

ANATOMY OF THE LOWER LIMBS

Faculty of medicine
Department of Anatomy and histology
The University of Jordan

a.shatarat@ju.edu.jo

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OBJECTIVES

1-TO STUDY THE BONES OF THE LOWER LIMBS

2- TO CHARACTERIZE DIFFERENT PARTS OF EACH BONE

3- TO DISCUSS THE NERVE SUPPLY OF LOWER LIMBS

4- TO DISCUSS GENERAL FEATURES OF THE BLOOD SUPPLY OF
THE LOWER LIMBS

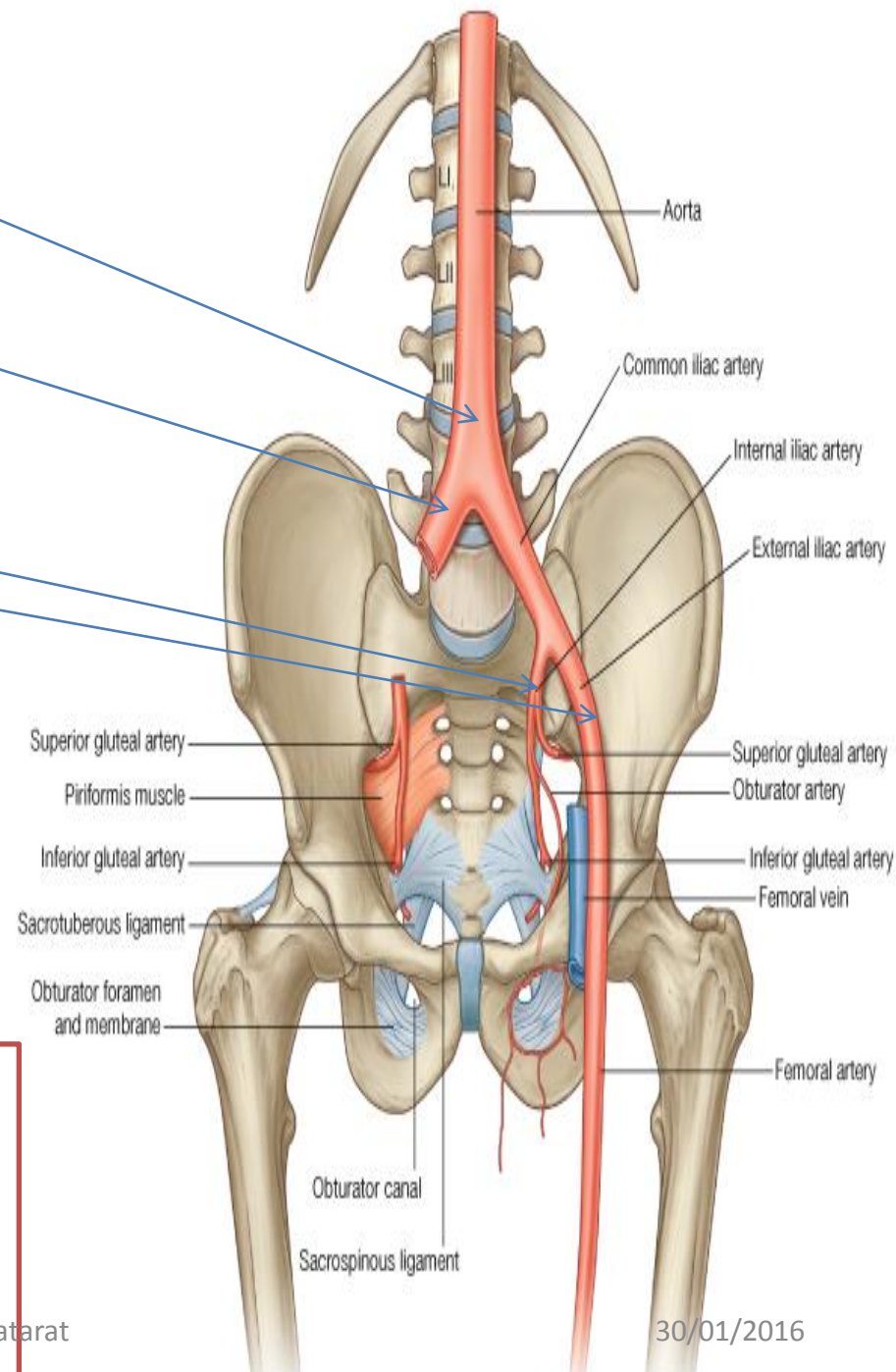
Blood supply of the lower limbs

1- The abdominal aorta divides at the level of **L4** into Right and left **common iliac arteries**

2- Each common iliac artery divides into **external and internal iliac arteries**

3- The external iliac artery becomes **the femoral artery** (**as it passes behind the inguinal ligament**) which will be the **main** blood supply to the whole lower limb

4- **The internal iliac artery** shares in the blood supply of the lower limb through its branches, for example, **the superior and inferior gluteal arteries and obturator artery** (to be discussed later)



5- THE FEMORAL ARTERY (to be discussed later)

begins midinguinal point and ends
at the **opening in the adductor magnus** where it
becomes

THE POPLITEAL ARTERY

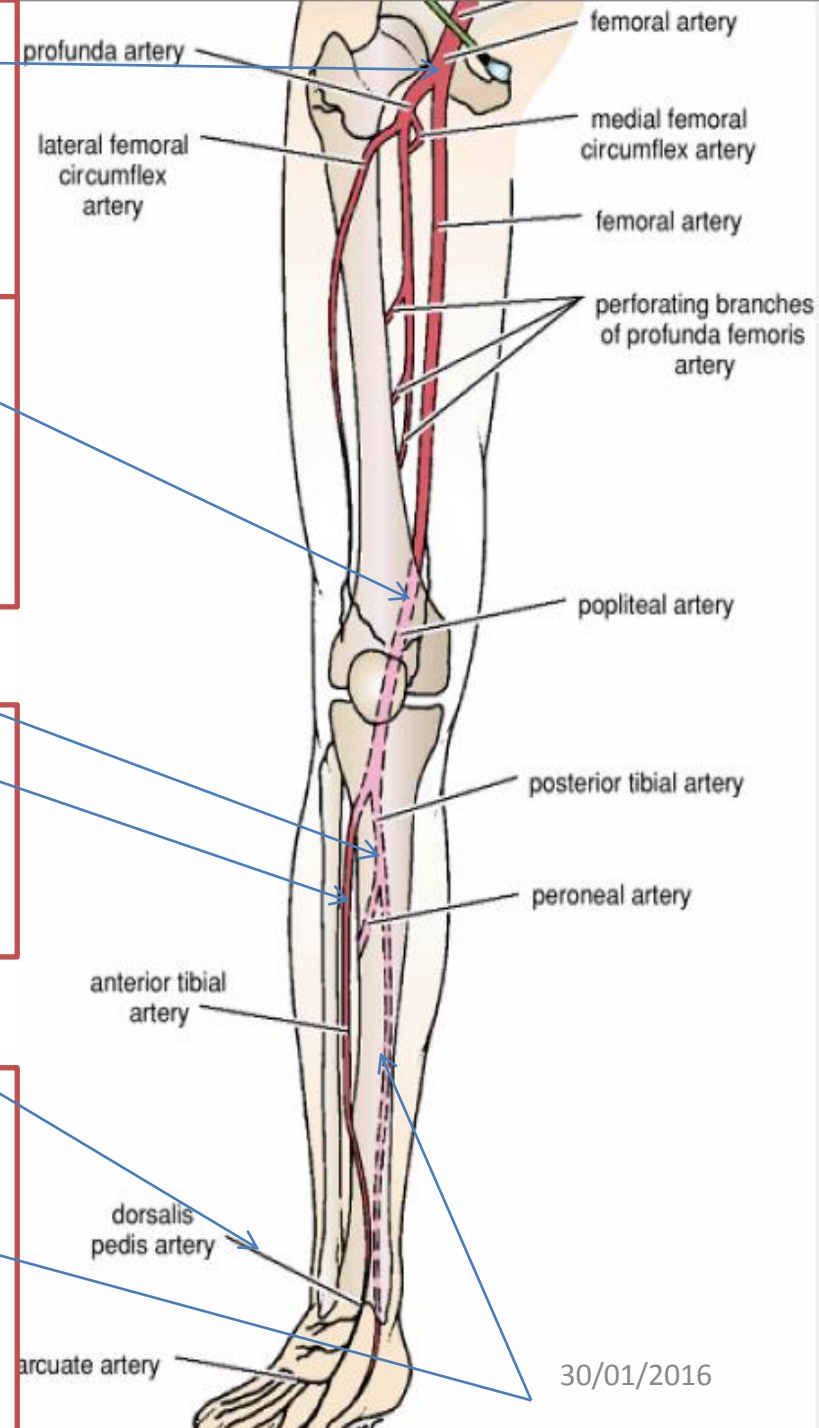
6- The popliteal artery

Ends at the lower border of the popliteus muscle
by dividing into

**ANTERIOR AND POSTERIOR TIBIAL
ARTERIES**

7- The anterior tibial artery supplies
the anterior compartment of the leg and terminates
in front of the ankle joint by becoming
THE DORSALIS PEDIS ARTERY

8- The posterior tibial artery supplies the posterior
and the lateral compartments of the leg
ends deep to the flexor retinaculum by dividing
Into
MEDIAL AND LATERAL PLANTER ARTERIES
which supply the sole



NERVES OF THE LOWER LIMB

LUMBER PLEXUS

The structure of the spinal nerves



The lumbar plexus

what about the posterior?

Is formed by

the anterior primary rami of *the upper four lumbar nerves* in the substance of psoas major muscle

It also receives a contribution from **T12** (subcostal) nerve

4 small nerves ? + 2 main nerves ?

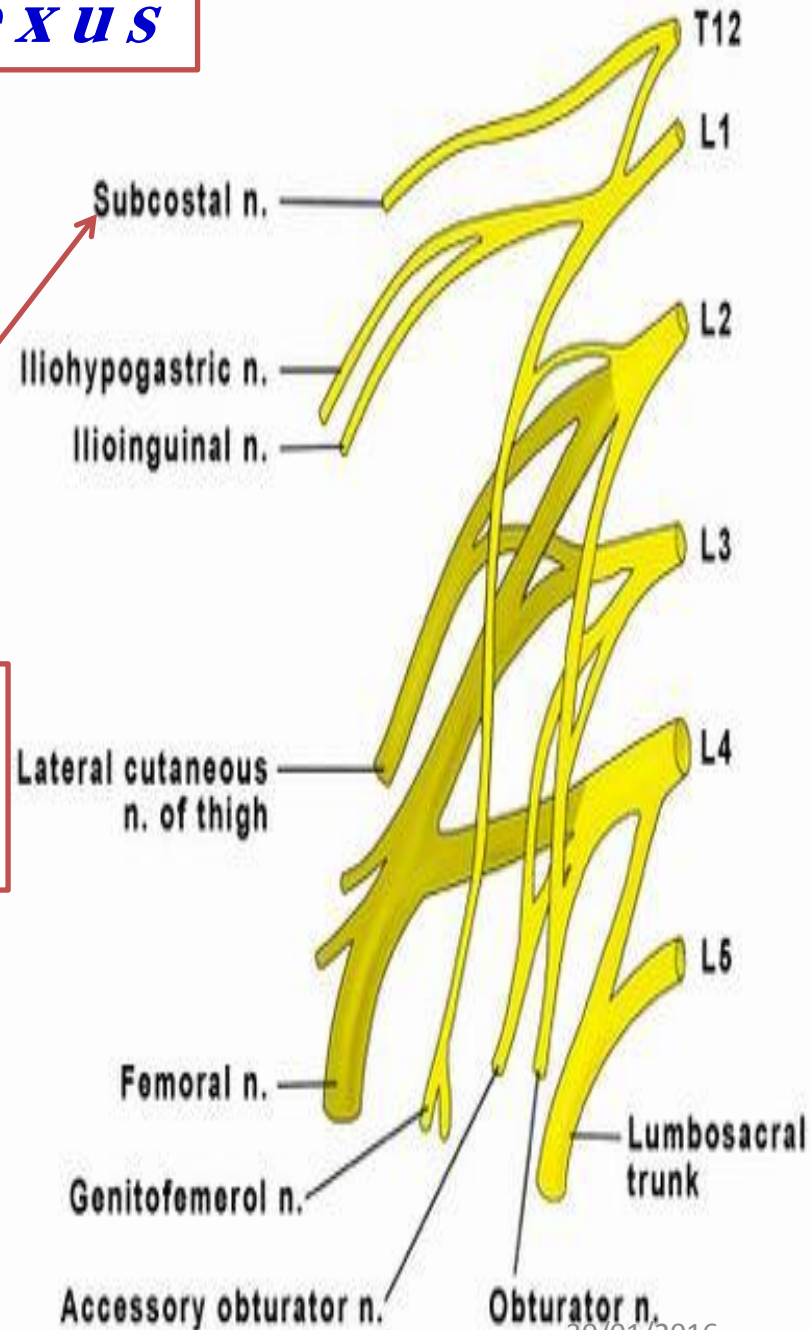
Ilio-hypogastric

Ilio-inguinal

Genitofemoral

Lateral cutaneous nerve of the thigh

**Femoral
Obturator**



L1 gives

- 1- Ilio-hypogastric nerve*
- 2- Ilio-inguinal*
- 3- The first root of the genito-femoral*

What is the key to memorize the lumbar plexus?

L2 gives (four branches)

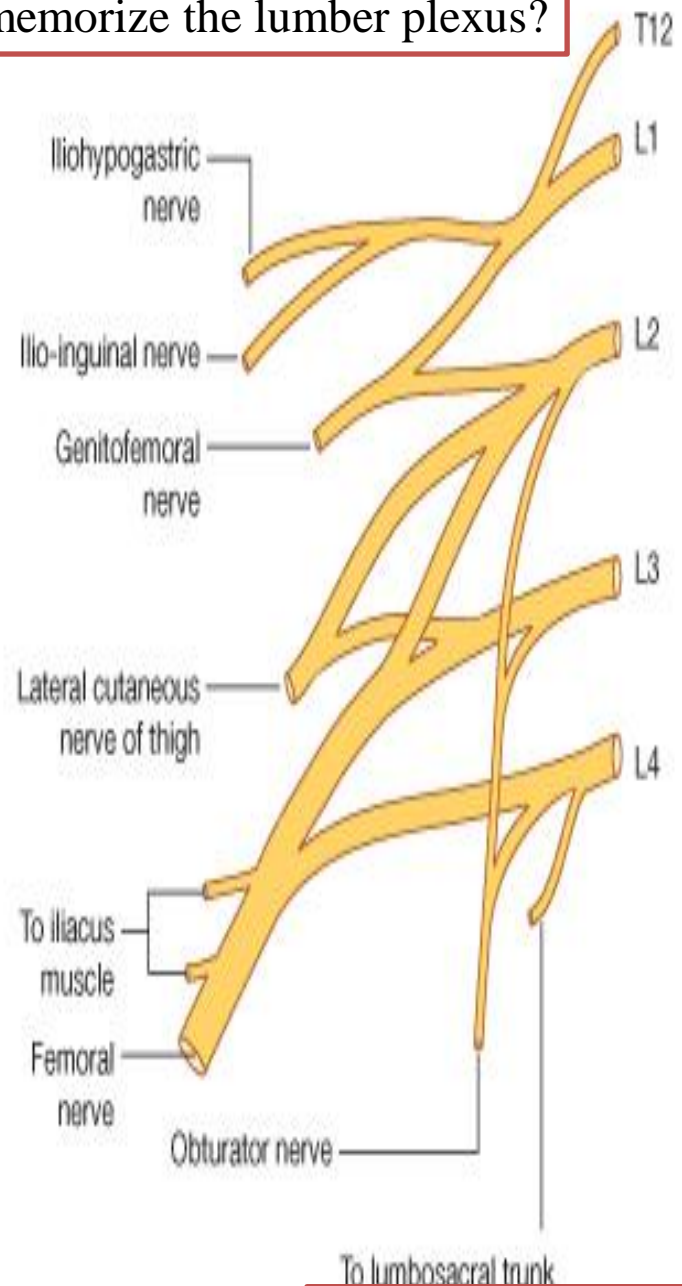
- 1- The second root of the genito-femoral*
- 2- The first root of the lateral cutaneous nerve of the thigh*
- 3- The first root of the femoral nerve*
- 4- The first root of the obturator nerve*

L3 gives

- 1- The second root of the lateral cutaneous nerve of the thigh*
- 1- The second root of the femoral nerve*
- 2- The second root of the obturator nerve*

L4 gives

- 1- The third root of the femoral nerve*
- 2- The third root of the obturator nerve*
- 3- The upper root of the lumbo-sacral trunk*



Each nerve of the lumbar **plexus** **emerges** (**exits**) from the substance of the **psoas major muscle** as flows:

➤ **Genitofemoral nerve** from the **anterior surface**.

➤ **Obturator nerve and lumbosacral trunk** from **the medial side**.

➤ **The Iliohypogastric**

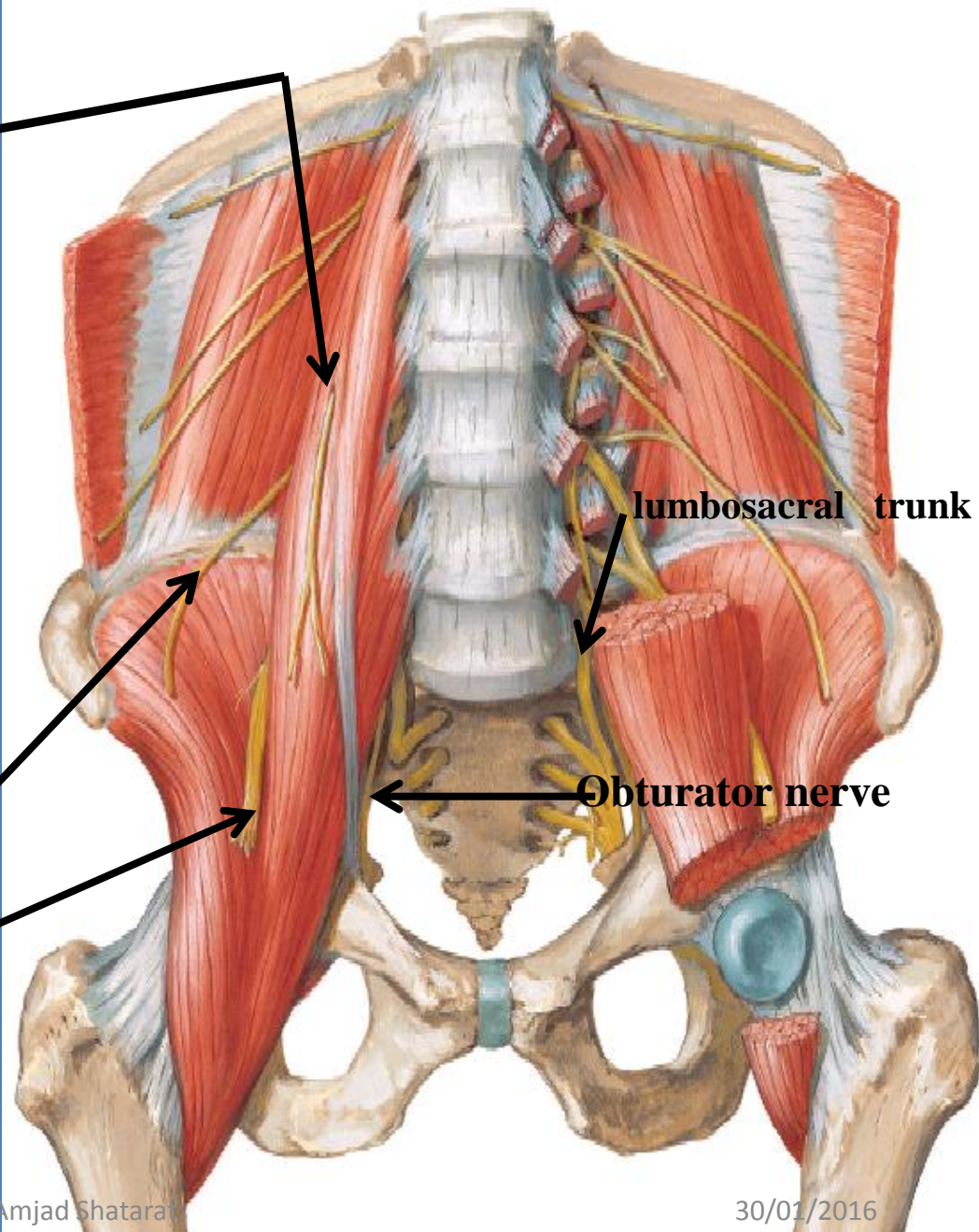
➤ **The Ilioinguinal**

➤ **The Lateral cutaneous nerve of the thigh**

➤ **Femoral nerve**

exit from the **lateral side of the psoas major muscle**

Psoas and Iliacus Muscles



Pay attention to this during practicals

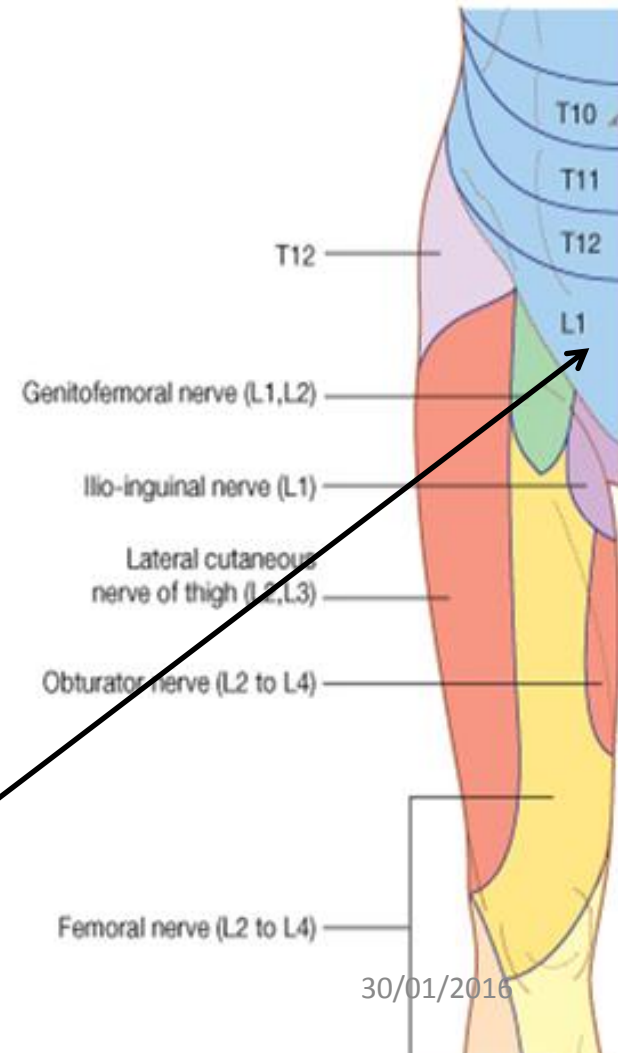
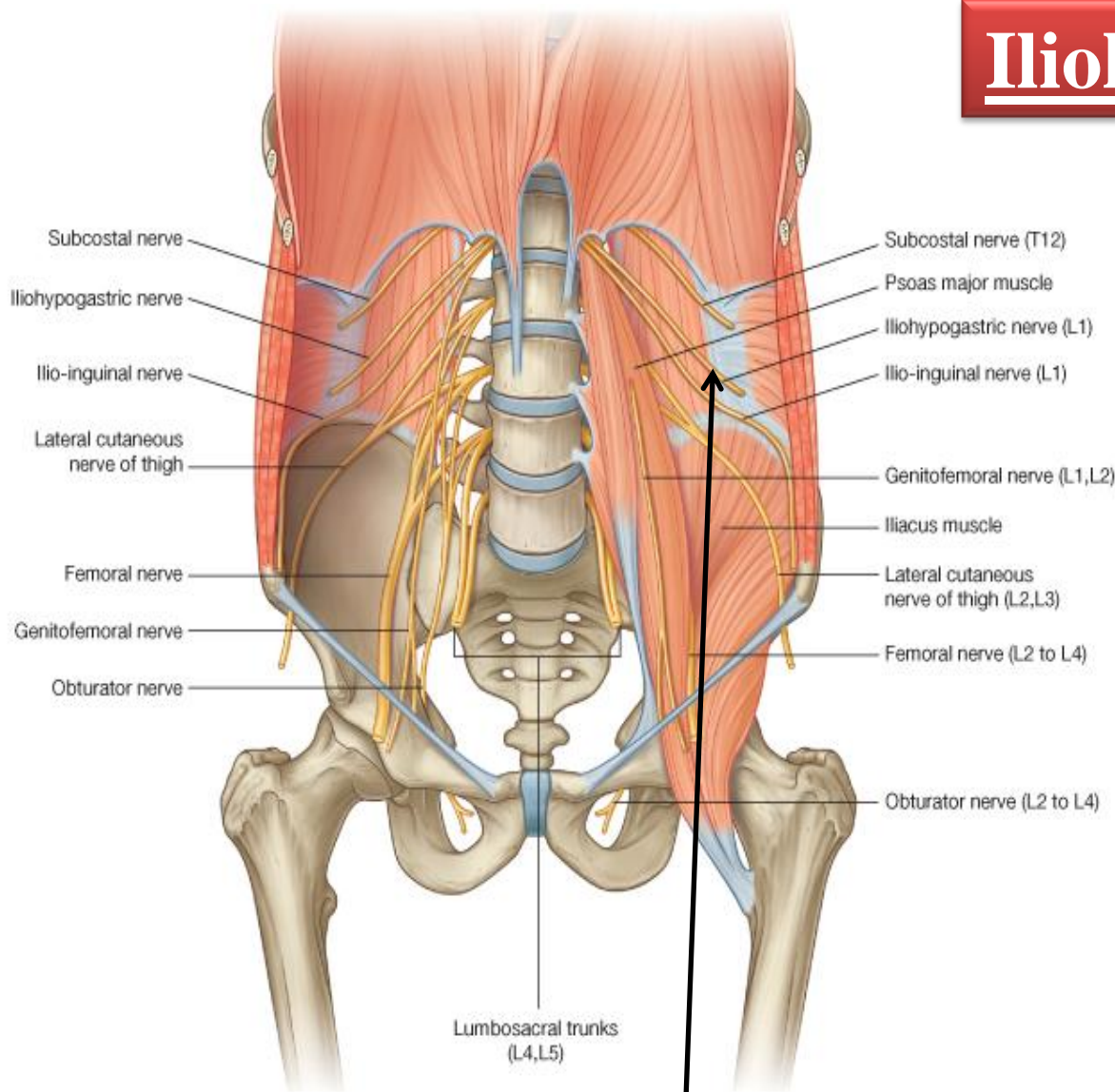
The ilio-hypogastric and ilio-inguinal nerves arise as a **single trunk** from the anterior ramus of L1

Either before or soon after emerging from the lateral border of the psoas major muscle, this single trunk divides into:
the ilio-hypogastric and the ilio-inguinal nerves

Note:

- 1- The iliohypogastric nerve is larger than the ilio-inguinal nerve
- 2- The iliohypogastric nerve runs superior to the ilio-inguinal nerve

Iliohypogastric nerve

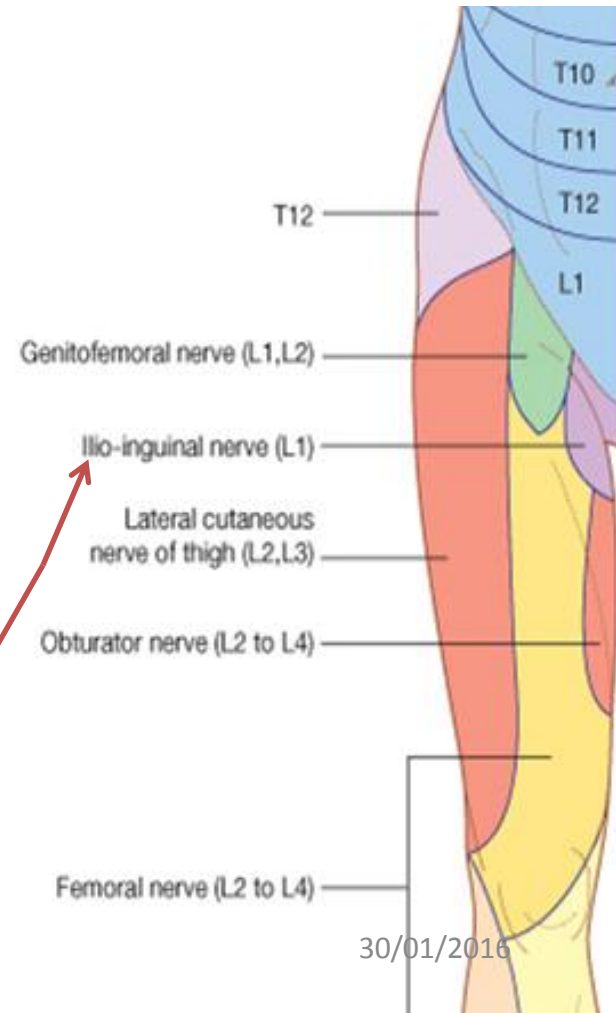
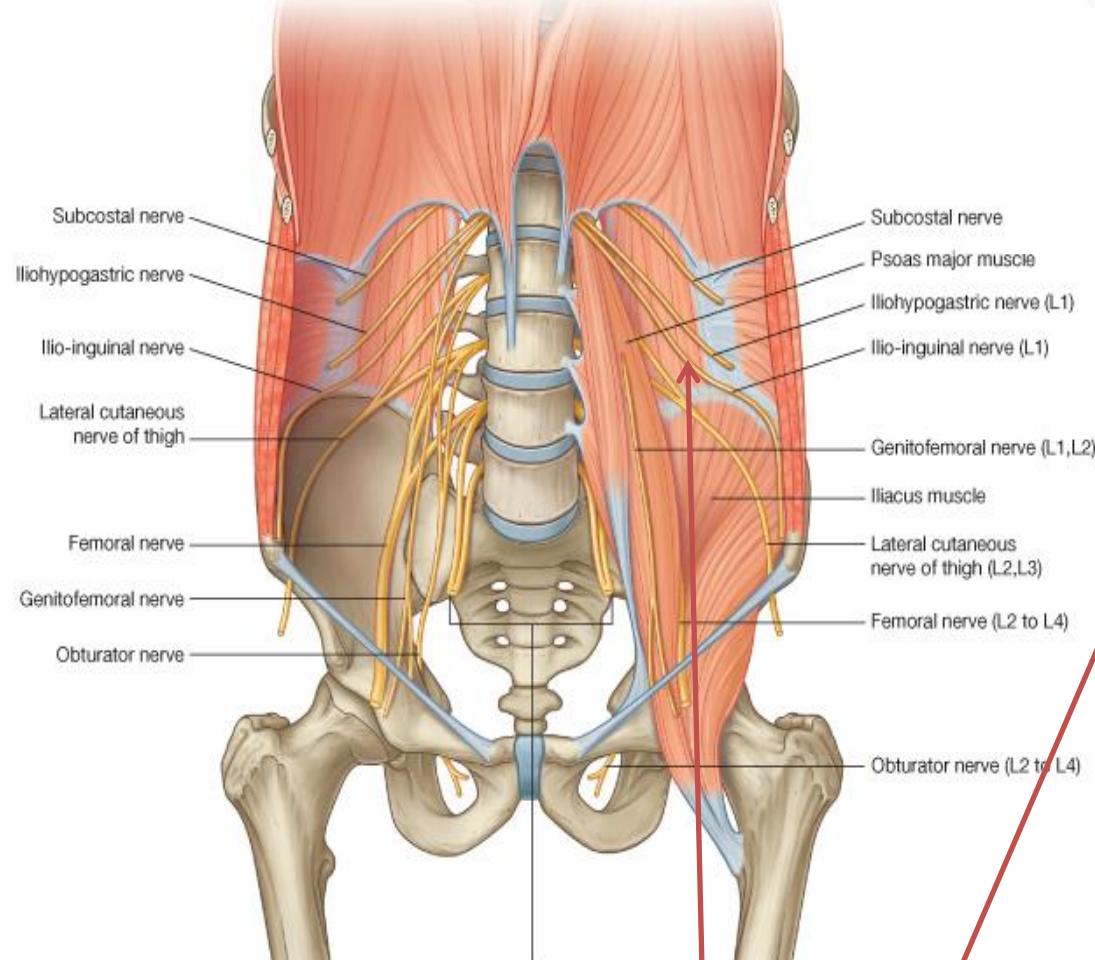
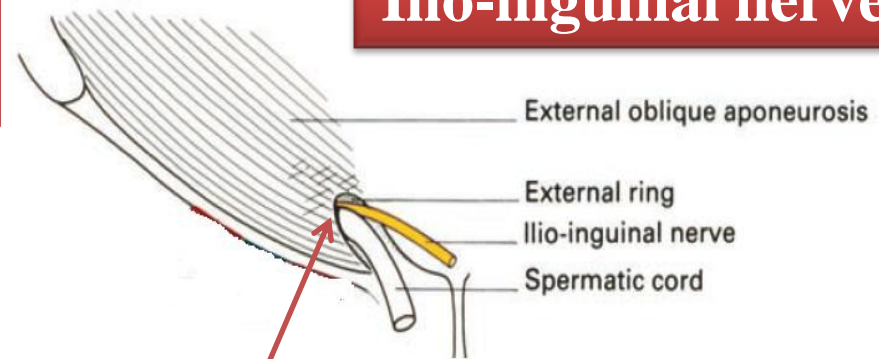


Iliohypogastric nerve

supplies the posterolateral gluteal skin and just above the superficial inguinal ring, after piercing the aponeurosis of the external oblique, it distributes to the skin in the pubic region

Ilio-inguinal nerve

The surgeon should be very careful to the Ilio-inguinal nerve while giving incision and hernia repair as it could be injured during these procedures



Ilio-inguinal nerve enters the inguinal canal

Then emerges through the superficial inguinal ring, along with the spermatic cord, and provides cutaneous innervation to the upper medial thigh, the root of the penis, and the anterior surface of the scrotum in men, or the mons pubis and labium majus in women

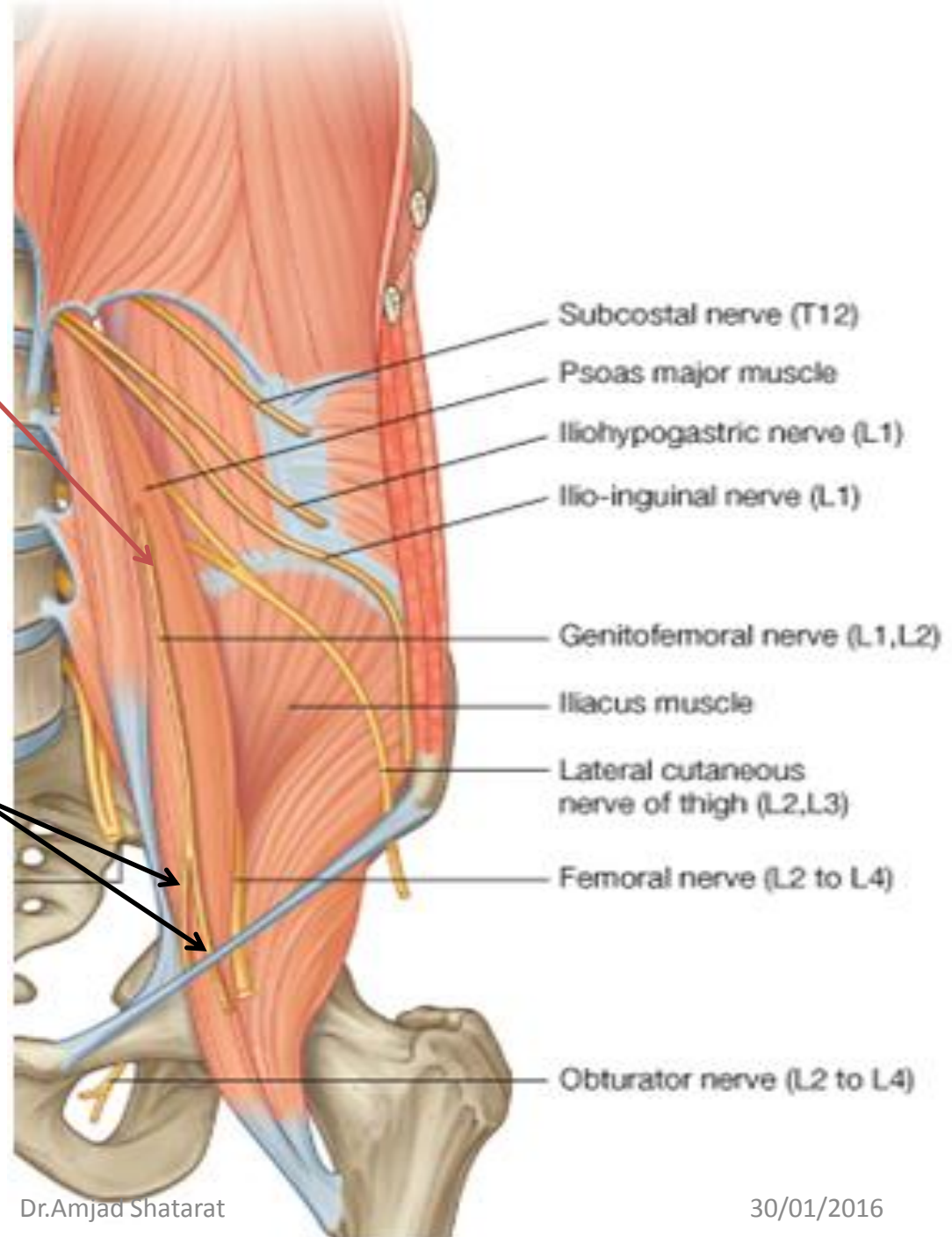
The distance between L1 spinal segment of the spinal cord and the pubic region that is supplied by its branches is too long.
How you explain this?

Genitofemoral nerve

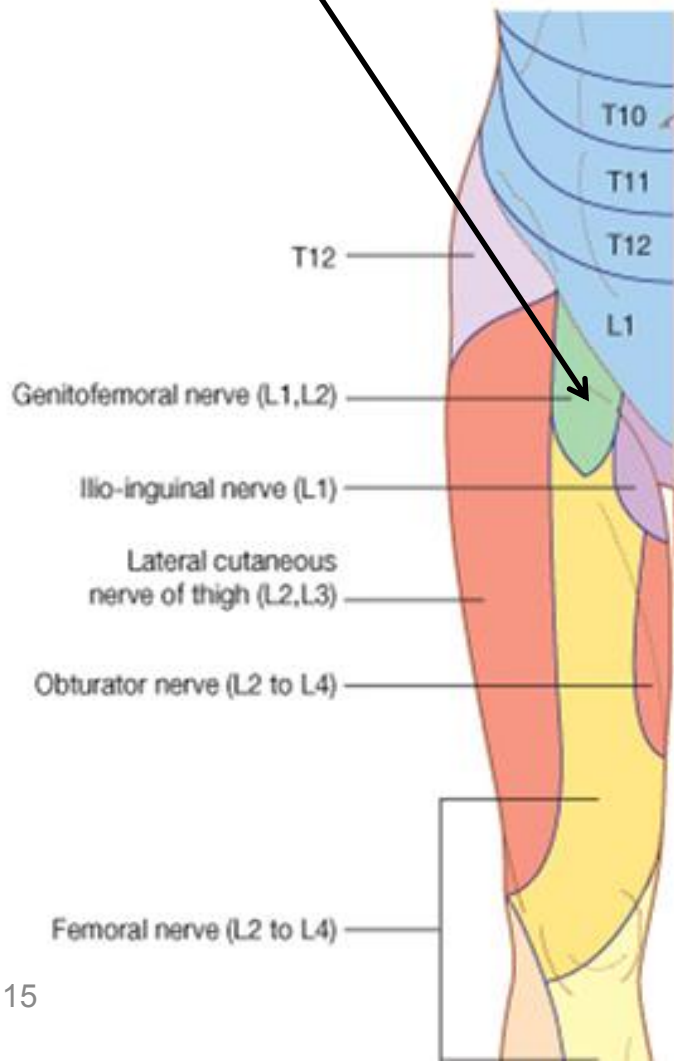
Genitofemoral nerve
(L1 and L2)

The genitofemoral nerve arises from the anterior rami of the nerves of L1 and L2 **emerges on the anterior surface of psoas major.**

It eventually divides into genital and femoral branches.



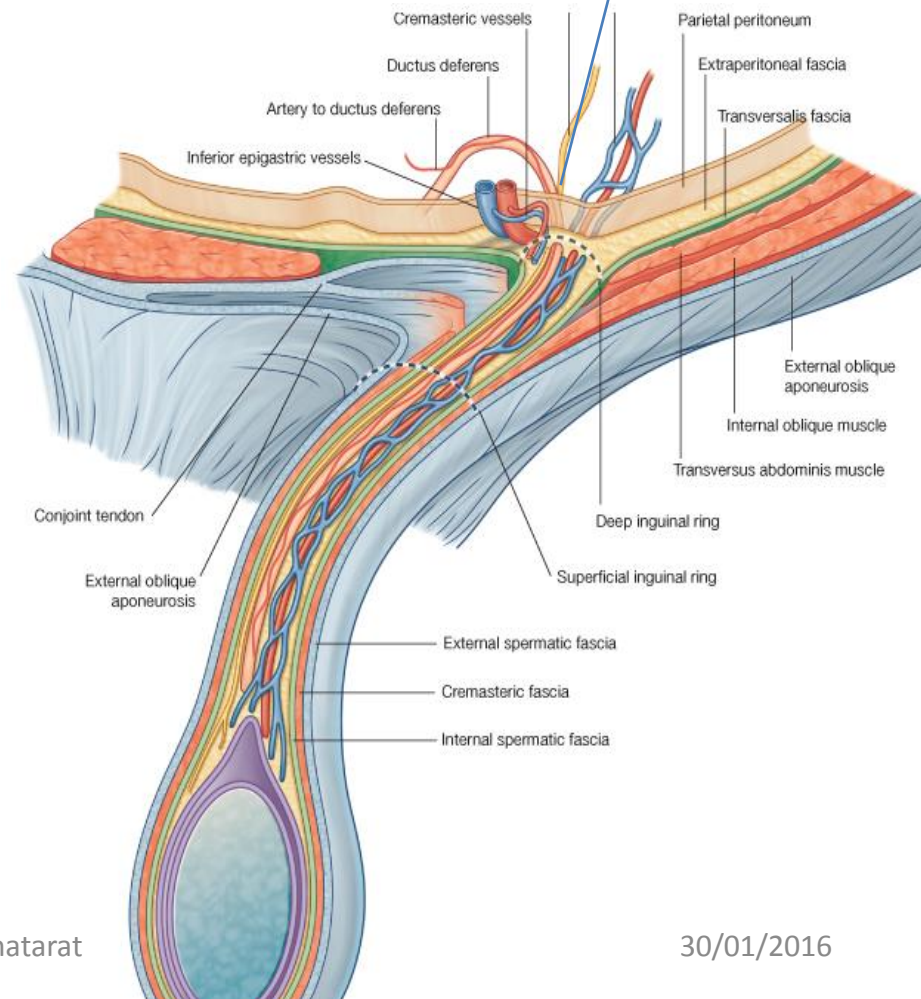
The **femoral branch** descends on the lateral side of the external iliac artery and passes posterior to the inguinal ligament, entering the femoral sheath lateral to the femoral artery. It pierces the anterior layer of the **femoral sheath** and the fascia lata to supply the skin of the upper anterior thigh



The **genital branch** continues downward and enters the inguinal canal through the deep inguinal ring.

It continues through the canal and:

- **in men**, innervates the **cremasteric** muscle and terminates on the skin in the upper anterior part of the scrotum;
- **in women**, accompanies the round ligament of the uterus and terminates on the skin of the mons pubis and labium majus.



Lateral cutaneous nerve of thigh (L2 and L3)

The lateral cutaneous nerve of thigh arises from the anterior rami of nerves L2 and L3

It emerges from the lateral border of the psoas major muscle

It passes posterior to the inguinal ligament and enters the thigh.

The lateral cutaneous nerve of thigh supplies the skin on the anterior and lateral thigh to the level of the knee

Intrapelvic: causes include pregnancy, abdominal tumors

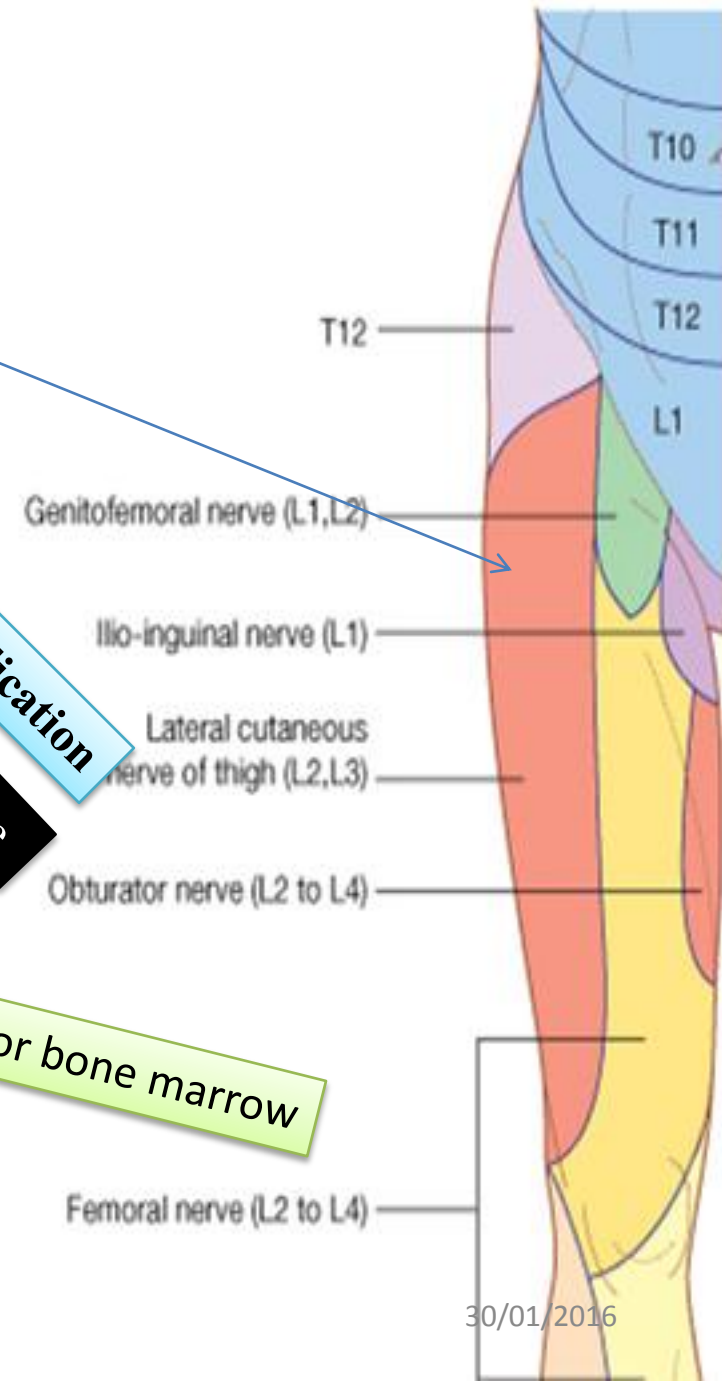
extrapelvic: causes include trauma to the region of the ASIS (eg, from a seatbelt in a motor vehicle accident), ***tight garments, belts, girdles***, or ***stretch from obesity***

Mechanical :factors include **prolonged sitting or standing.**

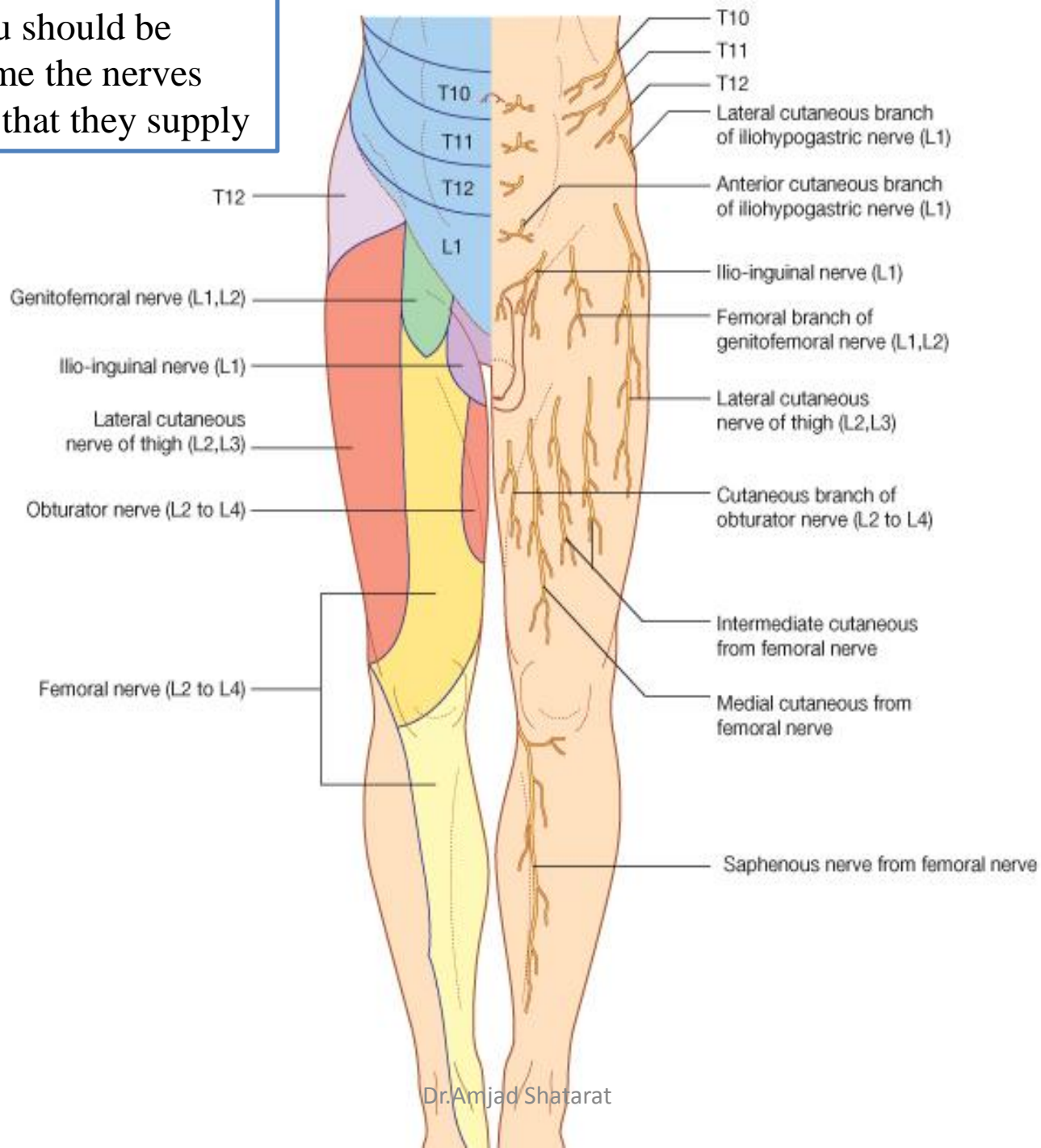
Diabetes can also cause this neuropathy in isolation or in the clinical setting of a polyneuropathy

Clinical application
Injury of this nerve

Graft for bone marrow



Now you should be able to name the nerves and the areas that they supply



LUMBOSACRAL PLEXUS

• The major nerves of the plexus are the:❖

❖ Femoral nerve-posterior divisions of L2 through L4❖

❖ Obturator nerve-anterior divisions of L2 through L4

❖ Tibial nerve-anterior divisions of L4 through S3

❖ Common fibular nerve-posterior divisions of L4 through S2

❖ Superior gluteal nerve-posterior divisions of L4 through S 1

❖ Inferior gluteal nerve-posterior divisions of LS through S2

Posterior divisions

Anterior divisions

Lumbosacral Plexus

Femoral nerve

Obturator nerve

Superior gluteal nerve

Inferior gluteal nerve

Common fibular nerve

Tibial nerve

L₂

L₃

L₄

L₅

S₁

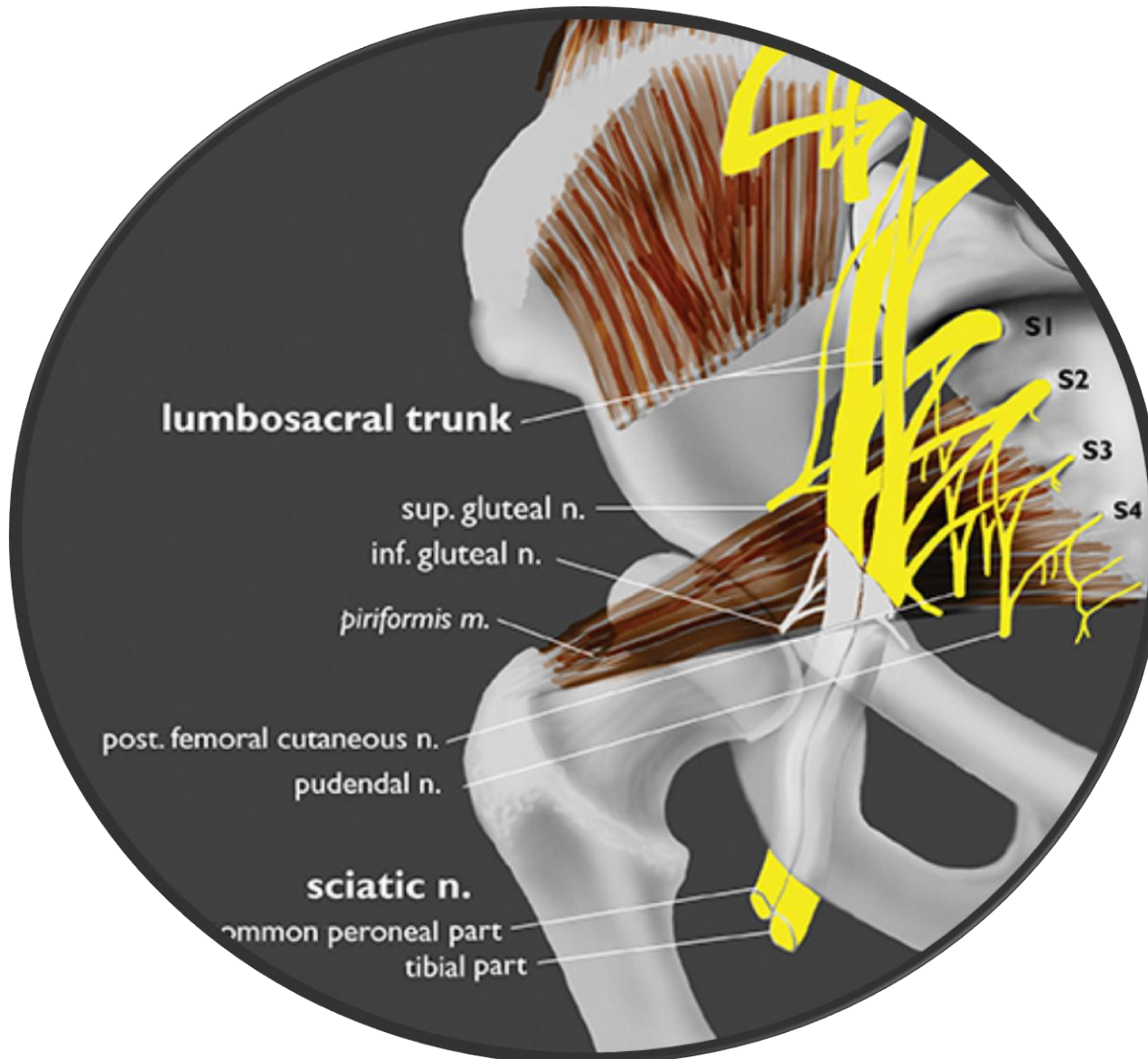
S₂

S₃



SACRAL PLEXUS

Sacral plexus

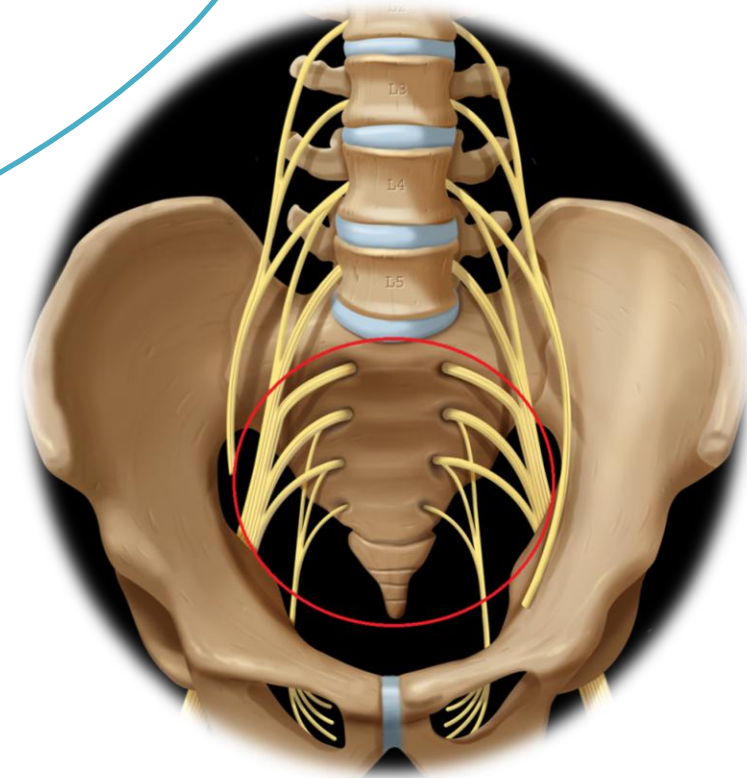


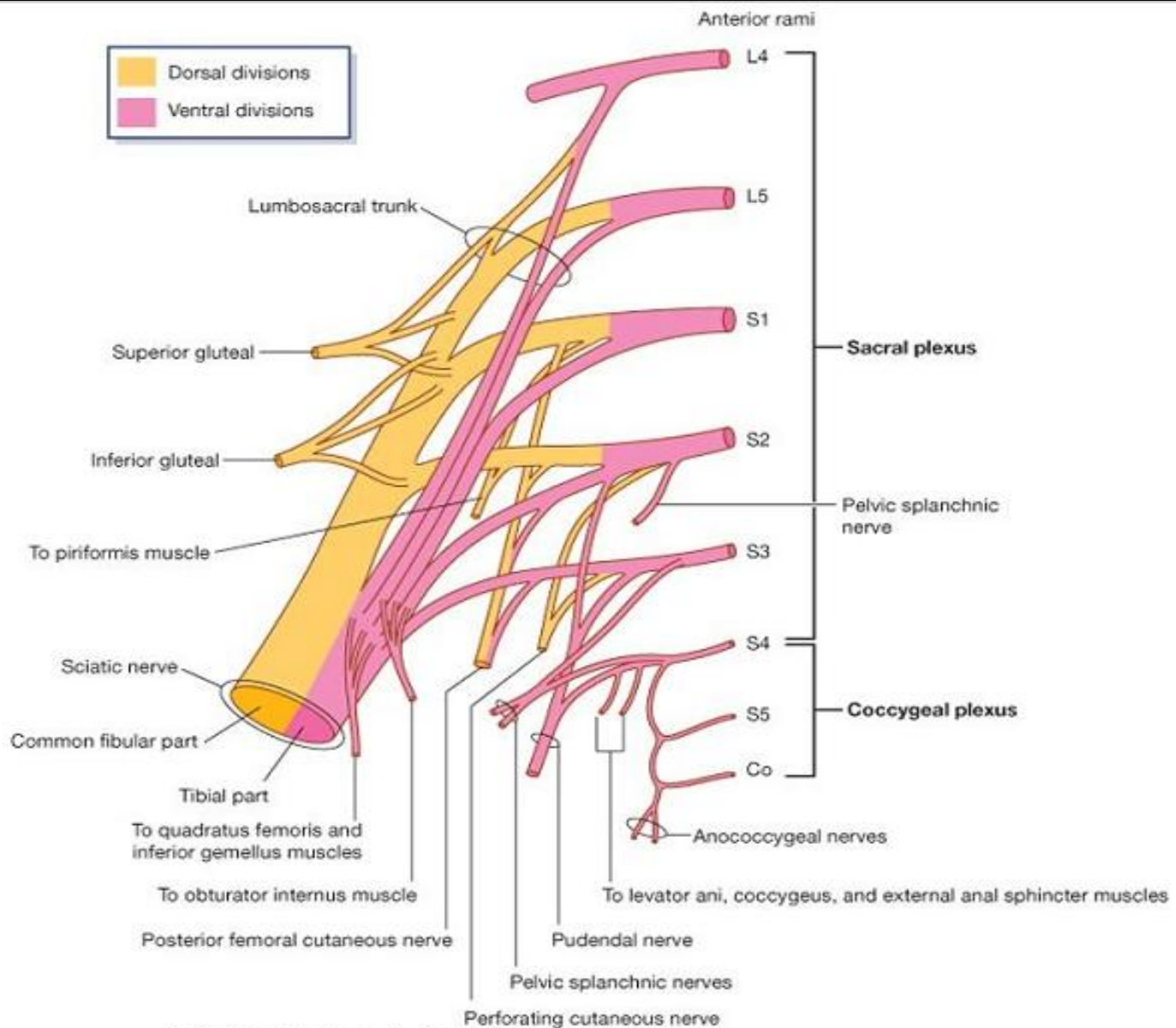
❖ Located on the posterior wall of pelvis on the anterior surface of piriformis muscle.

❖ Formed by the lumbosacral trunk and ventral rami of S1-S4.

Sacral plexus

- ❖ Branches supply: lower limb; pelvic floor and wall and perineum.
- ❖ Most branches leave the pelvis through greater sciatic foramina.





Drake: Gray's Anatomy for Students, 2nd Edition.

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Gluteal region

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

Superior 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

Read only

Nerve to obturator internus & superior
gemellus

Nerve to quadratus femoris & inferior
gemellus

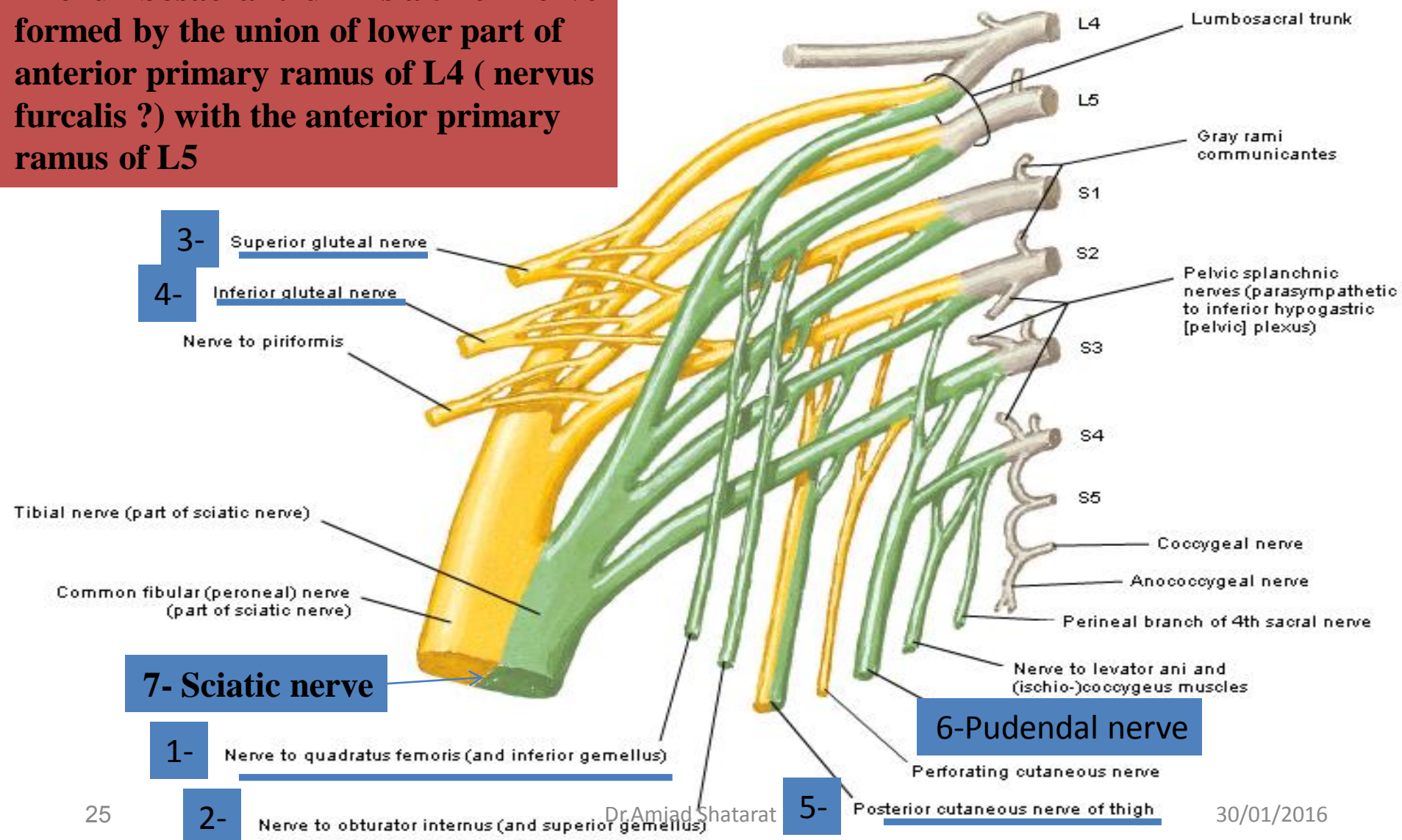
Perforating cutaneous nerve

Nerve to piriformis

Notice that the superior gluteal
artery which arises from the
internal iliac artery,
usually passes between
S1 and S2 nerves

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

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



THANK YOU

Dr.Amjad Shatarat

30/01/2016