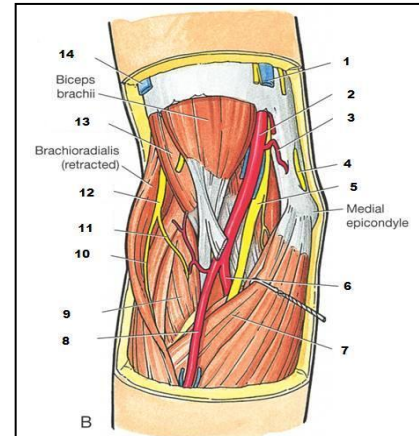


Palpation of the upper and lower limbs arteries

Arteries of the upper limb:

1. Brachial Artery:

- ❖ Brachial artery is a direct continuation of the axillary artery. It is found in the brachium (arm).
- ❖ It starts at the lower border of teres major and it ends in the cubital fossa exactly opposite to radial neck.
- ❖ Brachial artery passes medially to the tendon of biceps within the cubital fossa.



2. Radial and Ulnar Arteries:

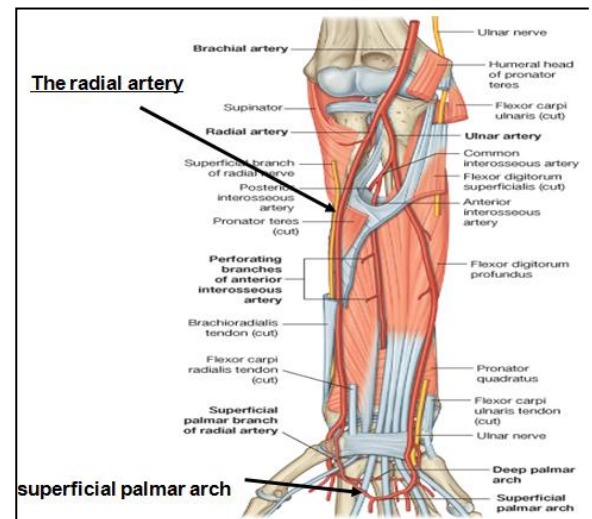
- ❖ Brachial artery divides into radial and ulnar arteries. They pass within the antebrachium (forearm). After that, they reach the hand to form superficial and deep palmar arches that supply the hand.
- ❖ Radial artery passes laterally to the flexor carpi radialis, in front of the distal end of radius.

✚ Note:

- Superficial palmar arch is formed predominantly by Ulnar Artery.
- Deep palmar arch is formed predominantly by Radial Artery.

Palpation of the Brachial and Radial:

- ❖ Generally, if you feel the pulses in the artery, this indicates that there is a blood flow within it, and if pulses are not palpated, this indicates that there is no blood flow → ischemia.
- ❖ If you put your little finger on the thumb and do flexion at the wrist joint, you will see these structures:



{Palmaris longus → median nerve → flexor carpi radialis → radial artery}

(Medial) -----> (Lateral)

- ❖ That's why a cut wound in this area may damage the tendons of these muscles, median nerve and radial artery.

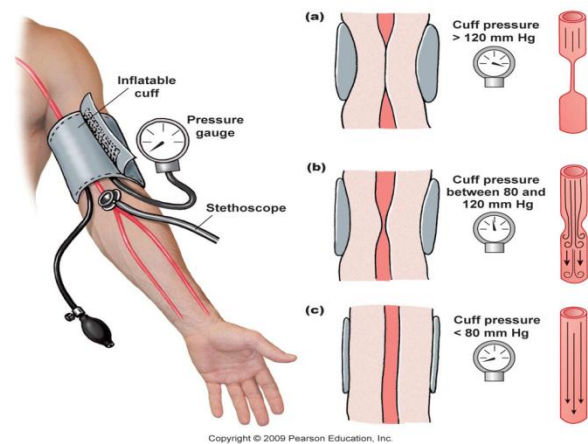
- ❖ Radial artery winds laterally around the wrist, passing through "anatomical snuff box" and in-between the two heads of first dorsal interosseous muscle to reach the palm of the hand.

❖ How to feel the Radial pulse?

- Simply, we gently compress the radial artery on the distal part of the radius (the artery is superficial there) and laterally to flexor carpi radialis using the middle and the index.
- Sometimes it's *very hard to feel the pulse* at **the anatomical snuff box** because the artery passes *deep* in this area. So you need to compress strongly to feel the pulse and this is not favorable.
- If there is a scaphoid bone fracture, this will affect the radial pulses within the snuff box.

❖ How to measure the blood pressure using a sphygmomanometer (blood pressure meter)?

1. Put the cuff on the upper arm.
2. Put the stethoscope on the brachial artery.
3. Put your finger on the radial artery to check whether there is a pulse or not during this process.
4. Increase the pressure within the cuff until there is **no pulse** detected in the **radial artery** (this means that the brachial artery is completely closed - no blood flow through radial artery).
5. After that, reduce the pressure within the cuff gradually until you hear a "whooshing" sound-first sound- (this is a **systolic blood pressure** at which the blood flow firstly starts again in the artery).
6. The cuff pressure is further released until the sound is longer heard (this is the **diastolic blood pressure**).



🚦 Note :

- If you don't place the stethoscope directly on the brachial artery, you might miss the first sound and you will end up with measurement errors (*incorrect reading of systolic blood pressure*).

Arteries of the lower limb :

1. Femoral Artery:

- Femoral artery is a direct continuation of the external iliac artery.
- It gives a branch called profunda femoris artery.
- It continues as the popliteal artery within the popliteal fossa.
- We feel it at **the mid-inguinal point**.
- The femoral is a *superficial structure*. It's covered with skin and fascia.
➔ It easily gets injured, and it's hard to stop the bleeding from it (life-threatening condition).

✚ Note :

- Clinical terms:
 - Femoral artery is called ➔ external femoral artery.
 - Profunda femoris artery ➔ deep femoral artery.
- Mid-inguinal point: midpoint between ASIS and symphysis pubis.
- Inguinal ligament: between the ASIS and pubic tubercle.

❖ If the radial pulse is “strong and bounded”, and the femoral pulse is” weak “, what do you expect?

- ✓ Aortic coarctation “*narrowing of the aorta*”. (Coarctations are most commonly present in the distal part of the arch where the blood flows to the abdomen and the leg).
- ✓ Thrombus in the bifurcation of the abdominal aorta.

2. Dorsalis Pedis and Posterior Tibial Artery:

- Popliteal artery divides into ➔ anterior and posterior tibial arteries.
- Anterior tibial artery continues as the dorsalis pedis artery which passes within the **proximal part of dorsal surface of foot and laterally to extensor hallucis longus tendon**, and then it passes to the sole before reaching the distal part of dorsal surface of foot.
- Posterior tibial artery passes behind **the medial malleolus**.



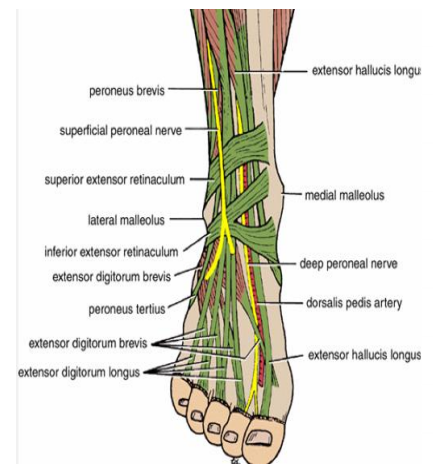
Dorsalis pedis pulse

❖ Palpation of dorsalis pedis and posterior tibial pulses?

- Dorsal pedis artery: laterally to the extensor hallucis longus tendon within the proximal part of dorsal surface of foot.
- Posterior tibial artery: behind the medial malleolus.

✚ Notes :

- Dorsalis pedis is absent in about 10% of the population.
- To make sure if the patient's foot is ischemic or not, you need to feel the pulses within both of these 2 arteries to check if there is an occlusive disease in them or not.



- If the patient has an occlusion in the arteries of the leg, such as in atherosclerosis, he will suffer from **intermittent claudication** which is a sense of fatigue that occurs during exercise such as walking, and is relieved by a short period of rest.



Posterior tibial pulse

❖ Why does the patient start to have pain when he is walking?

- ✓ Due to the increase in the level of metabolites that need to be washed out by the blood flow.
- ✓ But, because of that occlusive disease → no increase in the blood flow → no washing out → accumulation of metabolites → pain.

❖ **Causes** of sudden obstruction of the peripheral arteries - like femoral artery - :

- Thrombus at the site of obstruction.
- Embolus from:
 - 1- Thrombus (thromboembolism) :
 - A- Infarction of the left ventricle -> wall becomes rough -> formation of thrombus.
 - B- Atrial fibrillation -> blood stasis within atrium -> formation of thrombus.
 - C- Aortic aneurysm
 - 2- Atherosclerotic plaque.
 - 3- Deep vein thrombosis -> embolus reaches Rt atrium/Rt ventricle -> presence of atrial septal defect/ventricular septal defect-> reaches the Lt atrium/Lt ventricle -> goes through the systemic circulation -> reaches the peripheral arteries.

❖ **Signs** of sudden obstruction of the lower extremity arteries :

- Appears distally to the obstruction site.
- All the “P”s :
 - Pain
 - Pallor
 - Paresthesia (no blood supply to sensory nerves)
 - Paralysis (no blood supply to motor nerves)
 - Pulseless
 - Polar sensation (cold sensation)

✚ **Note :**

- The nerves of first part that will be affected after occlusion of the blood flow.

	Differentiation between :	
	Sudden obstruction of arteries	Deep vein thrombosis (DVT)
Polar sensation	√	X
Pallor	√	X

DVT: the blood will not flow from superficial vein to deep vein → this will lead to *congestion of blood within the superficial veins* so that they become prominent on the skin.

<u>Artery</u>	<u>Site of palpation</u>
Brachial	Medial to the tendon of biceps within the cubital fossa
Radial	Lateral to the flexor carpi radialis, in front of the distal end of the radius (generally)
Femoral	Mid-inguinal point
Popliteal	Popliteal fossa
Dorsalis pedis	Lateral to the extensor hallucis longus within the proximal part of the dorsal surface of the foot
Posterior tibial	behind the medial malleolus

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