

ANATOMY OF THE LOWER LIMBS

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

a.shatarat@ju.edu.jo

2021

BY DR. AMJAD SHATARAT



4/18/2021

Dr. Amjad Shatarat, Dep. of
Anatomy

Nerves of the lower limbs

LUMBER PLEXUS

The lumbar plexus

Is formed by

The anterior primary rami

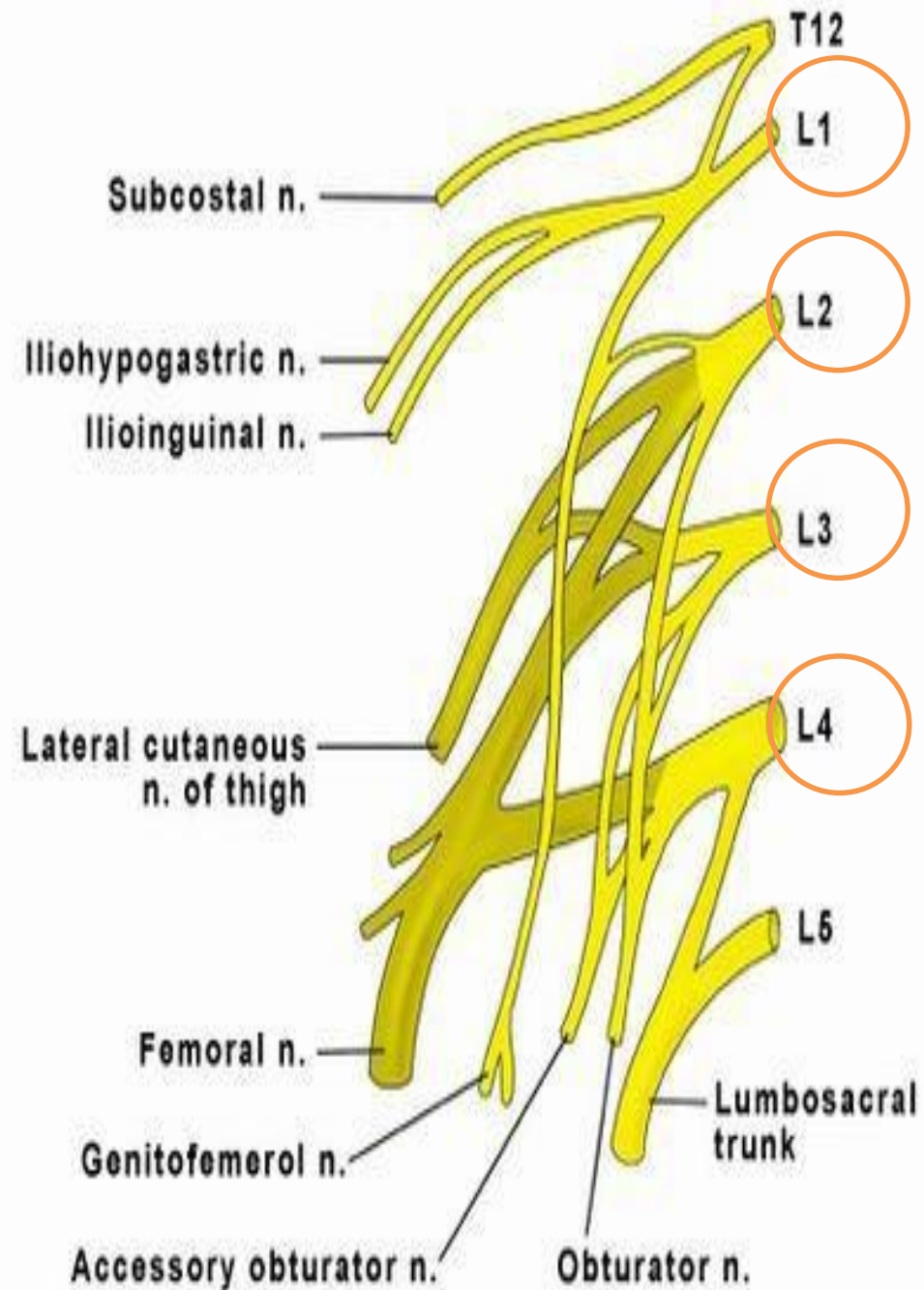
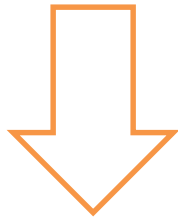
of *the*

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 ?



4 small nerves



Ilio-hypogastric (L1)

Ilio-inguinal (L1)

Genitofemoral (L1, L2)

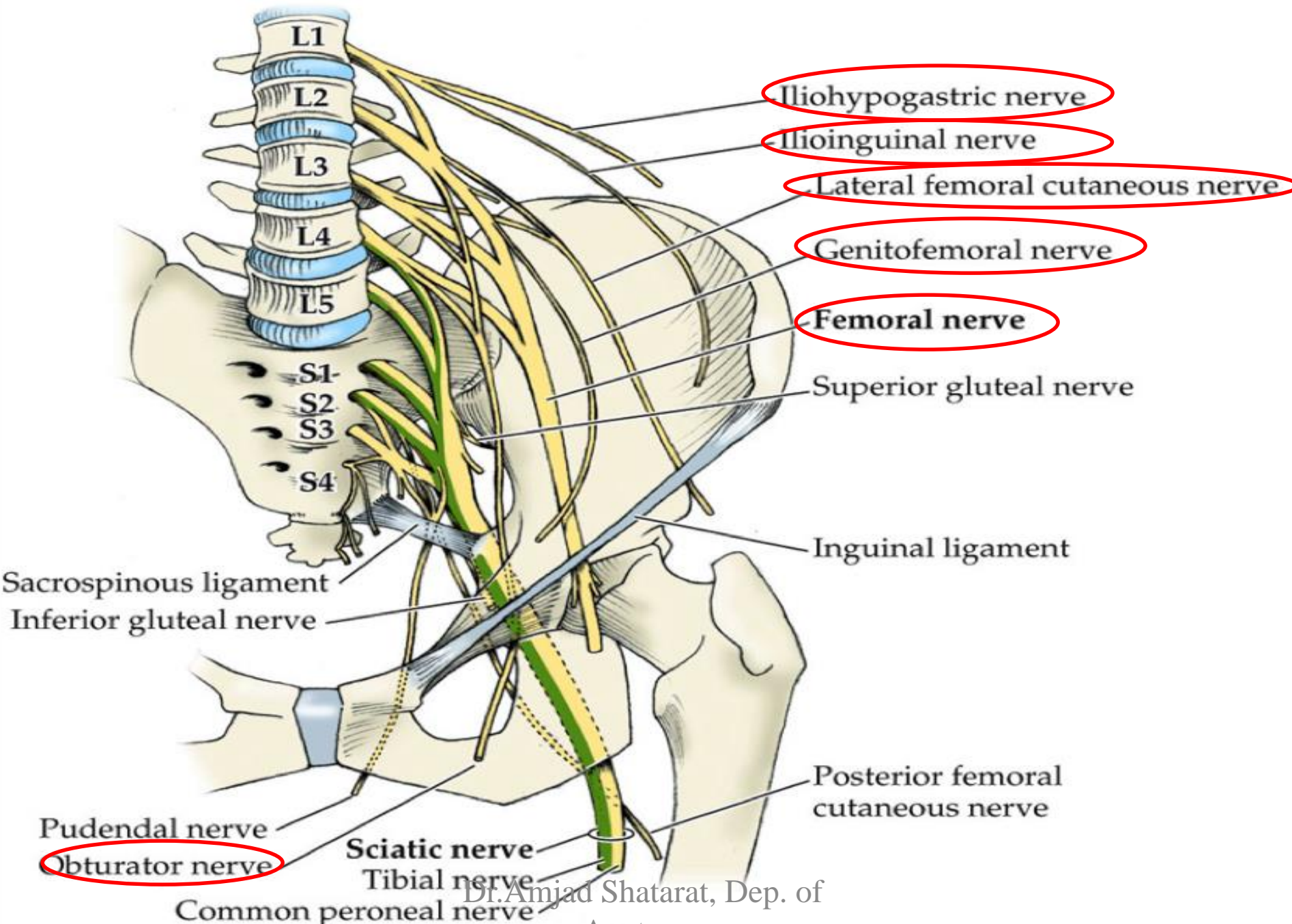
Lateral cutaneous nerve of the thigh (L2, L3)

2 main (large) nerves



1- Femoral nerve (L2, 3, 4)

2- Obturator nerve (L2, 3, 4)



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

From ***lateral side*** of the psoas major muscle

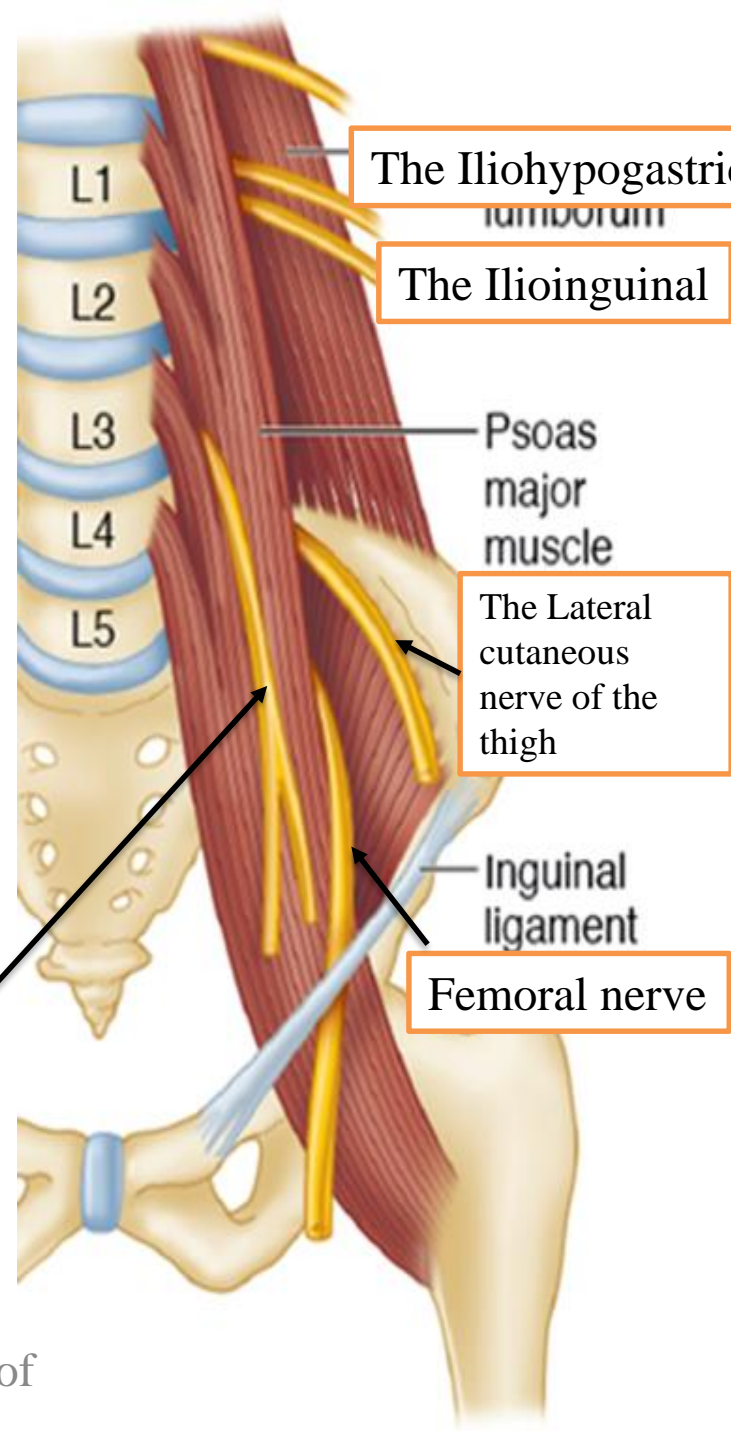
The Iliohypogastric
The Ilioinguinal
The Lateral cutaneous nerve of the thigh
Femoral nerve

From the medial side

Obturator nerve and Lumbosacral trunk

From the anterior surface

Genitofemoral nerve



Psoas and Iliacus Muscles

FROM THE LATERAL SIDE

The Iliohypogastric

The Ilioinguinal

The Lateral cutaneous nerve of the thigh

Femoral nerve

From the medial side

Obturator nerve

From the anterior side

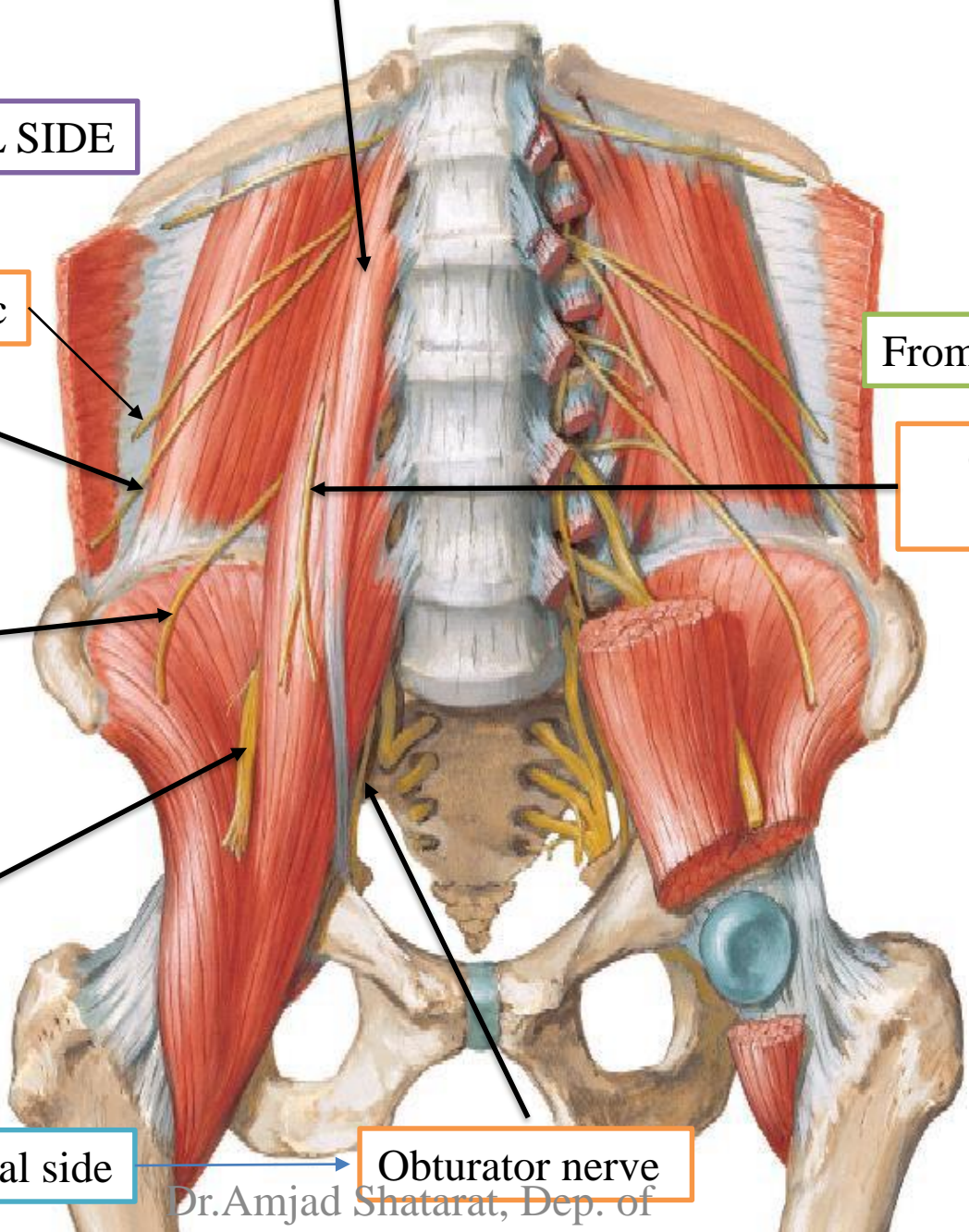
Genitofemoral nerve

4/18/2021

Dr. Amjad Shatarat, Dep. of

30/01/2016

Anatomy



Pay attention to this during practicals

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

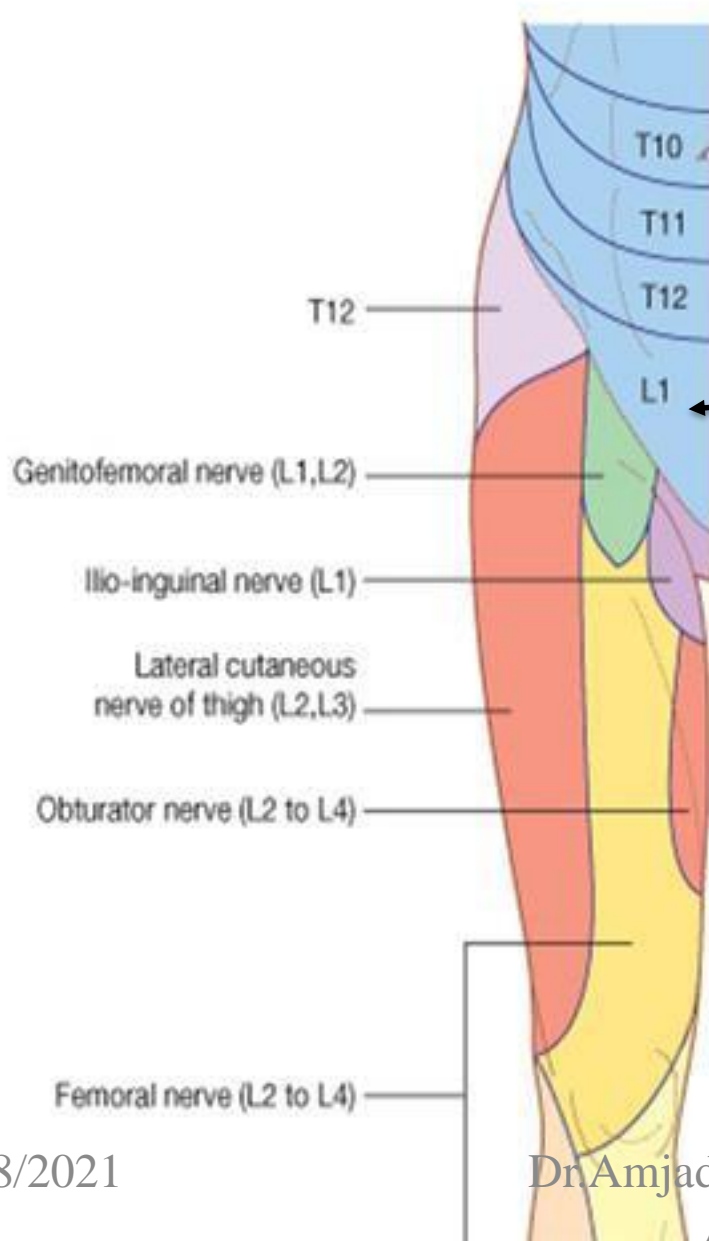


Either before or soon after emerging from the lateral border of the psoas major muscle, this single trunk divides into:
the ilio-hypogastric and the ilio-inguinal nerves



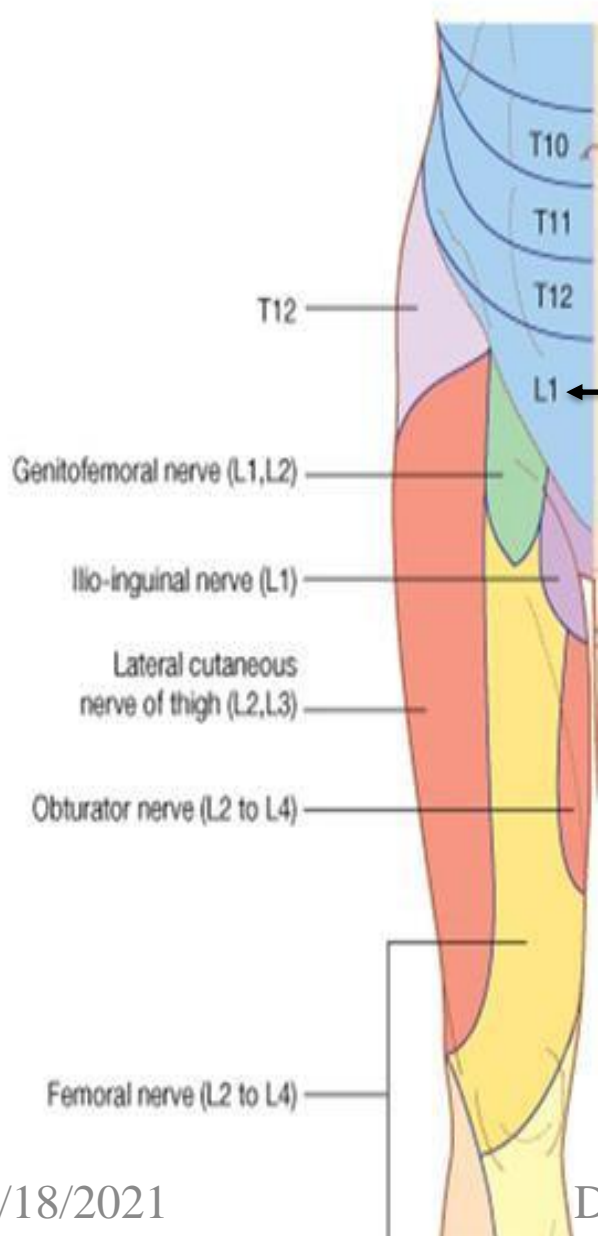
Note:
1 The iliohypogastric nerve is larger than the ilio-inguinal nerve
2 The iliohypogastric nerve runs superior to the ilio-inguinal nerve

Iliohypogastric nerve



- It is a branch from the lumbar plexus (L1)
- Emerges from the lateral border of Psoas major muscle
- supplies the posterolateral gluteal skin and it distributes to the skin in the pubic region

Ilio-inguinal nerve

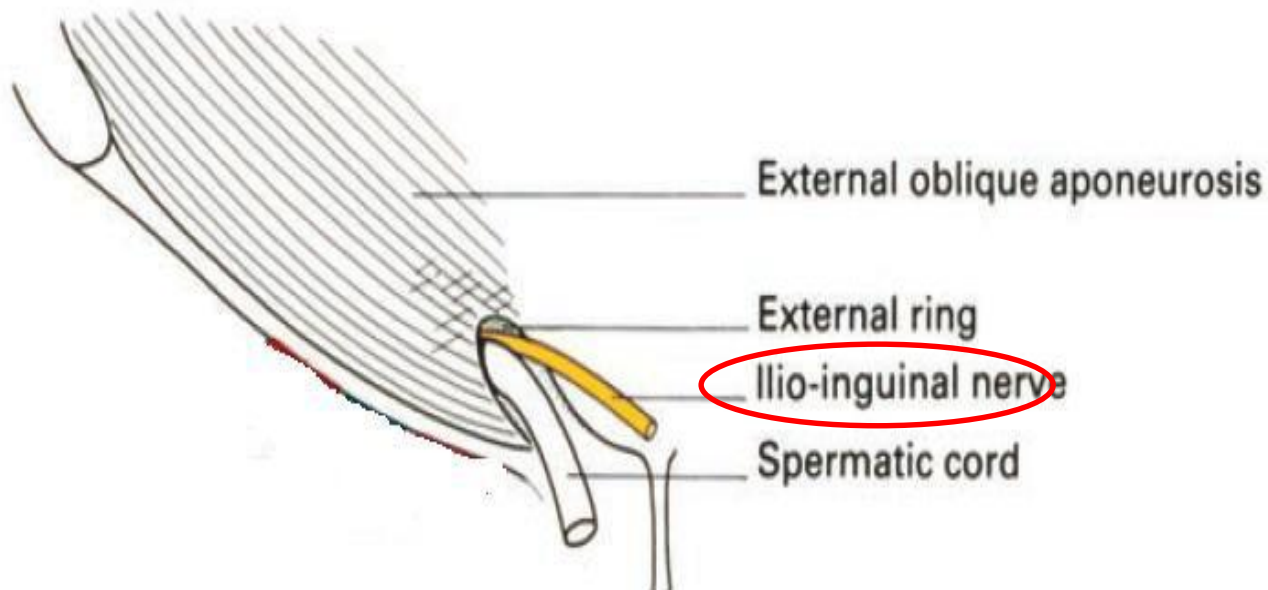


- It is a branch from the lumbar plexus (L1)
- Emerges from the lateral border of Psoas major muscle

- 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

Clinical correlations

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



Genitofemoral nerve

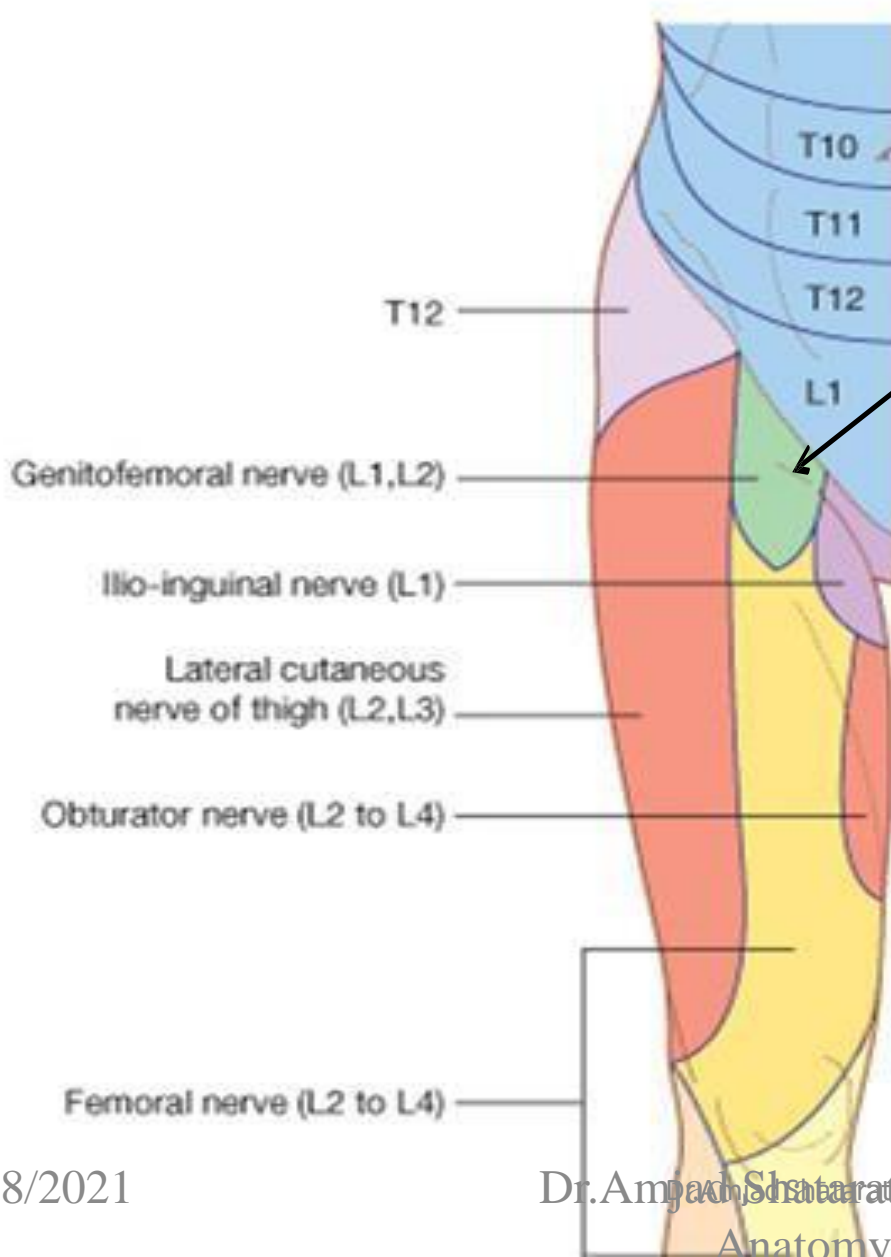
Genitofemoral nerve
(L1 and L2)

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 of genitofemoral nerve



supply the skin of the upper anterior thigh

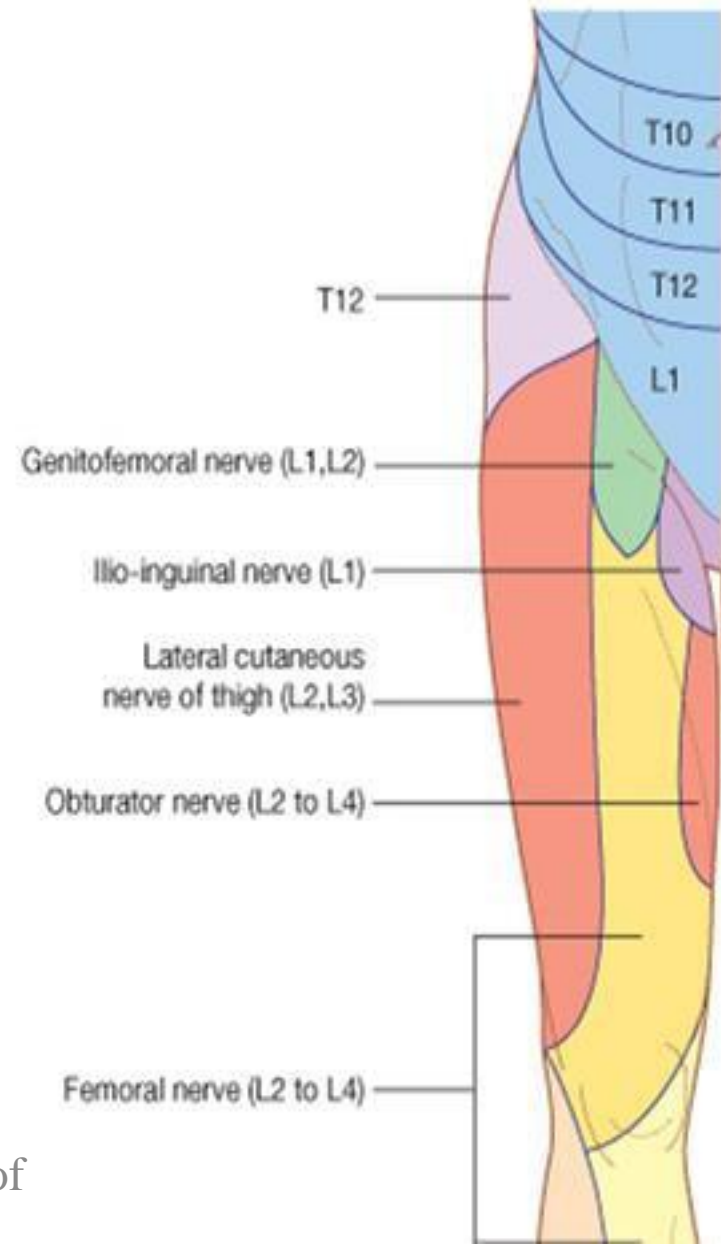
Read only to be covered in later GI and UGS systems

The genital branch of genitofemoral nerve

- **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.
- it supplies the skin on the anterior and lateral thigh to the level of the knee

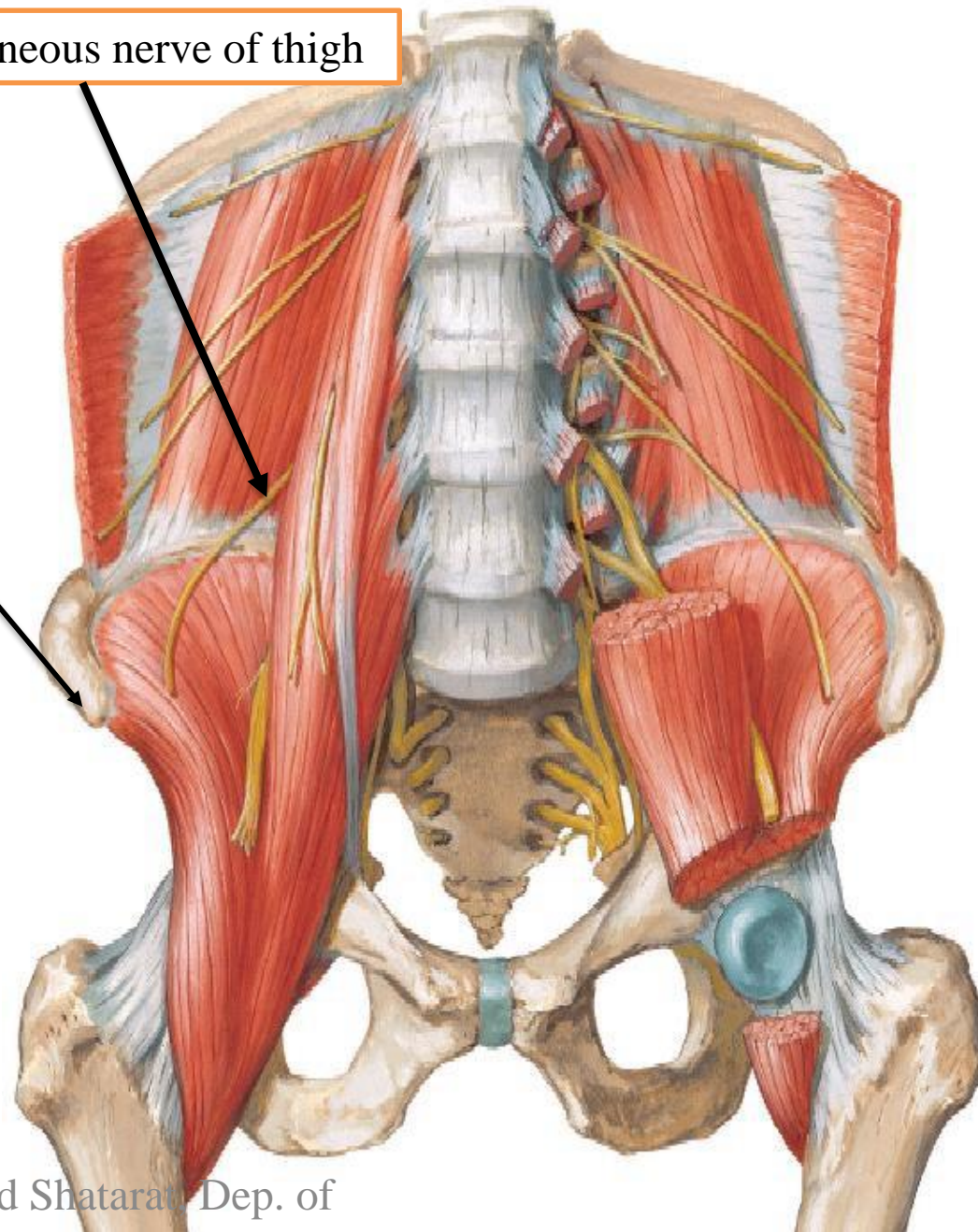


Psoas and Iliacus Muscles

Injury of this nerve

Lateral cutaneous nerve of thigh

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, bone marrow graft.
Mechanical: factors include prolonged sitting or standing.



FASCIAL COMPARTMENTS OF THE THIGH

Deep fascia of the thigh (fascia lata)

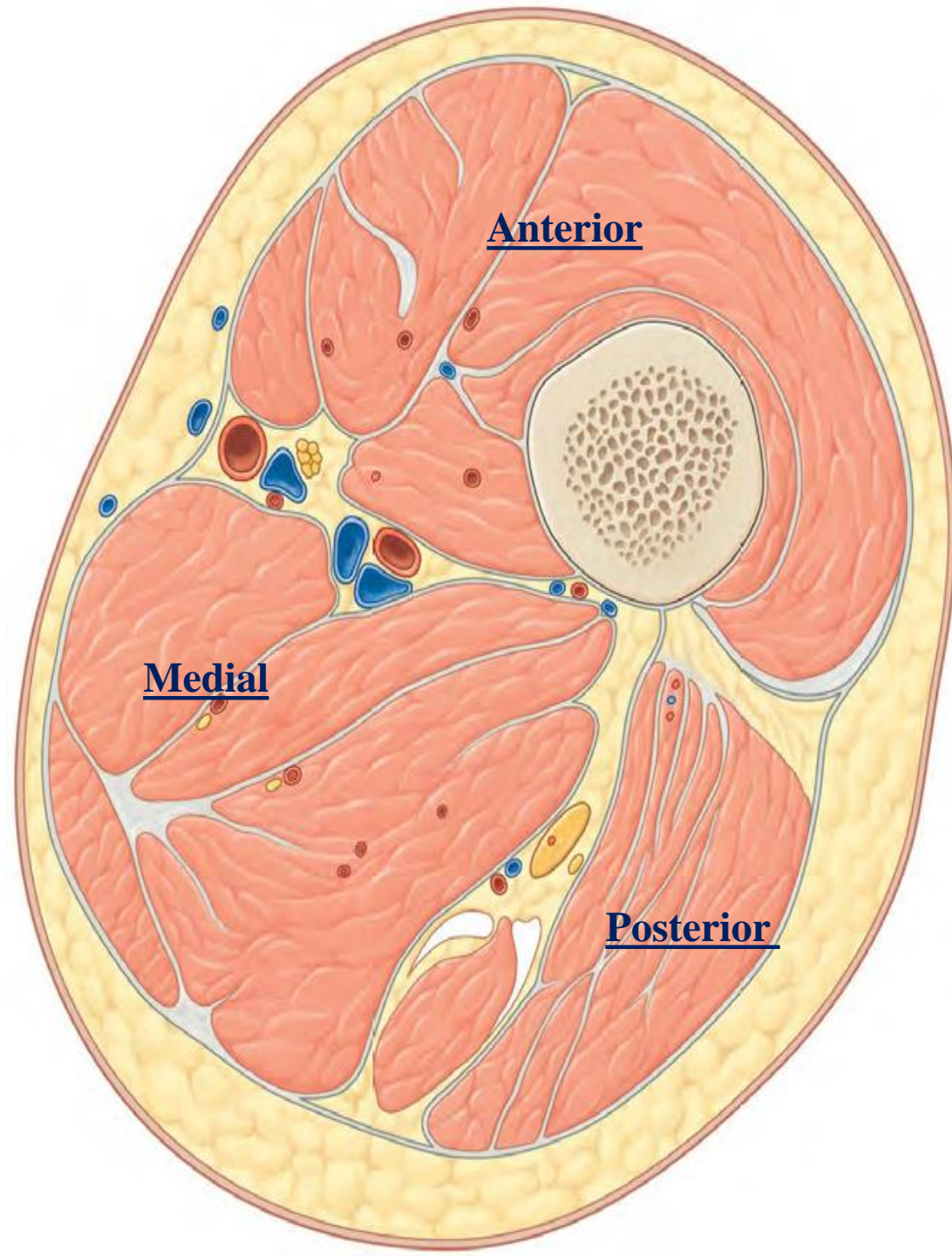
❖ Fascia lata is connected to the
linea aspera by

three intermuscular septa;

- 1- *Medial intermuscular septum*
- 2- *Lateral intermuscular septum*
- 3- *Posterior intermuscular septum*

Thus the deep fascia and septa
divide the thigh into three
compartment;

Anterior
Posterior
Medial.



Contents of the Anterior Fascial Compartment of the Thigh

1-Muscles: *Sartorius, iliacus, psoas, pectineus, and quadriceps femoris*

2-Blood supply: *Femoral artery*

3-Nerve supply: *Femoral nerve*

Note: that not all the contents of the anterior compartment have the Same function. For example psoas is the main flexor of the thigh at the hip joint while quadriceps femoris is the main extensor of the leg at the knee joint.

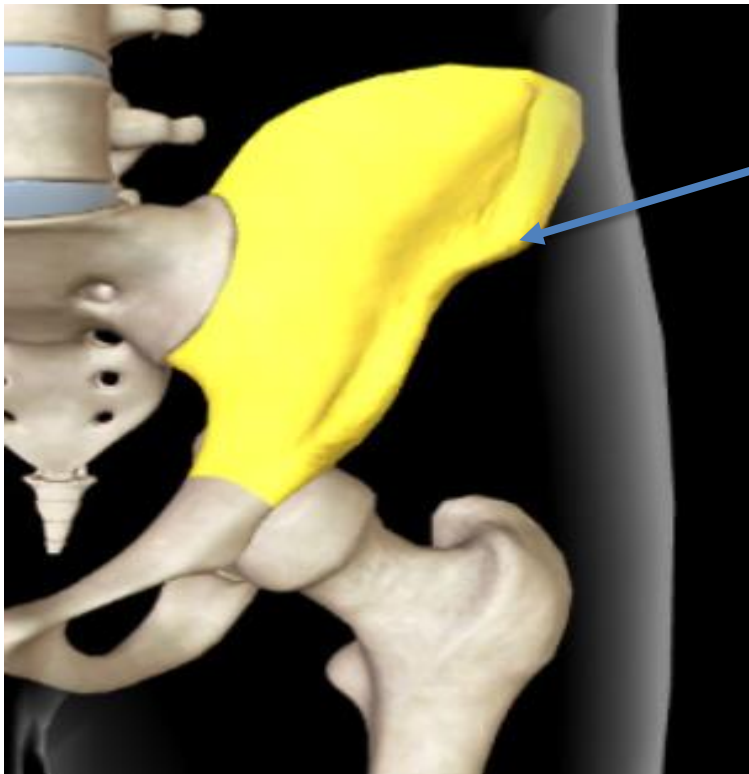
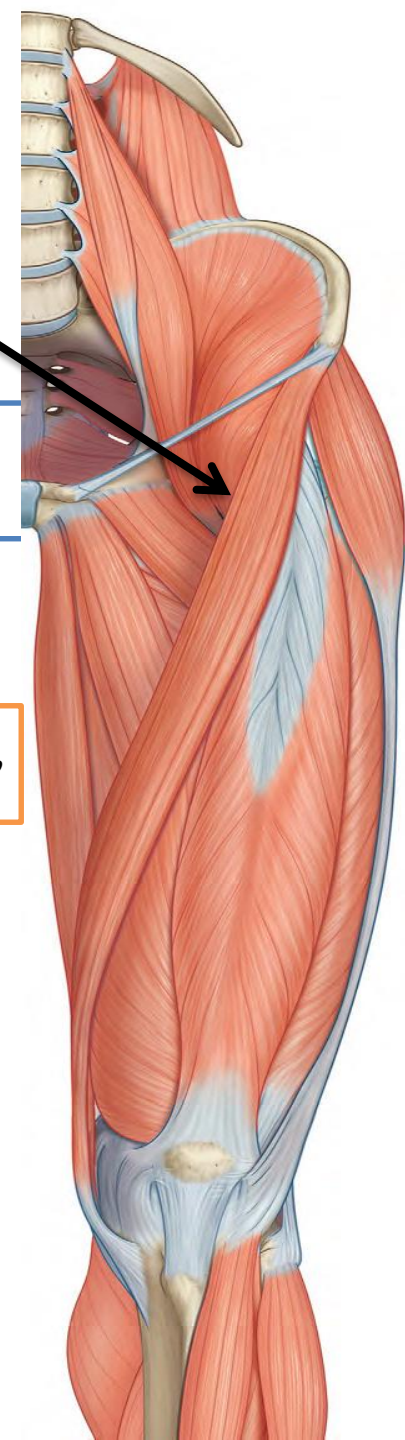
Sartorius

Origin: *Anterior superior iliac spine*

Insertion: *Upper medial surface of shaft of tibia*

Nerve supply: *Femoral nerve*

Actions: *Flexes, abducts, laterally rotates thigh at hip joint*
Flexes and medially rotates leg at knee joint

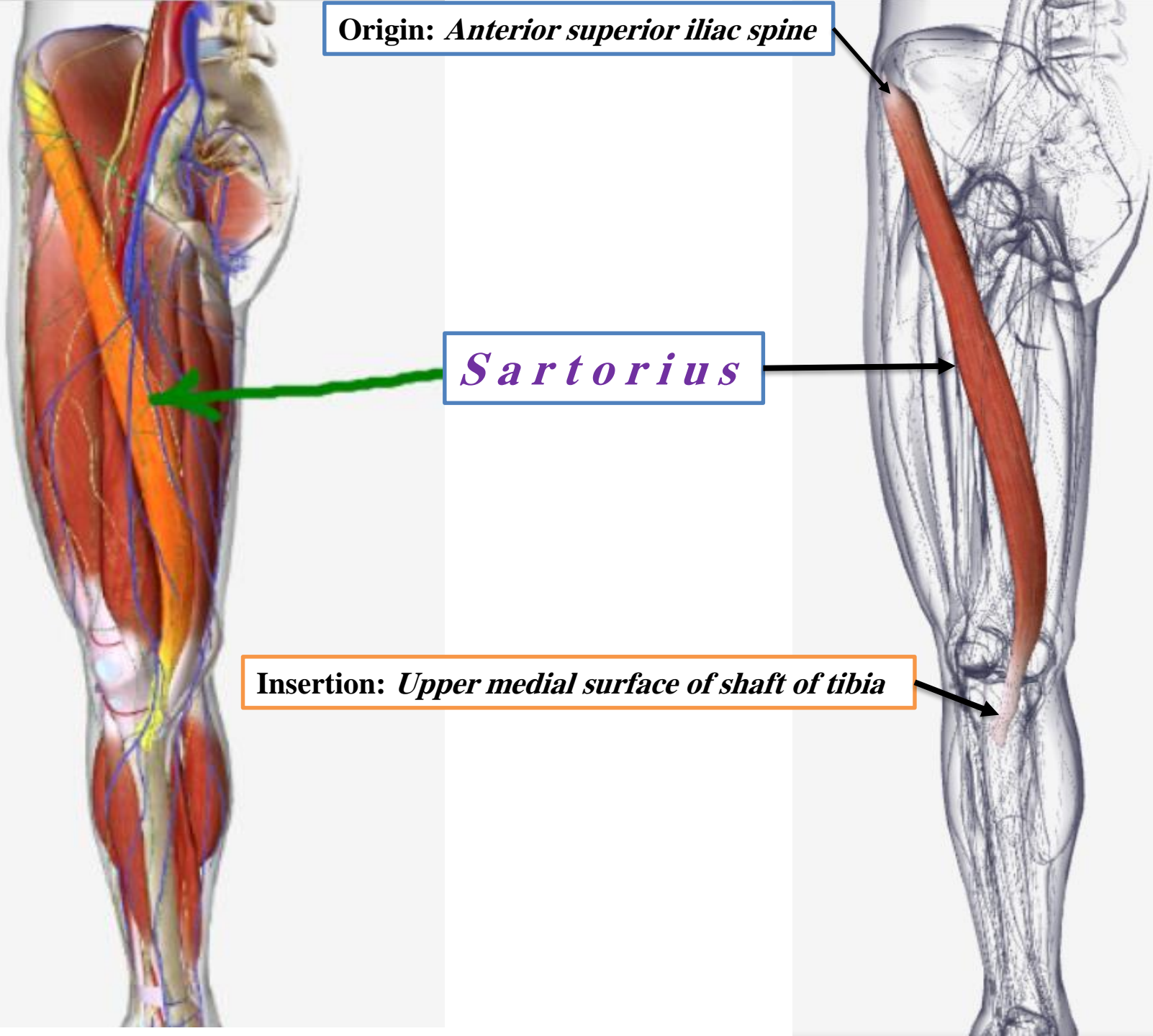


*Anterior superior
iliac spine of the hip
bone*

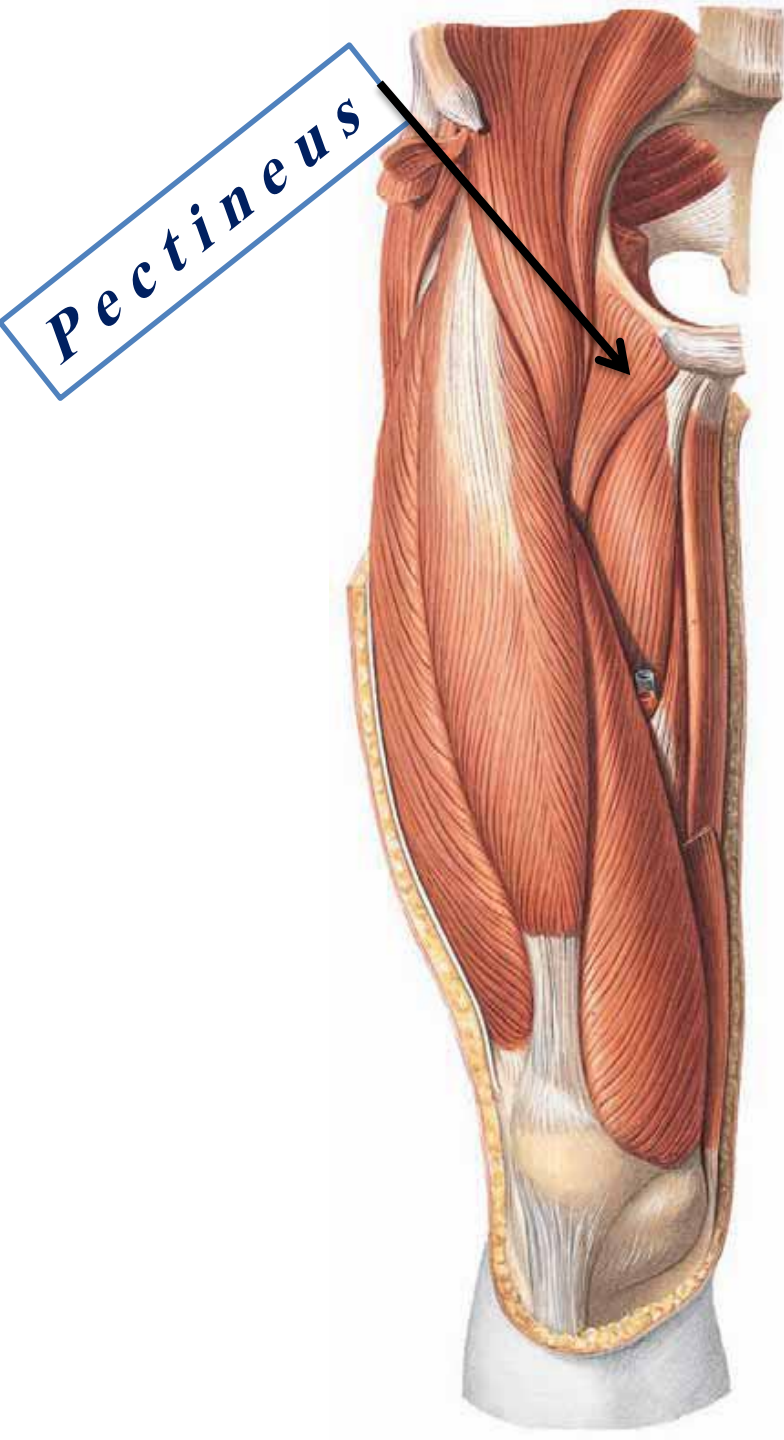
Origin: *Anterior superior iliac spine*

Sartorius

Insertion: *Upper medial surface of shaft of tibia*



Pectineus



Origin: *Superior ramus of pubis*

Insertion: *Upper end of linea aspera of shaft of femur*

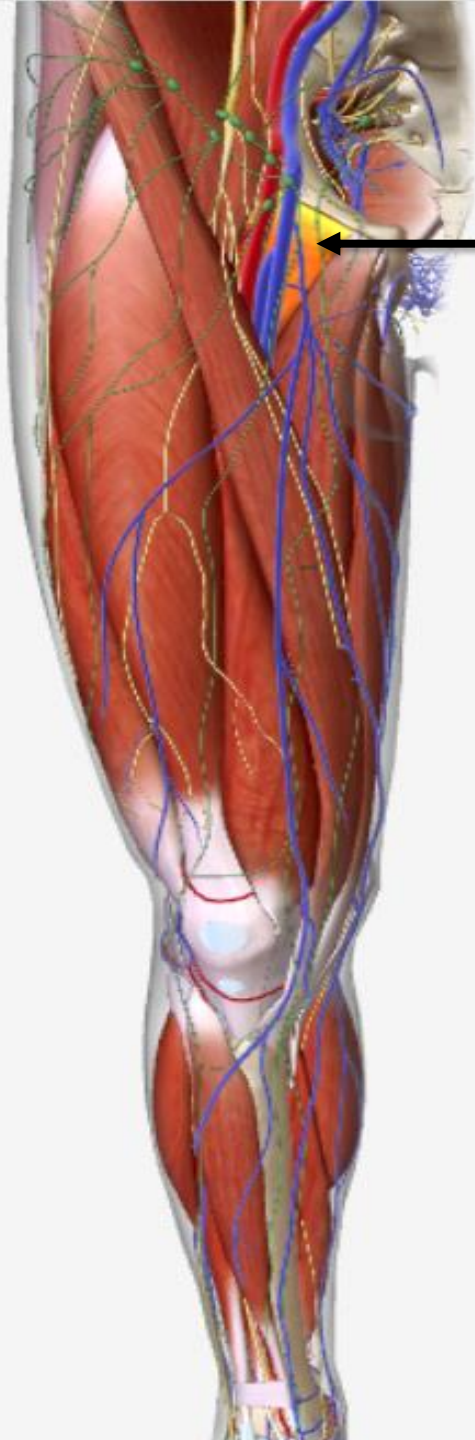
Nerve supply: *Femoral nerve?*

Actions: *Flexes and adducts thigh at hip joint*

Origin: *Superior ramus of pubis*

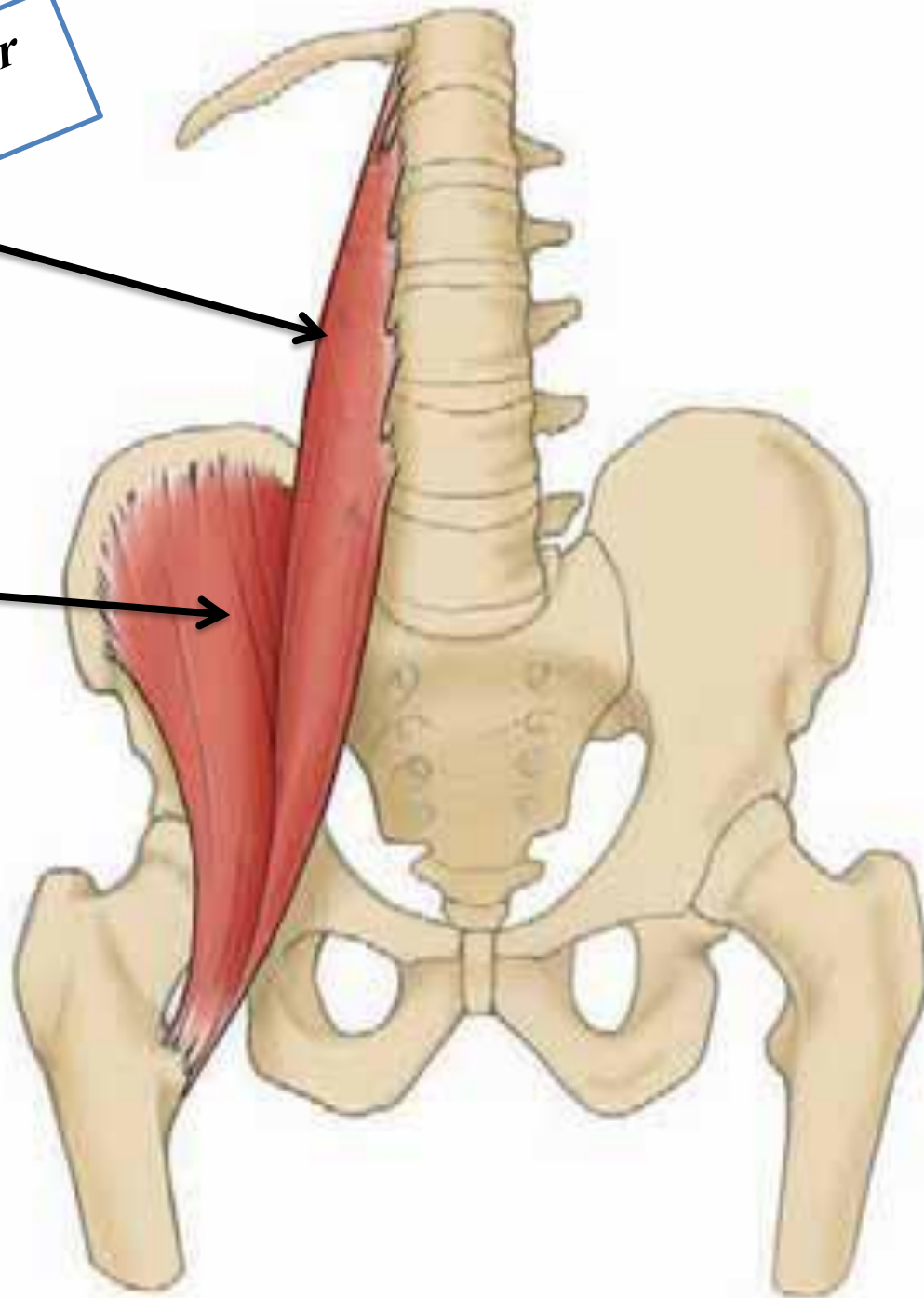
Pectineus

Insertion: *Upper end of linea aspera of shaft of femur*



*Psoas major
muscle*

iliacus

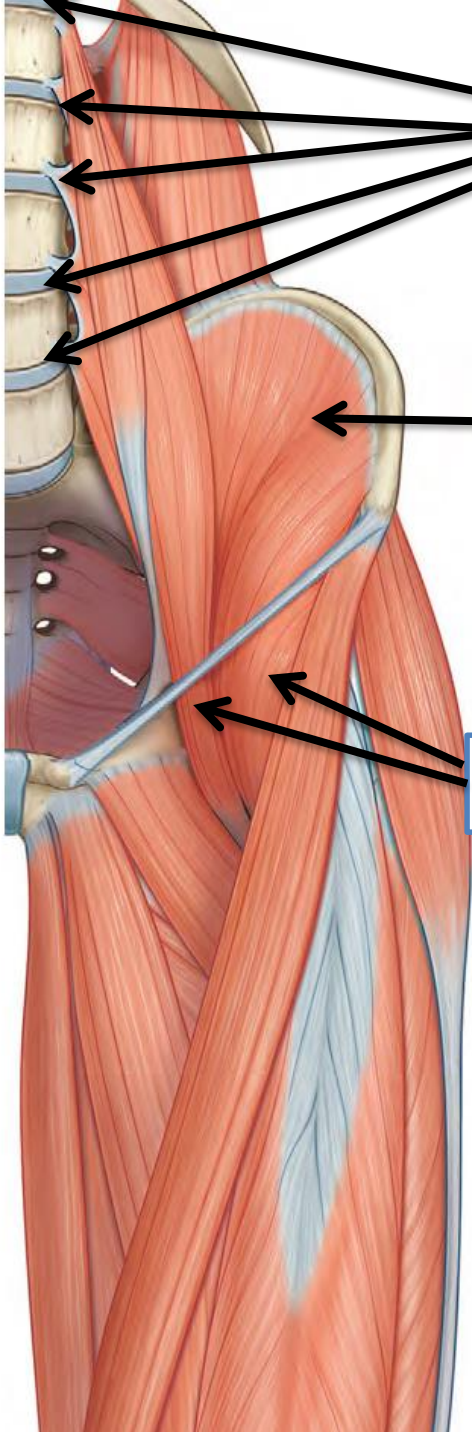


Psoas major

Origin: *Transverse processes, bodies, and intervertebral discs of the 12th thoracic and five lumbar vertebrae*

Origin: *Iliac fossa of hip bone*

Both muscles pass behind the inguinal ligament



Insertion

Both psoas and iliacus are inserted into lesser trochanter of femur

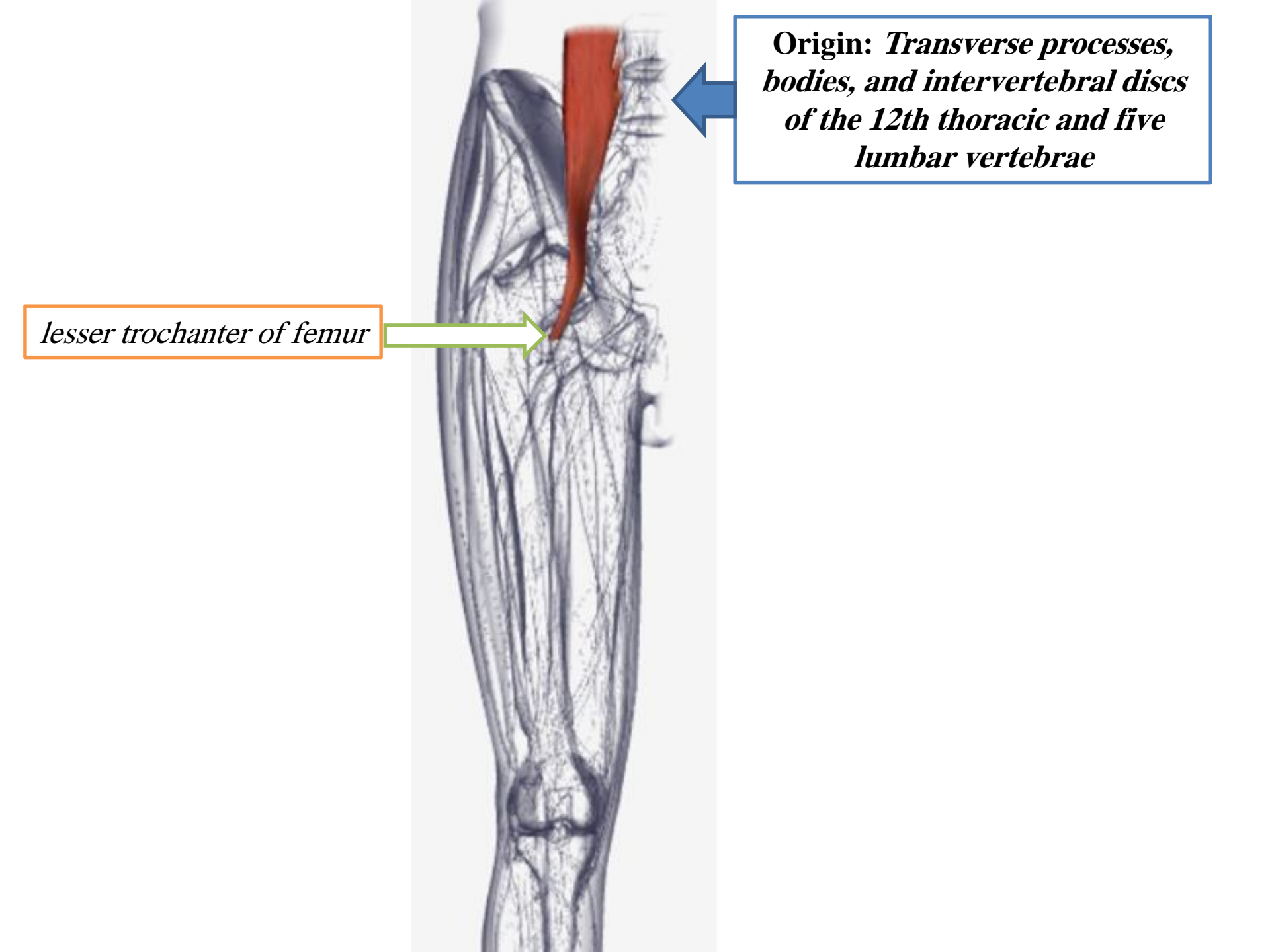
This means that the iliopsoas crosses anterior to hip joint

Any muscle crosses anterior to hip joint will flex it, therefore,

it Flexes thigh on trunk; if thigh is fixed
(The insertion is fixed while the origin is moving)
It flexes the trunk on thigh as in sitting up from lying down.

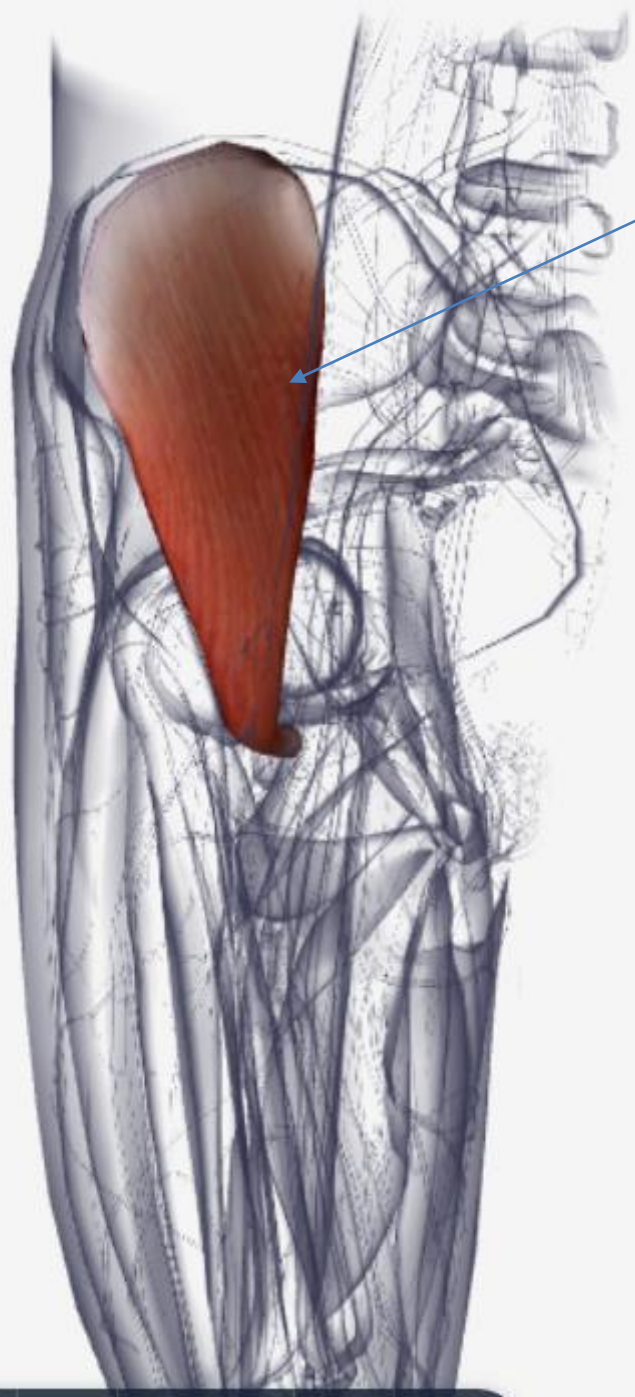
sit-up' exercise



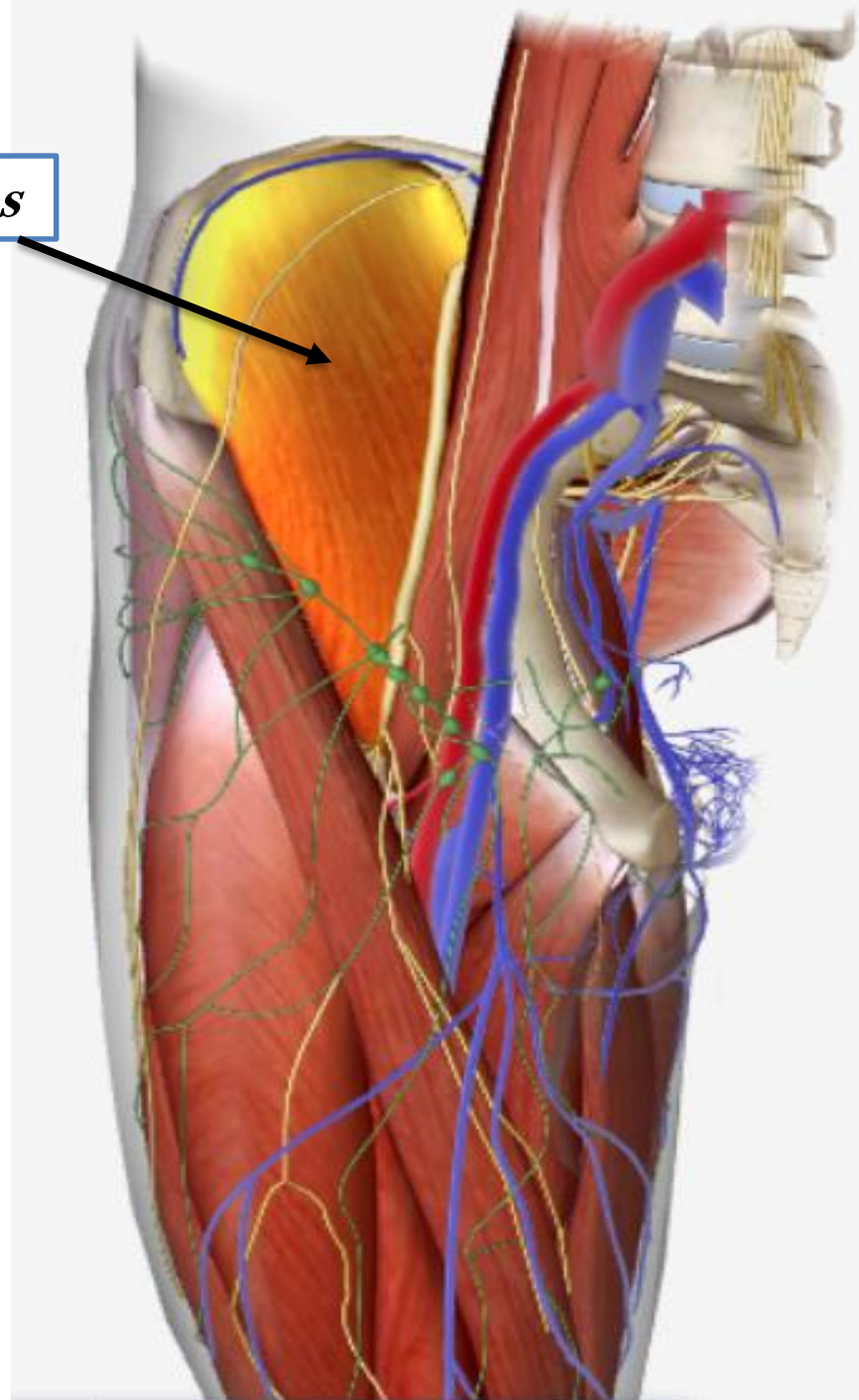


Origin: *Transverse processes, bodies, and intervertebral discs of the 12th thoracic and five lumbar vertebrae*

lesser trochanter of femur



Iliacus



Nerve supply

Psoas major muscle: Lumbar plexus

Iliacus muscle: by the Femoral nerve in the pelvis before it passes behind the inguinal ligament

Testing

Iliopsoas may be tested clinically by **actively flexing the hip against resistance**, in the supine position with hip and knee flexed.

The quadriceps femoris muscle

Consisting of:

- 1- The rectus femoris**
- 2- The vastus intermedius**
- 3- The vastus lateralis**
- 4- The vastus medialis**

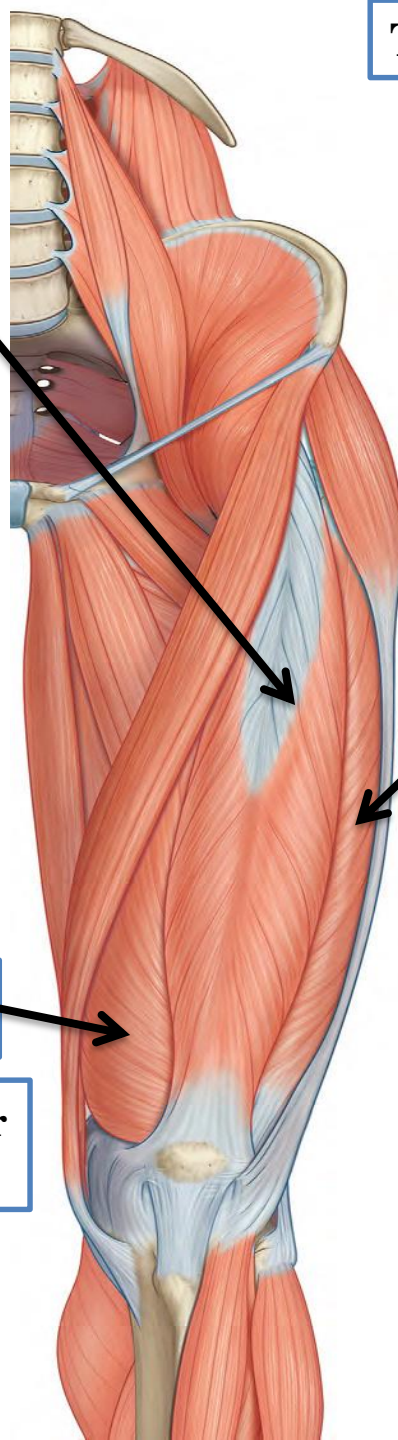
Rectus femoris

Vastus lateralis

***Origin* : Upper end and shaft of femur
(linear origin)**

Vastus medialis

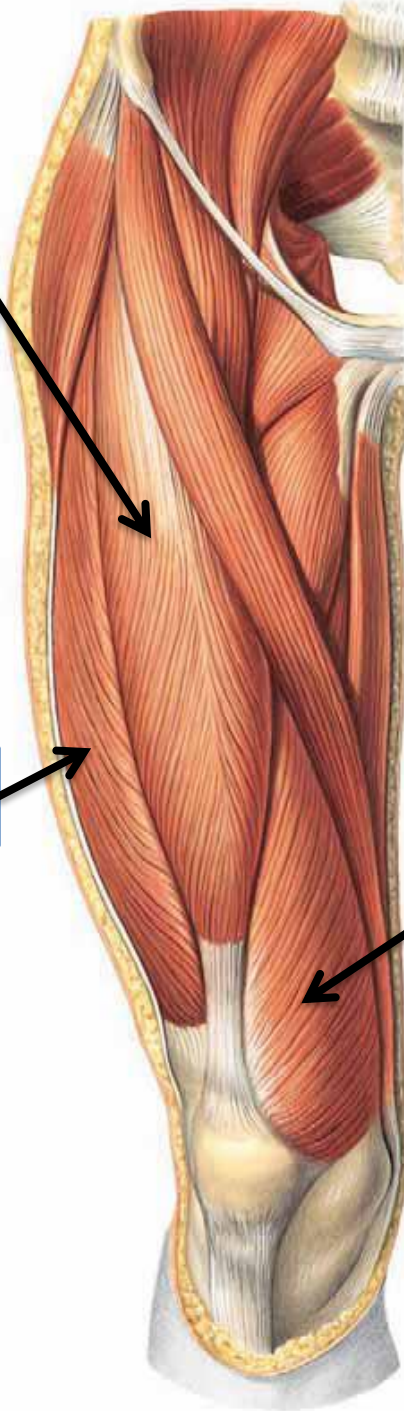
***Origin* : Upper end and shaft of femur
(linear origin)**

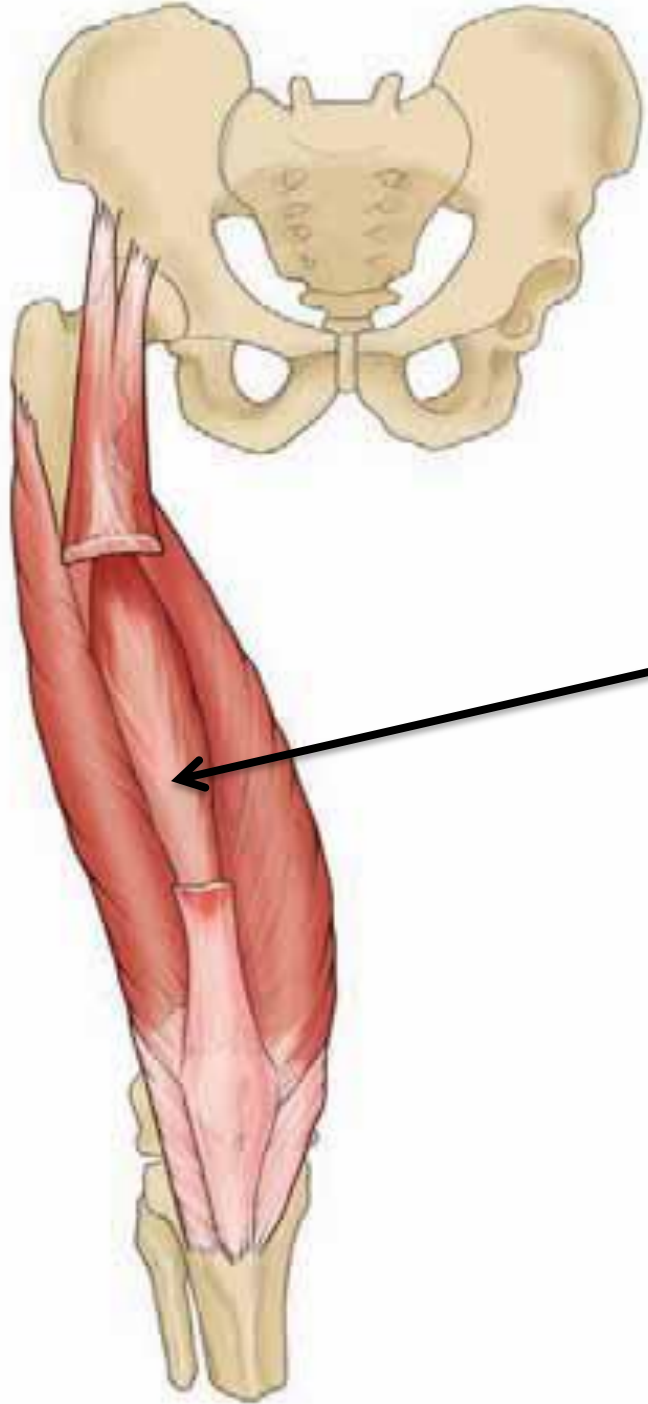


Rectus femoris

Vastus lateralis

Vastus medialis





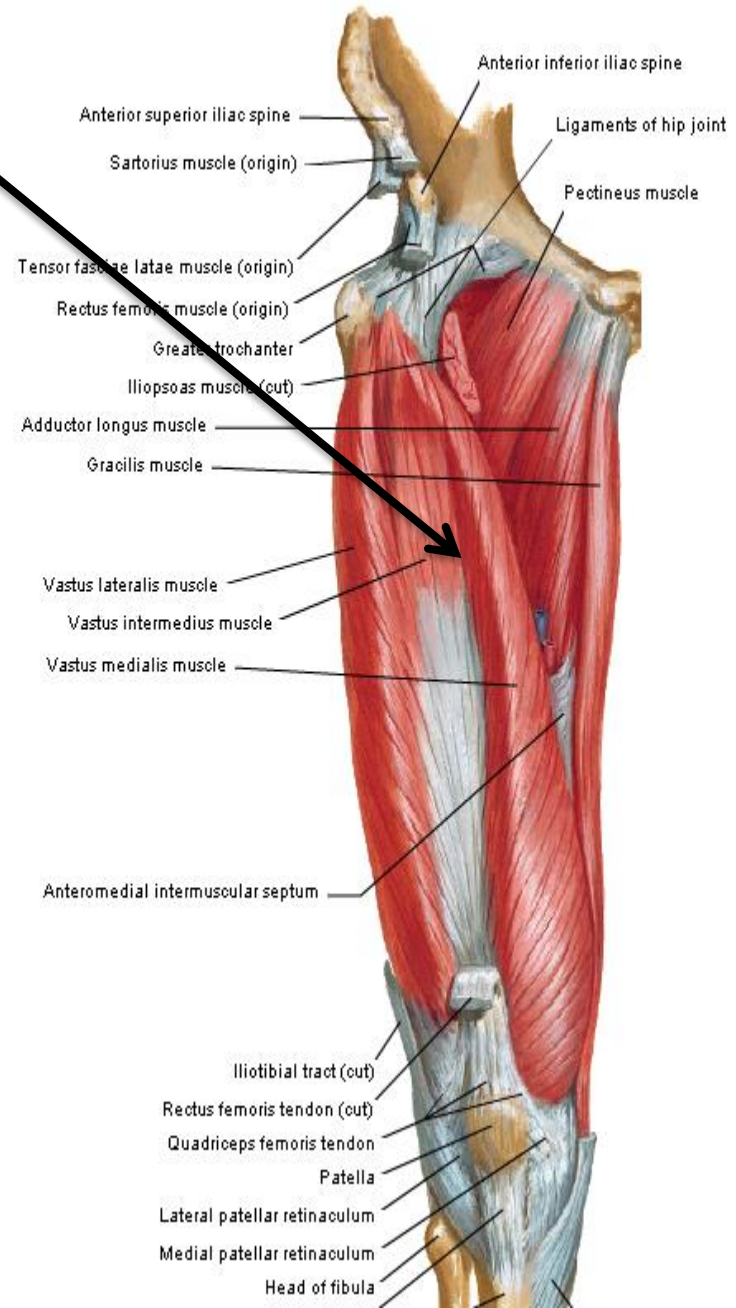
Vastus intermedius

Muscles of Thigh

Anterior View - Deeper Dissection

Vastus intermedius

***Origin: Anterior and lateral surfaces
of shaft of femur***



Rectus femoris

Originates by two heads

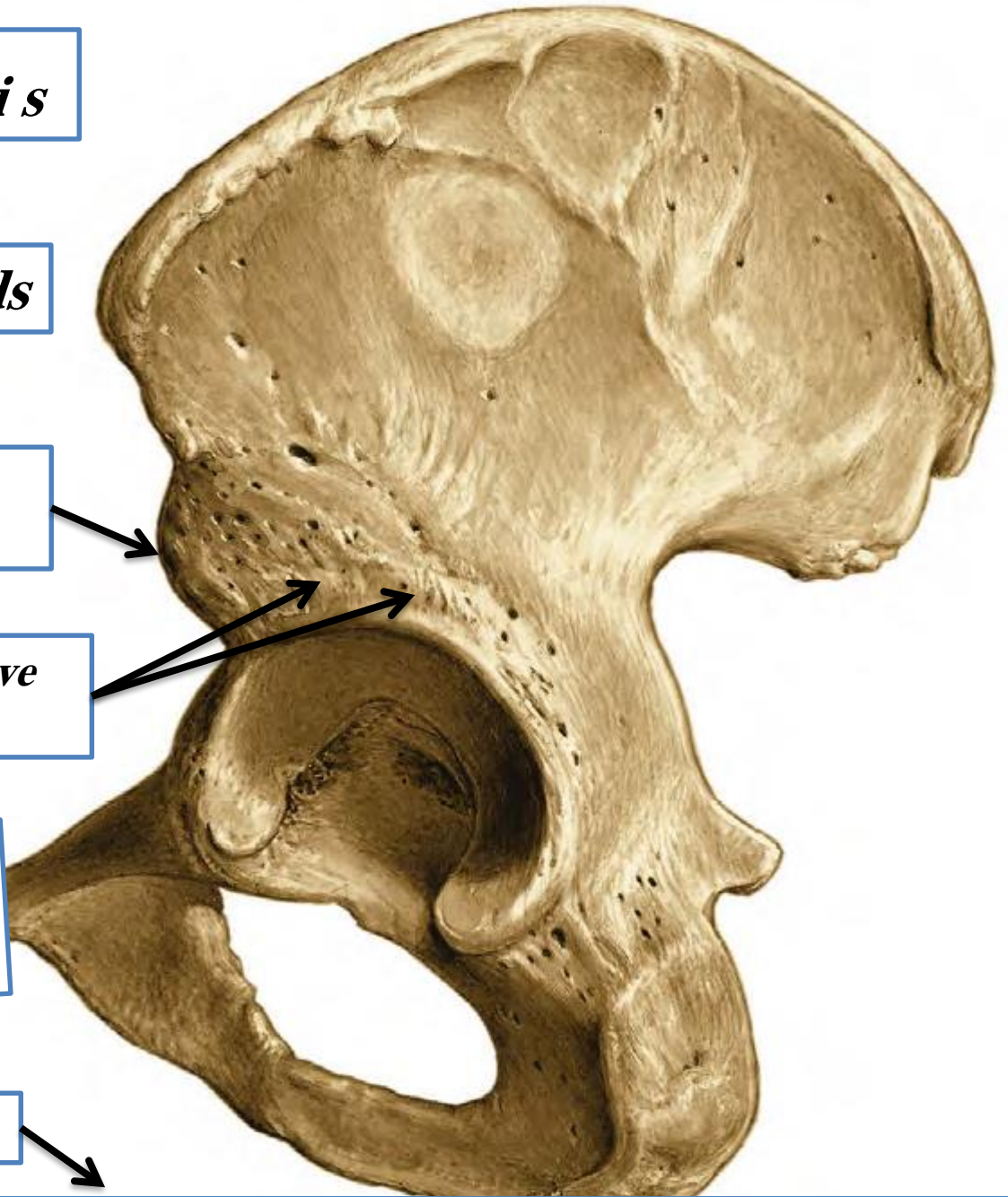
Straight head from *anterior inferior iliac spine*

Reflected head from *ilium above acetabulum*

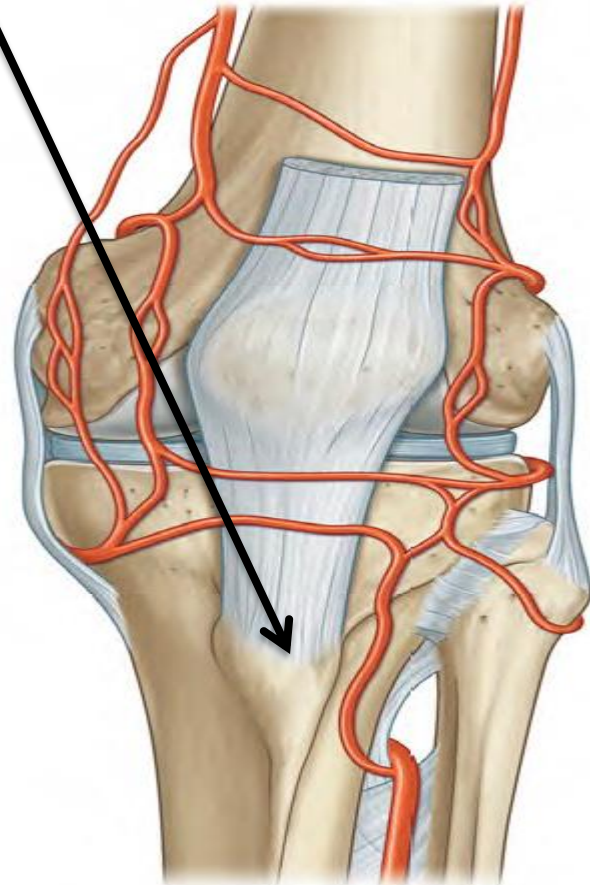
This means that rectus femoris crosses anterior to the hip joint

Flexion of the hip joint

Rectus can flex the hip and extend the knee simultaneously.



Insertion: the four heads are attached to the patella and, via the ligamentum patellae, to the tibial tuberosity (the real insertion)



Actions: the quadriceps femoris muscle

Any muscle crosses anterior to the knee joint, will extend it



**Extends the leg at knee joint;
flexes thigh at hip joint (only the rectus
femoris head).**

Remember

**Quadriceps femoris is the main
extensor of the knee joint**

Nerve supply : femoral nerve

Femoral Nerve

➤ It is the largest branch of the lumbar plexus (L2, 3, and 4).

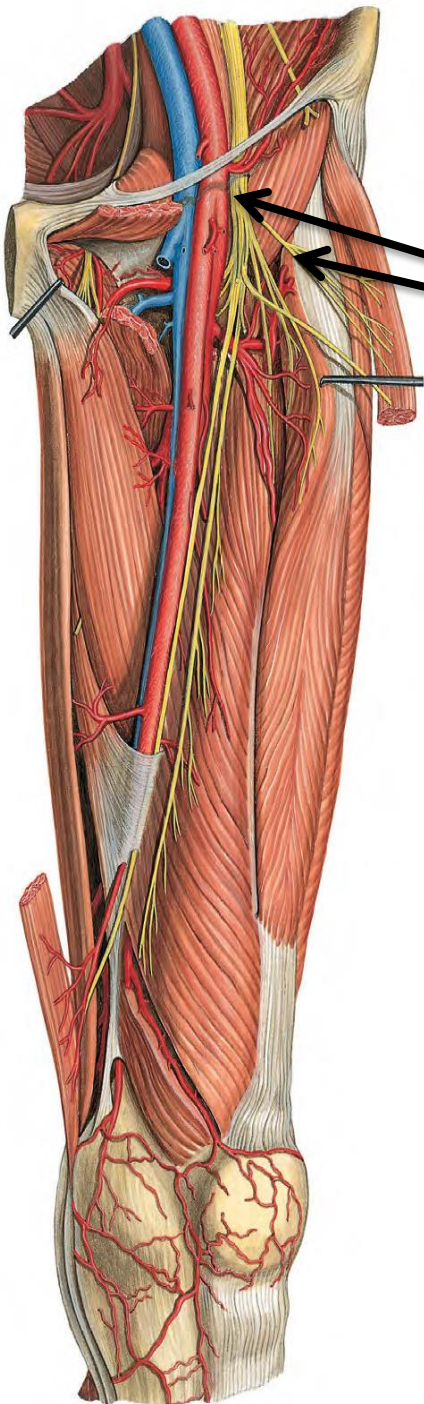
➤ It emerges from **the lateral border** of the psoas muscle

➤ enters the thigh lateral to the femoral artery and the femoral sheath, behind the inguinal ligament.

➤ it terminates by dividing into anterior and posterior divisions.



lateral



Anterior Division

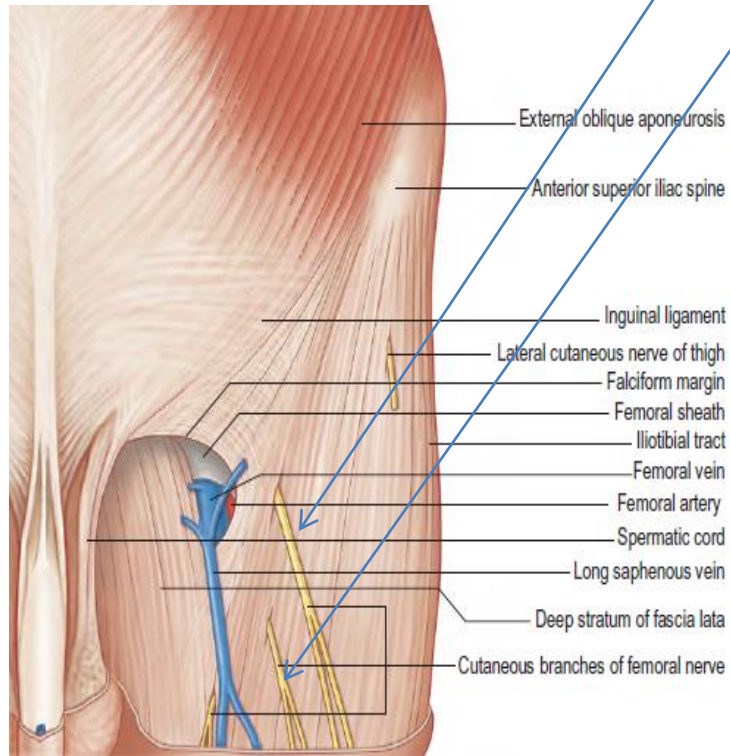
The anterior division gives off **two cutaneous branches**

1- **The medial cutaneous nerve of the thigh.**

2- **The intermediate cutaneous nerve of the thigh**

and **two muscular branches.**

Nerve to **sartorius** and nerve to **pectineus muscles.**



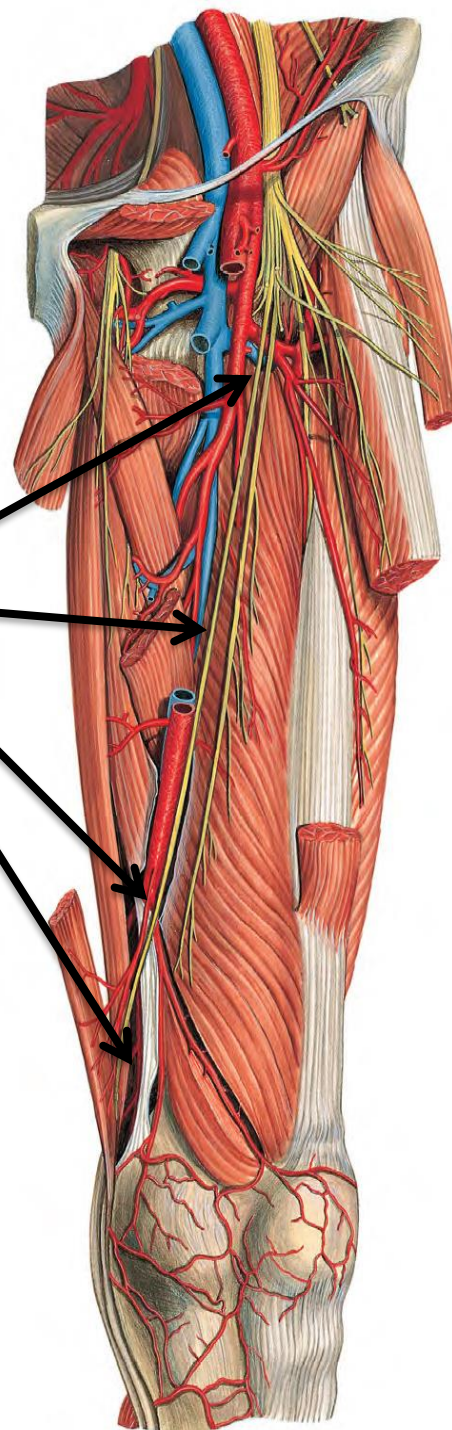
Posterior Division

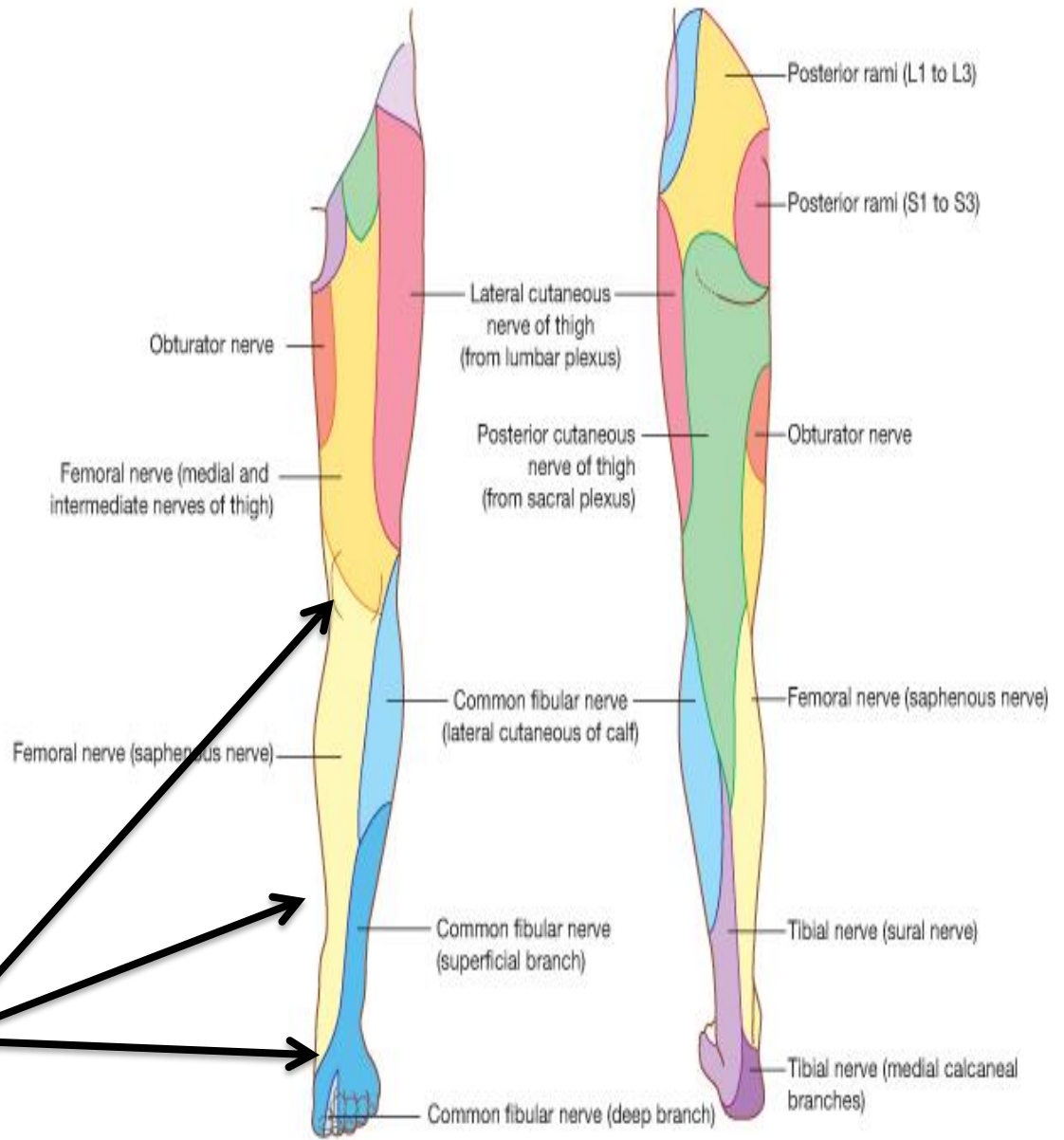
The posterior division gives off **one** cutaneous branch

The Saphenous nerve
and *muscular branches to the quadriceps muscle.*

THE SAPHENOUS NERVE

- runs downward and medially.
- It emerges between the tendons of sartorius and gracilis
- It then runs down in company with the *great Saphenous vein.*
- It passes *in front of the medial* malleolus and along the medial border of the foot, where it terminates in the region *of the ball of the big toe*





supplies skin on the medial side of the knee, leg, and foot.

THANK YOU

Dr.Amjad Shatarat

4/18/2021