Life is 10% what happens to you and 90% how you react to it

Musculoskeletal Block

ANATOMY

team 435

COLOR CODES

- IMPORTANT NOTES
- EXTRA NOTES
- DEFINITION

objectives

By the end of this lecture, you should be able to identify:

- Contents of the gluteal region:
- 3 Glutei muscles: Gluteus maximus, medius and minimus.
- Other 5 Small muscles: Piriformis, Obturator internus,
- Superior gemellus, Inferior gemellus and Quadratus
- femoris.
- Nerves & vessels.
- Foramina: 1-Greater Sciatic Foramen.
  2-Lesser Sciatic Foramen.
- Back of the thigh: Hamstring muscles.

CONTENTS :

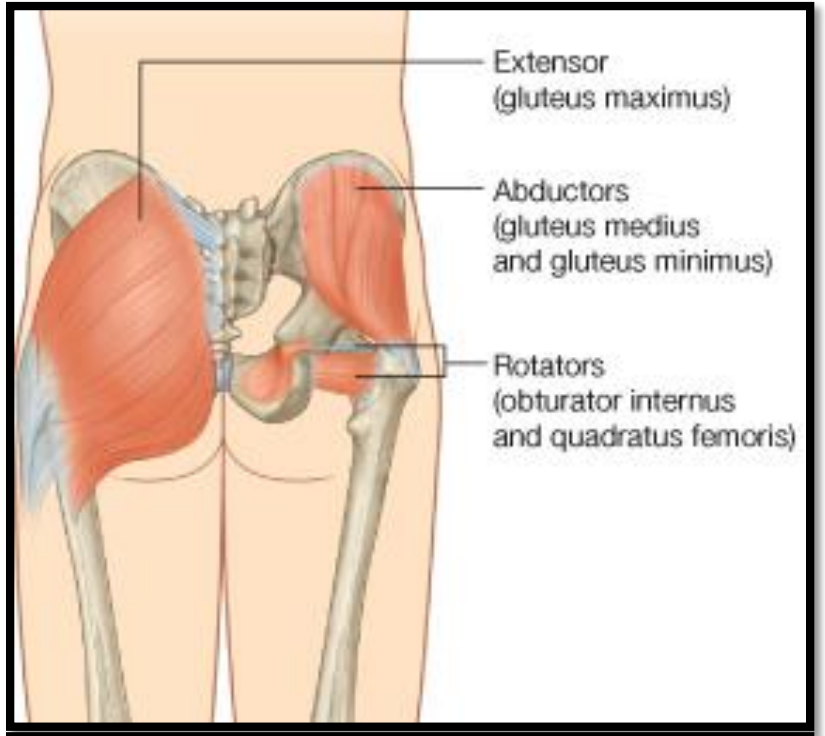
I - MUSCLES:

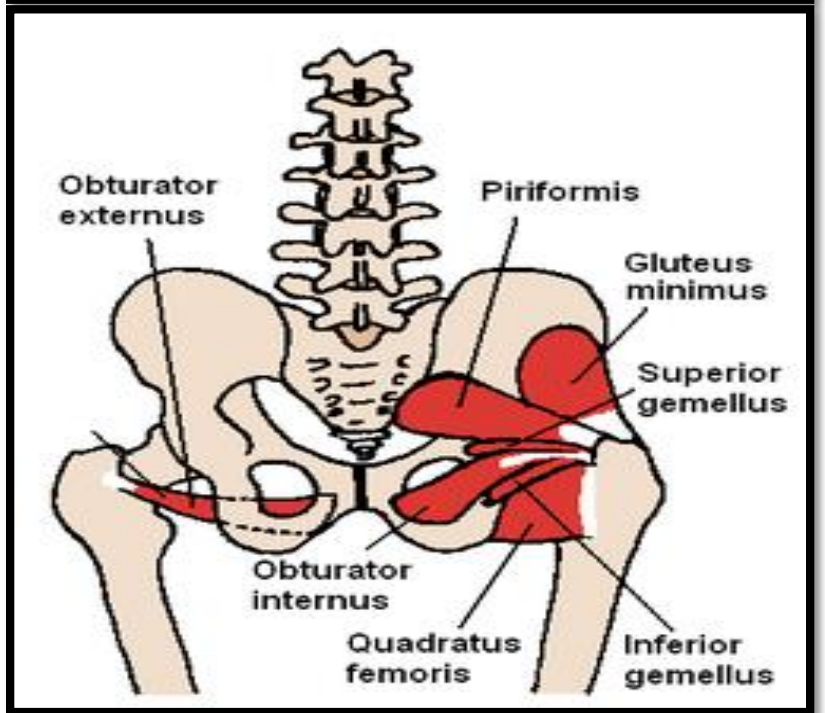
A- GLUTEI:

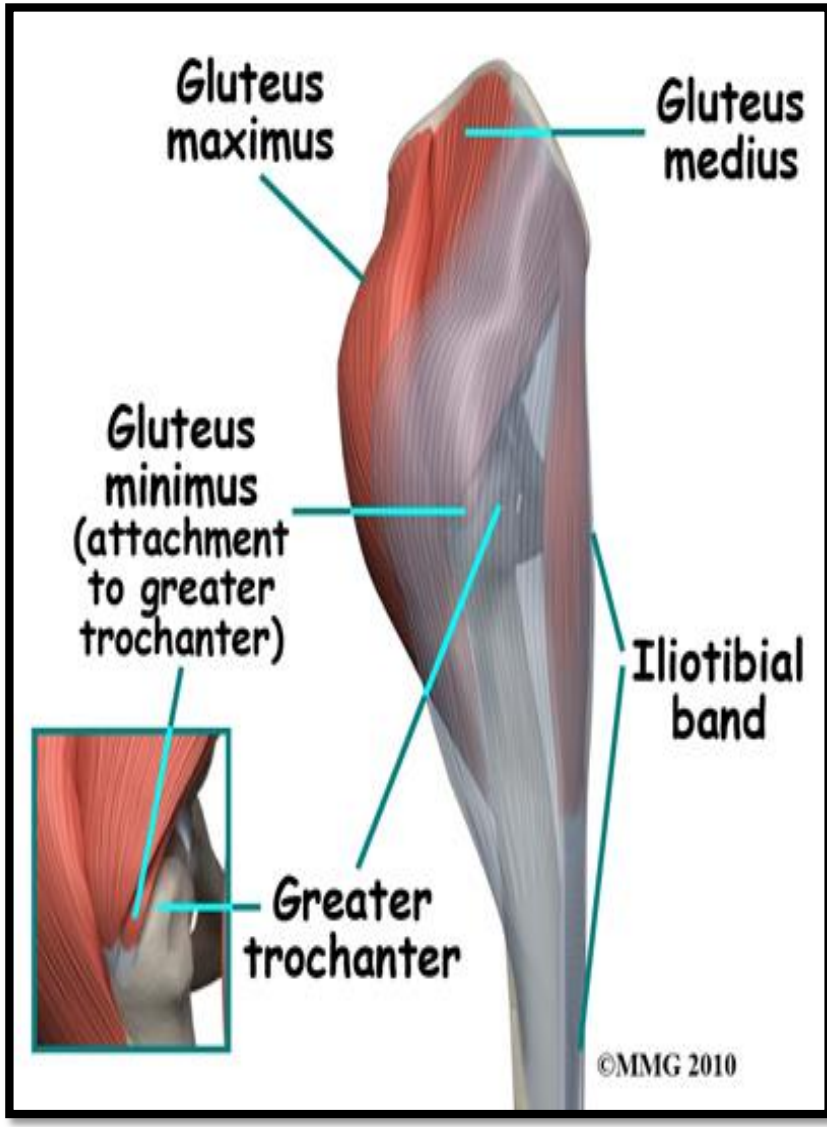
1. Gluteus maximus.
2. Gluteus medius. (IM injections)
3. Gluteus minimus.

B- GROUP OF SMALL MUSCLES:

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





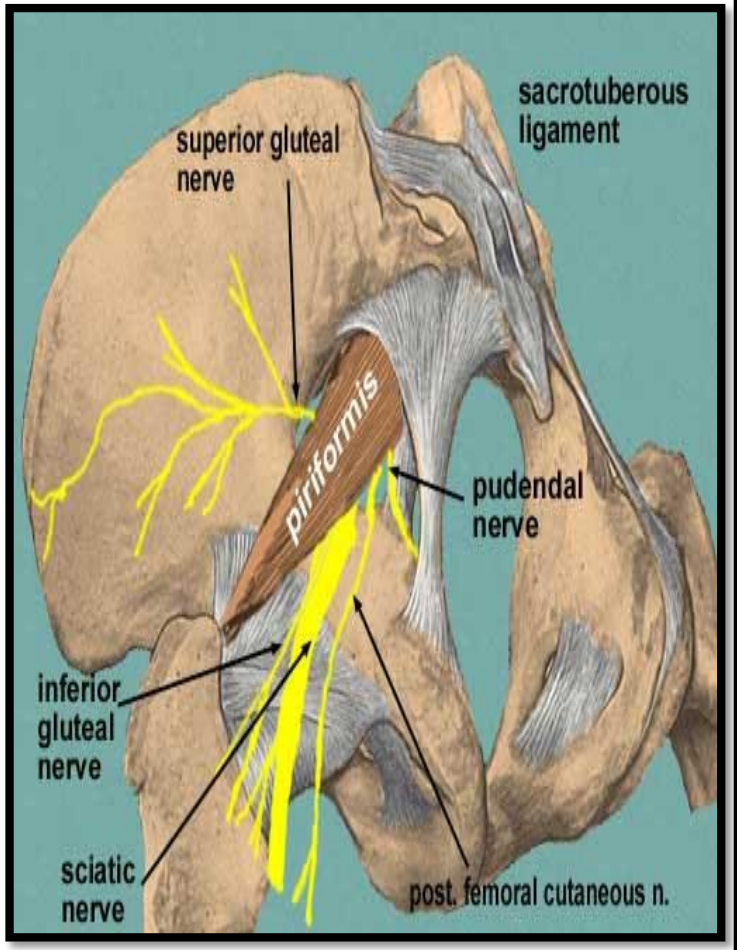


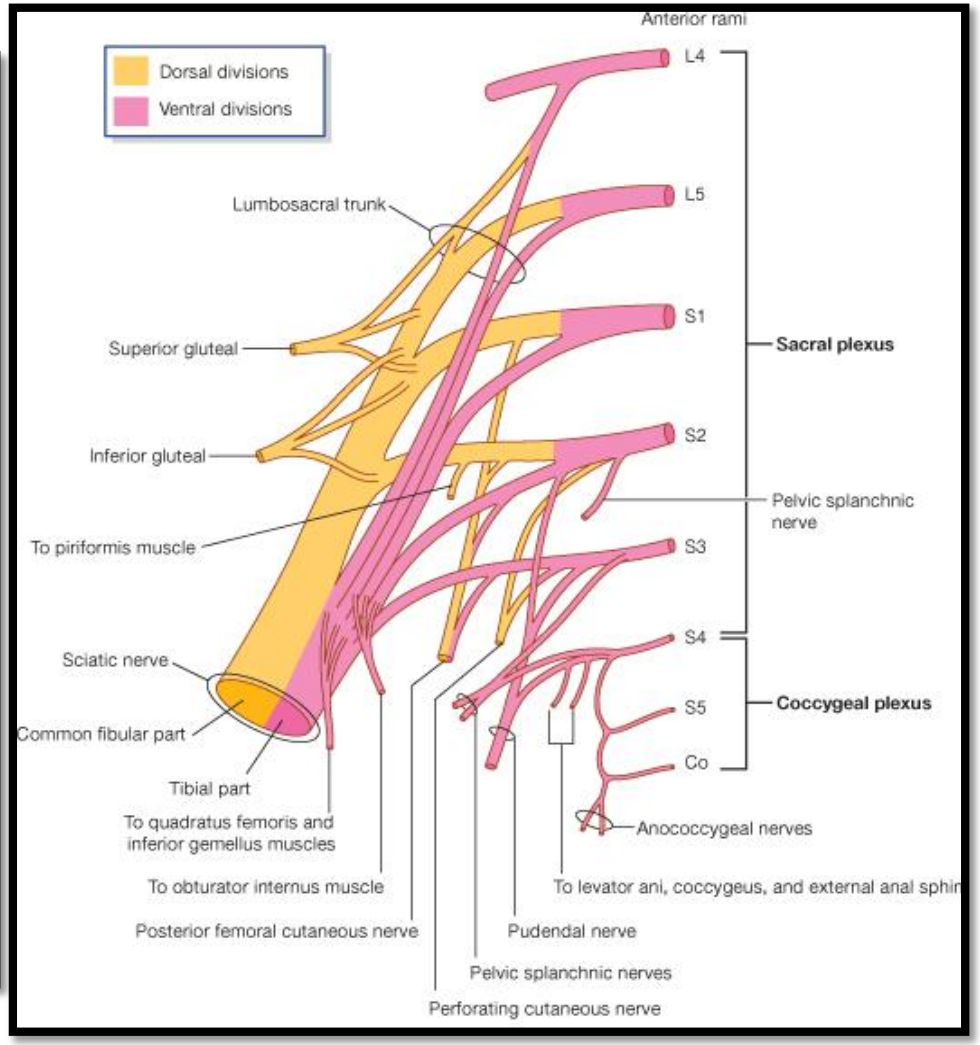
CONTENTS :

II – NERVES:

(all from sacral plexus):

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



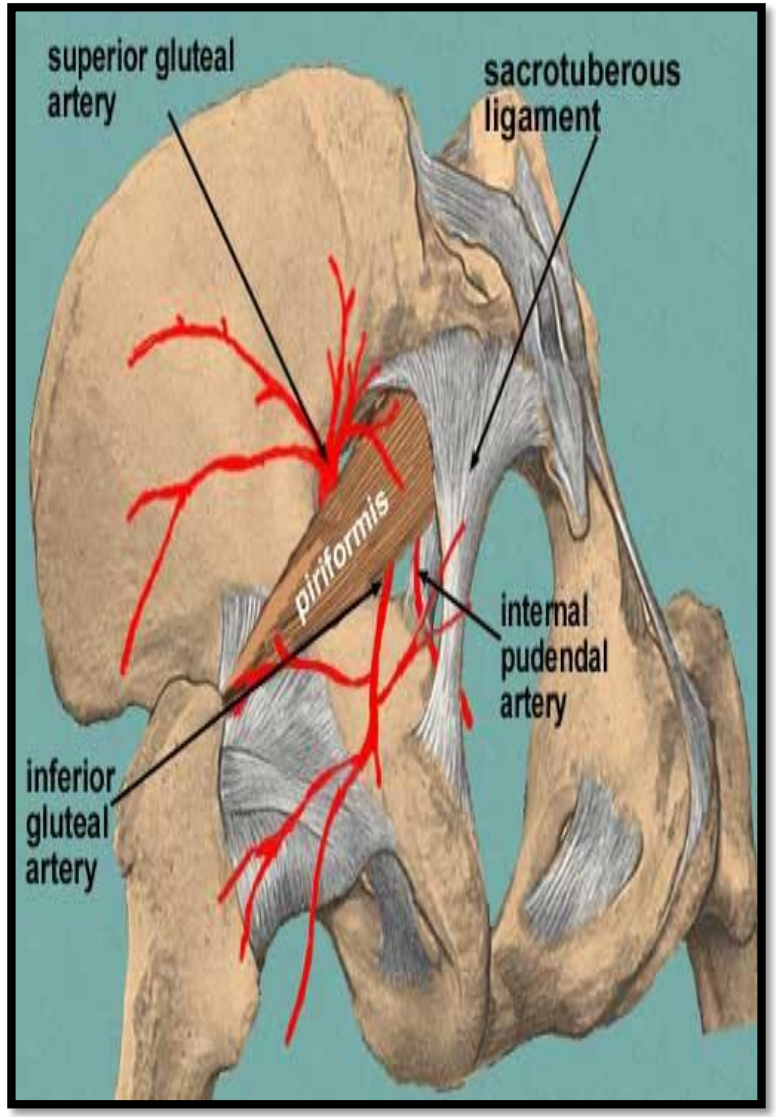


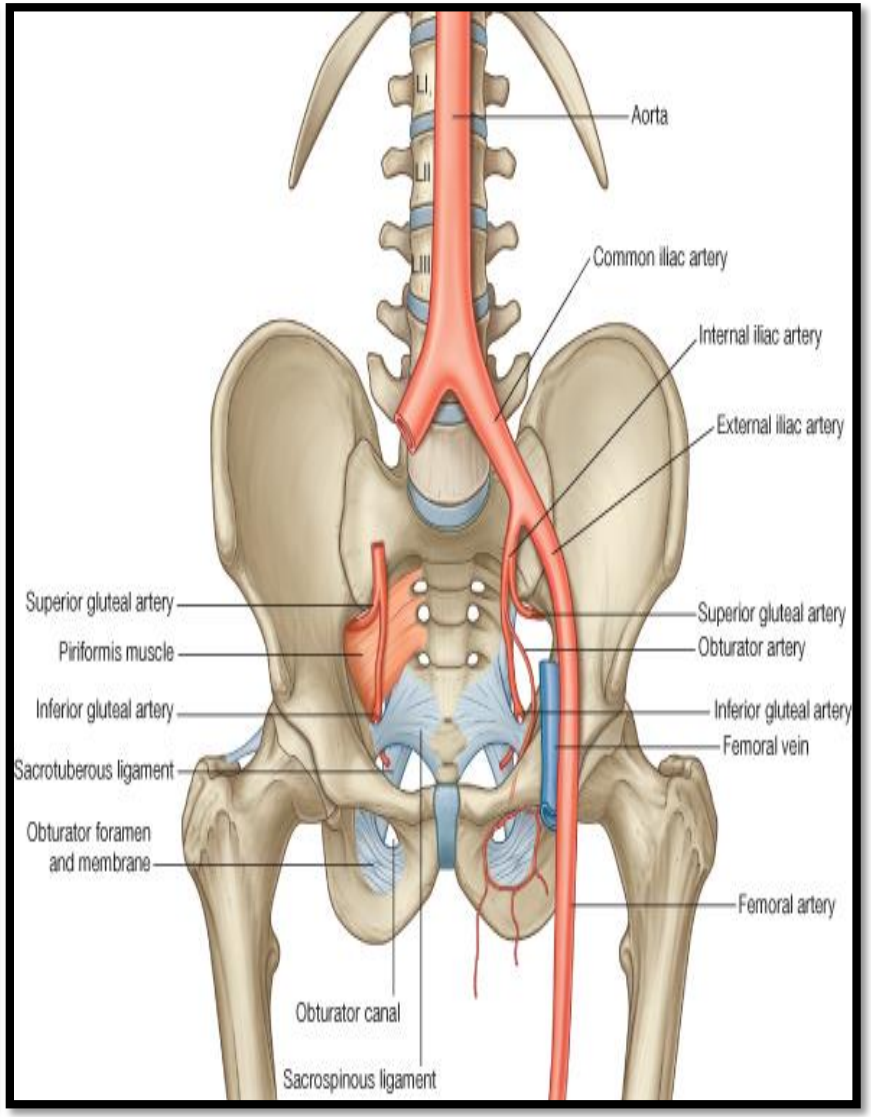
CONTENTS :

III - VESSELS:

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

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





Greater sciatic foramen

Greater sciatic notch of hip bone is transformed into foramen by sacrotuberous & sacrospinous ligaments.

Structures passing through Greater sciatic foramen:

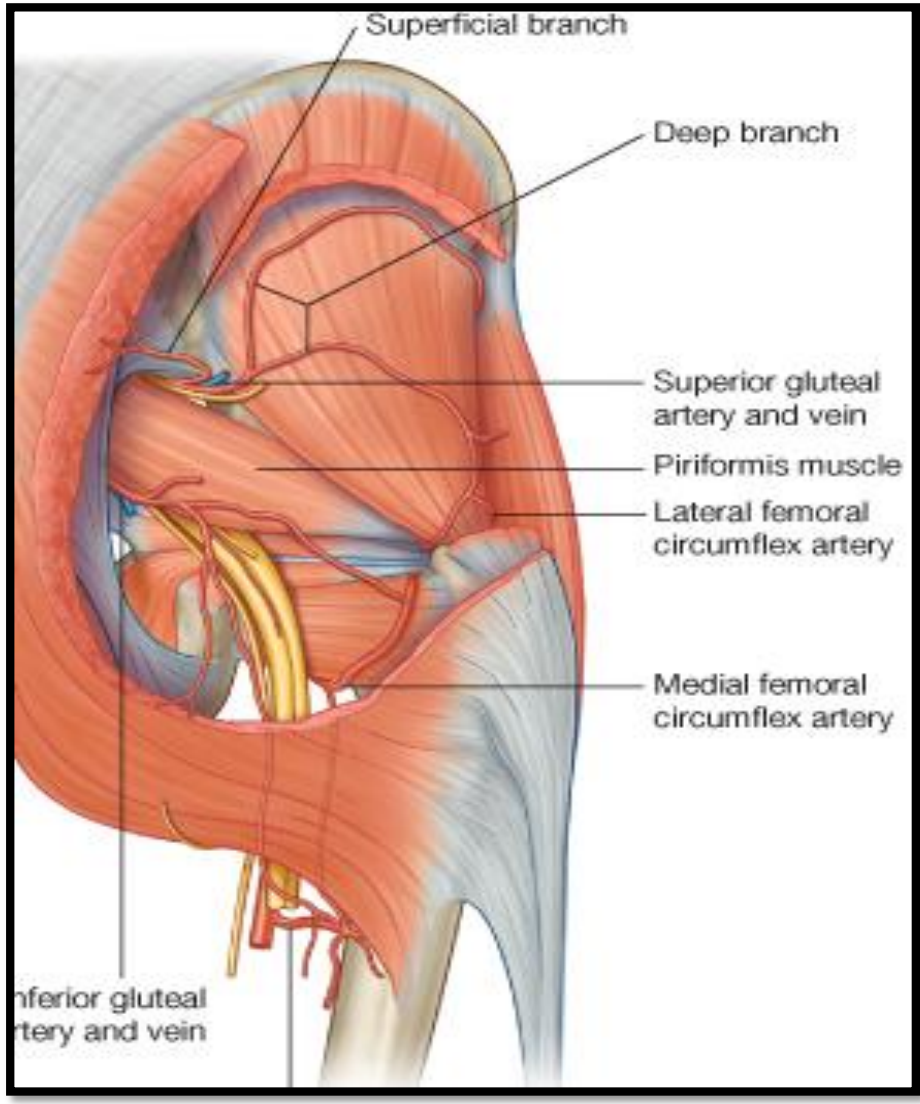
Piriformis muscle.

Above piriformis:

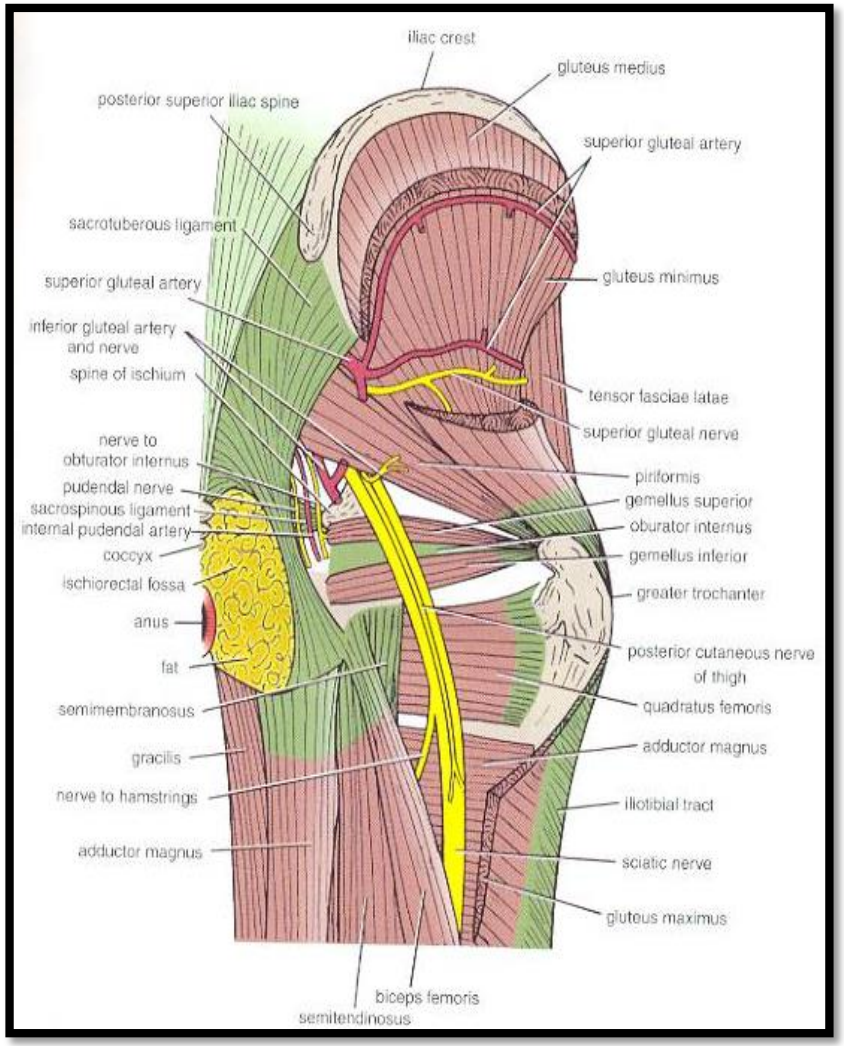
- Superior gluteal nerves & vessels.

Below piriformis:

- Inferior gluteal nerves & vessels.
- Sciatic nerve.
- Posterior cutaneous nerve of thigh.
- Nerve to quadratus femoris.
- Nerve to obturator internus.
- Pudendal N.
- Internal pudendal vessels.



Lesser sciatic foramen



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

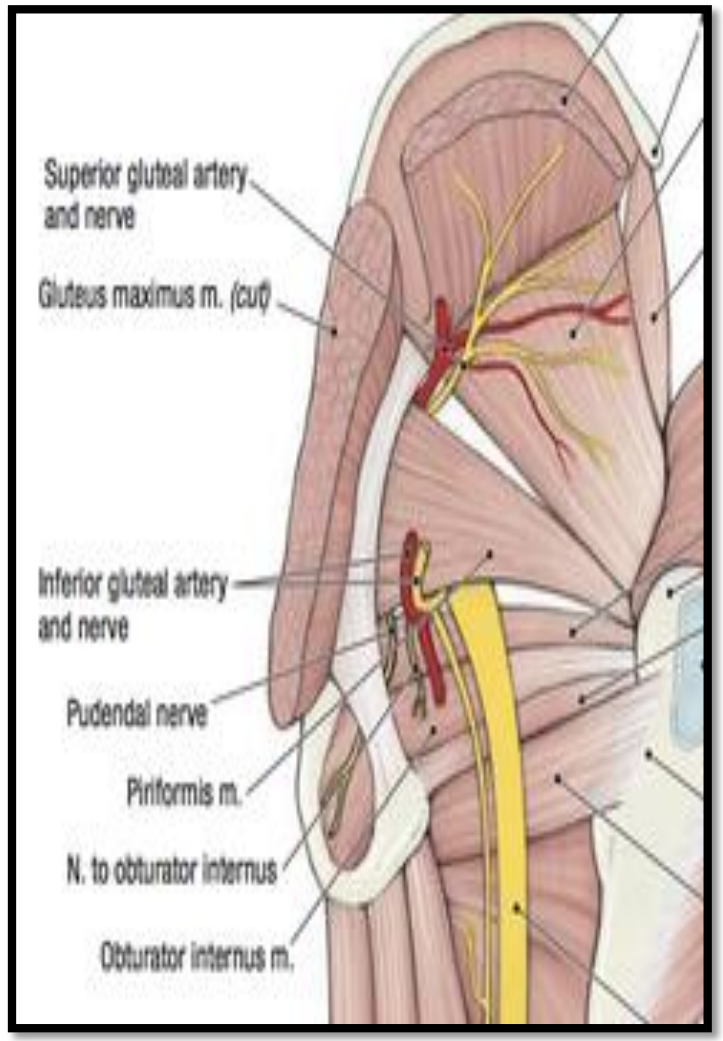
Structures passing through Lesser sciatic foramen :

1.Tendon of obturator internus.

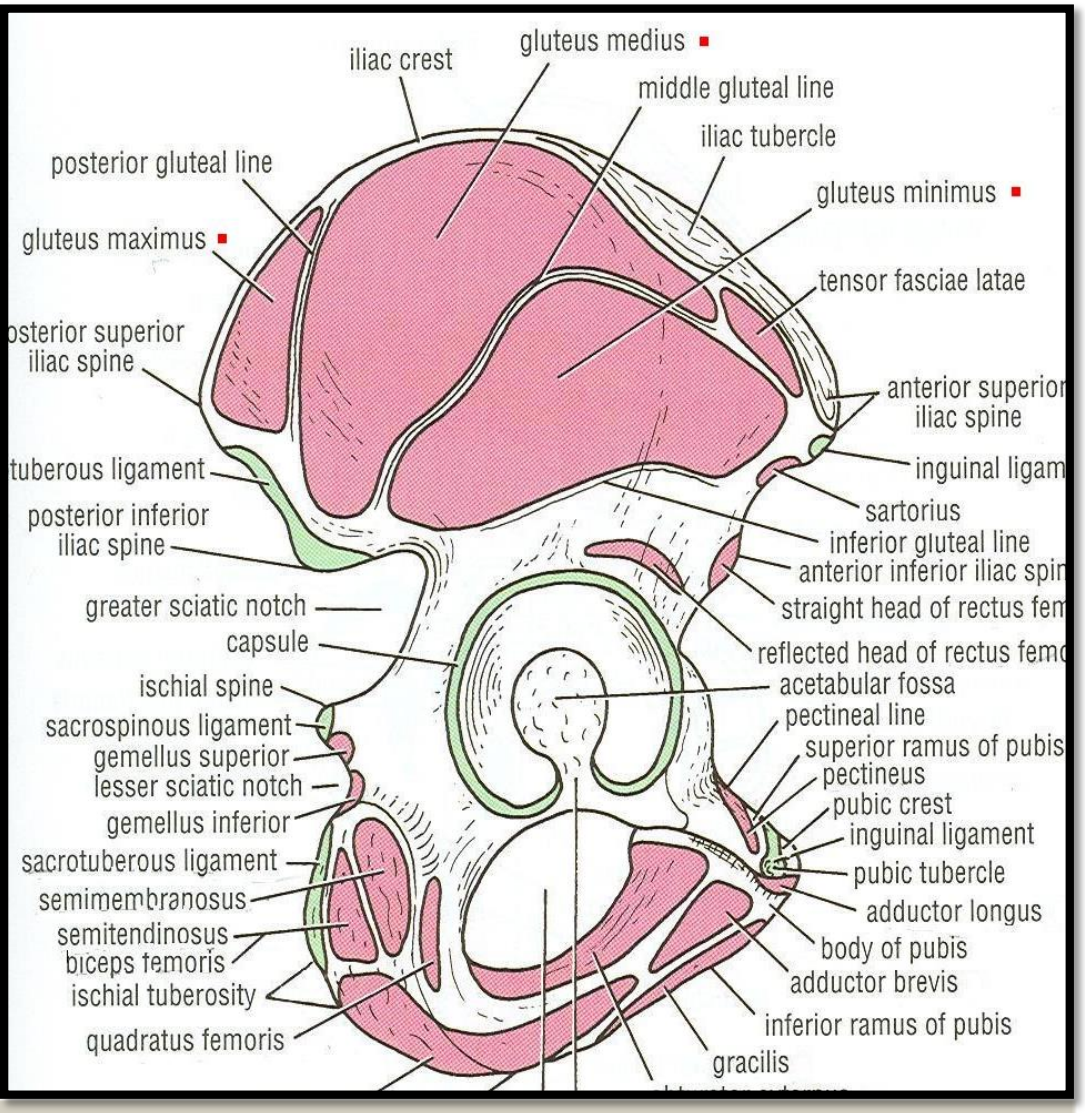
2.Nerve to obturator internus.

3.Pudendal nerve.

4.Internal pudendal vessels.



Glutei Muscles

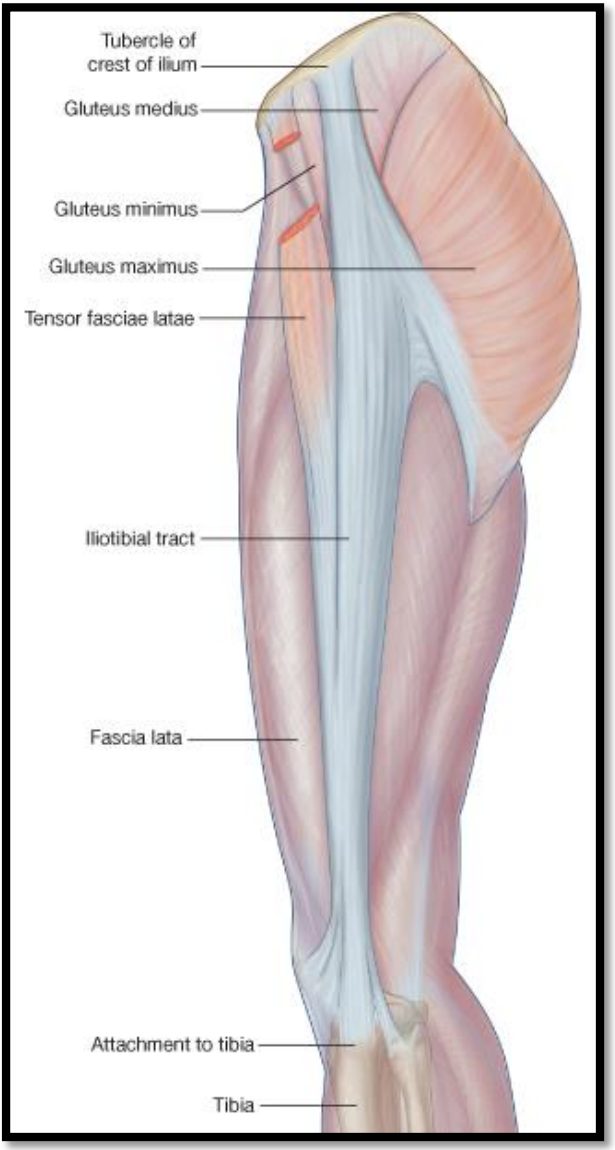


ORIGINS		
Gluteus maximus: Posterior part of the gluteal surface of ilium.	Gluteus medius: Middle part of the gluteal surface of ilium.	Gluteus minimus: Anterior part of the gluteal surface of ilium

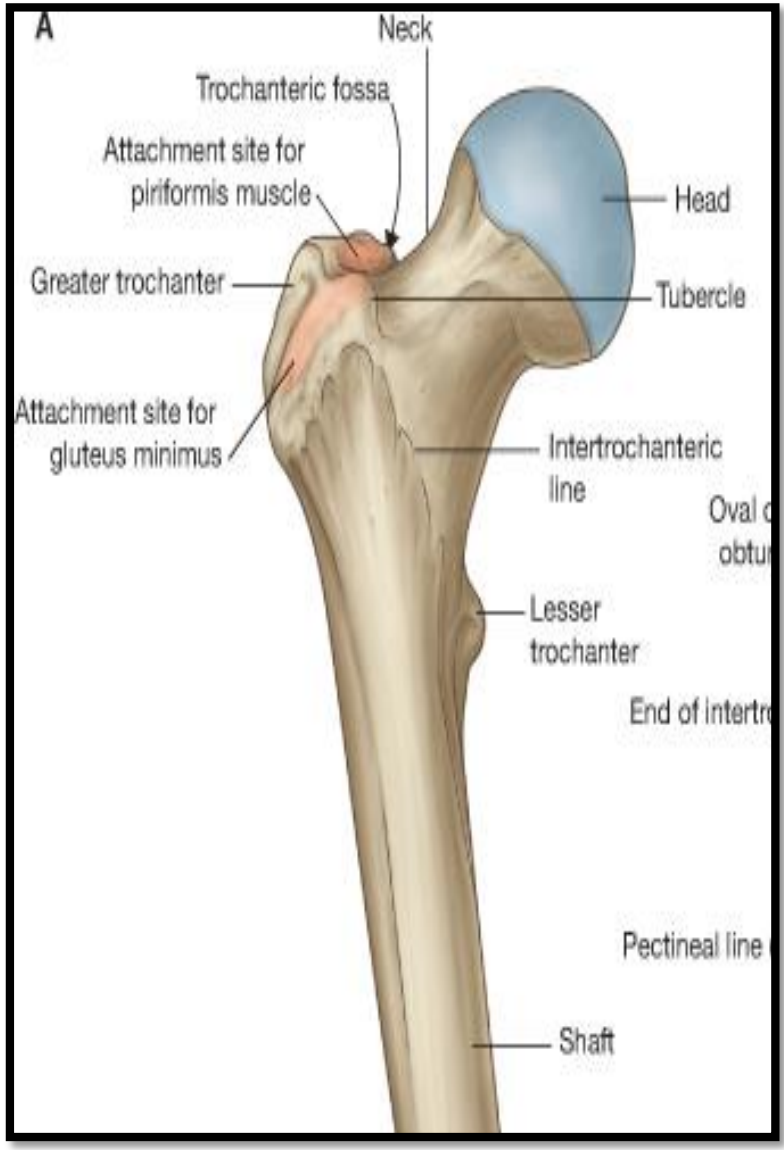
Main origin of gluteus maximus:

- Back of sacrum & coccyx & back of Sacrotuberous ligament.

Glutei muscles



Insertion:		
Gluteus maximus:	Gluteus medius:	Gluteus minimus:
• **Main insertion**: iliotibial tract • **Other insertion**: gluteal tuberosity of the femur.	Lateral surface of the greater trochanter	anterior surface of the greater trochanter



Nerve Supply and action

Gluteus medius & minimus:

Nerve supply:

Superior gluteal nerve.

Action:

- Abduction & Medial rotation of hip joint.
- Also they prevent tilt of the pelvis by contraction of **ABDUCTORS** on opposite side on raising the other limb from ground.
- If the pelvis tilts, this is means +ve Trendlenburge's sign

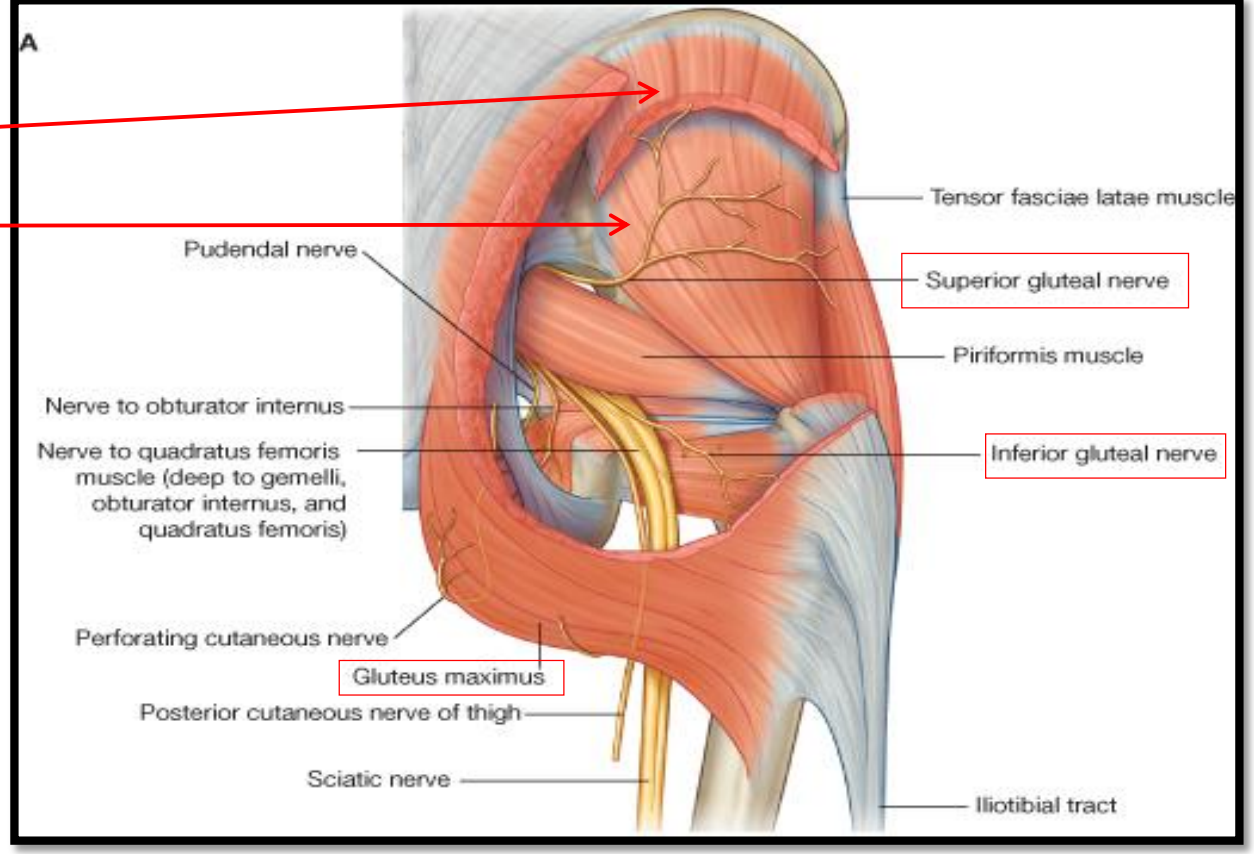
Gluteus maximus:

Nerve supply:

Inferior gluteal nerve.

Action:

- Extension & lateral rotation of the hip joint.
- Through its attachment to iliotibial tract, it stabilizes the femur on the tibia during standing.



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.

Pelvis Tilt & Gluteal Gait

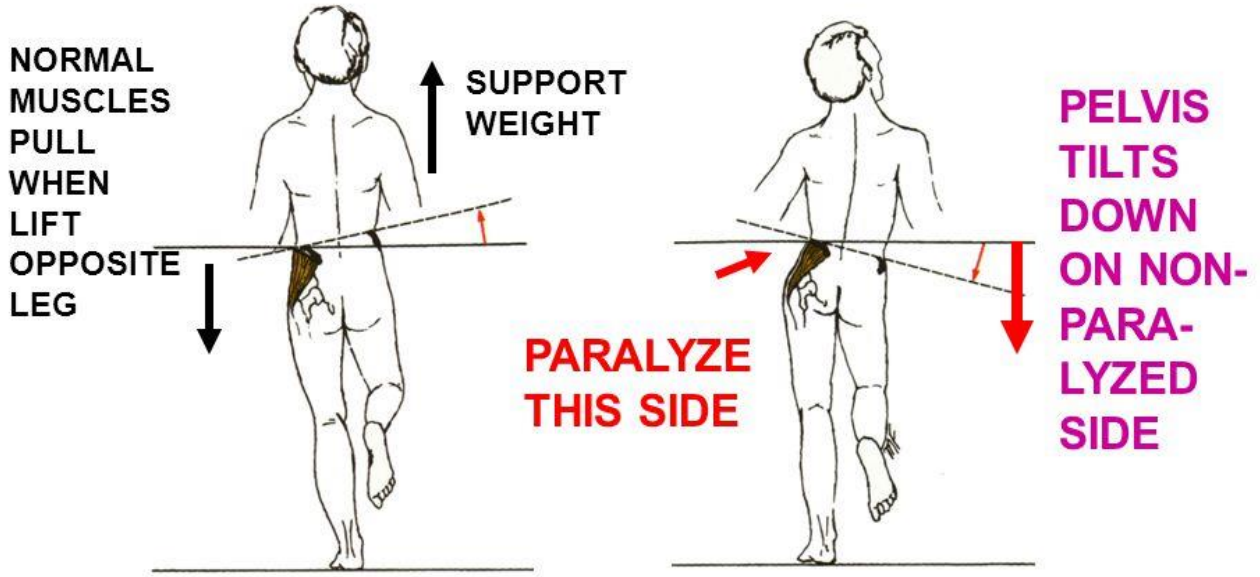
تكملة السلايد اللي قبله

- 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

This was taken from girls' lecture

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.

Small muscles

Obturator Internus:

Origin:
Inner surface and side wall of the pelvis.

Insertion:
Into the medial surface of the greater trochanter.

Nerve supply:
Nerve to obturator internus.

Superior & Inferior Gemelli:

Origin:
Superior gemellus;
upper part of lesser sciatic notch.

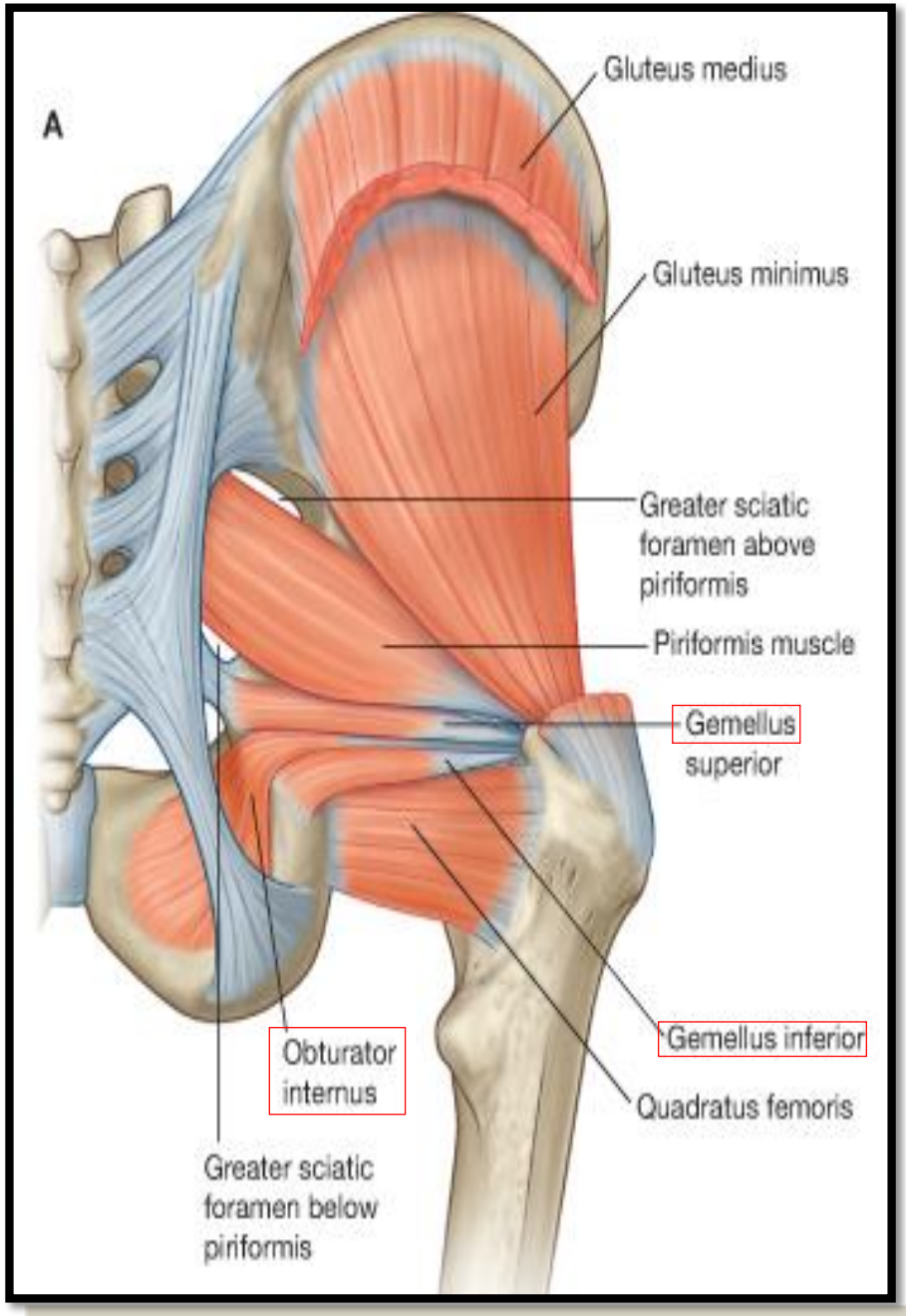
Inferior gemellus:
lower part of lesser sciatic notch.

Insertion:
Into tendon of obturator internus.

Nerve supply:
Superior gemellus: nerve to obturator internus.

Inferior gemellus: nerve to quadratus femoris.

Just make sure you remember the origin, insertion, action and nerve supply of each Muscle. It's very important.



Small muscles

Piriformis

Origin:

Pelvic surface of middle 3 sacral vertebrae.

Insertion:

It passes out of the pelvis through **GSF** to be inserted into the upper border of the greater trochanter.

Nerve supply:

Anterior rami of S1,2.

Quadratus femoris

Origin:

Lateral border of the ischial tuberosity.

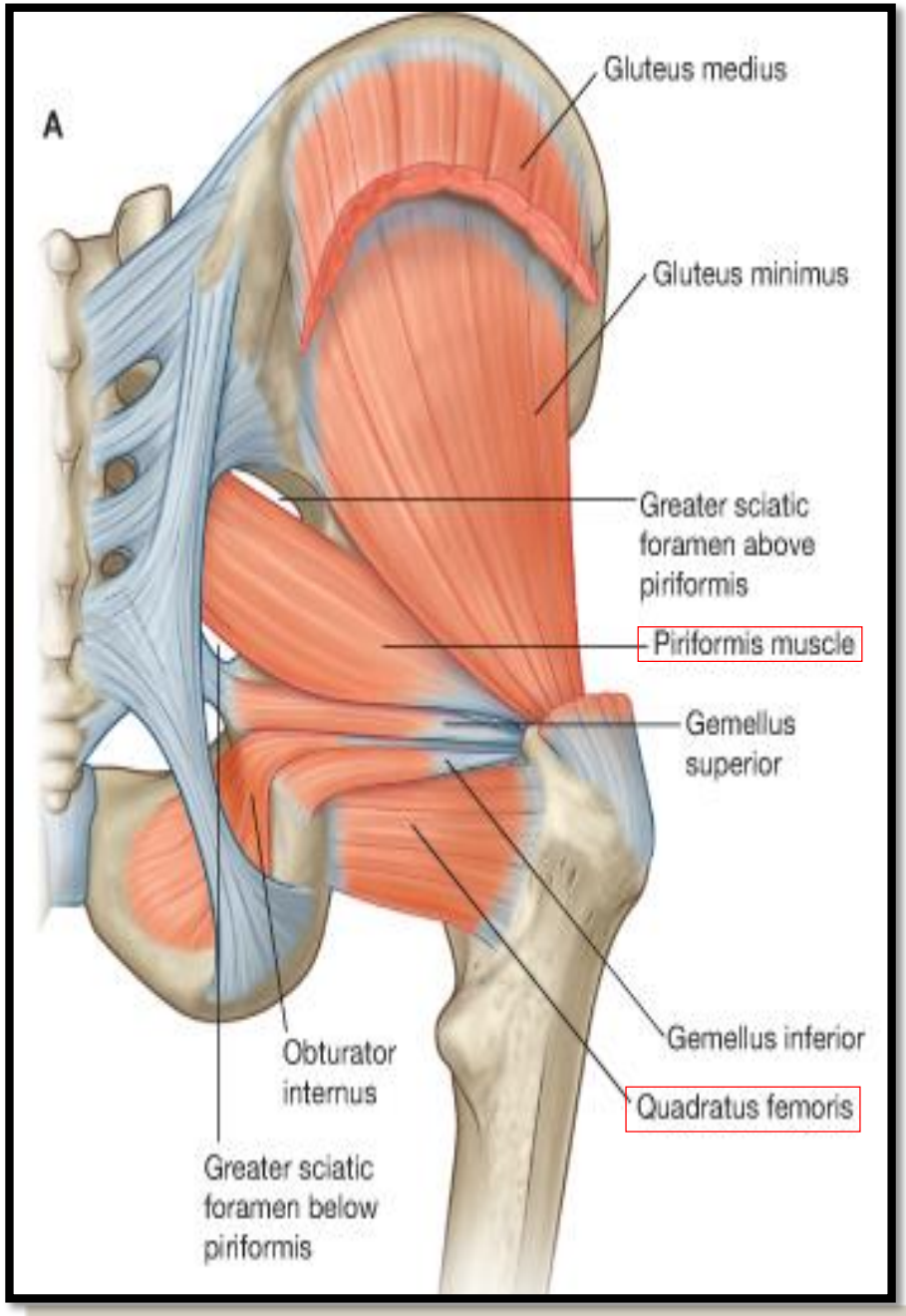
Insertion:

Quadrate tubercle & intertrochanteric crest.

Nerve supply:

Nerve to quadratus femoris (You can see this nerve in the picture next slide).

ALL HAVE SIMILAR ACTION: Lateral rotation of the hip joint. Control movement of the hip joint.



Just make sure you remember the origin, insertion, action and nerve supply of each Muscle. It's very important.

TEAM Anatomy

GSF = Greater Sciatic Foramen

Nerves

SUPERIOR GLUTEAL NERVE

Course: Passes through **GSF**, above piriformis, then *between gluteus medius & minimus.*

Branches:

1. Muscular to gluteus medius, minimus & tensor fasciae lata muscle.
2. Articular to hip joint.

INFERIOR GLUTERAL NERVE

Course: passes through **GSF**, below piriformis, then **deep** *to gluteus maximus.*

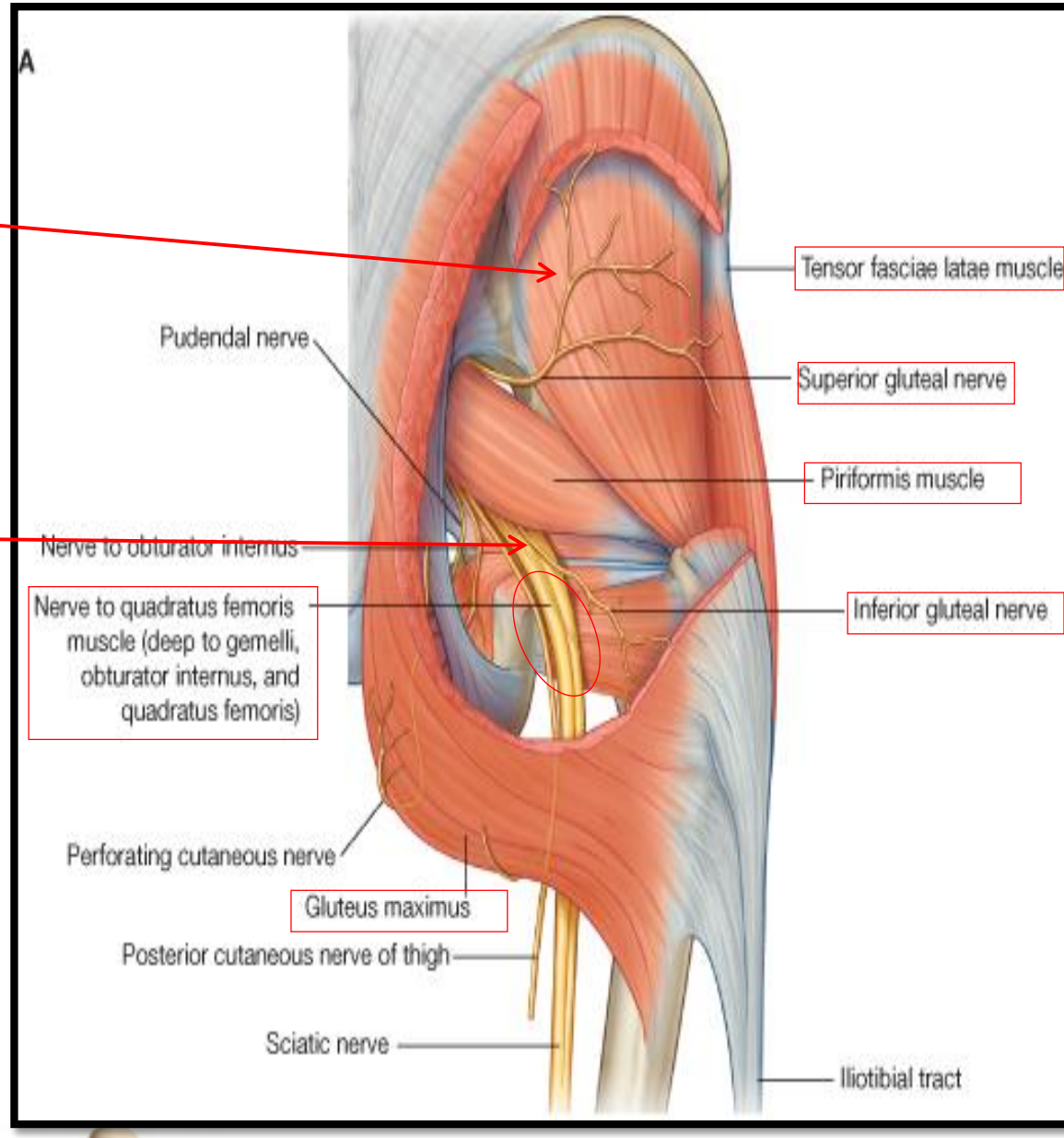
Branches: muscular to gluteus maximus.

NERVE TO QUADRATUS FEMORIS

Course: passes through **GSF**, below piriformis.

Branches:

1. Muscular to quadratus femoris & inferior gemellus.
2. Articular to hip joint.

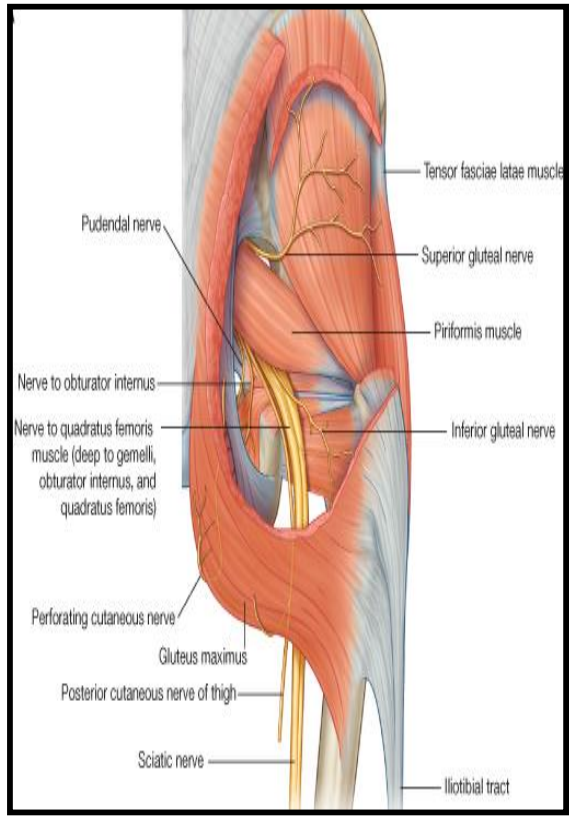


Note: The nerve to Quadratus Femoris is not the sciatic nerve. The nerve to Quadratus femoris enters the gluteal region through the GSF deep to the sciatic nerve.

GSF = Greater Sciatic Foramen

NERVES

NERVES	Course:	Branches:
POSTERIOR CUTANEOUS NERVE OT THE THIGH	Passes through GSF,(Greater Sciatic Foramen) below piriformis, then descends deep to deep fascia	**Cutaneous branches to**: gluteal region, back of scrotum (labium majus) back of thigh & upper part of back of leg
SCIATIC:	passes through GSF, below piriformis, then superficial to: ischial spine, superior gemellus, tendon of obturator internus, inferior gemellus, quadratus femoris & adductor magnus.	No branches in gluteal region, divides into **tibial & common** peroneal nerves, in the middle of back of thigh



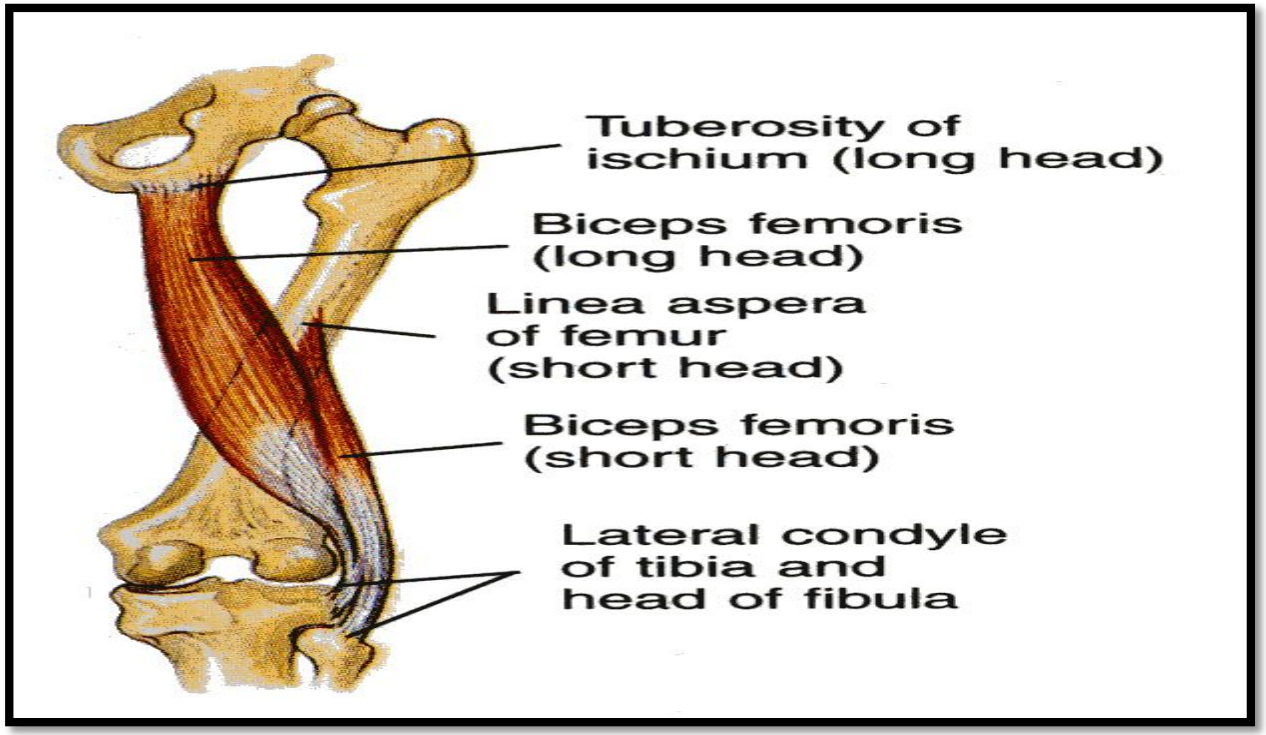
POSTERIOR COMPARTMENT OF THE THIGH

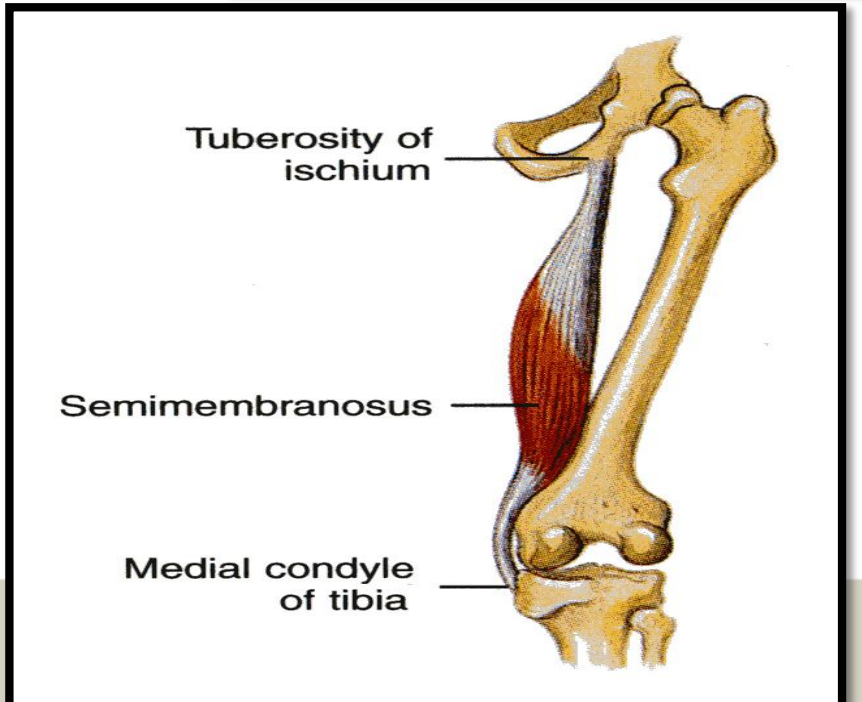
Content:

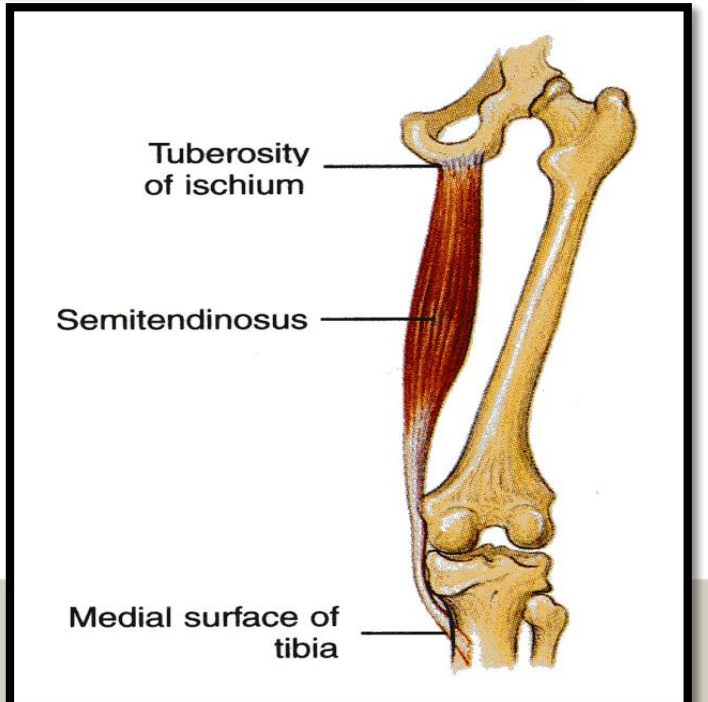
Nerve supply:
Sciatic nerve.

Blood supply:
Branches of the <u>profunda femoris artery.</u>

Muscles:
<u>Hamstring muscles:</u>
1-Biceps femoris.
2- Semitendinosus.
3-Semimembranosus.
4- Ischial part of adductor magnus.





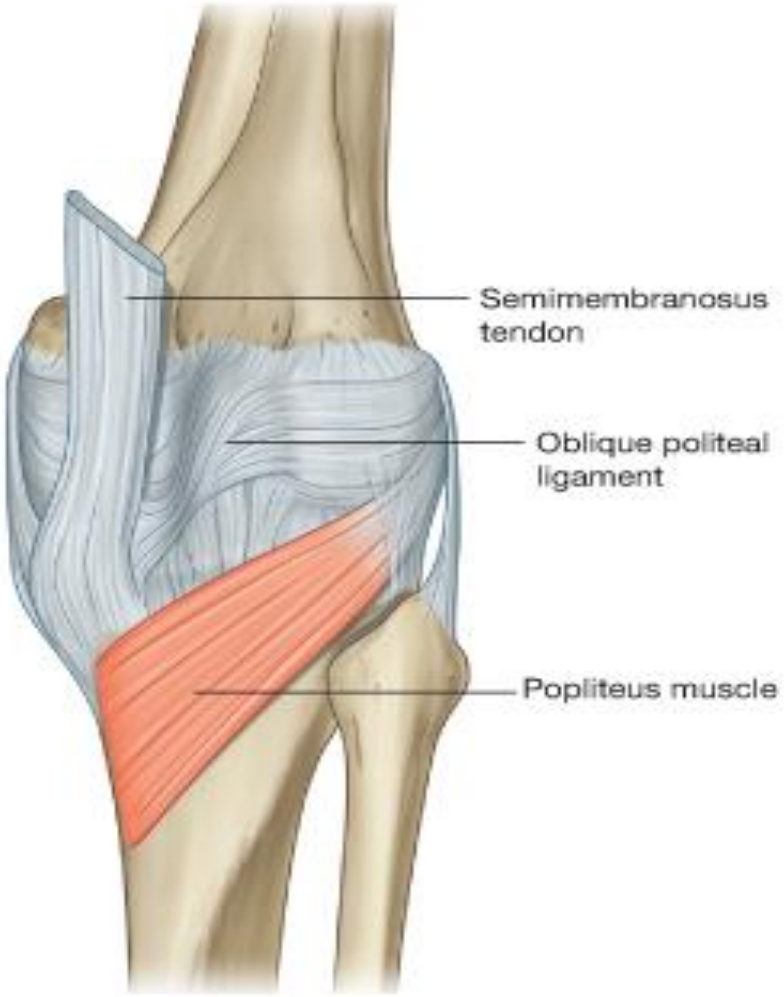


MUSCLES	Origin:	Insertion	Nerve supply:	Action
Biceps Femoris	- Long head from the **ischial tuberosity**. - Short head from the **linea aspera**	Into the head of the fibula.	- Long head is supplied by the tibial part of the sciatic - Short head is supplied by the common peroneal part of the sciatic	- Flexion of knee. - Lateral rotation of flexed leg. - Long head: extends the hip
SEMITENDINOSUS	**Ischial tuberosity.**	Upper part of the medial surface of the shaft of the tibia (**SGS**).	Tibial portion of the sciatic	- Flexes and medially rotates the leg at the knee joint. - Extends the thigh at the hip joint.

What are the SGS? They are the muscles that are inserted in the medial surface of the shaft of Tibia,which are:
semitendinosus +gracialis ++sartorius

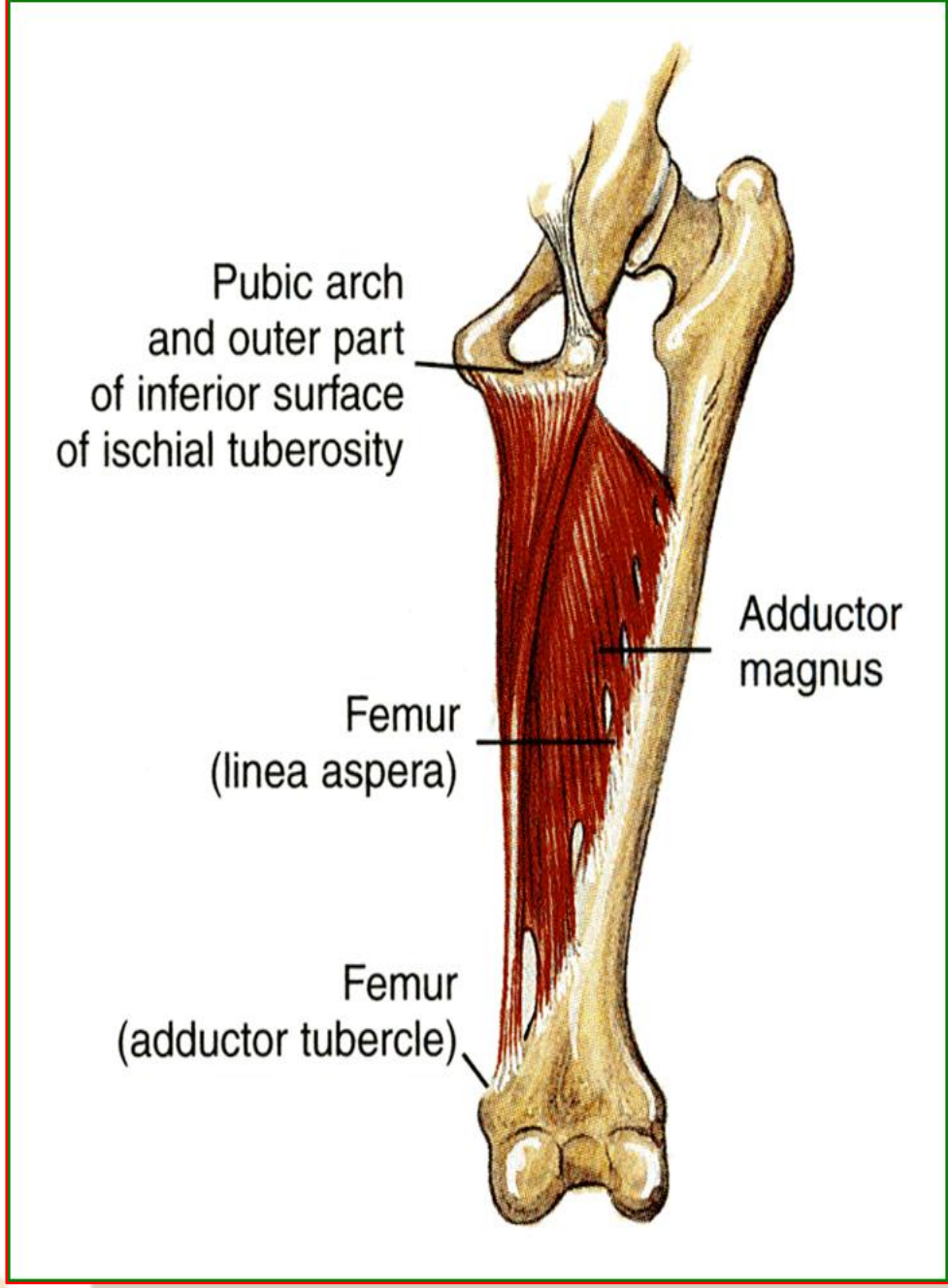
SEMIMEMBRANOSUS

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 nerve.
Action	• Flexes and medially rotates the leg at the knee joint • Extends the thigh at the hip.



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. .

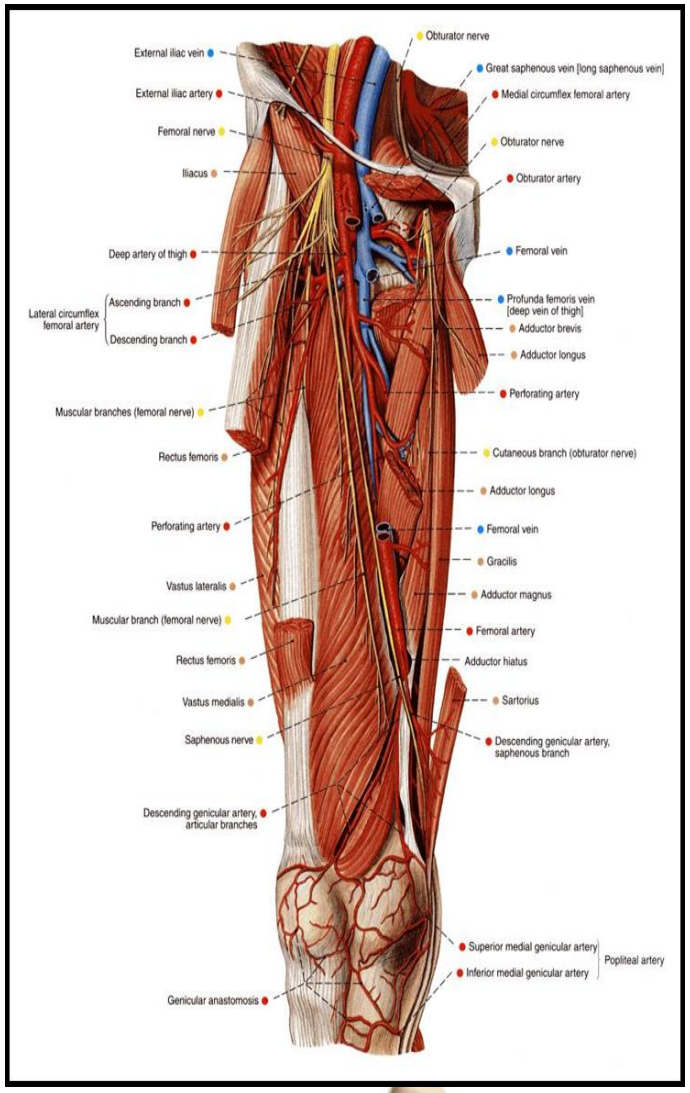


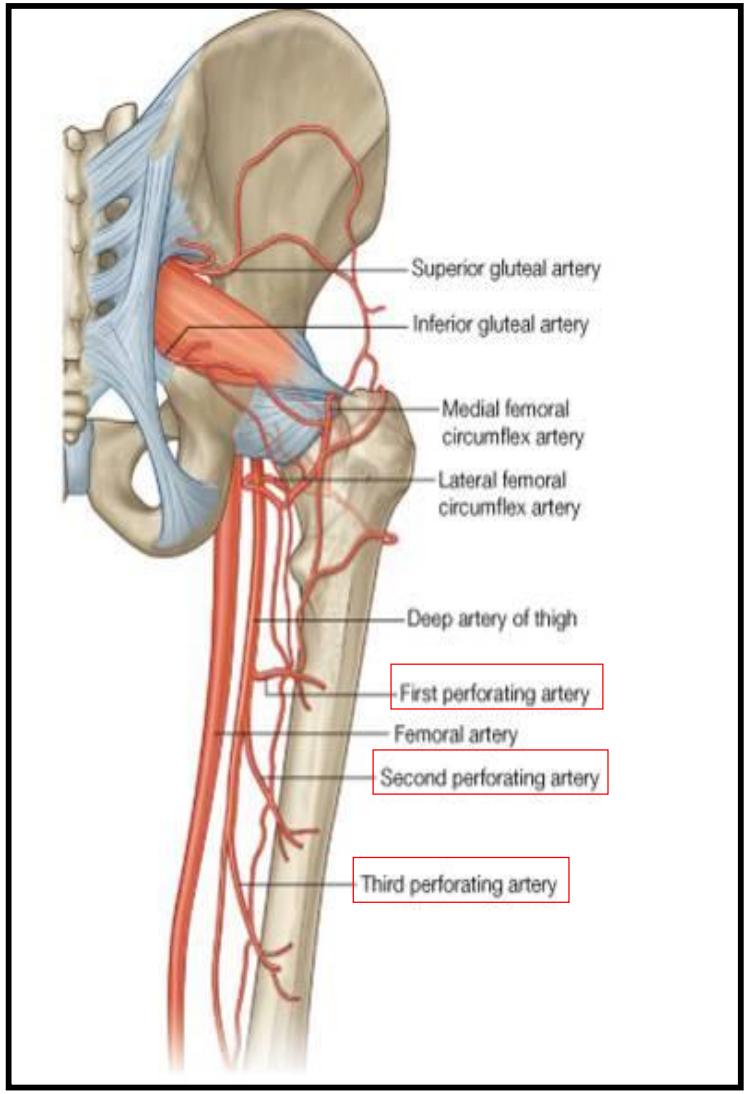
* Different origin from the previous muscle.

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

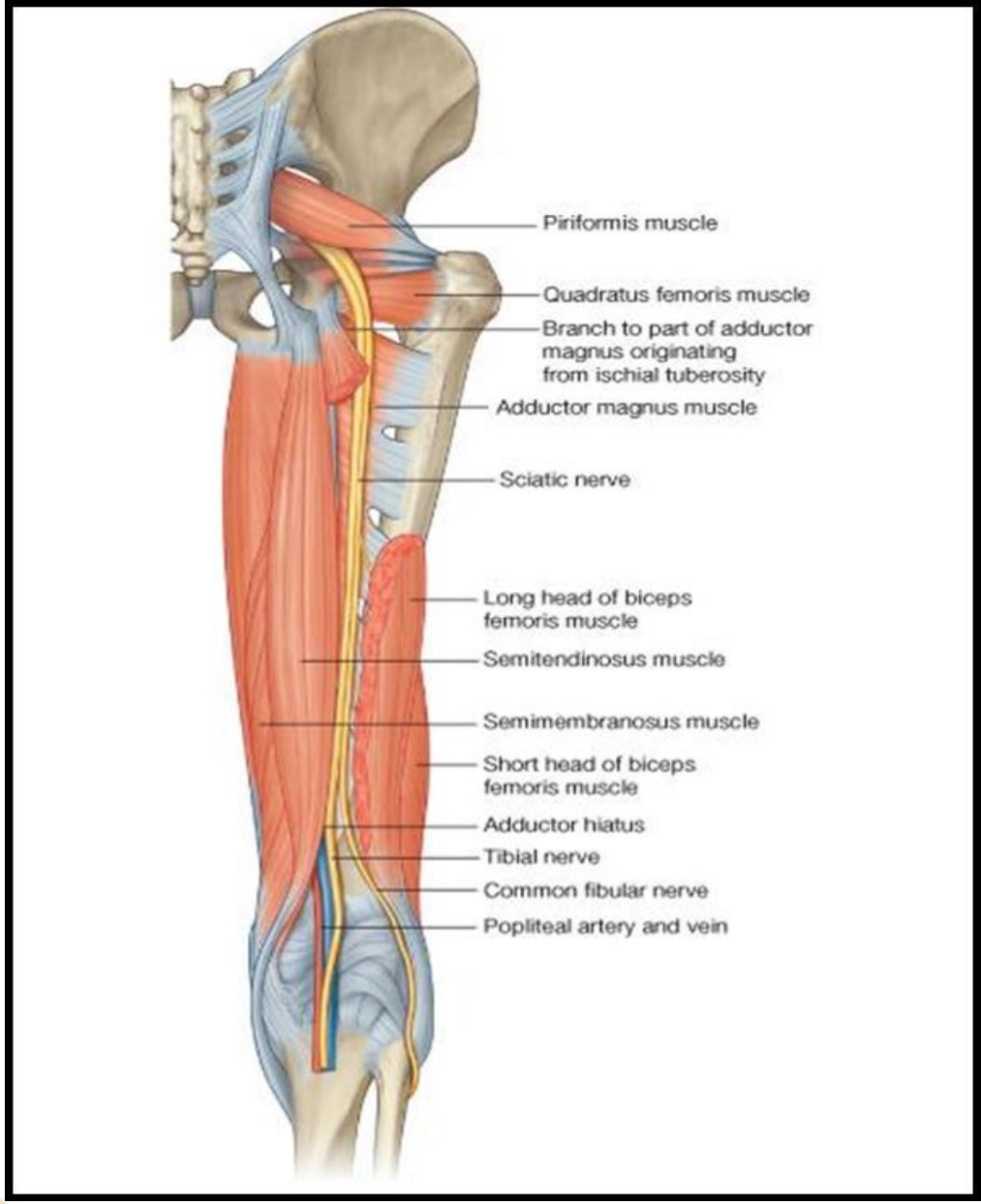




Nerve supply

Sciatic Nerve:

- The **sciatic nerve,** is 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 tibial and common peroneal nerves.



summery

* Any muscles attach to Ischial tuberosity extend hip joint.
* Sciatic Nerve a branch of the sacral plexus (L4 to S3), it divides into the tibial and common peroneal nerves.
* Greater& lesser sciatic notch are transformed into foramen by sacrotuberous & sacrospinous ligaments.
* Hamstring muscles origin from Ischial tuberosity except short head of biceps femoris linea aspera.
* Insertion of biceps femoris head of fibula, Semitendinosus & Semimembranosus medial condyle of the tibia (SGS).

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Video: https://youtu.be/kXg3akhbrrg

Video: https://youtu.be/mc_2lMuHkIk

Application: Essential anatomy 5
you can have it for free, ask
https://twitter.com/Med_435

Quiz: https://www.onlineexambuilder.com/gluteal-region-and-back-of-the-thigh/exam-52493

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TEAM MEMBERS:

Group (2) Leader:
Fahad AlAbdullatif
Group(2) members:
Faisal AlJammaz
Faisal AlYahya
Saad AlMotairi
Hassan AlShammasi
Abdulwahab AlMansour
Talal AlEbewani
Abdullah AlMushawah
Ibrahim AlSuhaim
Fahad AlHomaid

TRAM LEADERS:

Ghaida Aljamili
Elham Alzahrani
Abdullah Alfuraih
Boudor Julaidan

- For questions and suggestions you can contact us on Anatomy435@gmial.com

Editing Team (boys):

Khaled Al Jedia
Rodhdan Al Nahdi
Abdulwahab Sanari