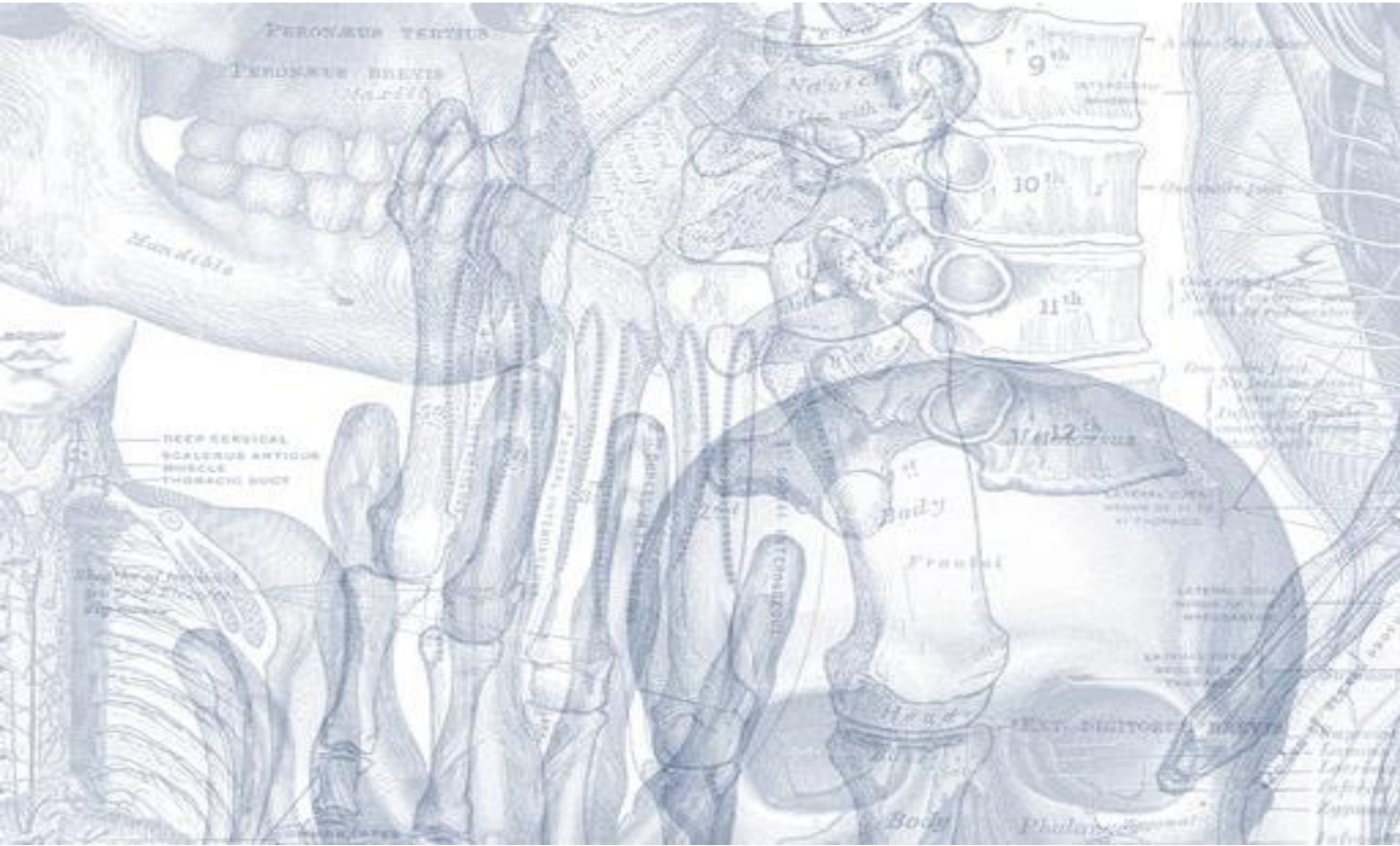


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# Gluteal Region and Back of Thigh

[Editing File](#)

Color Code

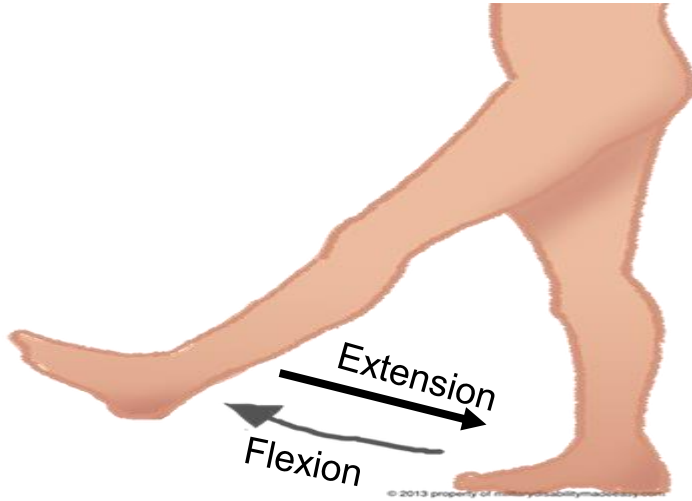
- Important
- Doctors Notes
- Notes/Extra explanation

# Objectives

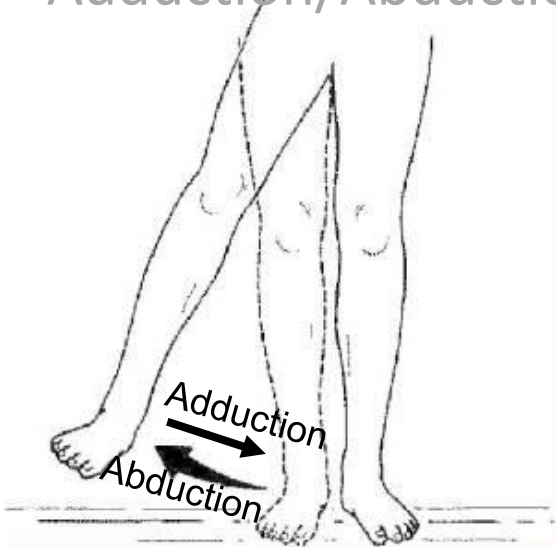
- ✓ Know contents of gluteal region:
  - ✓ Groups of Glutei muscles and small muscles (Lateral Rotators).
  - ✓ Nerves & vessels.
- ✓ Foramina and structures passing through them as:
  - 1-Greater Sciatic Foramen.
  - 2-Lesser Sciatic Foramen.
- ✓ Back of thigh : Hamstring muscles.

# Movements of the lower limb

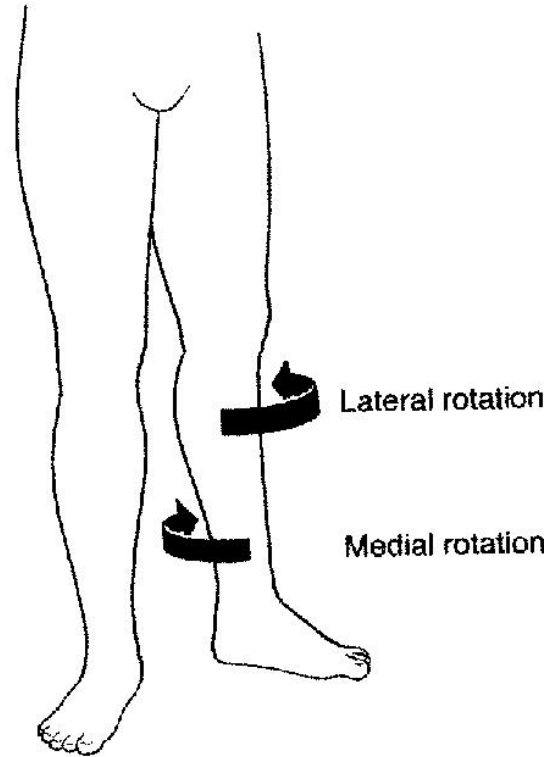
Hip = Thigh  
Flexion/Extension



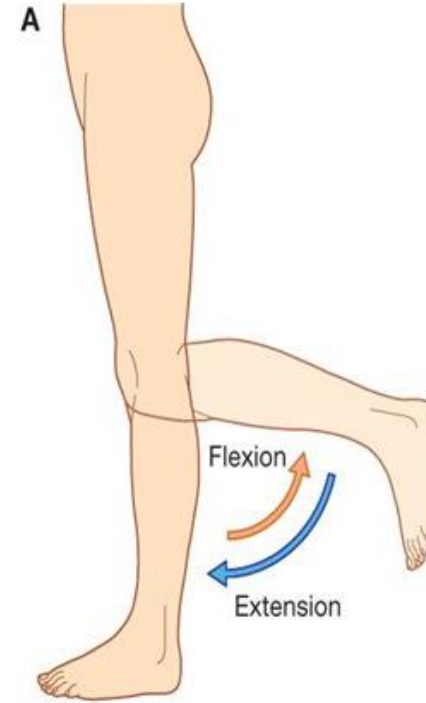
Adduction/Abduction



Rotation



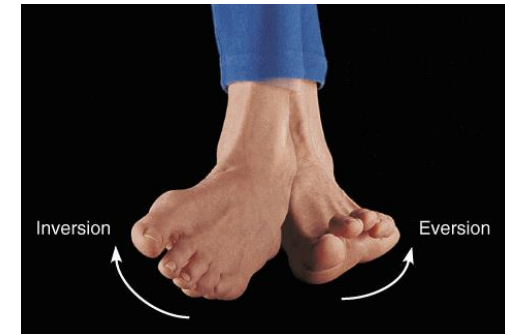
Knee=Leg  
Flexion/Extension



Foot=Ankle  
Flexion/Extension



Inversion/Eversion



# Contents Of Gluteal Region: Muscles / Nerves / Vessels



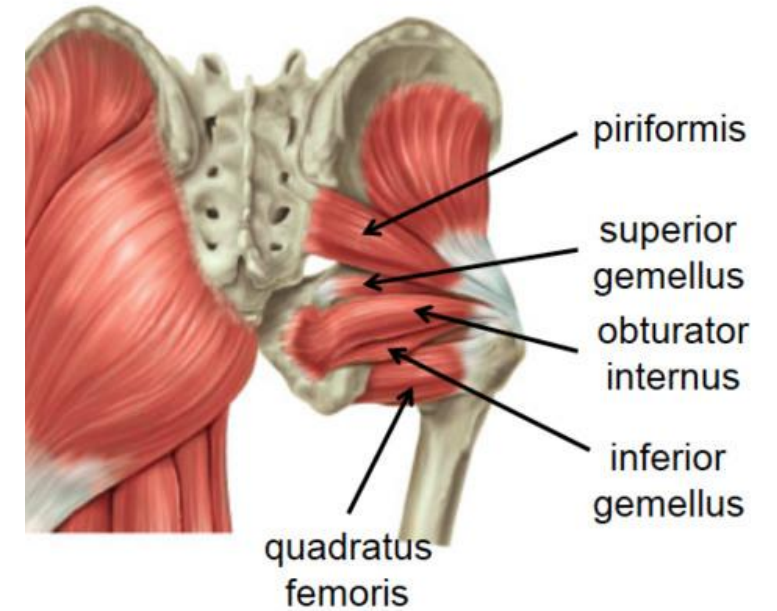
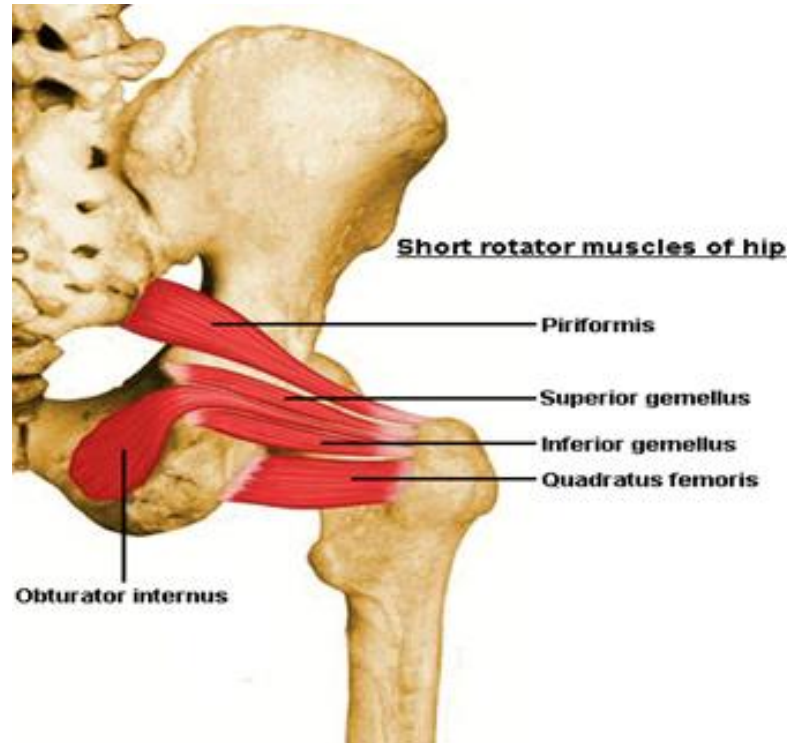
## 1- Muscles:

- **Glutei:**

1. Gluteus maximus.
2. Gluteus medius.
3. Gluteus minimus.

- **Group of small muscles (Lateral Rotators):**

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



## Abductors:

1. Gluteus medius.
2. Gluteus minimus.

## Rotators:

1. Obturator internus.
2. Quadratus femoris.

## Extensor:

Gluteus maximus.



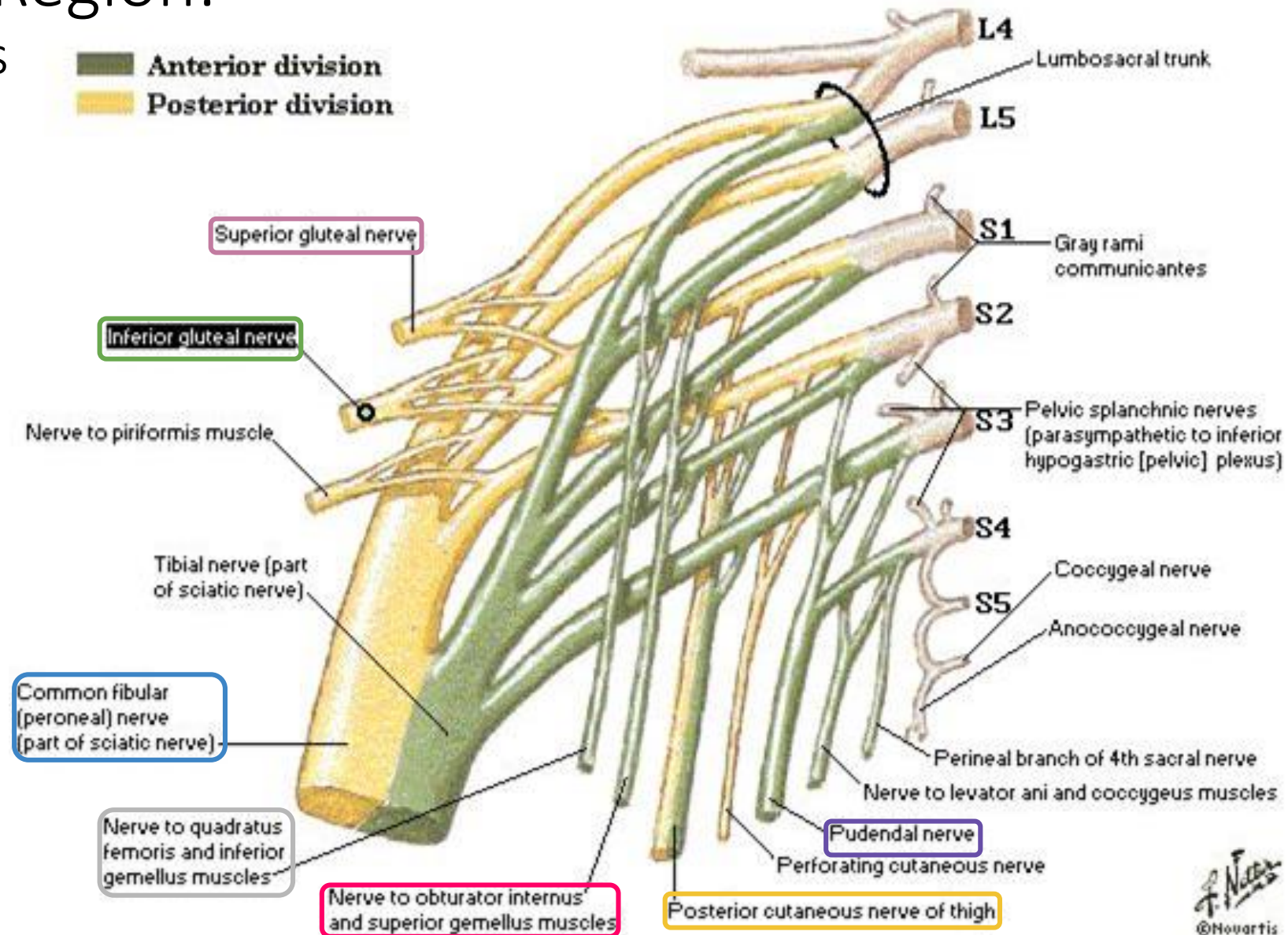
# Contents Of Gluteal Region:

Muscles / Nerves / Vessels

## 2- Nerves

(All from Sacral Plexus):

1. Sciatic nerve.
2. Superior gluteal nerve.
3. Inferior gluteal nerve.
4. Post. cutaneous nerve of thigh.
5. Nerve to obturator internus.
6. Nerve to quadratus femoris.
7. Pudendal nerve.

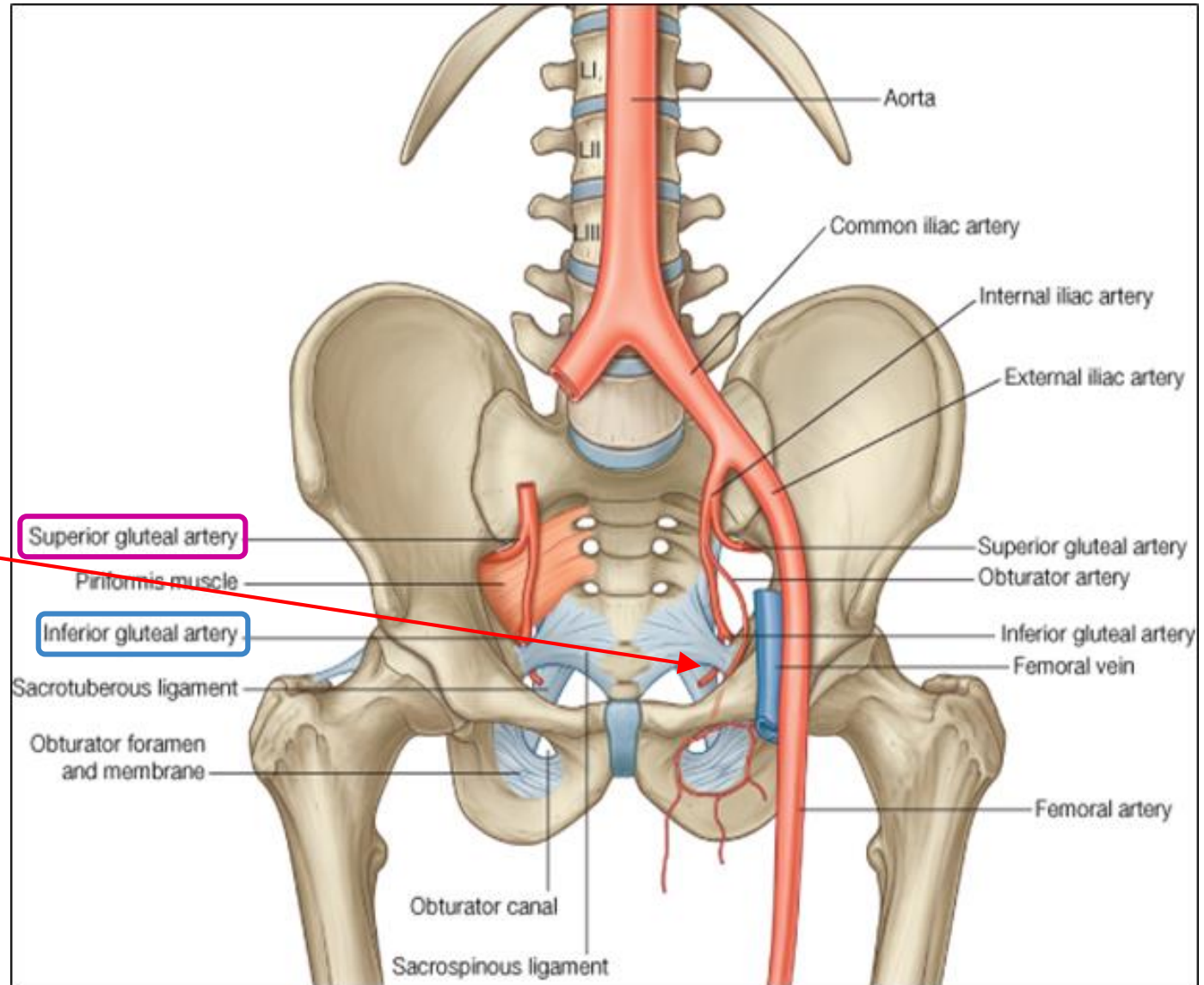


# Contents Of Gluteal Region:

Muscles / Nerves / **Vessels**

3- **VESSELS**: (all from internal iliac vessels):

1. Superior gluteal
2. Inferior gluteal
3. Internal pudendal vessels.



# Greater sciatic foramen:

Greater sciatic notch of hip bone is transformed into foramen by: **sacrospinous** (between the sacrum to ischial spine) & **sacrotuberous** (between the sacrum to ischial tuberosity)

Structures passing through Greater sciatic foramen :

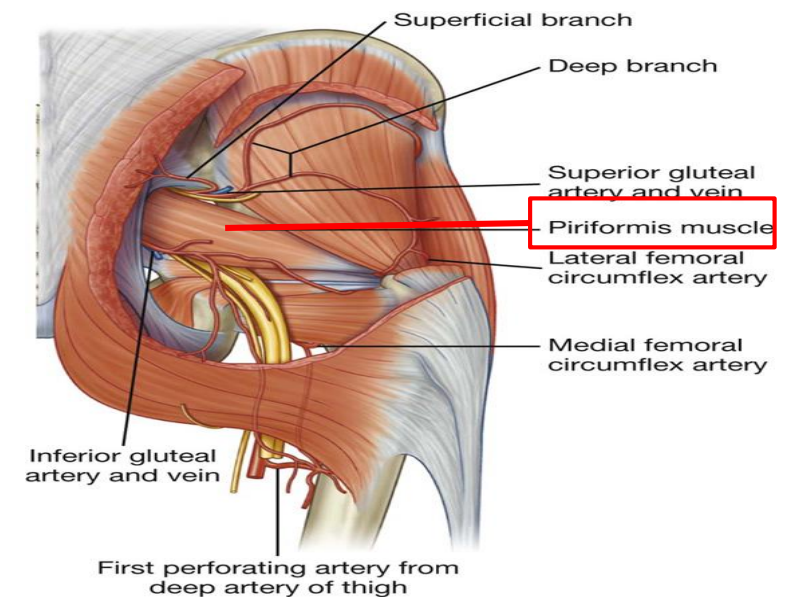
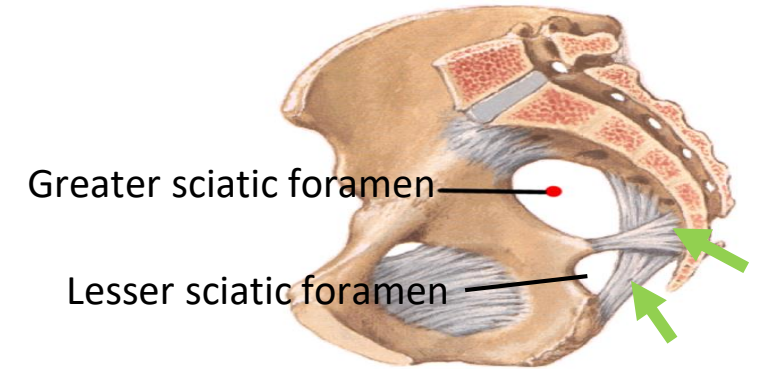
	Nerves:	Vessels:
<i>Above piriformis muscle.</i>	1. Superior gluteal nerves,	2. Superior gluteal vessels.
	3. Piriformis muscle.	
<i>Below piriformis muscle.</i>	4. Inferior gluteal nerves 5. Sciatic nerve. 6. Posterior cutaneous nerve of thigh.(superficialis) 7. Nerve to quadratus femoris. 8. Nerve to obturator internus. 9. Pudendal Nerve .	10. Inferior gluteal vessels. 11. Internal pudendal vessels.

- Nerve to obturator internus.

- pudendal nerve.

-internal pudendal vessels.

( pass through both greater sciatic and lesser foramen)



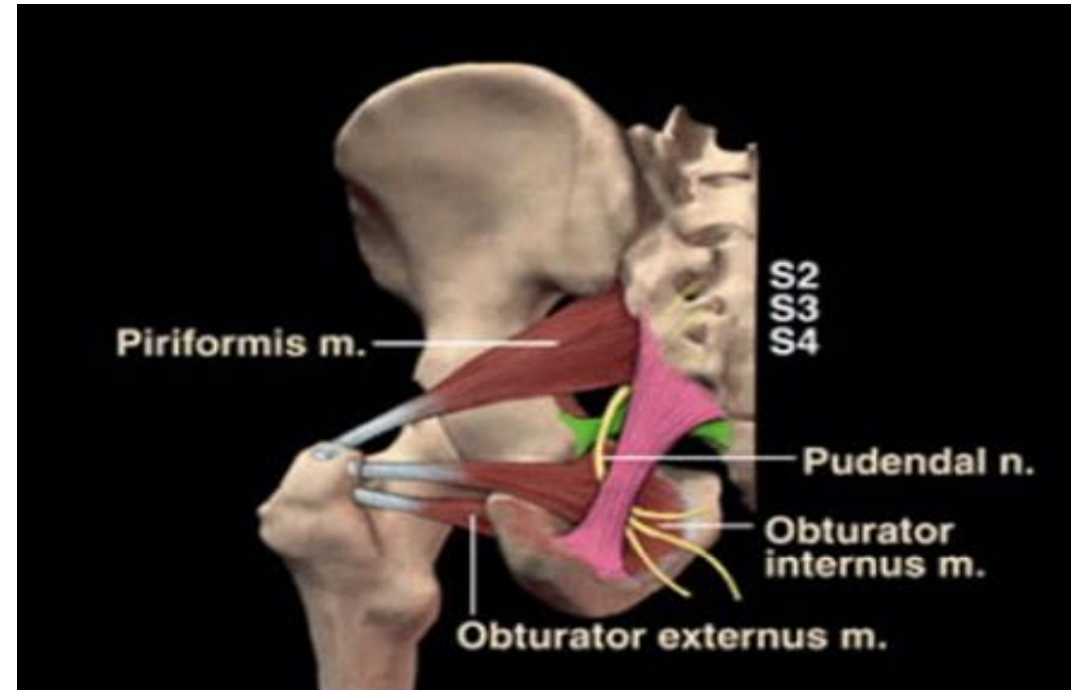
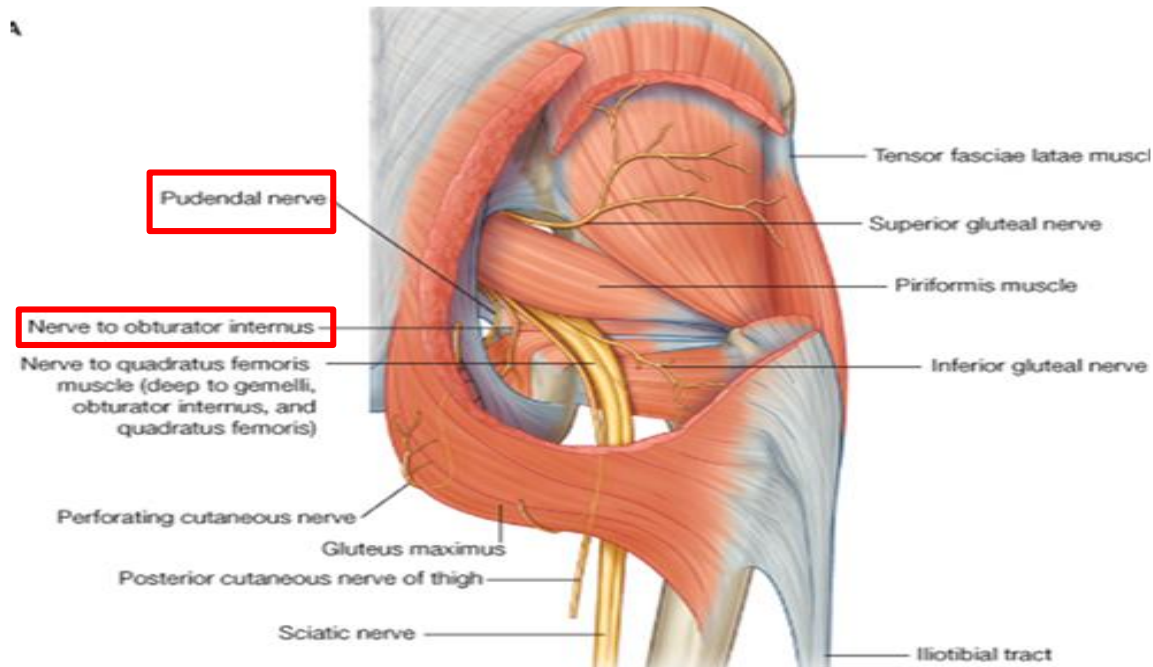


# Lesser sciatic foramen:

Lesser sciatic notch of hip bone is transformed into foramen by Sacrotuberous & sacrospinous ligaments.

## Structures passing through Lesser sciatic foramen

Tendons	Nerves	Vessels
1. Tendon of obturator internus.	2. Nerve to obturator internus. 3. Pudendal nerve.	4. Internal pudendal vessels.





# Glutei Muscles

## Origins

### Gluteus minimus:

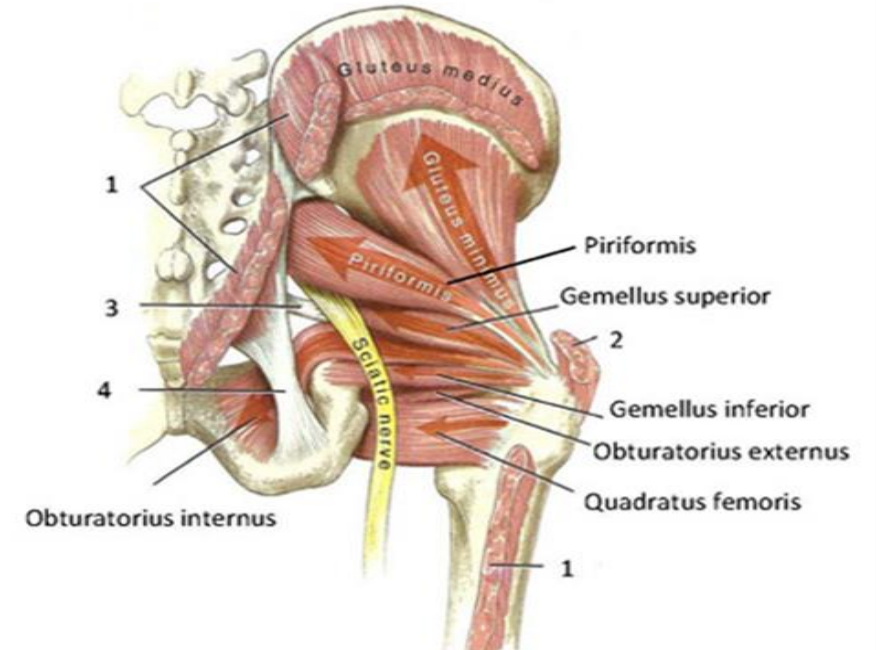
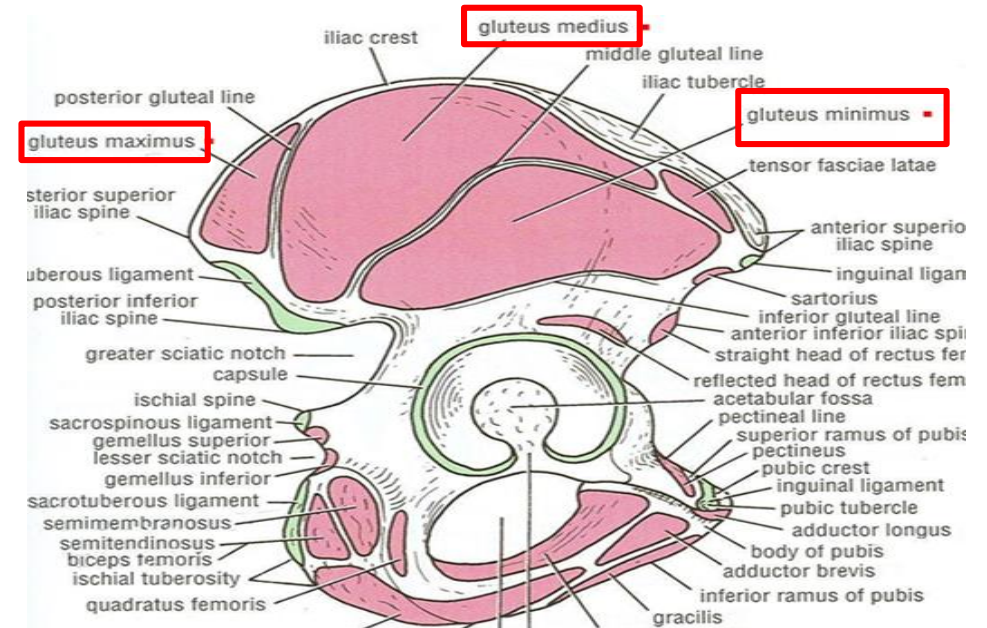
**Anterior** part of the **gluteal surface of ilium.**

### Gluteus medius:

**Middle** part of the **gluteal surface of ilium.**

### Gluteus maximus:

- **Posterior** part of the **gluteal surface of ilium.**
- Main origin: **Back of sacrum & coccyx & back of Sacrotuberous ligament.**



# Glutei Muscles

## Insertions

### Gluteus minimus:

**anterior** surface of the **greater trochanter**

### Gluteus medius:

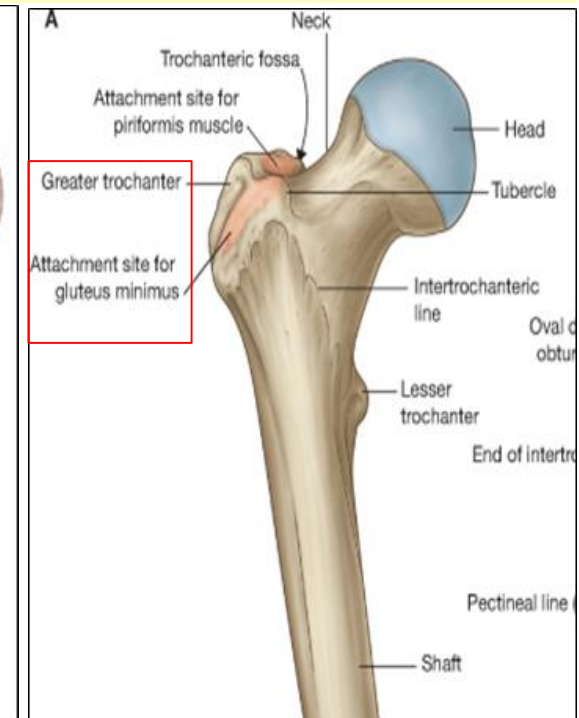
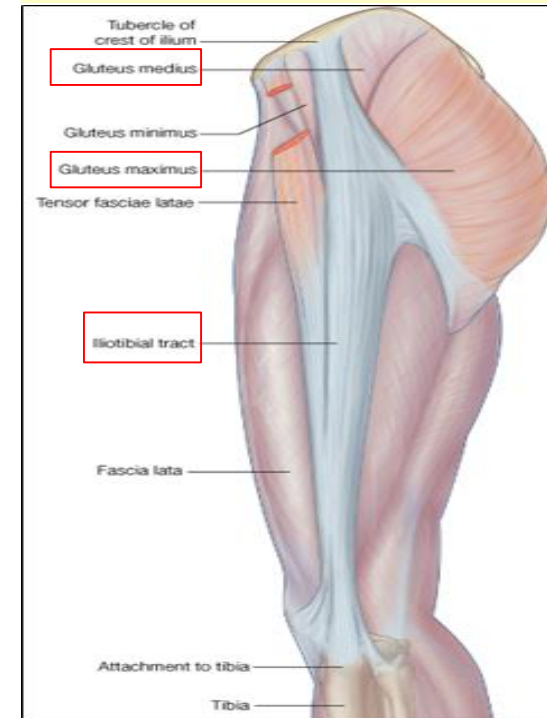
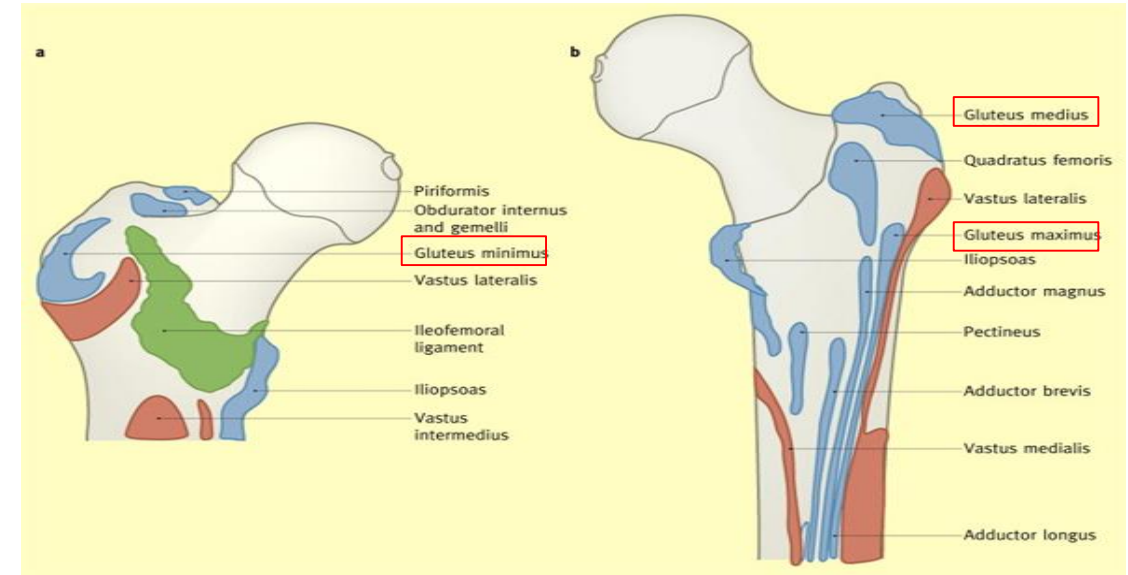
**lateral** surface of the **greater trochanter**

### Gluteus maximus:

Main insertion: 1. **iliotibial tract**

(iliotibial tract : thickening of the lateral part of deep fascia of the thigh)

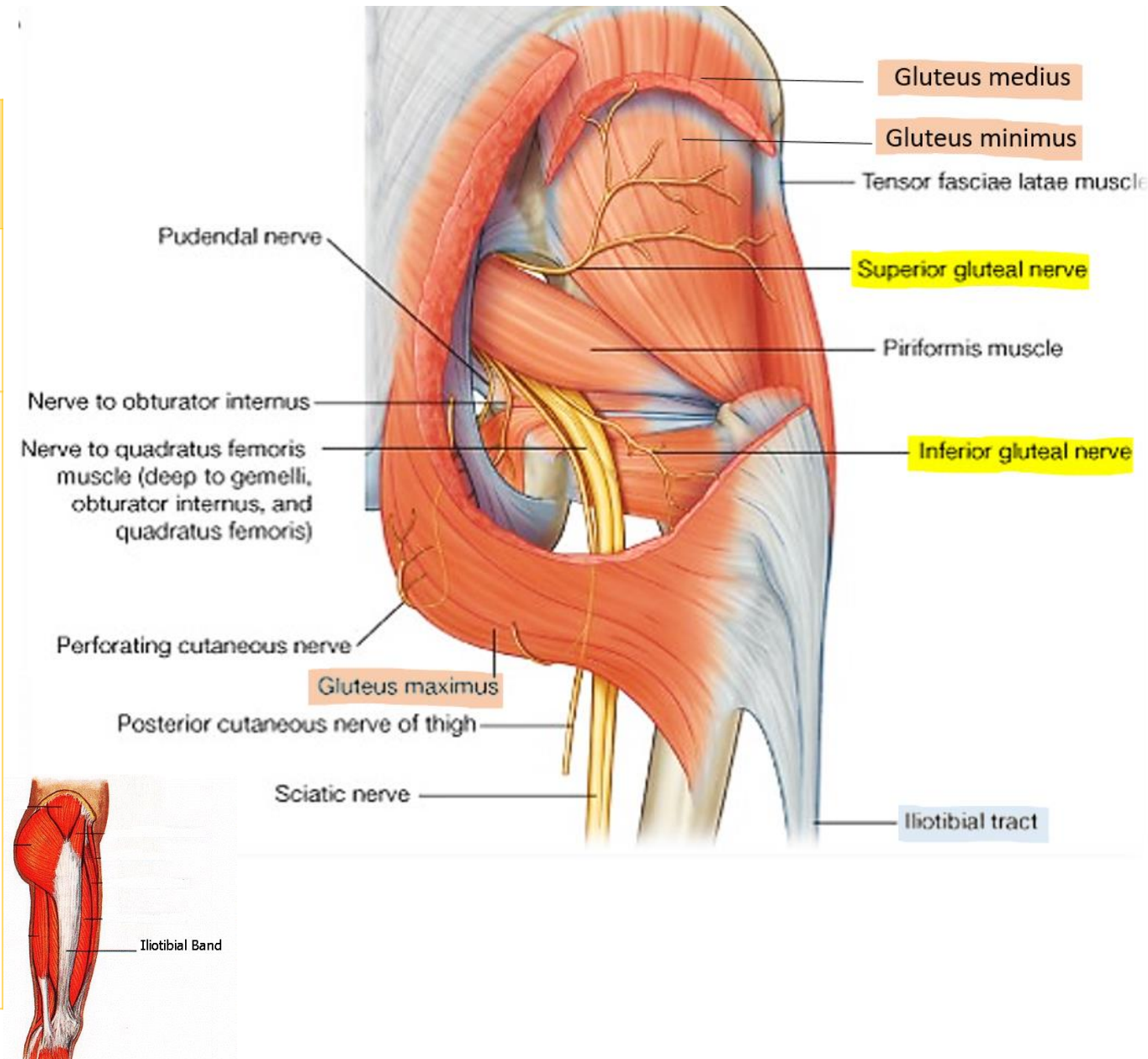
Other insertion: 2. **gluteal tuberosity** of the femur.



# Glutei Muscles

## Nerve Supply & Actions

<b>Gluteus <u>medius</u> and Gluteus <u>minimus</u></b>	<b>Gluteus <u>maximus</u></b>
<p><b>Nerve supply:</b> Superior gluteal nerve</p>	<p><b>Nerve supply:</b> Inferior gluteal nerve</p>
<p><b>Action:</b></p> <ul style="list-style-type: none"> <li>▪ <u>Abduction &amp; medial rotation of hip joint</u></li> <li>▪ Normally they prevent lateral tilt of the pelvis by contraction of ABDUCTORS on opposite side while raising the other limb from ground.</li> </ul> <p>* Pelvis tilting is a positive Trendelenburge's sign.</p>	<p><b>Action:</b></p> <ul style="list-style-type: none"> <li>▪ <u>Extension &amp; lateral rotation of hip joint.</u></li> <li>▪ It stabilizes the femur on tibia during standing through its attachment to <u>iliotibial tract</u></li> <li>▪ Note: The iliotibial band is a thick band of fascia on the lateral aspect of the knee, extending from the outside of the pelvis, over the hip and knee, and inserting just below the knee. The band is crucial to stabilizing the knee during running and moving.</li> </ul>





# Continued...

Right pelvic tilt (the left side of the pelvis is elevated higher than the right side) as in picture.

This requires a muscular effort by the hip abductors (glutei medii and minimi of opposite side) to pull the pelvis up.

Trendelenburg gait: is an abnormal gait that is usually found in people with weak abductor muscles of the hip which are supplied by the superior gluteal nerve

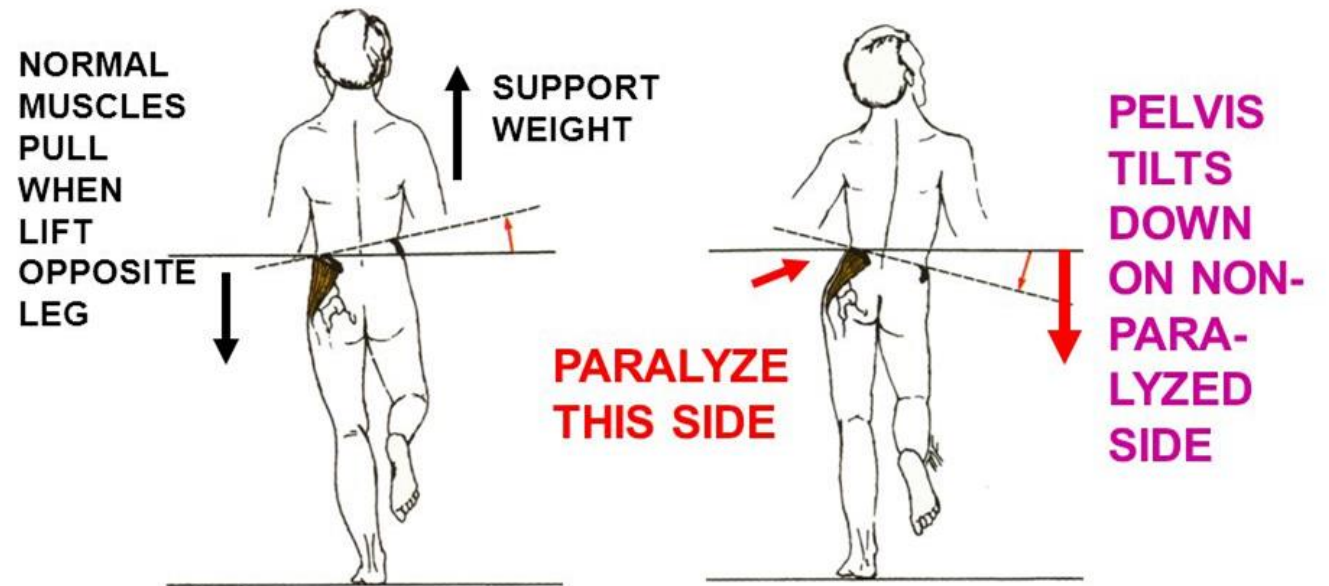


← Helpful video for understanding

<https://www.youtube.com/watch?v=DkSTr7K-eAo>

## GLUTEAL GAIT -

caused by injury to Superior Gluteal nerve or poliomyelitis (also congenital dislocation of hip joint). Paralyze Gluteus Medius and Minimus. In walking, pelvis tilts down on non-paralyzed side when lift foot of opposite, non-paralyzed leg.



**Positive Trendelenburg sign - WHEN LIFT OPPOSITE LEG, PELVIS TILTS DOWN ON (NON-PARALYZED) OPPOSITE SIDE.**

## Glutei Muscles (Summary)

<i>Muscle</i>	<i>Origin</i>	<i>Insertion</i>	<i>Action</i>	<i>Nerve Supply</i>
<b>Gluteus minimus:</b>	<u>Anterior</u> part of the gluteal surface of ilium	anterior surface of the greater trochanter	1. <u>Abduction</u> & 2. medial rotation <u>of hip joint</u> . 3. prevent lateral tilt of the pelvis by contraction of <b>ABDUCTORS</b> on opposite side, on raising the other limb from ground.	Superior gluteal nerve
<b>Gluteus medius:</b>	<u>Middle</u> part of the gluteal surface of ilium,	lateral surface of the greater trochanter		
<b>Gluteus maximus:</b>	<u>Posterior</u> part of the gluteal surface of ilium, <u>Main origin:</u> Back of sacrum & coccyx & back of Sacrotuberous ligament.	1. Main insertion: iliotibial tract 2. Other insertion: gluteal tuberosity of the femur.	1. <u>Extension</u> & 2. lateral rotation <u>of the hip joint</u> . 3. Stabilizes the femur on tibia during standing (Through its attachment to iliotibial tract)	Inferior gluteal nerve

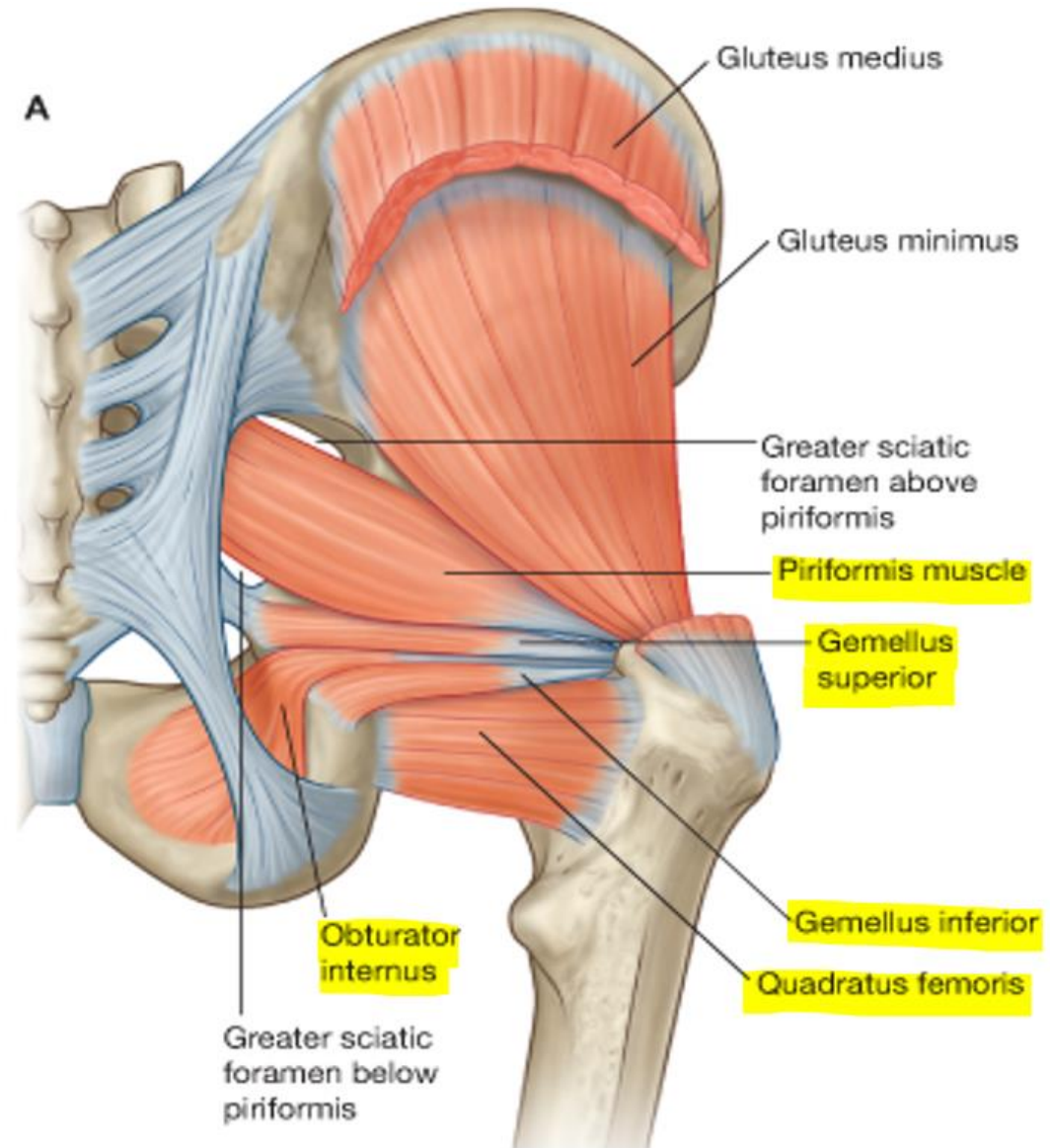
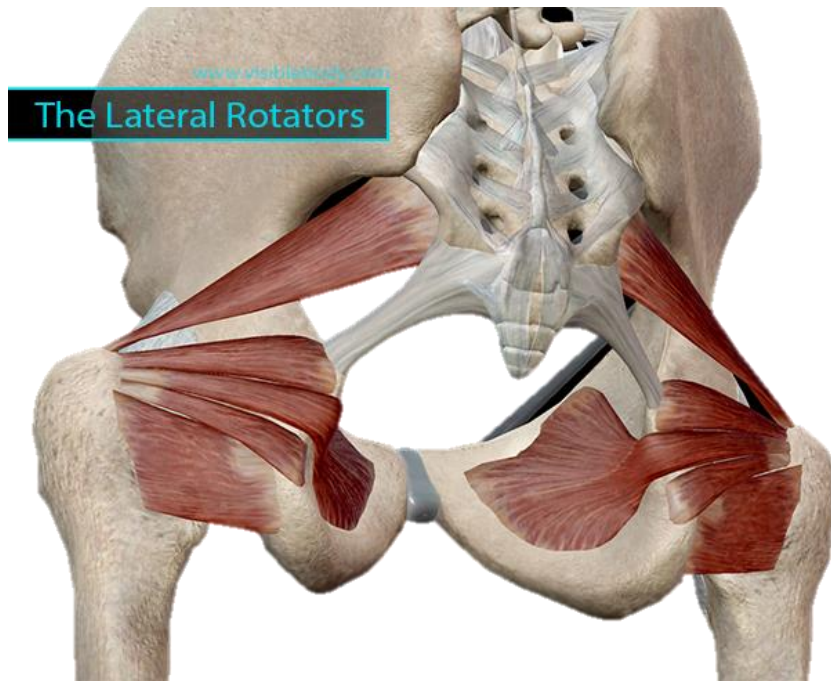
# Small Muscles (Lateral Rotators) **important**

	Obturator Internus	Superior & Inferior Gemelli		Piriformis	Quadratus femoris
Origin	Inner surface of the side wall of the pelvis	Superior gemellus upper part of lesser sciatic notch	Inferior gemellus lower part of lesser sciatic notch	Pelvic surface of middle 3 sacral vertebrae	Lateral border of the <u>ischial tuberosity</u> .
Insertion	Into the medial surface of the greater trochanter	Upper & lower parts into <u>tendon of obturator internus</u>		It passes through GSF (Greater Sciatic Foramen) to be inserted into the <i>upper border</i> of the <b>greater trochanter</b>	<u>Quadratus tubercle</u> & intertrochanteric crest
Nerve supply	Nerve to obturator internus	nerve to obturator internus	nerve to quadratus femoris	Anterior rami of S1,2	Nerve to quadratus femoris
Action	<p>All have <b><u>SIMILAR ACTIONS</u></b>:</p> <ul style="list-style-type: none"> <li>• Lateral rotation of the hip joint.</li> <li>• Control movement of the hip joint</li> </ul>				

See next slide for picture



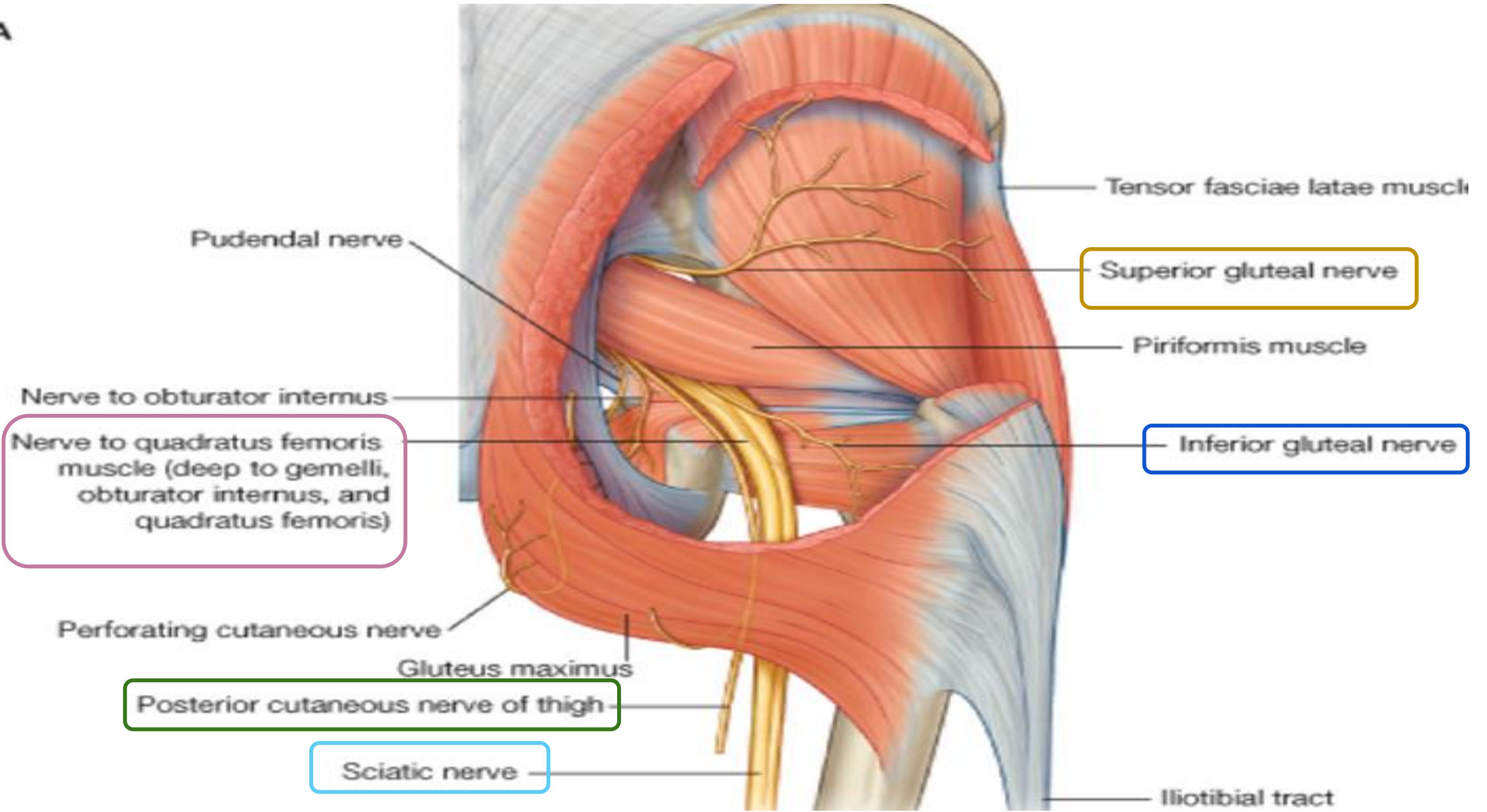
# Small Muscles (Lateral Rotators) **important**



# Nerves

Name	Course	Branch
SUPERIOR GLUTEAL	Passes through GSF, <u>above</u> piriformis, then <u>between</u> gluteus medius & minimus.	1) Muscular to gluteus medius, minimus & tensor fasciae lata. 2) Articular to hip joint.
INFERIOR GLUTEAL	Passes through GSF, <u>below</u> piriformis, then <u>deep to</u> gluteus maximus.	Muscular to <u>gluteus maximus</u>
NERVE TO QUADRATUS FEMORIS	Passes through GSF, <u>below</u> piriformis.	1) Muscular to quadratus femoris & inferior gemellus 2) Articular to hip joint
POSTERIOR CUTANEOUS NERVE TO THIGH	Passes through GSF, <u>below</u> piriformis, then descends deep to deep fascia.	Cutaneous branches to: gluteal region, back of scrotum <b>in males</b> (labium majus <b>in females</b> ) back of thigh & upper part of back of leg.
SCIATIC	Passes through GSF, <u>below</u> piriformis, then superficial to: ischial spine, superior gemellus, tendon of obturator internus, inferior gemellus, quadratus femoris & adductor magnus.	<ul style="list-style-type: none"> <li>• No branches in gluteal region.</li> <li>• Divides into tibial &amp; common peroneal nerves, in the middle of back of thigh.</li> </ul>

A





# Posterior Compartment Of The Thigh

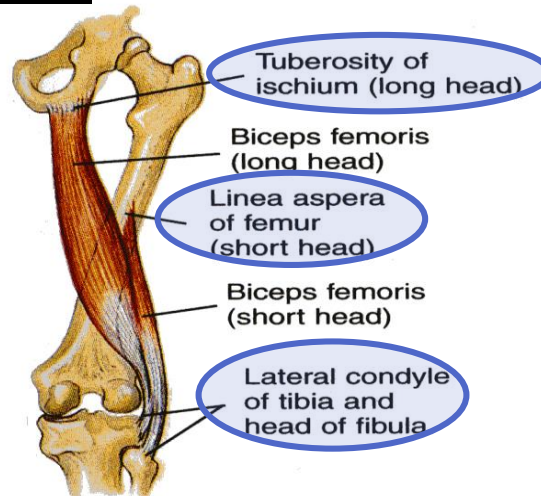
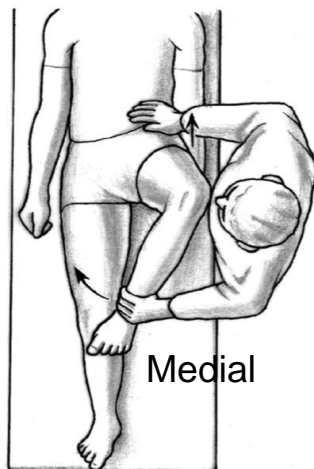
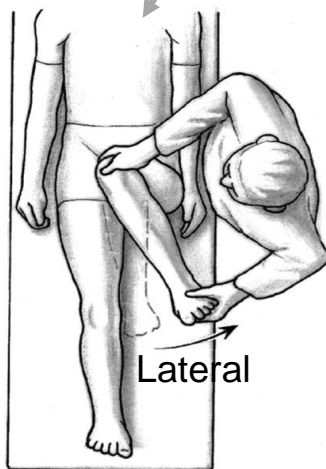
Contents		
Muscles	Blood supply	Nerve supply
<b>Hamstring muscles:</b> 1. Biceps femoris. 2. Semitendinosus. 3. Semimembranosus. 4. Ischial part of adductor magnus.	Branches of the profunda femoris artery.	Sciatic nerve.



# Posterior Compartment Of The Thigh: Muscles

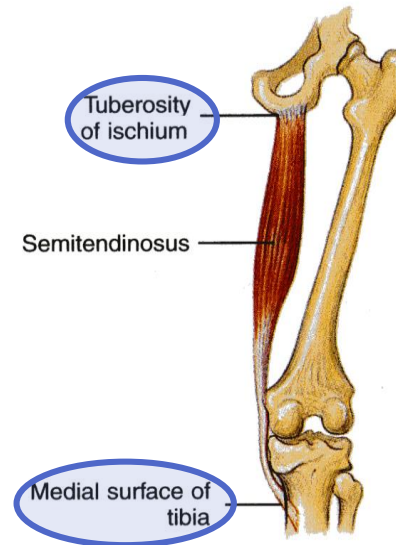
## 1. Biceps femoris

- Origin**     **The long head** from the *ischial tuberosity*.  
**The short head** from the *linea aspera* .
- Insertion**   Mainly into the *head of the fibula*.
- Nerve Supply**   The **long head** is supplied by the ***tibial part of sciatic***;  
the **short head** is supplied by the ***common peroneal part of the sciatic***.
- Action**       **Flexion of knee.**  
**Lateral rotation of flexed leg.**  
**Long head (only): extends hip.**



## 2. Semitendinosus

- Origin**        *Ischial tuberosity*
- Insertion**     Upper part of the medial surface of the shaft of the *tibia* **(SGS)\***
- Nerve Supply**   **Tibial** portion of the **sciatic**.
- Action**        **Flexes** and **medially rotates** the leg at the knee joint  
**Extends** the thigh at the **hip joint**



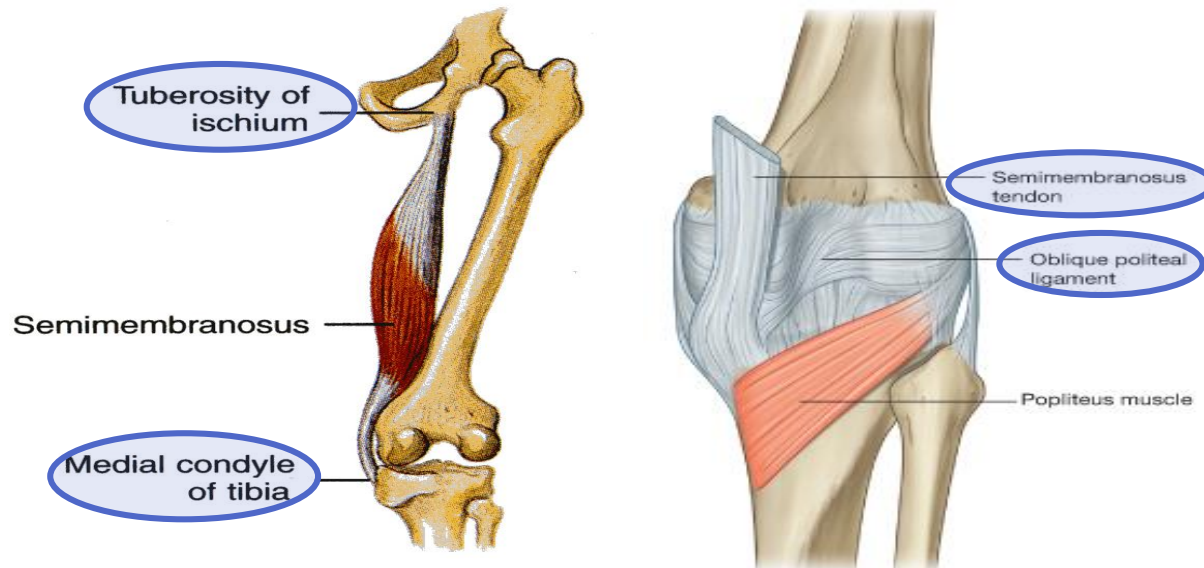
Remember:  
\*SGS (semitendinosus / gracialis / sartorius):  
Three muscles that have the same insertions.

Extra information:  
Their tendons join and form Pes anserinus

# Posterior Compartment Of The Thigh: Muscles

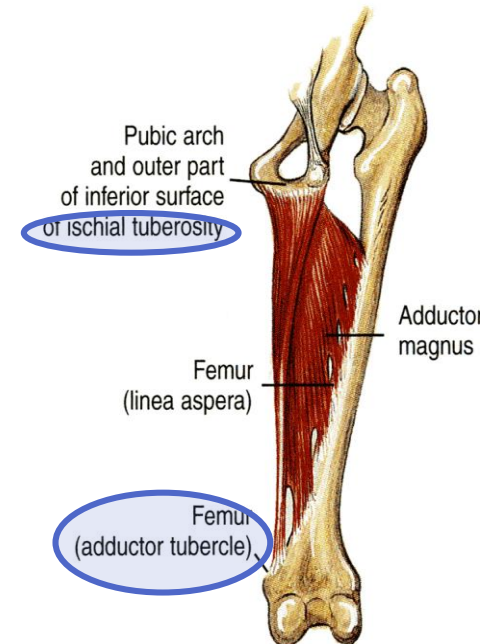
## 3. Semimembranosus

- Origin** *Ischial tuberosity*
- Insertion** Posterior surface of the **medial condyle** of the **tibia**. It forms the **oblique popliteal ligament**, which reinforces the capsule on the back of the knee joint.
- Nerve Supply** **Tibial** portion of the **sciatic**.
- Action** Flexes and medially rotates the leg at the knee joint  
Extends the thigh at the hip joint



## 4. Adductor Magnus (Hamstring part)

- Origin** Ischial ramus and **ischial tuberosity**
- Insertion** **Adductor tubercle** of the **medial condyle** of the **femur**
- Nerve Supply** **The tibial** portion of the **sciatic**
- Action** **Extends** the thigh at the **hip joint**



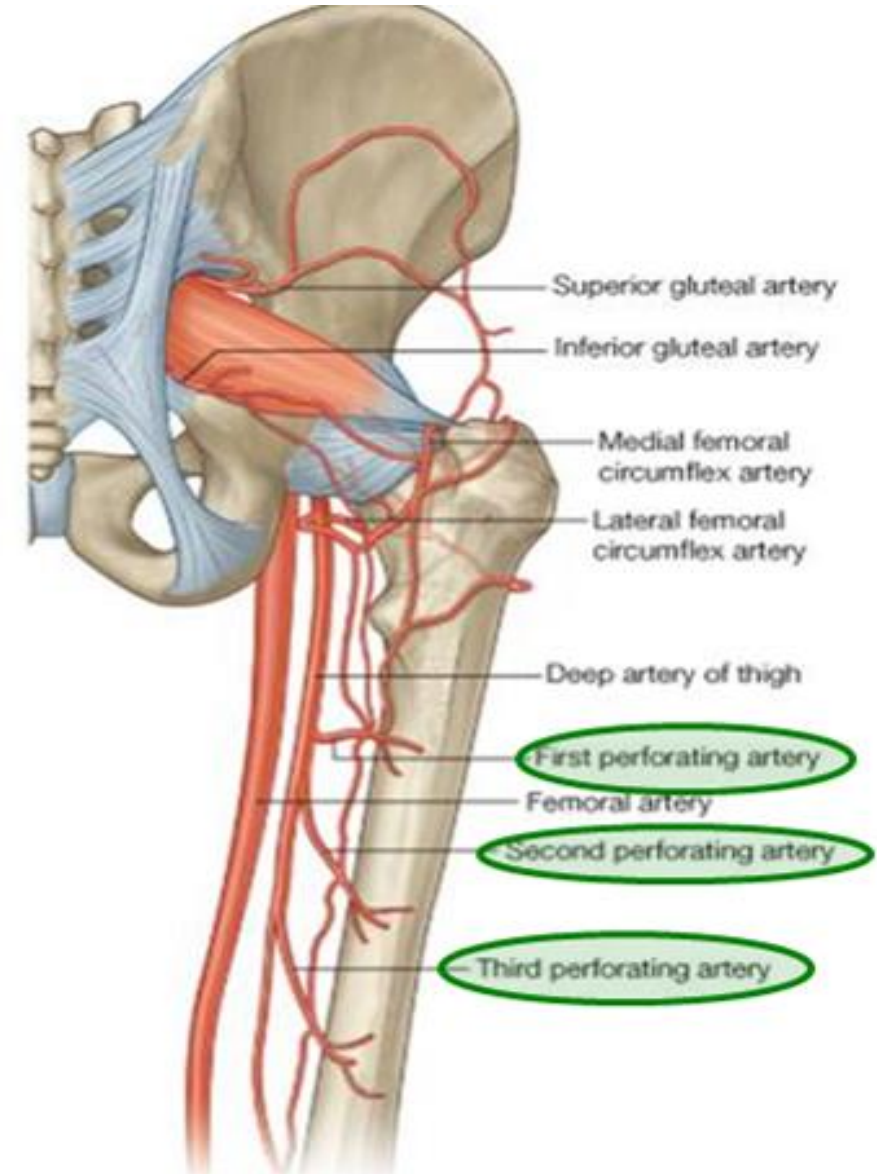
**Note:** The adductor magnus has 2 parts: adductor part and hamstring part. The 2 parts have different origin, insertion, action and nerve supply. They are also in different compartments of the thigh



# Posterior Compartment Of The Thigh: Blood Supply

The **four perforating branches of the profunda femoris artery (deep artery of thigh)** provide a rich blood supply to this compartment.

The **profunda femoris vein** drains the greater part of the blood from the compartment.

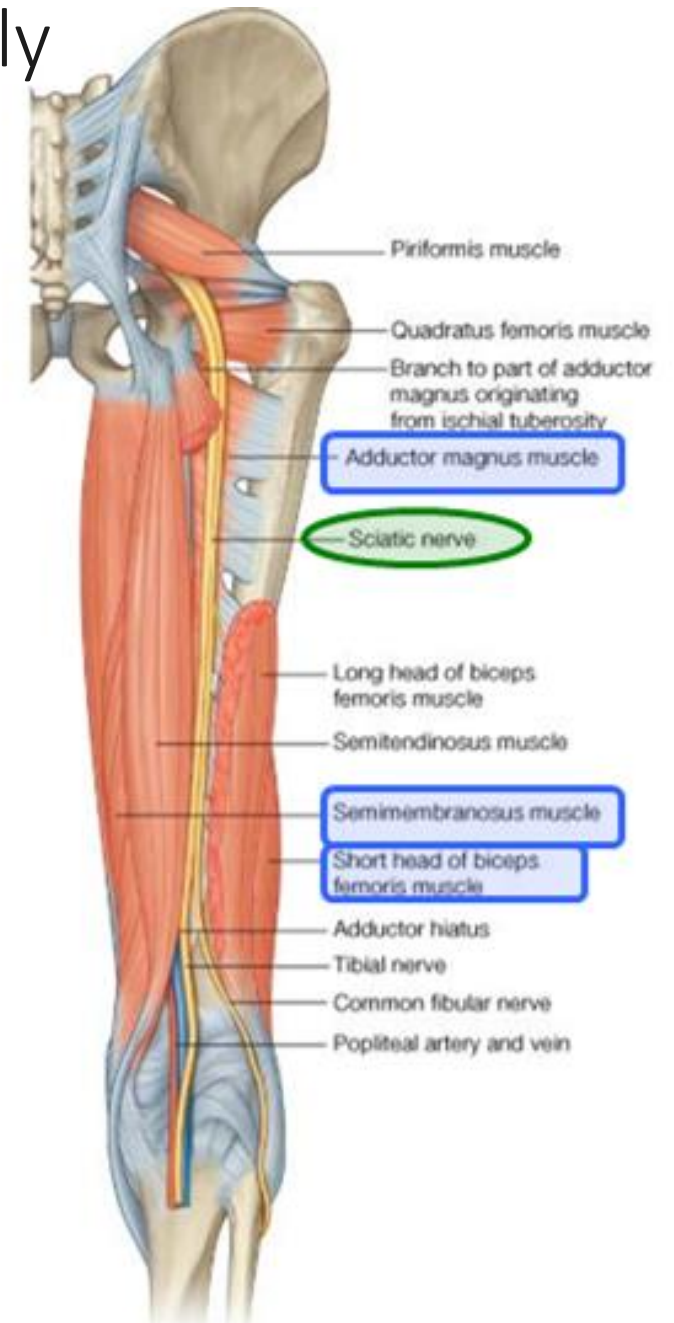


# Posterior Compartment Of The Thigh: Nerve Supply

## Sciatic Nerve

- The **sciatic nerve**, a branch of the sacral plexus (**L4 and 5; S1, 2, and 3**), leaves the gluteal region as it descends in the midline of the thigh.
- It is **overlapped posteriorly** by the adjacent margins of the biceps femoris and semimembranosus muscles.
- **It lies on** the posterior aspect of the **adductor magnus**.
- In the lower third of the thigh it ends by dividing into the **tibial** and **common peroneal nerves**.

Common fibular nerve = common peroneal nerve

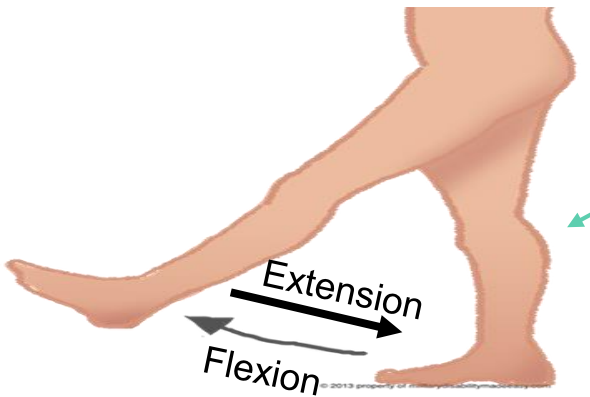
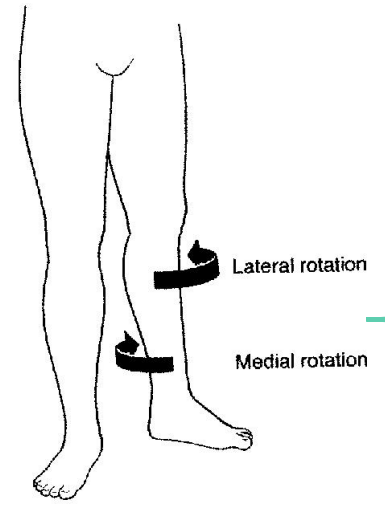
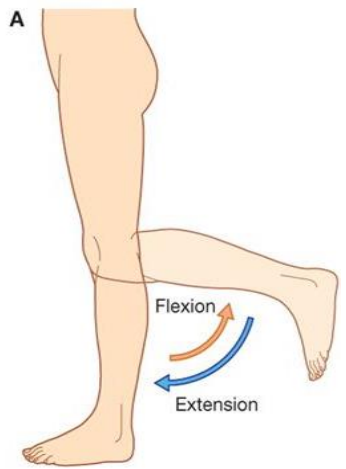


## Summary of Posterior Compartment

HAMSTRINGS	Muscle	Origin	Insertion	Action	Nerve Supply
	Biceps femoris	<u>The long head</u> : the ischial tuberosity. <u>The short head</u> : the linea aspera .	Mainly into the head of the fibula.	1. Flexion of knee. 2. Lateral rotation of flexed leg. <u>Long head (only)</u> : extends hip.	<u>The long head</u> : tibial part of sciatic <u>the short head</u> : the common peroneal part of the sciatic.
	Semitendinosus	Ischial tuberosity	Upper part of the medial surface of the shaft of the tibia <b>(SGS)*</b>	1. Flexes and 2. medially rotates the leg at the knee joint 3. Extends the thigh at the hip joint	Tibial portion of the sciatic
	Semimembranosus		Posterior surface of the medial condyle of the tibia. (forms the <b>oblique popliteal ligament</b> )		
Adductor magnus (hamstrings part)	Ischial ramus and ischial tuberosity	Adductor tubercle of the medial condyle of the femur	1. <b>Extends</b> the thigh at the <b>hip joint</b>		



# Summary of Posterior Compartment Actions



Action	Muscles
Flexion of knee.	Semimembranosus Semitendinosus Biceps femoris
Medially rotates the leg	Semimembranosus Semitendinosus
Lateral rotation of flexed leg.	Biceps Femoris
Extends the thigh at the hip.	Semimembranosus Semitendinosus Long head : biceps femoris Adductor magnus (hamstring part)

# Questions

1. What is the structure that pass through greater and lesser foramen:

- A. Nerve to obturator internus.
- B. pudendal nerve.
- C. internal pudendal vessels.
- D. All of them

2. What ligaments form the greater and lesser foramen?

3. The main insertion of gluteus maximus is

- A. iliotibial tract.
- B. anterior part of the gluteal surface of ilium.
- C. lateral surface of the greater trochanter.
- D. gluteal tuberosity.

4. Which one of the following is NOT one of the Hamstring muscles?

- A. Biceps femoris.
- B. Semitendinosus.
- C. Triceps femoris.
- D. Semimembranosus.

5. The sciatic nerve most commonly divides into tibial & common peroneal nerves, in:

- A. Gluteal region.
- B. The middle of back of lower third thigh.
- C. The lateral of back of lower third thigh.
- D. Below Piriformis.

6. Name the branches of Posterior Cutaneous Nerve Of Thigh?

7. Insertion of ADDUCTOR MAGNUS (HAMSTRING PART):

- A. Adductor tubercle of the medial condyle of the tibia.
- B. Abductor tubercle of the medial condyle of the femur.
- C. Posterior surface of the medial condyle of the tibia.
- D. Adductor tubercle of the medial condyle of the femur.

Answers:

1. D

2. Sacrotuberous & sacrospinous

3. A

4. C

5. B

6. It has cutaneous branches to 1. gluteal region, 2. back of scrotum in males (labium majus in females) 3. back of thigh & 4. upper part of back of leg.

7. D

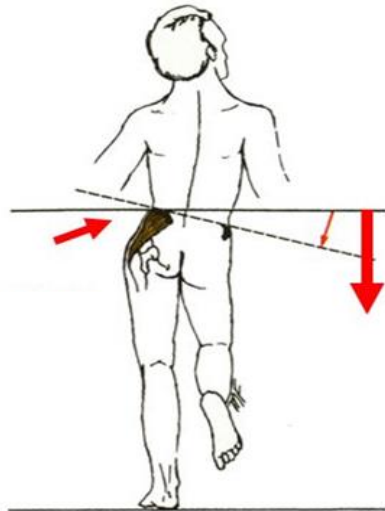
# Questions

8. Sciatic nerve lies in the :

- A. posterior aspect of the adductor magnus.
- B. anterior aspect of the adductor magnus.
- C. posterior aspect of the semimembranosus .
- D. posterior aspect of the biceps femoris.

9. A patient presented to the ER with tilting of the pelvis when lifting one of the legs while walking (see picture).

- a) What muscles are affected?
- b) What nerve(s) is supplying them?
- c) The patient had a positive trandelenburg sign. What does this mean?
- d) What is the name of this condidtion?



10. How many branches does the sciatic nerve have in the gluteal regoin?

- A. 0
- B. 1
- C. 2
- D. 3

11. Which of the following forms the obliques popliteal ligament?

- A. Biceps glutei
- B. Semitendinosus
- C. Semimembrinosus
- D. Adductor magnus

Answers:

8. A

9. a) Gluteus Medius and Gluteus Minimus.

b) Superior gluteal nerve.

c) When lifting (opposite) leg the pelvis tilts down on the non-paralyzed opposite side,

d) Gluteal gait.

10. A

11. C



