

# Peripheral Vascular Examination

# 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

# Peripheral Vascular Exam

- Arms
  - Size, symmetry, skin color, temp., edema
  - Radial and brachial pulse
  - Epitrochlear lymph nodes
  - Allen's test (radial and ulnar patency), venous filling
- Legs
  - Size, symmetry, skin color, temperature
  - Femoral pulse, bruit and inguinal lymph nodes
  - Popliteal, DP and PT pulse,
  - Peripheral edema, ulcers/lesions

# 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



# LOOK

- Move Closer (pressure areas)
  - Lateral side of the foot
  - Head of first metatarsal
  - Heel
  - Both Malleoli
  - Tips of the Toes
- Look in between each of the toes



**common sites  
of sores in  
feet that have  
lost feeling**



# FEEL...

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



# 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**

# LISTEN

- Bruits at the Aorta, Iliac and Femoral arteries
- Subclavian and Carotid Arteries

# There are several systems for grading the amplitude of the arterial pulses.

- 4+ Bounding
- 3+ Increased
- 2+ Brisk, expected
- 1+ Diminished, weaker than expected
- 0 Absent, unable to palpate

# 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

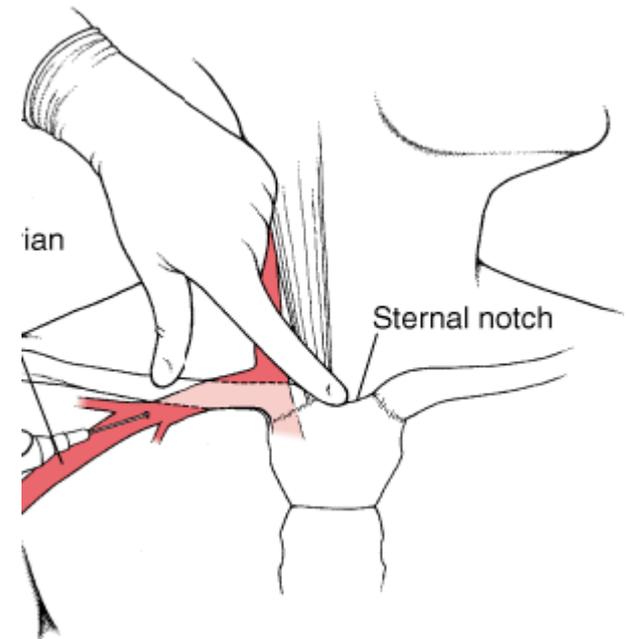
Flex the patient's elbow slightly, and with the thumb of your opposite hand palpate the artery just medial to the biceps tendon at the antecubital crease.

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



# Subclavian artery

- Palpable less frequently
- Audible often



# 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.



# Abdominal Aorta

Is an upper abdominal, retroperitoneal structure which is best palpated by applying firm pressure with the flattened fingers of both hands to indent the epigastrium toward the vertebral column.

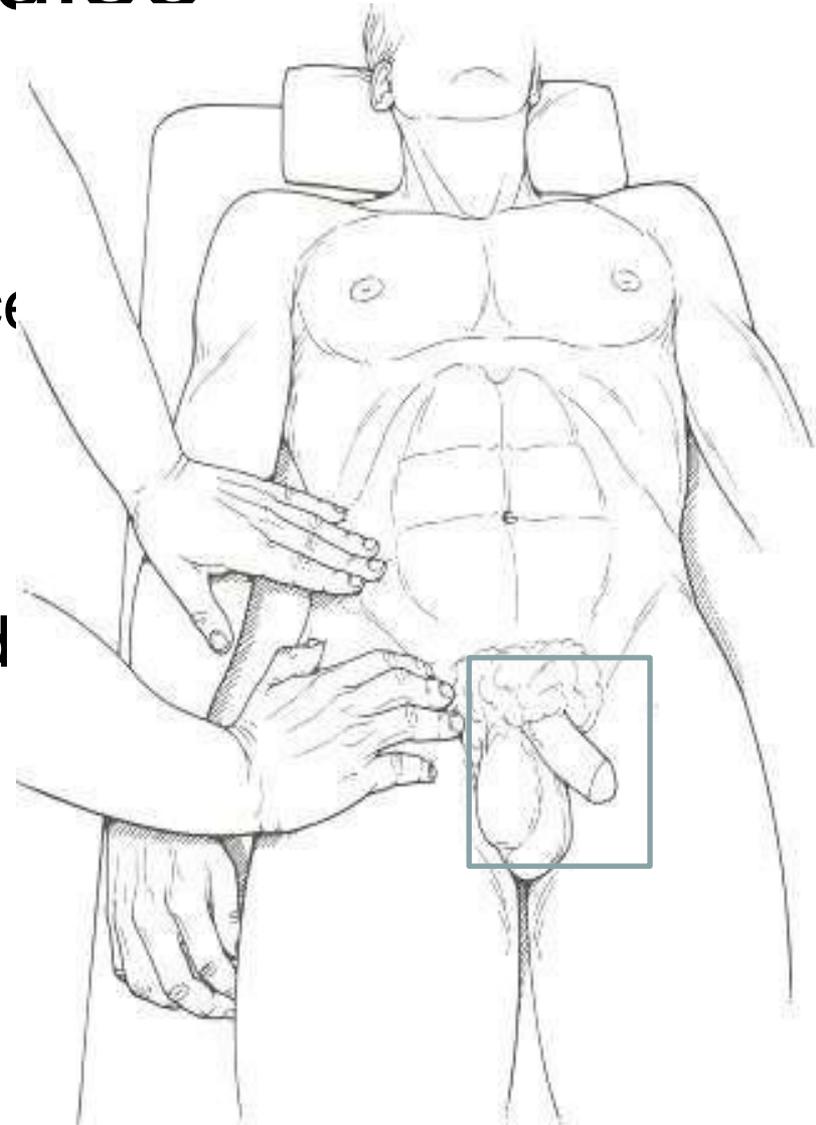
In extremely obese individuals or in those with massive abdominal musculature, it may be impossible to detect aortic pulsation.

Auscultation should be performed over the aorta and along both iliac vessels into the lower abdominal quadrants.

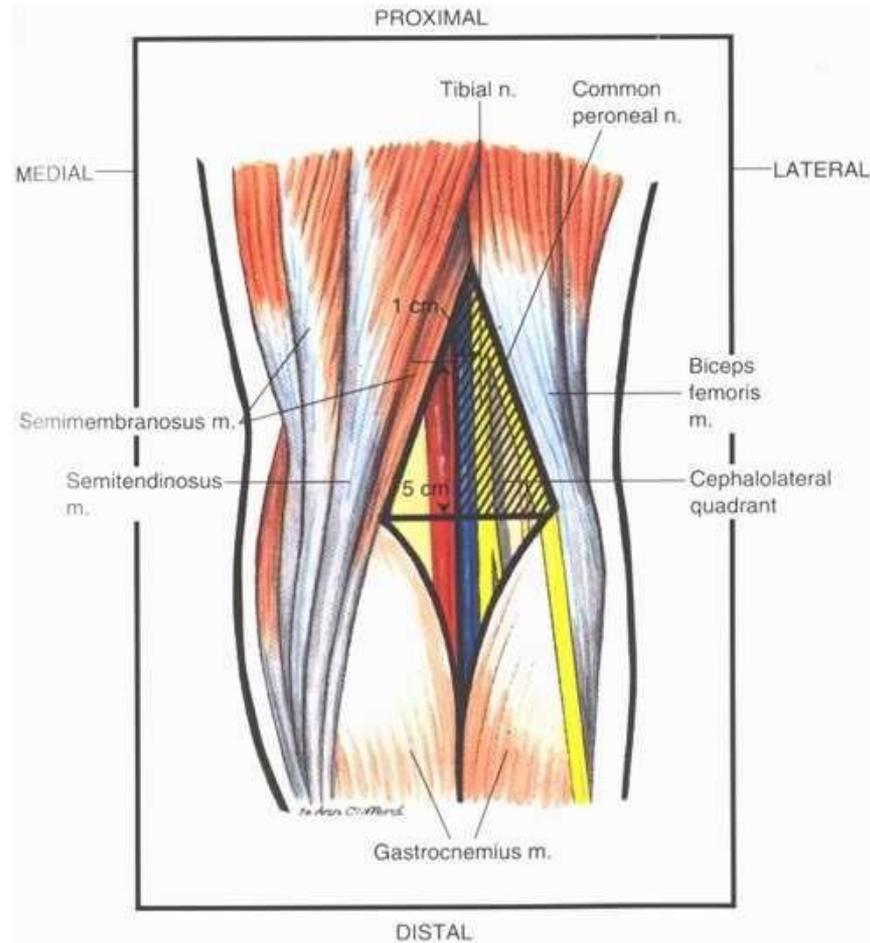


# Femoral pulse

- 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



# Popliteal Artery

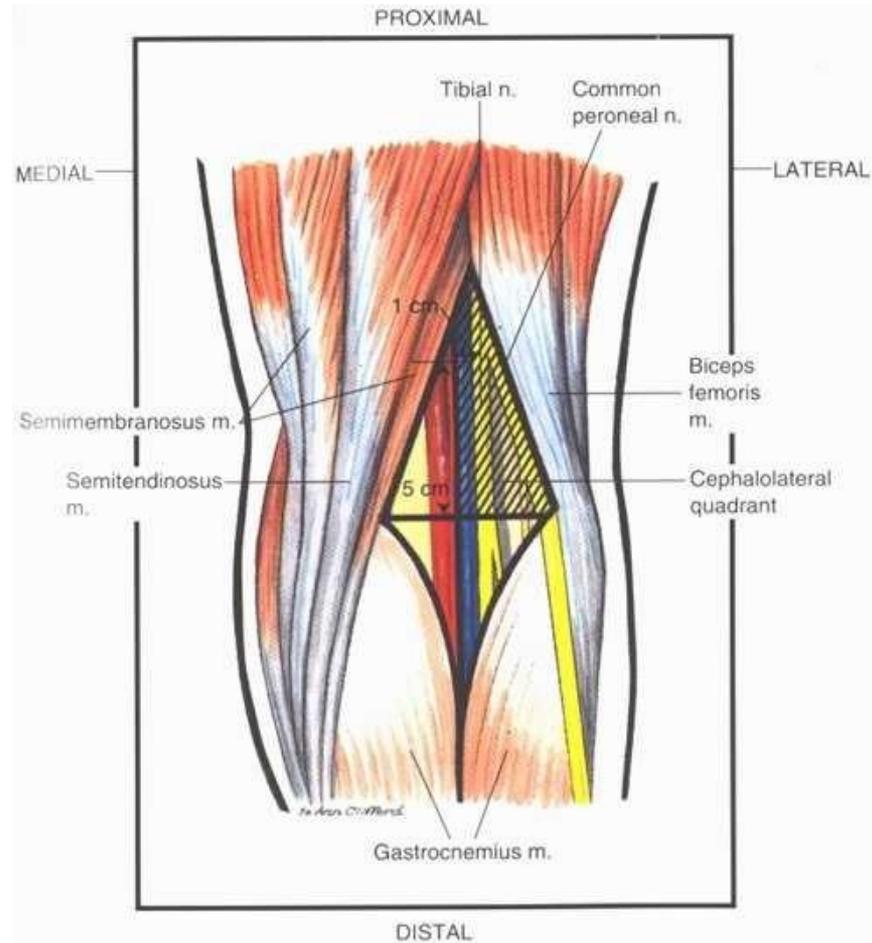
- *The popliteal artery* passes vertically through the deep portion of the popliteal space just lateral to the midplane.
- It may be difficult or impossible to palpate in obese or very muscular individuals.
- Generally this pulse is felt most conveniently with the patient in the supine position and the 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



# Third 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.



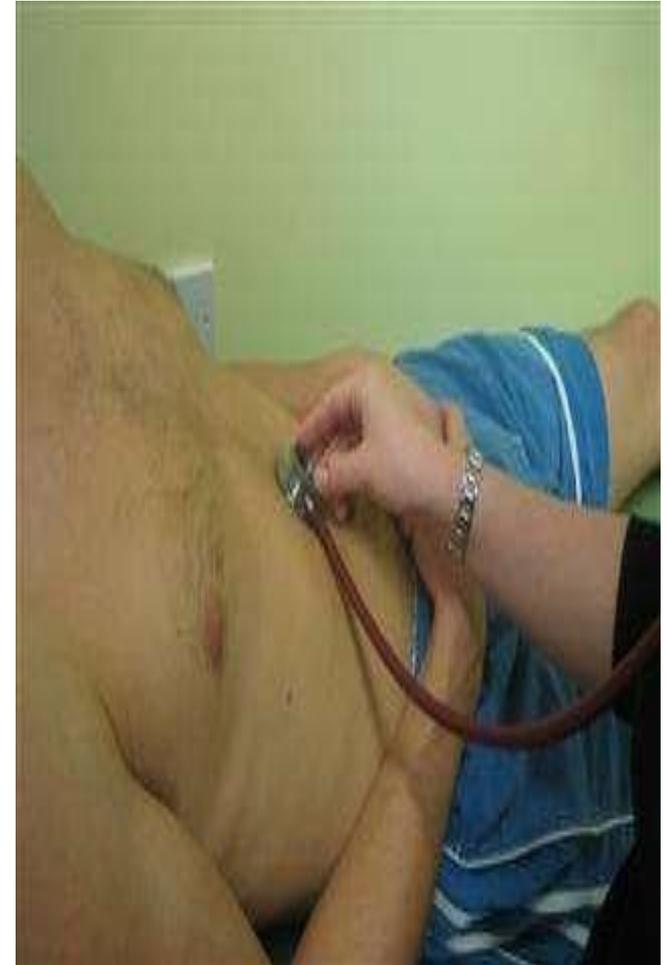
# The *dorsalis pedis* artery

- 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.



# FURTHER TESTS

- **Elevate to 15 degrees** ?venous guttering
- Elevate leg further. Note angle at which turns pale (**BUERGER'S ANGLE**)
- Ask patient to **hang their leg over the edge** of the bed (**BUERGER'S TEST**)  
**White → Pink → Flushed purple-red**  
**(Reactive Hyperaemia)**

# THEN

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