

Femoral Nerve Injury

Clinical manifestations:

If The nerve is completely injured ***Motor:*** The *quadriceps femoris muscle is paralyzed*, and the *knee cannot be extended.*

Sensory: Skin sensation is lost

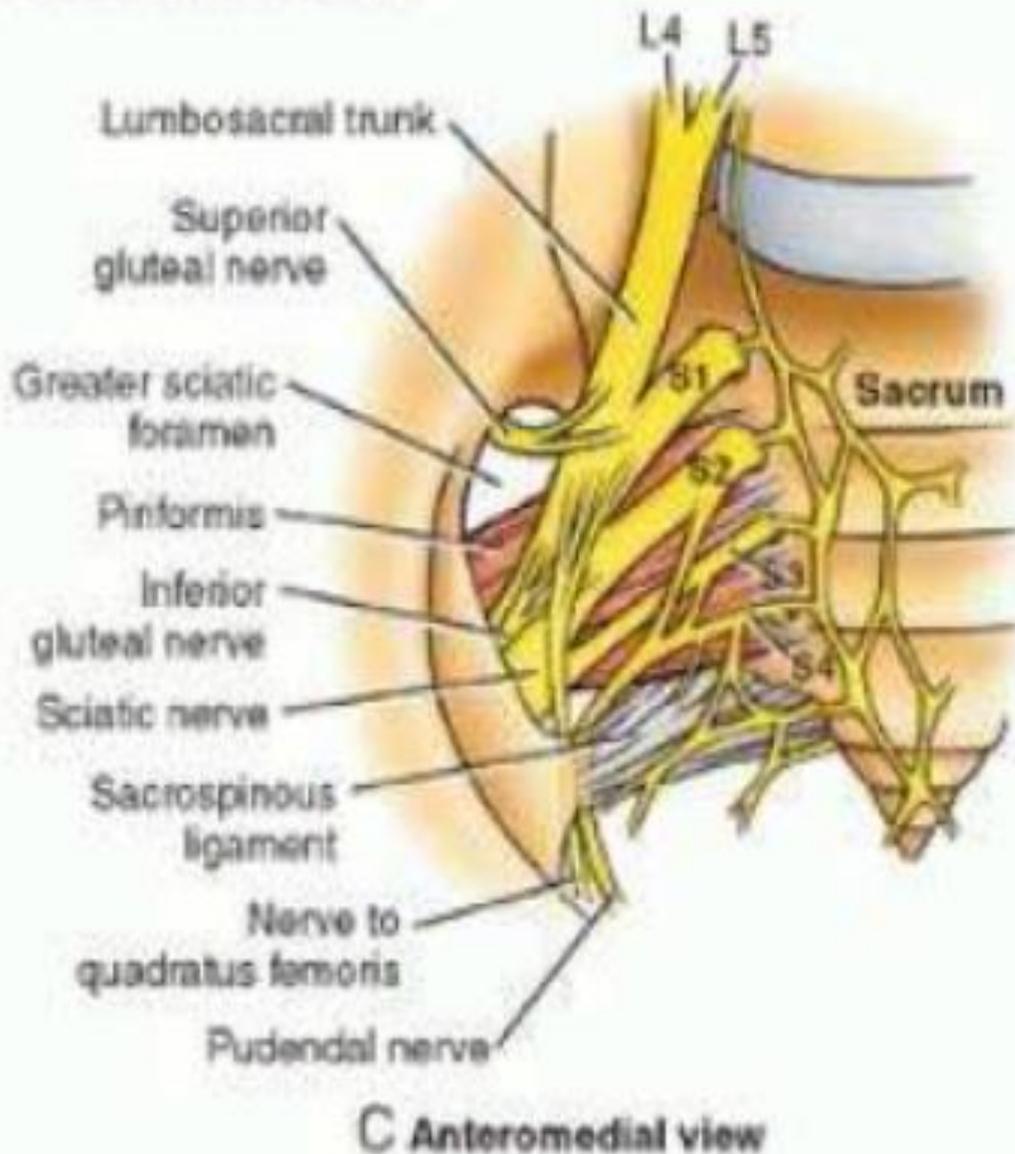
over

1-The anterior and medial sides of the thigh,

Over the ***Medial side of the lower part of the
Leg***

SACRAL PLEXUS

B Anteromedial view

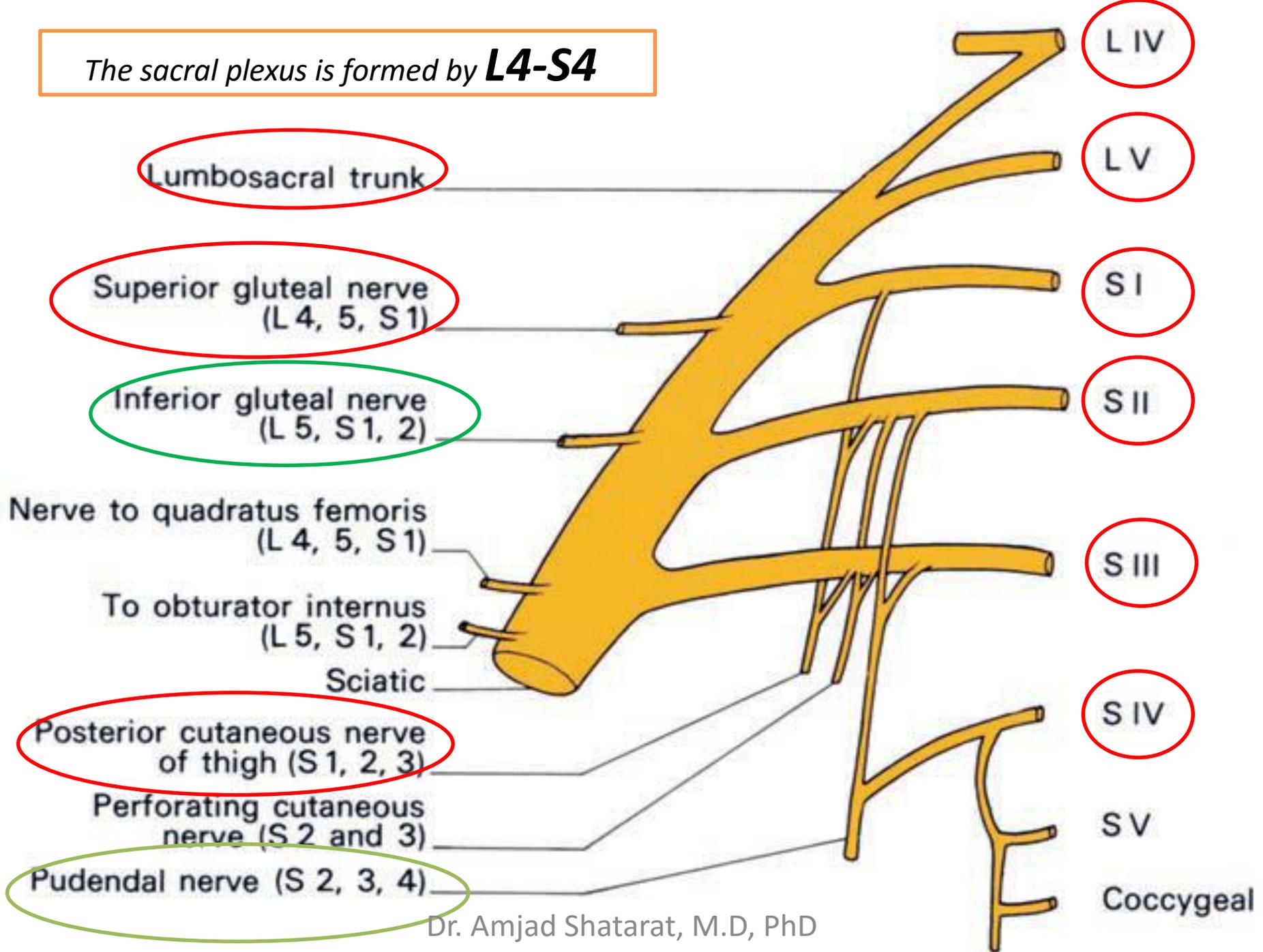


- ❖ Located on the posterior wall of pelvis on the anterior surface of piriformis muscle.
- ❖ Formed by the lumbosacral trunk and ventral rami of S1-S4.

The lumbosacral trunk

is a thick nerve formed by the union of lower part of anterior primary ramus of L4 (nervus furcalis) with the anterior primary ramus of L5

The sacral plexus is formed by **L4-S4**



Gluteal region

Superior gluteal nerve **L4, L5 and S1**

Inferior gluteal nerve **L5 and S1 and S2**

Posterior cutaneous nerve of the thigh **S1,S2 and S3**

The sacral plexus is formed by **L4-L5 and S1-S4**

The sciatic nerve **L4-L5 and S1-S3**

All roots
except
S4

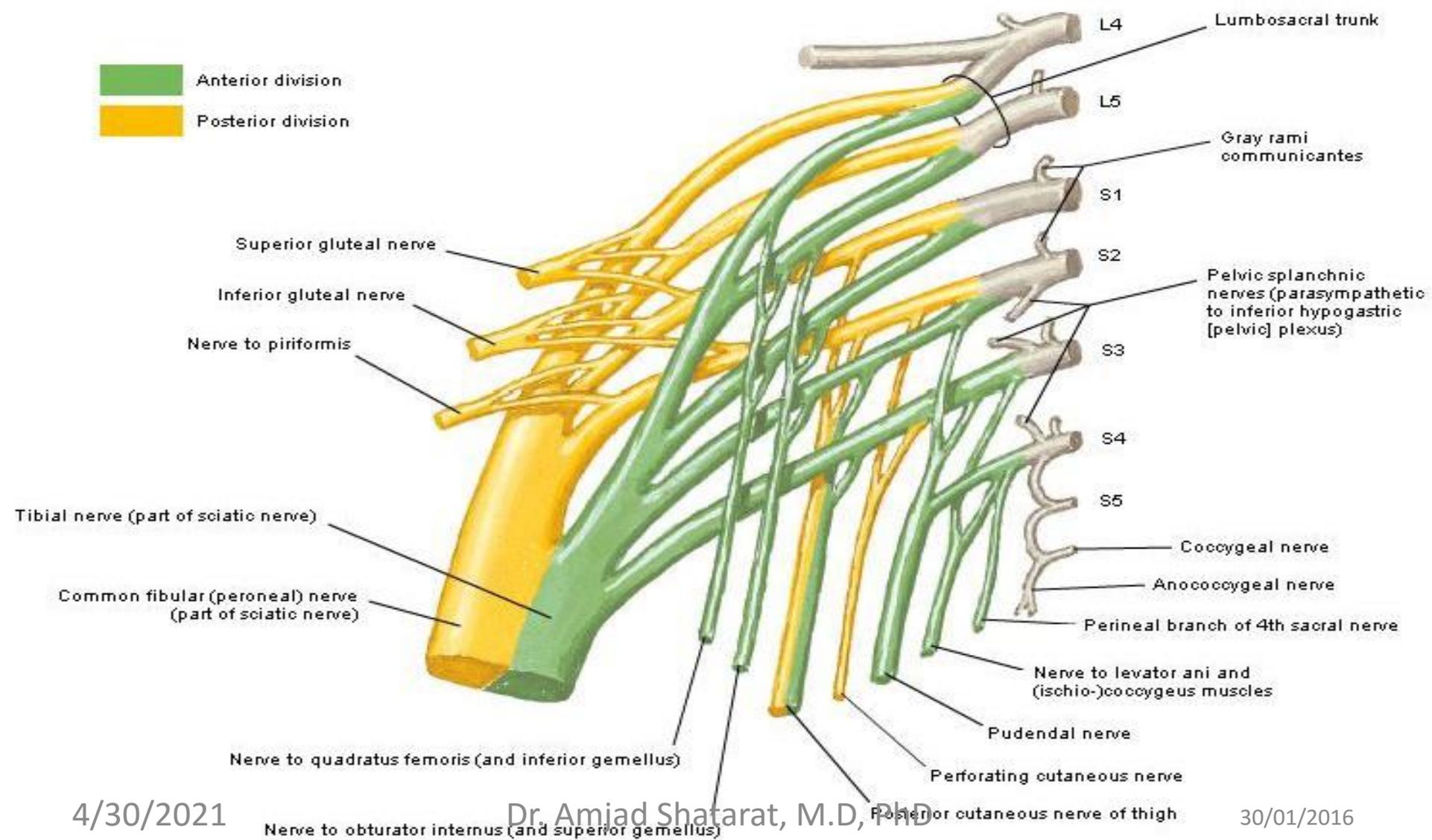
The tibial nerve **L4-L5 and S1-S3**

The same
as sciatic

The common peroneal nerve **L4-L5 and S1-S2**

The same
root value
as the tibial
except S3

The sacral plexus is formed by the union of lumbosacral trunk and anterior primary rami of the S1, S2, S3 and the upper part of S4 in the pelvis in front of sacrum



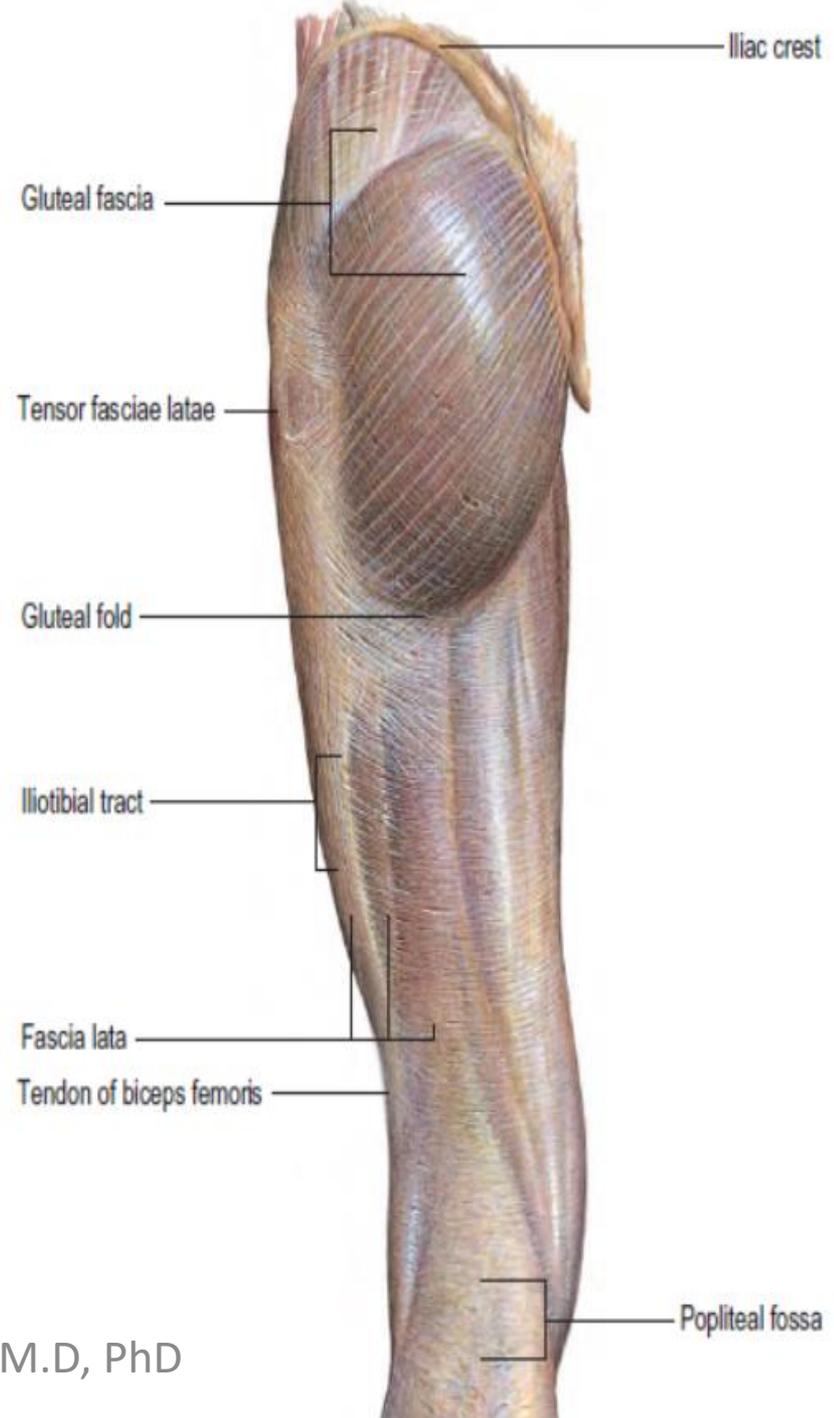
GLUTEAL REGION

SKIN AND FASCIA OF THE GLUTEAL REGION

B) Fascia of the Buttock (Gluteal region)

1- Superficial fascia; is thick especially in women . It contributes to the prominence of the buttock.

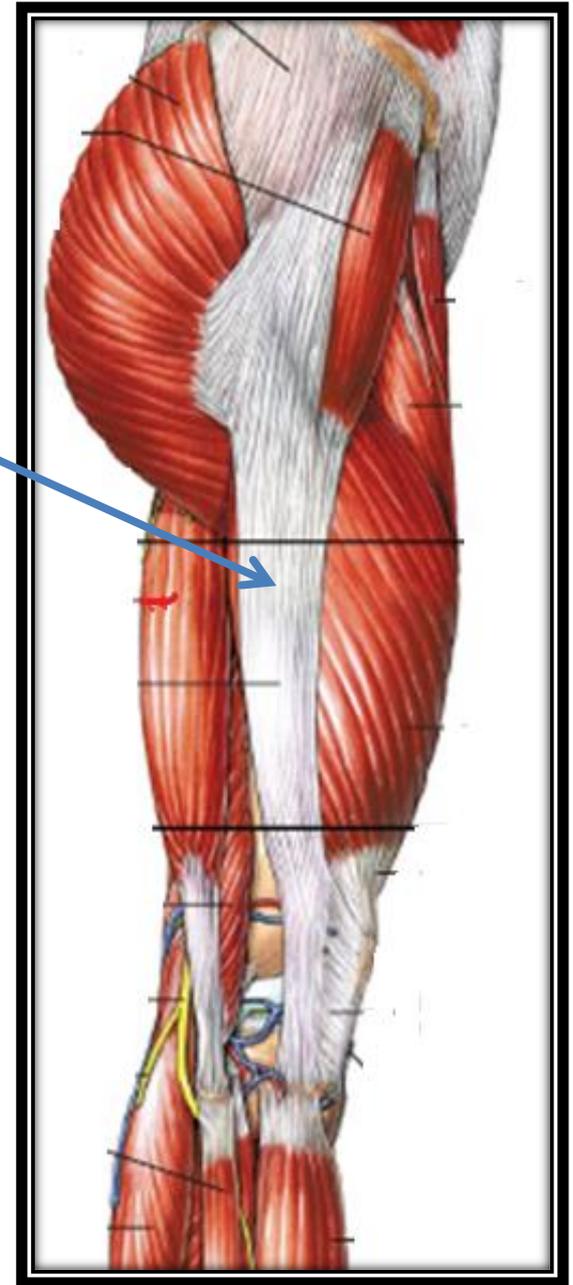
2- Deep fascia; continuous with the deep fascia of the thigh (fascia lata).



Fascia lata

- Is a strong **fibrous sheet** that surrounds the whole of the thigh like a **tight trousers**.
- **Thin** on its **medial** side while it is getting **thicker** on its **lateral** side to form

THE ILIOTIBIAL TRACT

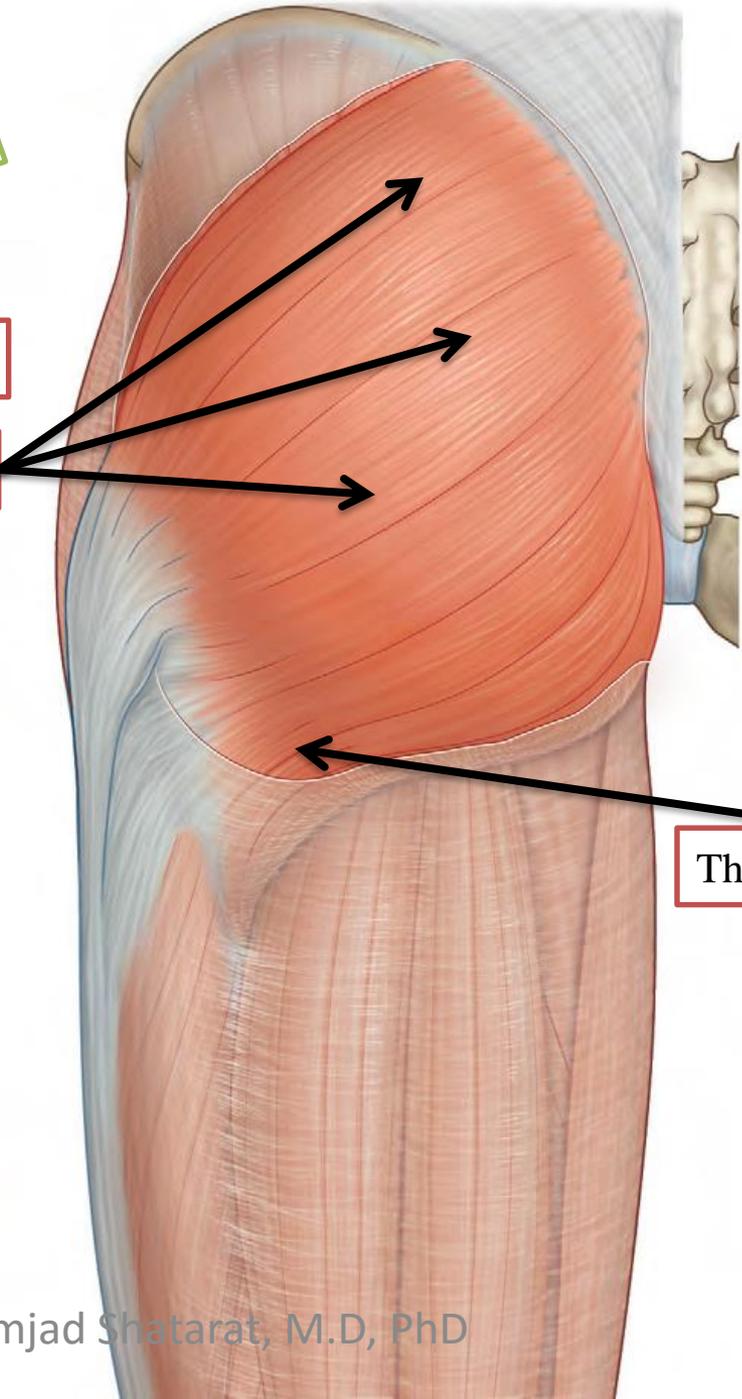


MUSCLES OF THE GLUTEAL REGION

Gluteus maximus

Made of two parts:

The *superficial three-fourths*



The *lower deep part*

➤ **Origin:**

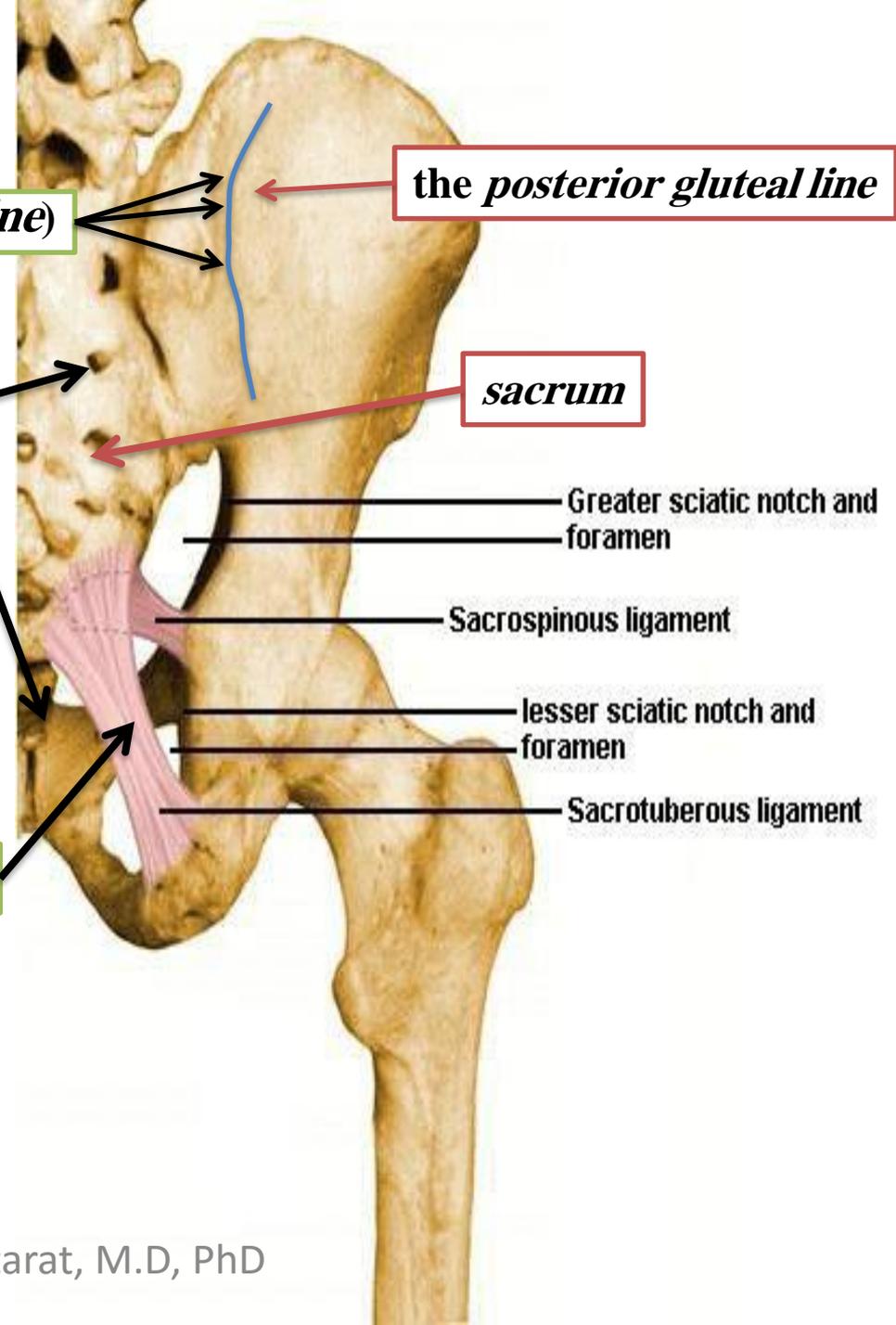
1-Ilium (area behind the *posterior gluteal line*)

the posterior gluteal line

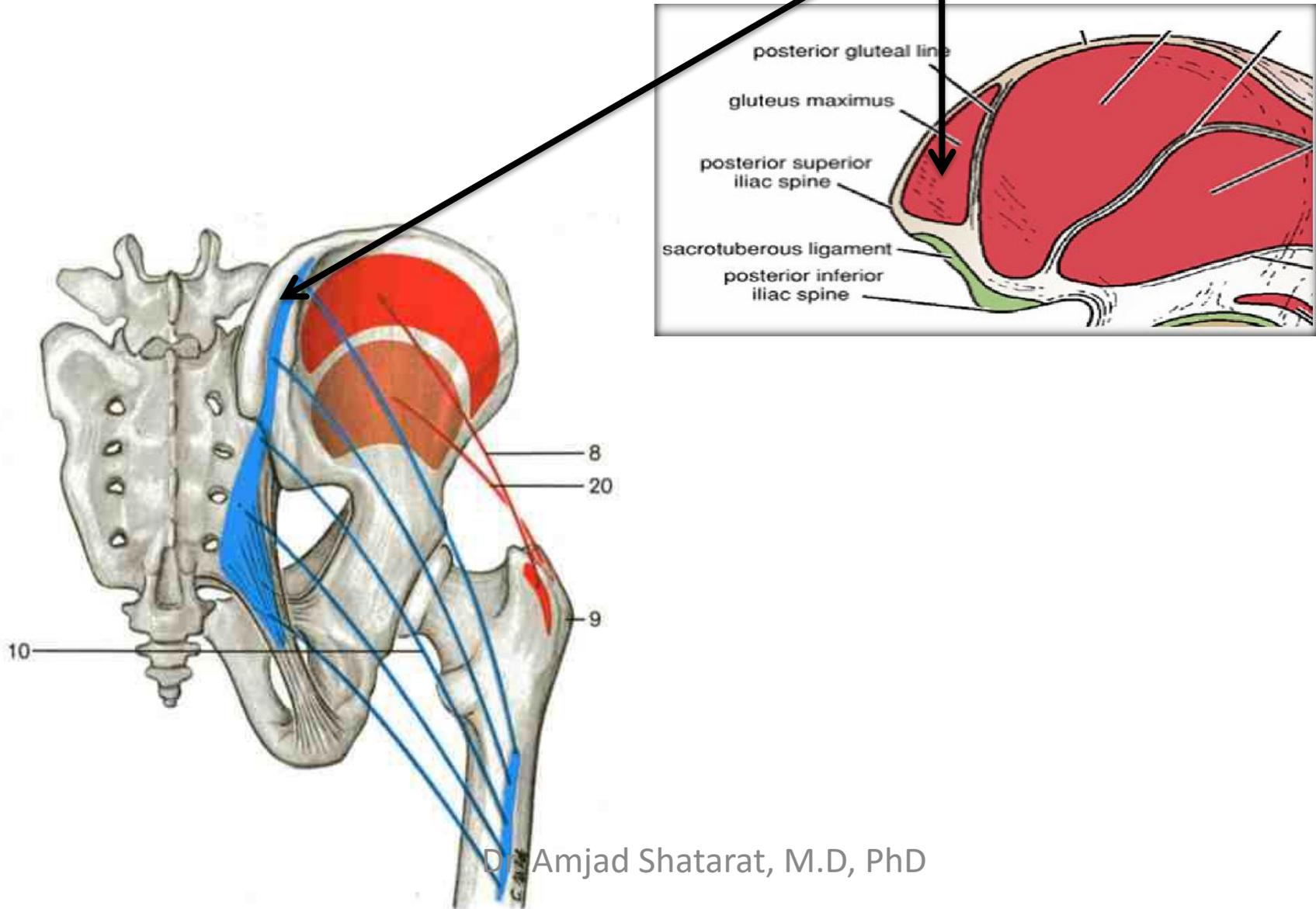
2 -Back of *sacrum* and *coccyx*

sacrum

3- Back of *sacrospinous* ligament



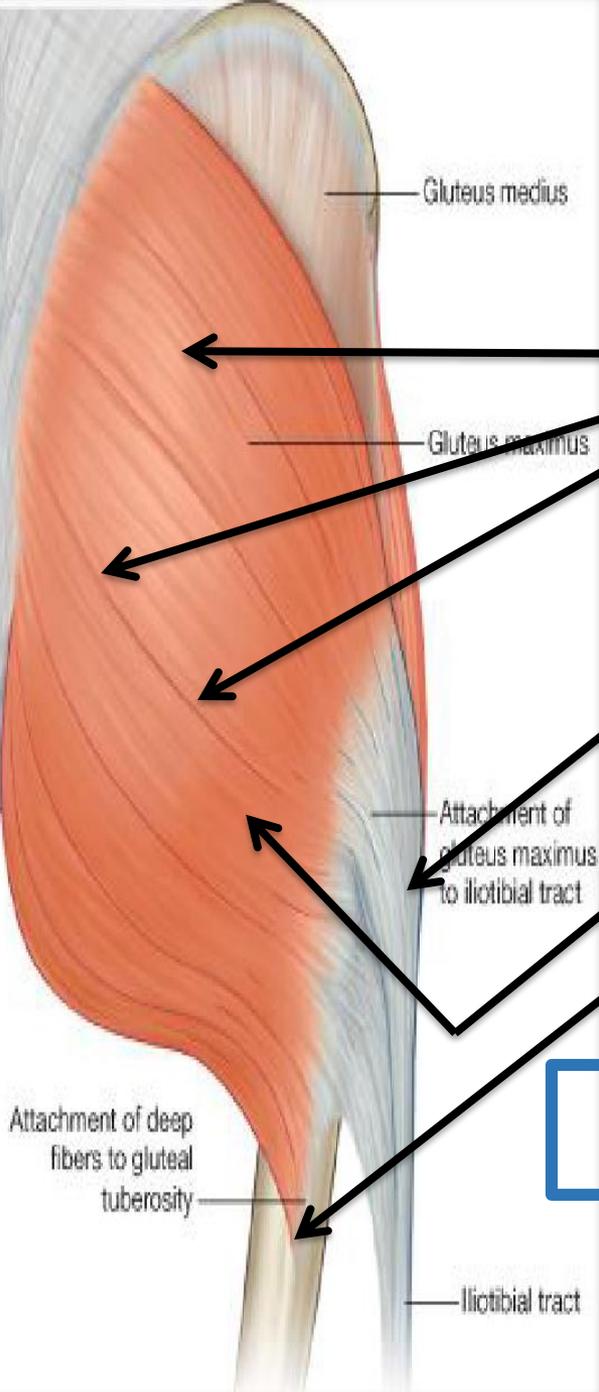
1-Ilium (area behind the *posterior gluteal line*)



insertion

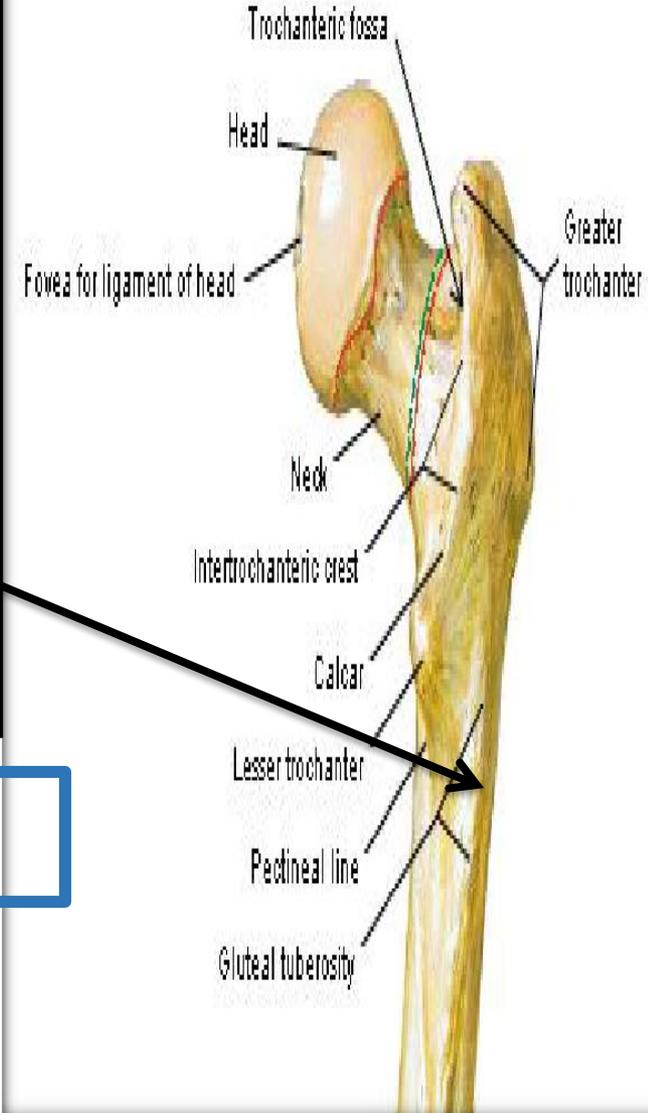
- 1 The *superficial three-fourths* are inserted into the *iliotibial tract*
- 2 The *lower deep part* is inserted into the *gluteal tuberosity* of femur

➤ **Innervation - Inferior gluteal nerve, L5;S1,2**



Femur

Posterior View



➤ **Actions**

Extends thigh, some lateral rotation
(**main extensor of the hip joint**)

Supports the Extended knee joint through **Iliotibial tract**

Plays an important role in climbing
cycling and upstairs



acting more often to extend the trunk on the femur than to extend the limb on the trunk.

STRUCTURES UNDER THE COVER OF GLUTEUS MAXIMUS MUSCLE

A- Bony structures

- 1-Greater trochanter and bursa
- 2-Gluteal tuberosity
- 3-Ischial tuberosity and bursa

B- Ligaments

- 1- Sacrotuberous ligament
- 2- Sacrospinous ligament

C- Muscles

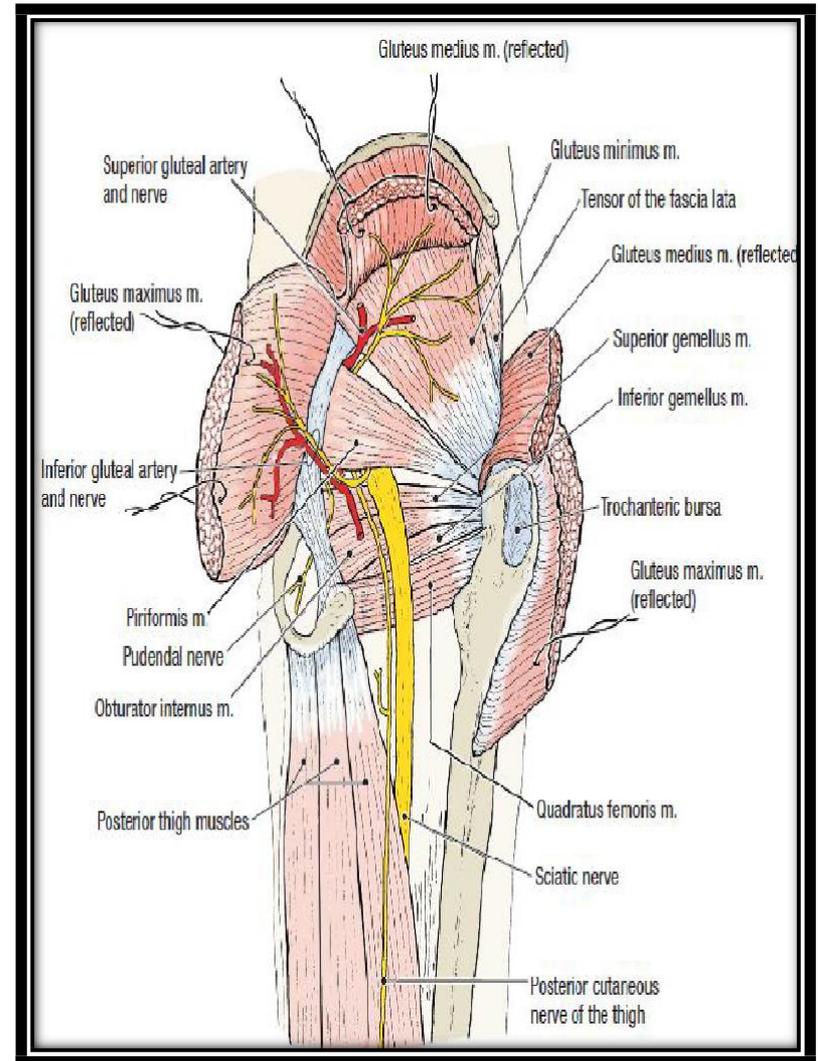
- 1- Gluteus medius and minimus
- 2- Short Lateral rotator muscles (6)
- 3- origin of the hamstring muscles

D- Vessels

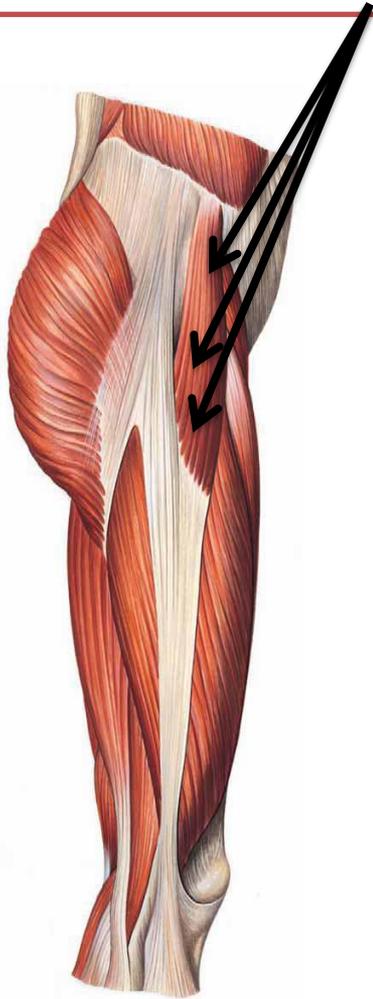
- 1- Superior gluteal vessels
- 2- inferior gluteal vessels
- 3- Internal pudendal vessels

E- Nerves

- 1- Superior and inferior gluteal nerve
- 2- Sciatic nerve
- 3- Pudendal nerve
- 4- Posterior cutaneous nerve of the thigh
- 5- Nerve to obturator internus
- 6- Nerve to quadratus femoris



Tensor fasciae latae



➤ **Origin**

Iliac crest

➤ **Insertion**

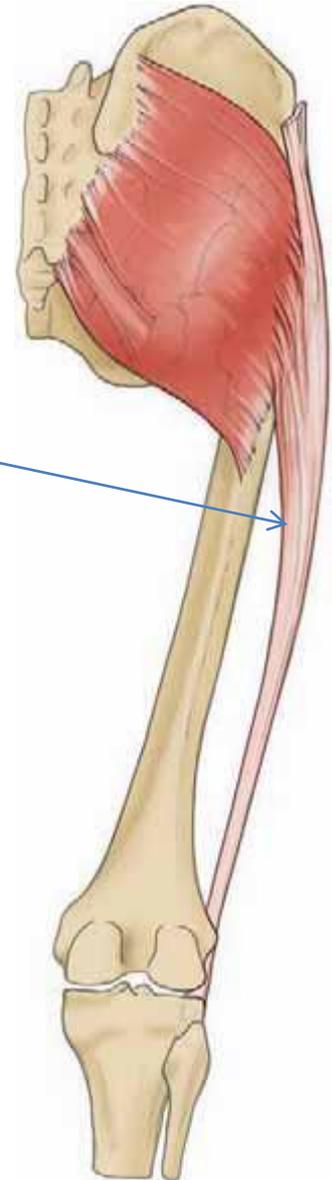
Iliotibial tract

➤ **Action**

Assist gluteus maximus in extending the knee joint

➤ **Nerve supply**

Superior gluteal nerve L4,5



- *Gluteus medius*

➤ **Origin**

Ilium ?

➤ **Insertion**

Greater trochanter of femur

➤ **Actions**

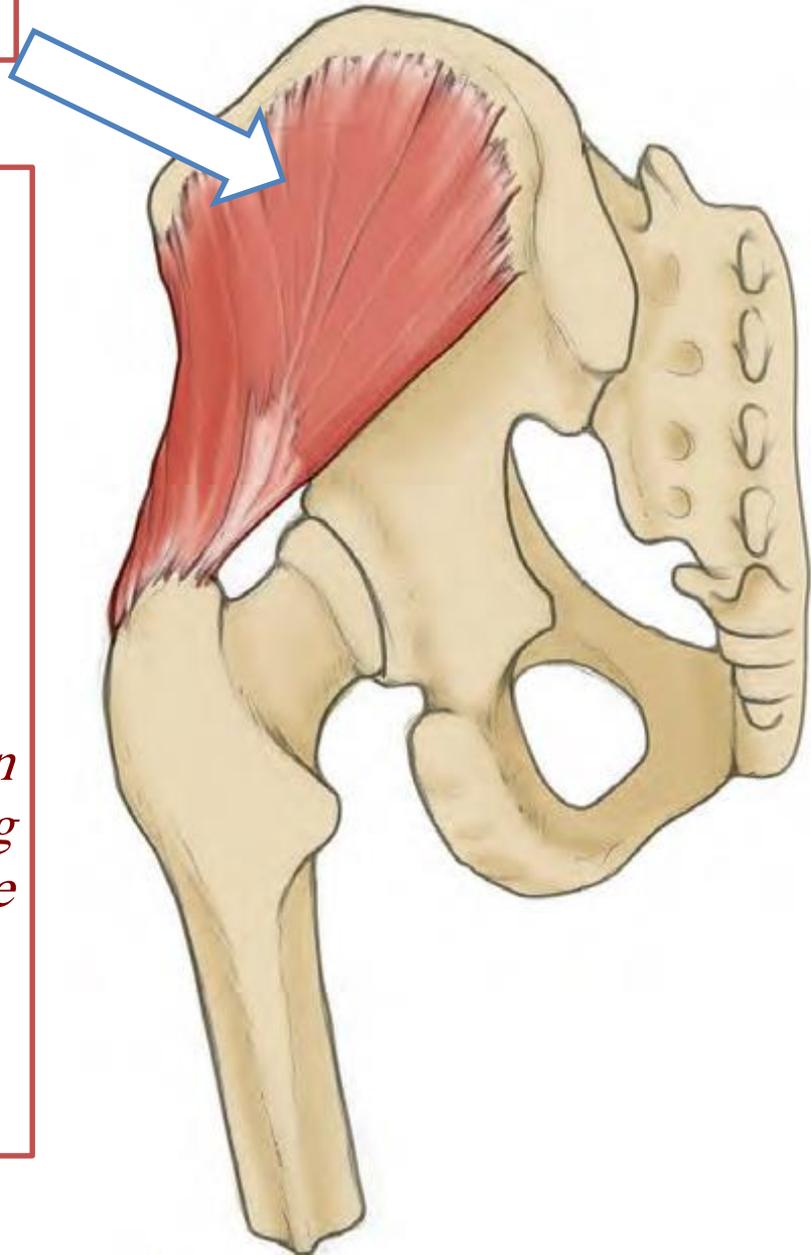
1 Abduction (*main abductor of the hip joint*)

2 Medial rotation (*anterior fibers*)

3 Both muscle contract reflex on each side alternatively during walking to prevent tilting of the pelvis to the unsupported side

➤ **Innervation**

Superior gluteal nerve



- *Gluteus minimus*

➤ **Origin**

Ilium ?

➤ **Insertion**

Greater trochanter of femur

➤ **Actions**

1 Abduction (*main abductor of the hip joint*)

2 Medial rotation (*anterior fibers*)

3 Both muscle contract reflexly on each side alternatively during walking to prevent *tilting* of the pelvis to the *unsupported* side

➤ **Innervation**

Superior gluteal nerve



Short Lateral rotator muscles

1-Piriformis

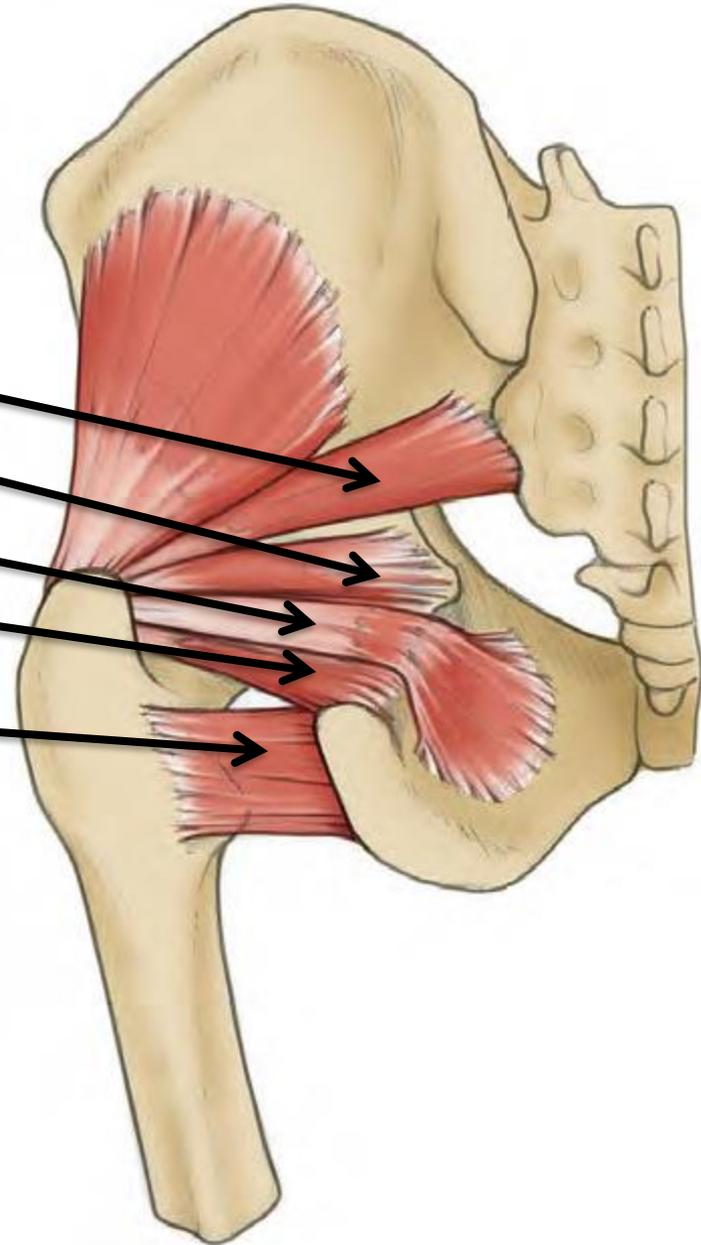
2-Superior gemellus

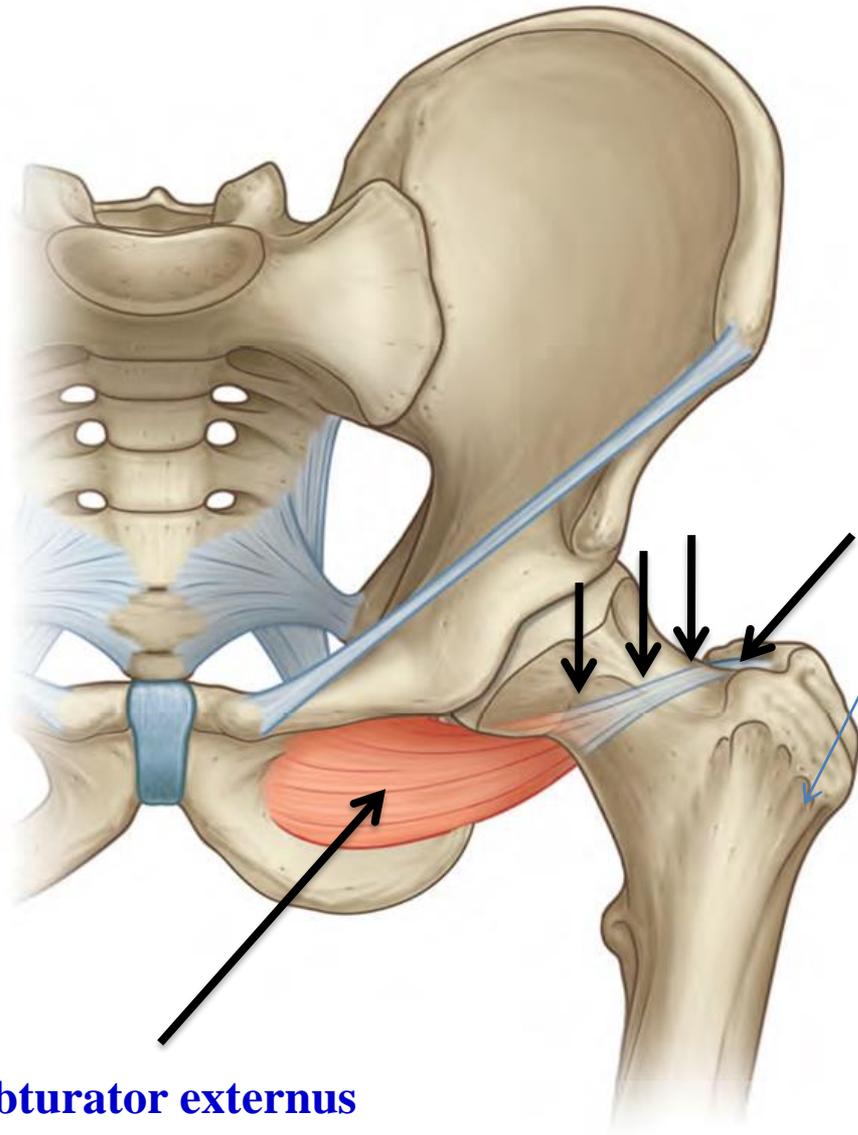
3-Obturator internus

4-Inferior gemellus

5-Quadratus femoris

6-Obturator externus





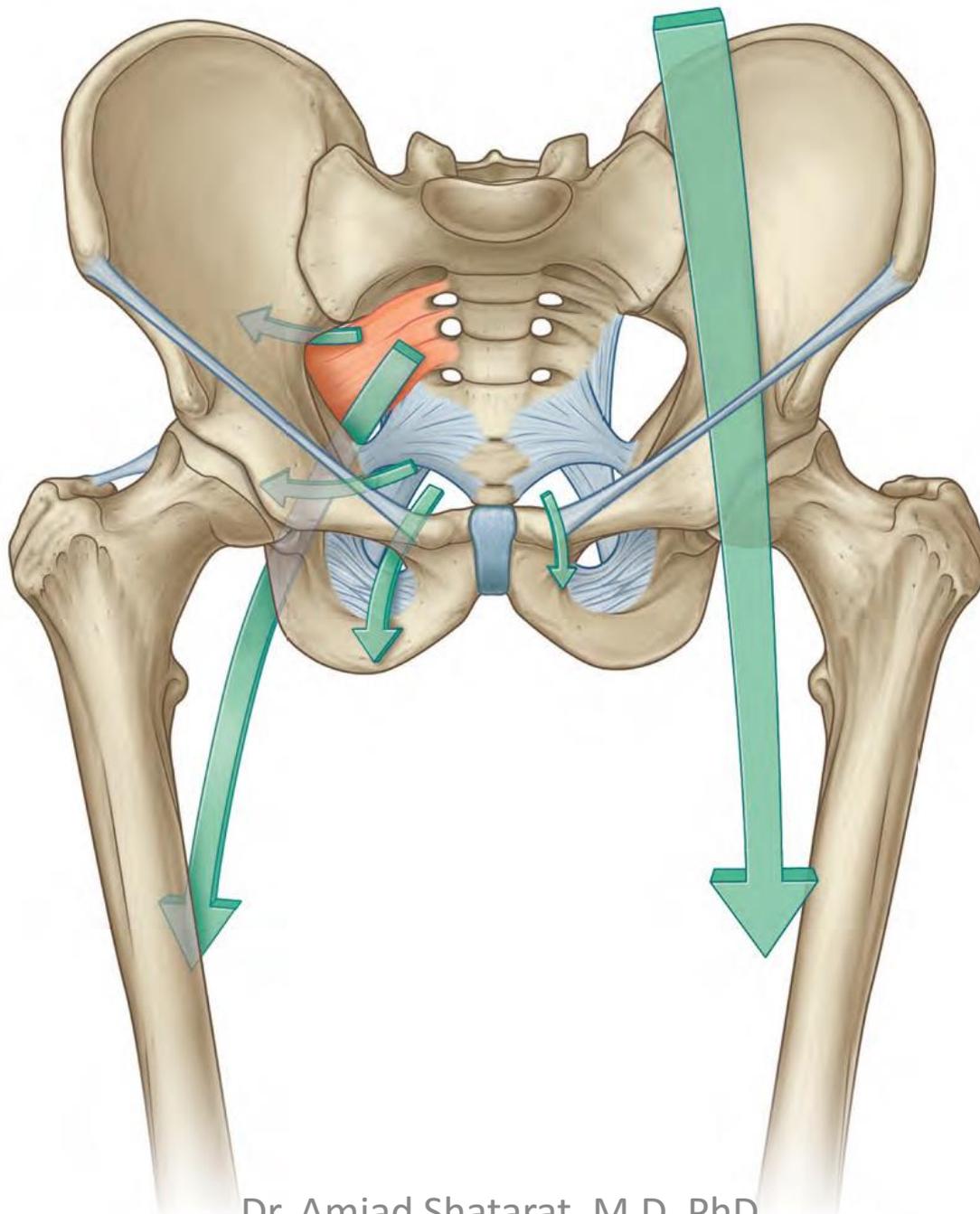
Obturator externus

Read these muscles from this slide which can be found on page (566) Snell 8th edition

Short lateral rotator muscles of the hip joint

They have common function; **lateral rotation of the thigh at hip joint.**

Muscle	Origin	Insertion	Nerve supply
Piriformis	Anterior surface of sacrum	Upper border of greater trochanter of femur	First and second sacral nerves
Obturator internus	Inner surface of obturator membrane	Upper border of greater trochanter of femur	Sacral plexus
Gemellus superior	Spine of ischium	Upper border of greater trochanter of femur	Sacral plexus
Gemellus inferior	Ischial tuberosity	Upper border of greater trochanter of femur	Sacral plexus
Quadratus femoris	Lateral border of ischial tuberosity	Quadratus tubercle of femur	Sacral plexus



4/30/2021

Dr. Amjad Shatarat, M.D, PhD

A) Structures passing through the greater sciatic foramen:

1- **Piriformis:** *fills the foramen almost completely leaving some structures to pass either **above** or **below** it.*

Structures passing above Piriformis muscle:

1- Superior gluteal nerve and vessels

Structures passing below Piriformis muscle:

1- *inferior gluteal nerve*

2- *inferior gluteal vessels*

3-Sciatic nerve

4- *posterior cutaneous nerve of the thigh*

5- *nerve to quadratus femoris*

6- *pudendal nerve*

7- *internal pudendal vessels*

9- *nerve to obturator internus*

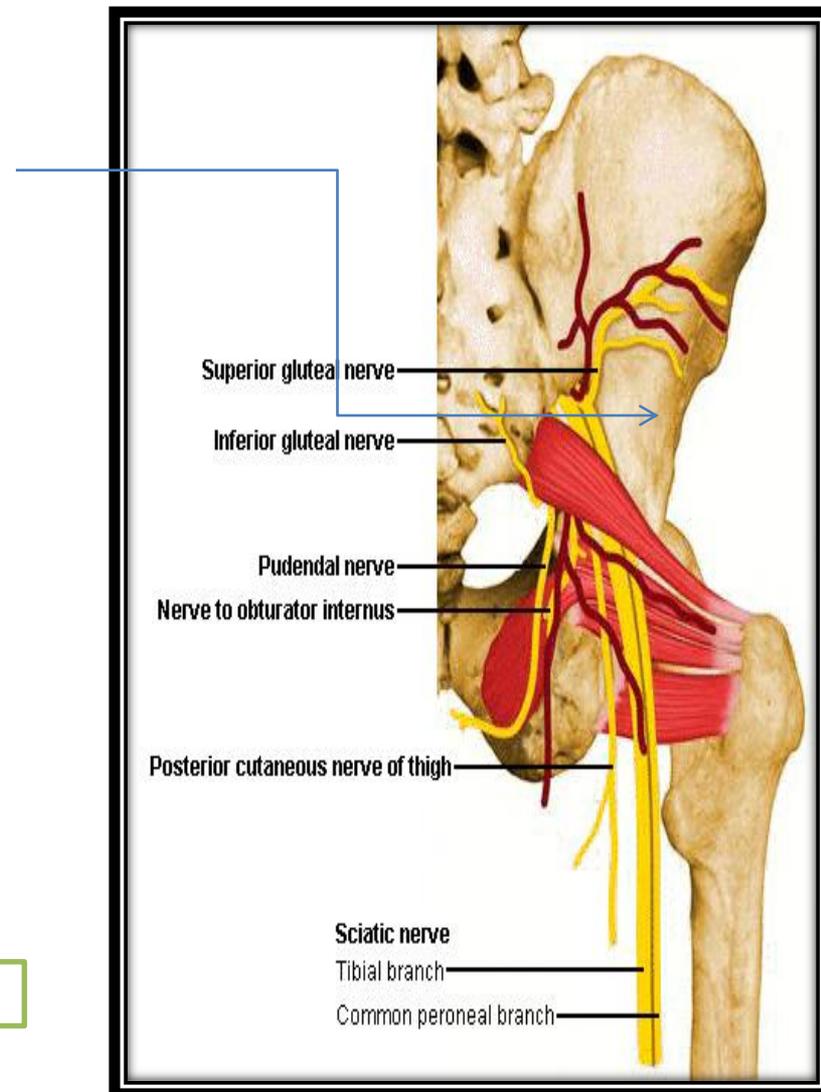
B) Structures passing through the lesser sciatic foramen:

1- *tendon of obturator internus*

2- *pudendal nerve*

3- *internal pudendal vessels*

4- *nerve to obturator internus*



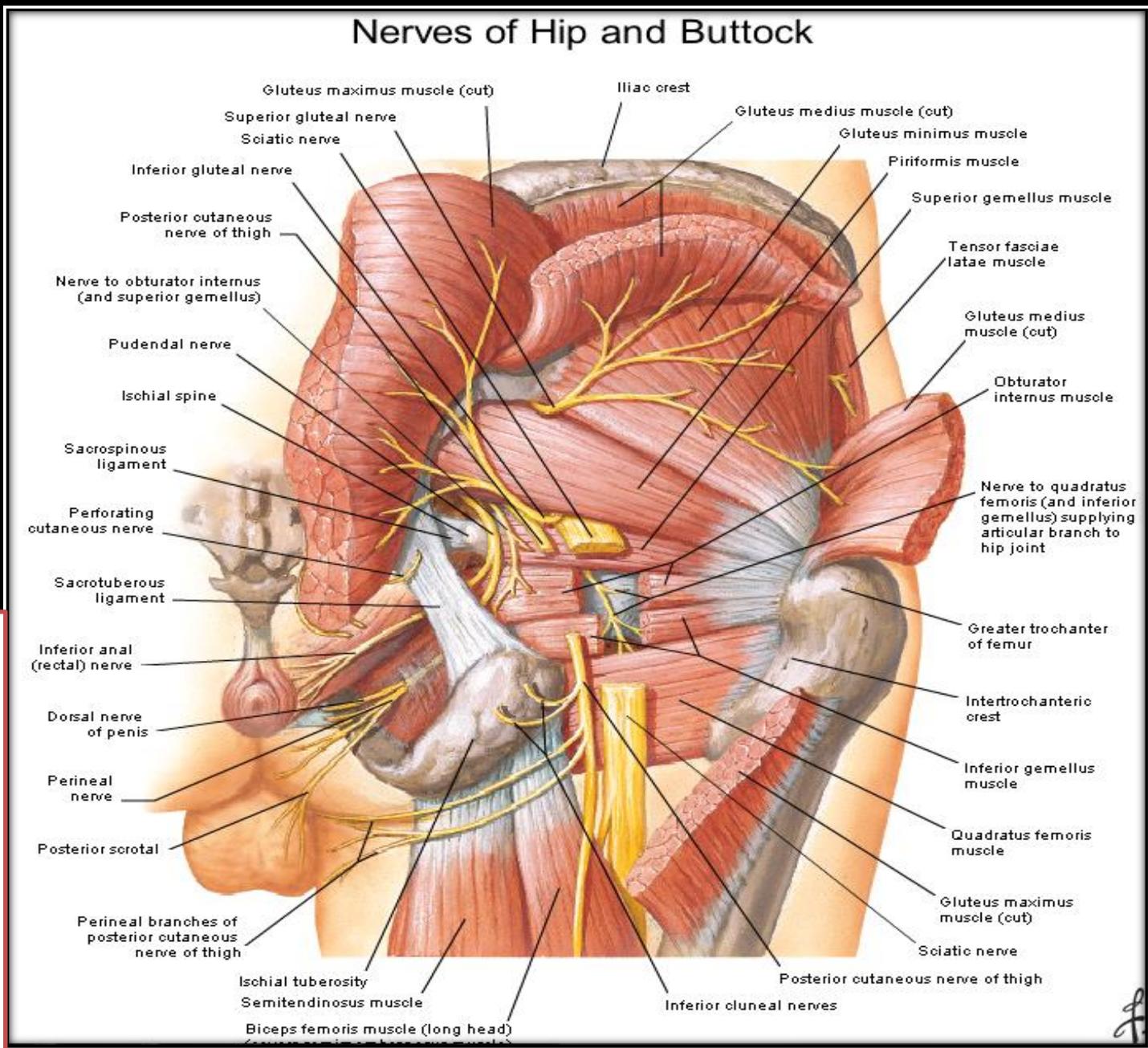
Superior Gluteal Nerve (L4, 5 and S1)

- a branch of the sacral plexus
- leaves the pelvis through the greater sciatic foramen **above the piriformis**

Inferior Gluteal Nerve (L5, S1, S2)

- a branch of the sacral plexus, leaves the pelvis through the greater sciatic foramen **below the piriformis**

➤ **It supplies the gluteus maximus muscle**



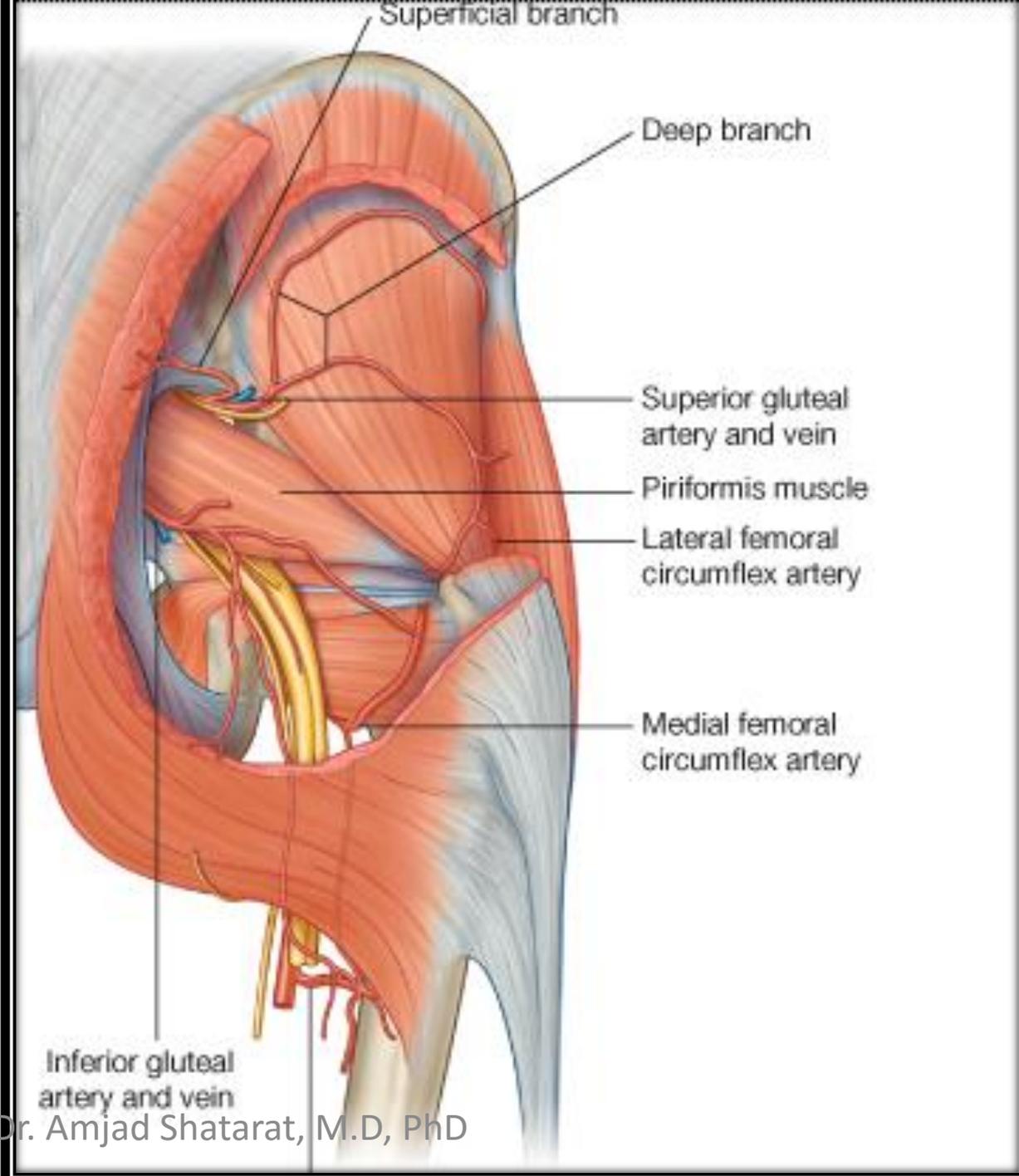
Arteries of the Gluteal Region

1-Superior Gluteal Artery

- is a branch from the internal iliac artery
- enters the gluteal region through the greater sciatic foramen **above the piriformis**

2-Inferior Gluteal Artery

- is a branch of the internal iliac artery
- enters the gluteal region through the greater sciatic foramen, **below the piriformis**



**The muscles of the gluteal region are acting on the hip joint
as different functional groups**

Gluteus maximus

Acts as the main extensor of the hip joint

Gluteus medius and minimus

**They act as the main abductors of the hip joint while
their anterior fibers act as medial rotators on the hip joint**

Short Lateral rotator muscles

They act as lateral rotators on the hip joint

**The muscles of the gluteal region, therefore, extend, abduct and
rotate the hip joint
medially and laterally**

Leaving adduction and flexion to other groups of muscles, which ?

Why?

Injury to the superior gluteal nerve

➤ On one side causes *Lurching gait*

➤ Both sides *Waddling gait*

The test indicates
'a defect in
the osseo-muscular
stability
of the hip joint'

Positive Trendelenburg's test

Note

Other conditions also may cause lurching and waddling gates such as:

Clinical Notes

Gluteus Medius and Minimus and Poliomyelitis

The gluteus medius and minimus muscles may be *paralyzed* when poliomyelitis involves the lower lumbar and sacral segments of the spinal cord.

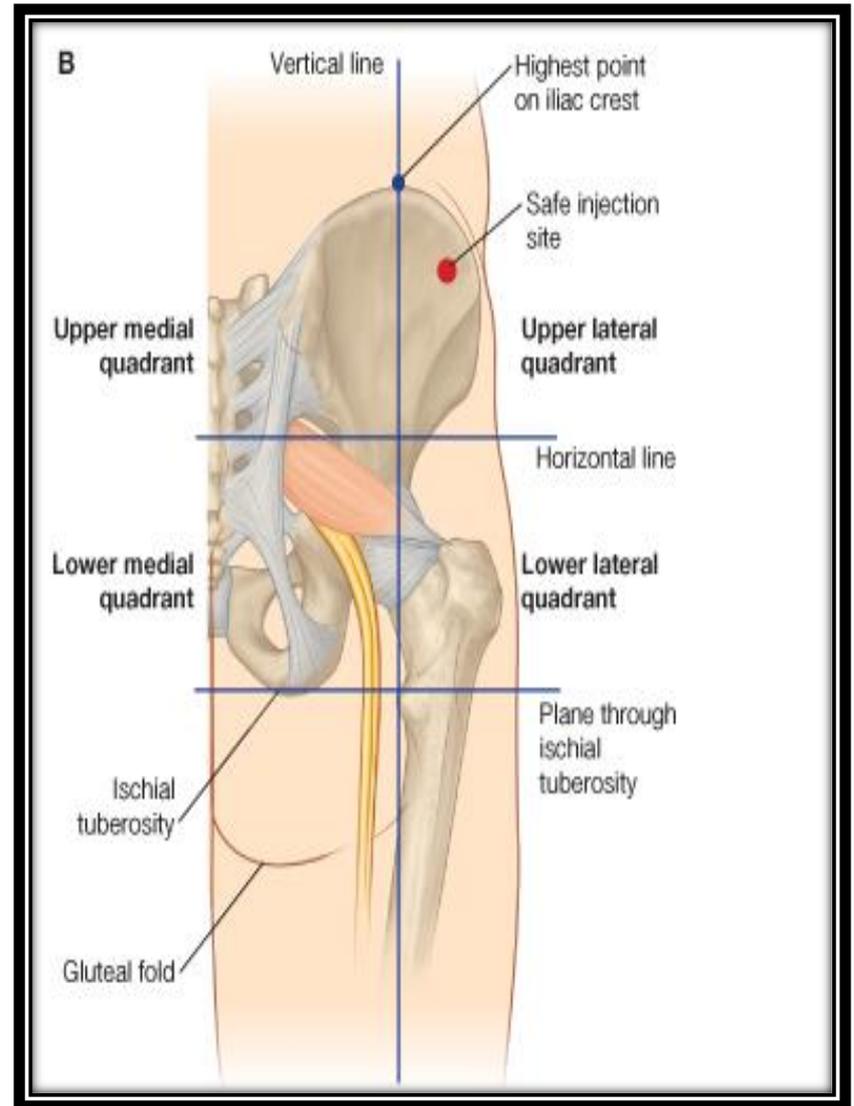
They are supplied by **the superior gluteal nerve (L4 and 5 and S1)**

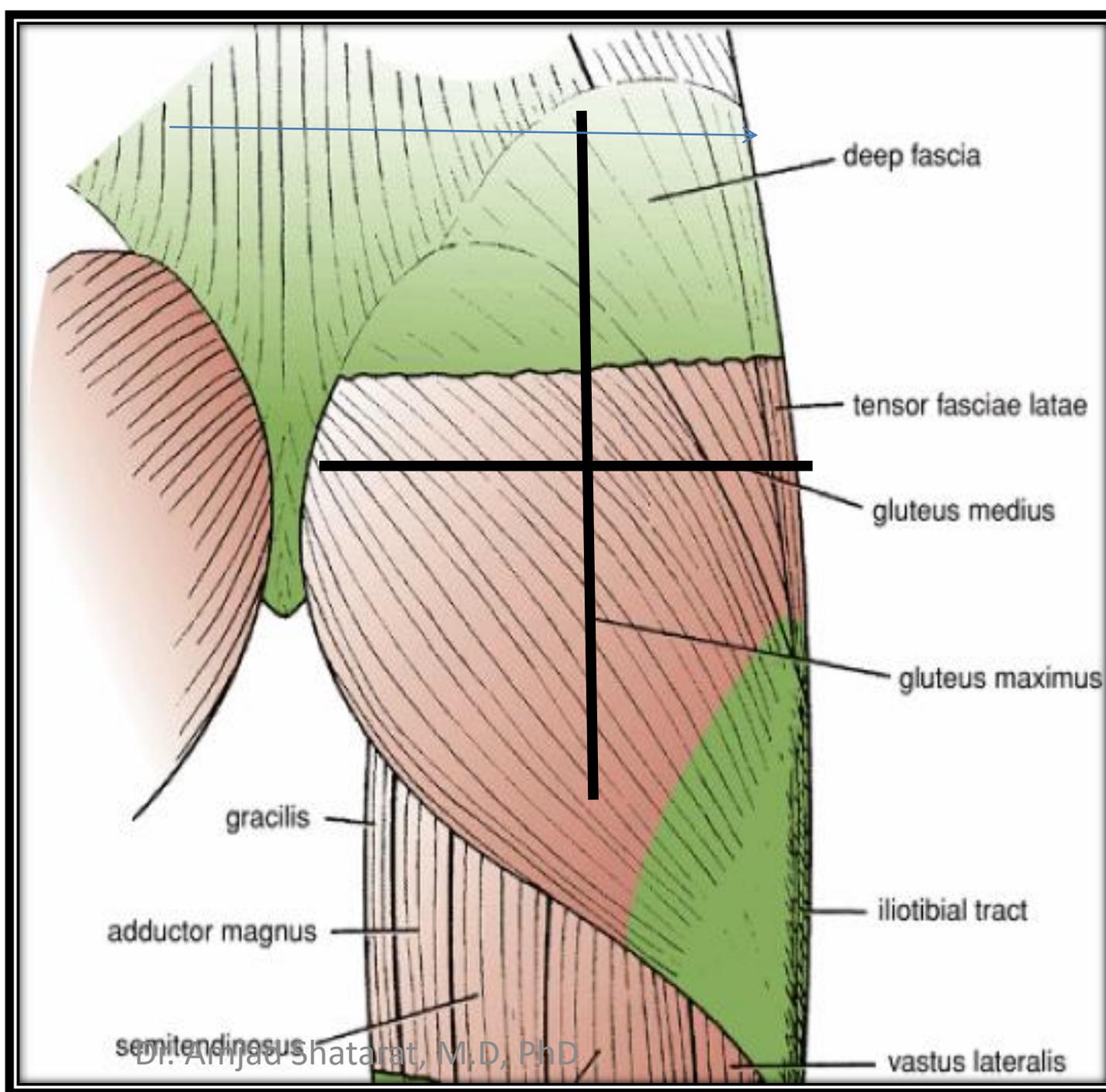
Paralysis of these muscles seriously interferes with the ability of the *patient to tilt the pelvis when walking.*

Clinical Notes

The great thickness of gluteus maximus muscle makes it ideal for intramuscular injections.

To avoid injury to the underlying sciatic nerve, the injection should be given well forward on the upper outer quadrant of the buttock.





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