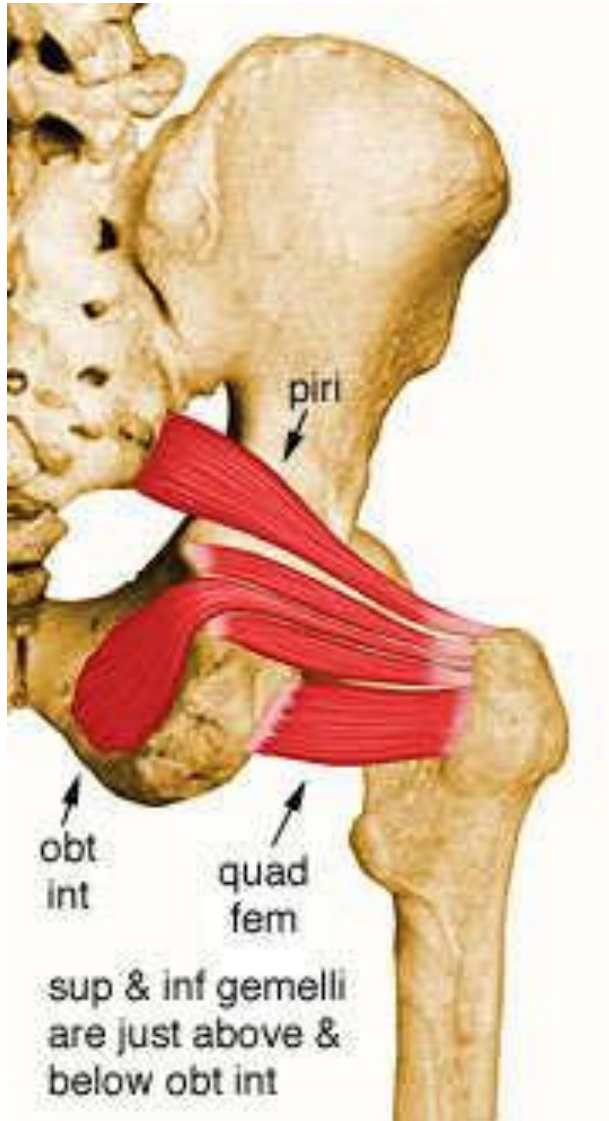


**Insertion:** the fibers are emerge laterally through the greater sciatic foramen as a narrow tendon attached to the posterior inturned upper border of the greater trochanter.

**Innervation** - “nerve to the piriformis” [S1, 2.]

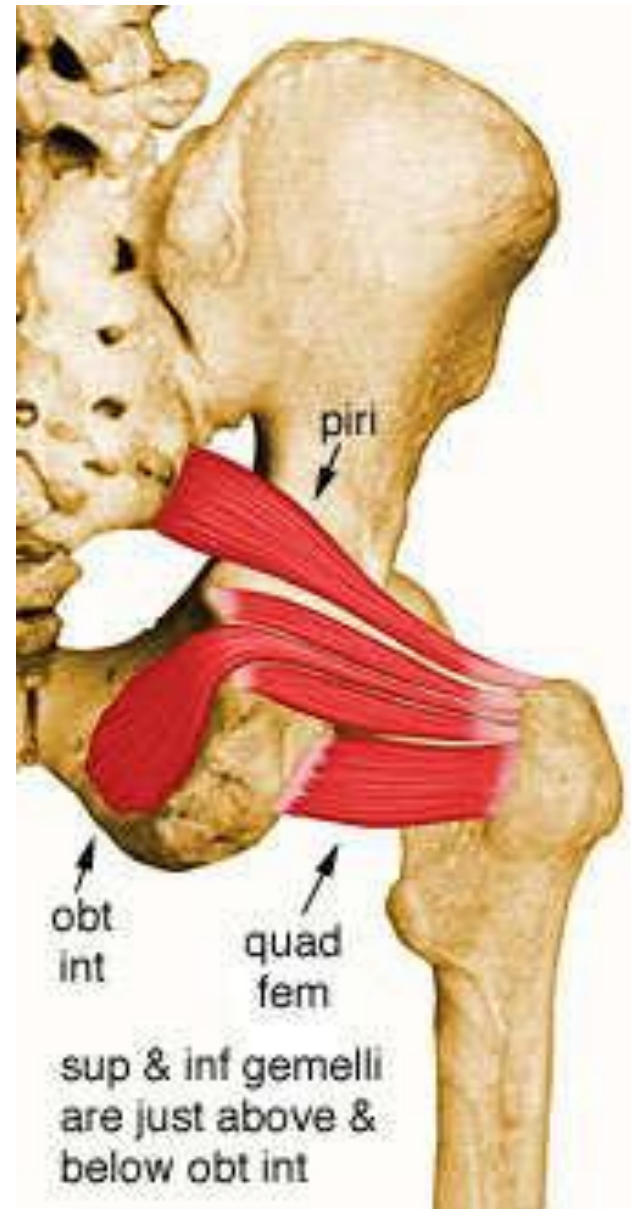
**Action** - lateral rotator and abductor of the thigh.

# Obturator internus and externus



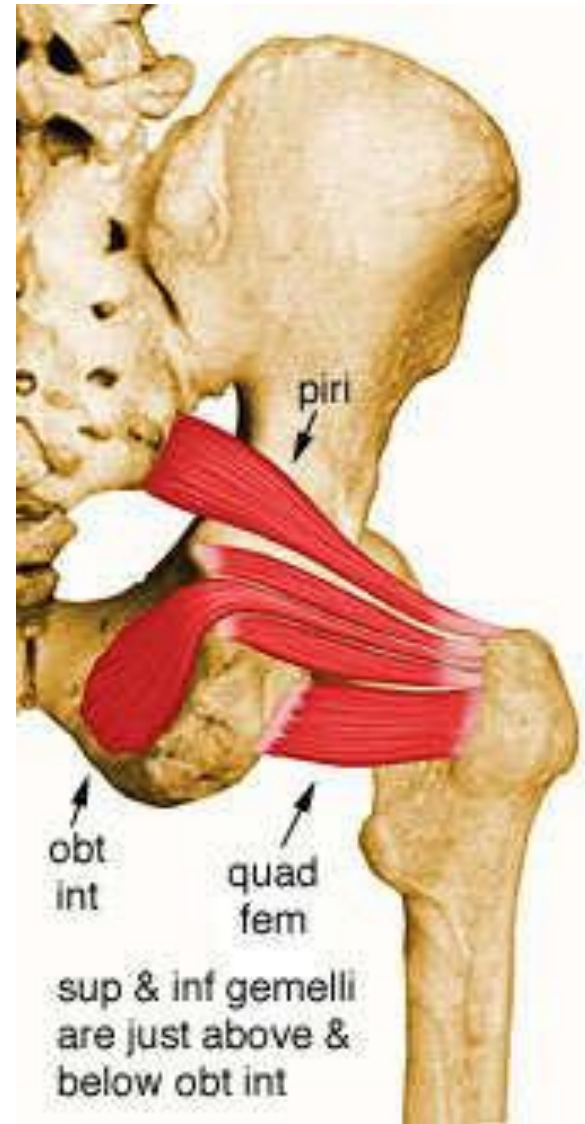
# Obturator internus

- **Origin** : inner surface of obturator membrane and Adjoining ischio-pubic ramus.
- **Insertion**: Tendon makes a right angle bend at lesser sciatic foramen to insert to the medial surface of greater trochanter above and in front of the trochanteric fossa



# Obturator internus

- It is accompanied by Superior and Inferior Gemelli and insert at superior and inferior margin of the insertion of obturator internus.
- Superior Gemellus from ischial spine.
- Inferior Gemellus from lower margin of lesser sciatic notch.





# Obturator internus

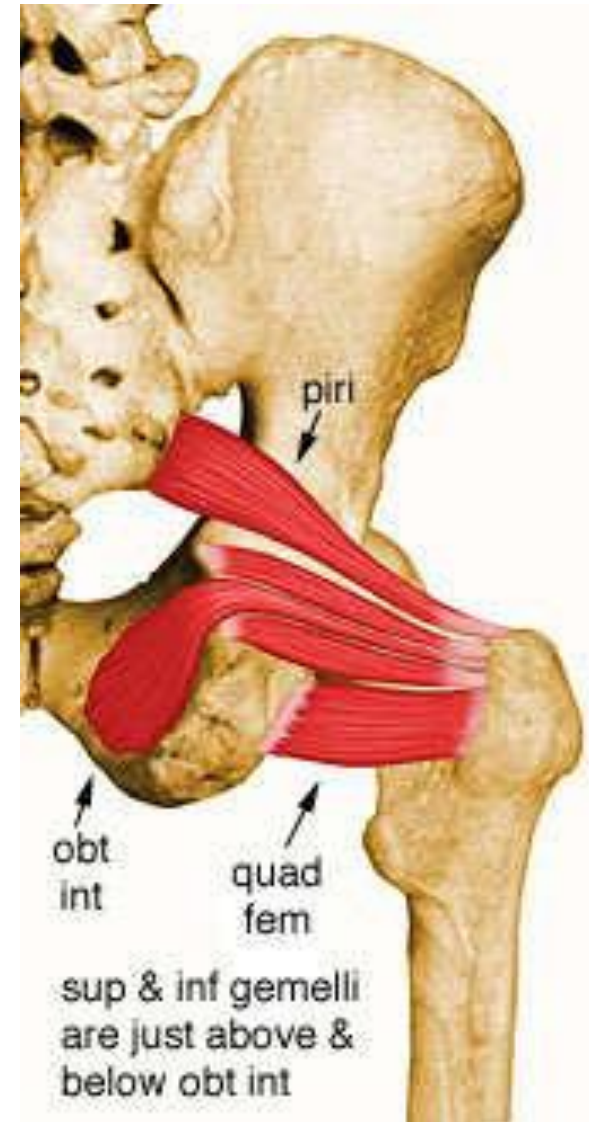
- **Nerve supply :**

Nerve to obturator internus also supplies Sup. Gemellus (L5,S1,S2)

Inf. Gemellus is supplied by nerve to Quadratus femoris (L4,L5,S1)

- **Action:**

Lateral rotation at Hip joint



# Quadratus Femoris

- **Origin:**

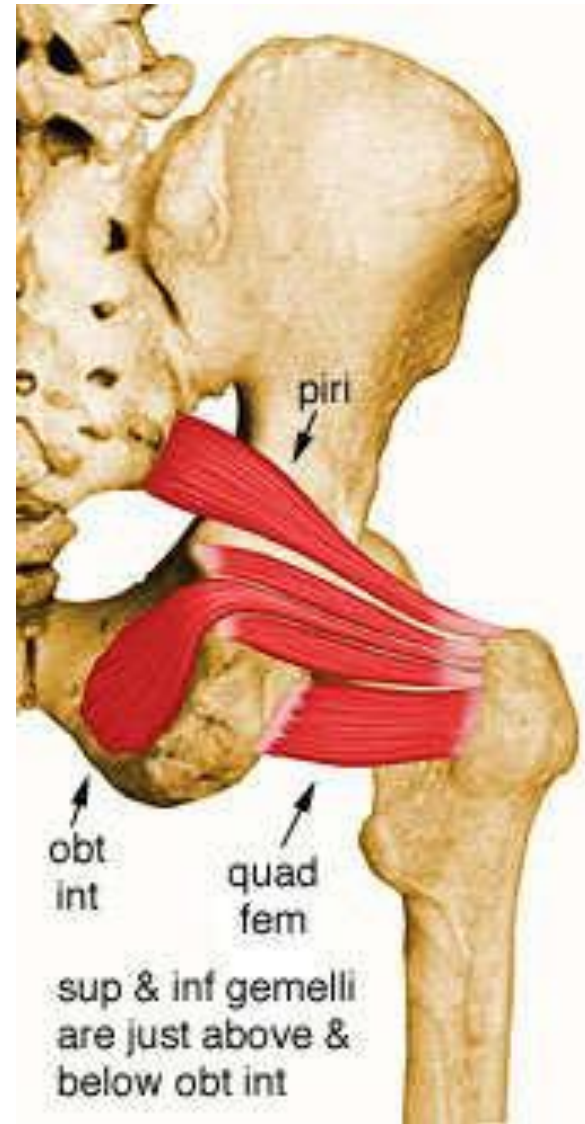
Linear origin from external surface of ischial tuberosity.

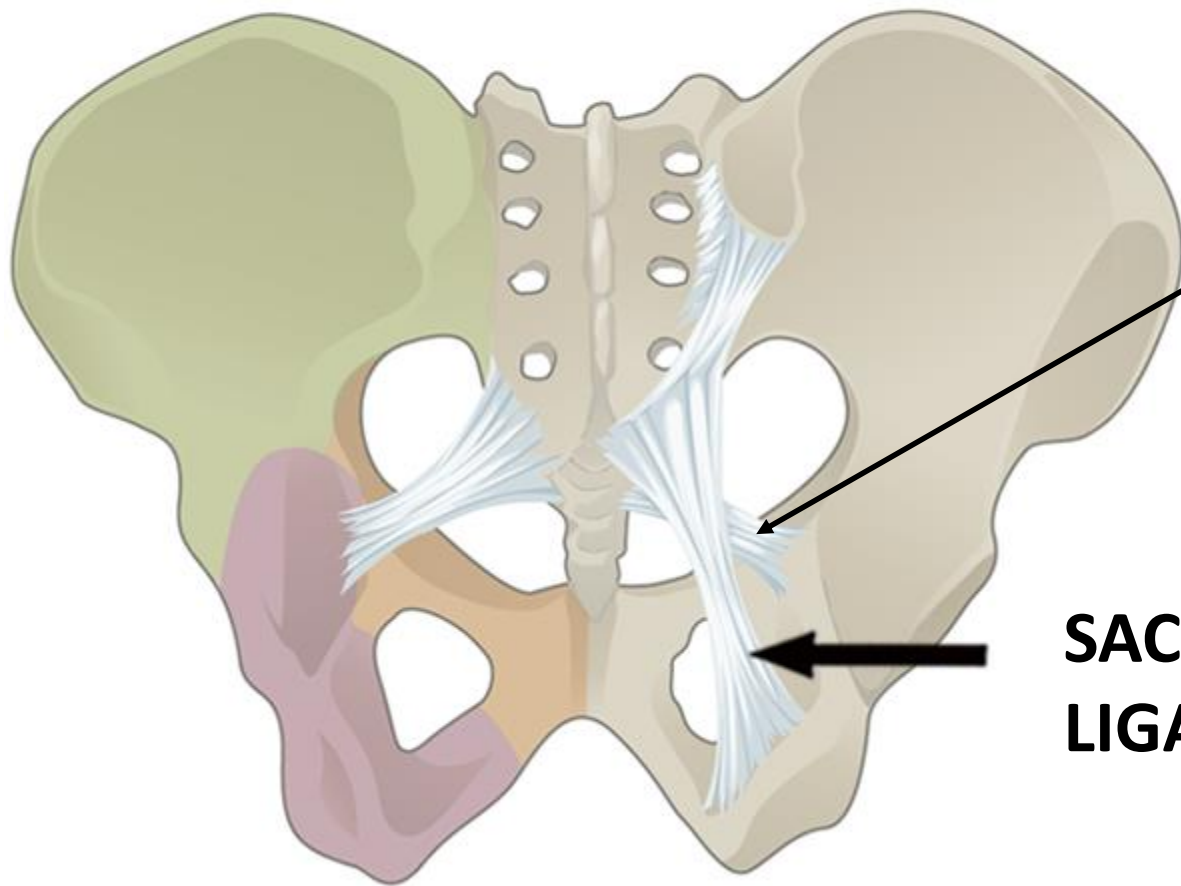
- **Insertion:**

Quadrate tubercle near middle of intertrochanteric crest.

- **Innervation:** nerve to Quadratus femoris (L4,L5,S1)

- **Action:** Lateral rotation of hip





**SACROSPINOUS  
LIGAMENT**

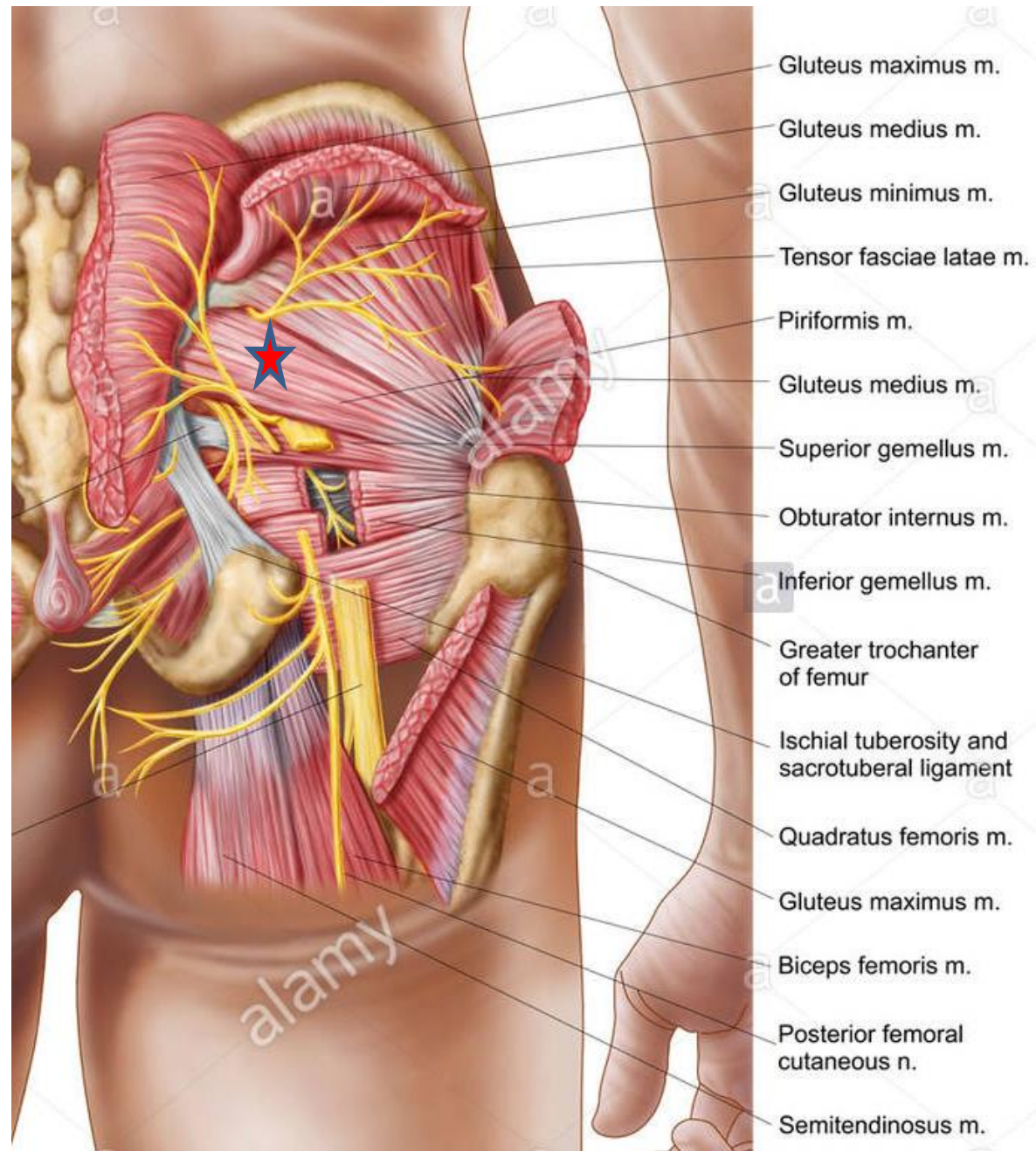
**SACROTUBEROUS  
LIGAMENT**

## Above piriformis

- Superior gluteal nerve and vessels

## Below piriformis

- Sciatic nerve
- Posterior femoral cutaneous nerve
- Inferior gluteal nerve and vessels
- Nerve to obturator internus
- Internal pudendal vessels
- Pudendal nerve



# Structures undercover of gluteus maximus

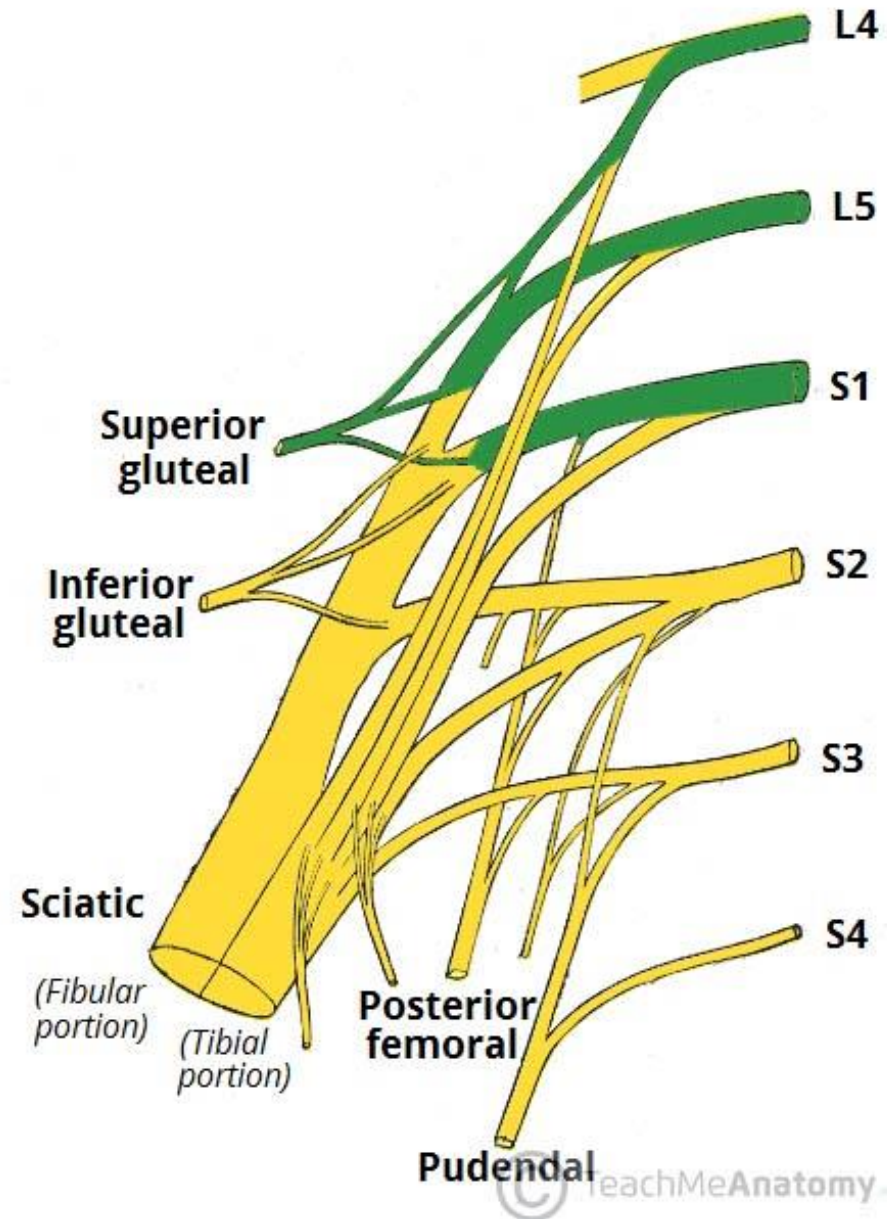
## Nerves

- Superior gluteal nerve (L4,L5,S1),
- Inferior gluteus nerve (L5,S1, S2),
- Pudendal Nerve (S2,S3,S4),
- Posterior Cutaneous Nerve of thigh (S1,S2,S3),
- Perforating Cutaneous Nerve (S2,S3),
- Sciatic Nerve (L4,L5,S1,S2,S3),
- Nerve to Quadratus Femoris (L4,L5,S1),
- Nerve to Obturator Internus (L5,S1,S2)

# Sciatic nerve

Tibial component  
V (L4-S3)

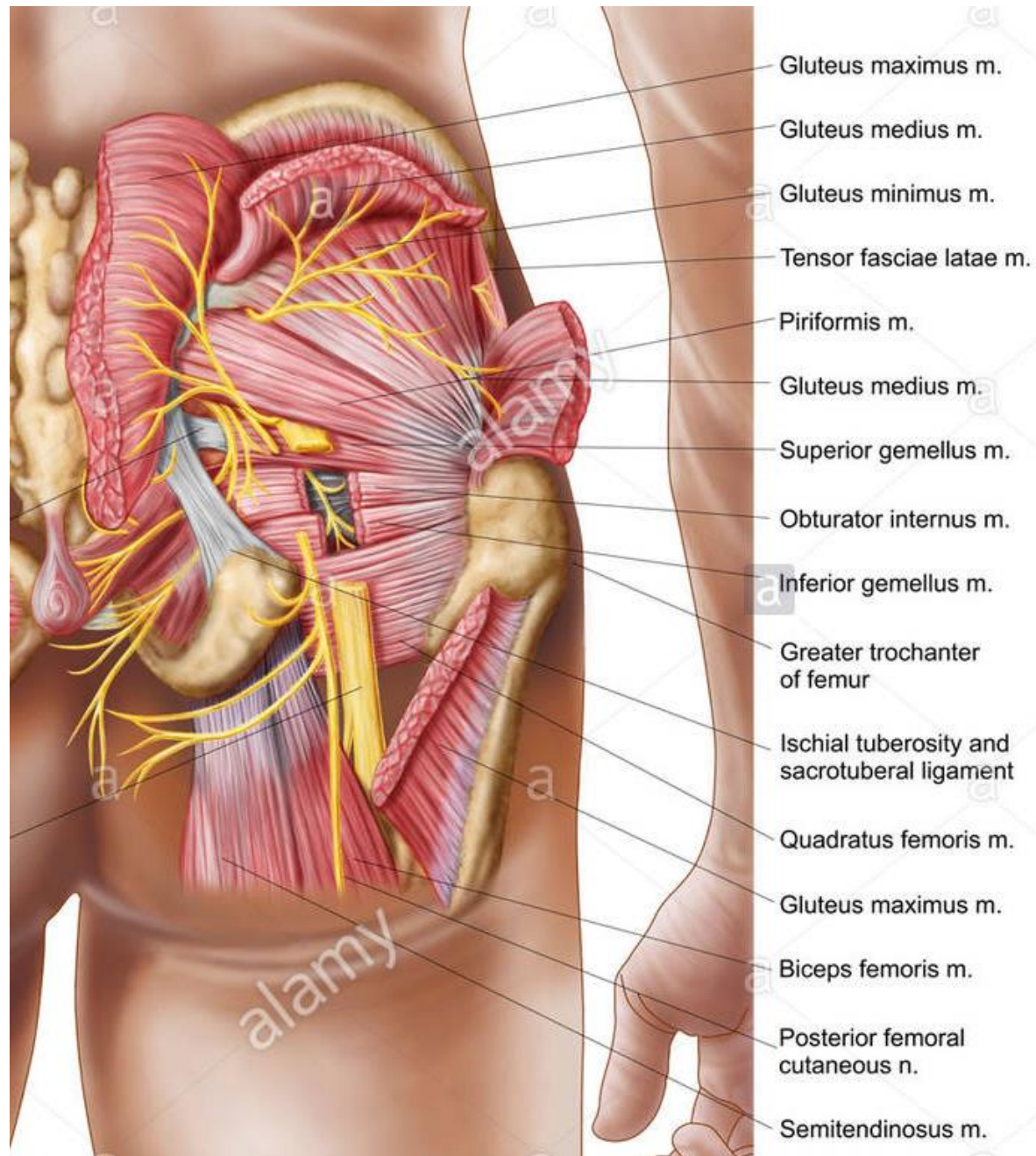
Common peroneal  
Component  
D (L4-S2)



# Course

## Branches

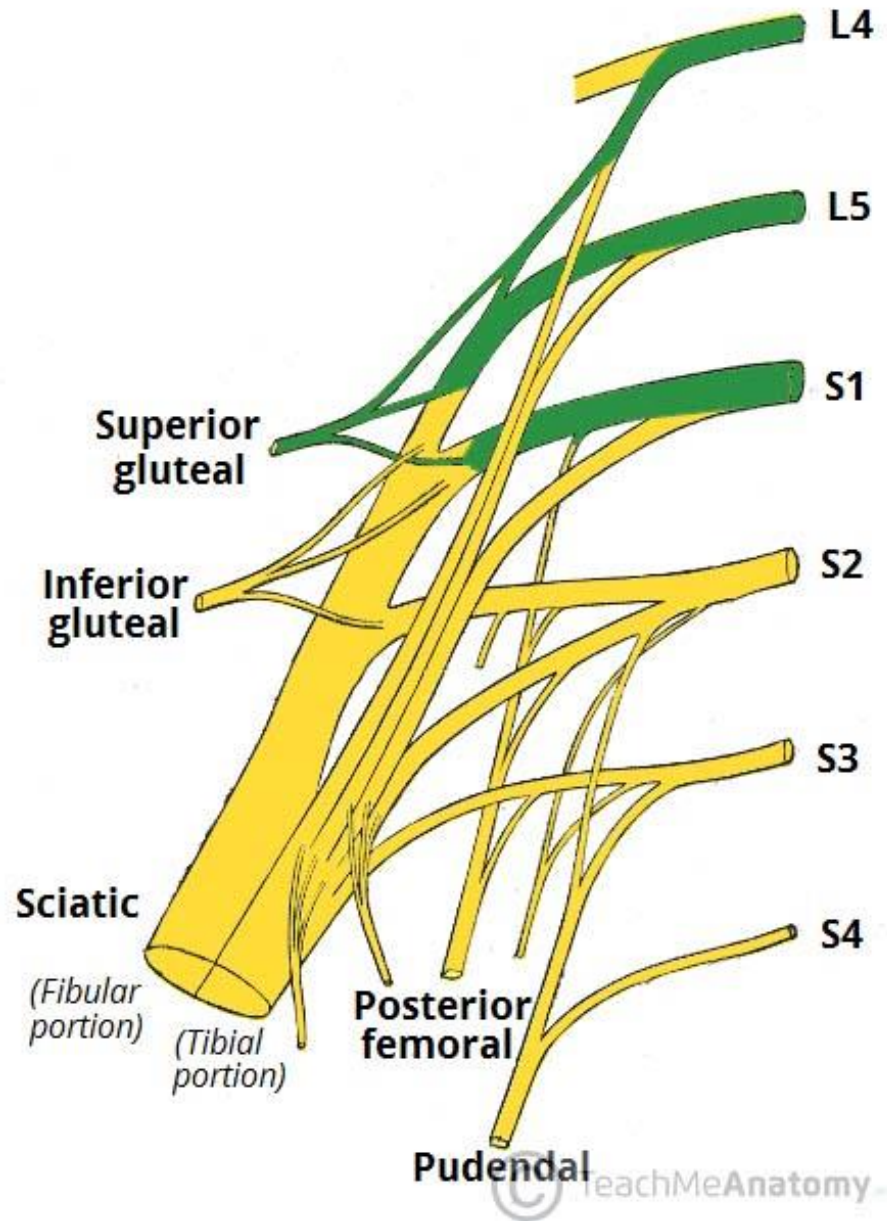
- Muscular branches to hamstrings. (medially)
- Articular branches to Hip joint



**Superior gluteal nerve**  
**Ventral rami of**  
**L4, L5, S1**

**Inferior gluteal nerve**  
**Ventral rami of**  
**L5, S1, S2**

**Pudendal nerve**  
**Ventral rami of**  
**S2, S3, S4**





# Posterior femoral cutaneous nerve

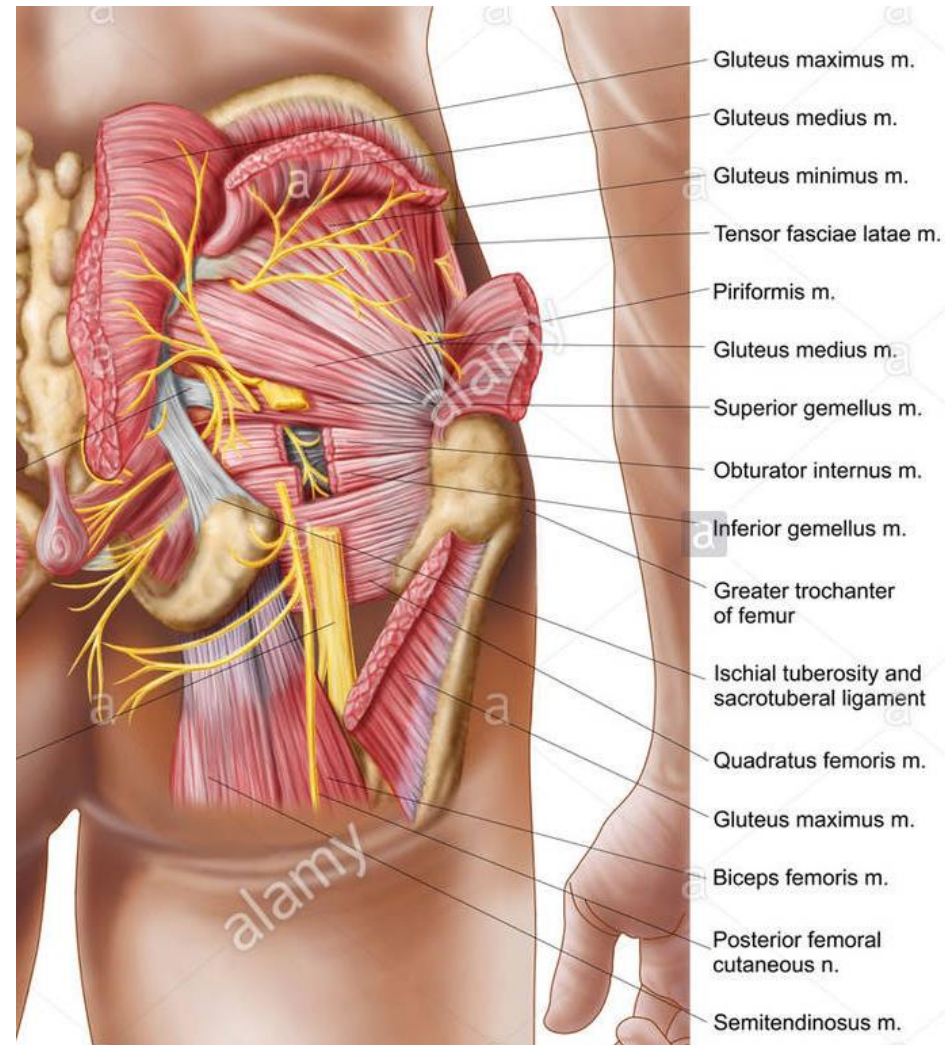
**D (S1, S2)**

**V (S2, S3)**

It descends on the back of the thigh, and in the popliteal fossa it pierces the deep fascia and supplies the skin on the back of the thigh and the upper part of the leg

## Branches:

- a) Gluteal**
- b) Perineal**
- c) Perforating**

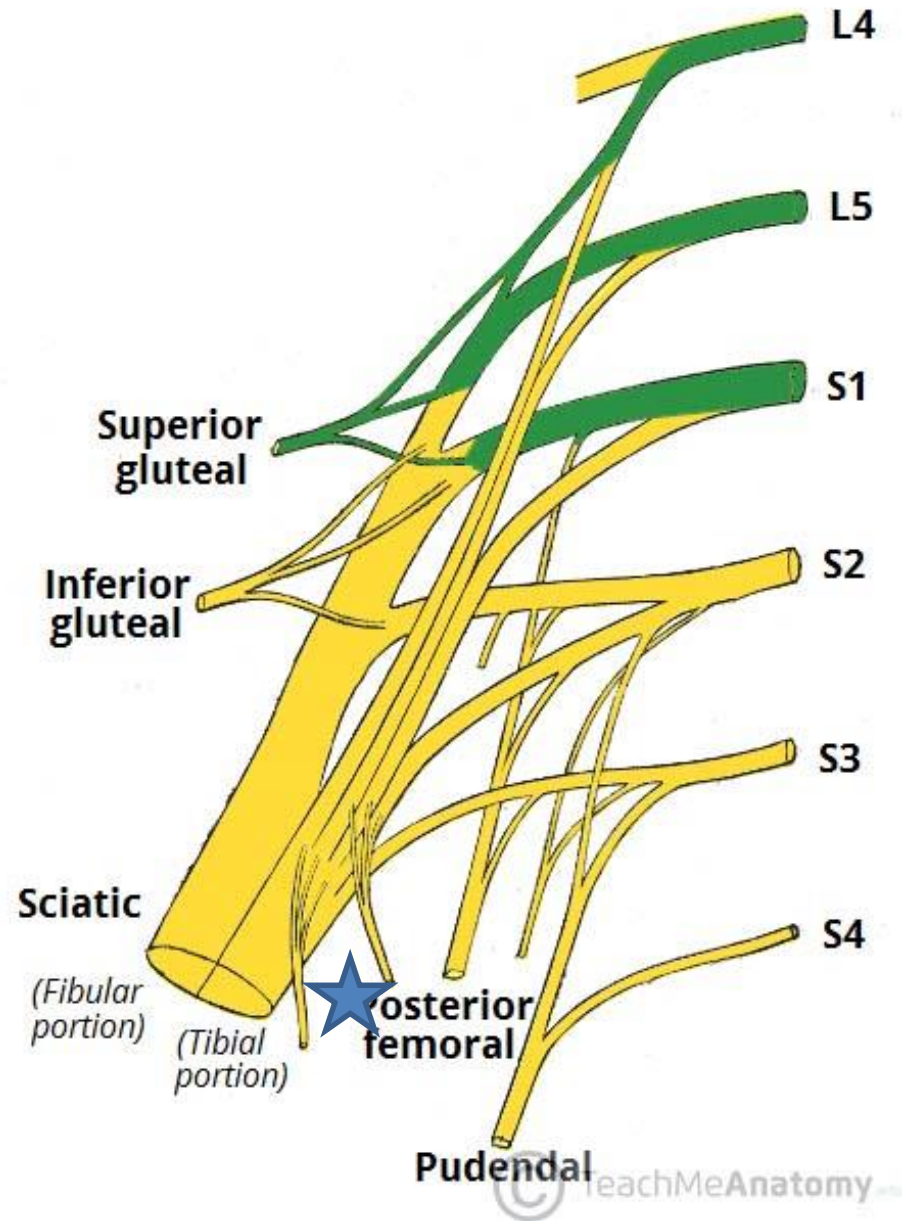


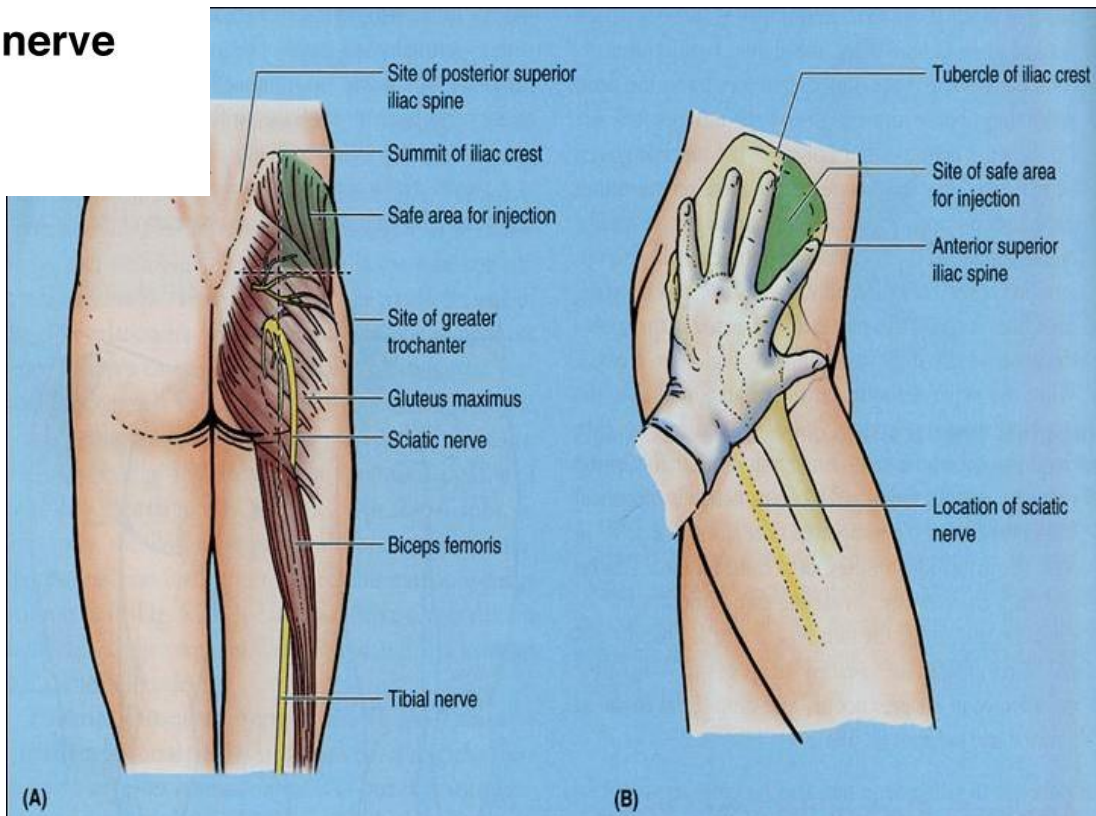
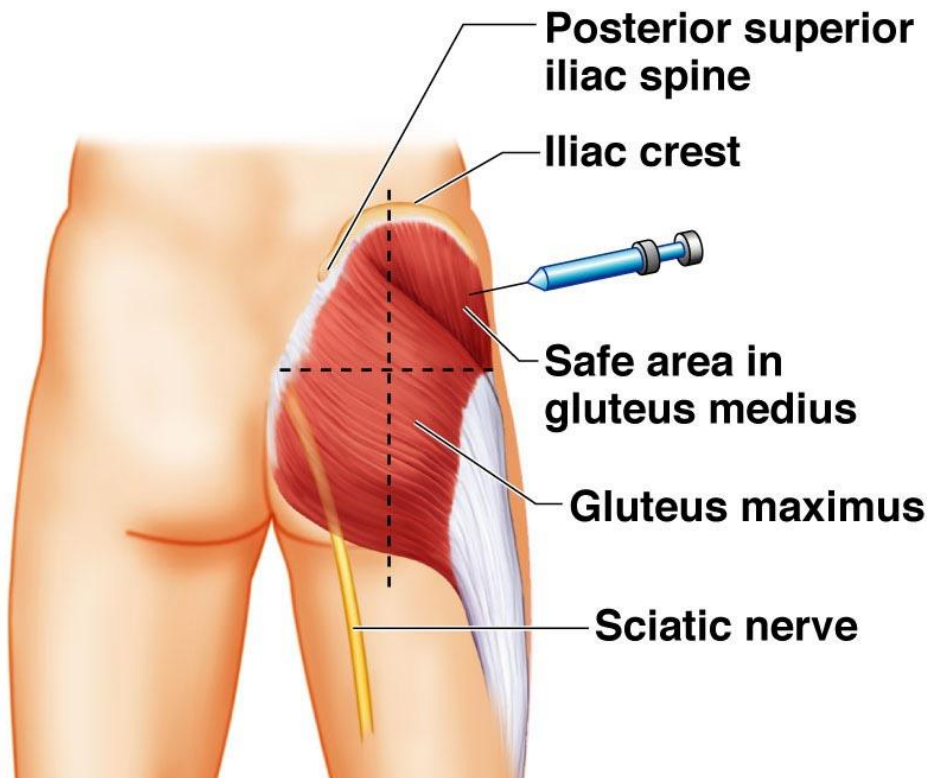
- **Nerve to obturator internus**

Ventral rami of  
V (L5, S1, S2)

- **Nerve to quadrator femoris**

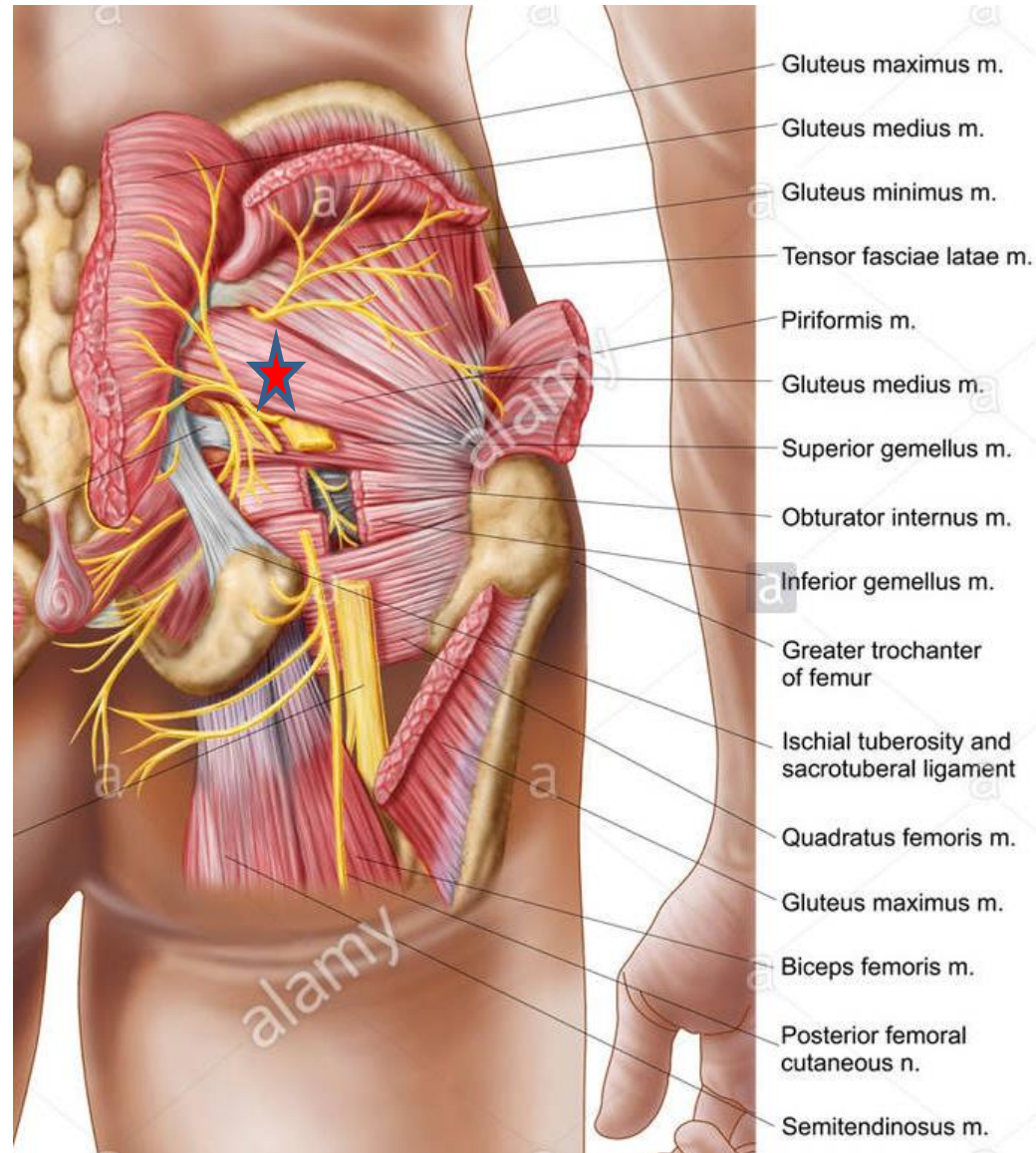
Ventral rami of  
V (L4, L5, S1)





- **Superior gluteal artery**

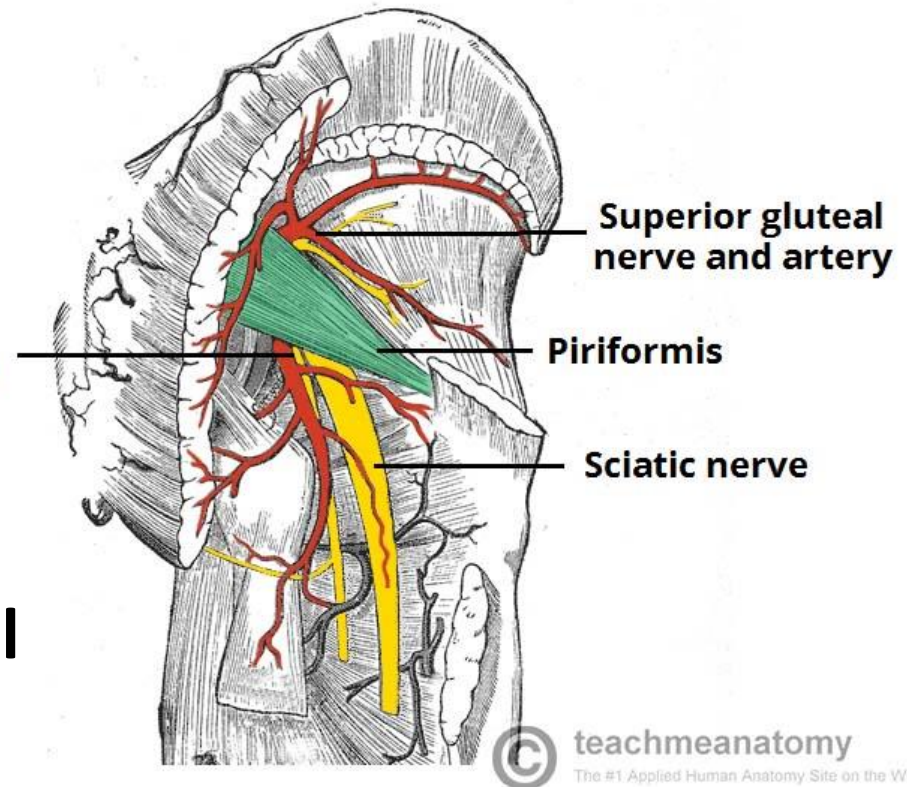
**Branch of posterior division of Internal Iliac artery.**



- Superior gluteal artery divides into  
Superficial branch  
Deep branch- upper branch and lower branch

## SPINOUS ANASTOMOSIS

1. Upper branch of Superior gluteal artery
2. Superficial and deep circumflex iliac arteries
3. Ascending branch of lateral circumflex femoral artery
4. Iliac branch of ilio-lumbar artery.

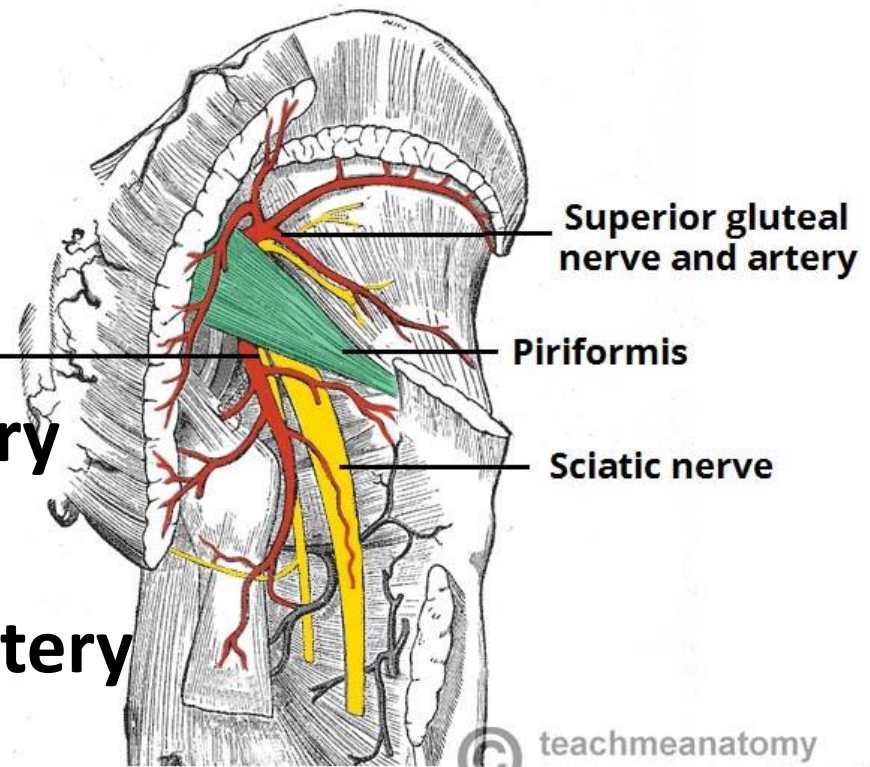


- **Superior gluteal artery**

**Branch of posterior division of Internal Iliac artery.**

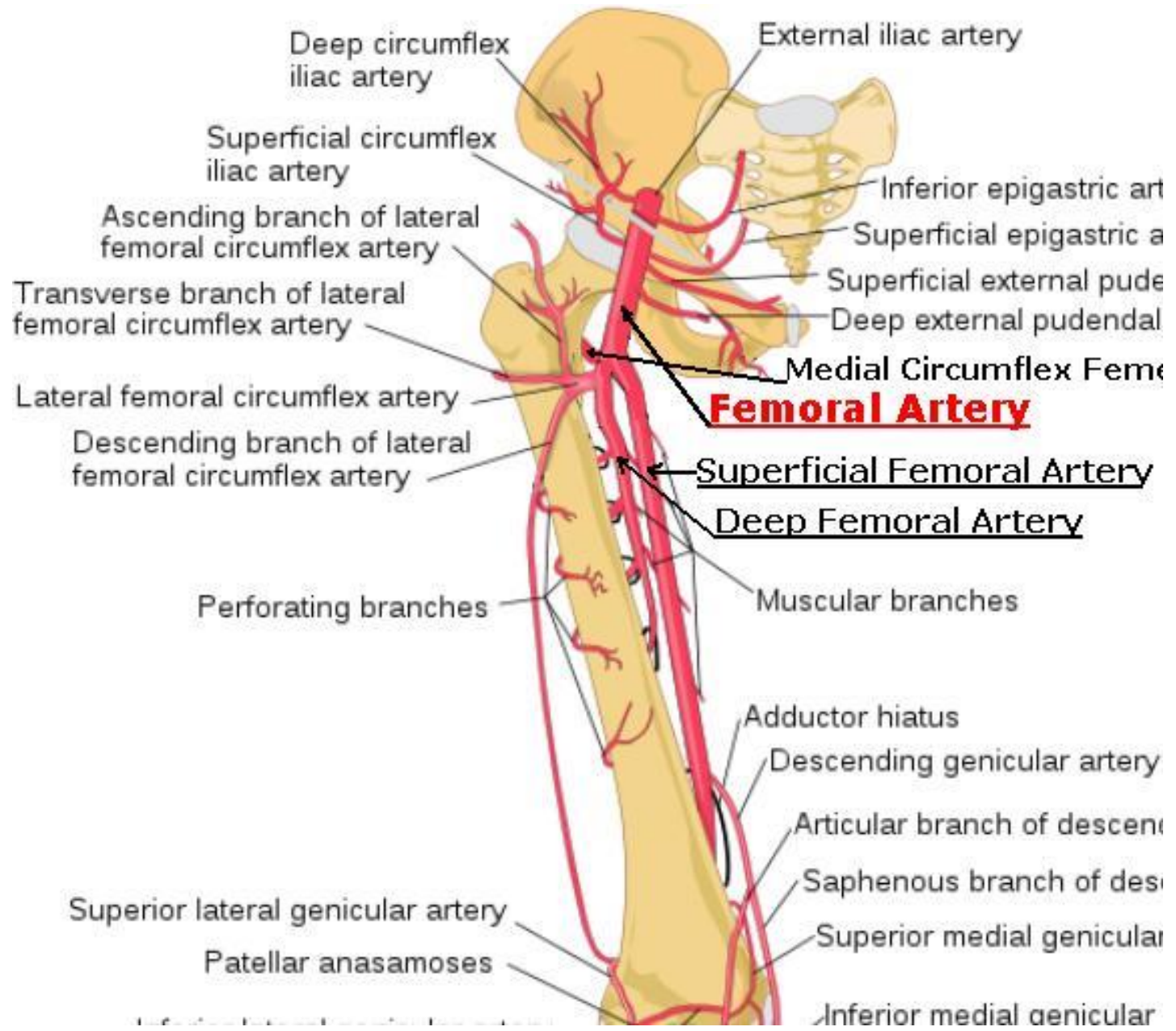
**Branches:-**

- a) **Muscular branches**
- b) **Anastomotic branches**
- c) **Arteria nervi ischiadici**

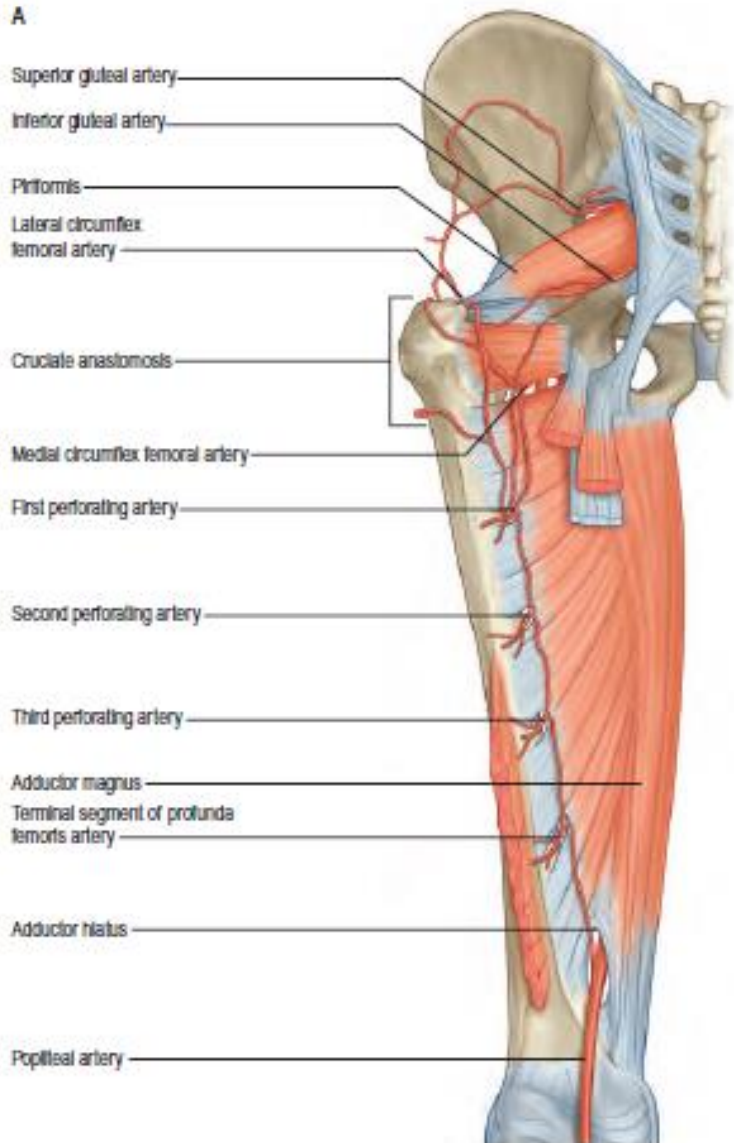


- **Internal pudendal artery**

**Branch of anterior division of Internal Iliac artery**



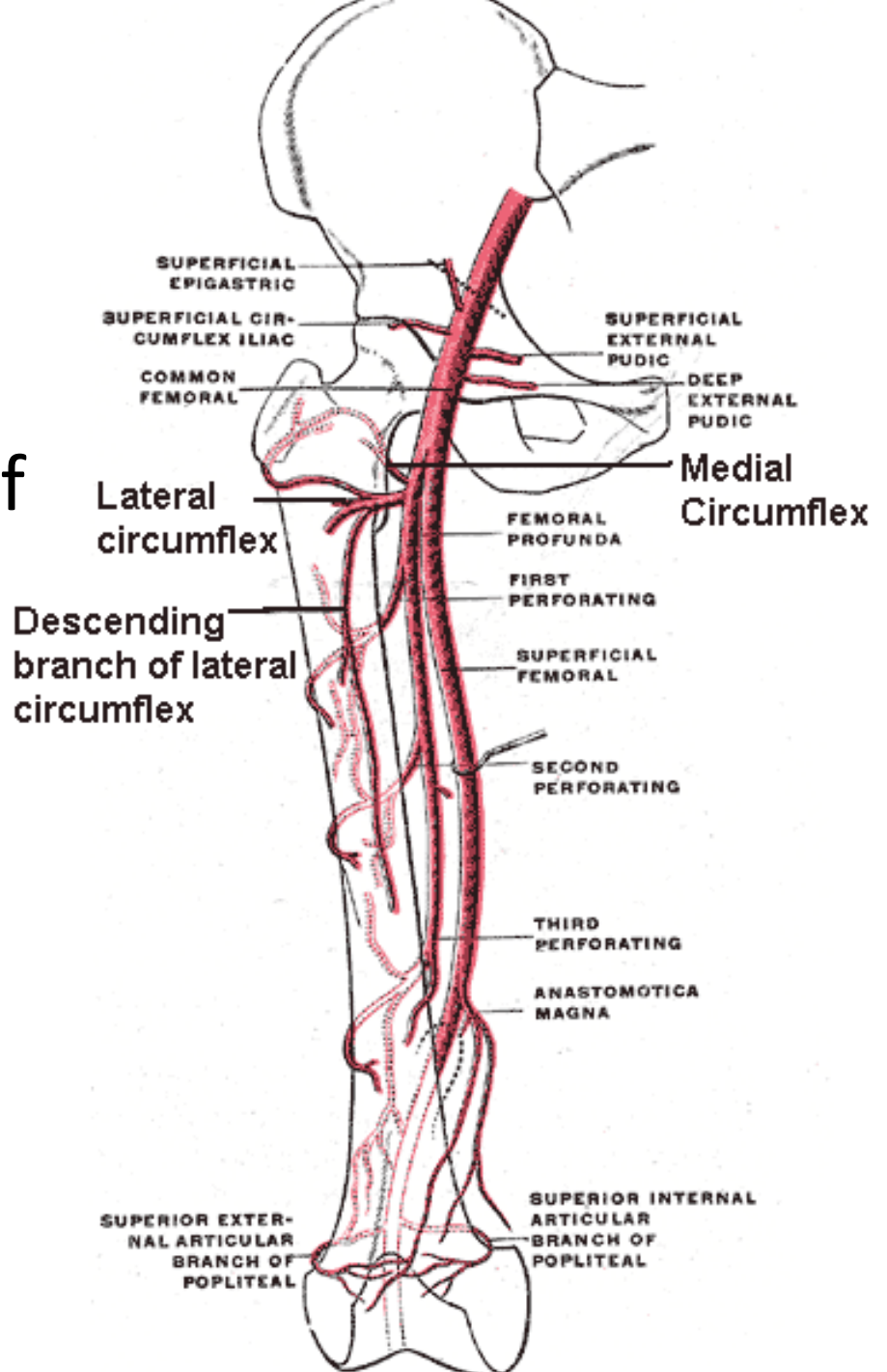
# CRUCIATE ANASTOMOSIS



- **Descending branch of inferior gluteal artery**
- **Ascending branch of 1st perforating artery**
- **Medially- transverse branch of medial circumflex femoral artery**
- **Laterally- transverse branch of lateral circumflex femoral artery**

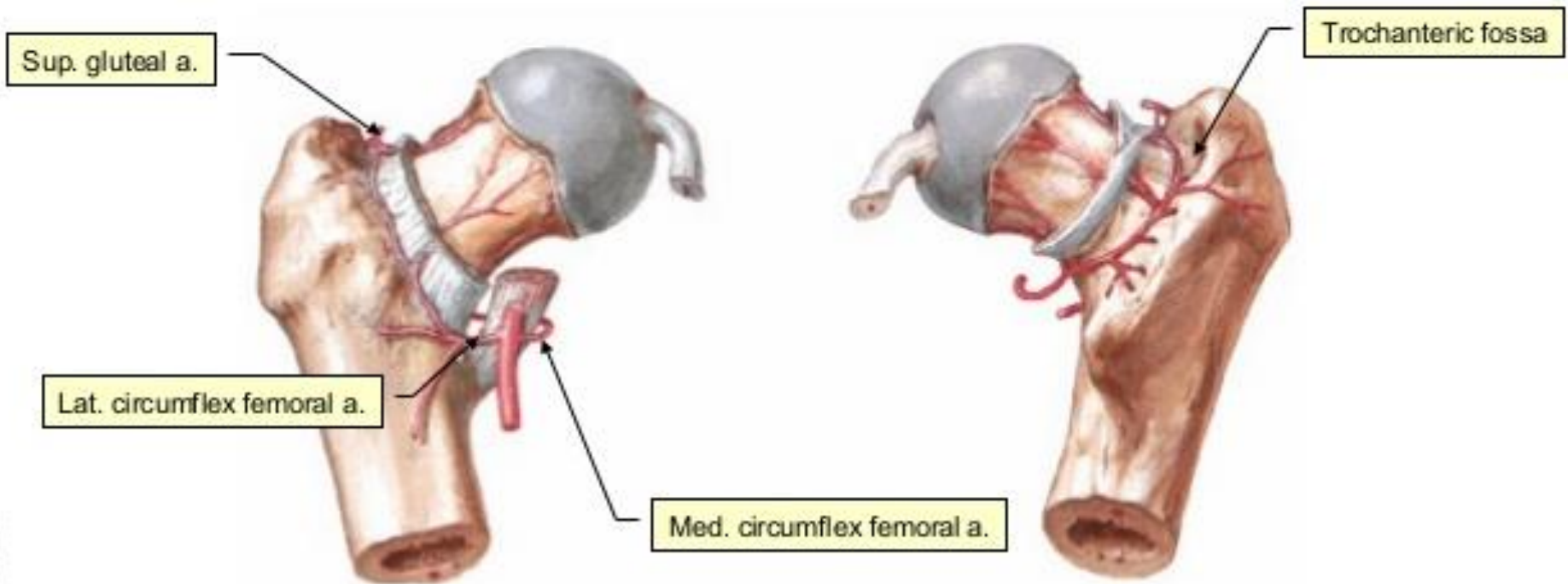


- Collateral circulation between branches of iliac arteries and profunda femoris arteries in case of ligature of femoral artery



# TROCHANTERIC ANASTOMOSIS

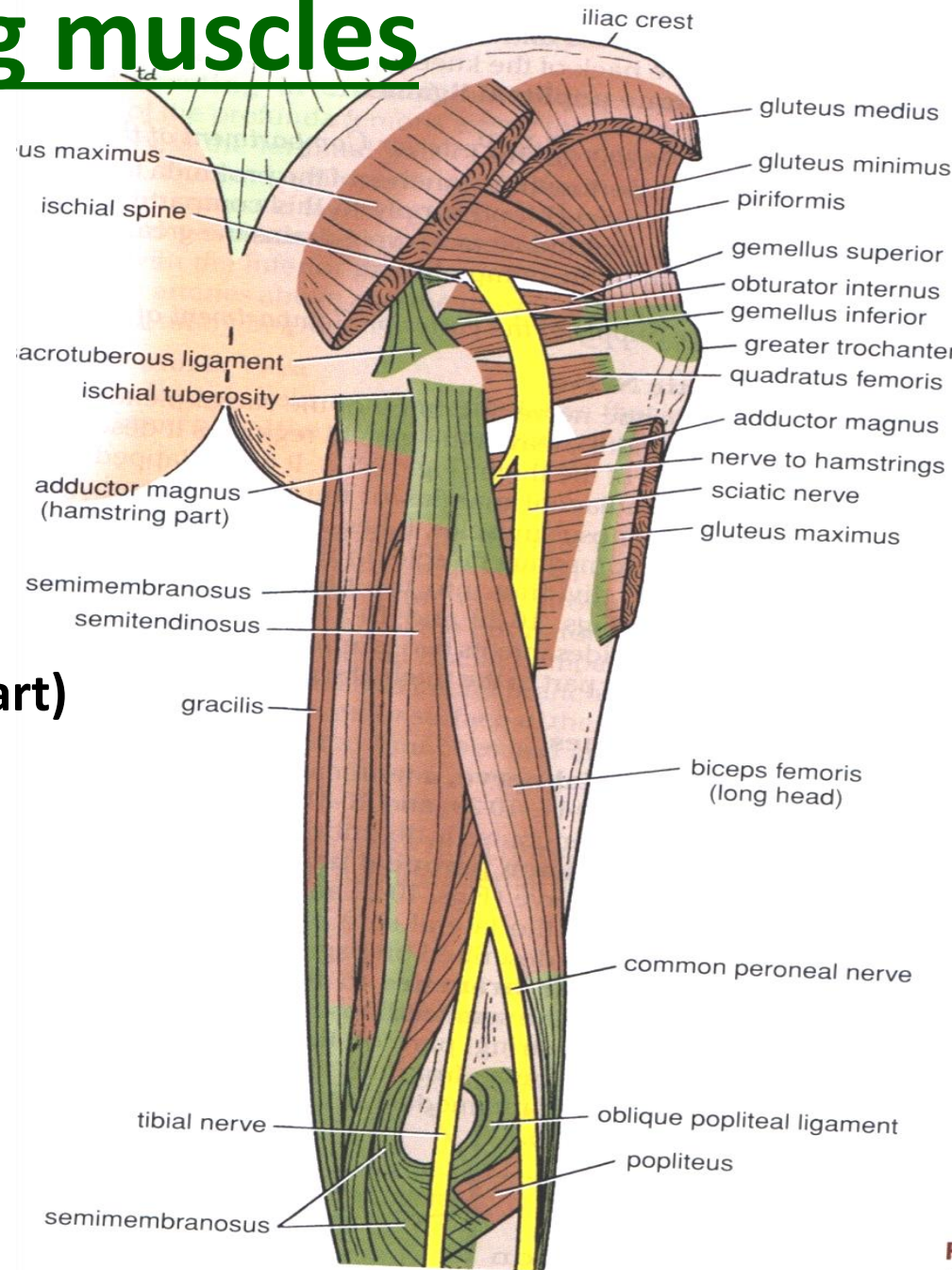
- Provides the main source of blood for the supply of the head of the femur.
- Lies near the trochanteric fossa, hence the name.
- Formed by the anastomosis of the descending branch of the superior gluteal artery and the ascending branch of the lateral and medial circumflex femoral arteries. The inferior gluteal artery usually participating by an anastomotic branch.



# Trochanteric anastomosis

- **Descending branch of superior gluteal artery**
- **ascending branches of medial & lateral circumflex femoral artery**
- **Branch from inferior gluteal artery**
- **situated near the trochanteric fossa of the femur & supplies the head of femur and retinacular fibers of neck**

# Hamstring muscles



These are:

**Semi-membranosus**

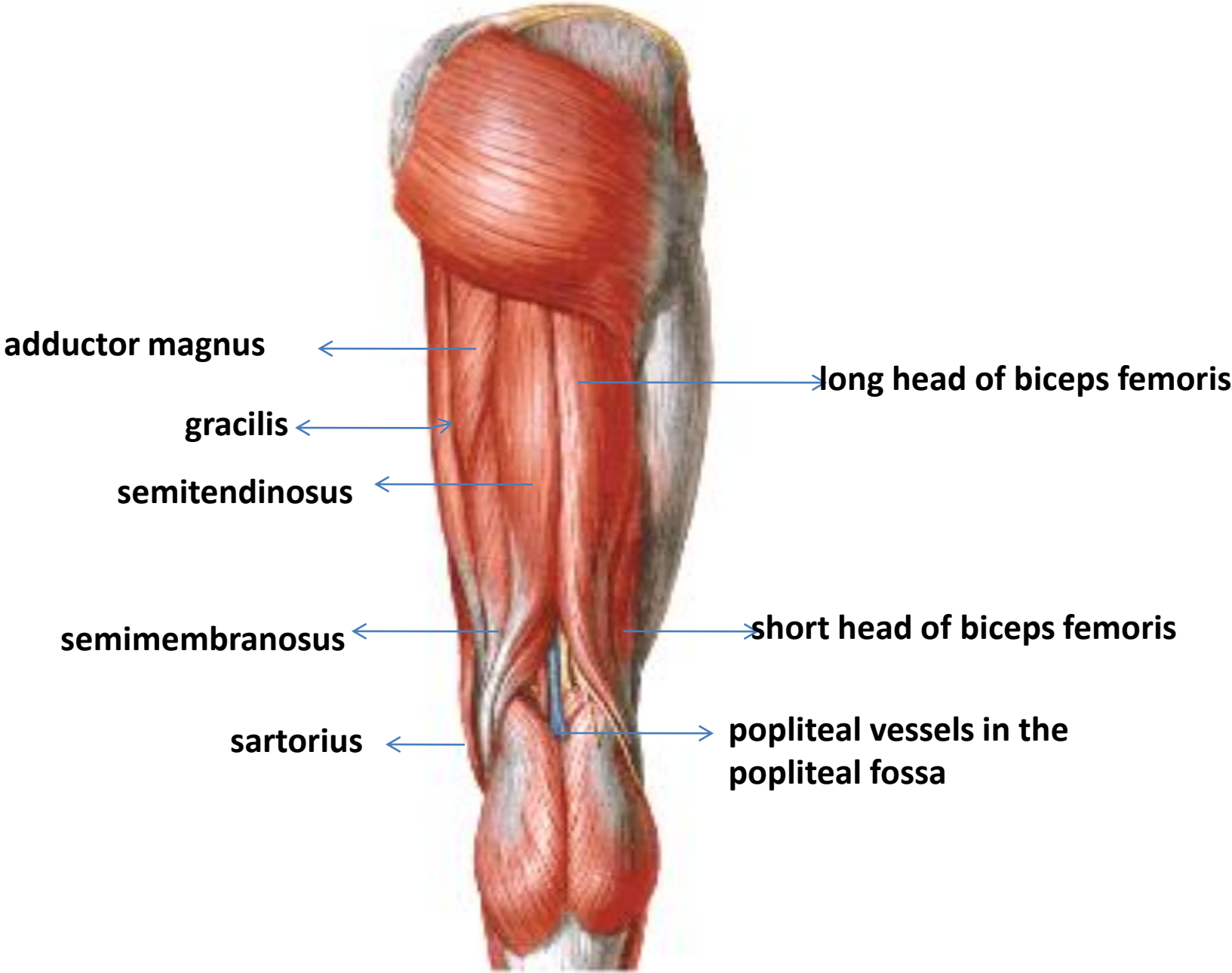
**Semi-tendinosus**

**Biceps femoris (long head )**

**Adductor Magnus (ischial part)**

# Hamstring Muscles

- ❑ Common name applied to the muscles in the Posterior compartment.
- ❑ They have a common origin from the **ischial tuberosity** and crosses knee joint to insert on tibia or fibula.
- ❑ They are innervated by the **tibial component of sciatic nerve**.
- ❑ They also have a common primary function of **flexing the leg**, but they also help **to extend and adduct the thigh**.
- ❑ Their blood supply comes principally from the **perforating branches** of the deep femoral artery.



**adductor magnus**

**gracilis**

**semitendinosus**

**semimembranosus**

**sartorius**

**long head of biceps femoris**

**short head of biceps femoris**

**popliteal vessels in the popliteal fossa**

**Origin** - Common from Ischial tuberosity.

**Insertion** - One of the leg bones.

**Nerve supply**-Tibial part of sciatic nerve.

**Common action** \_\_\_\_\_ Extensors of hip joint.  
Flexors of knee joint.

## True hamstrings-

- **Semimembranosus**
- **Semitendinosus**

## Modified hamstrings

• Long head of biceps femoris-

• Sacrotuberous ligament **morphologically degenerated part.**

• Ischial head of adductor magnus-

Tibial collateral ligament represents the  
**morphological degenerated part of adductor magnus**



**Biceps Femoris** - most lateral muscled with a “long head” from the ischial tuberosity, and a “short head” from the middle of the linea aspera and the lateral supracondylar ridge.

\*The two heads unite to form a common tendon, which deviates lateral to its insertion into the apex of the head of the fibula where it is joined by an extension of the iliotibial tract.

•The short head receives a branch from the common peroneal nerve; it also helps in the lateral rotation of the leg.

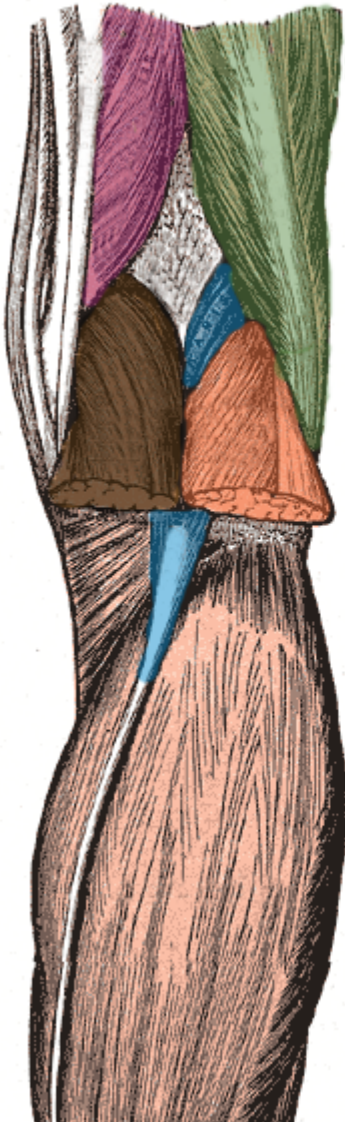


**Semitendinosus** - usually fusiform tapering distally into a long cylindrical tendon at the popliteal region to be inserted to the upper medial surface of the tibia, adjacent to the attachments of the sartorius and gracilis.

**Semimembranosus** - usually has a fleshy belly that form a thick flattened tendon that inserts at the back of the medial condyle of the tibia, the tendon contributes to the formation of the “oblique popliteal ligament” of the knee joint, which reinforces the posterior capsule of the joint.



# POPLITEAL FOSSA



- Semimembranosus
- Biceps femoris
- Plantaris
- Lateral head of gastrocnemius
- Medial head of gastrocnemius



# Boundaries of popliteal fossa

MEDIAL

LATERAL

Adductor magnus

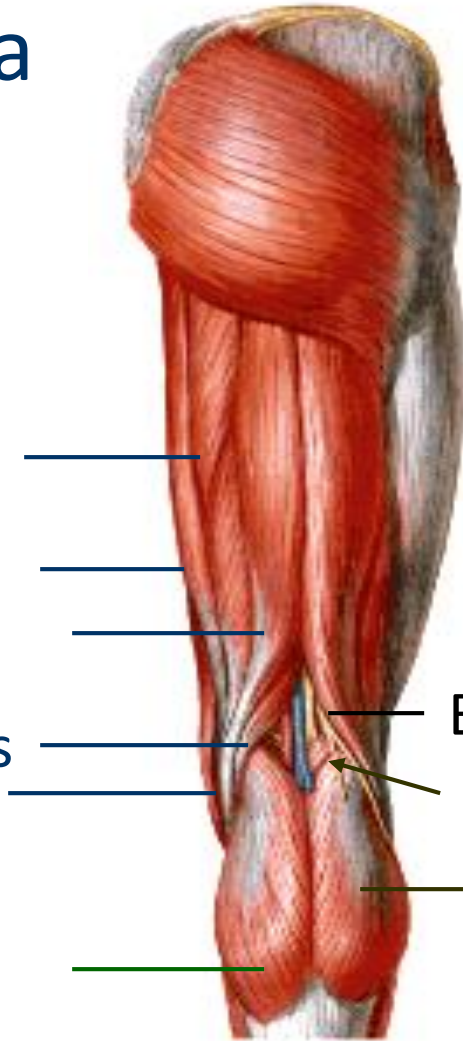
Gracilis

Semitendinosus

Semimembranosus

Sartorius

Medial head of  
gastrocnemius



Biceps femoris

Plantaris

Lateral head of gastrocnemius

# CONTENTS OF POPLITEAL FOSSA

- POPLITEAL ARTERY AND ITS BRANCHES
- POPLITEAL VEIN AND ITS TRIBUTARIES
- TIBIAL & COMMON PERONEAL NERVES
- POSTERIOR FEMORAL CUTANEOUS NERVE
- GENICULAR BRANCH OF OBTURATOR NERVE
- POPLITEAL LYMPH NODES
- POPLITEAL FAT