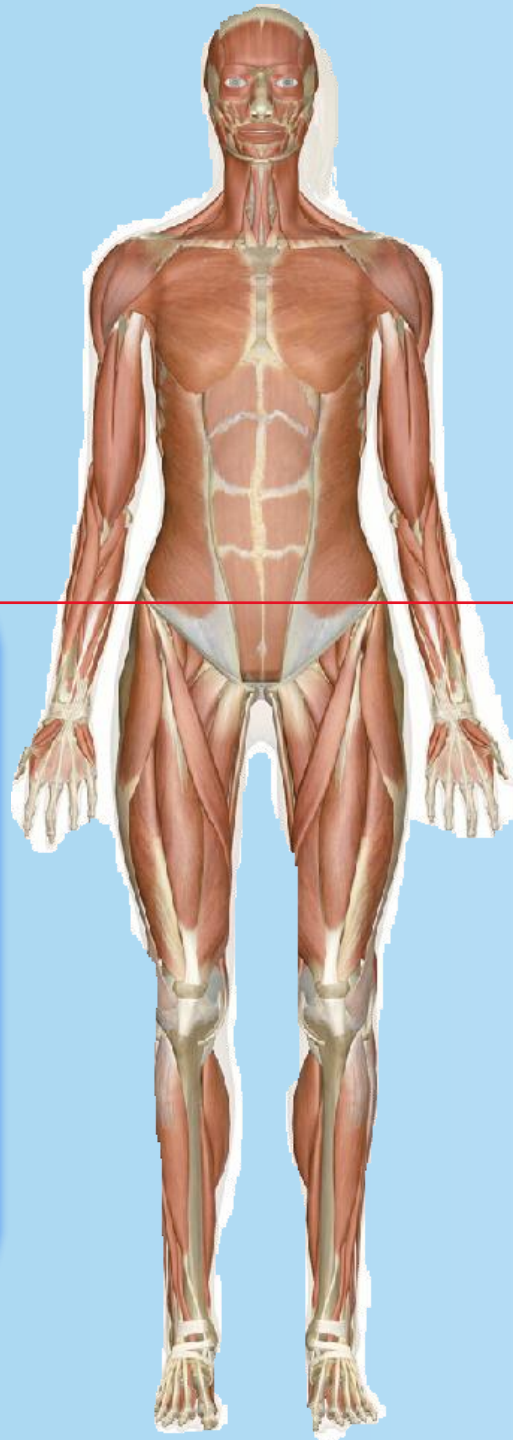


Pelvis & Lower limb overview

– clinical rotation, practical training and landmarks

By Glenn André Breivik



- ★ Inguinal canal and spermatic cord
- ★ Hasselbach and femoral triangles with femoral/adductor canal
- ★ Piriformis muscle and general buttocks anatomy
 - ★ Iliotibial canal
- ★ Superficial and deep pes anserinus
 - ★ Foot drop
 - ★ Sural nerve

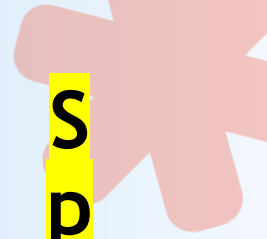


actually
learn how stomach,
liver,
pancreas, intestine
work internally



learn
about weird
triangles,
ligaments, spaces,
borders, fascia

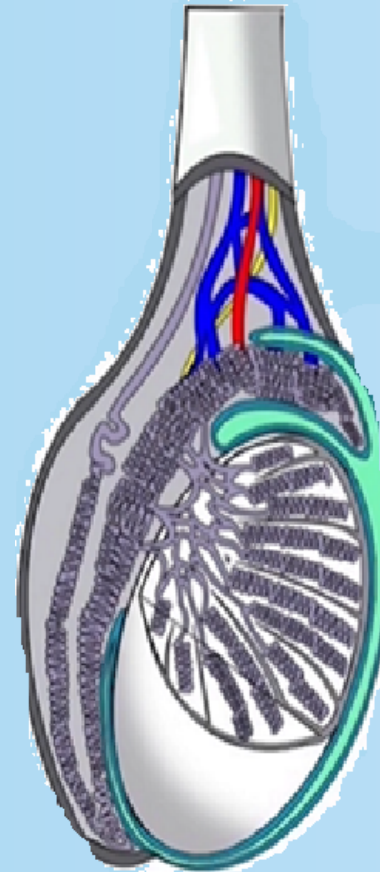
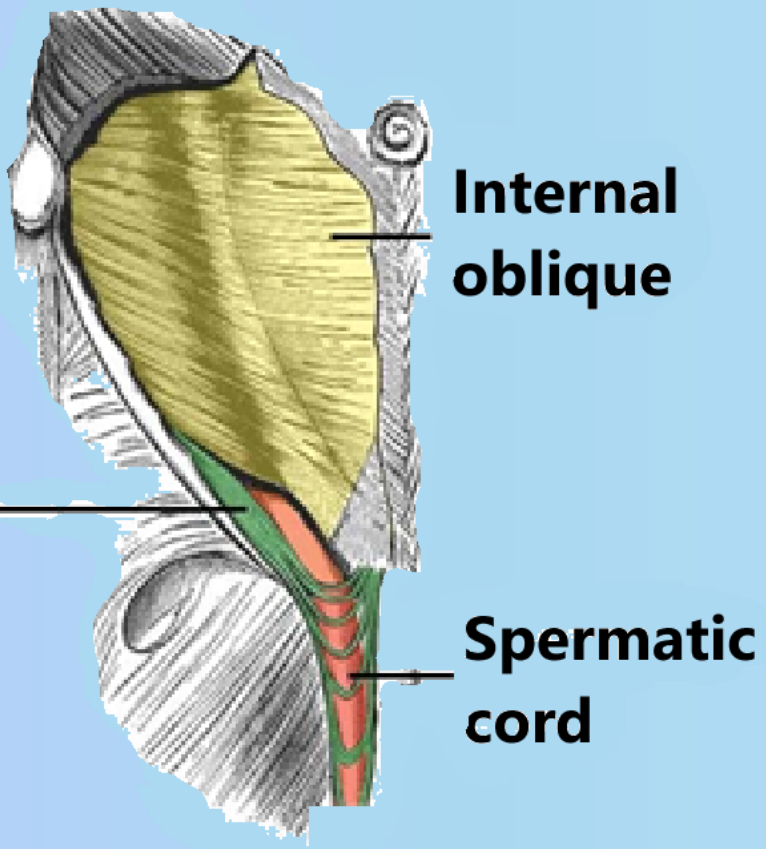
Contents	Reasoning
Ductus deferens (Vas deferens)	A spermatic duct brings sperm cells to the ejaculatory duct (which is outside of the spermatic cord).
Arteries (cremasteric and testicular)	Supplies the cremaster muscle, testes and epididymis + spermatic cord itself
Nerve to cremaster muscle	Motorically innervates the cremasteric muscle
Pampiniform plexus (testicular veins)	Venous drainage of the testes, epididymis and spermatic cord itself. Drains into testicular vein
Lymphatic vessels	Runs through spermatic cord to get into the abdomen, into lumbar → para-aortic lymph nodes
Testicular sympathetic plexus	Derives from renal and mesenteric plexus. Related to celiac ganglion. Testes are innervated sympathetically by T10 spinal nerves (lesser splanchnic nerves that participate in this plexus) and will course together with the testicular artery
Genital branch from genitofemoral nerve	Innervates the external genitalia



**S
P
E
R
M
A
T
I
C
C
O
R
D**

Cremaster muscle

On the outside,
around the
spermatic cord



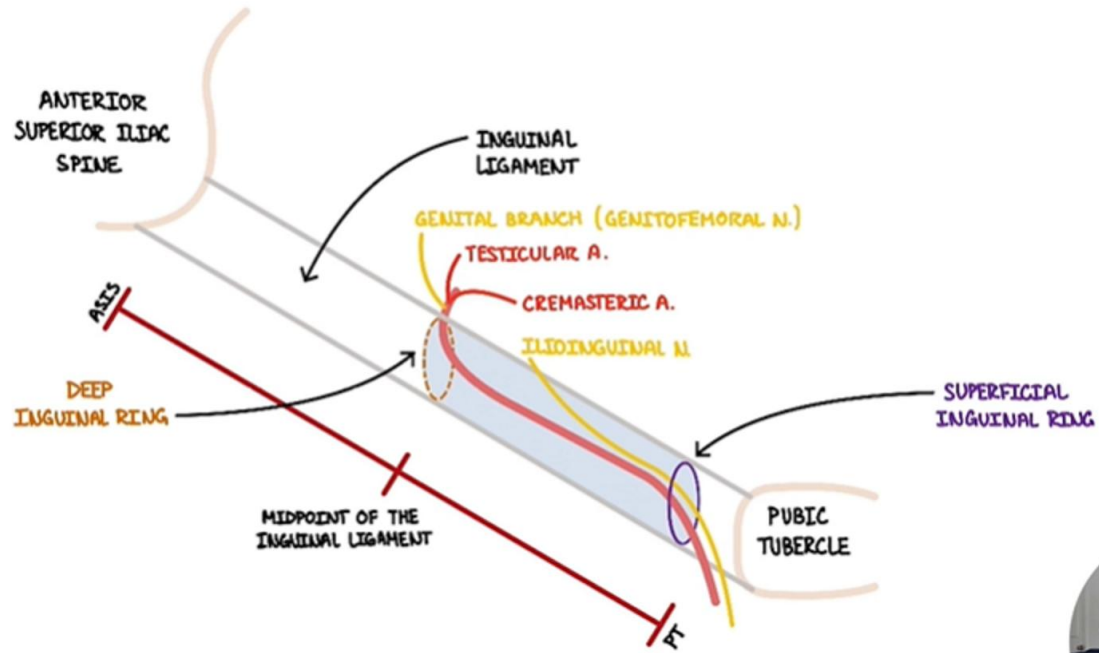
SPERMATIC CORD



EXTERNAL SPERMATIC FASCIA
CREMASTER MUSCLE
INTERNAL SPERMATIC FASCIA

1. TESTICULAR A.
CREMASTERIC A.
A. OF THE DUCTUS DEFERENS
2. PAMPINIFORM PLEXUS → TESTICULAR V.
3. GENITAL BRANCH OF GENITOFEMORAL N.
PARASYMPATHETIC & SYMPATHETIC NN.
4. DUCTUS (VAS) DEFERENS
5. LYMPHATICS

INGUINAL CANAL

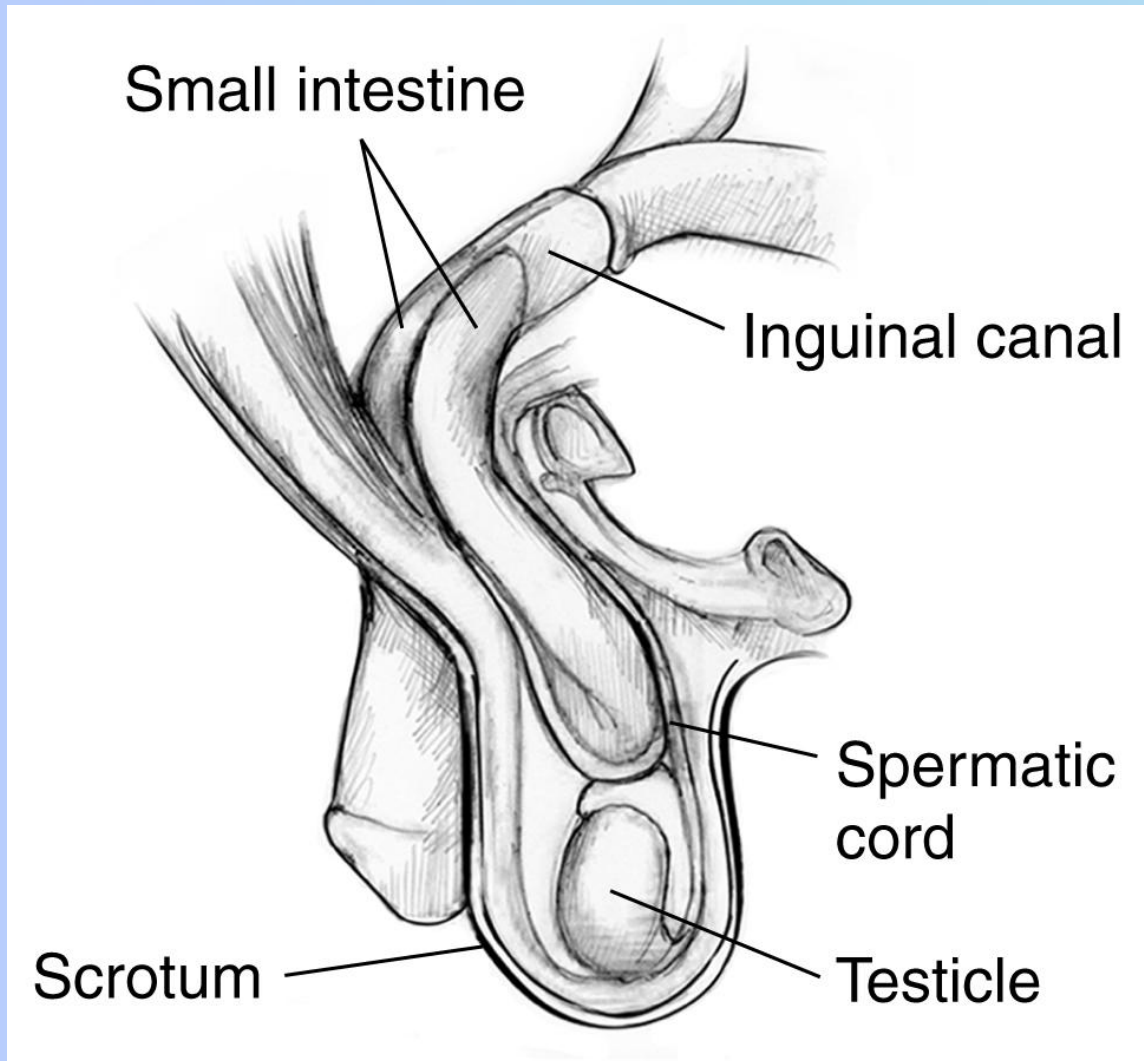


Spermatic cords

- Spermatic cord
 - Cremasteric m. & fascia
 - Ductus (vas) deferens
 - Testicular a.
 - Pampiniform plexus (of veins)
- Testes



In which main scenario can the spermatic cord/components inside get damaged?



- What is the main difference between direct and indirect inguinal hernia?

Indirect inguinal hernia:

Enters the deep inguinal ring to enter the inguinal canal. This hernia is much more likely to enter the scrotum by exiting the superficial inguinal ring.

Direct inguinal hernia:

Will ***NOT*** enter the inguinal canal through the **deep inguinal ring** as it enters the inguinal canal/area around it ***DIRECTLY***. Intestines may exit through the superficial inguinal canal, but this is rare.

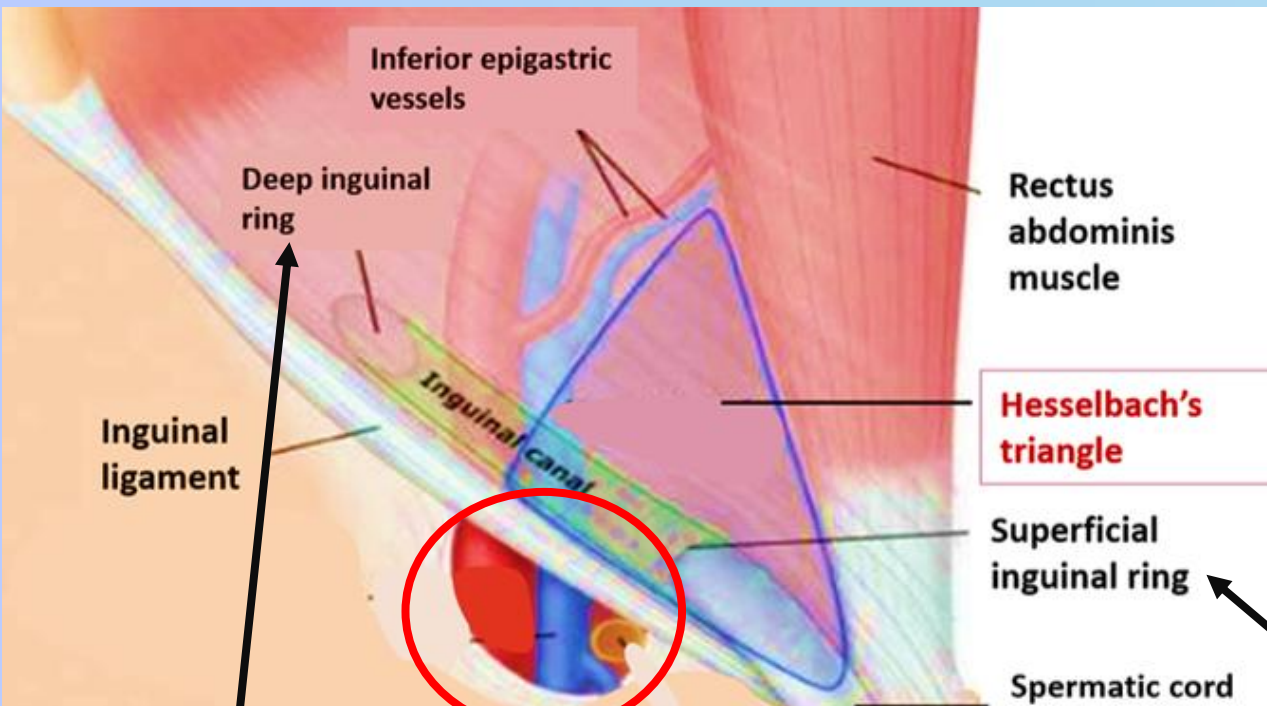
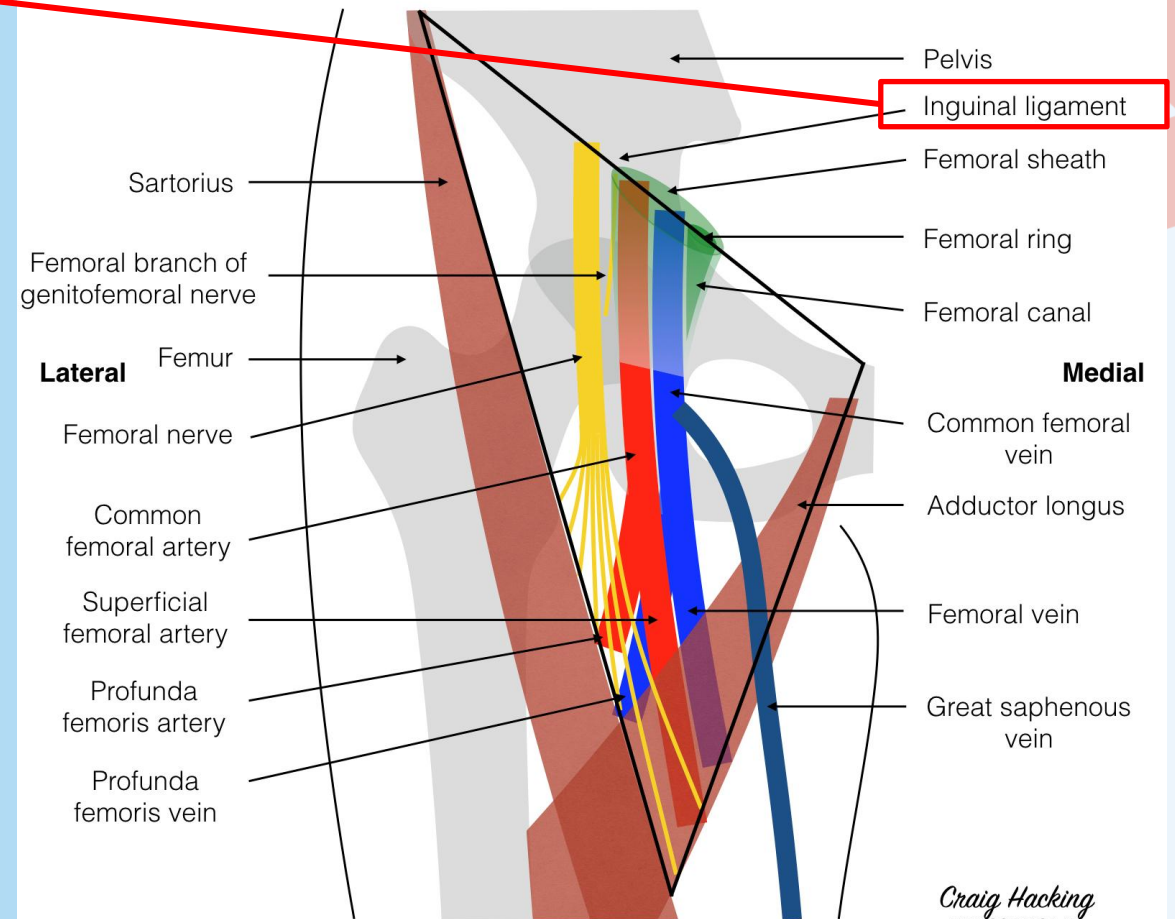
Hasselbach and femoral triangles

Hasselbach's triangle have 3 borders:

1. **Lateral border:**
Inferior epigastric vessels
2. **Medial border:**
Rectus abdominis
3. **Inferior border:**
Inguinal ligament.

Both have
inguinal
ligament as a
border

FEMORAL TRIANGLE



Outside of Hasselbach's!

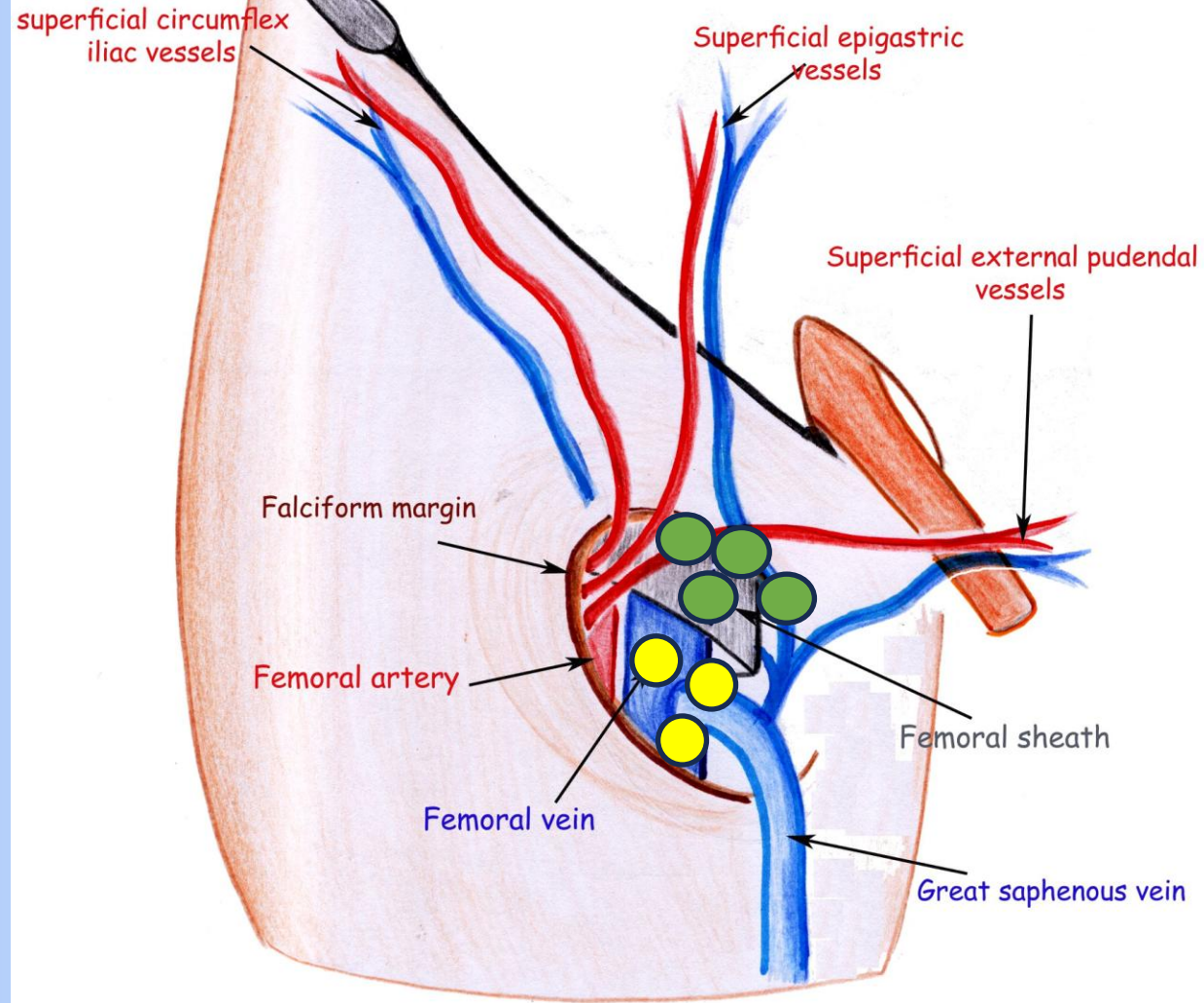
What is this?

Inside Hasselbach's!

Craig Hacking
2019 CC-BY-SA-NC
Radiopaedia.org

Saphenous opening

Located on top of the femoral triangle

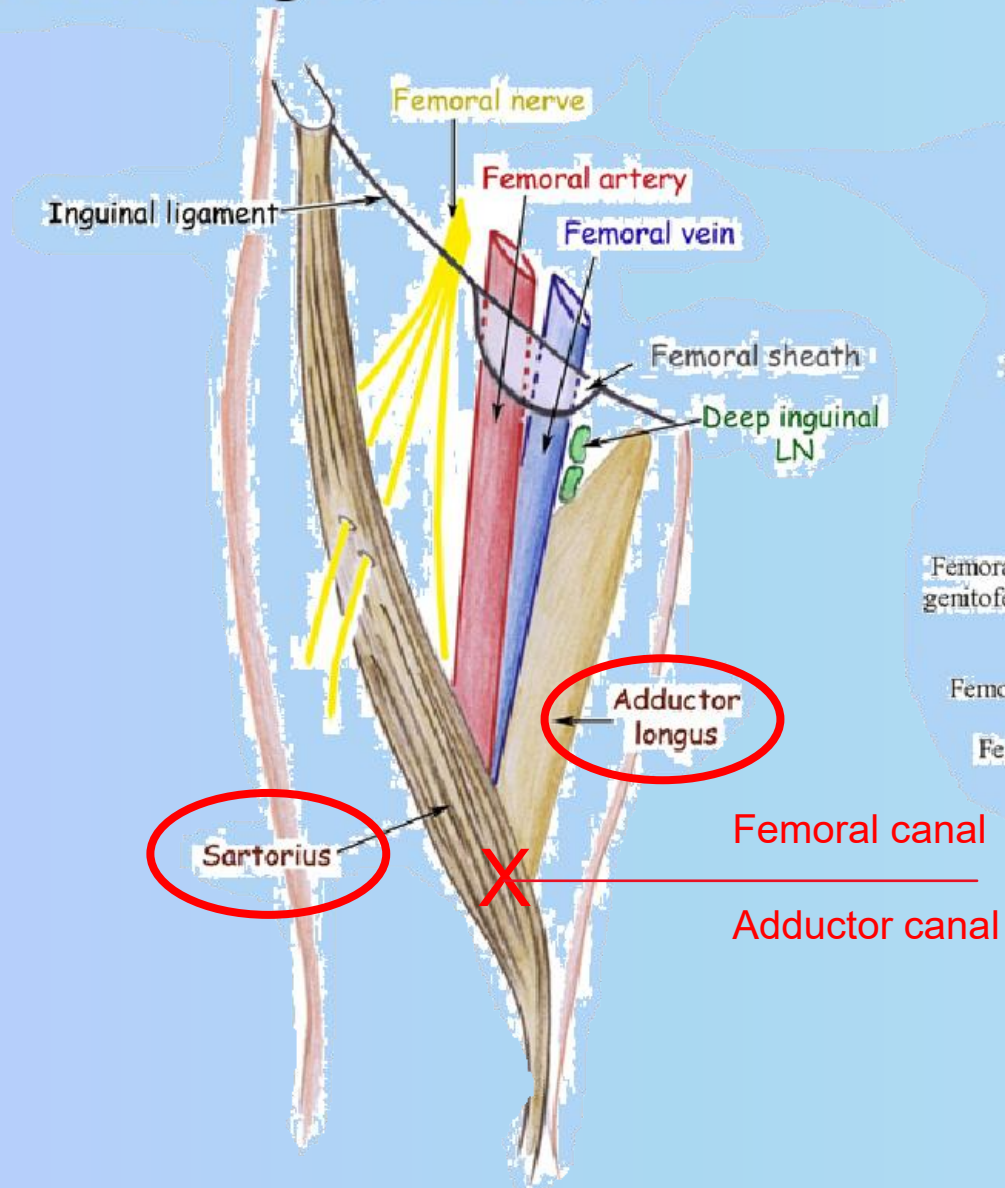


Deep and superficial inguinal lymph nodes are separated by the femoral sheath

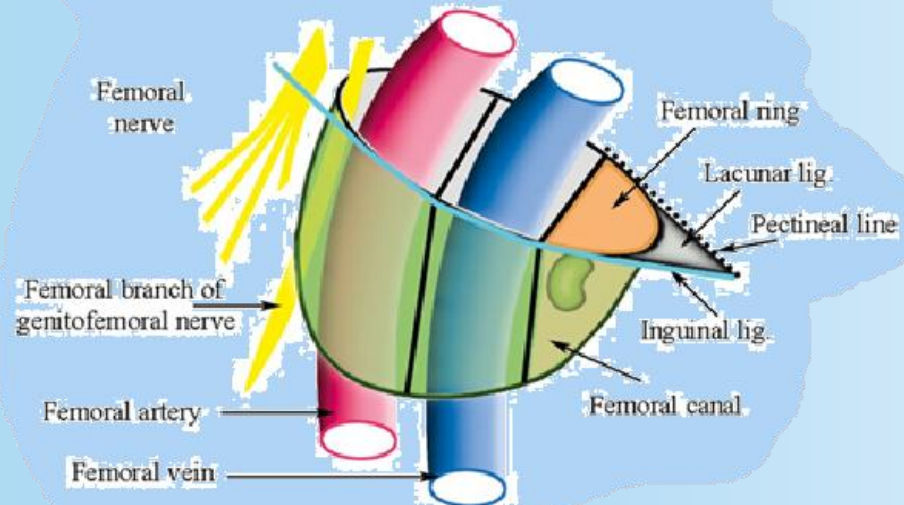
- **Superficial inguinal lymph nodes**
 - Medial malleolus (great saphenous vein)
- **Deep inguinal lymph nodes**
 - Lateral malleolus (lesser saphenous vein)

Femoral canal (triangle) & adductor canal

Femoral triangle/Canal, contents



Femoral sheath

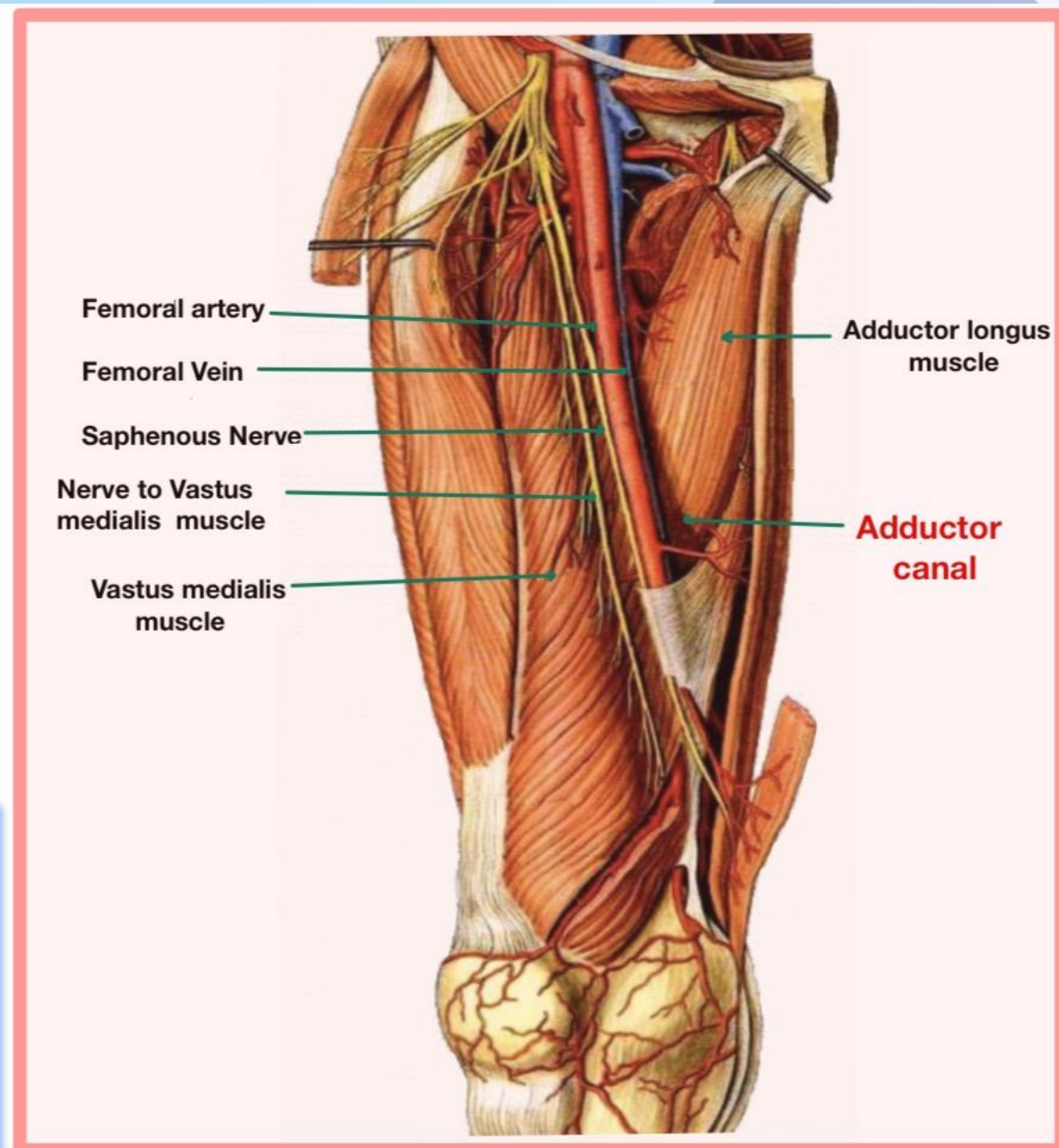
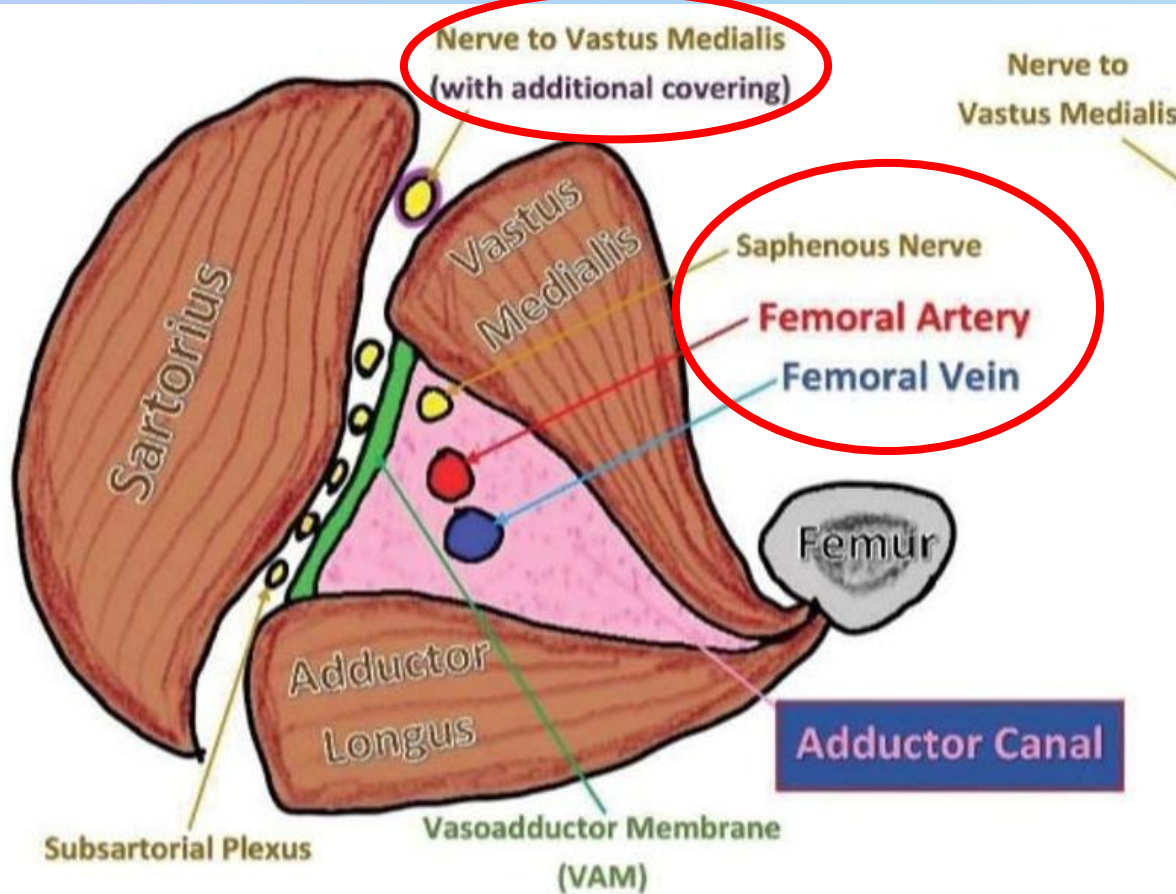


NAV = Nerve, Artery, Vein
→ From medial to lateral

VAN = Vein, Artery, Nerve
→ From lateral to medial



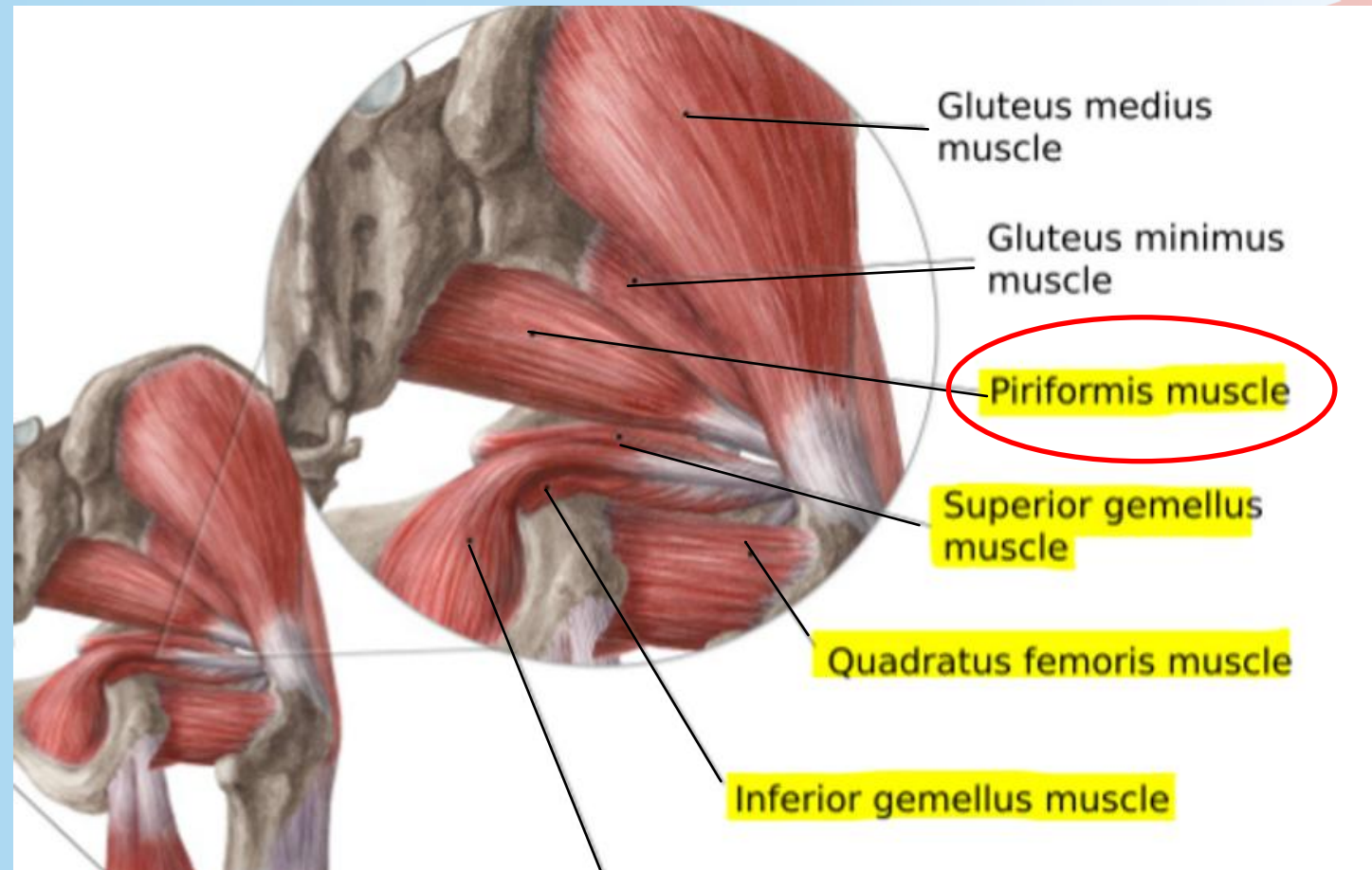
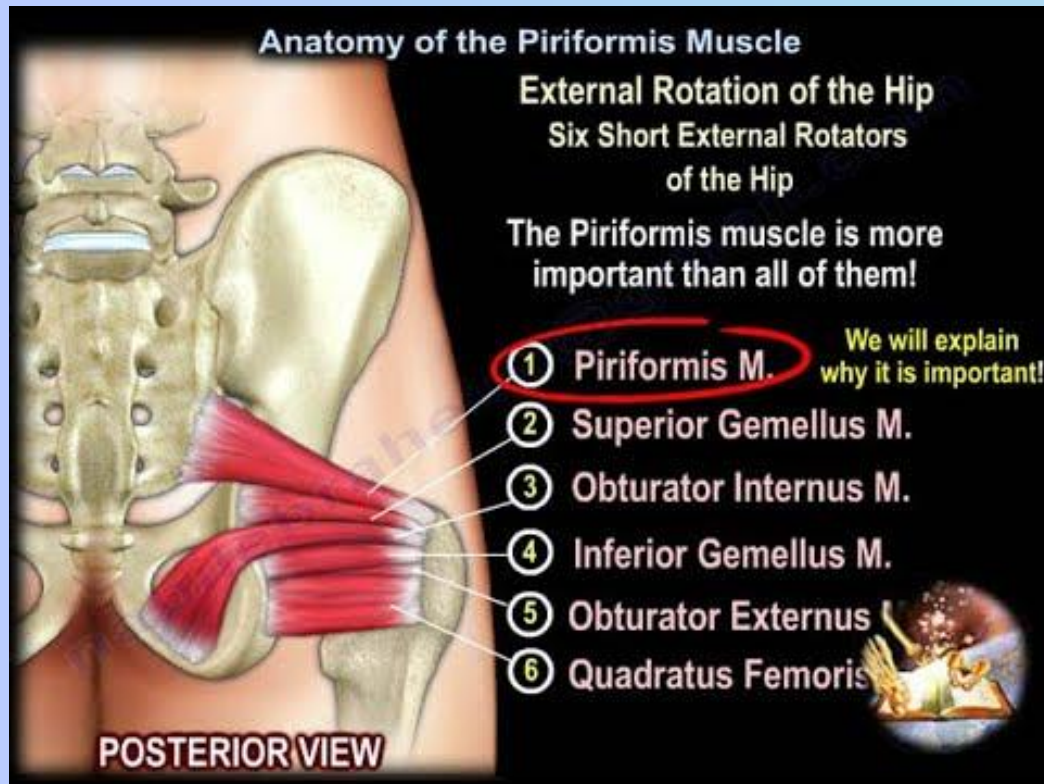
Adductor canal (Hunter`s canal)



1. Sartorius and Adductor longus will cross to «start» adductor canal and «end» femoral canal.

2. **Femoral nerve** is **NOT** part of adductor canal – **Saphenous nerve and nerve to vastus medialis** are.

«Buttocks anatomy»





1. Quadratus femoris muscle
2. Iliacus muscle
3. Sciatic nerve



1. Piriformis
2. Superior gemellus
3. Obturator internus
4. Inferior gemellus
5. Sciatic nerve



Suprapiriform and infrapiriform foramen

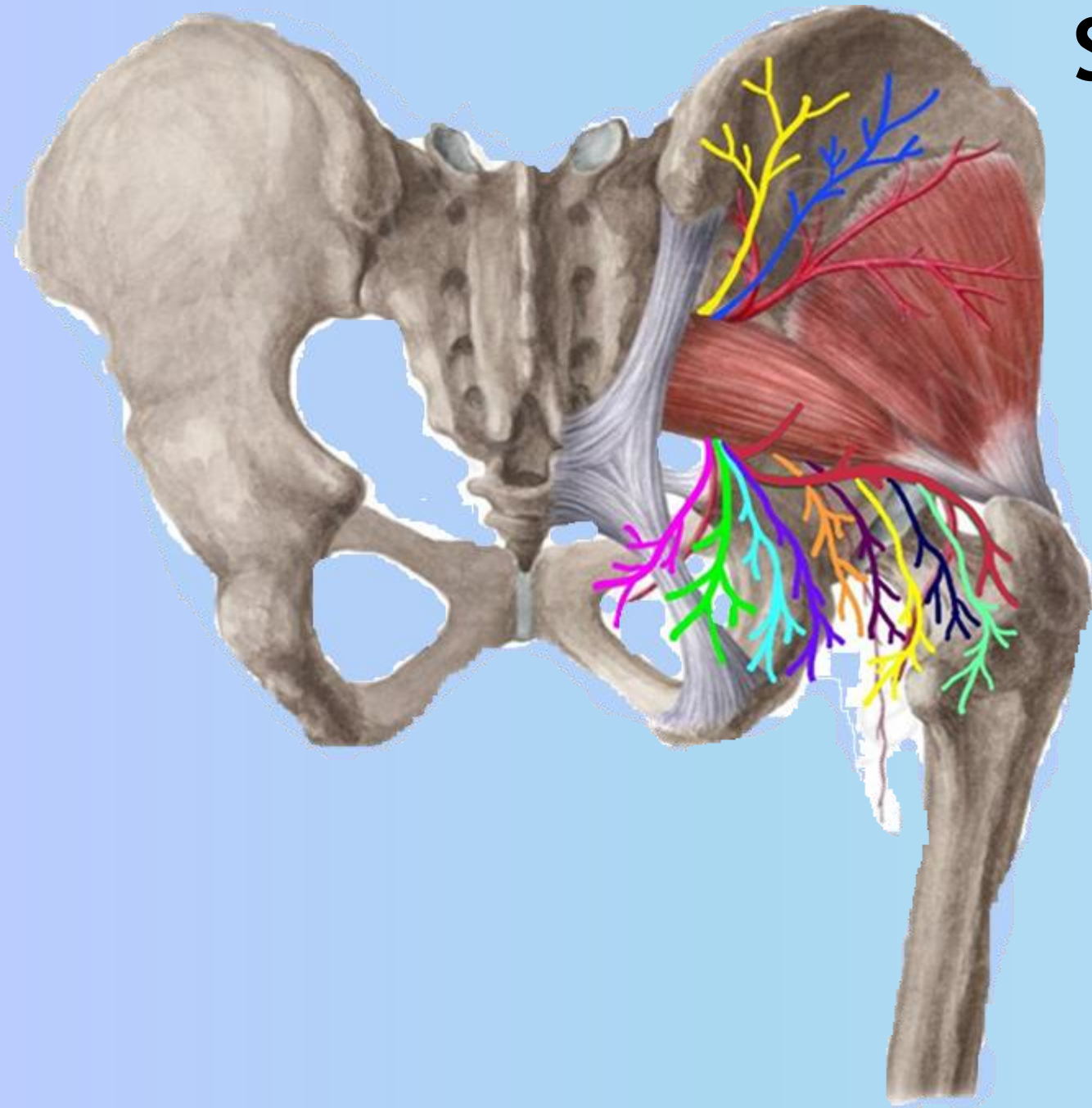
These ligaments form the:

- Greater sciatic foramen
 - Suprapiriform foramen
 - Infrapiriform foramen
- Lesser sciatic foramen



Suprapiriform foramen

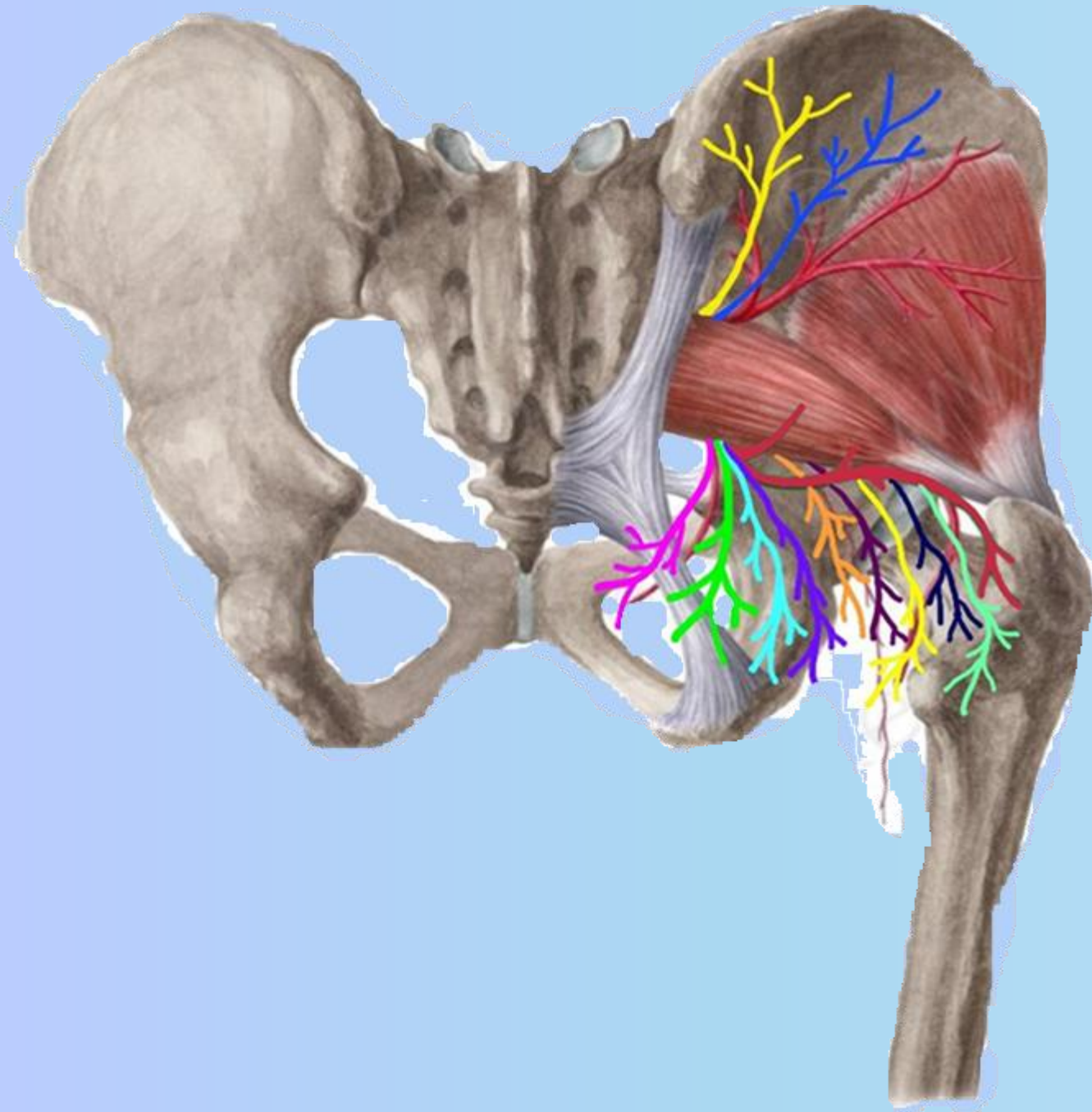
(contents)



1. Superior gluteal nerve
2. Superior gluteal artery
3. Superior gluteal vein (*variable*)

Infrapiriform foramen

(contents)

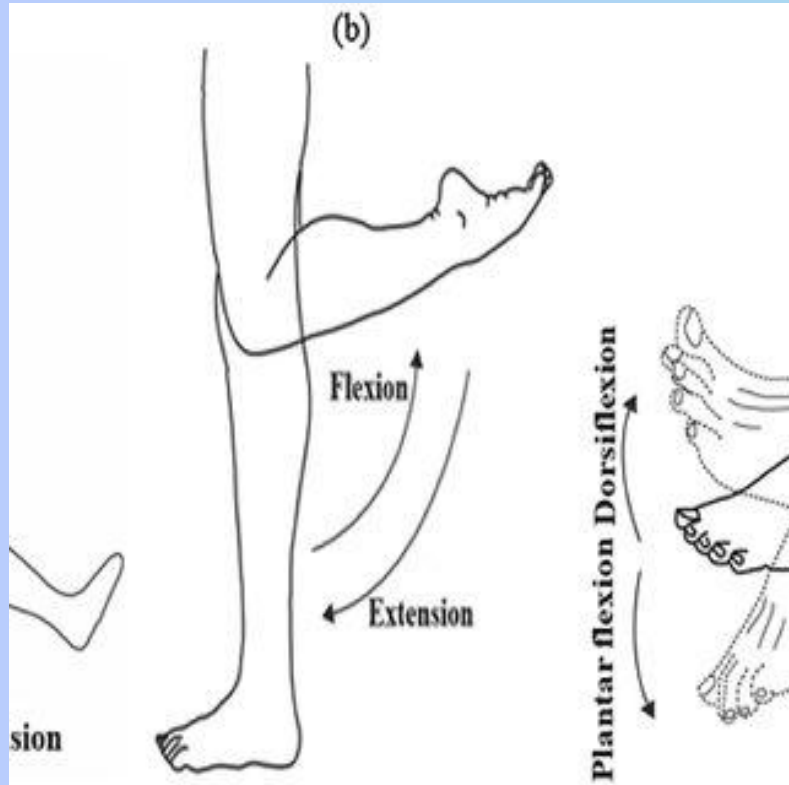


1. Posterior cutaneous nerve of thigh
2. **Inferior gluteal artery**
3. **Inferior gluteal vein**
4. Inferior gluteal nerve
5. **Nerve to quadratus femoris**
6. Pudendal nerve
7. **Internal pudendal artery and vein**
8. Nerve to obturator internus
9. **Sciatic nerve**

Which muscle is the strongest hip extensor?

What is the group of the strongest knee flexors called?

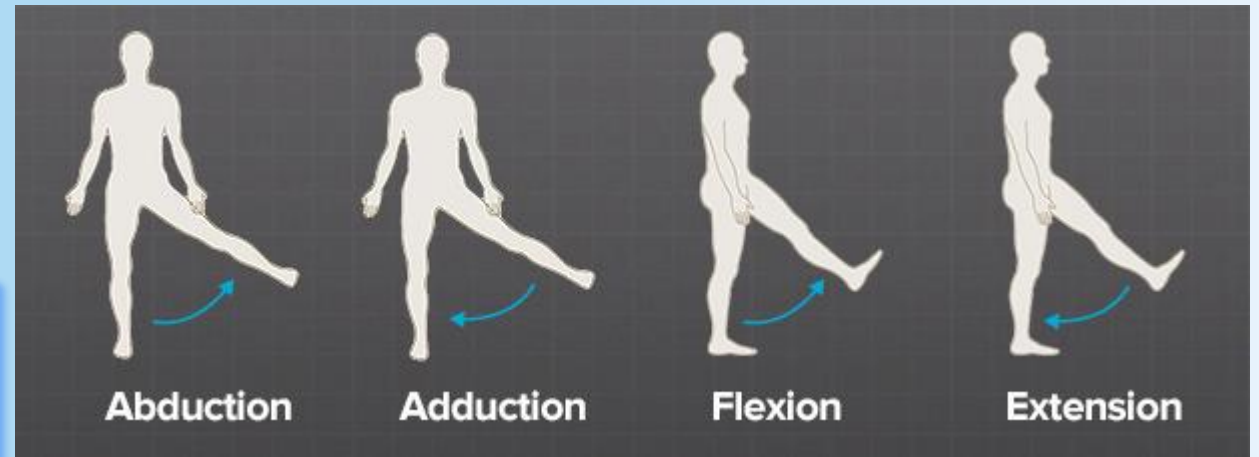
Lower limb movement



Foot movement



Ankle-joint movement



Hip movement

The knee is just like an upside-down elbow:

Both the elbow and knee joints are so-called hinge joints

Iliotibial tract

Tensor fasciae latae muscle is on the hip, not the thigh

Lateral side!



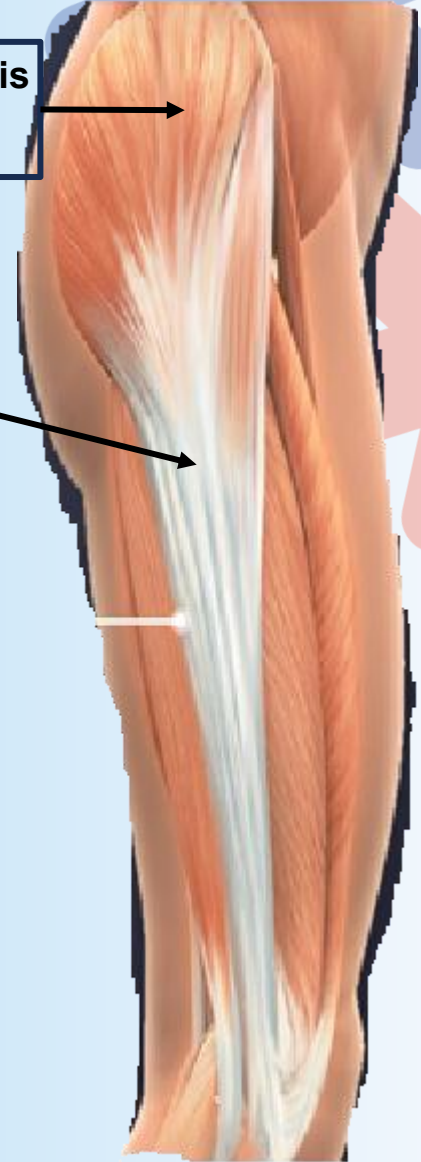
Abduction
with
extension

Static muscle use (standing)

- **Contributors with function:**
Gluteus maximus, gluteus medius & tensor fasciae latae

- **Origin:**
Iliac crest and the aponeurosis of the tensor fasciae latae and gluteus maximus

- **Attachment:**
Gerdy`s tubercle on the lateral condyle of the tibia.



Which important anatomical structures/components reside within the iliotibial tract?

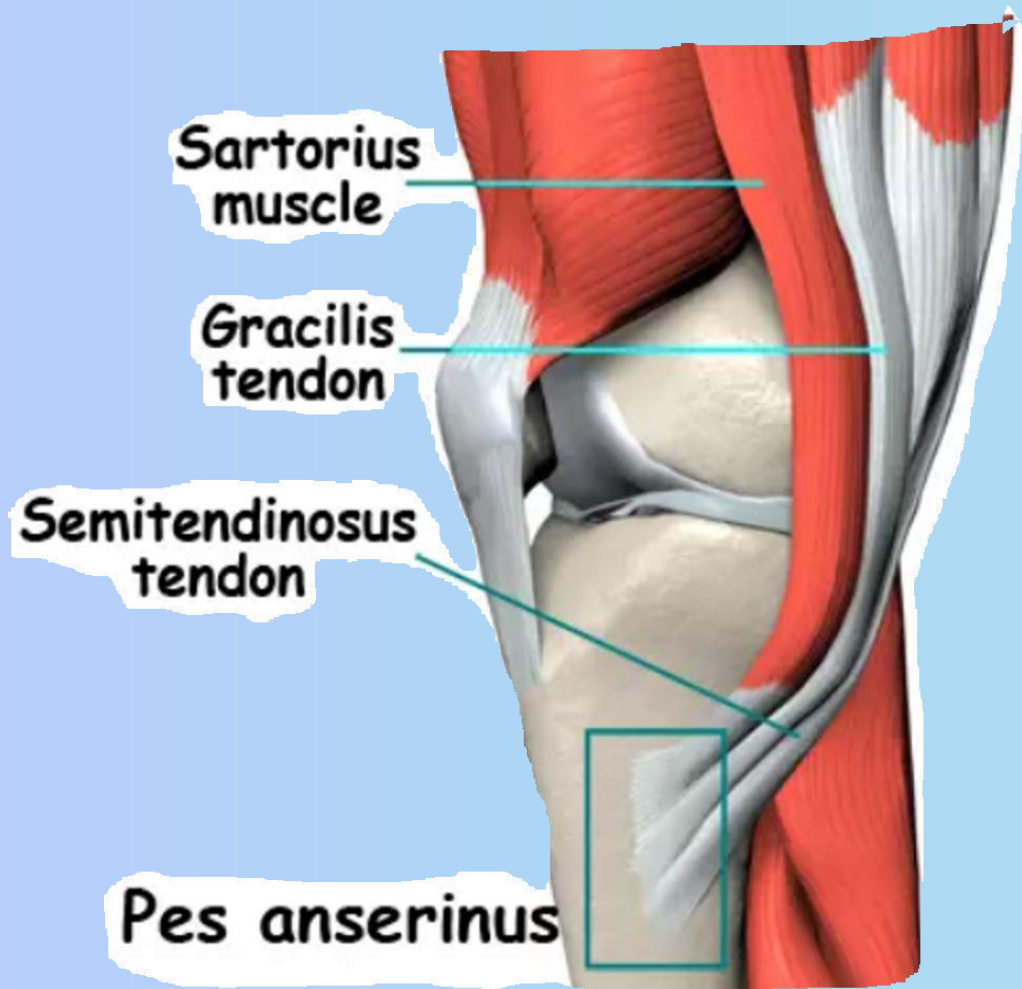
Pes anserinus

(the goosefoot)

What is the main difference between **superficial** and **deep** pes anserinus?

Superficial = Semitendinosus, gracilis and sartorius

Deep = Semimembranosus

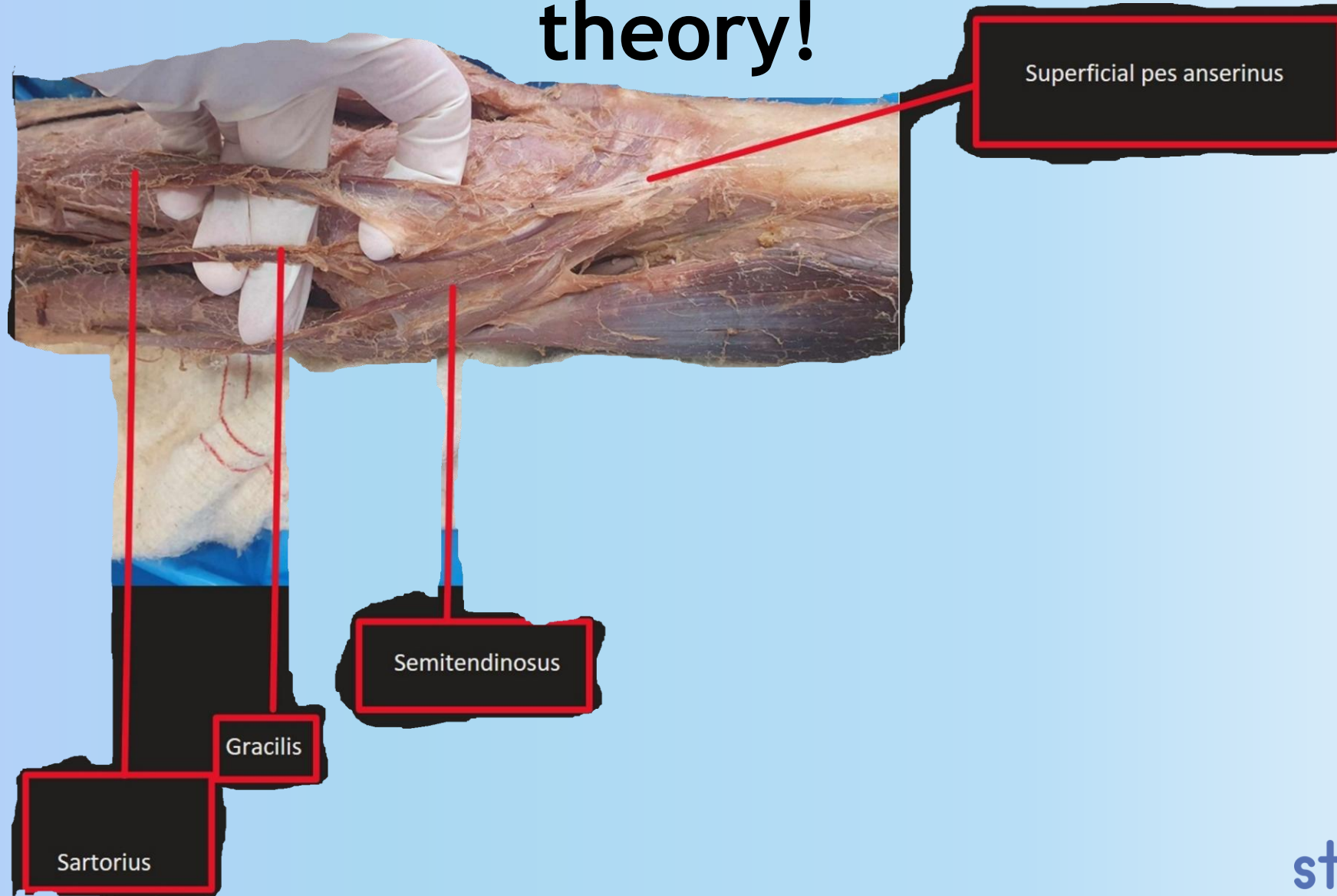


Pes anserinus is located on the medial side of the knee.

Lateral side?

Iliotibial tract!

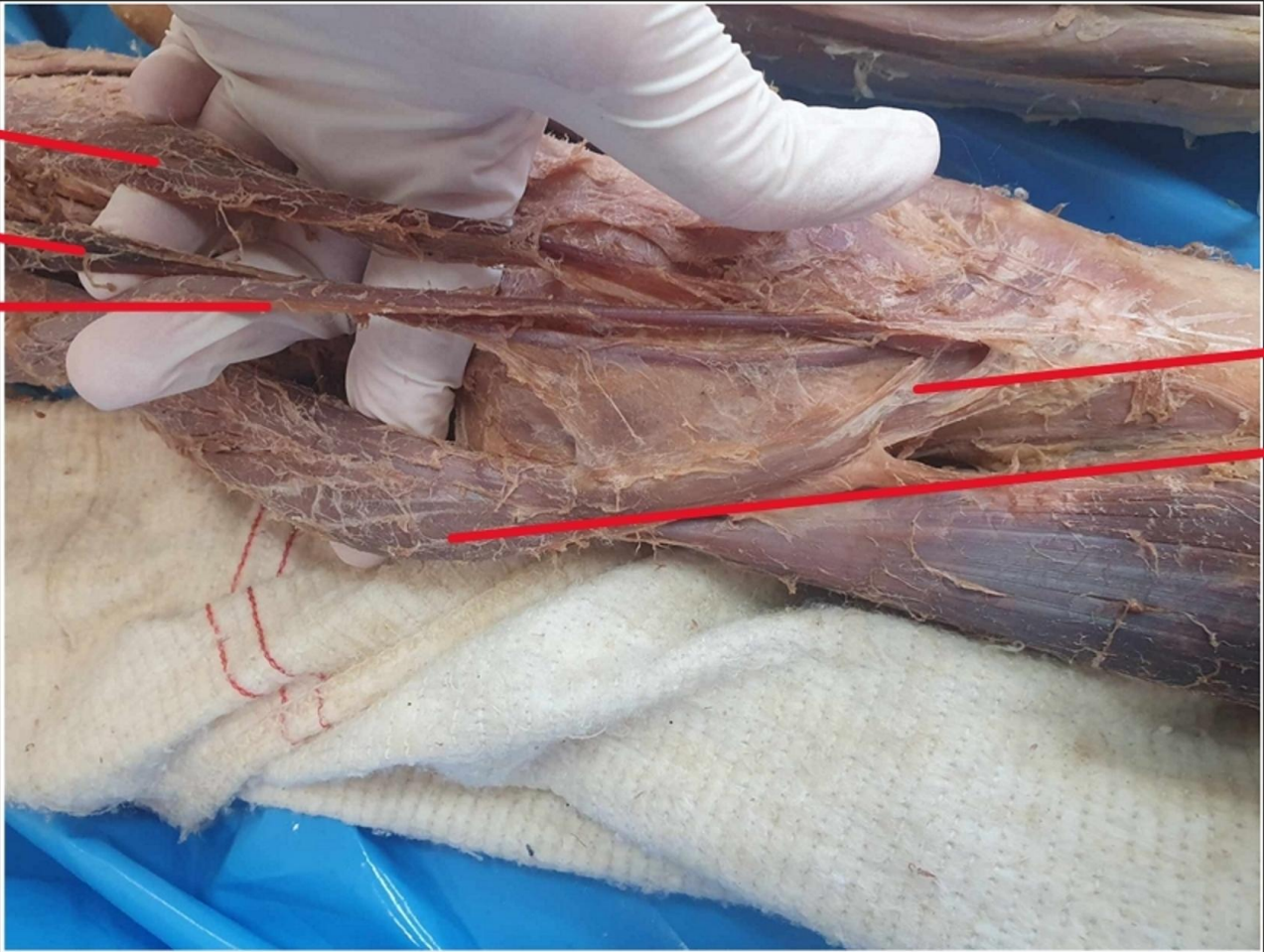
How do we use this practically? Mix in the theory!



Sartorius

Gracilis

Semitendinosus



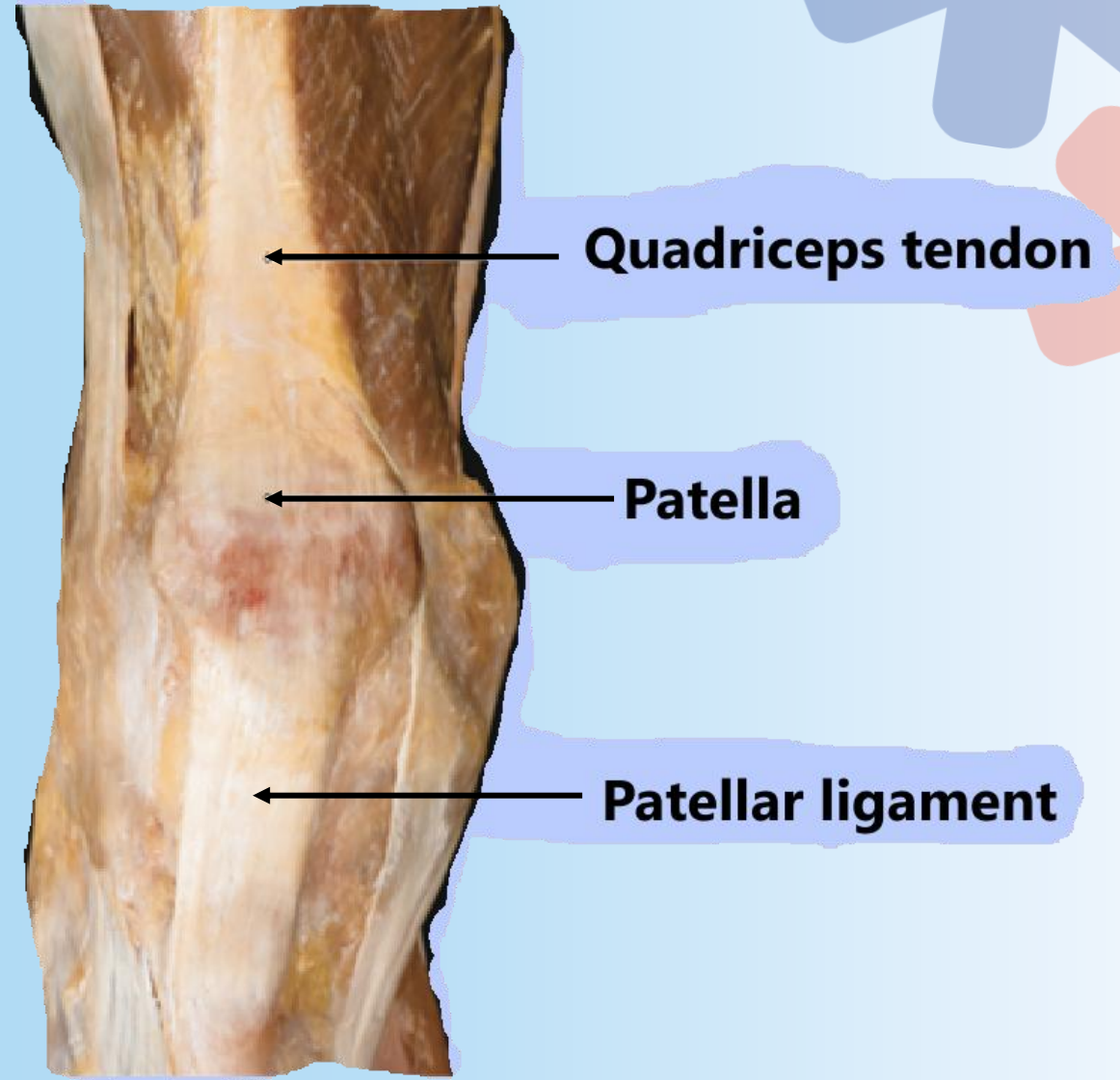
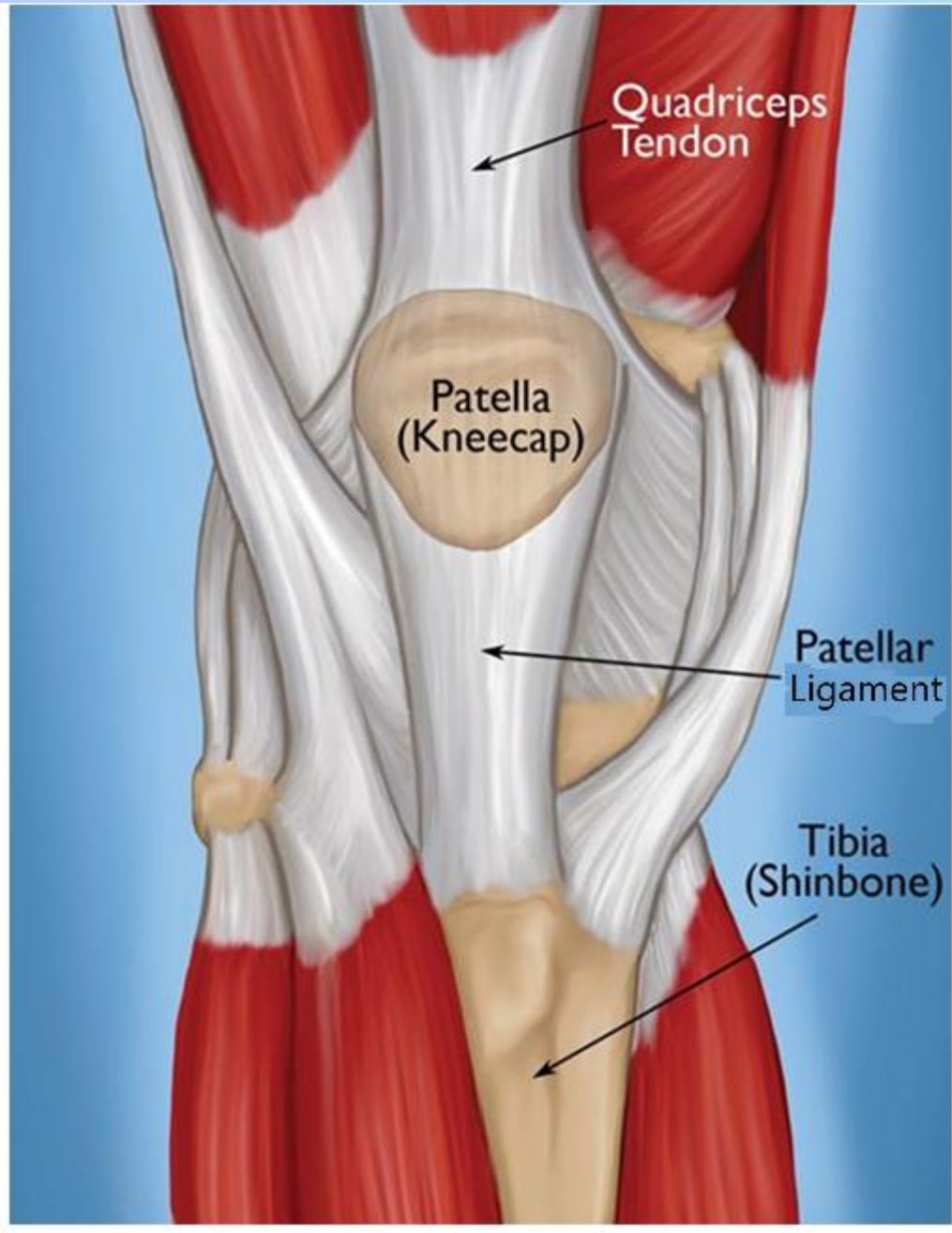
Area towards deep pes anserinus

Semimembranosus



Rule apart from the attachment point, look at the names:

- Semi**TENDINOSUS** because it has a longer tendon
- Semi**MEMBRANOSUS** because it attaches to the «membrane» of pes anerinus.

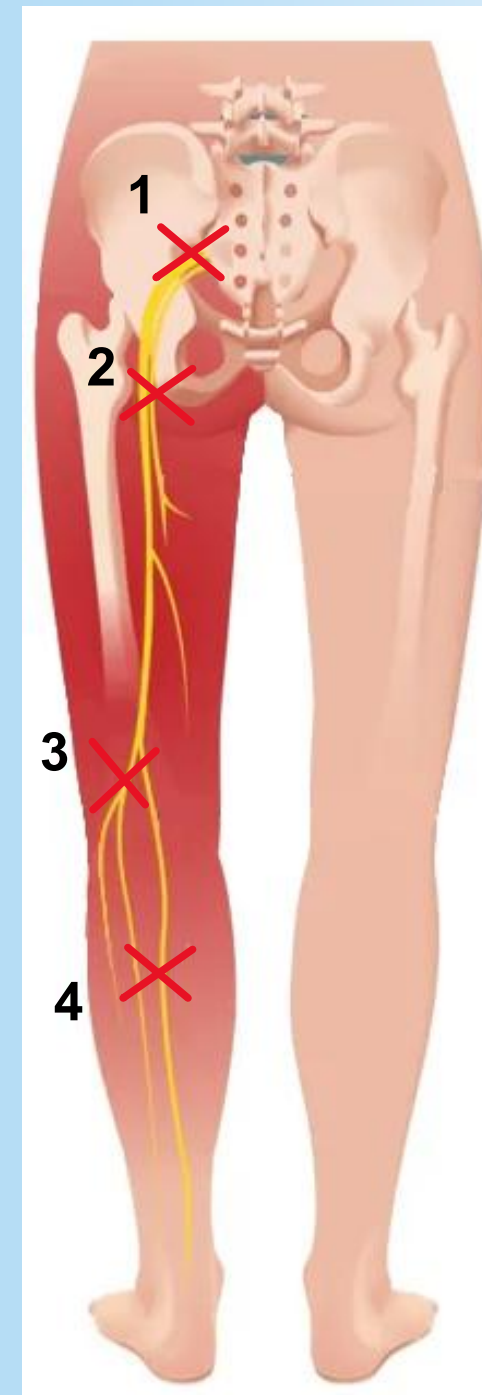


Foot drop

Sciatic nerve

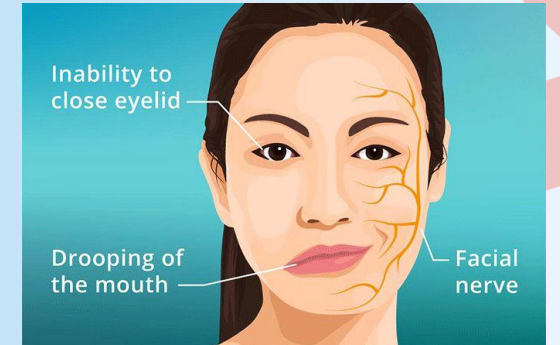
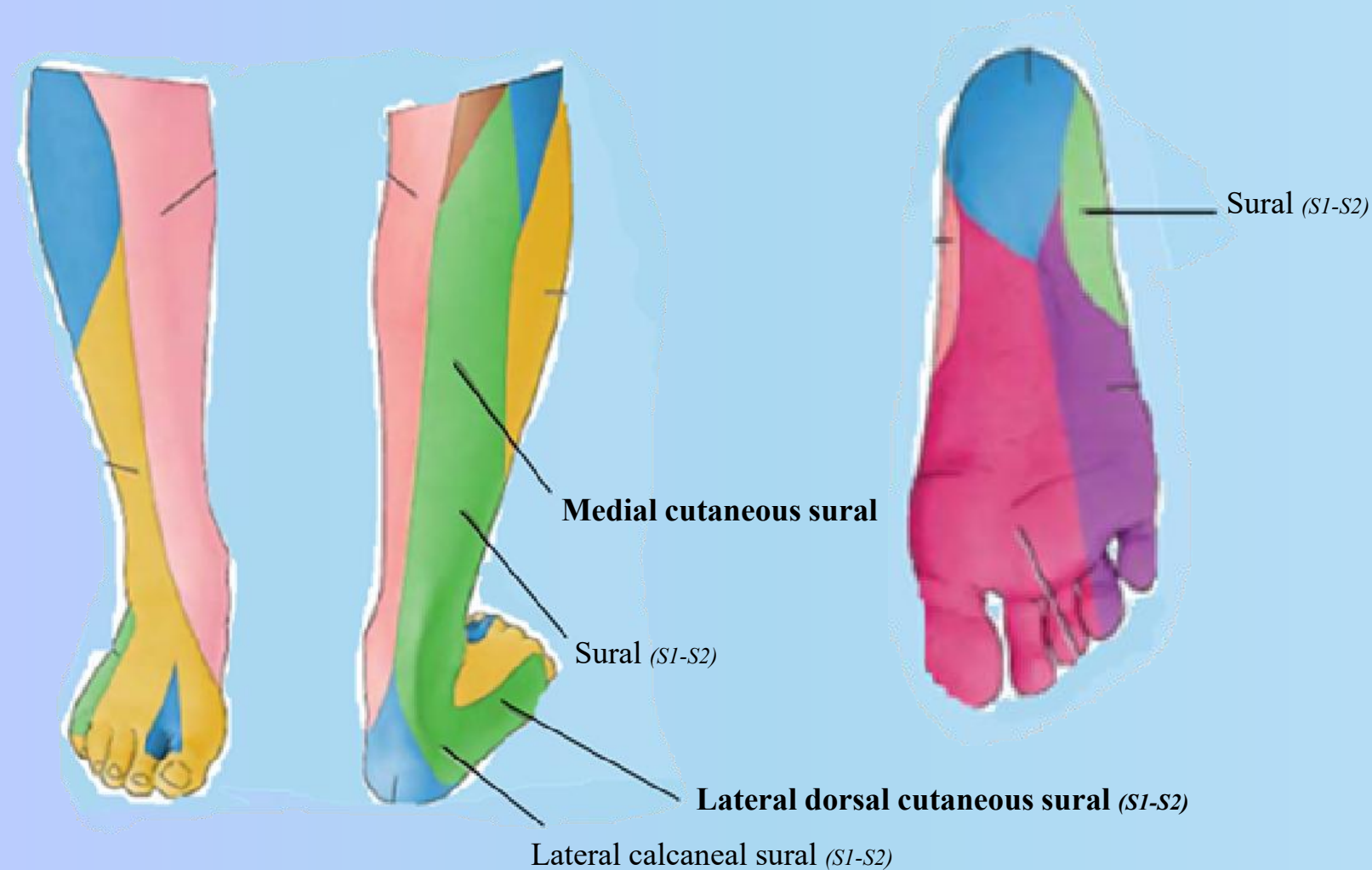
(L4, L5, S1, S2, S3)

1. Nerve root lesion at the spinal cord
2. Compression with gluteus maximus (sitting)
3. Lesion at the common fibular nerve
4. Lesion at the deep fibular nerve



Sural nerve

- **Runs together with lesser saphenous vein (posterolateral side)**
- **Medial and lateral cutaneous branches**
- **Posterolateral innervation – only sensory!**



Clinical box

Clinically important as it can be used for nerve transplantation/grafting in patients with *chronic facial nerve palsy*

Sural nerve together with lesser saphenous vein

Medial side

Lateral side



Lesser saphenous vein

Sural nerve (S1-S2)