

Lecture 4

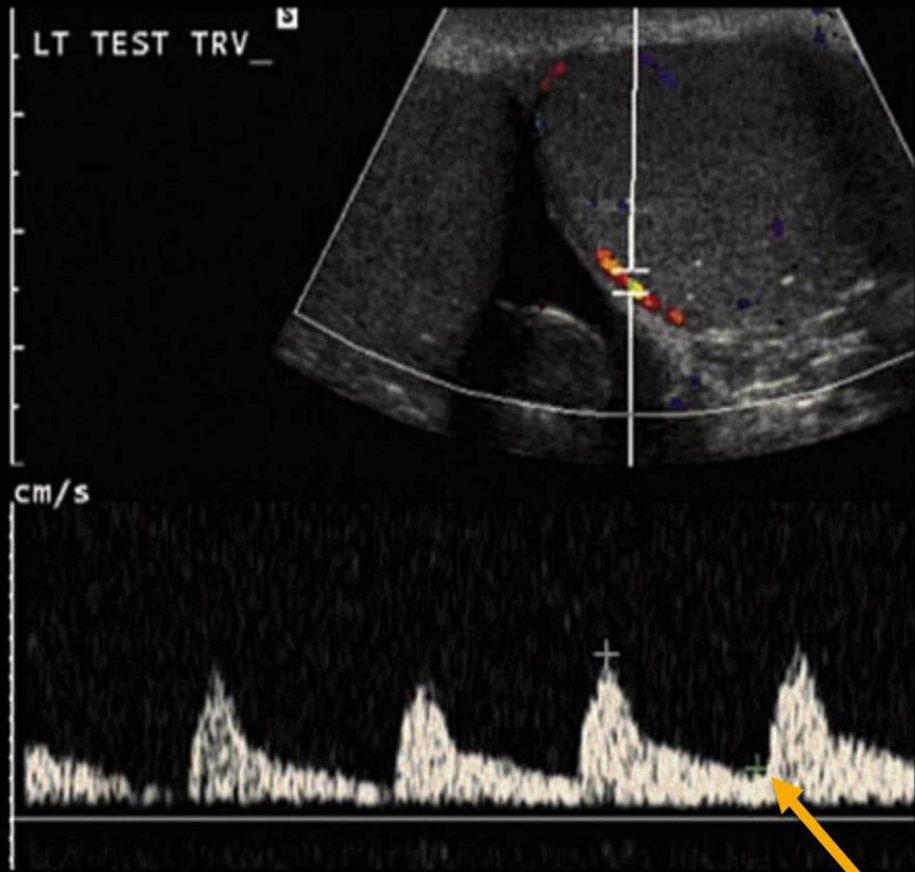
Doppler ultrasound

Tutor:

Dr. Wisam Aziz Yousif

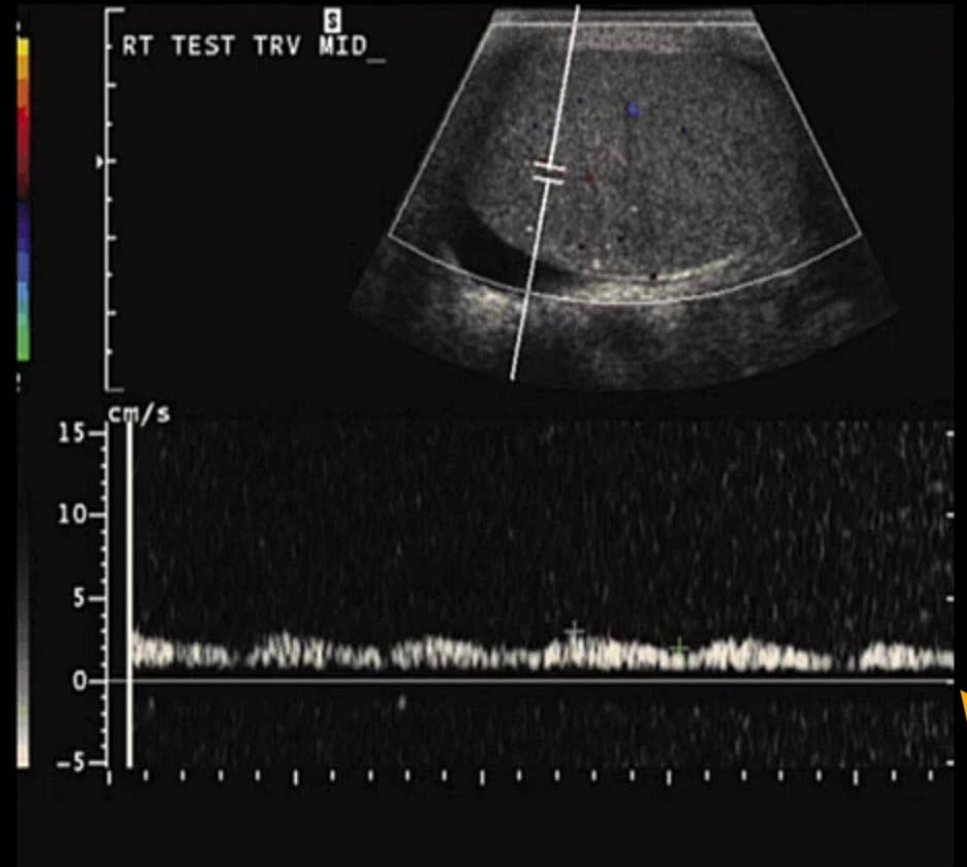
Testicles

Normal (Postpubertal)



Low Resistance

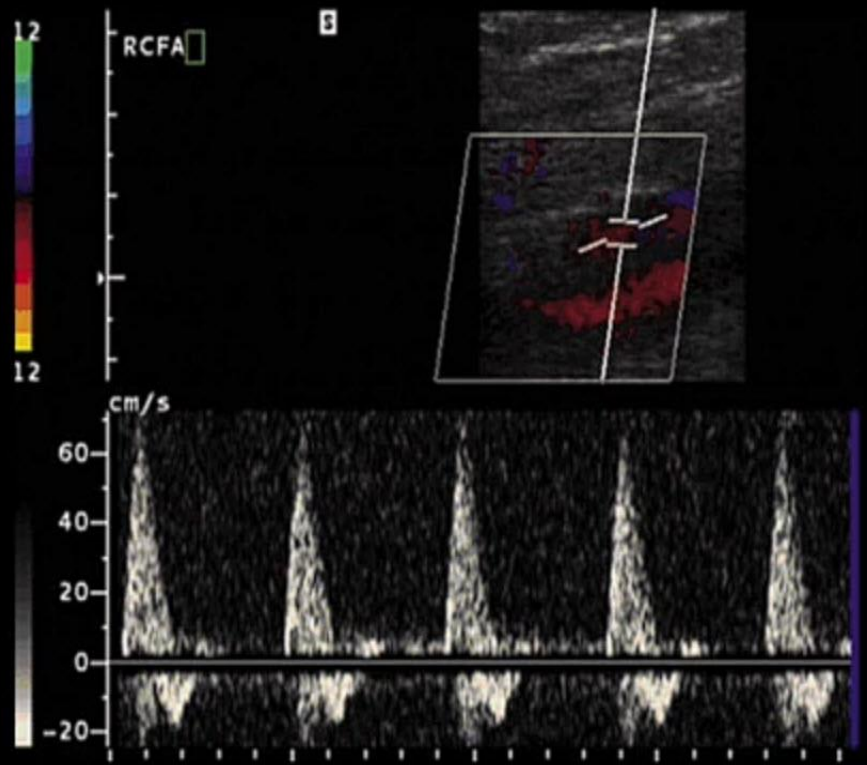
Torsion



Tardus parvus

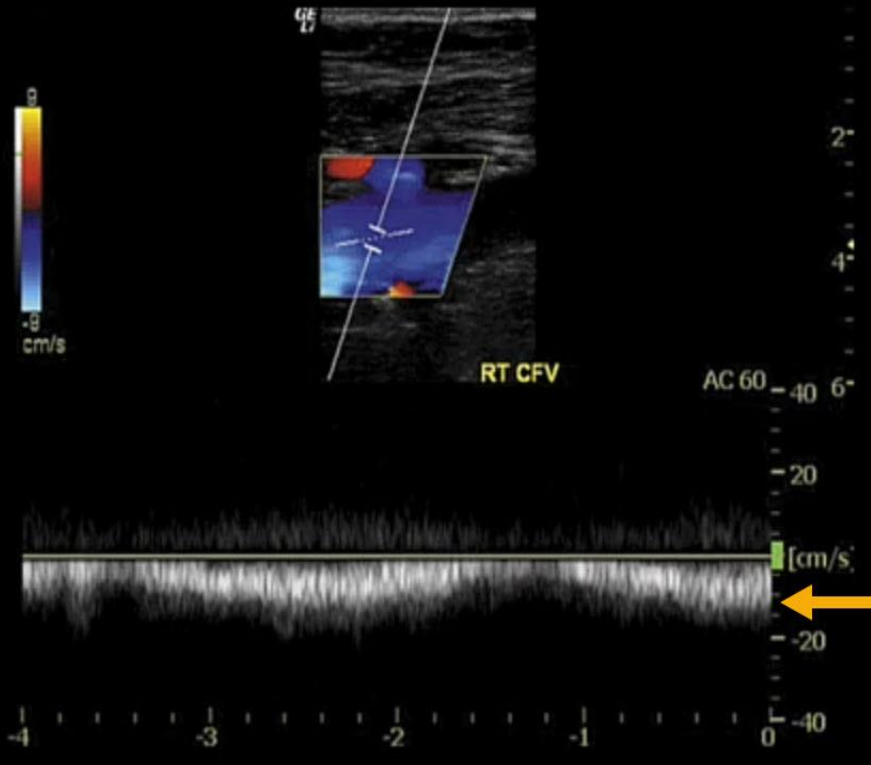
Extremities

Normal Femoral Artery



High Resistance

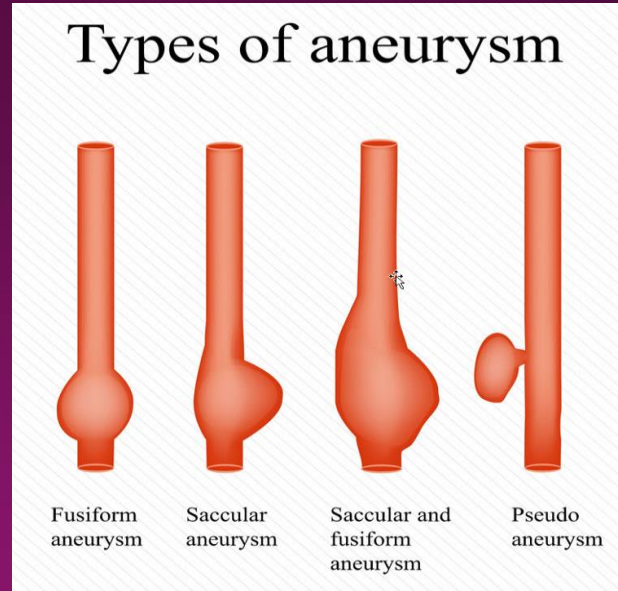
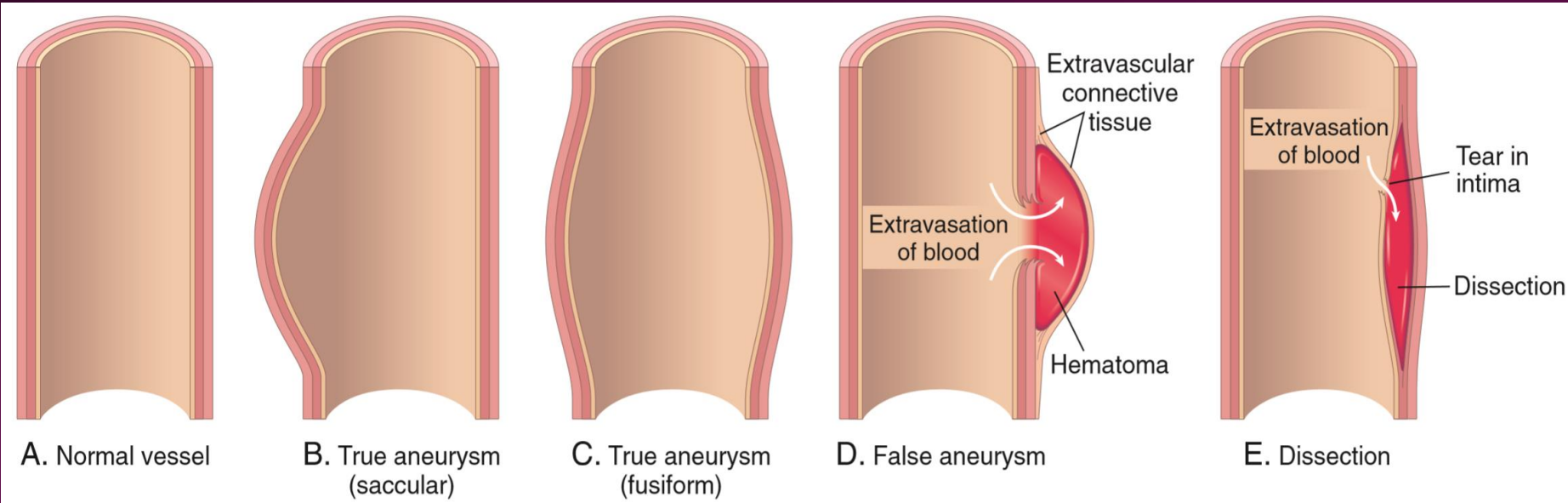
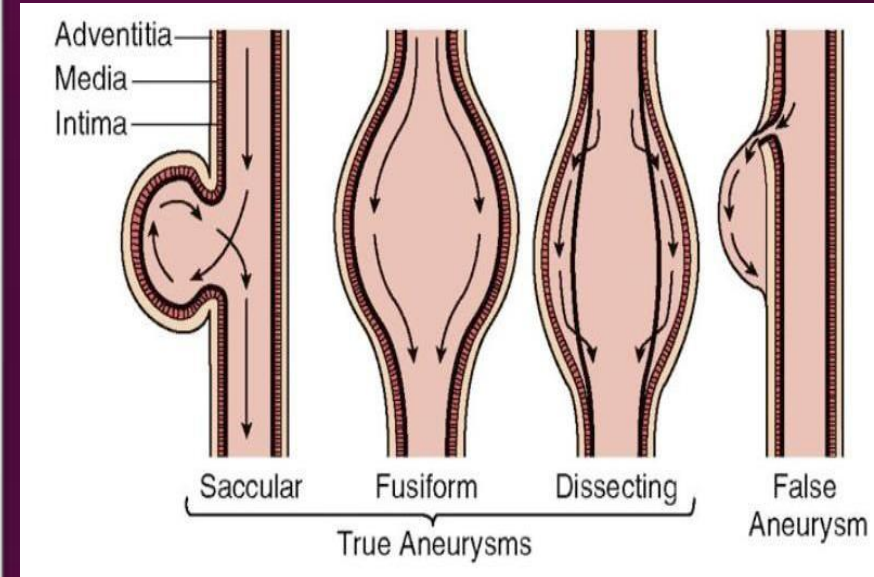
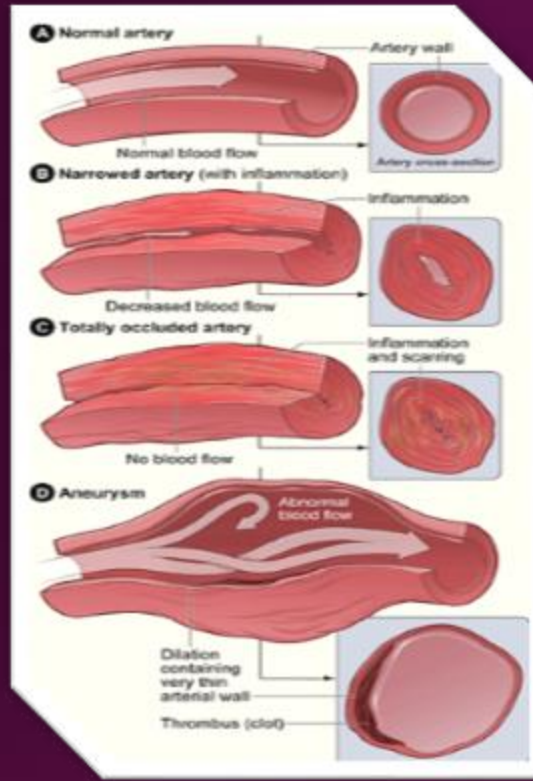
Normal Femoral Vein



Variability

Arterial lesions

Types of arterial aneurysm



Pseudoaneurysm:

False aneurysms, also known as a pseudoaneurysm, is when there is a breach in the vessel wall such that blood leaks through the wall but is contained by the adventitia or surrounding perivascular soft tissue. Generally appear as rounded sacs close to, and often with, a connecting "neck" from the parent vessel. These are distinguished from **true aneurysms**, which are bounded by all three layers of the arterial wall. Pseudoaneurysms typically occur when there is a breach in the vessel wall such that blood leaks through the inner wall but is contained by the adventitia or surrounding perivascular soft tissue.

Etiology:

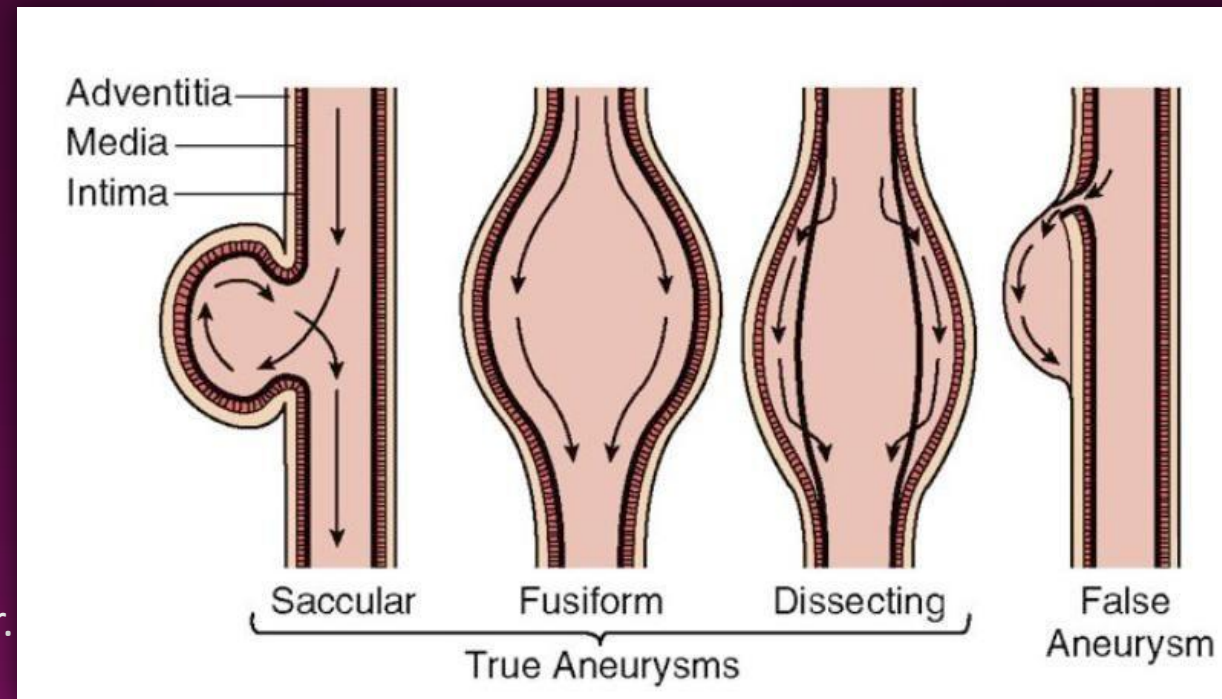
- trauma (dissection or laceration)
- iatrogenic (dissection, laceration or puncture)
- arterial catheterization - most iatrogenic pseudoaneurysms
- spontaneous dissection
- myocardial infarction (left ventricular false aneurysm)
- regional inflammatory process
- acute pancreatitis and chronic pancreatitis
- vasculitis

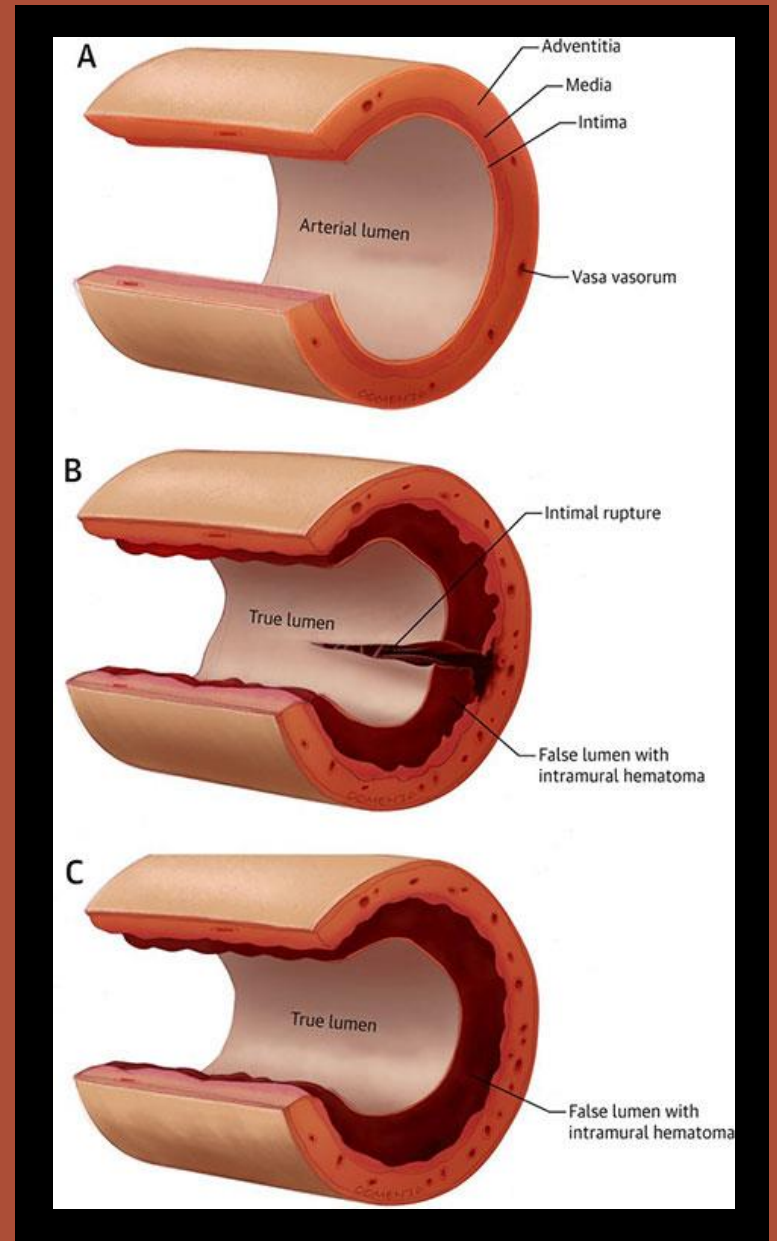
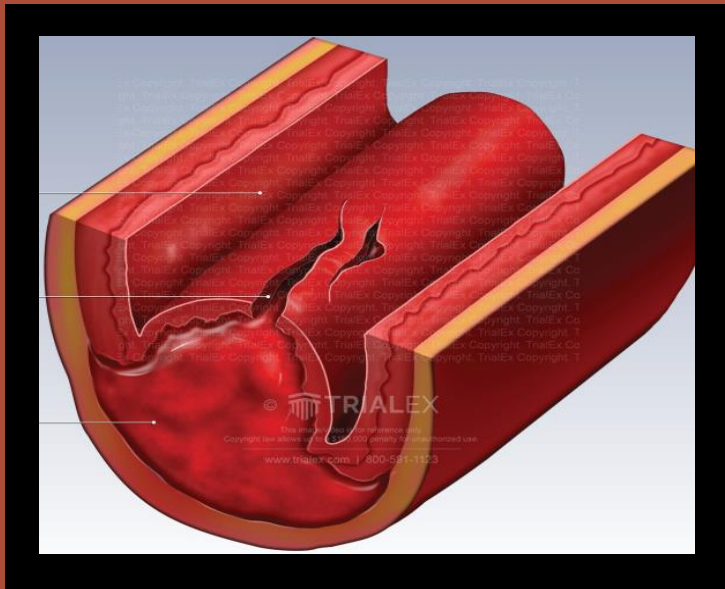
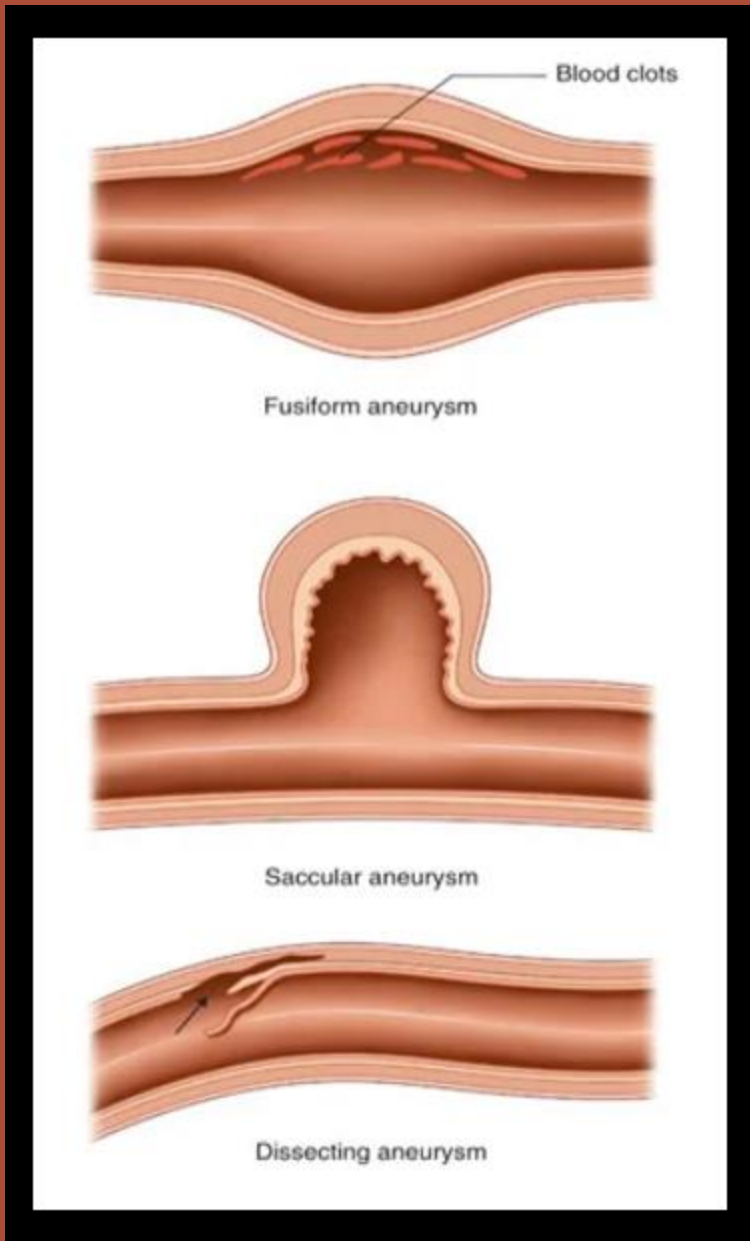
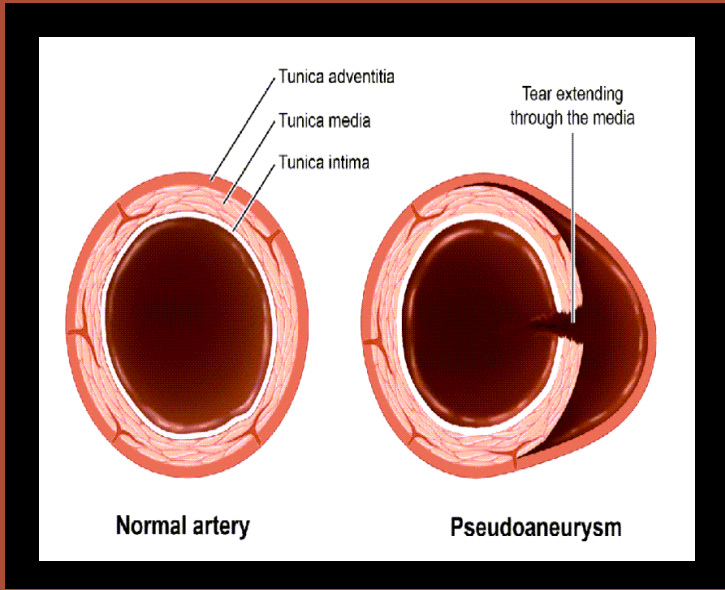
Location:

They can involve any arterial segment or even a cardiac chamber.

Ultrasound:

Due to the turbulent forward and backward flow, a characteristic **yin-yang sign** may be seen on color flow doppler while a **"to and fro"** pattern may be seen with pulsed Doppler.





DIVERTICULA

~ SMALL OUTPOUCHINGS ALONG the WALLS of a HOLLOW STRUCTURE

* USUALLY form at WEAK SPOTS
e.g. near BLOOD VESSELS

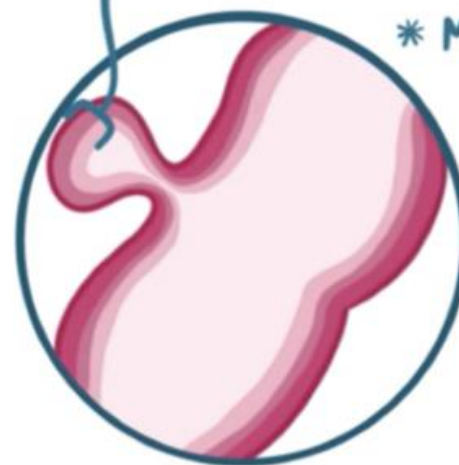
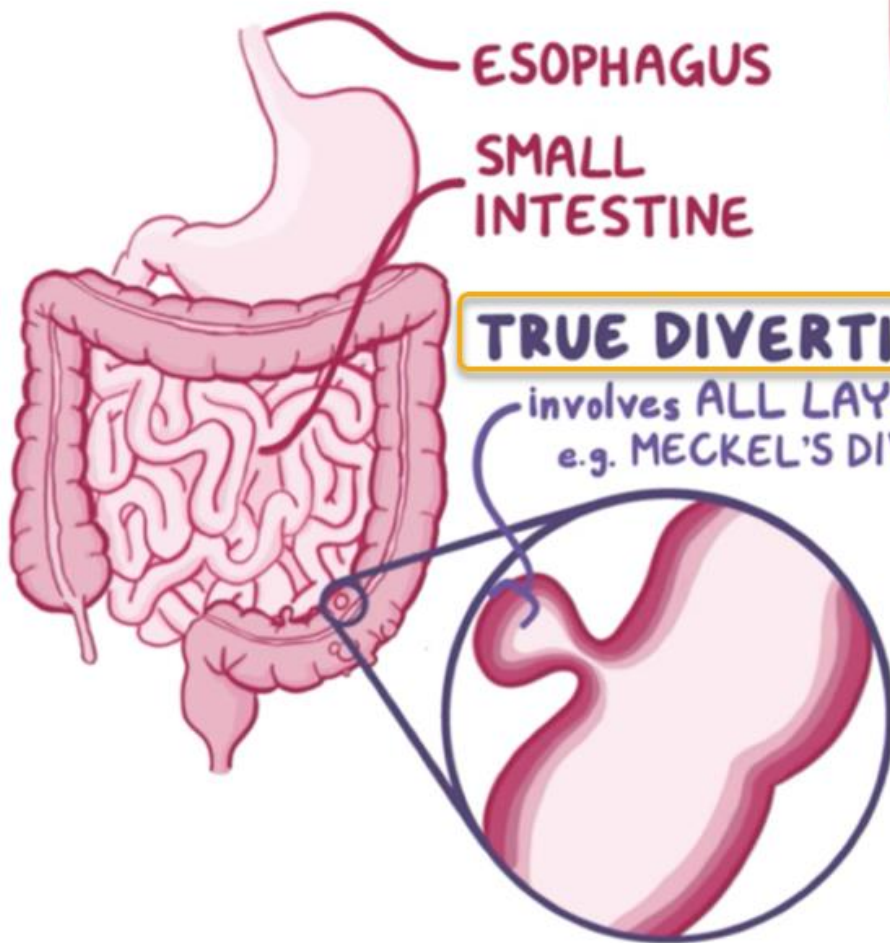
→ 2 TYPES

TRUE DIVERTICULA

involves ALL LAYERS
e.g. MECKEL'S DIVERTICULUM

PSEUDODIVERTICULA

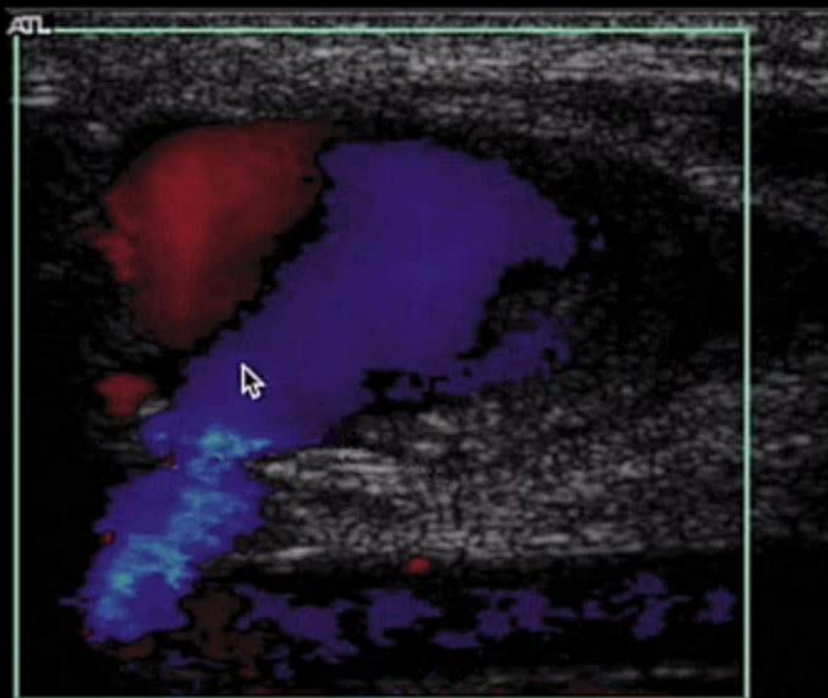
only MUCOSAL &
SUBMUCOSAL LAYERS
* MORE COMMON



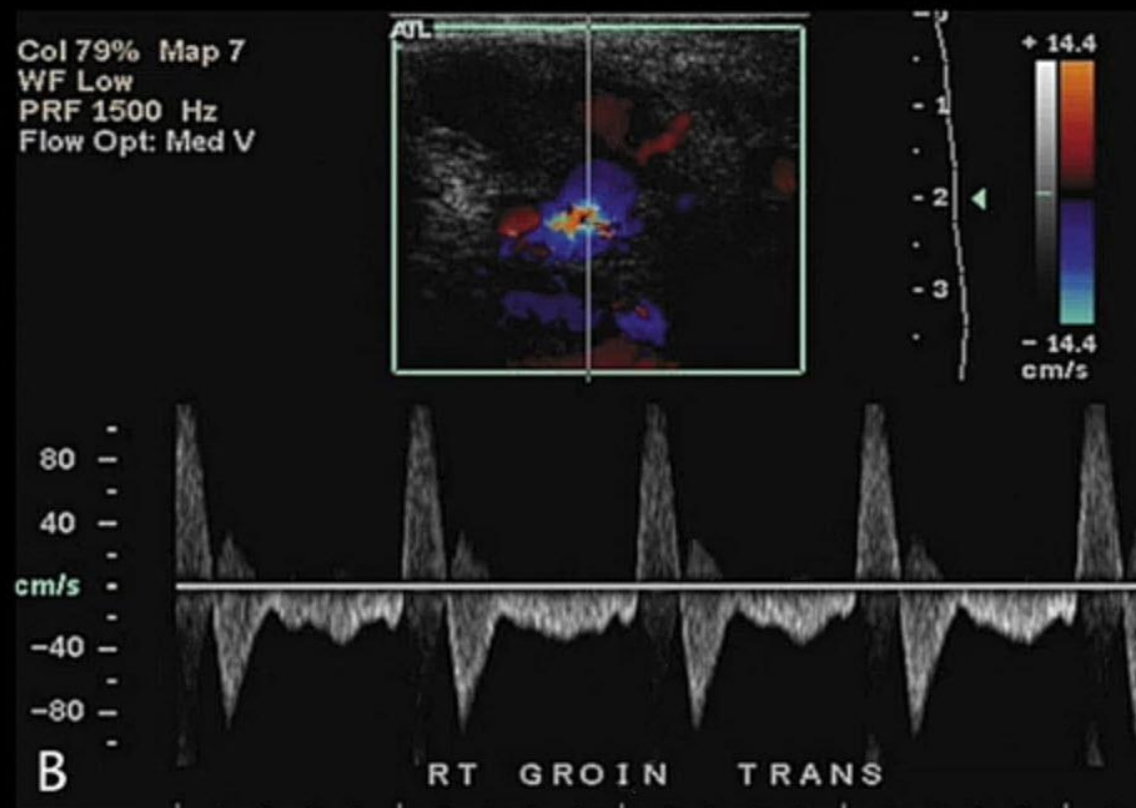
Case: 1

Hx: Previous arterial puncture

Femoral artery



A RT GROIN LONG



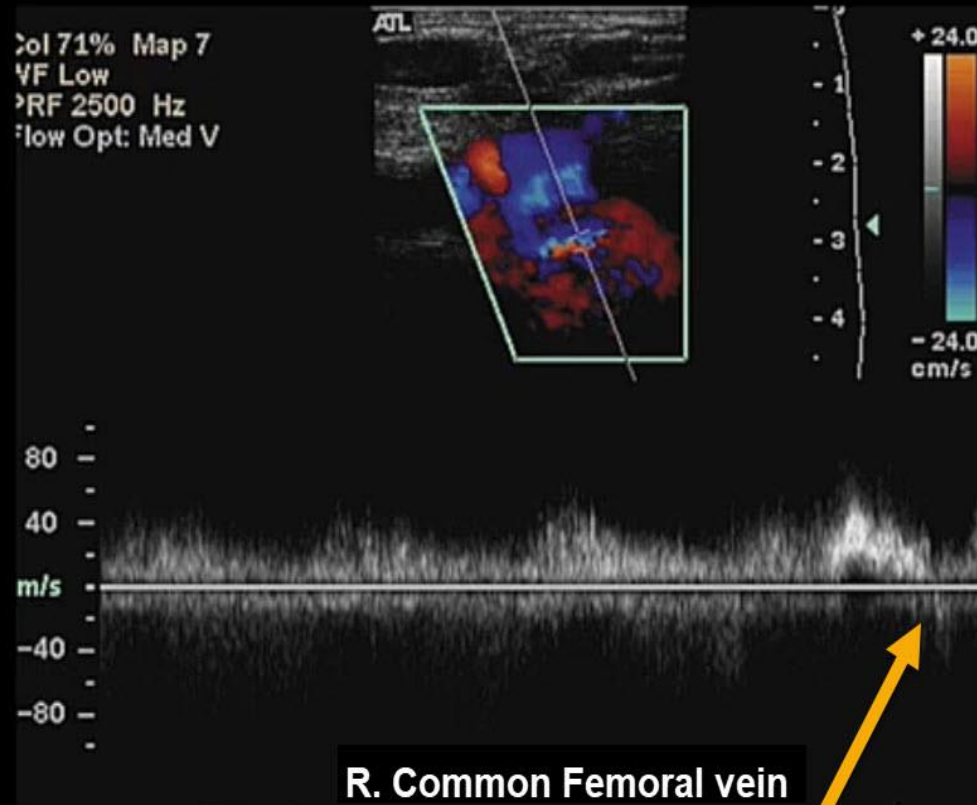
Yin-and-Yang

Dx: Pseudoaneurysm

To-and-Fro Pattern (@ neck)

Case: 2

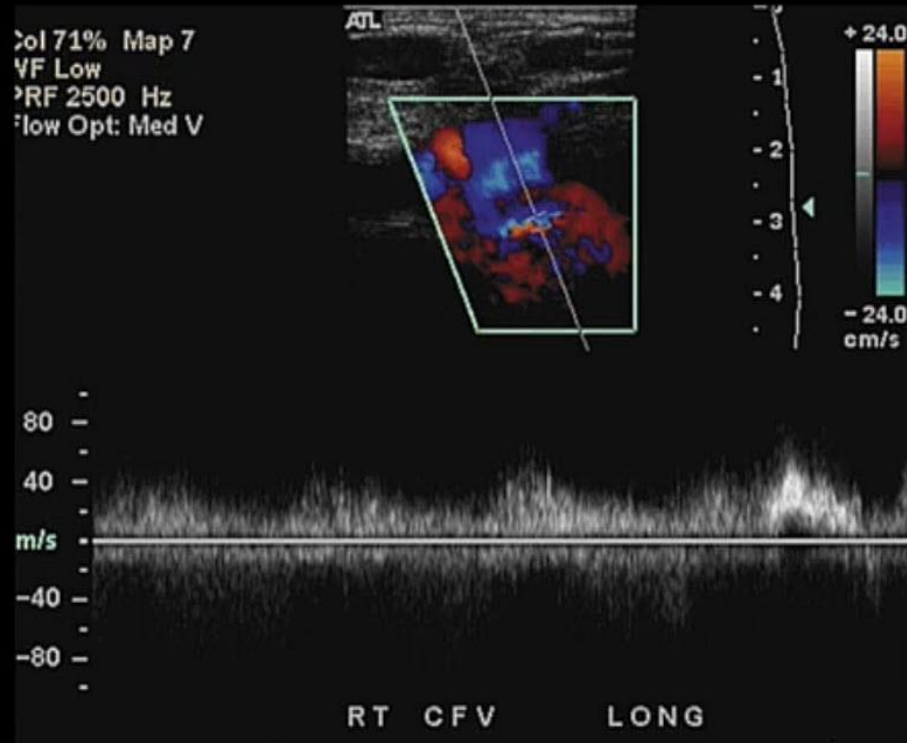
Hx: Previous arterial puncture



Pulsatile flow in vein

Low Resistance flow in artery

DX is → **AV Fistula**

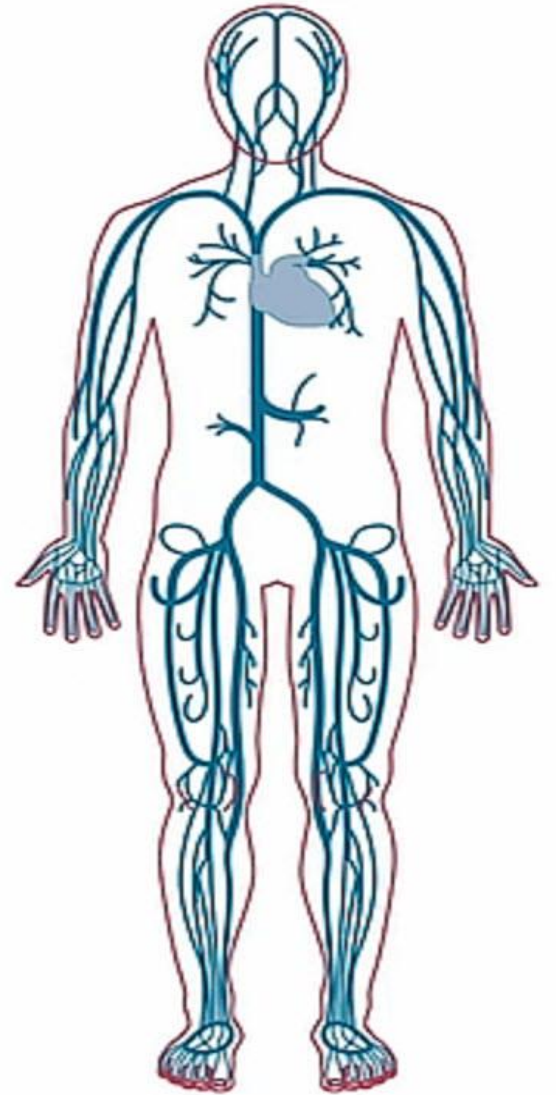


Pulsatile flow in vein

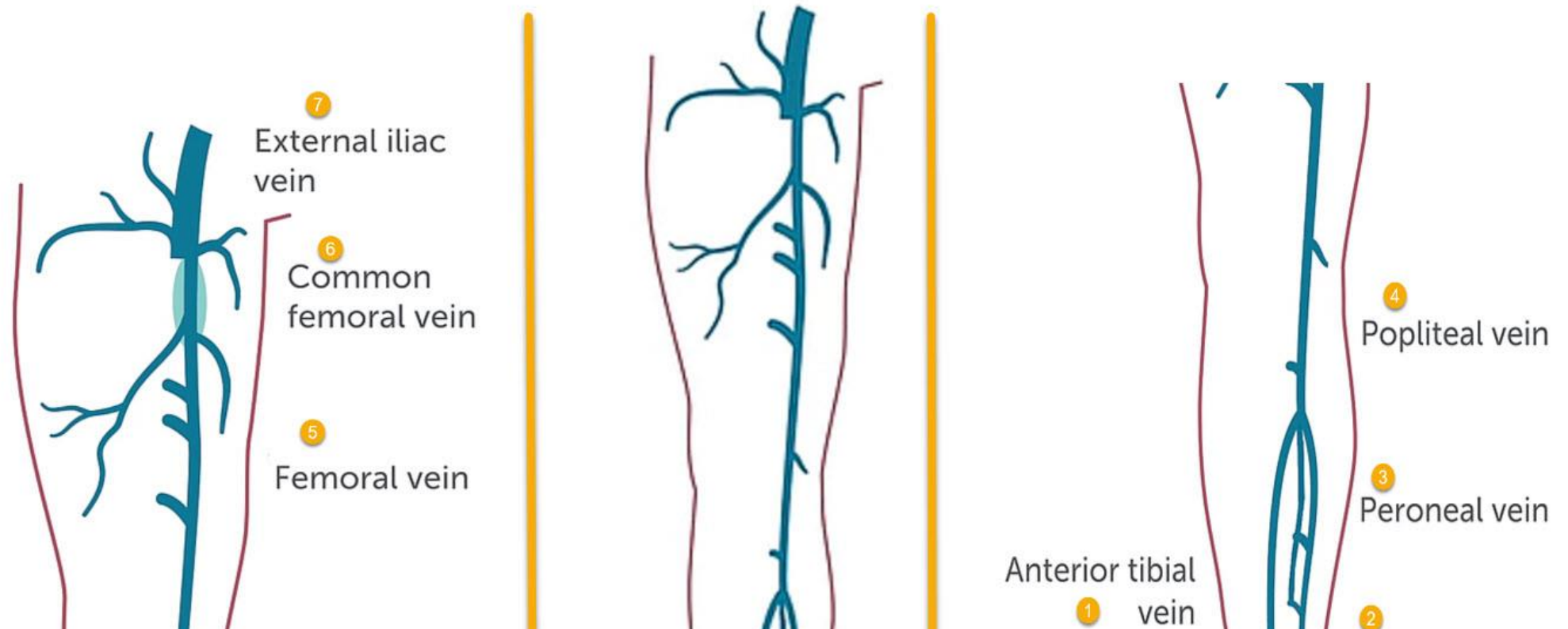
Low Resistance flow in artery

Venous Anatomy

- 1 Deep Veins
- 2 Superficial Veins
- 3 Perforating Veins

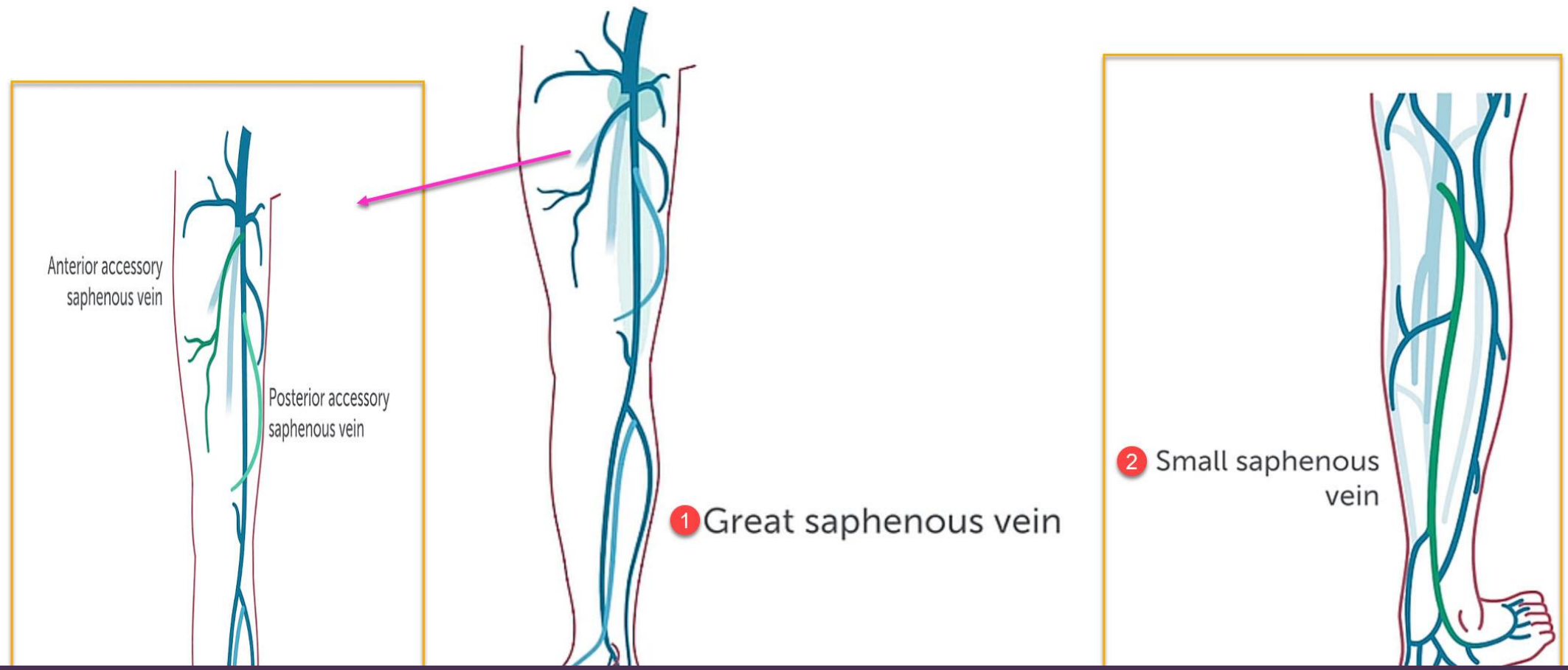


1 Venous Anatomy – Deep Veins

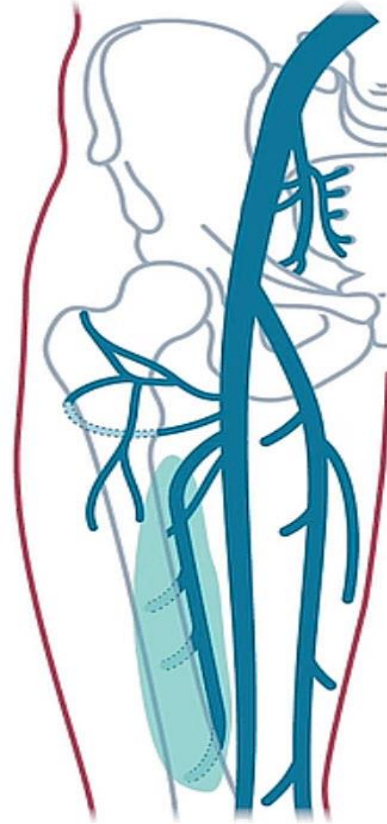


2

Venous Anatomy – Superficial Veins - GSV



3 Venous Anatomy – Perforating Veins



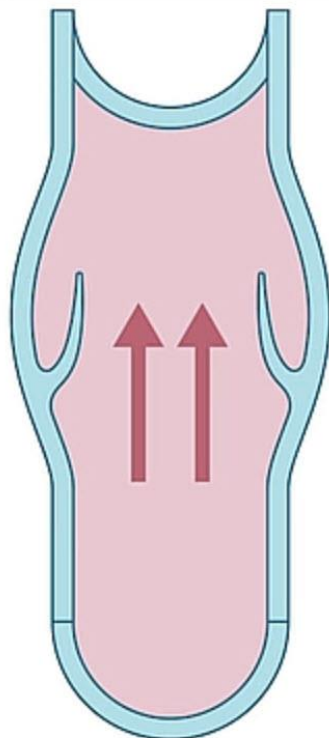
Perforating veins

Physiology: Valves

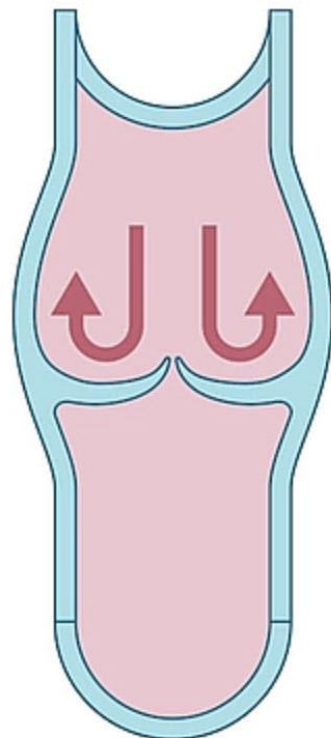
Valve functions:

- 1 Unidirectional flow
- 2 Flow optimization
- 3 Prevention of thrombosis

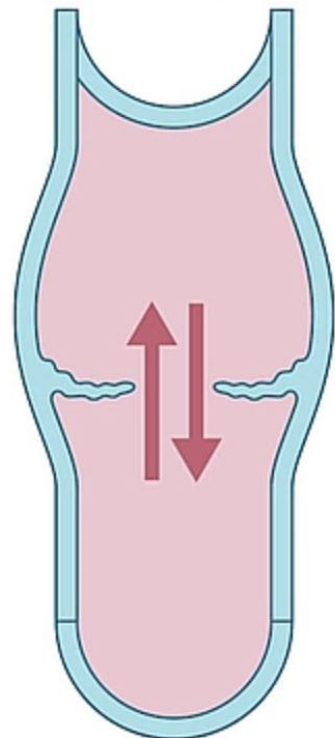
Proximal



Normal flow
to the heart

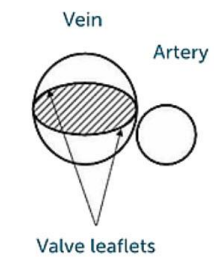


Normal valve
function
Distal

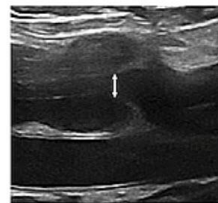
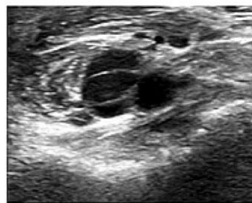


Abnormal valve
function

Venous valve: Flow optimization

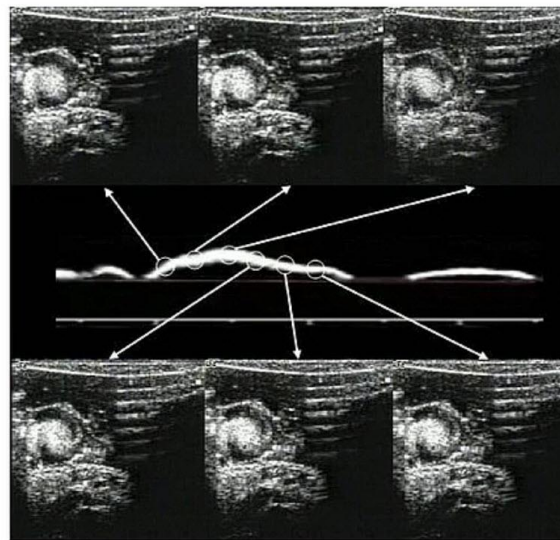
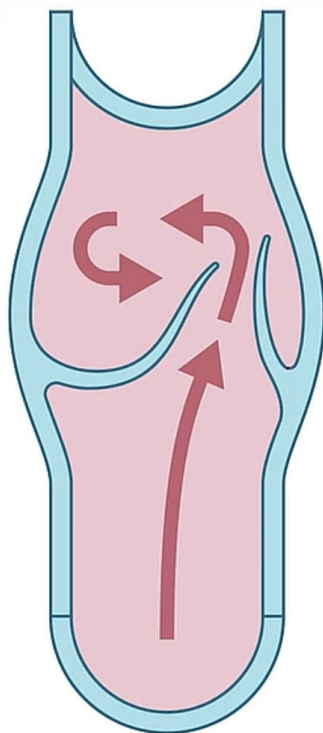


 - Valve orifice at maximal opening

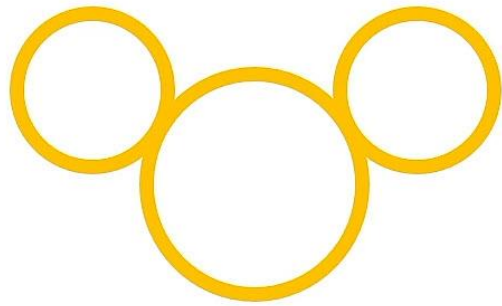
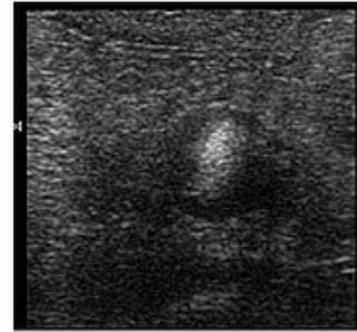
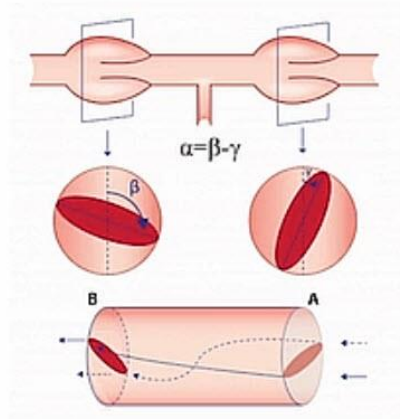
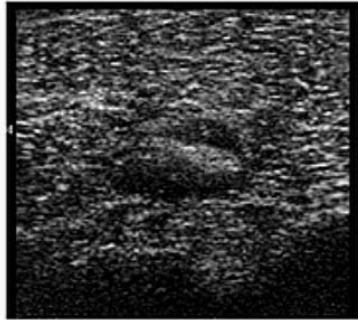


Venous Valve

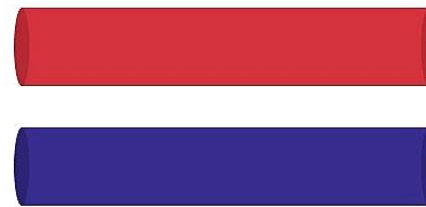
Spiral Flow



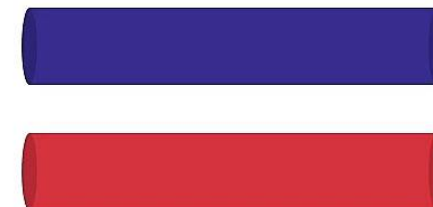
Orientation of paired valves is at an angle to each other



CFA

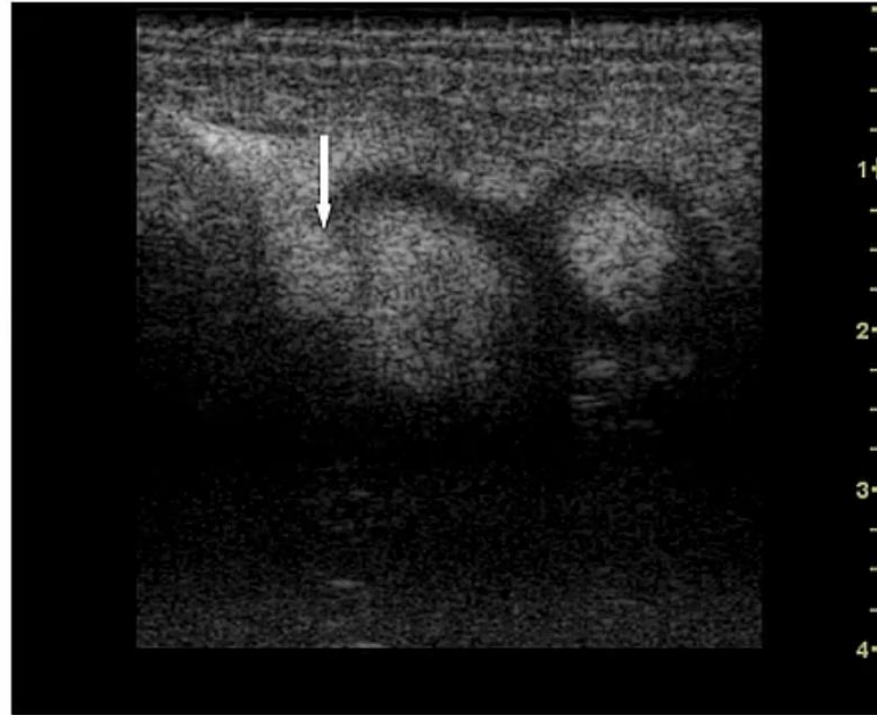


SFA

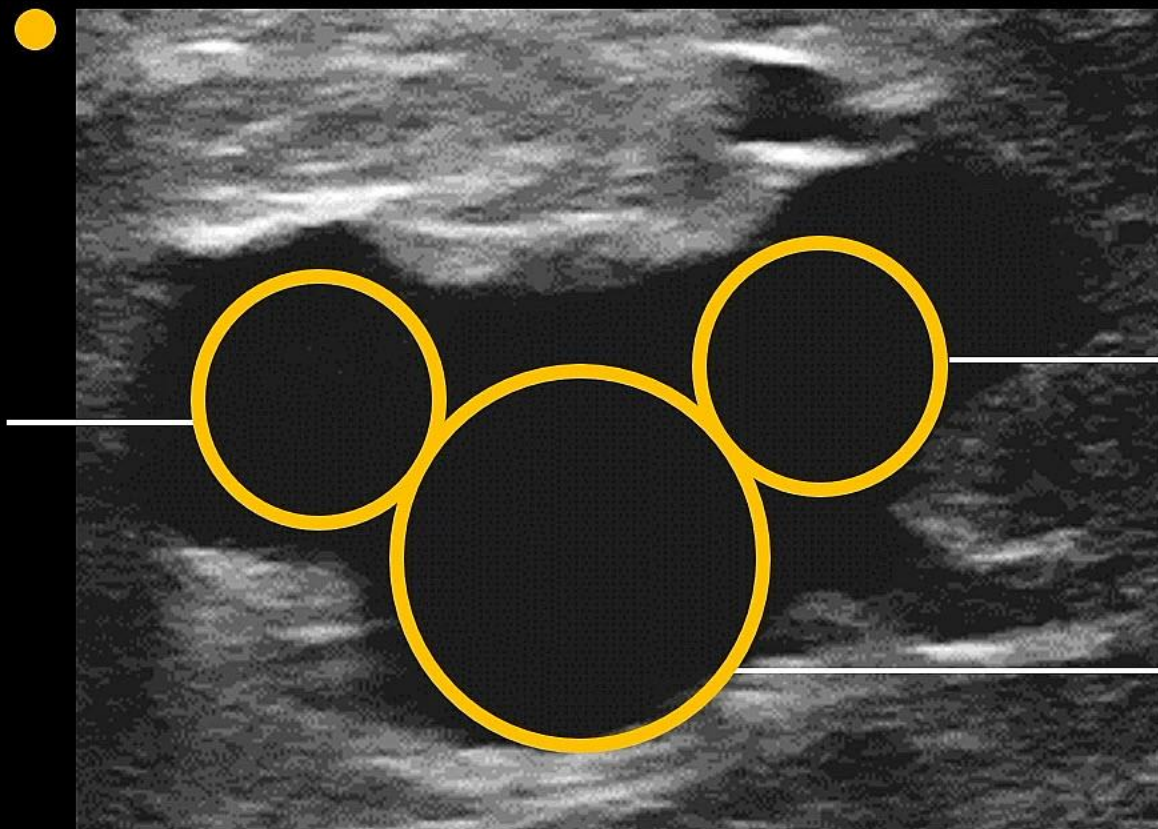


Popliteal artery

Spiral flow

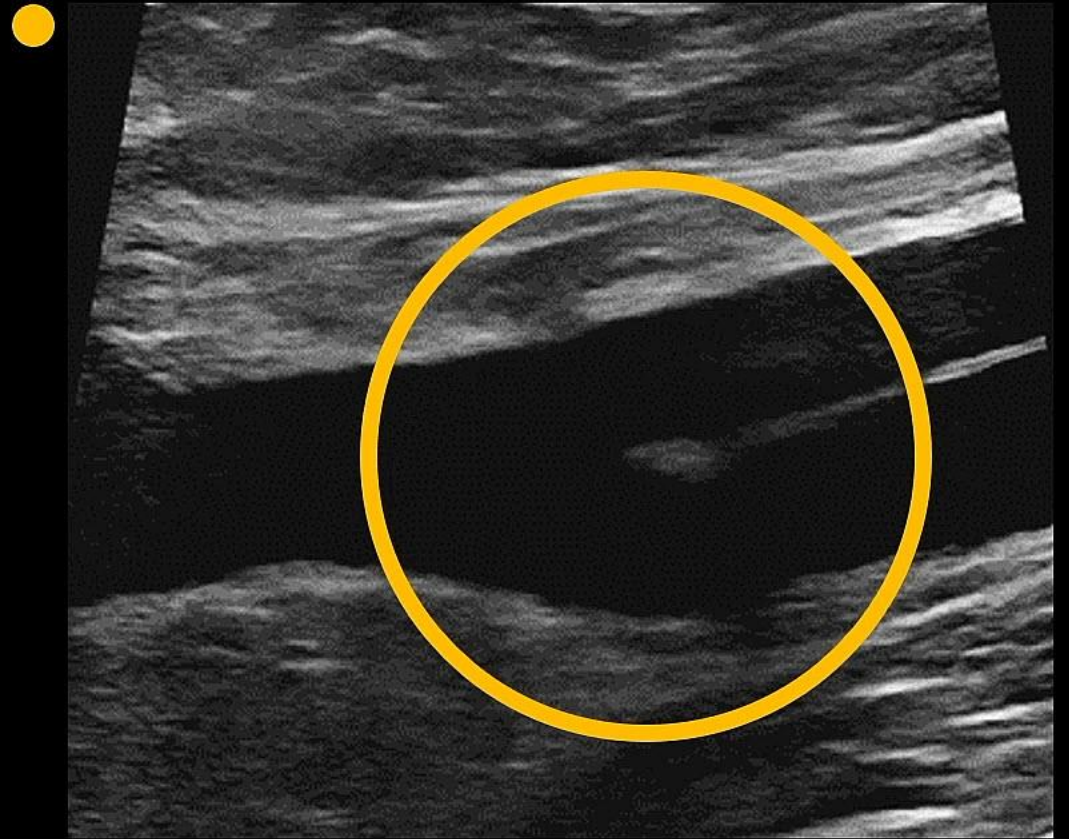
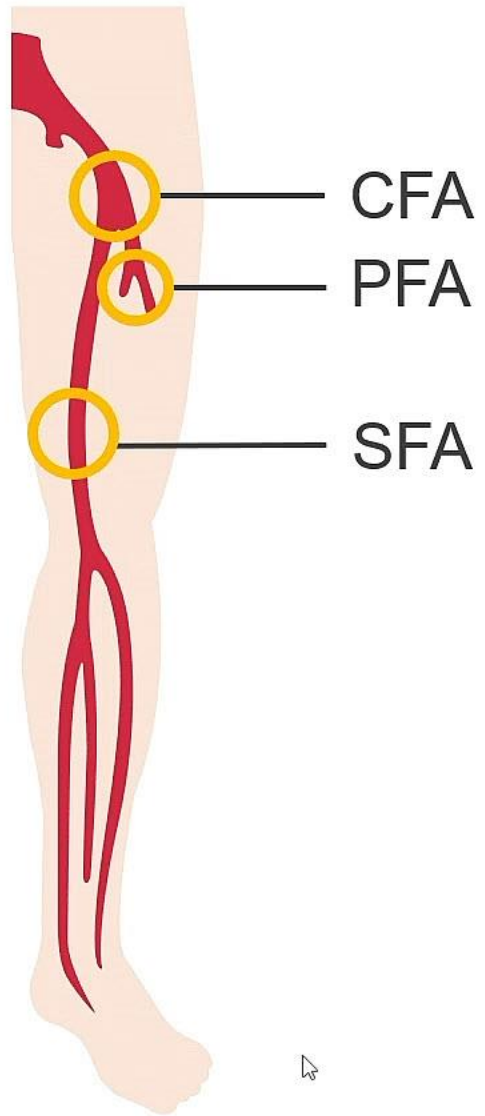


Common femoral artery (CFA)



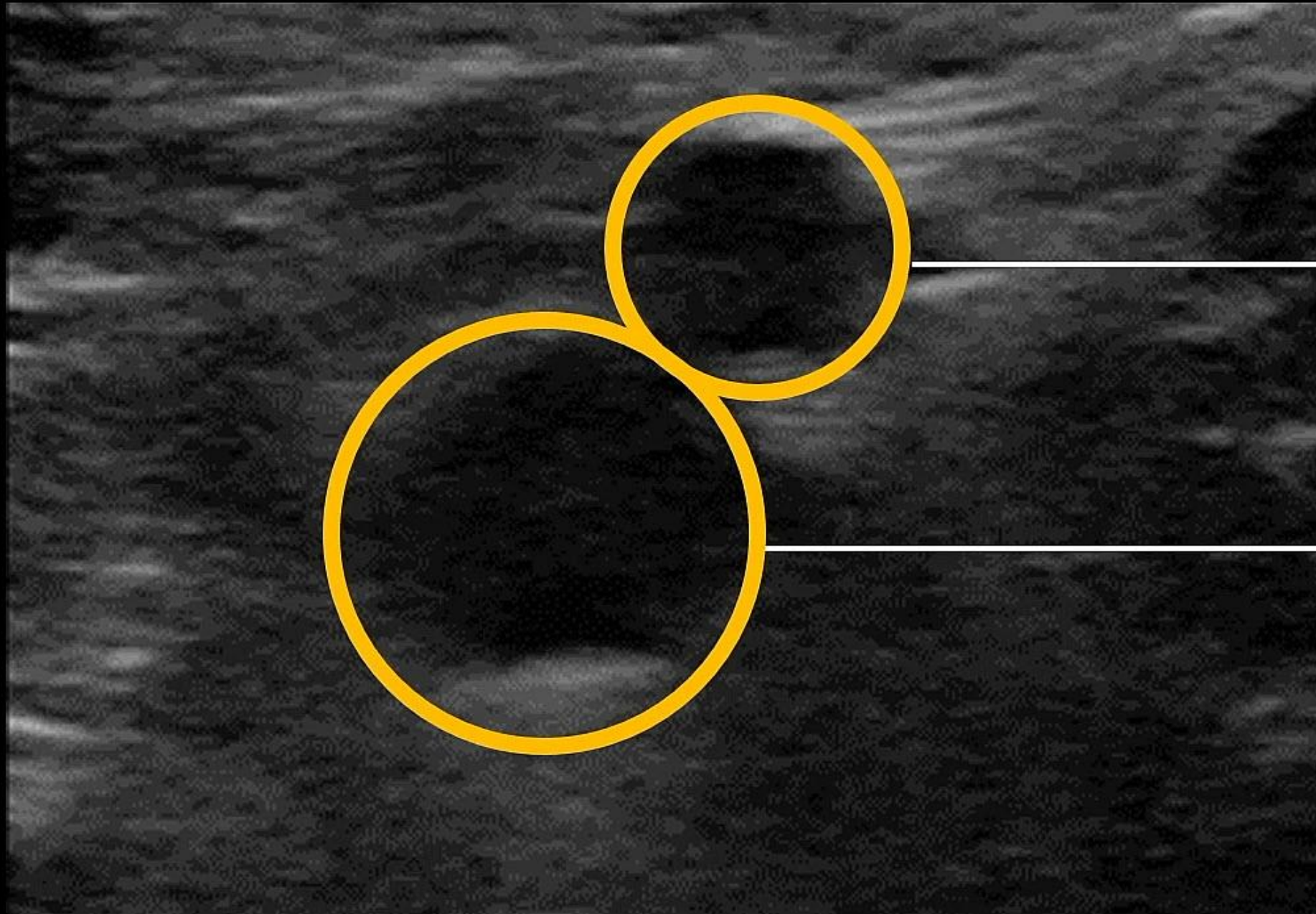
Saphenofemoral junction (SFJ)

Common femoral vein (CFV)



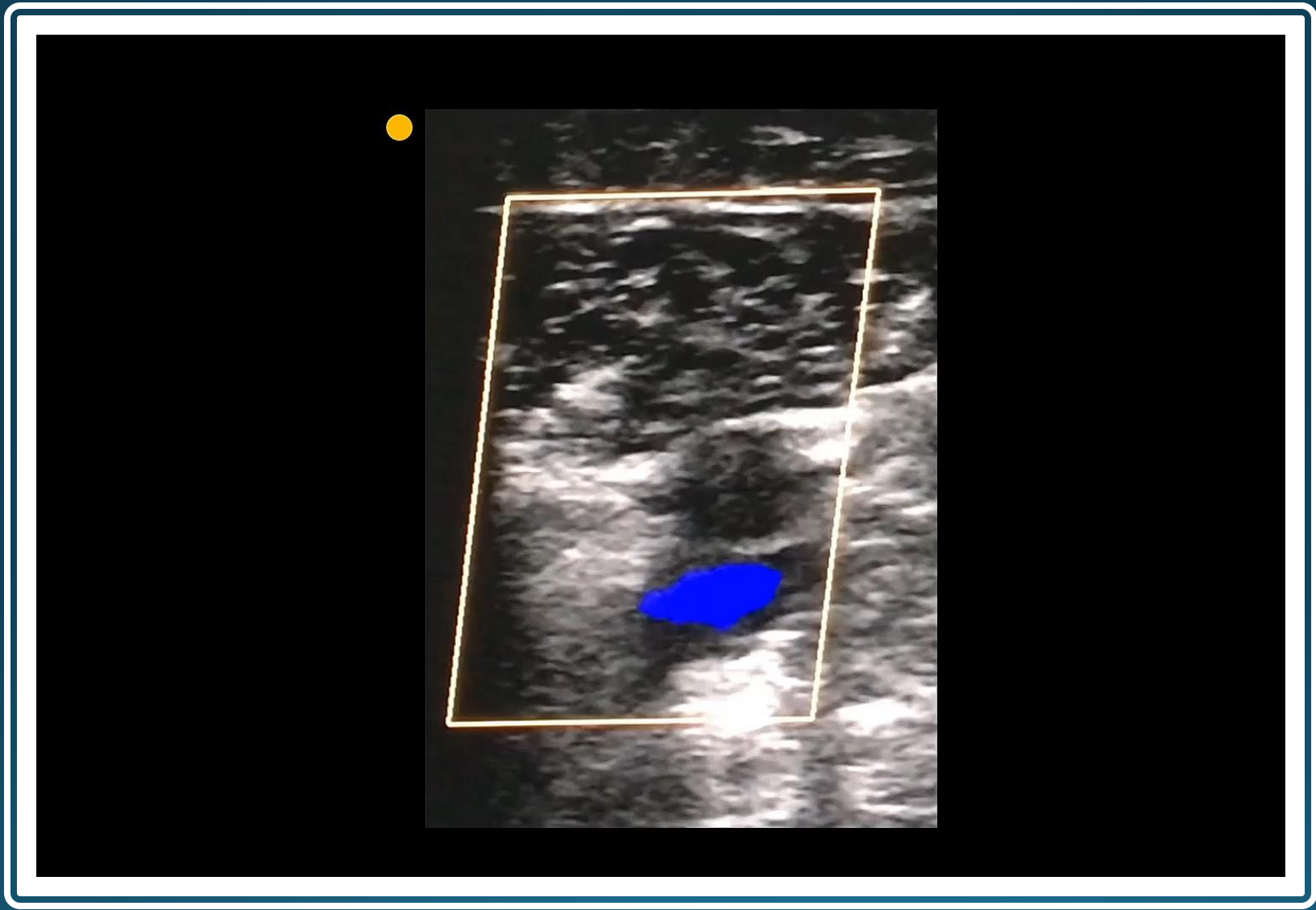
Sag view

Trans view

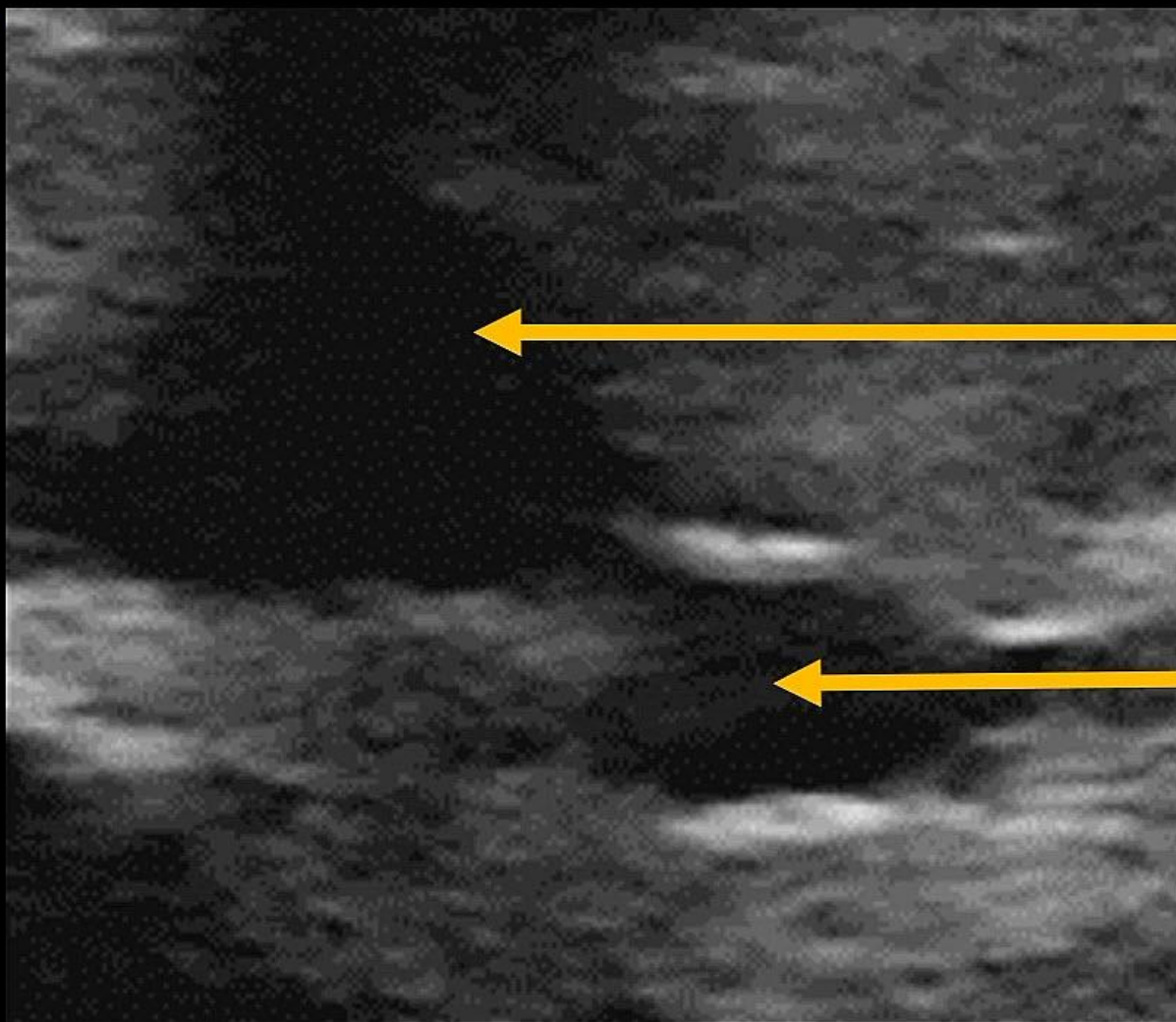


Artery

Vein

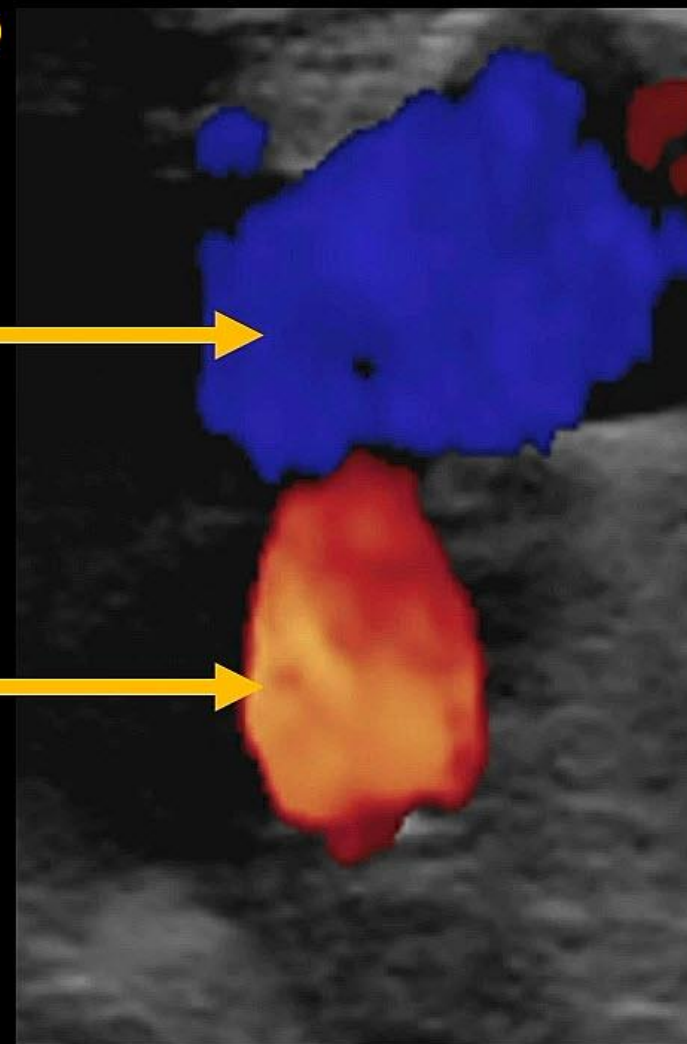


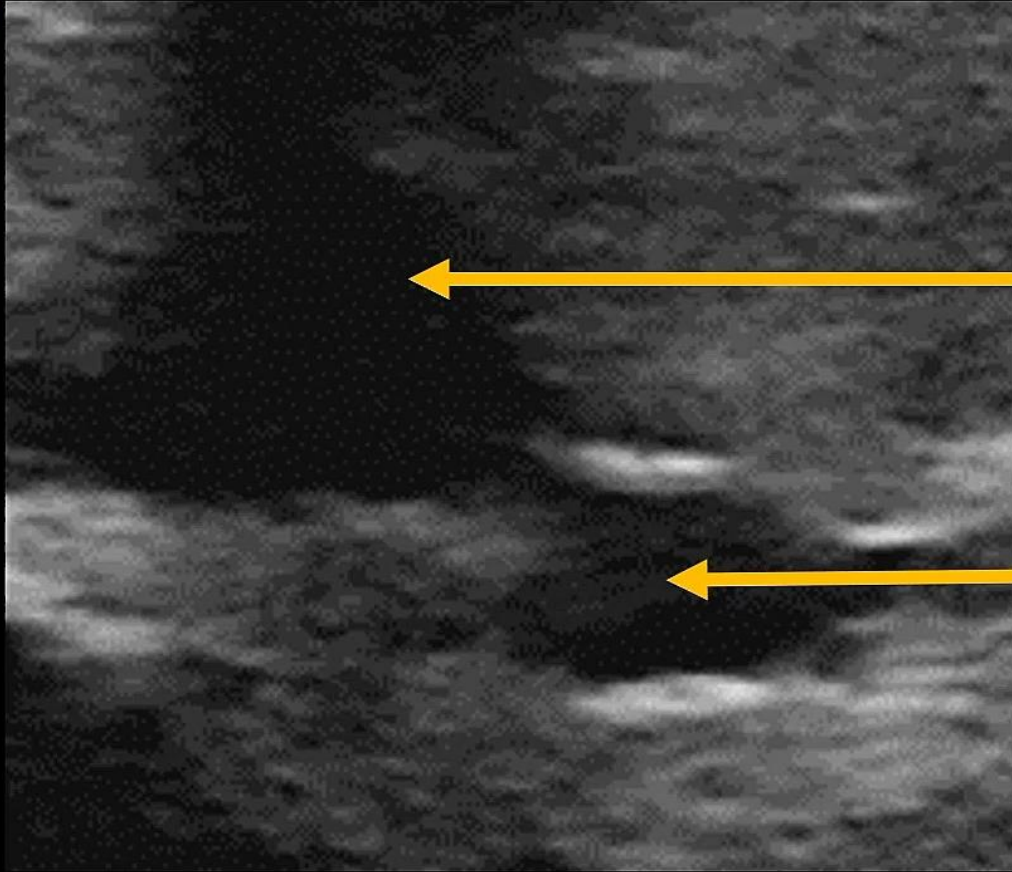
Popliteal Art.



●
Vein
above

Artery
below

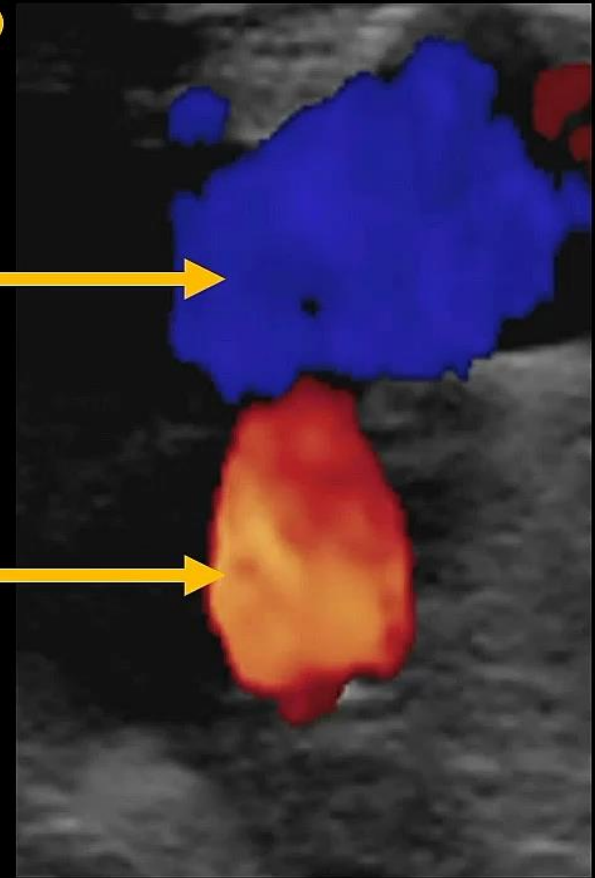


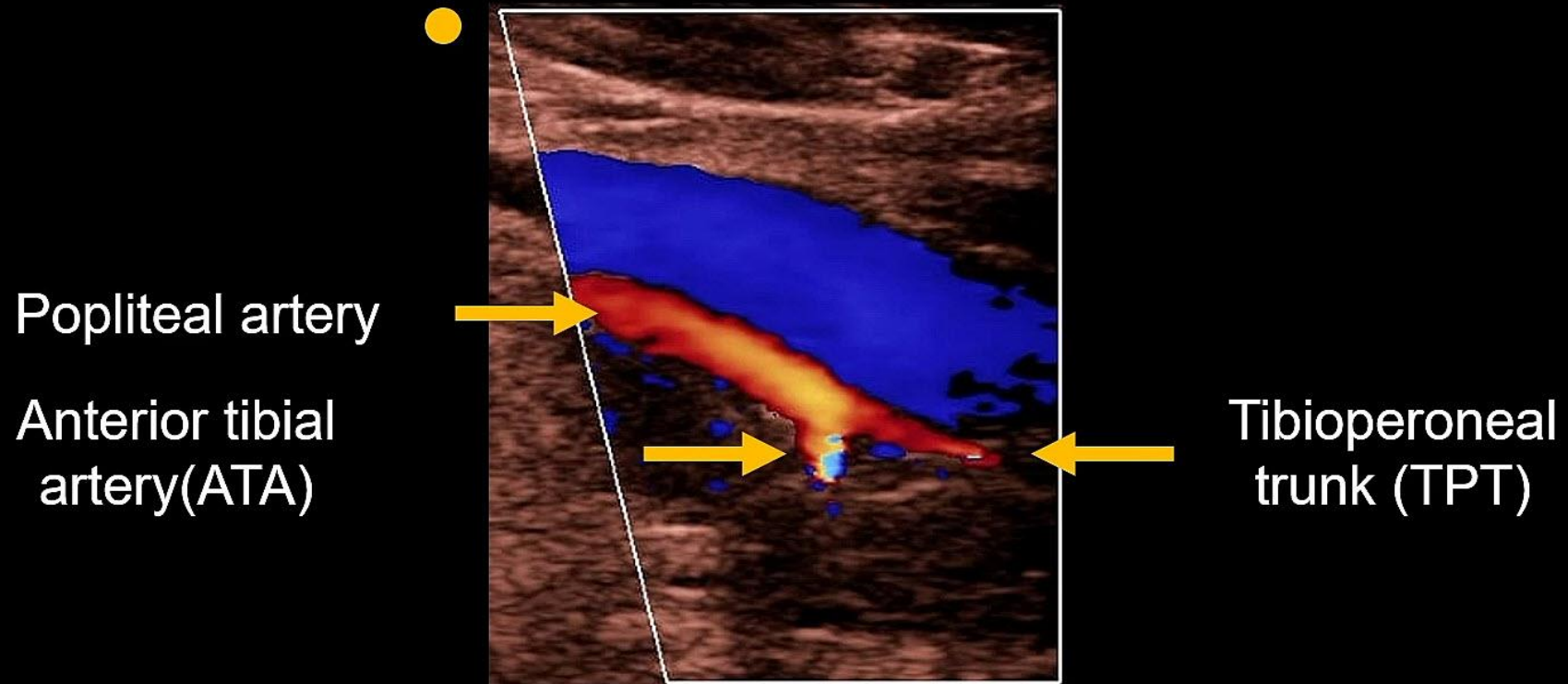


Vein



Artery

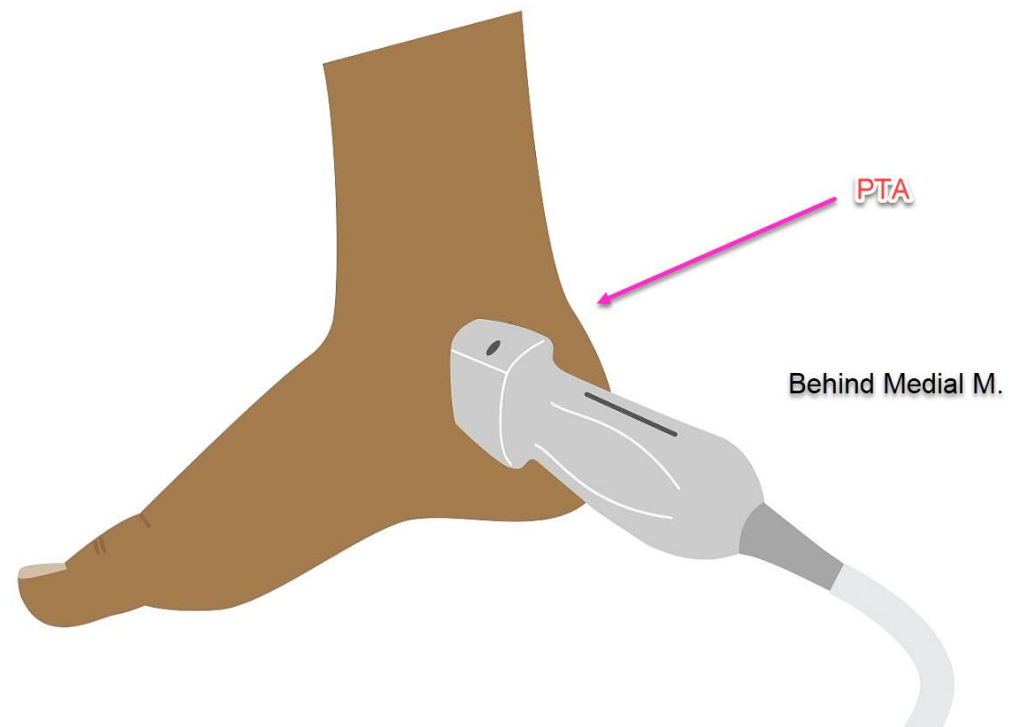
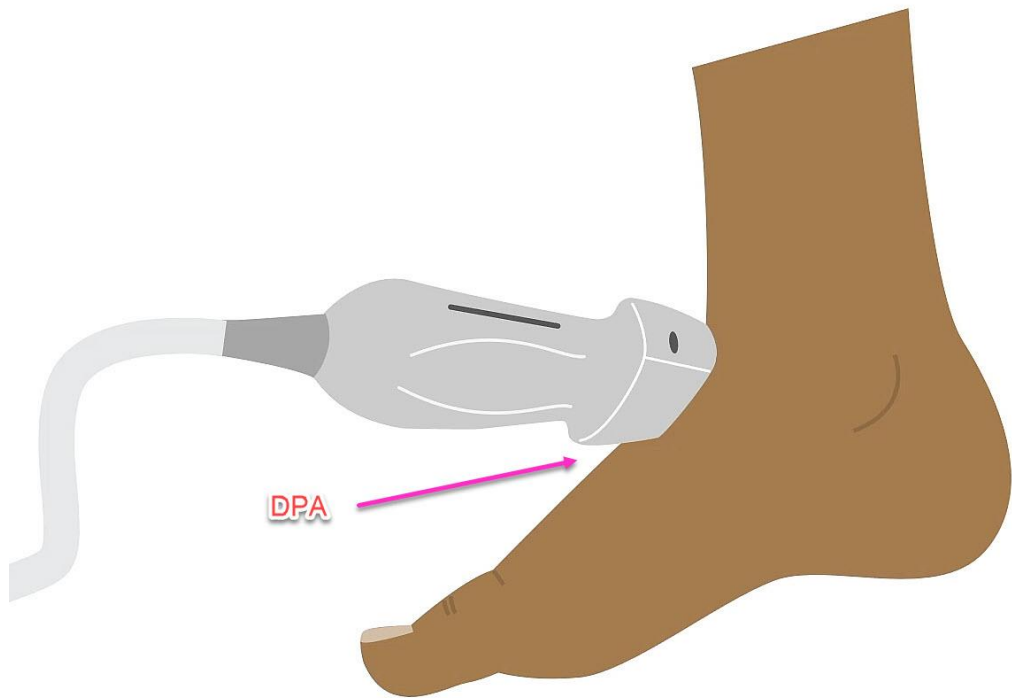


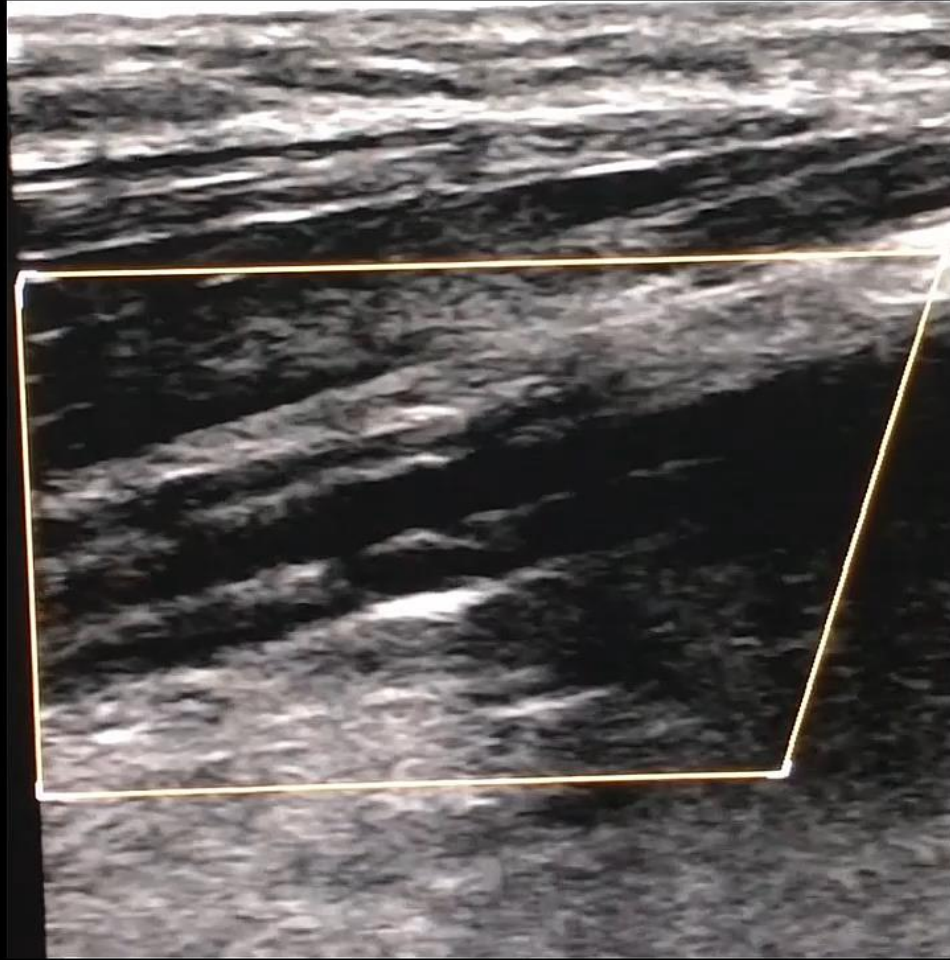


Easily compressed
Blue color flow



Not easily compressed
Red color flow





Thank you for listening