

# **Peripheral vascular assessment**

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# Vascular System Components

- Arteries
- Veins
  - Deep veins of the legs carry 90% of venous return from the lower extremities
  - Superficial include great saphenous , small saphenous and communicating veins
- Lymphatics and lymph nodes
  - Only cervical, supraclavicular, axillary, arm and leg nodes palpable

Ask the following question to elicit important information

1. Do you experience pain

**intermittent claudication.**(cramping pain , sudden painful involuntary contraction of a muscle in legs)

- **This is a phenomenon of pain in the leg (especially in the calf but sometimes in the thigh or buttock) increasing steadily until the patient is forced to stop; (b) relief of that pain by rest. Should he resume his journey on foot, this sequence is repeated, and he is forced to halt at exactly the same distance(claudication distance) as before.**
- **Rest limb pain.**
- **It is pain that its felt in a limb at rest and it is more severe than intermittent claudication. Usually the pain is felt in the foot and is worse at night.**

2. Have you noticed any color, temperature, or texture in your skin?

**Rationale: Extremities with cold, pale, clammy skin, and thin, shiny skin with loss of hair over the lower legs (arterial insufficiency).**

**Warm skin and brown pigmentation around the ankles (venous insufficiency)**



### 3. Do you have any sores, ulcer or open wounds on your legs?

*Rationale:* Arterial ulcers are usually painful, while venous ulcers are usually painless.

**Chronic Venous Insufficiency**



**Peripheral Arterial Disease**



**Neuropathy**



### 4. Do you have any swelling in your legs and feet?

*Rationale:* Peripheral edema results from obstruction of the lymphatic flow, venous insufficiency, or DVT.

**Deep Vein Thrombosis**



- ***5. Numbness/Tingling***

- **Do you have numbness or tingling in your hands or feet?**

***Peripheral neuropathies*, a complication of diabetes, may be painful and result in loss of sensation. Subsequent damage to skin increases risk for wounds.**

- **6-Deformity and loss of function.**
- **7- Family history** of cardiovascular problems like hypertension, ischaemic heart disease, heart failure or diabetes mellitus hypercholesterolemia etc.
- **8. History of trauma or surgery**
- **9. Do you have ropelike, bulging, or contorted veins?**
  - *Rationale:* These signs may indicate varicose veins
- **10. Do you have swollen glands or lymph nodes?**
  - Enlargement may indicate local or systemic infection

## 11. Do you smoke?

- *Rationale:* Smoking increases the risk for PVD.
  - **Do you smoke cigarettes, pipes, or cigars? (If yes, find out how many packs per day, for how long**

## 12. Do you exercise regularly?

- *Rationale:* Regular exercising improve PV circulation and decreases the risk for developing PV disease.  
Describe the level of your stress
- *Rationale:* Stress increases HR and BP and may contribute to PV disease.

## 13. Are you regularly taking prescribed medications to improve your circulation?

- Noncompliance increases the risk for developing PV disease.



# Introduction

- **Introduce** yourself
- Ask **Permission** to examine
- **Expose** the patient lower limbs and upper limbs
- **Ask the patient if they have any pain**



**Stand at the end of the bed**

**STOP**

**Look for a few seconds**

**Show you are looking around  
the bed**

Oxygen  
Inhalers/GTN  
Catheters  
Drains  
Fluids  
Dressings  
Position  
Comfortable?

# LOOK...

- Stand at the end of the bed
  - Colour of the Limbs (pale/blue/black)
  - Hair Loss
  - Ulcers
  - Scars
  - Muscle Wasting



## FEEL...

- Run the **back of your hand** down both limbs
- Compare Sides
- Warm or cold? Point of change?
- **Capillary Refill time**
- **Pulses**



Describe the pulse (rate ,  
rythem, volume)  
Capillary refill normal  $\leq 2$  sec



**Figure 13.1** Testing capillary refill.

# PULSES

- **Upper limb** → Subclavian, Carotid, Brachial, Radial, Ulnar, Allen's test, Capillary re-filling
- **Lower Limb**
  - **Aorta**
  - **Femoral** (mid inguinal point)
  - **Popliteal** 3 methods feel with 8 fingertips!!
  - **Posterior tibial**
  - **Dorsalis Pedis**
  - **Anterior tibial**

**Auscultation.** Evaluate blood pressure (BP) in both arms. Document the arm with the higher pressure and take subsequent BPs in that arm. Adult SBP is 100 to 140 mm Hg and DBP is 60 to 90 mm Hg.

**Auscultation in lower limb for Ankle – Brachial index normal (1)**



**Figure 13.5** Doppler ultrasonic stethoscope.

**Auscultation for Bruits at the Aorta , Femoral , Carotid arteries**

# Radial pulse

- *Palpate the radial pulse with the pads of your fingers on the flexor surface of the wrist laterally.*
- Partially flexing the patient's wrist may help you feel this pulse.
- Compare the pulses in both arms



## Brachial pulse

Flex the patient's elbow slightly, and with the thumb of your opposite hand palpate the artery just medial to the biceps tendon at the antecubital crease.

The brachial artery can also be felt higher in the arm in the groove between the biceps and triceps muscles.





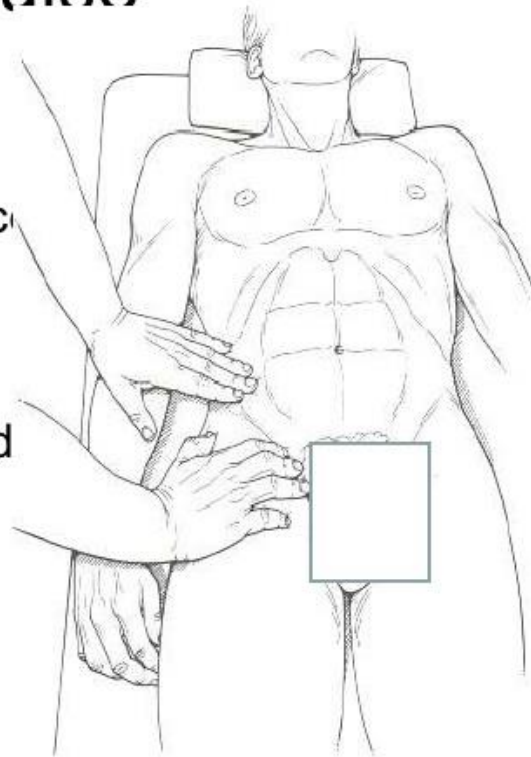
# Carotid Arteries

- At the level of thyroid cartilage
- Opposite to the mid third of the
- It may be visible just medial to the sternomastoid muscles.



# Femoral pulse

- The *common femoral artery* emerges into the upper thigh from beneath the inguinal ligament one-third of the distance from the pubis to the anterior superior iliac spine.
- It is best palpated with the examiner standing on the ipsilateral side of the patient and the fingertips of the examining hand pressed firmly into the groin.
- Auscultation should be performed in this area, as well.



# Popliteal Artery

- *The popliteal artery* passes vertically through the deep portion of the popliteal space just lateral to the midplane.
- It may be difficult or impossible to palpate in obese or very muscular individuals.
- Generally this pulse is felt most conveniently with the patient in the supine position and the examiner's hands encircling and supporting the knee from each side.
- The pulse is detected by pressing deeply into the popliteal space with the supporting fingertips. Since complete relaxation of the muscles is essential to this examination, the patient should be instructed to let the leg "go limp" and to allow the examiner to provide all the support needed.



## Seconded Method



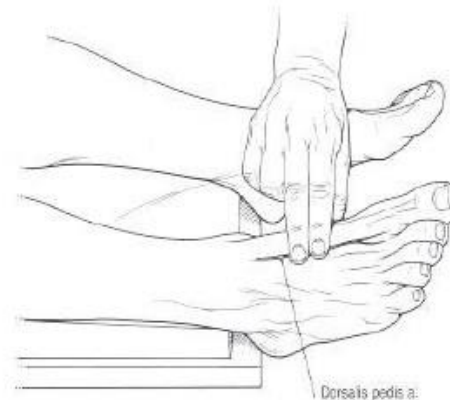
# *The posterior tibial pulse.*

- The *posterior tibial artery* lies just posterior to the medial malleolus.
- It can be felt most readily by curling the fingers of the examining hand anteriorly around the ankle, indenting the soft tissues in the space between the medial malleolus and the Achilles tendon, above the calcaneus.
- The thumb is applied to the opposite side of the ankle in a grasping fashion to provide stability.
- Again, obesity or edema may prevent successful detection of the pulse at the location.



# The *dorsalis pedis* artery

- Is examined with the patient in the recumbent position and the ankle relaxed.
- The examiner stands at the foot of the examining table and places the fingertips transversely across the dorsum of the forefoot near the ankle.
- The artery usually lies near the center of the long axis of the foot, lateral to the extensor hallucis tendon but it may be aberrant in location and often requires some searching.
- This pulse is congenitally absent in approximately 10% of individuals.



# Bruits

- After palpating the artery, auscultation for a bruit should be performed. Bruits are detected by auscultation over the large and medium-sized arteries (e.g., carotid, subclavian, brachial, abdominal aorta, femoral) with the diaphragm of the stethoscope using light to moderate pressure.
- Excessive pressure may produce, intensify, or prevent a bruit from being detected by indenting the vessel wall or occluding blood flow in the artery. One should listen over the artery after palpation of the artery to avoid overlooking a significant lesion.
- Occasionally, bruits are audible over the upper abdomen in young, healthy individuals. These sounds apparently originate from tortuous vessels and are of no clinical significance; if the subject has a normal blood pressure and is free of abdominal symptoms, such findings may be disregarded.
- Frequently the examiner will detect a "thrill" or palpable vibratory sensation over a vessel in which a loud bruit is audible. The thrill is indicative of marked turbulence in local blood flow and suggests significant vascular pathology. If a thrill is noted during examination of the pulses, it should be recorded in the appropriate space on the data base.



## **THEN**

- Cover the patient up & thank them
- Turn to the examiner and present your findings.....



I examined this elderly gentleman's peripheral vascular system.

On inspection from the end of the bed he appeared comfortable at rest with no peripheral signs of vascular disease.

Both limbs were pink and well perfused with capillary refill time <2secs.

All pulses were present and equal on both sides. Buerger's test was negative.

## **TO COMPLETE MY EXAMINATION.....**

- I would like to examine the rest of the peripheral vascular system including the cardiovascular system
- Test the relevant muscles and nerves of the affected limb
- Perform a duplex scan and ABPI's

# Venous examination

- **Q.** “What symptoms and risk factors are important to elicit in a patient with varicose veins?”
- **A.** “I would want to know about”:-
- Varicose Veins
- Primary symptoms
- Symptoms of complications
- History of DVT etc.
- Other risk factors trauma etc

# Inspection

- **INSPECTION:**
- **General Appearance:**
- **Veins** –Distribution / Size / Size of and visible sc veins
- Varicose Veins are by definition dilated and tortuous.
- Compare size of both legs esp at ankle level for evidence of oedema.
- Venous Stars – minute veins radiating from a single feeding vein.
- **Skin** – Inspect the skin of the whole leg but particularly the lower medial third since venous dx affects this area first, causing Pigmentation / Eczema and Ulceration.
- **Signs of Chronic Venous Insufficiency** – lipodermatosclerosis =
- **Ulcers** -

