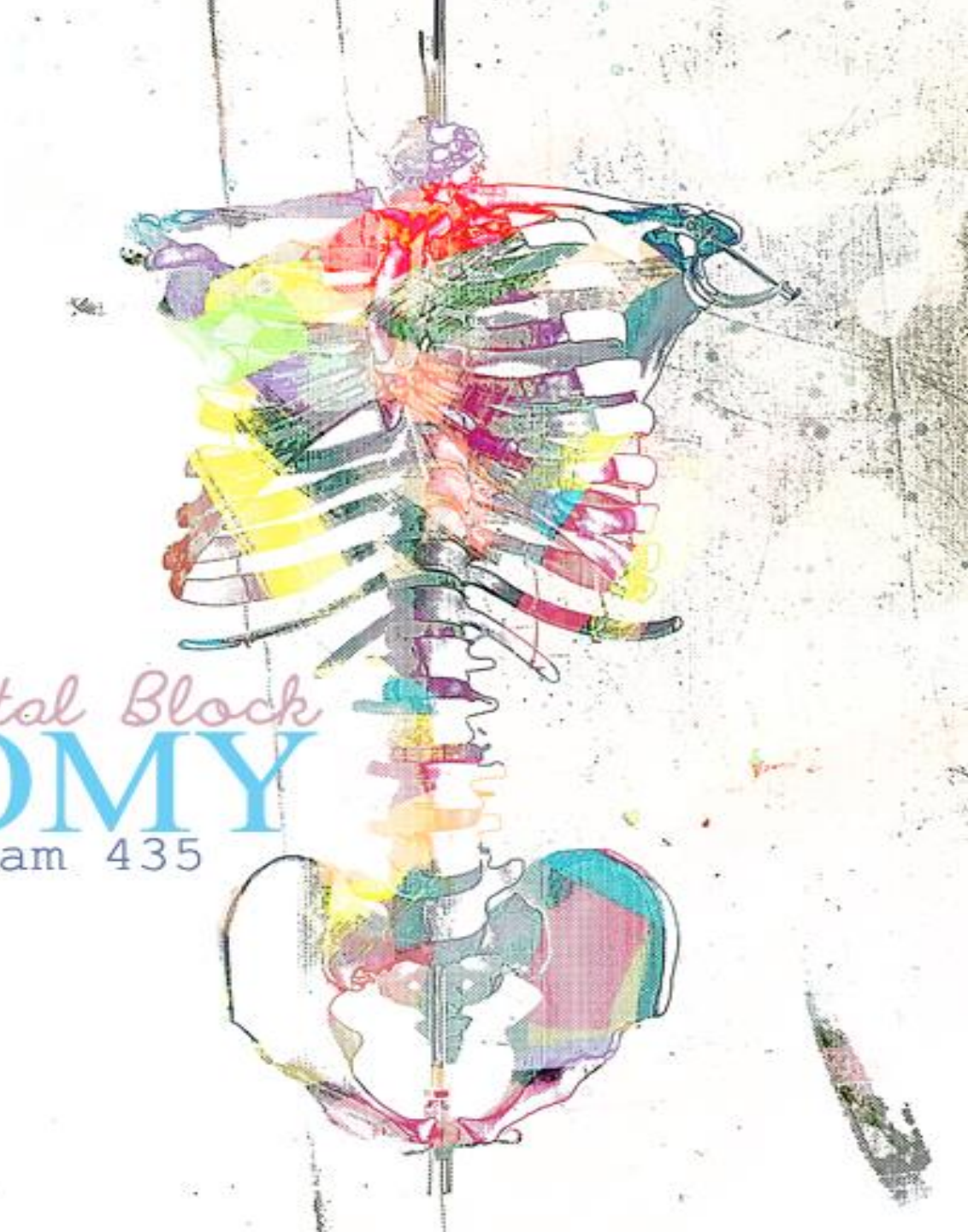
Vascular Anatomy of The Lower Limb



"Spending today complaining about yesterday won't make tomorrow any better"

-Unknown

Musculoskeletal Block

ANATOMY

team 435

COLOR CODES

- IMPORTANT NOTES
- EXTRA NOTES
- DEFINITION

Objectives

At the end of the lecture, students should be able to:

- List the main arteries of the lower limb
- Describe their origin, course distribution & branches
- List the main arterial anastomosis
- List the sites where you feel the arterial pulse
- Differentiate the veins of Lower Limb into superficial & deep veins
- Describe the veins' origins, courses & terminations as well as tributaries
- Some related clinical points

Femoral Artery

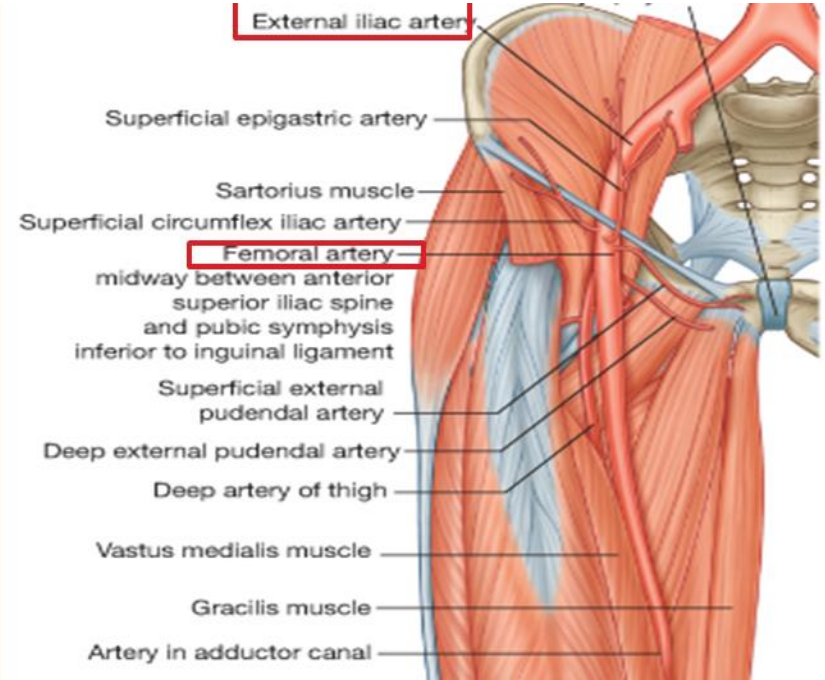
- Main arterial supply to the lower limb.
- **Origin:**
  - Continuation of the **External iliac artery.**
  - Enters the thigh behind the inguinal ligament, midway between the anterior superior iliac spine and the symphysis pubis.

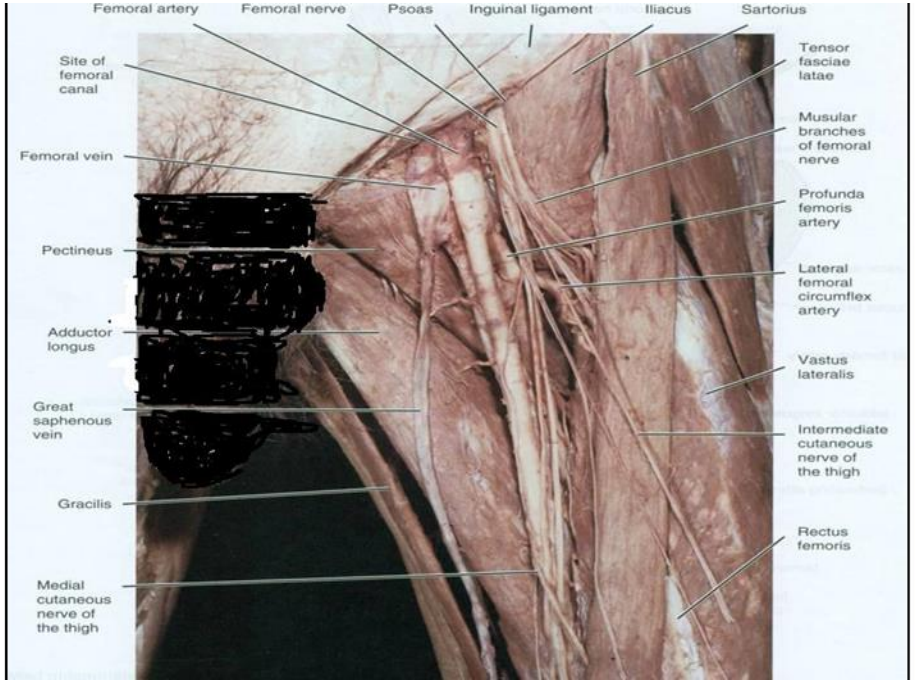
Relations

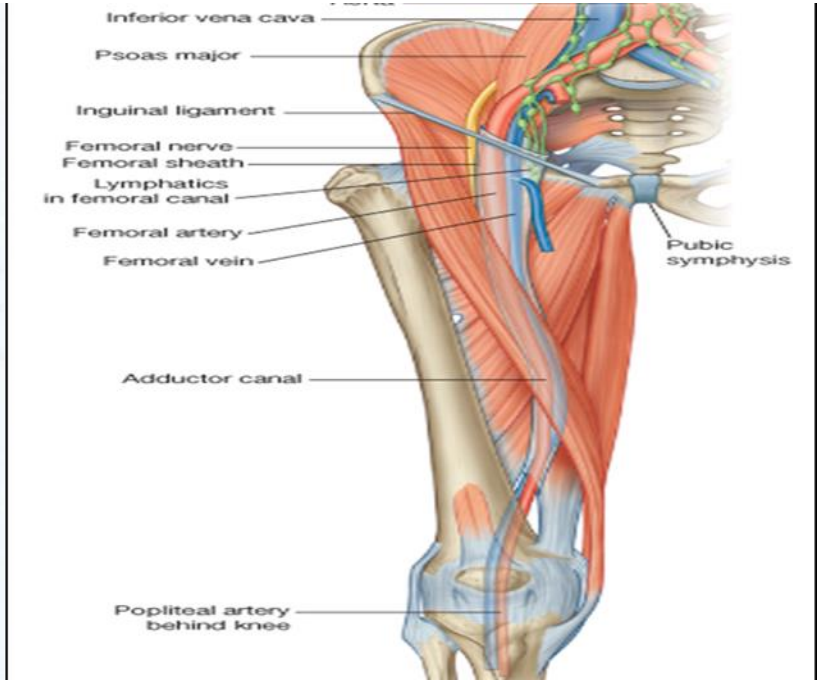
- Anteriorly:
  - Upper part: Skin & fascia.
  - Lower part: Sartorius.
- Posteriorly:
  - Psoas (separates it from the hip joint), Pectineus & Addcutor Longus
- Medially:
  - Femoral vein.
- Laterally :
  - Femoral nerve and its branches

Femoral Artery/Vein

- At the inguinal ligament:
  - The vein is medial to the artery.
- At the apex of the femoral triangle:
  - The vein is posterior to the artery.
- At the opening in the adductor magnus:
  - The vein lies lateral to the artery.







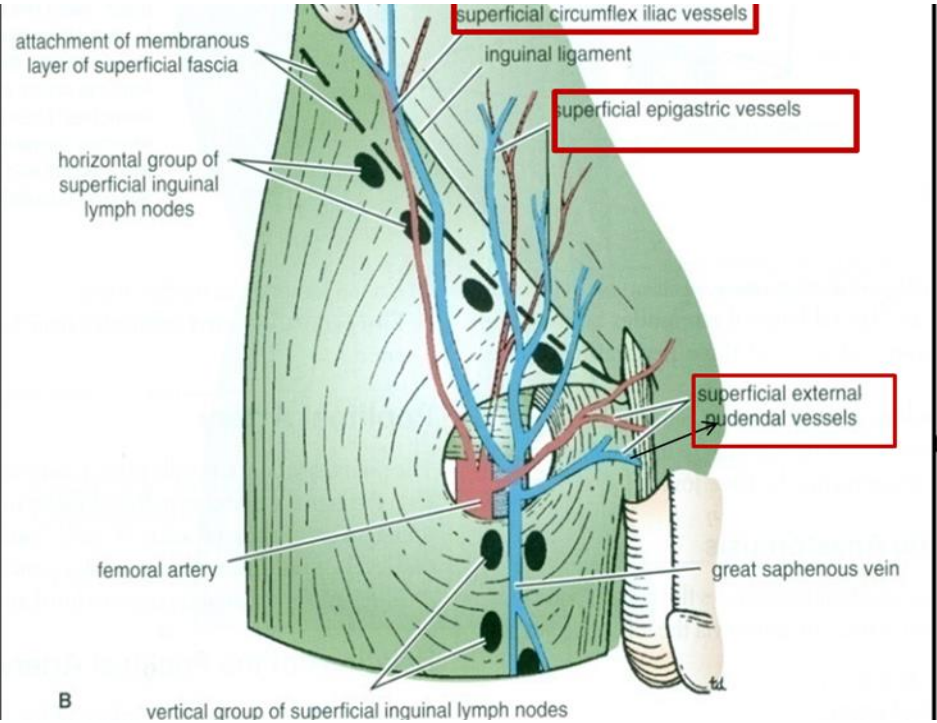
Branches of Femoral Artery

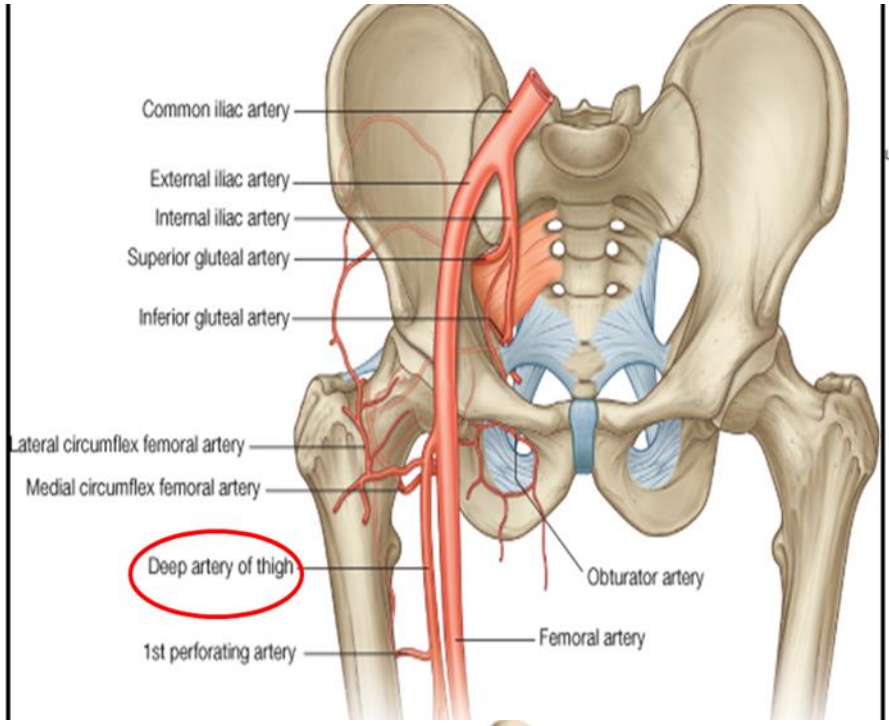
1. Superficial Epigastric.
2. Superficial Circumflex iliac.
3. Superficial External Pudendal.
4. Deep ExternalSPudendal.
5. Profunda Femoris

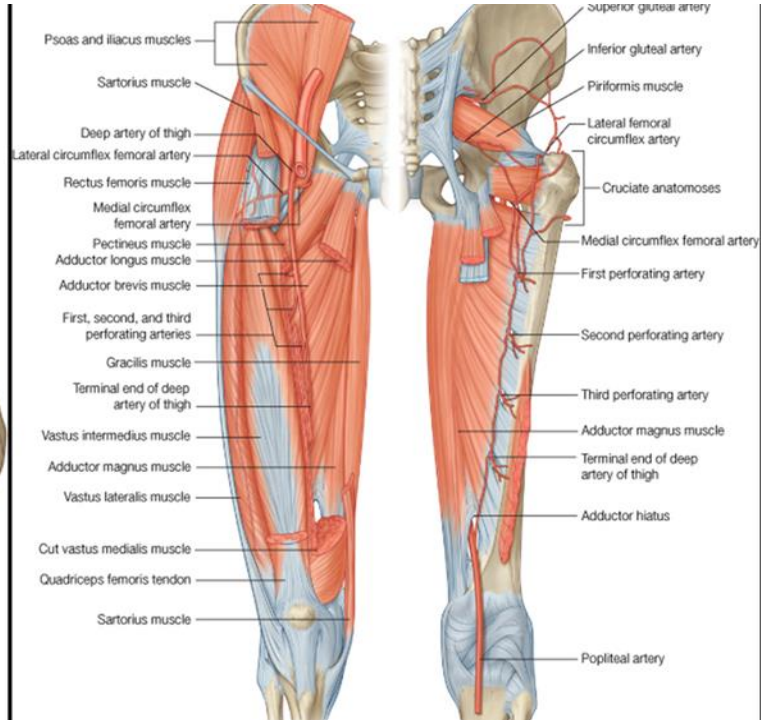
Profunda Femoris Artery → Branches

- It is a large artery supplying the medial compartment of the thigh.
- Arises from the lateral side of the femoral artery (about 4cm below the inguinal ligament).
- Passes medially behind the femoral vessels.

- Medial & Lateral circumflex femoral arteries.
- Three Perforating arteries.
- Profunda Femoris ends by becoming the 4th perforating artery.

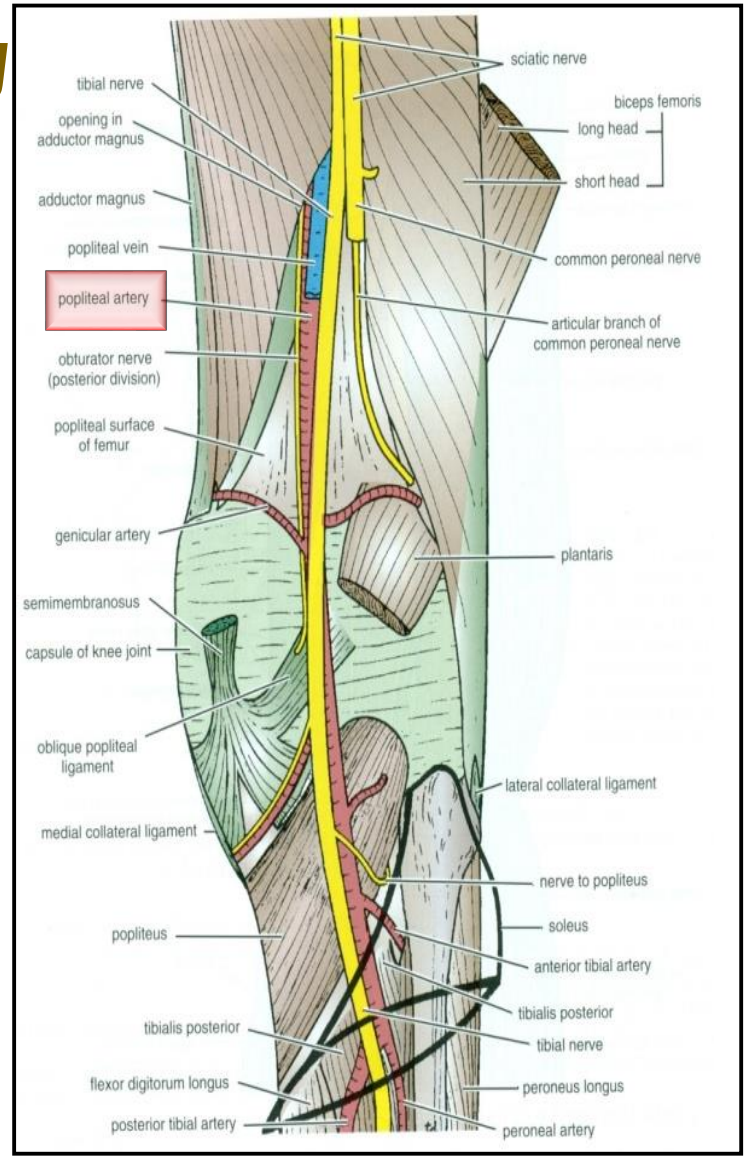






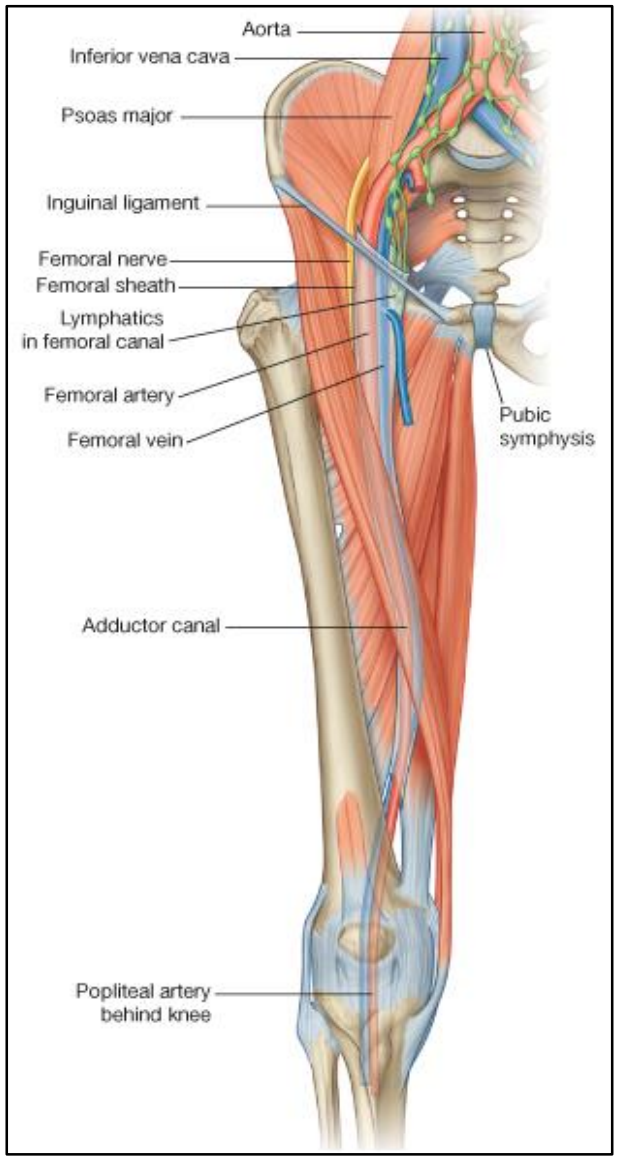
Popliteal Artery

- It is the continuation of femoral artery.
- It enters the popliteal fossa through an opening in the Adductor magnus. (The Adductor hiatus)



Relations & Branches

- **Anteriorly:**
  - Popliteal surface of the femur.
  - The Knee joint.
  - Popliteaus muscle.
- **Posteriorly:**
  - Popliteal vein, tibial nerve.
  - Skin and fascia.
- **Branches:**
  Muscular & articular branches to the knee joint.
- **Termination:**
  - At the lower border of popliteus muscle, where it dividies into:
  - Anterior tibial artery.
  - Posterior tibial artery.

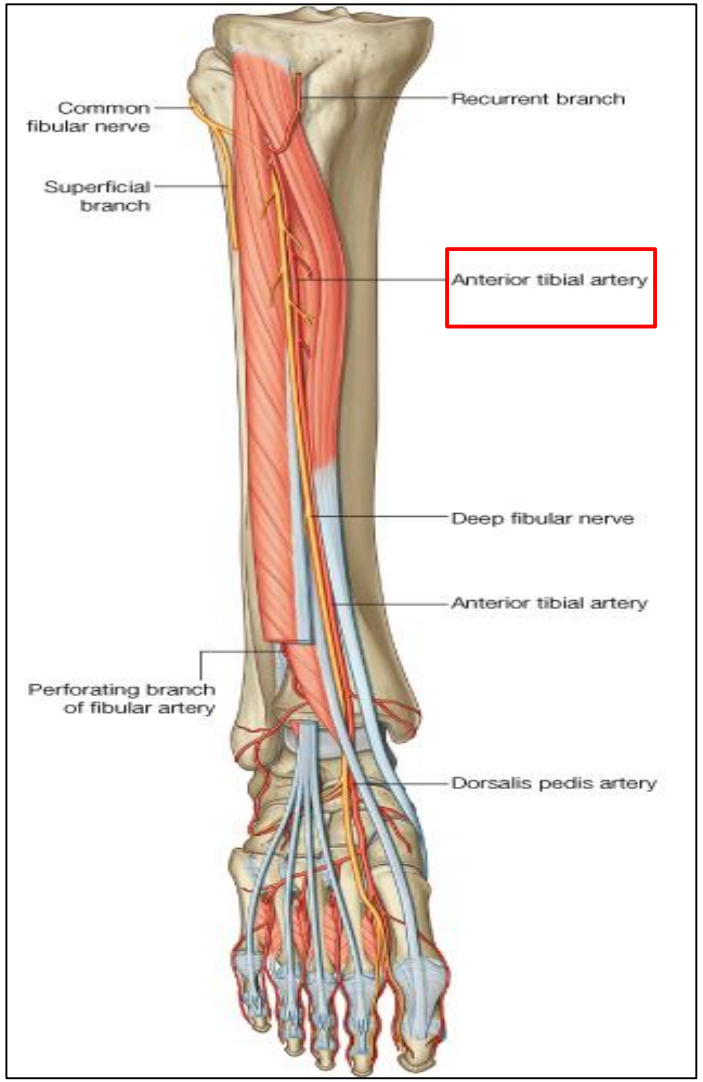


Anterior Tibial Artery

- The smaller of the two terminal branches of the popliteal artery.
- It enters the anterior compartment of the leg through an (oval-shaped) opening in the upper part of the interosseous membrane.
- It descends with the deep peroneal nerve.
- It's Upper part is Deep, and it's Lower part is Superficial

❑ **Branches:**

- Muscular
- Anastomotic



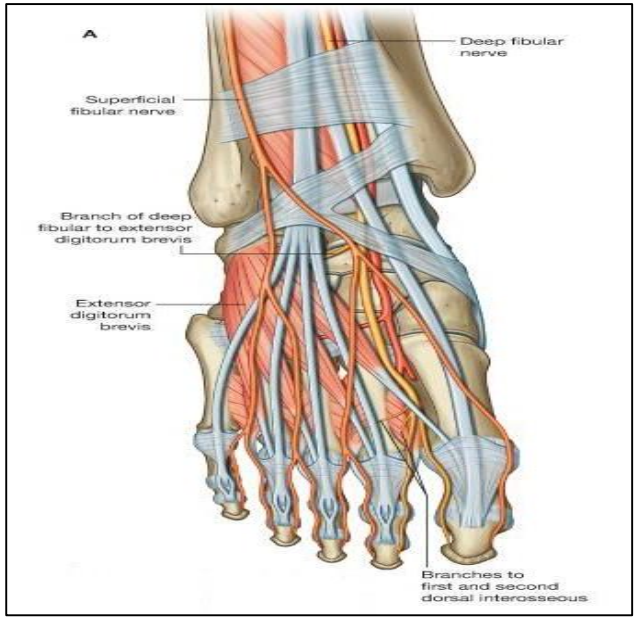
Dorsalis Pedis Artery

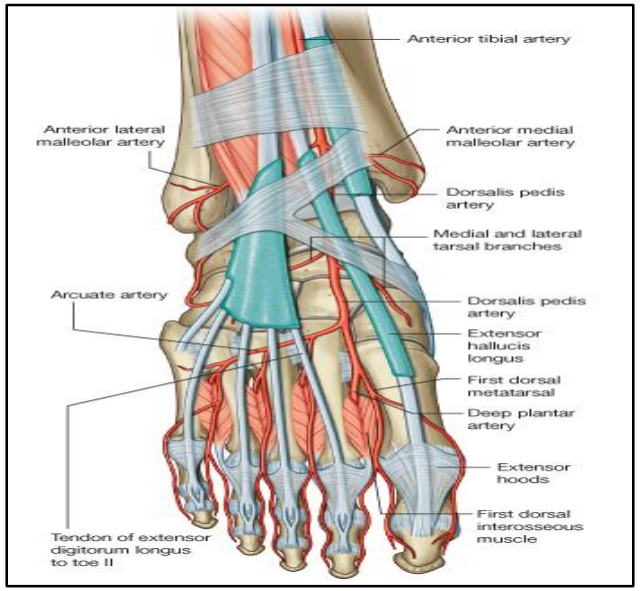
- Begins in front of the ankle joint as a continuation of the **Anterior Tibial artery.**
- Superficial in position.

- **Crossed by:**
  Inferior extensor retinaculum and the 1st tendon of extensor digitorum brevis.

- **Medially:**
  Tendon of extensor hallucis longus.

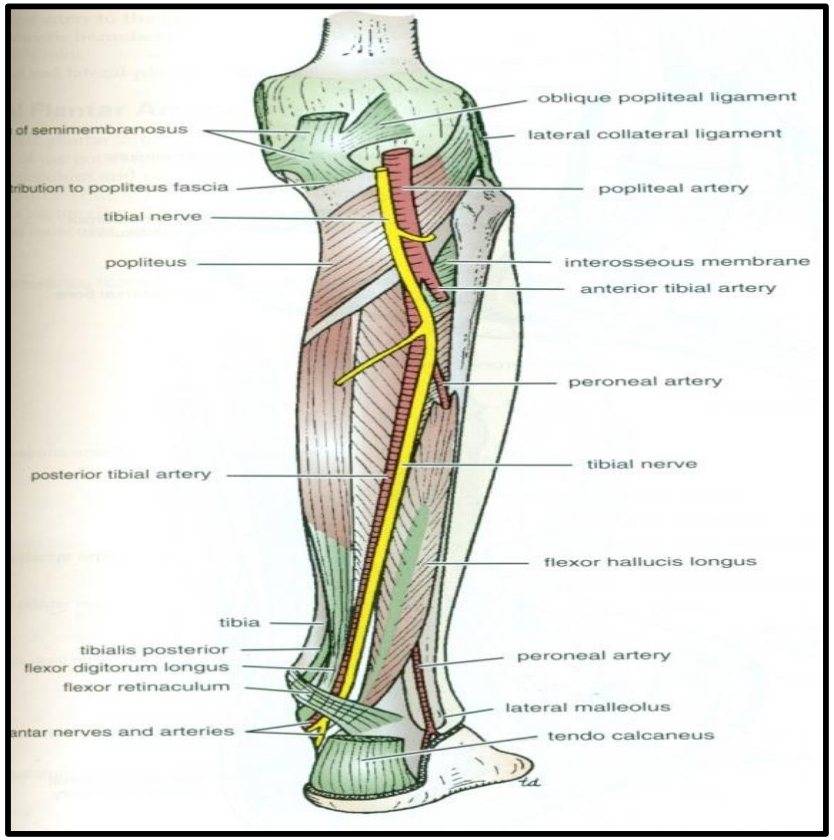
- **Laterally:**
  - Deep peroneal nerve & extensor digitorum longus.
  - It terminates by passing between the two heads of the 1st dorsal interosseous muscle.
  - Joins the lateral plantar artery to complete the plantar arch.
- **Branches:**
  - Lateral tarsal artery.
  - Arcuate artery.
  - 1st dorsal metatarsal artery.





Posterior Tibial Artery

- The larger terminal branch of the Popliteal Artery
- Above: Lies on the posterior surface of Tibialis Posterior.
- Below: Lies on the posterior surface of Tibia.
- Its lower part is covered by Skin & Fascia.
- Passes behind the Medial Malleolus , Deep to the Flexor Retinaculum.
- Terminates by dividing into: Medial & Lateral plantar arteries.



Branches of the Posterior Tibial Artery

❖1. Peroneal (Fibular) artery:

A large artery descending behind the fibula (the artery of the lateral compartment of the leg).

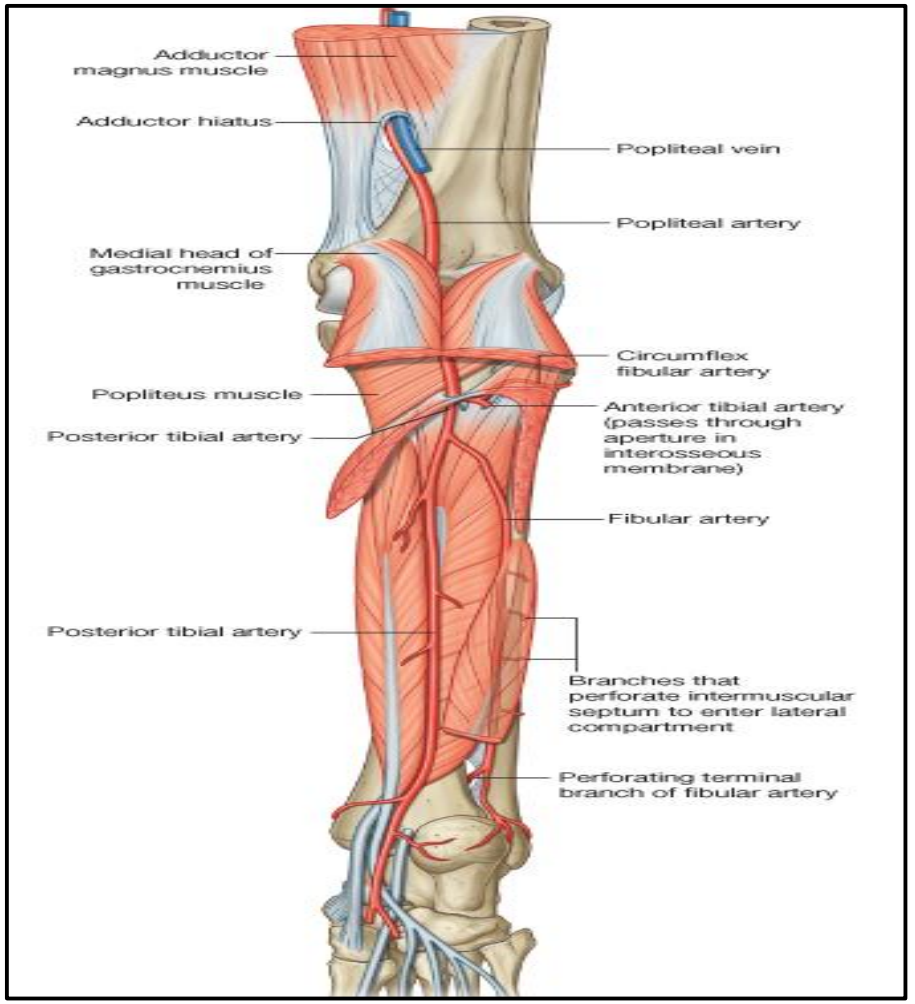
❖It gives:

- ***A. Nutrient artery to the fibula.***
- ***B. Muscular branches.***
- ***C. Perforating branch to lower part of front of leg.***
- ***D. Shares in the Anastomosis around the ankle joint.***

❖2.Nutrient artery to the tibia.

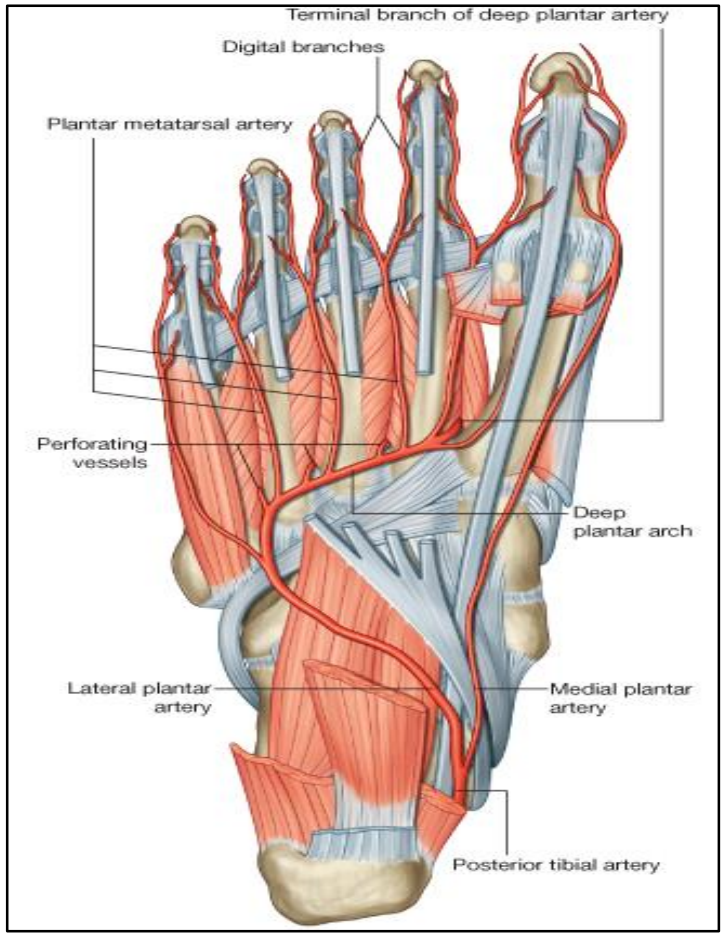
❖3. Anastomotic branches to anastomosis around ankle joint.

❖4. Medial & Lateral plantar arteries.



Medial & Lateral plantar arteries

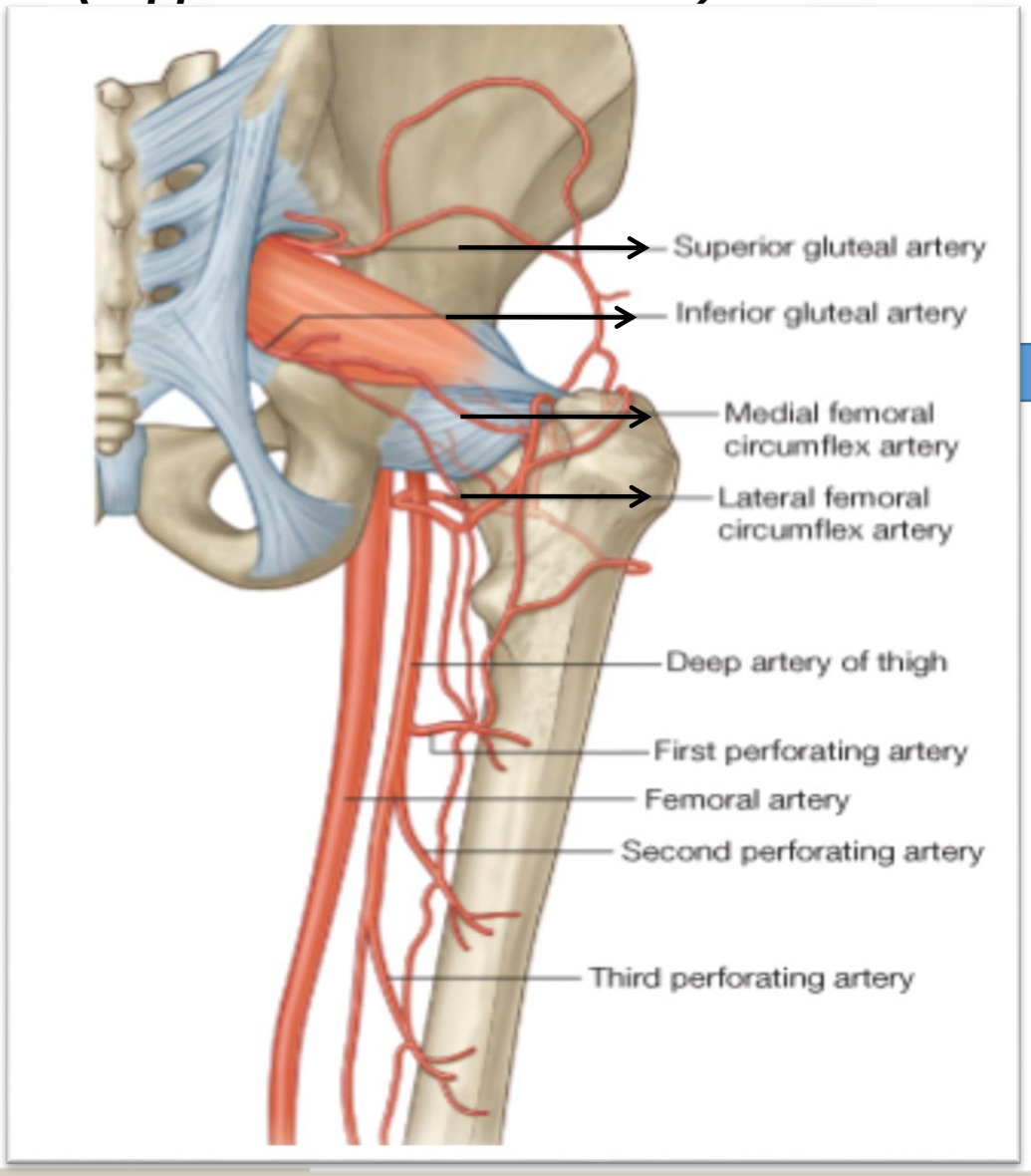
Medial Plantar Artery	Lateral Plantar Artery
•The smaller terminal branch of the posterior tibial artery	•The larger terminal branch of the posterior tibial artery
•Arises beneath the Flexor Retinaculum	•Curves medially at the base of the 5th metatarsal bone forming the Plantar Arch
<u>Branches:</u> •Muscular, Articular and Cutaneous. •Terminates by supplying the medial side of the big toe.	•Joins the Dorsalis pedis artery at the proximal end of the 1st intermetatarsal space
	<u>Branches:</u> •Muscular, Articular & Cutaneous branches. •The Plantar Arch gives Plantar Digital Arteries.



Arterial Anastomosis

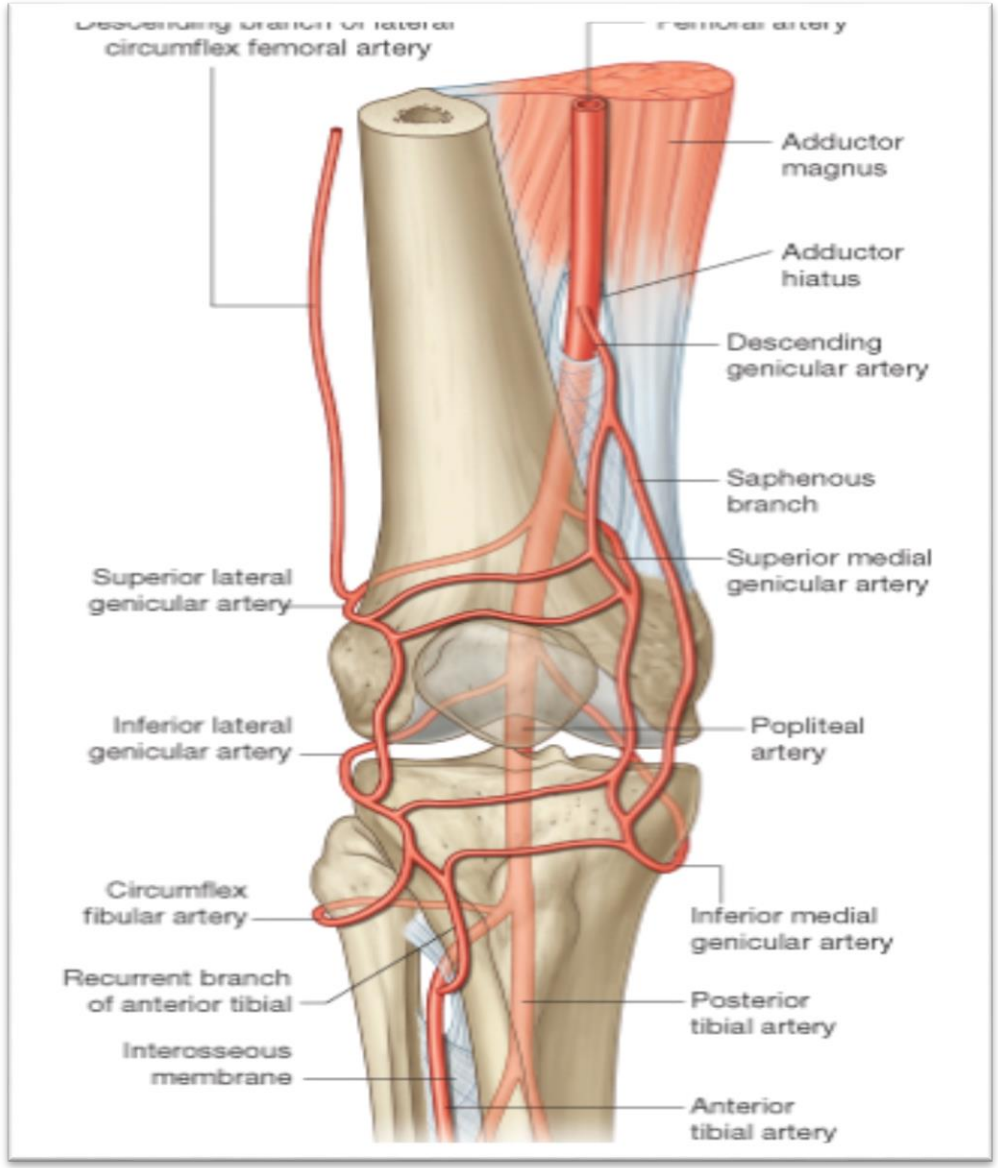
❖ TROCHANTERIC

(supplies the head of femur)

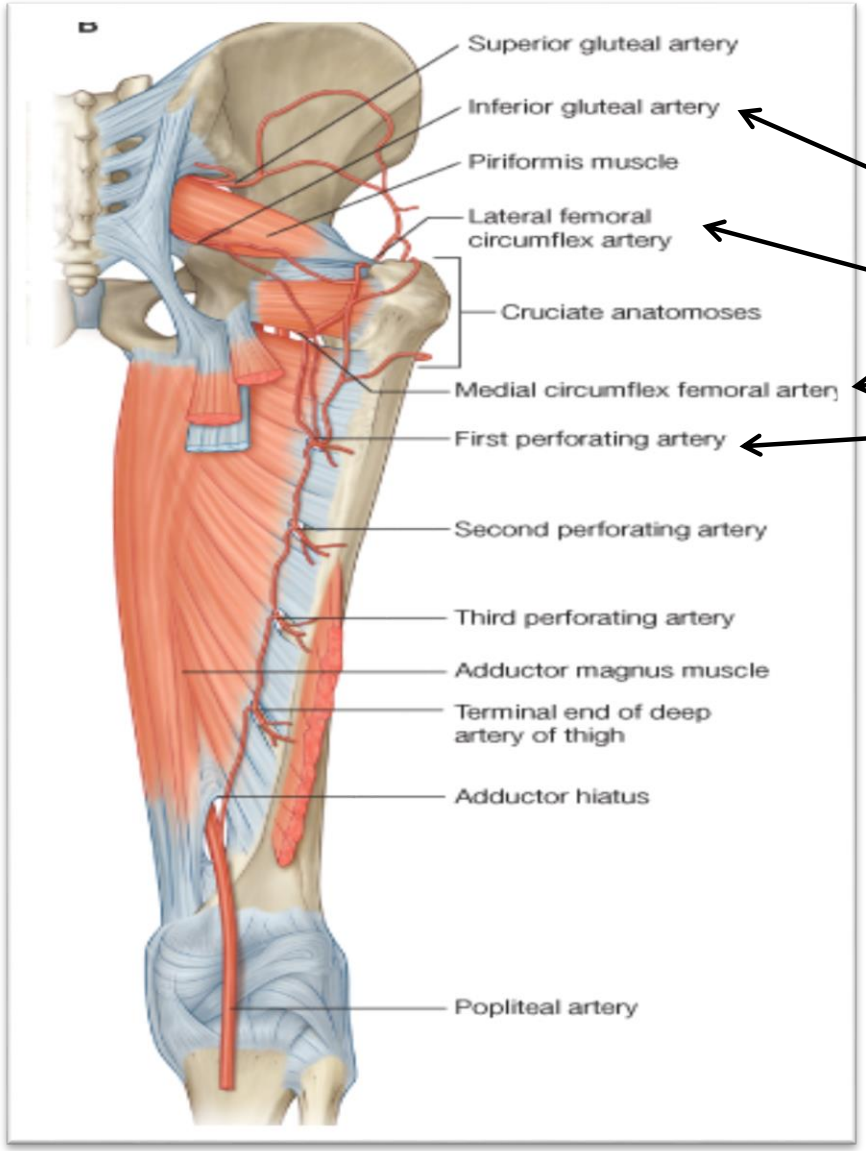


1. ***Superior gluteal.***
2. ***Inferior gluteal.***
3. ***Medial circumflex femoral.***
4. ***Lateral circumflex femoral***

❖ AROUND THE KNEE



Cruciate

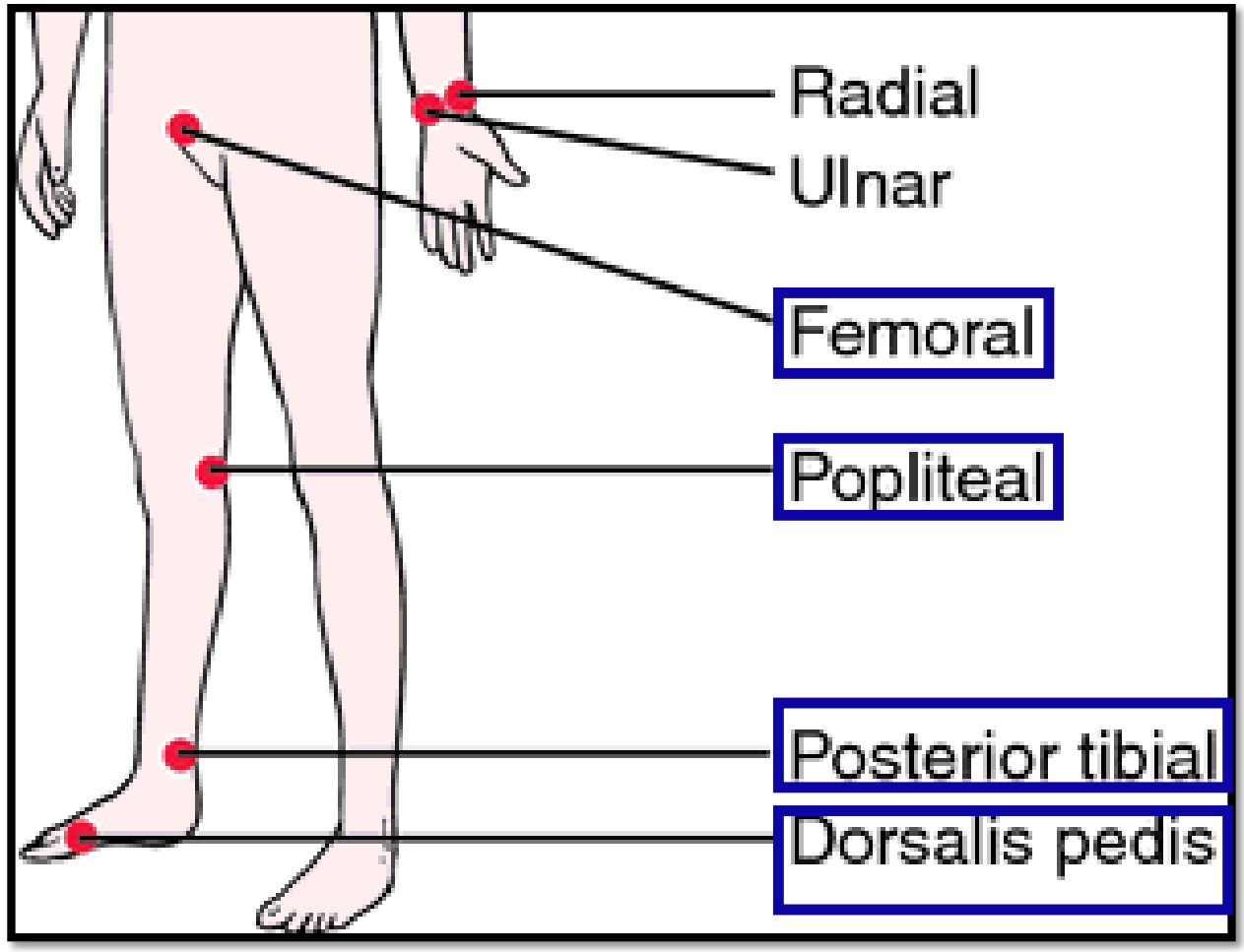


1. *Inferior gluteal.*
2. *. Lateral circumflex femoral.*
3. *Medial circumflex femoral*
4. *First perforating*

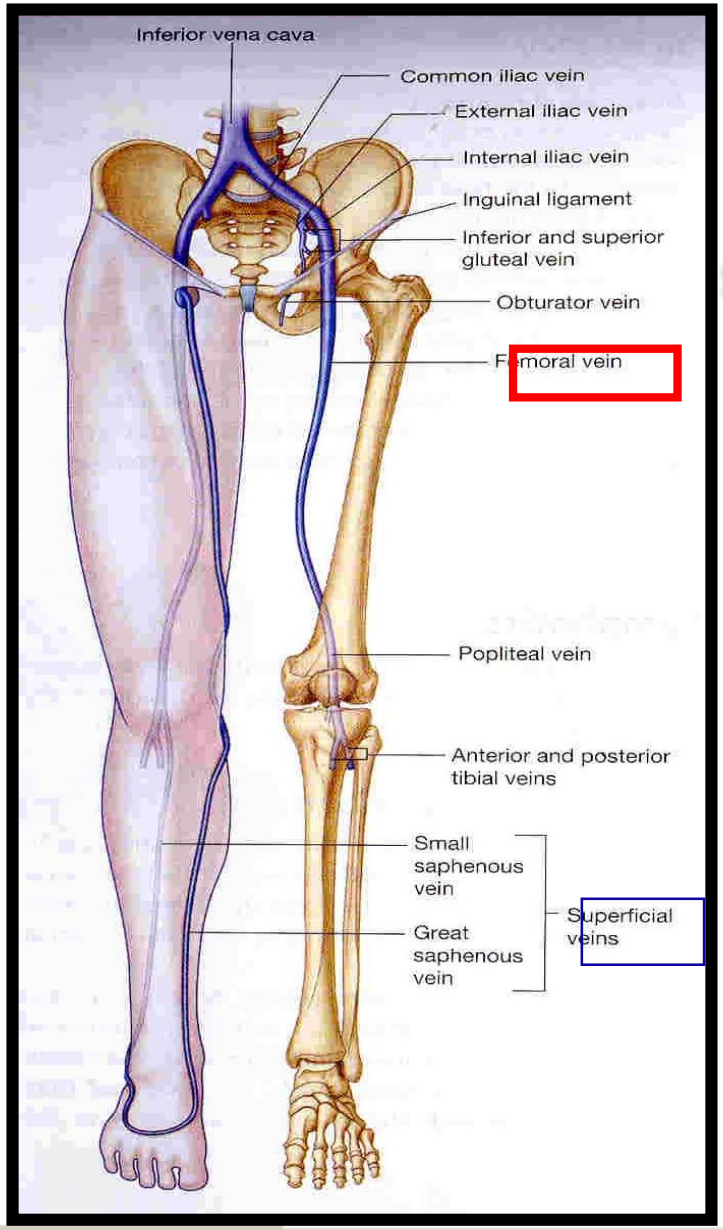
Provides connection between Internal iliac and Femoral arteries

Sites of Peripheral Arterial Pulse

- ✓ **Femoral:** *Inferior to the lingual ligament and midway between the anterior superior iliac spine and symphysis pubis.*
- ✓ **Popliteal:** *Deep in the popliteal fossa medial to the midline.*
- ✓ **Posterior tibial:** *Posteroinferior to the medial malleolus in the groove between the malleolus and the heel.*
- ✓ **Dorsalis pedis:** *Over the tarsal bones between the tendons of extensor hallucis longus and extensor digitorum.*



Veins of Lower Limbs



- **Superficial System**

And

- **Deep System**

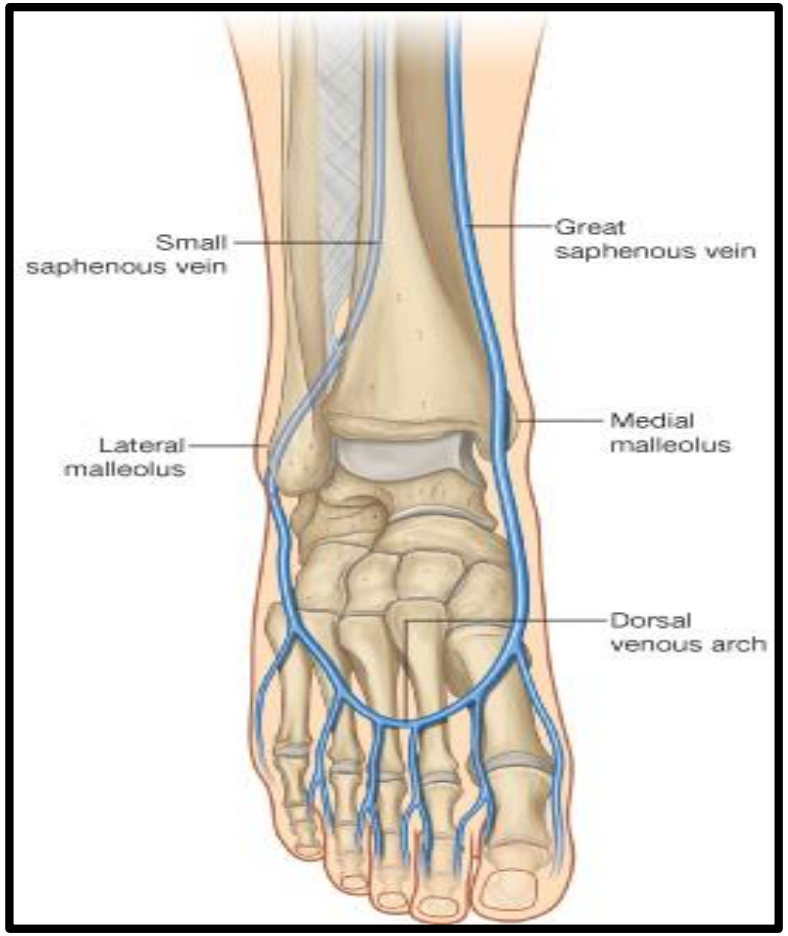
Superficial veins: DORSAL VENOUS ARCH (NETWORK):

Receives most of the blood of the foot through Digital and Communicating veins.

- **Drained:**

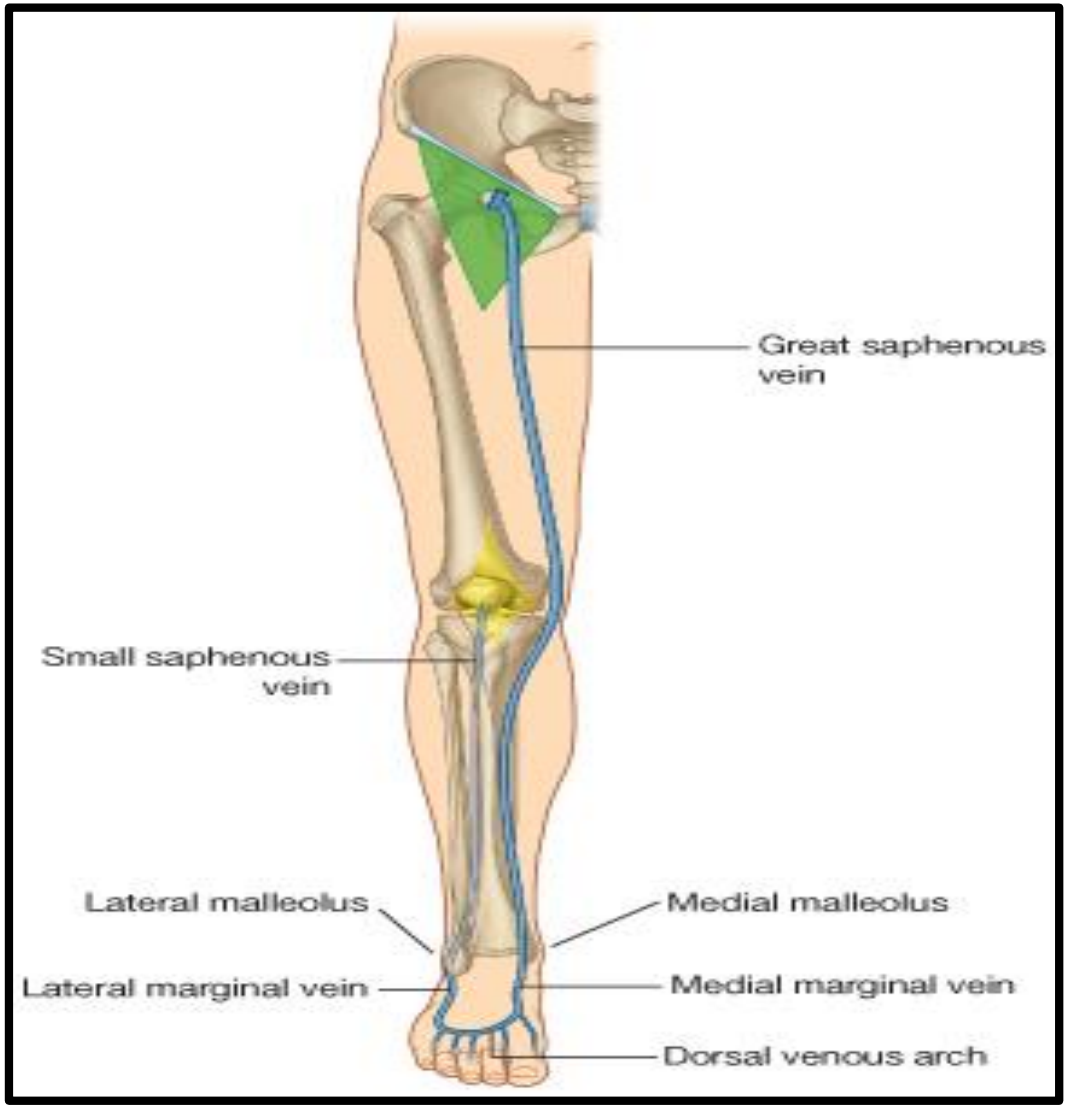
  Medially: *by the Great Saphenous vein.*

  Laterally: *by the Small saphenous vein*



Great Saphenous Vein

- The Longest Superficial vein of the body.
- Begins from the medial end of the dorsal venous arch (as the medial marginal vein).
- **Ascends:**
- In front of the Medial Malleolus accompanied by the (Saphenous nerve).
- Posterior to the Medial Condyle of the femur.
- **Passes through** the Saphenous Opening (2.5-3.25) cm below and lateral to the pubic tubercle.
- **Terminates** in: Femoral Vein.



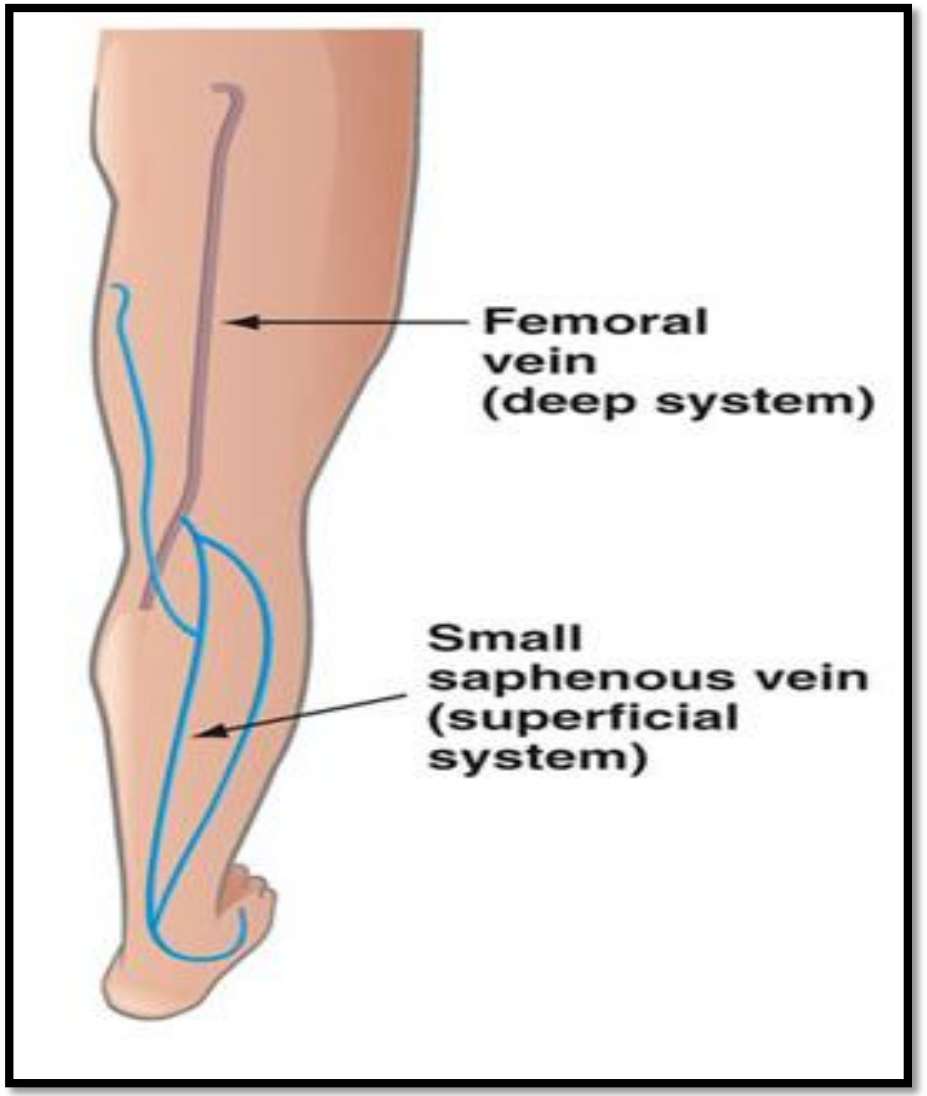
Small Saphenous Vein

- Originates from the lateral end of the dorsal venous arch.
- **Ascends:**
- Behind the lateral Malleolus along with the Sural nerve; along the middle of the back leg.
- **Termination :**

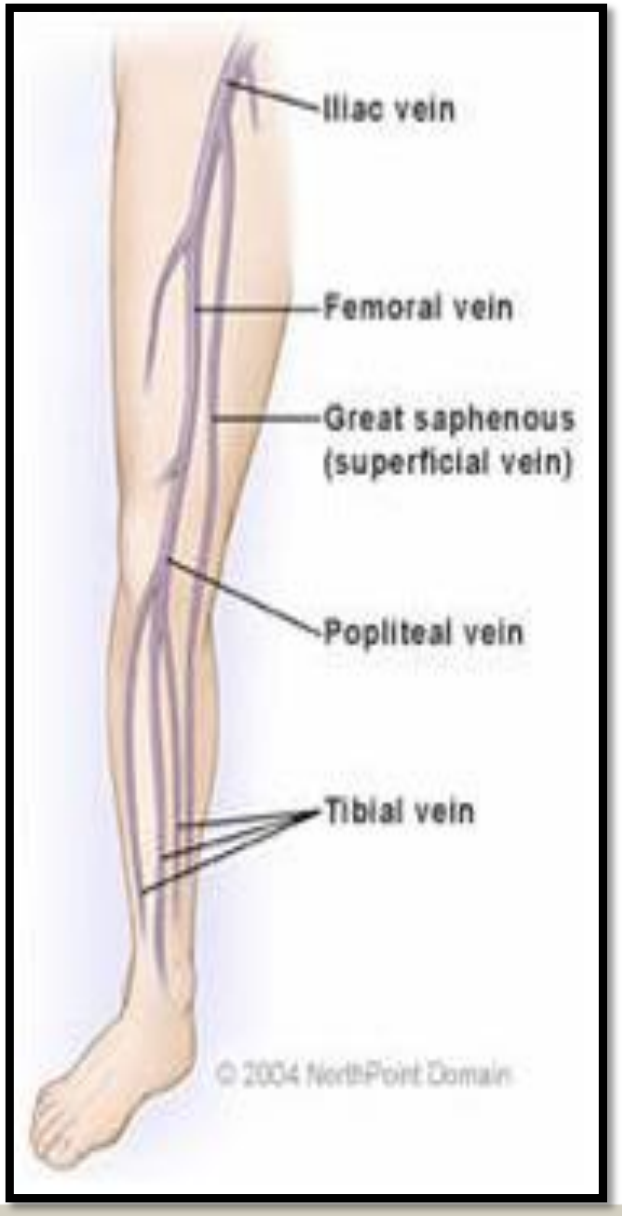
1. It may join the Great Saphenous vein.
2. Or *Bifurcates:

One branch joins the Great saphenous and the other joins the Popliteal vein.

*Bifurcates: Divides into two parts



Deep Veins

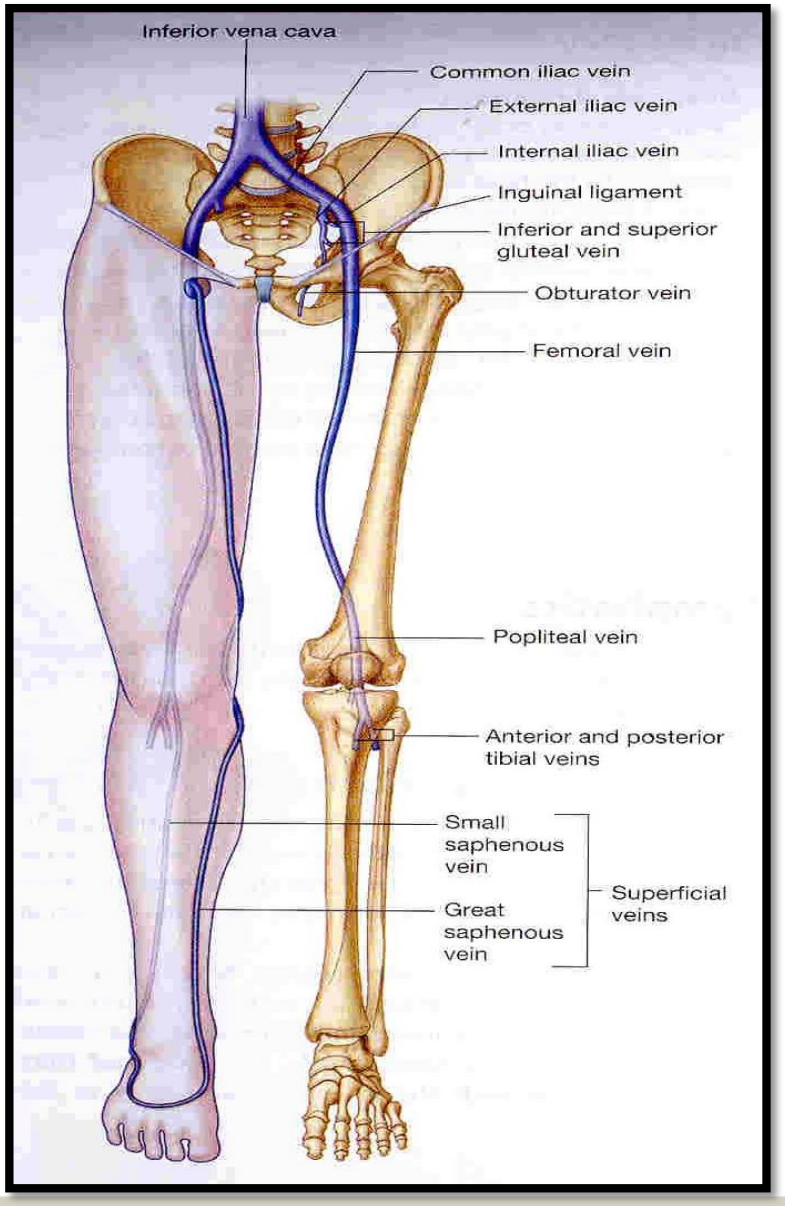


1-) Popliteal vein

- Formed by the union of venae comitantes around the anterior & posterior tibial arteries.
- Lies posterior to the popliteal artery.

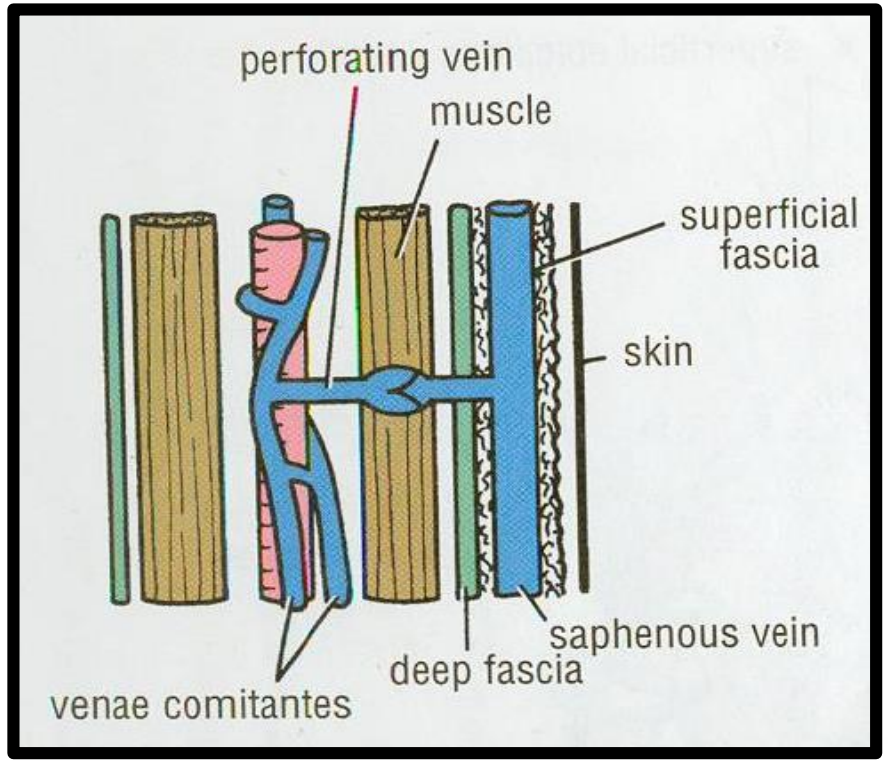
1-) Femoral vein

- Enters the thigh by passing through the opening in the adductor magnus.
- It leaves the thigh in the intermediate compartment of the femoral sheath.
- Passes behind the inguinal ligament to become the External iliac vein



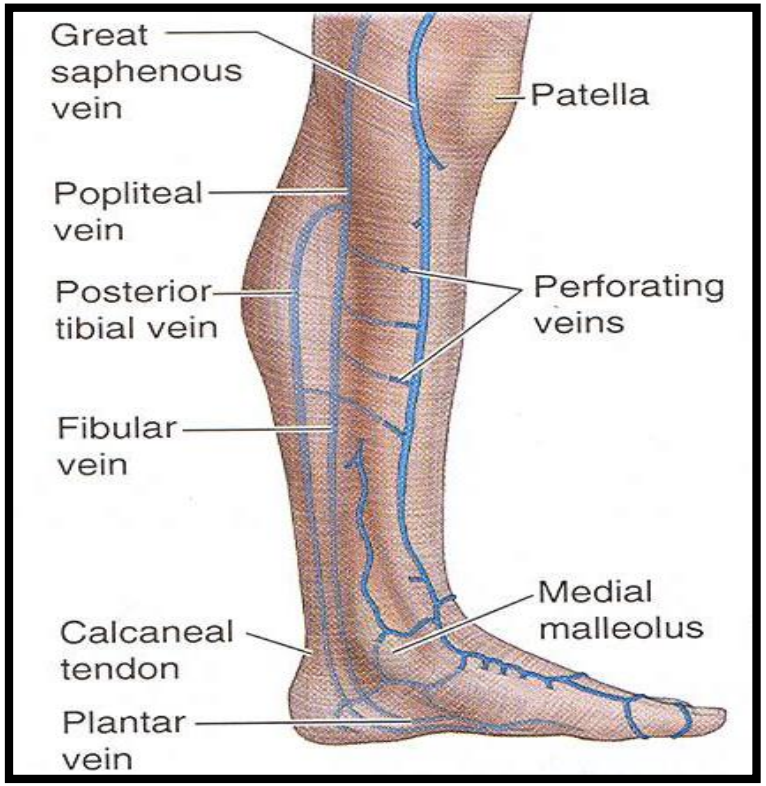
Venae Comitantes

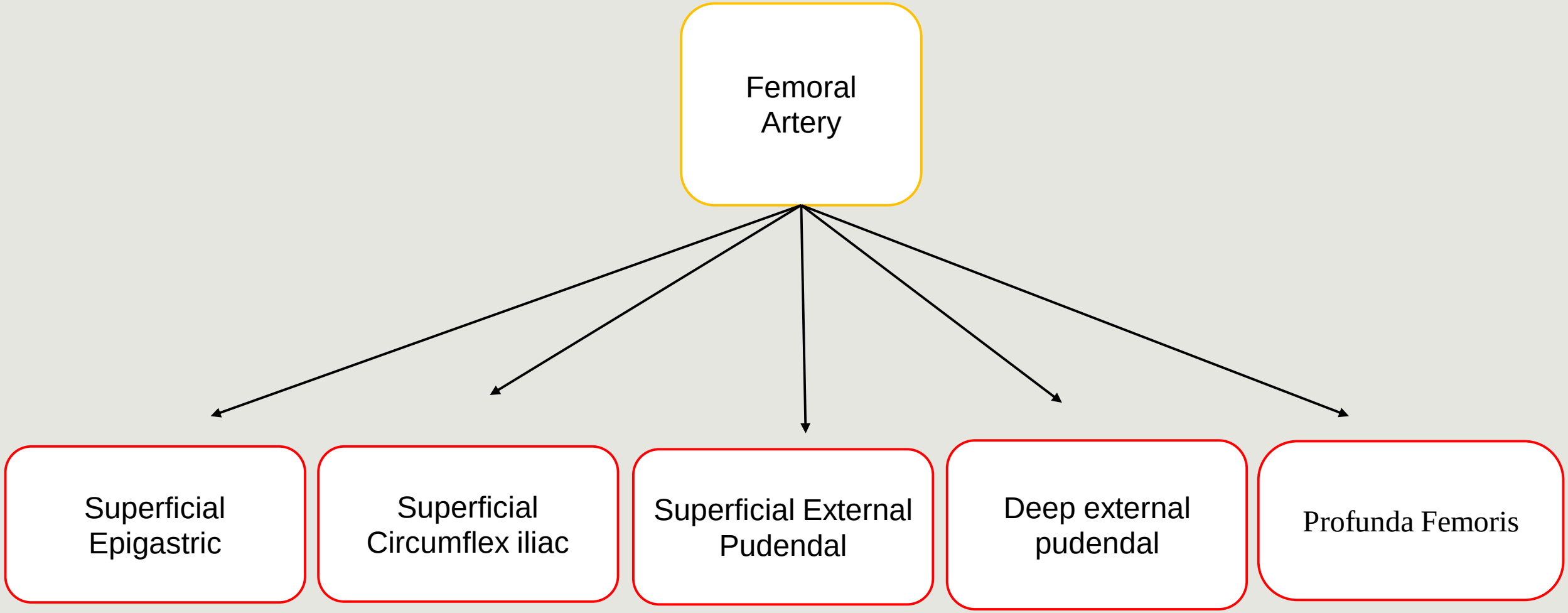
- Deep veins that accompany all the major arteries and their branches.
- Usually come in pairs.
- They are contained within the vascular sheath of the artery, whose pulsations help to compress and move blood in the veins

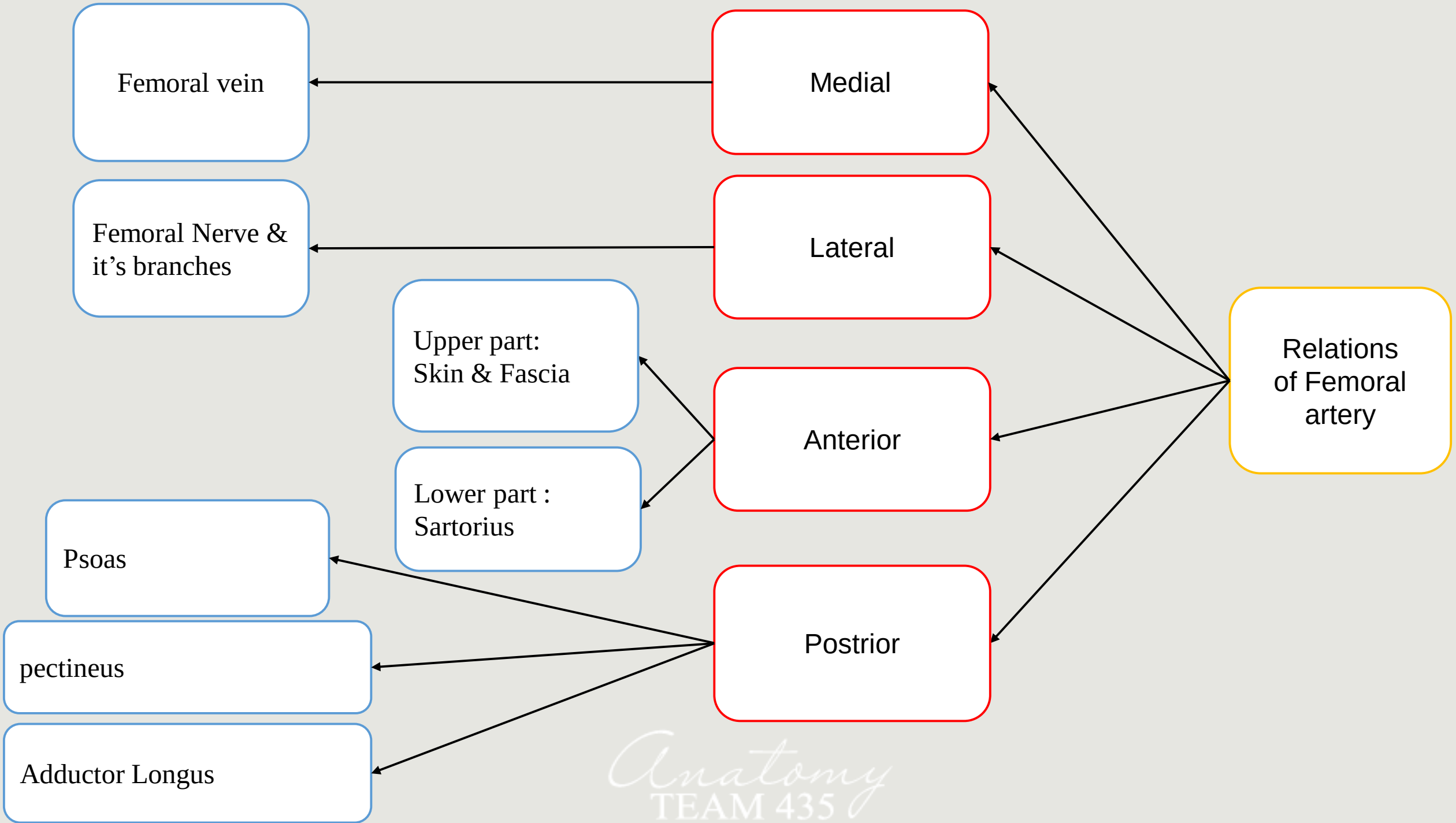


Perforating Veins

- Connect the superficial veins (Great Saphenous vein) with the deep veins along the medial side of the calf.
- Their valves only allow blood to flow from the superficial to the deep veins. (Single direction)






Relations of Femoral artery
Medial
Femoral vein
Lateral
Femoral Nerve & it's branches
Anterior
Upper part: Skin & Fascia
Lower part : Sartorius
Postrior
Psoas
pectineus
Adductor Longus
Anatomy TEAM 435

Video: arteries of lower limb
Link:
https://www.youtube.com/watch?v=JNczJx2ju3I

Video: veins of lower limb
Link:
https://www.youtube.com/watch?v=AinzrO_qnHw

Website :
http://www.getbodysmart.com/ap/muscularsystem/armmuscles/menu/menu.html

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

Quiz:
https://www.onlineexambuilder.com/vascular-anatomy-of-the-lower-limb/exam-52413

ANATOMY TEAM 435

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إن أصبنا فمن الله و إن أخطأنا فمن أنفسنا و من الشيطان

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