

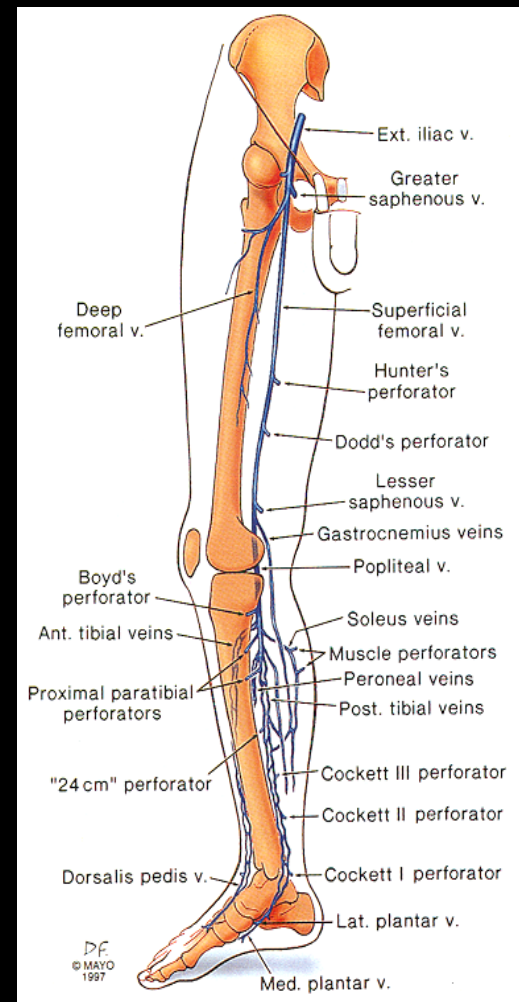
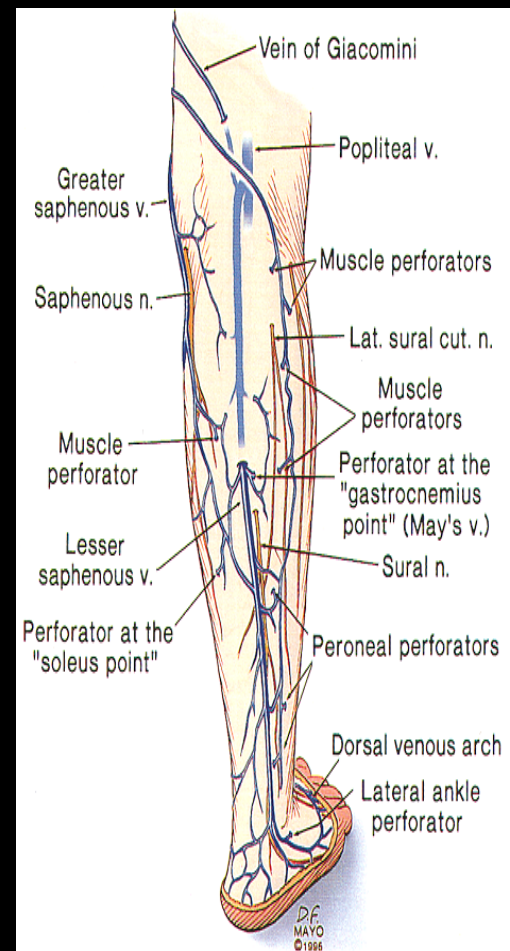
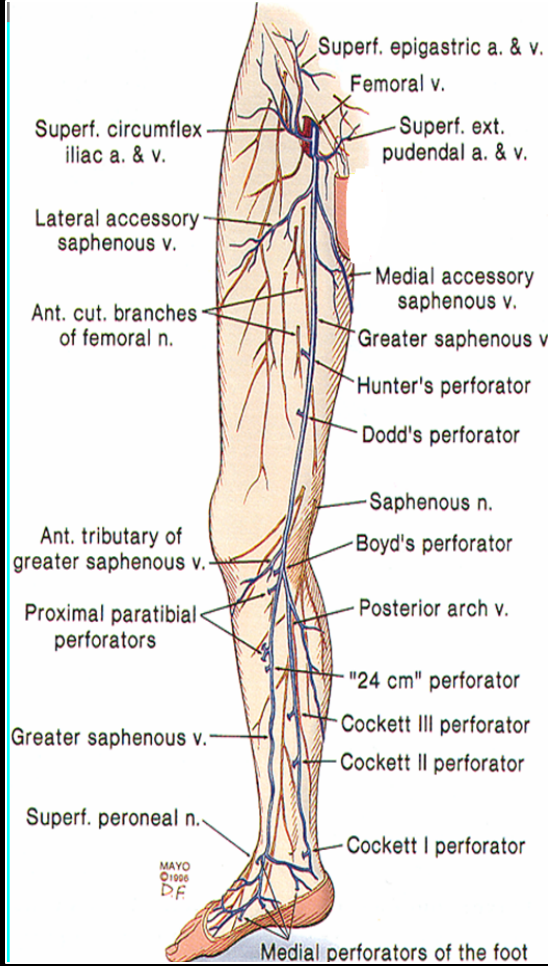
A vertical strip on the left side of the slide shows a microscopic view of a vein. The vein lumen is on the left, and the vessel wall is on the right. A red overlay is applied to the vessel wall, highlighting its structure. The background of the slide is black.

# Chronic Venous Insufficiency

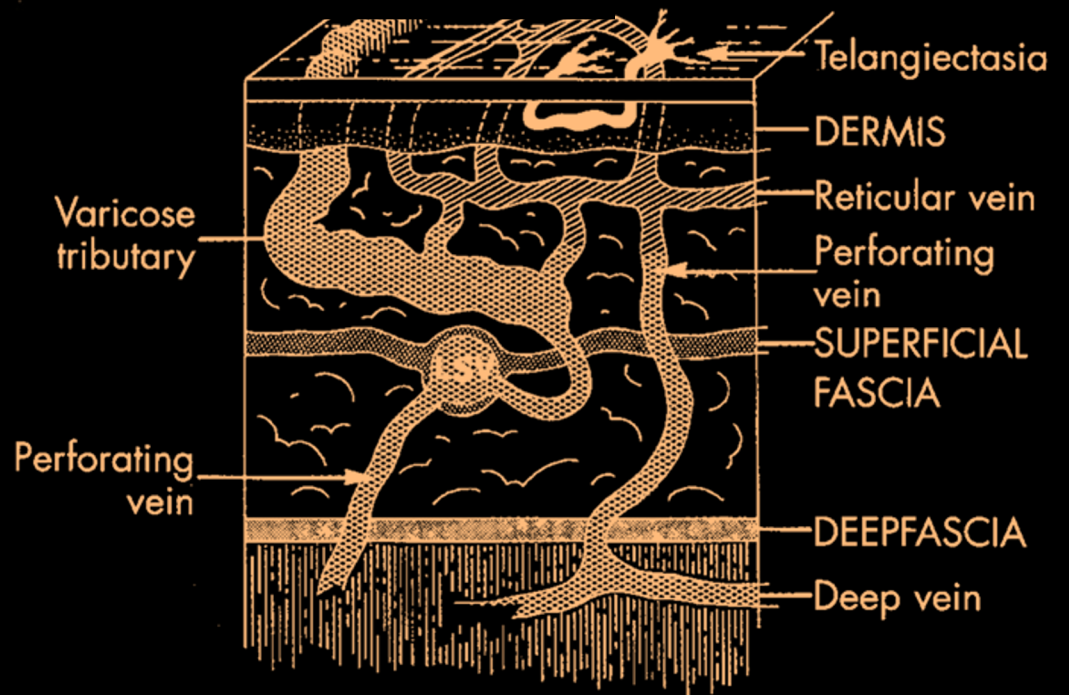
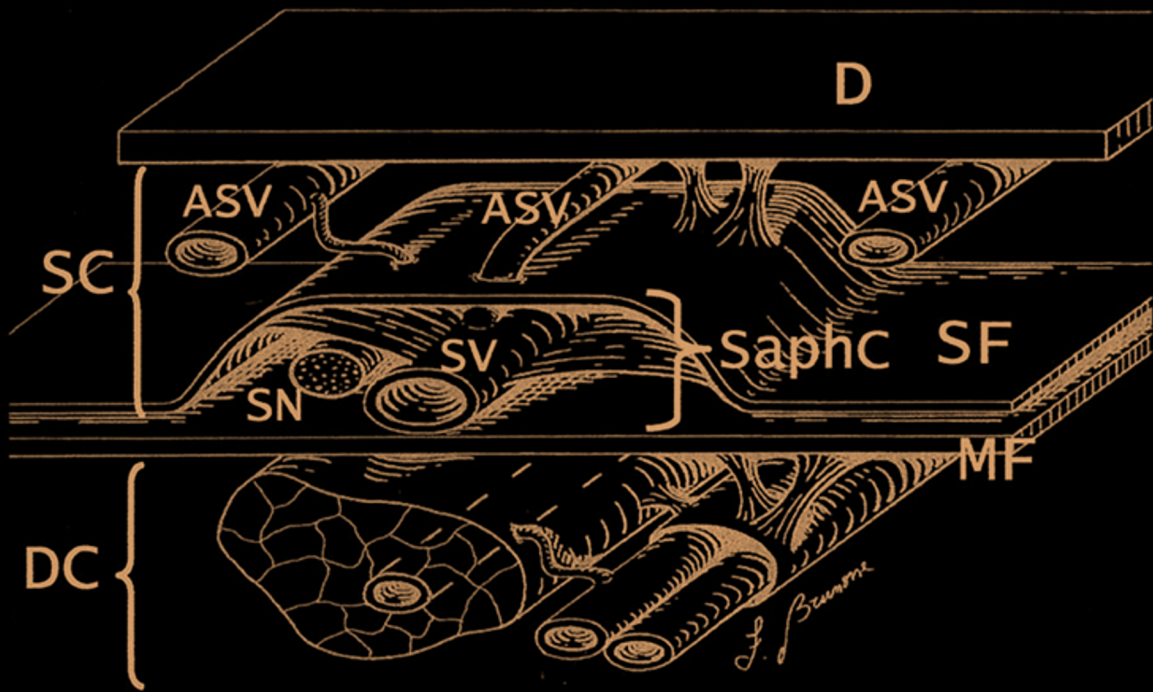
**Dr. Talal A. Altuwaijri**

A vertical strip on the left side of the image shows a microscopic view of plant tissue, likely a stem or root, stained with a red dye. The tissue shows distinct cellular structures, including elongated cells and vascular bundles.

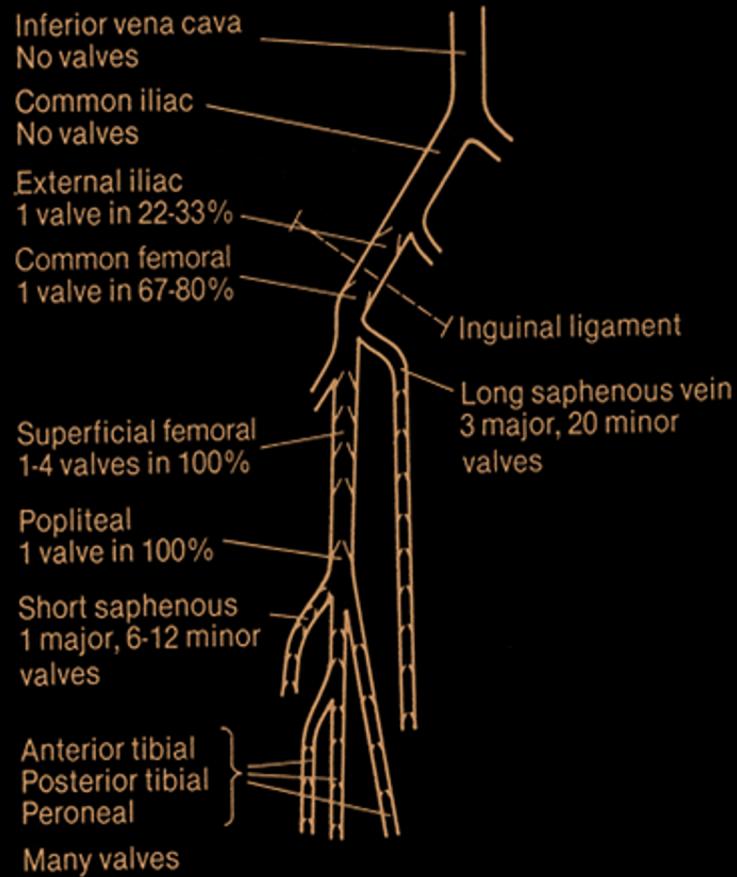
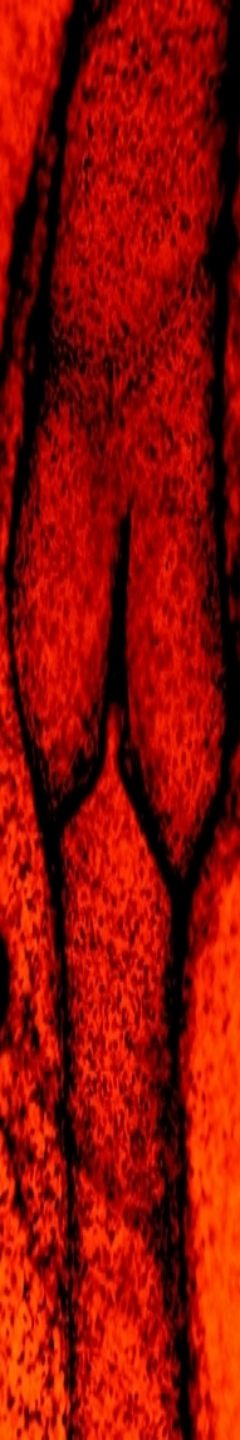
# *Anatomy*

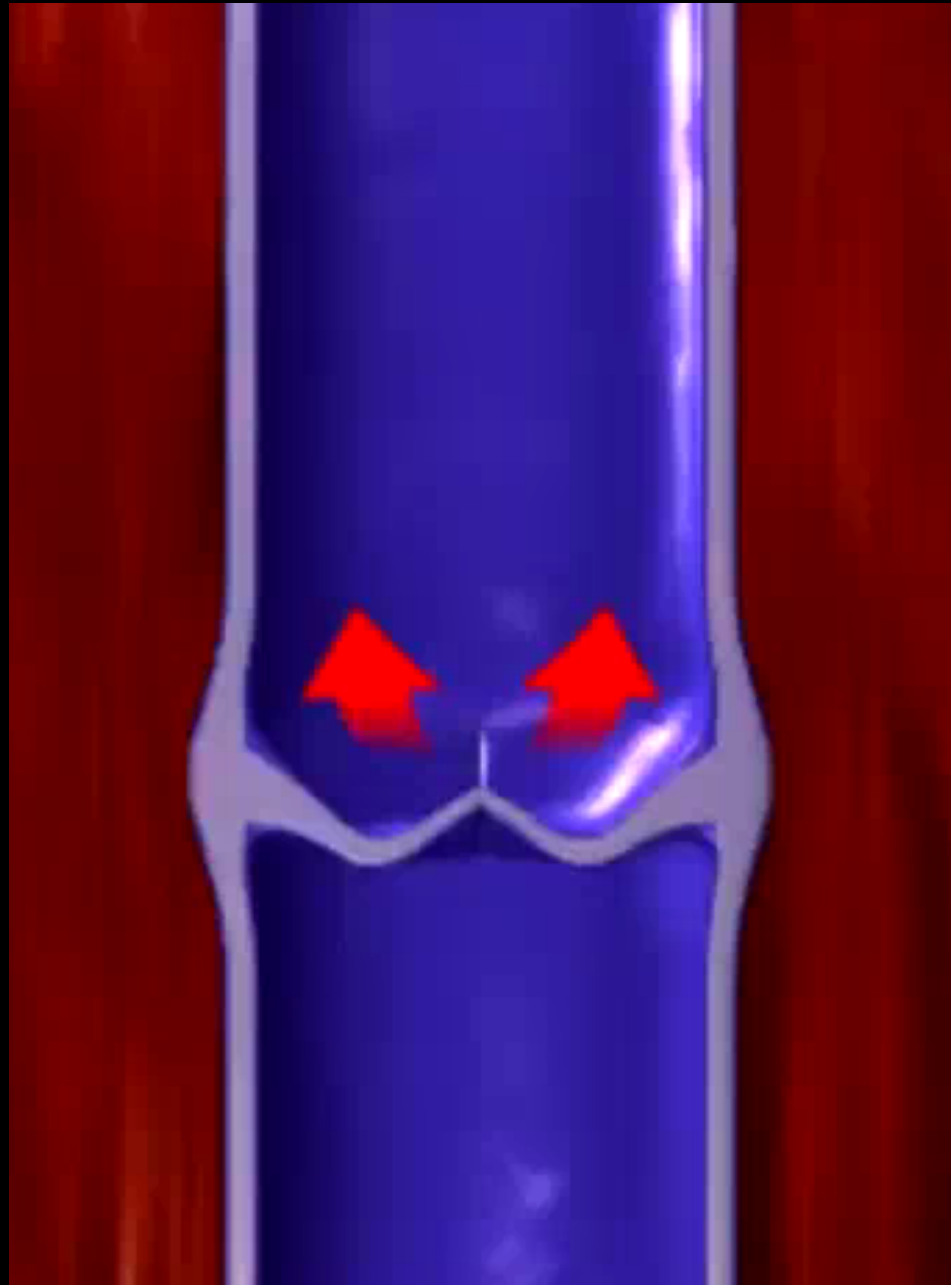
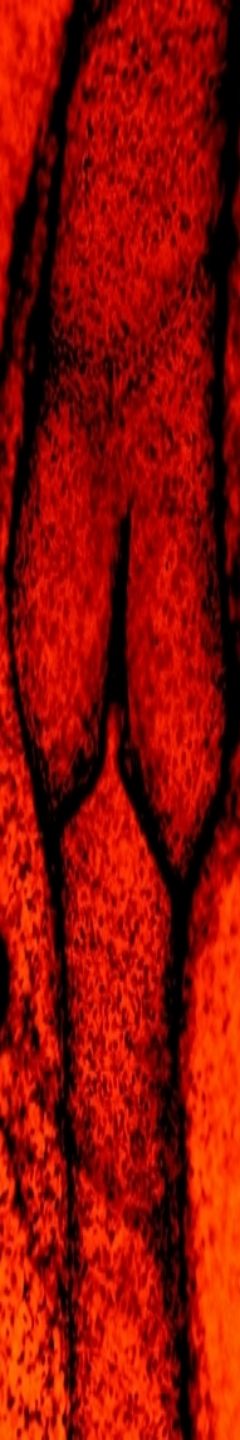


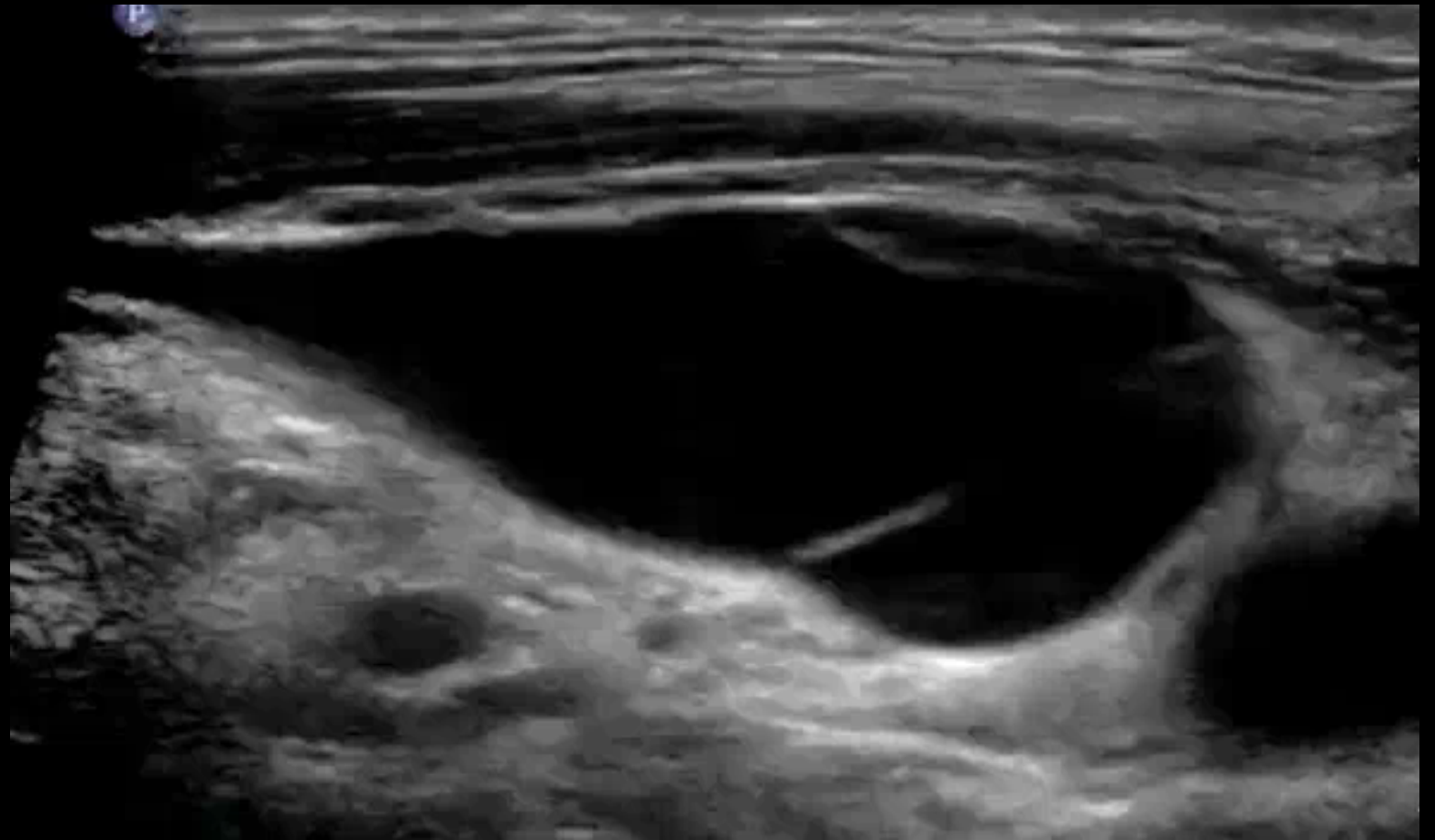
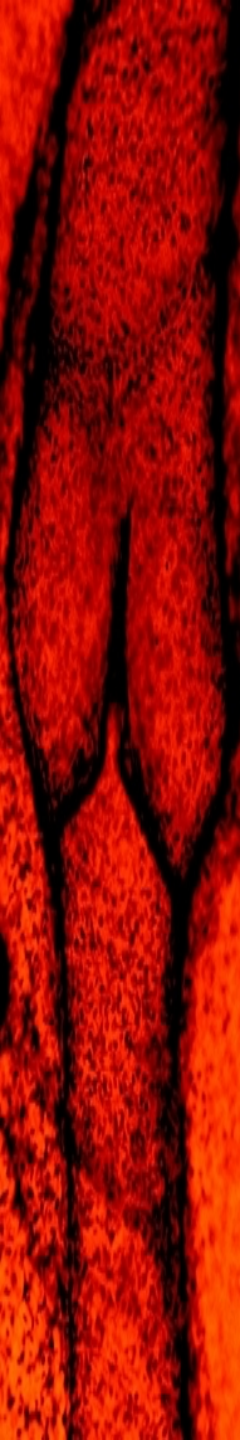








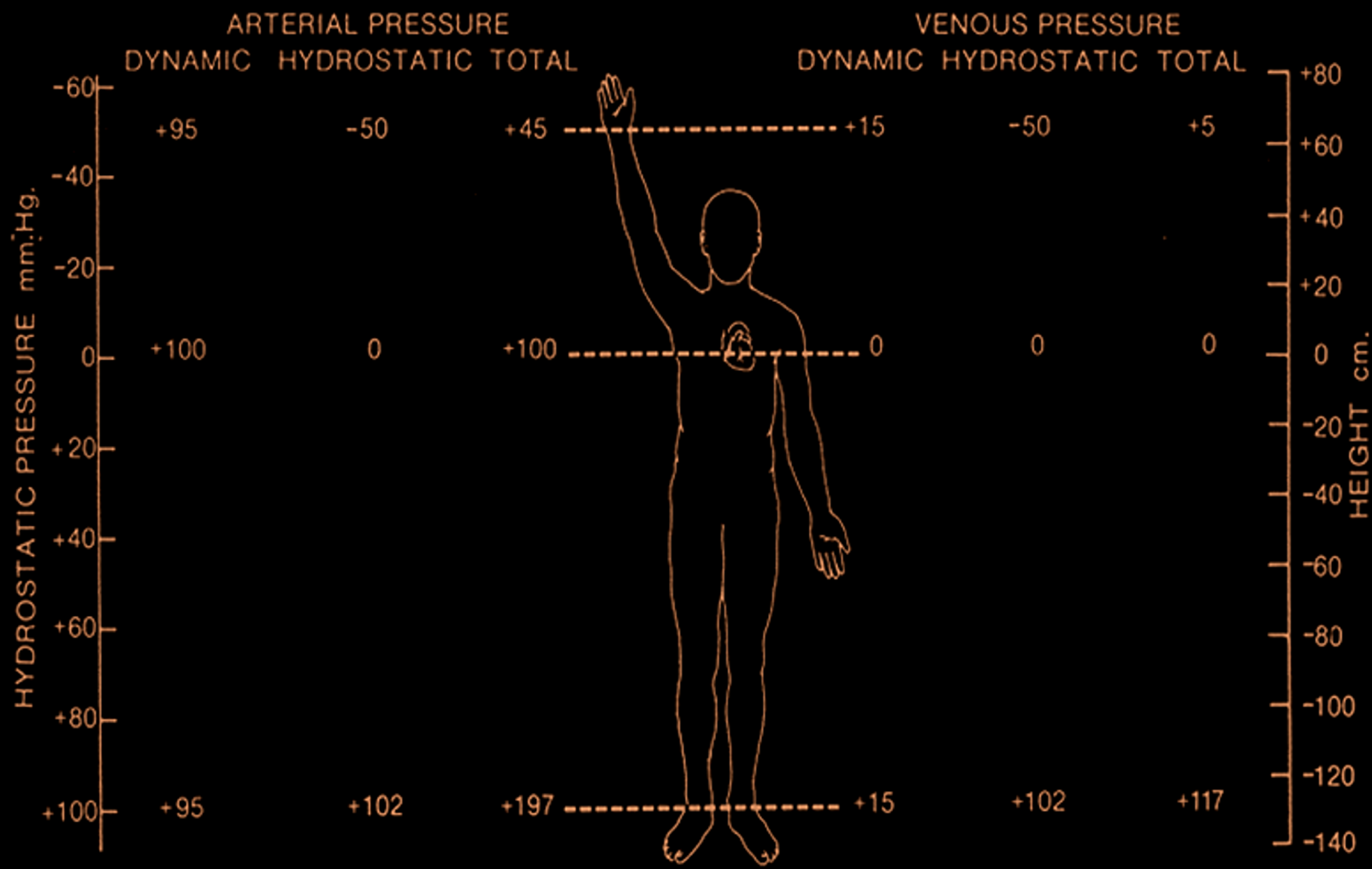


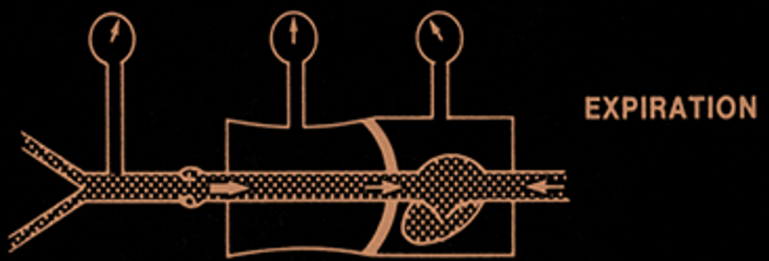
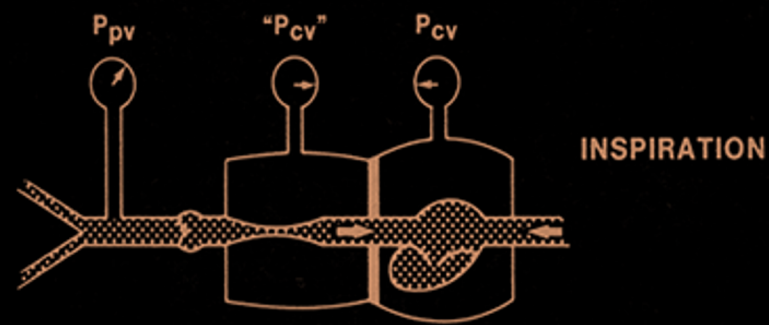




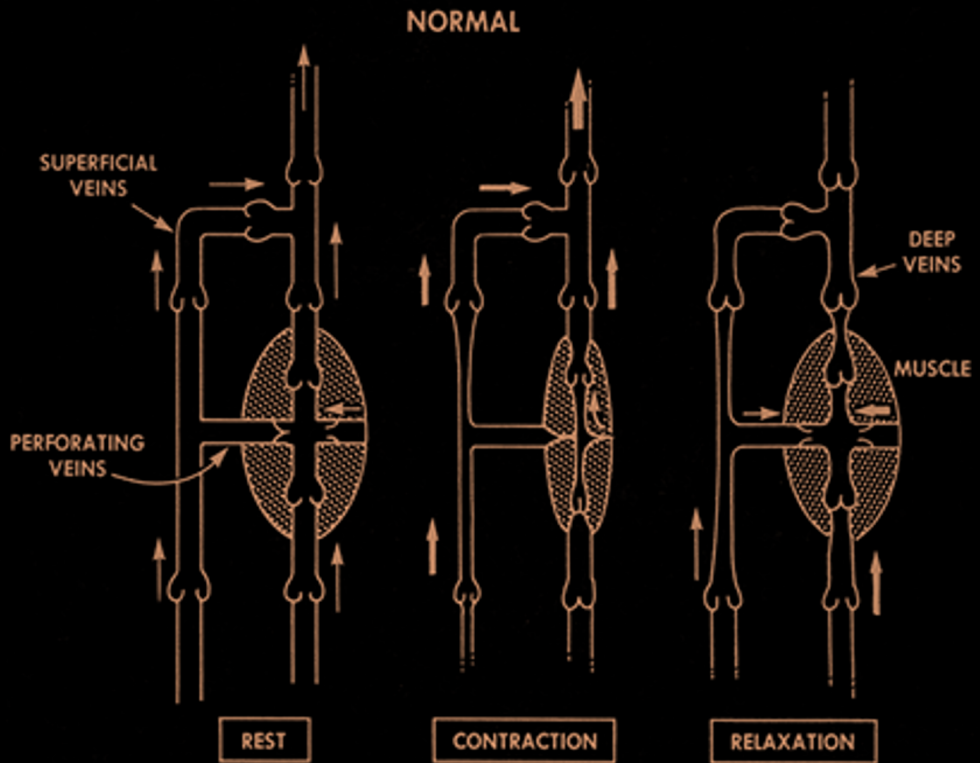
A vertical strip on the left side of the slide shows a microscopic view of plant tissue, likely a stem or root, stained with a red dye. The tissue shows distinct cellular structures, including elongated cells and vascular bundles.

# *Physiology*





LEGS      ABDOMEN      THORAX      ARMS      HEAD

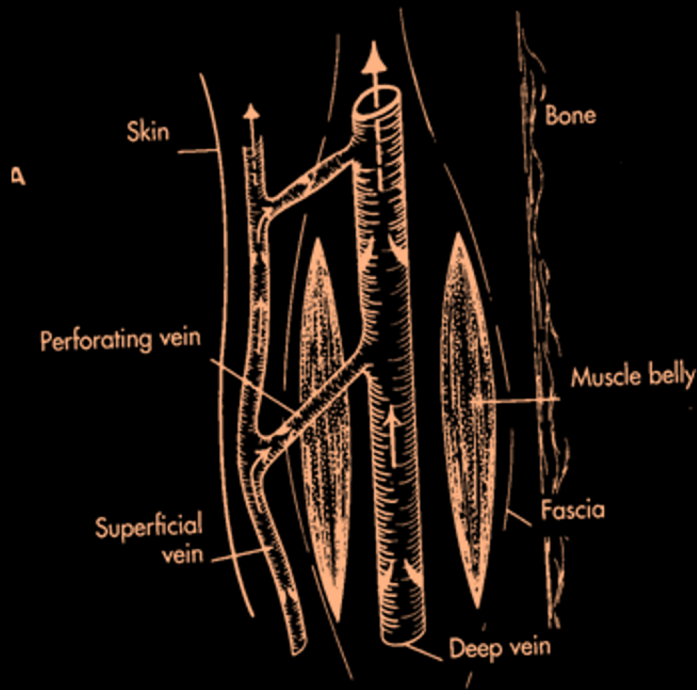




# Calf Muscle Pump

Rest

Contraction



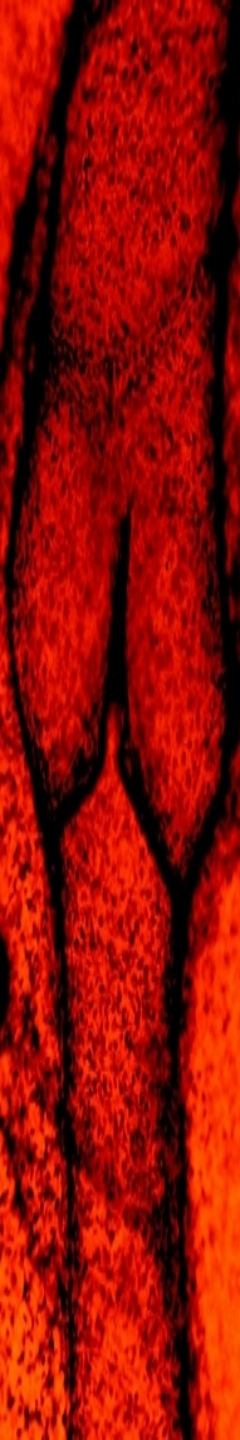
# Ambulatory Venous Pressure

<u>Position</u>	<u>mm Hg</u>
Supine	10
Standing	90
Walking*	25

\* 7 steps = maximum effect

**PPT NOTE:**

**IN REVIEW! If you understand normal you will be able to advise and guide regarding therapy for the abnormal.**



# What is Chronic venous insufficiency?

**PPT NOTE:**

The presence of (irreversible) skin damage in the lower leg as a result of sustained venous hypertension.



A vertical strip on the left side of the slide shows a microscopic view of plant tissue, likely a stem or root, stained with a red dye. The tissue shows distinct cellular structures, including elongated cells and vascular bundles.

# Pathophysiology

Reflux (90%)

Obstruction (10%)

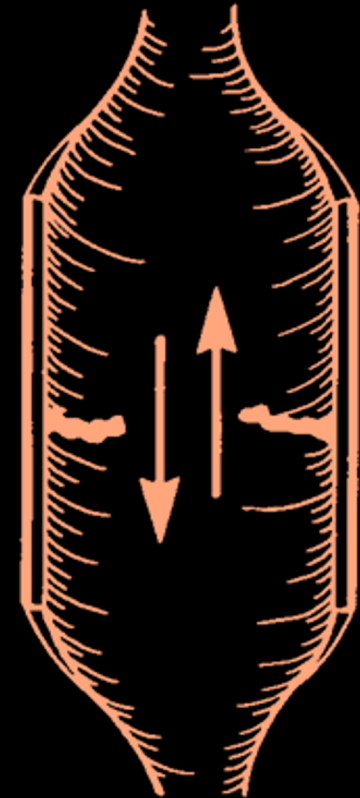
PROXIMAL



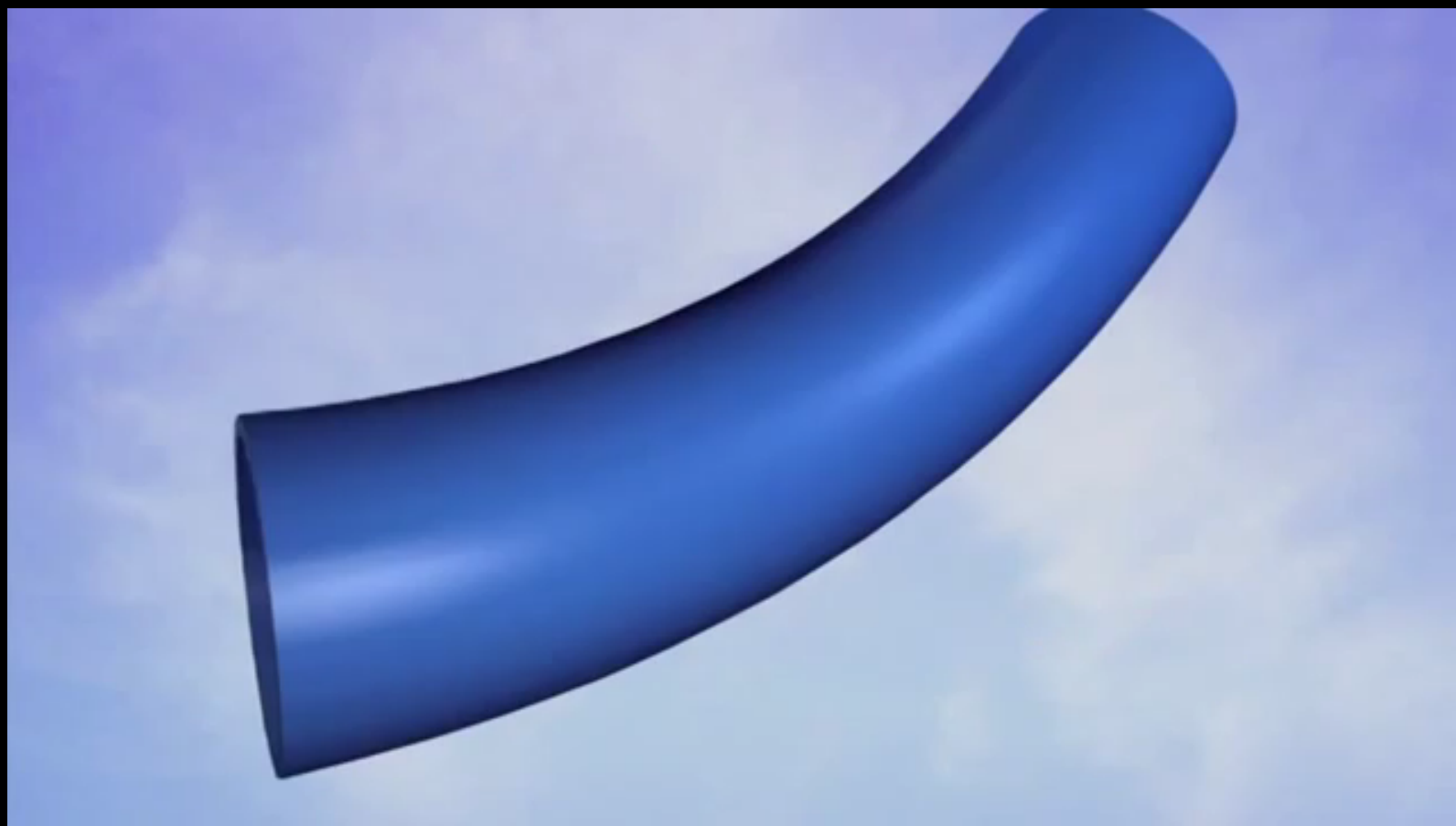
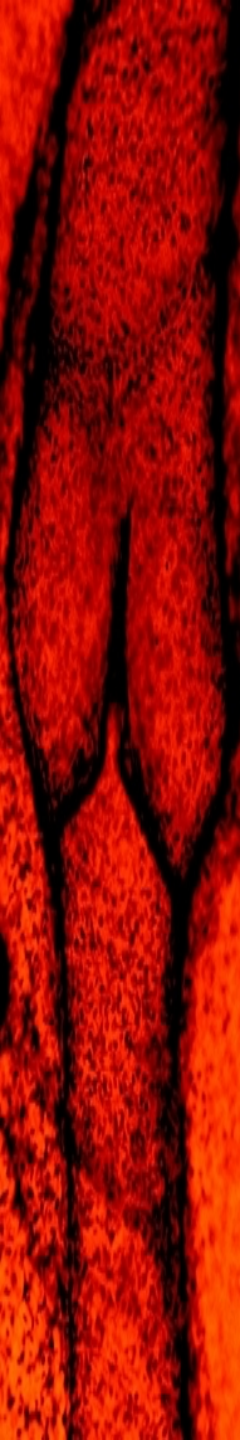
Normal flow  
to heart

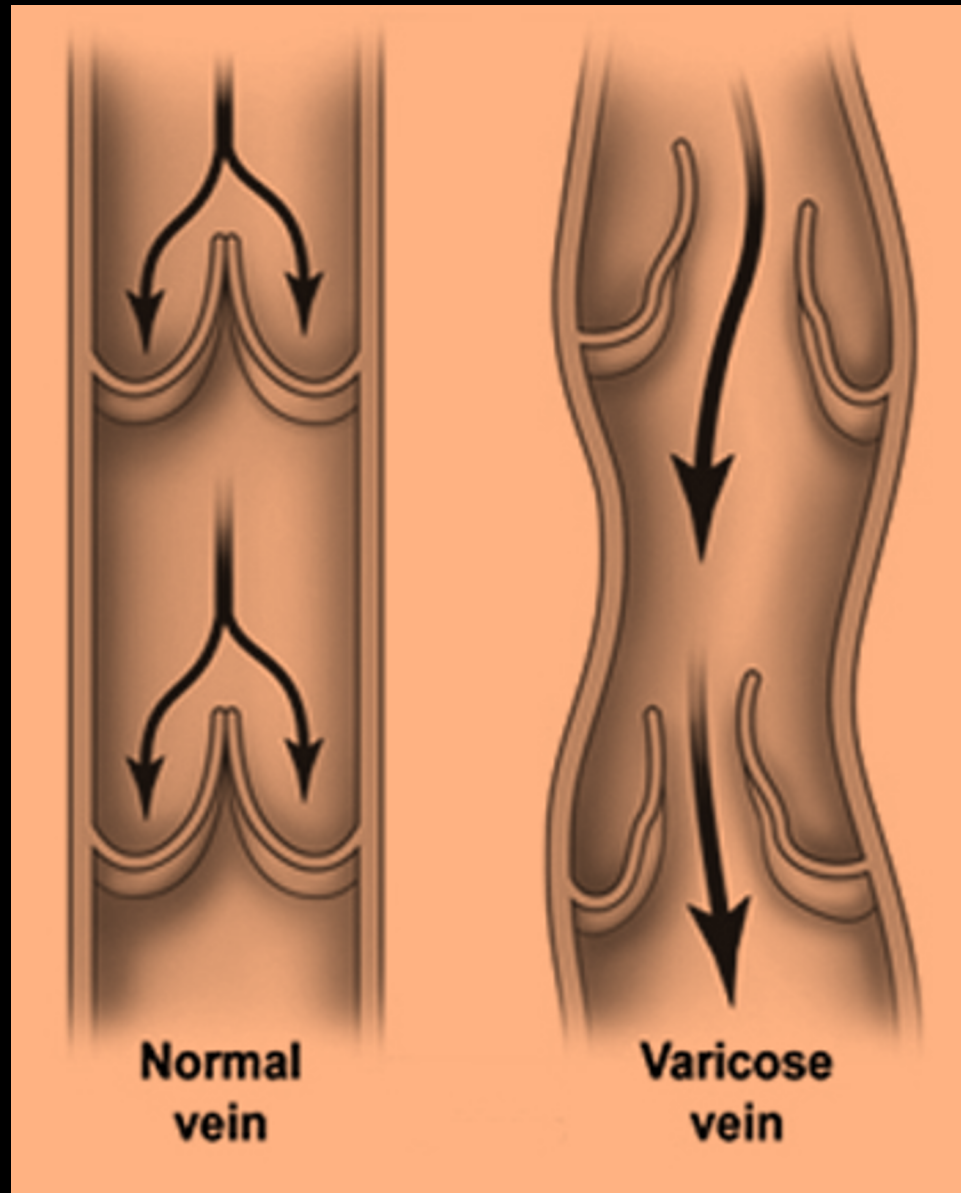
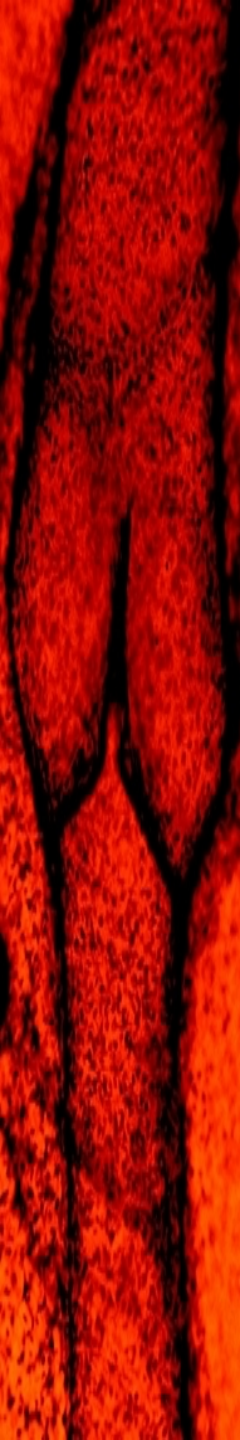


Normal  
valve function



Abnormal  
valve function



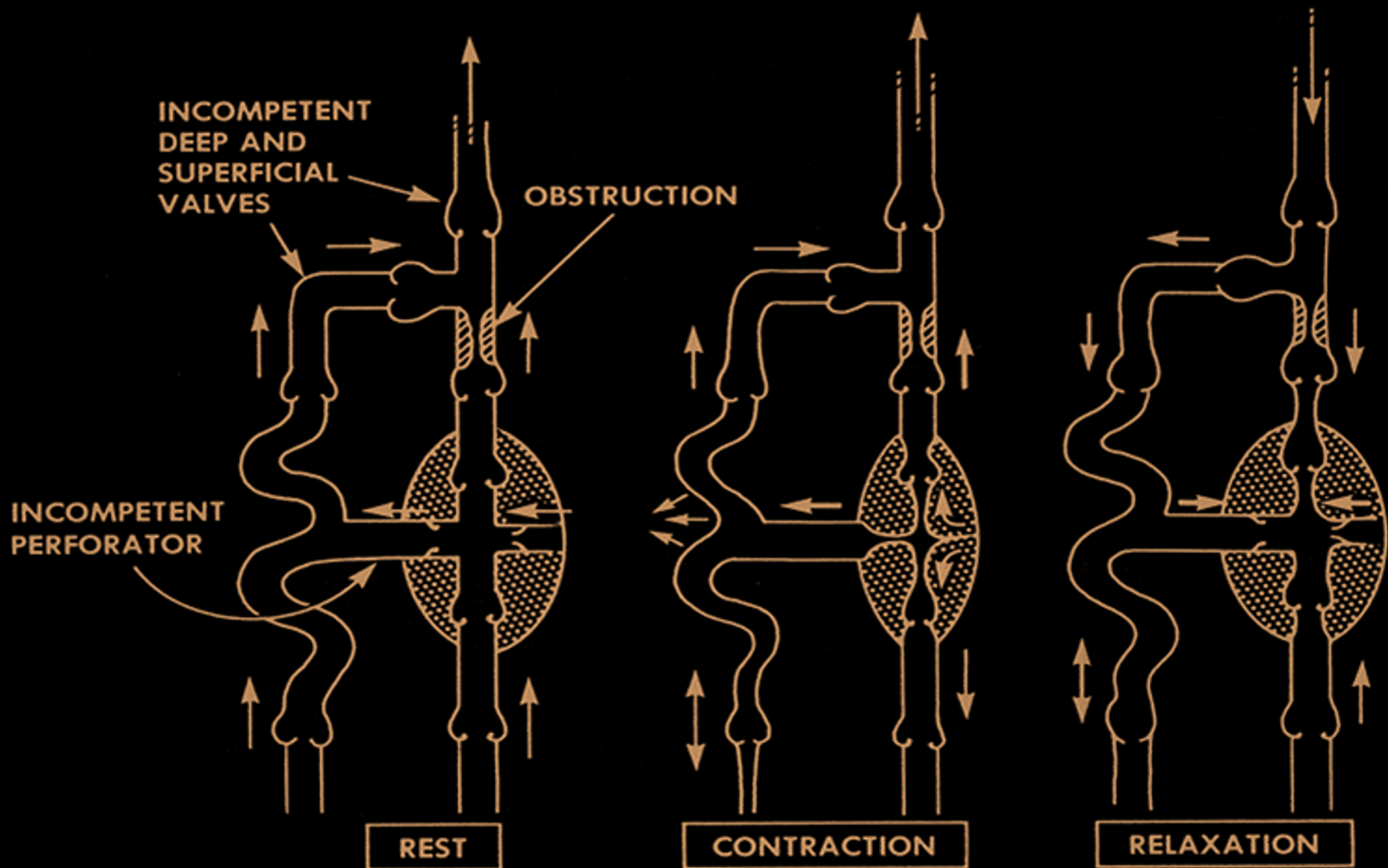




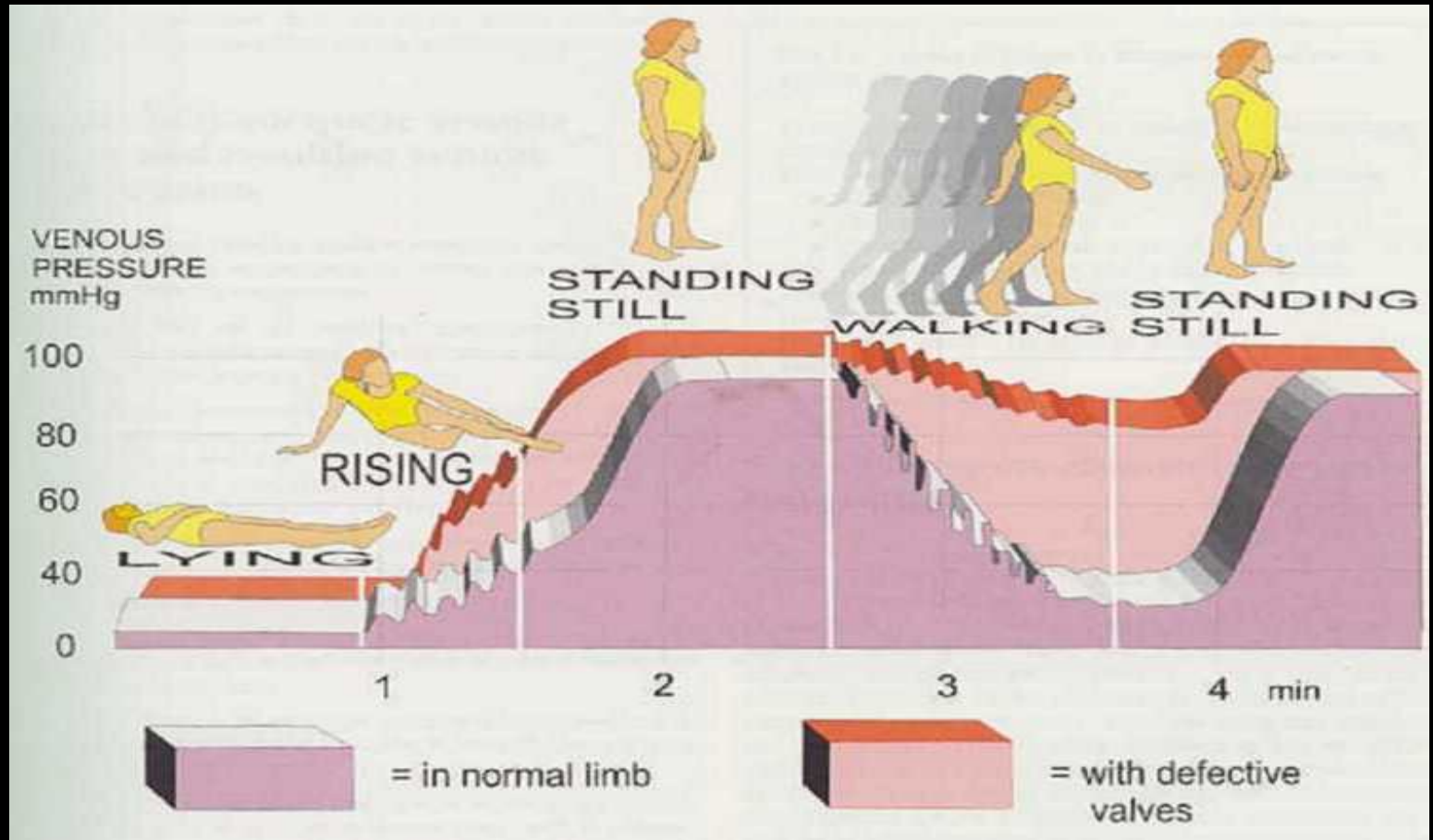
# Primary Valvular Incompetence

“ floppy valve ”

# Secondary Valvular Incompetence



# SO, Waht happens to the Venous Pressure?



## PPT NOTE:

This slide depicts the pressures in a healthy limb, in mauve, while lying, rising, standing still and walking compared with the pressures present in a limb with defective valves.

The mauve depicts the normal rise and fall of venous pressure according to body positioning and gravitational effect.

# Evaluation

- History
- Physical Examination
- Investigations:
  - Non-invasive (Doppler/Duplex)
  - Invasive (AVP/ Venography)

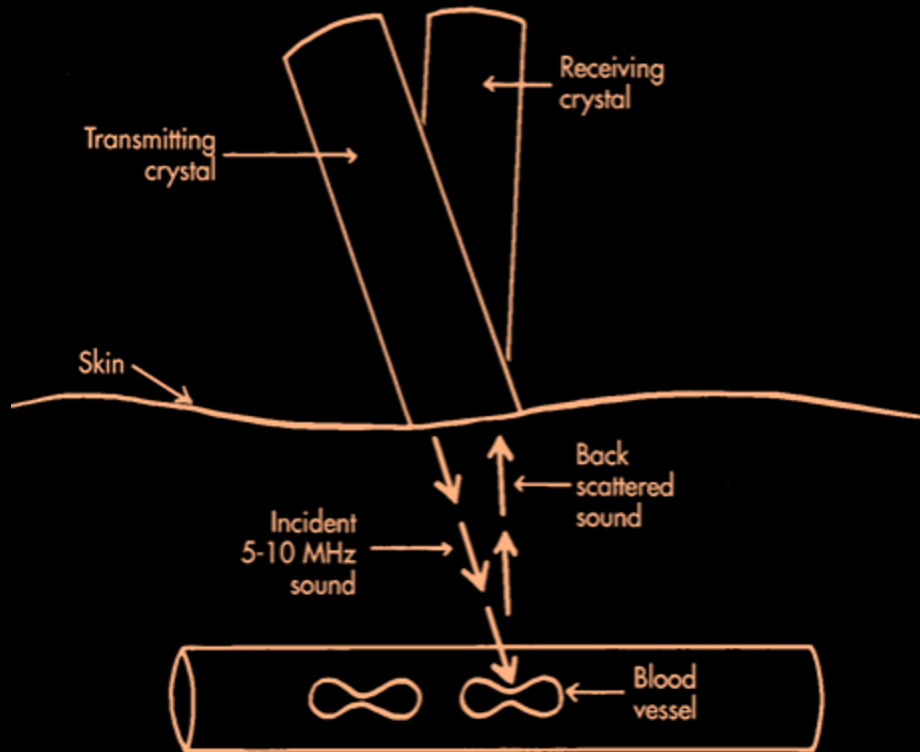


# Clinical Presentation

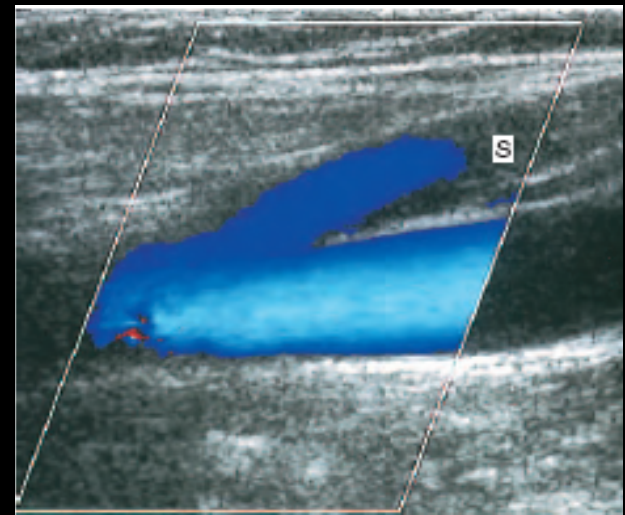
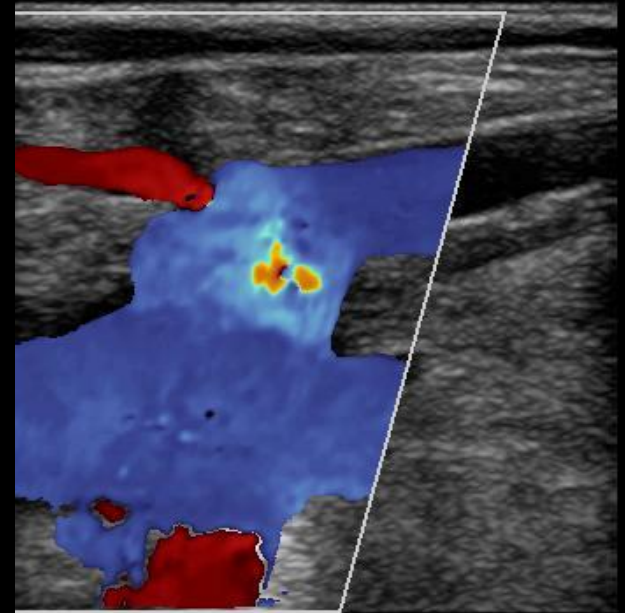




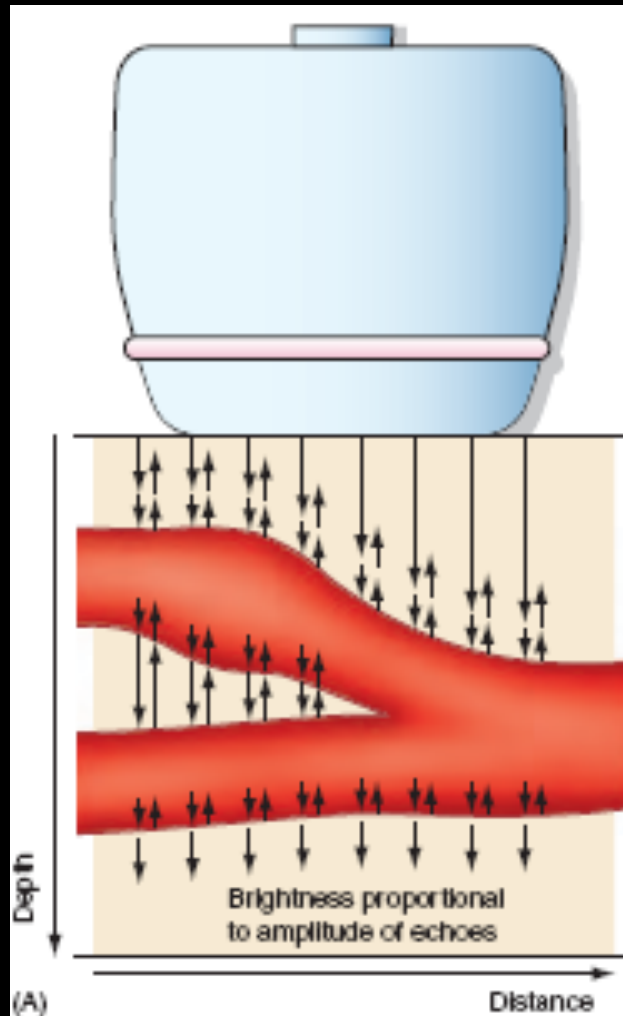
# Doppler



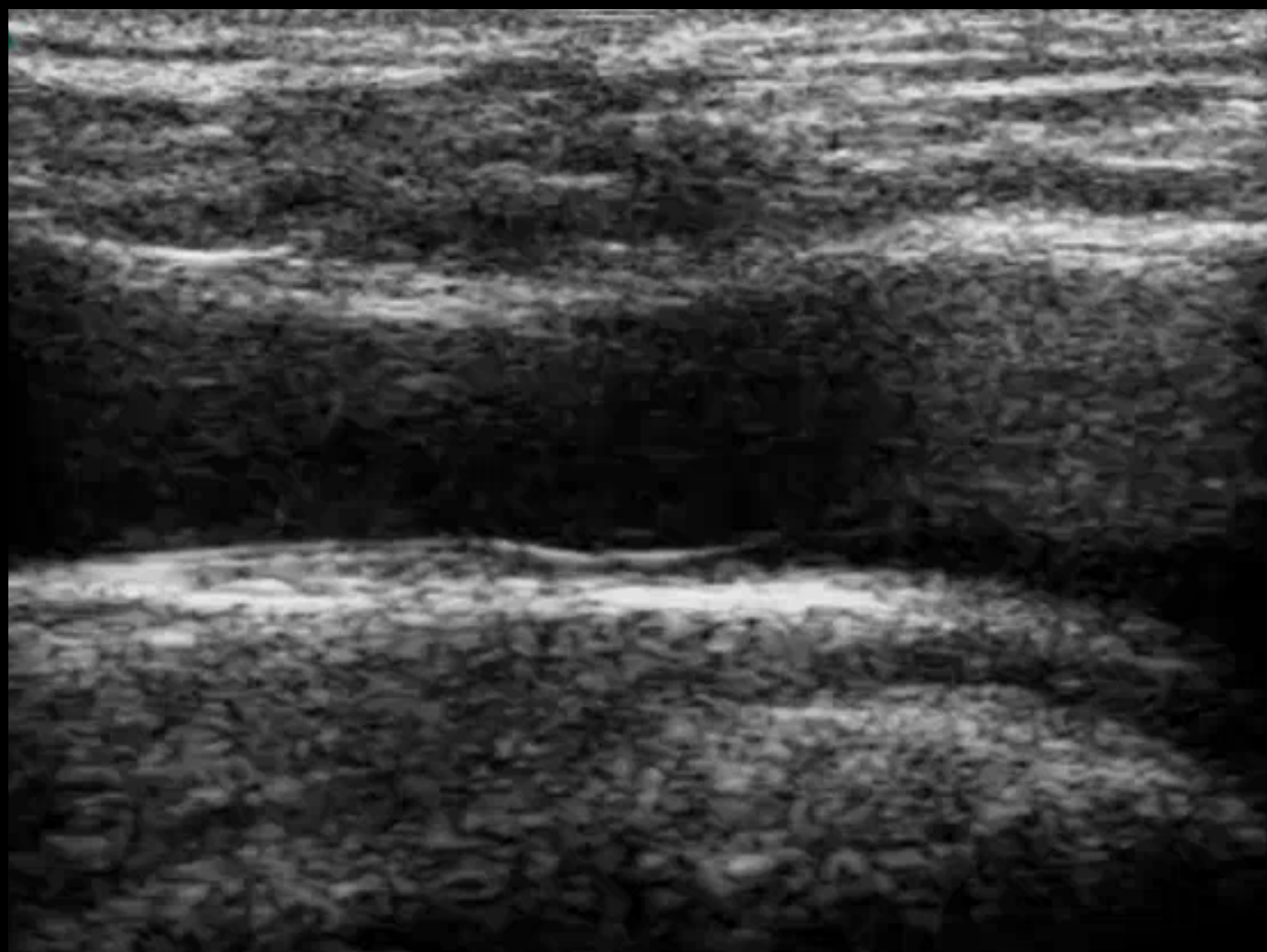
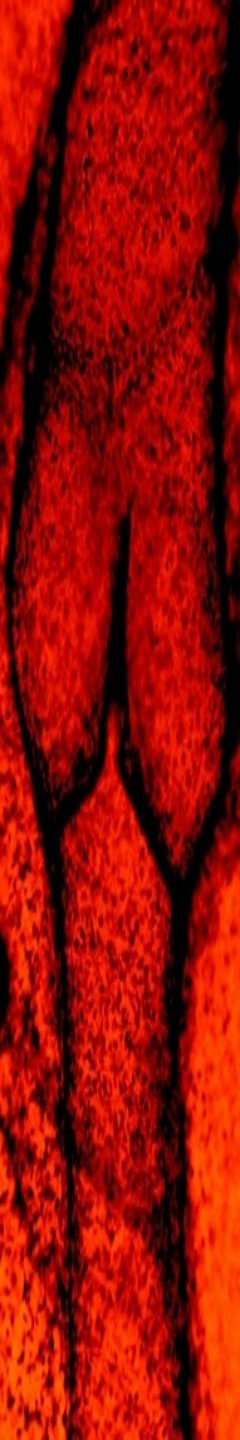
# Duplex-Scanning



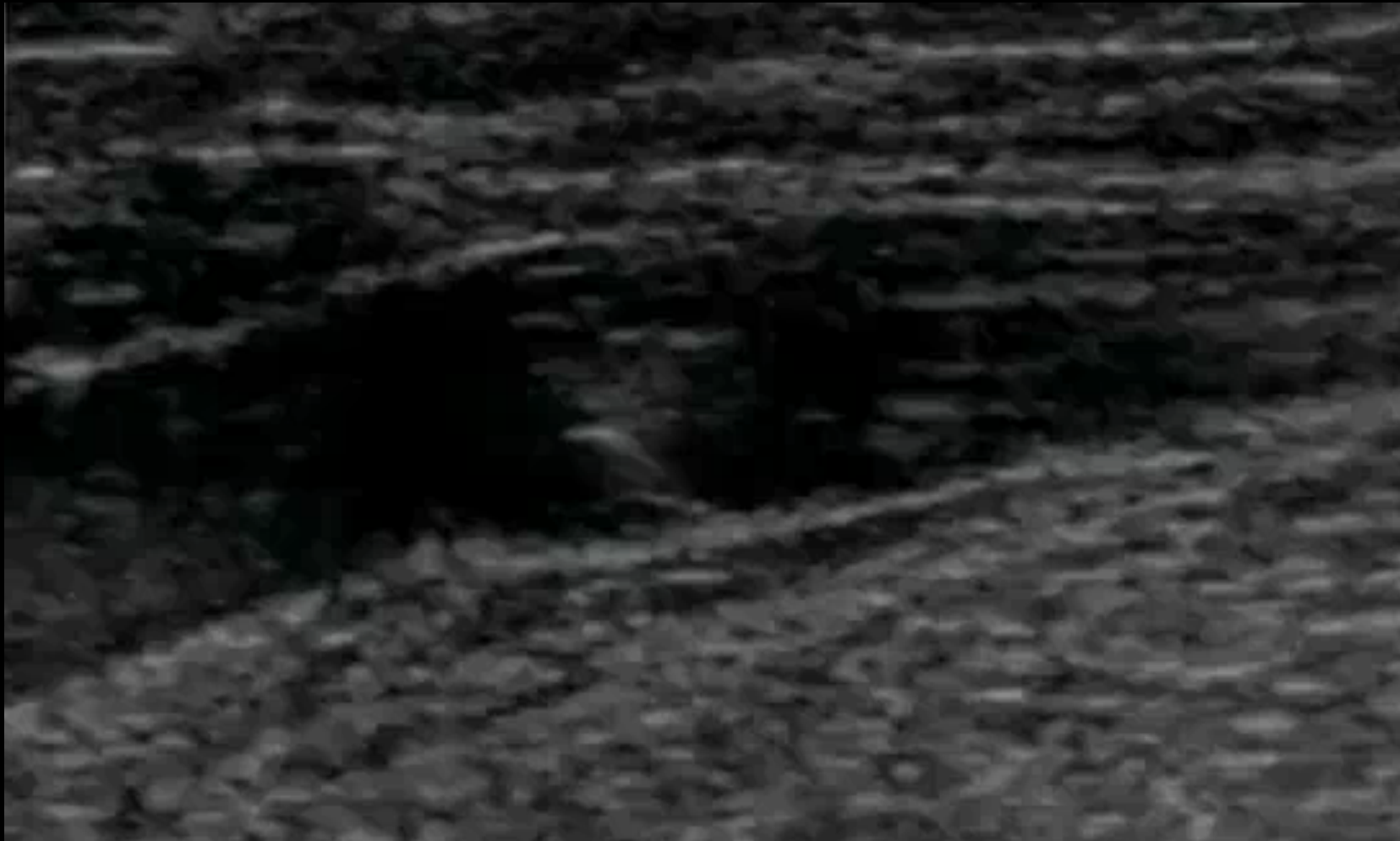
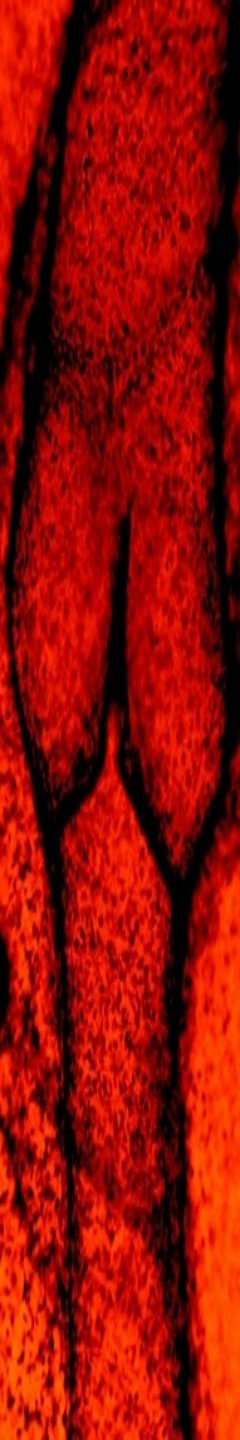
# Duplex-Scanning



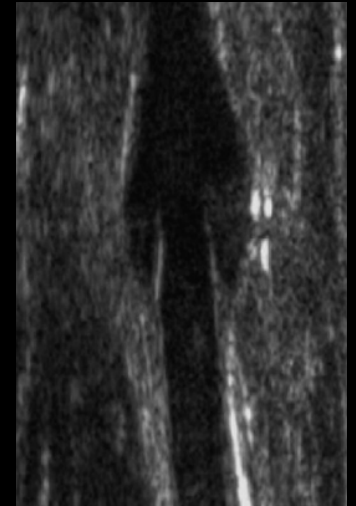
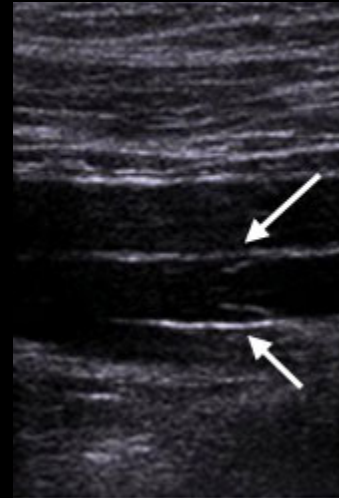
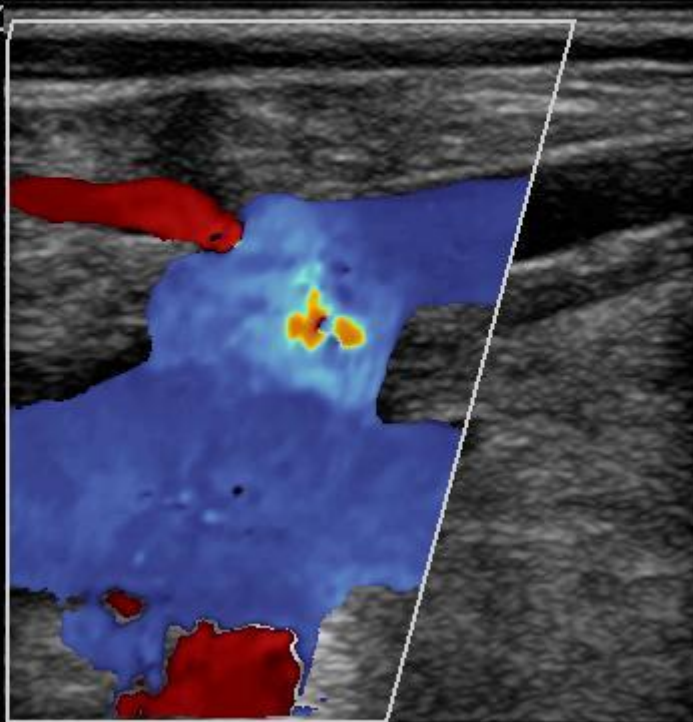




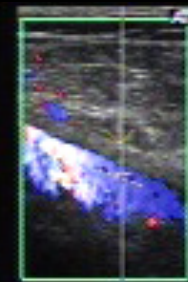




# Duplex-Scanning

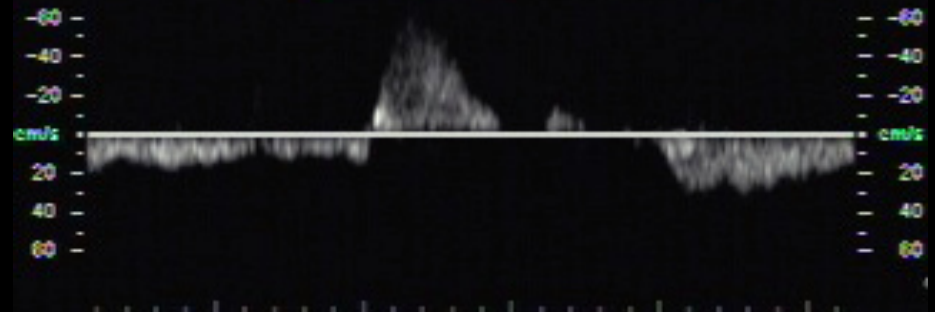
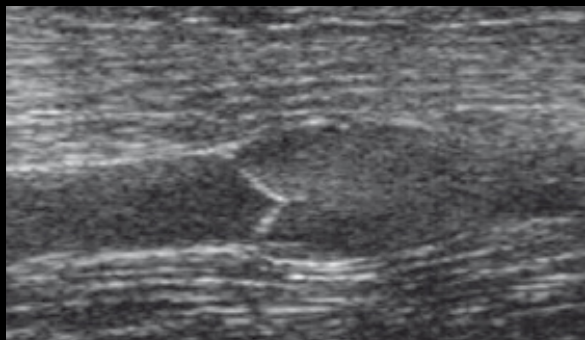


Col 76% Map 3 LEFT  
WF Low  
PRF 700 Hz  
Flow Opt: Med V

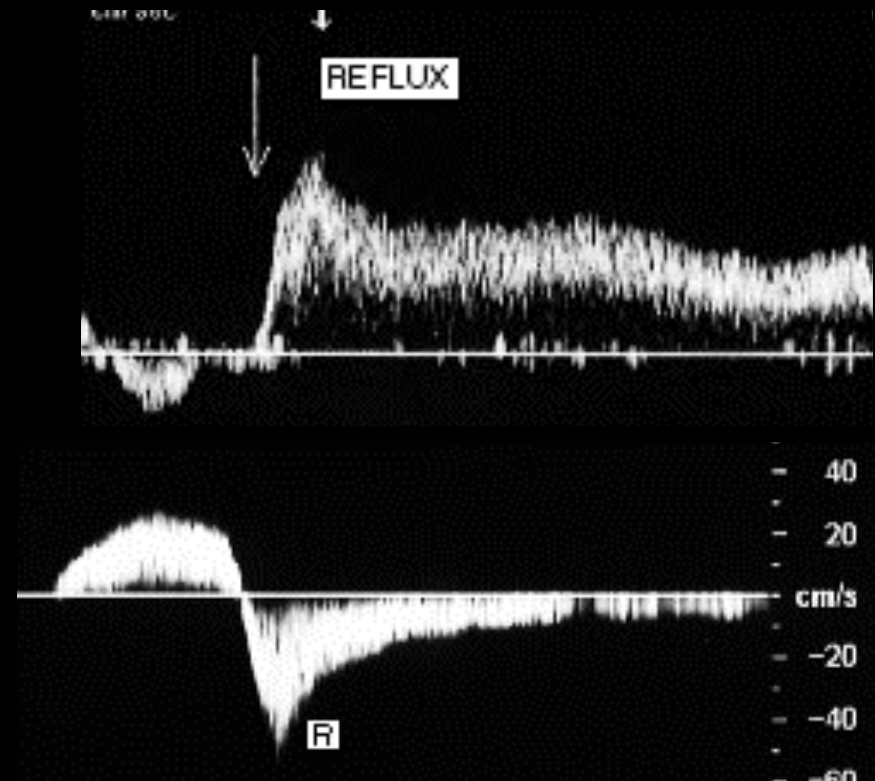
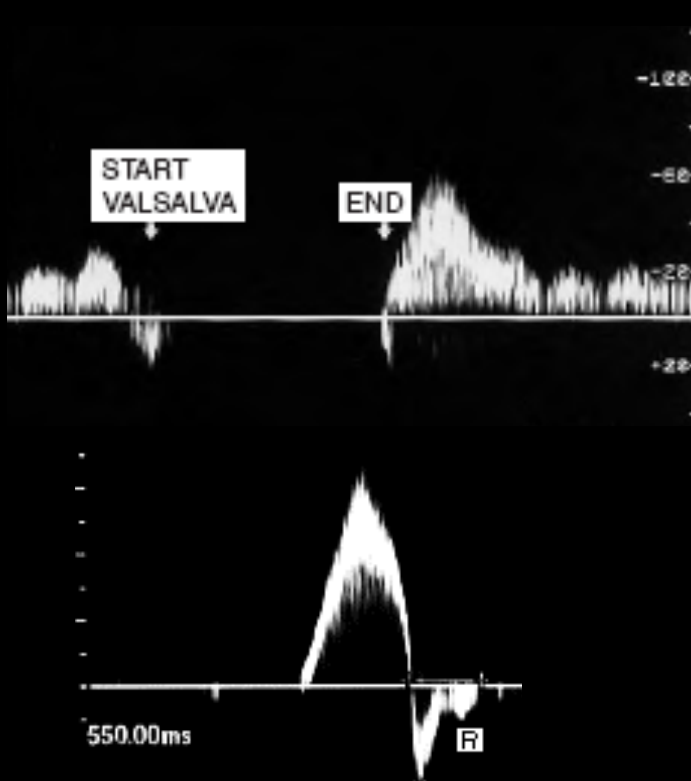
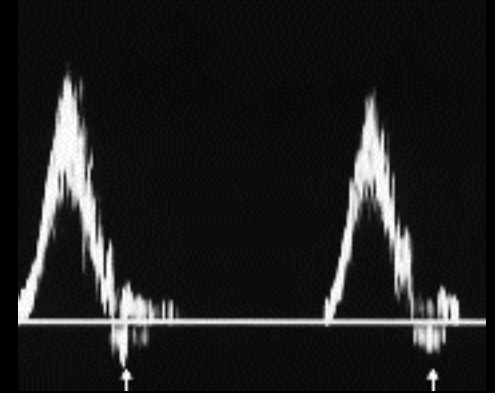
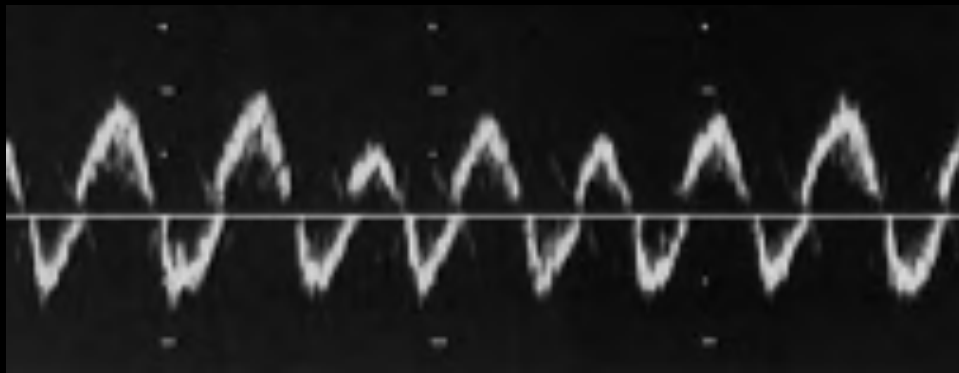


SV Angle 70°  
Dep 3.7 cm  
Size 2.0 mm  
Freq 4.0 MHz  
WF Low  
Dop 64% Map  
PRF 2500 Hz

+ 850  
- 850  
Hz

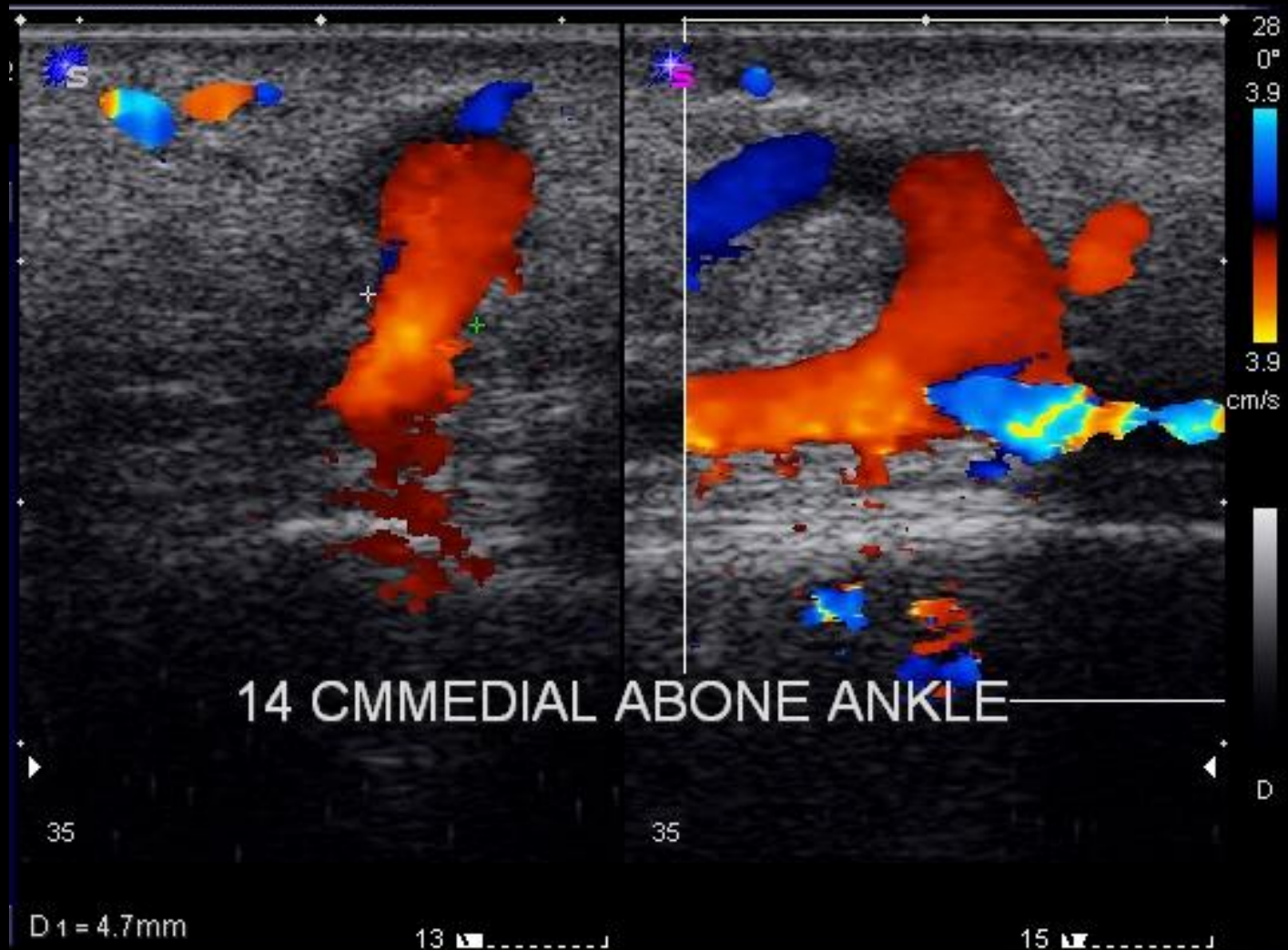


# Duplex-Scanning



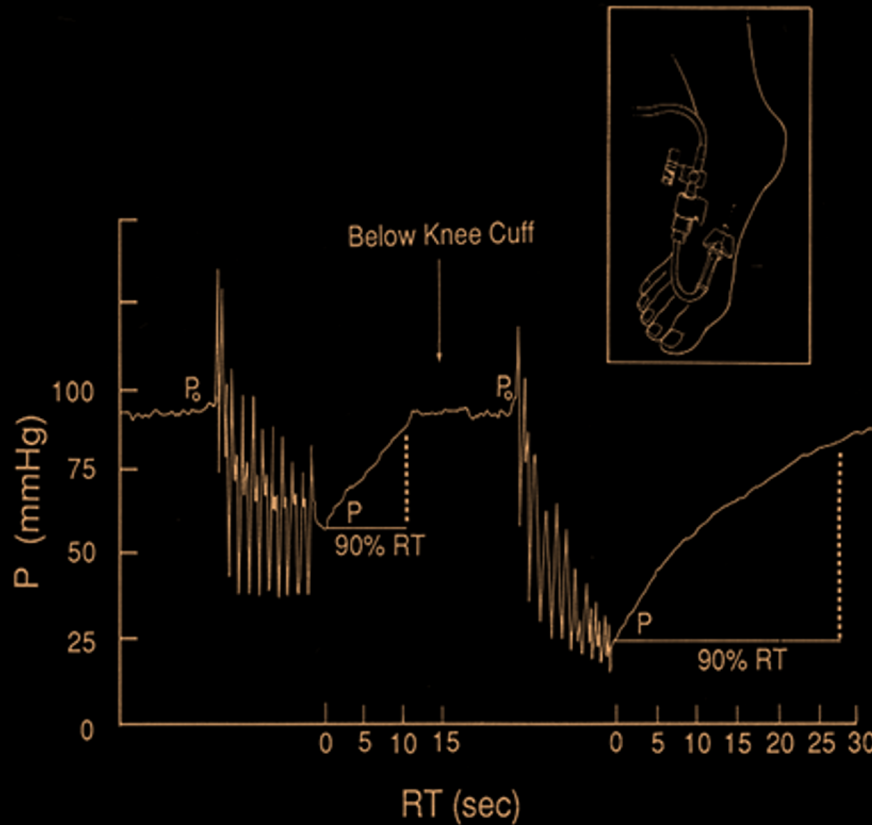


# Incompetent Perforator Vein





# Ambulatory Venous Pressure

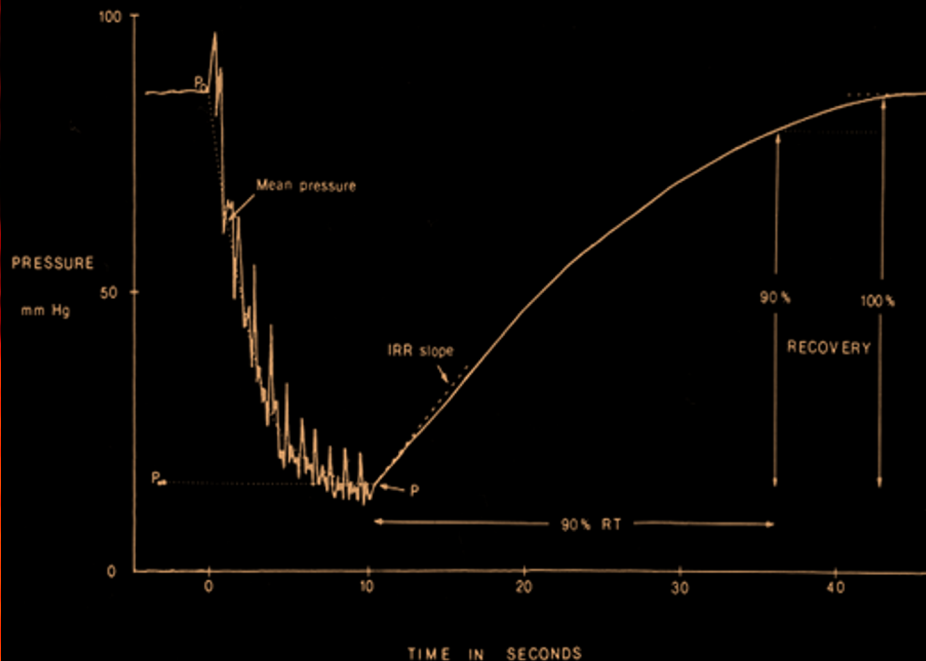


## Reflux

### 20-21gauge Butterfly Needle

- Superficial Dorsal Vein (Foot) or Ankle Vein
- Standing
- Heal Raised
- Measurements

# Ambulatory Venous Pressure



## Interpretation

**Normal :**



Pressure 80 - 90mm Hg  
to 20-30 mm Hg  
or > 50% drop

**Venous RF Time:  $\geq 20$  SEC**

# Abnormal AVP

I

Lack of sufficient drop  
in pressure with  
ambulation



**P < 50%**

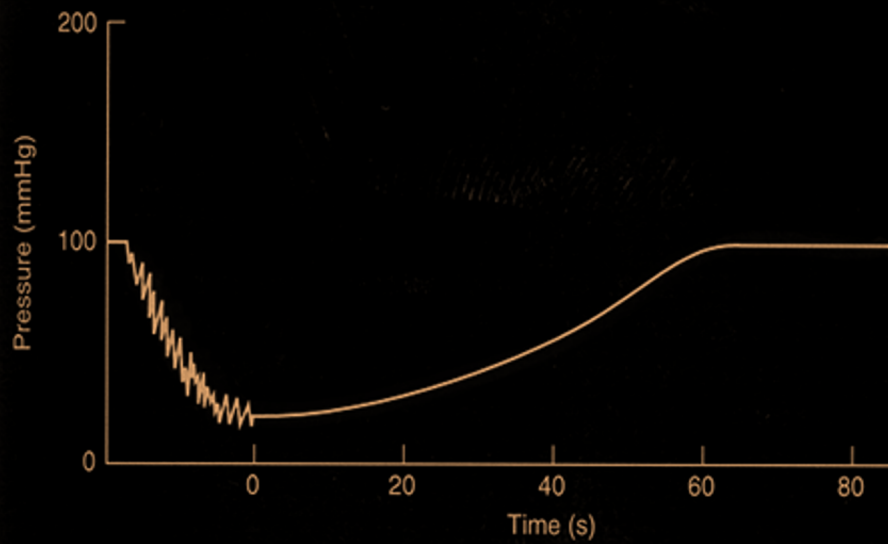
II

Short Venous Refill Time

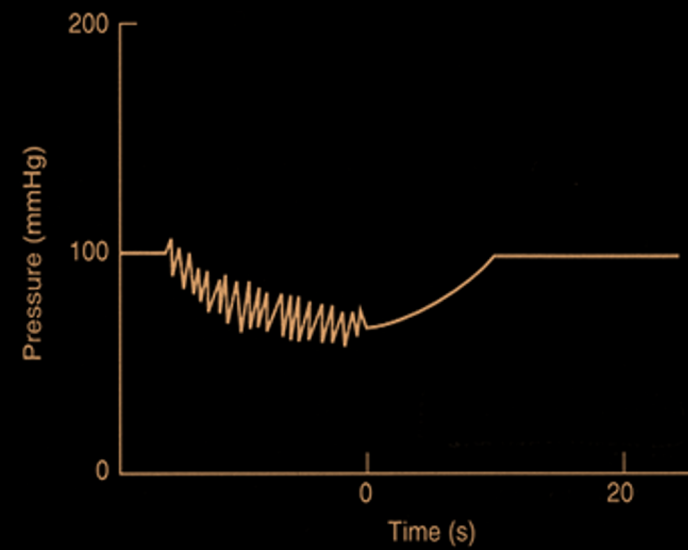
**VRT < 20 sec**

# AVP

Normal



Deep venous  
incompetence

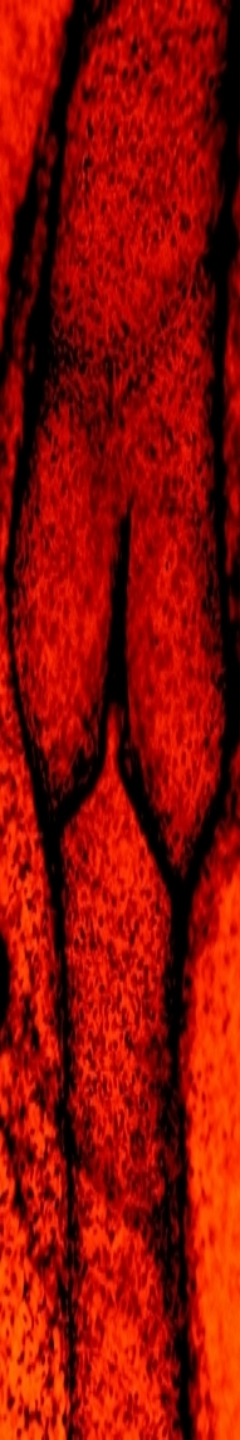




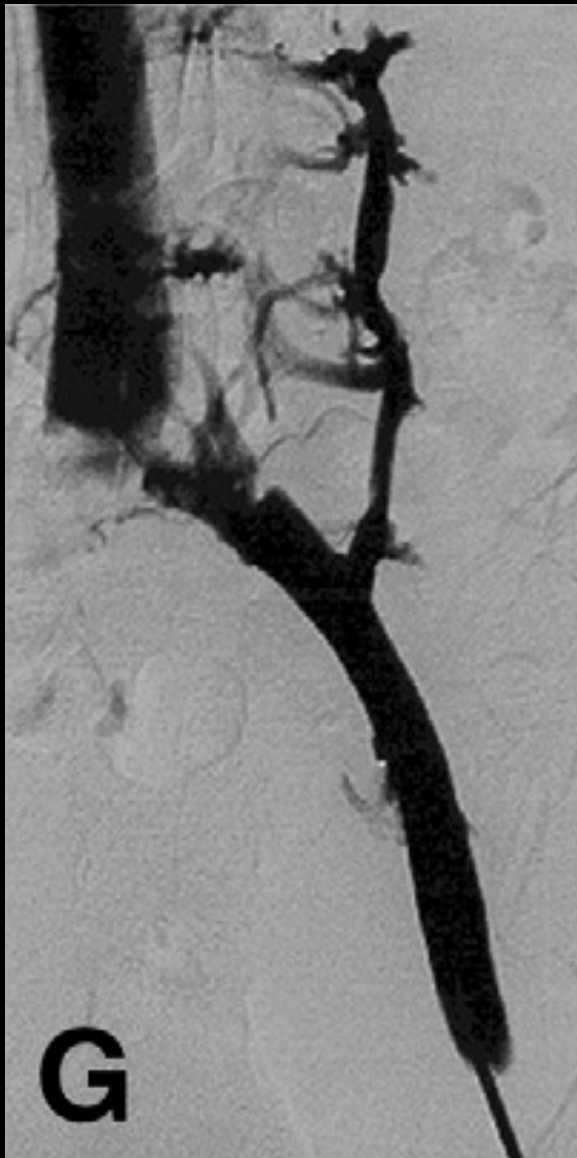
# Phlebography



# Phlebography



# Phlebography







# Treatment



# Treatment

Telangiectasias  
& Reticular veins



Stocking and/or Sclero-Rx



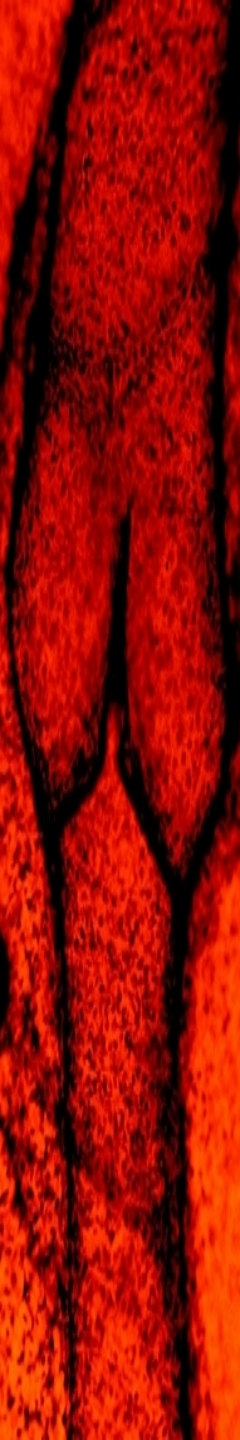
# Treatment



Varicose Veins



Stocking  
USG-Sclero-Rx  
EVLT/Surgery



Edema

Cutaneous Ulcer

Local Wound



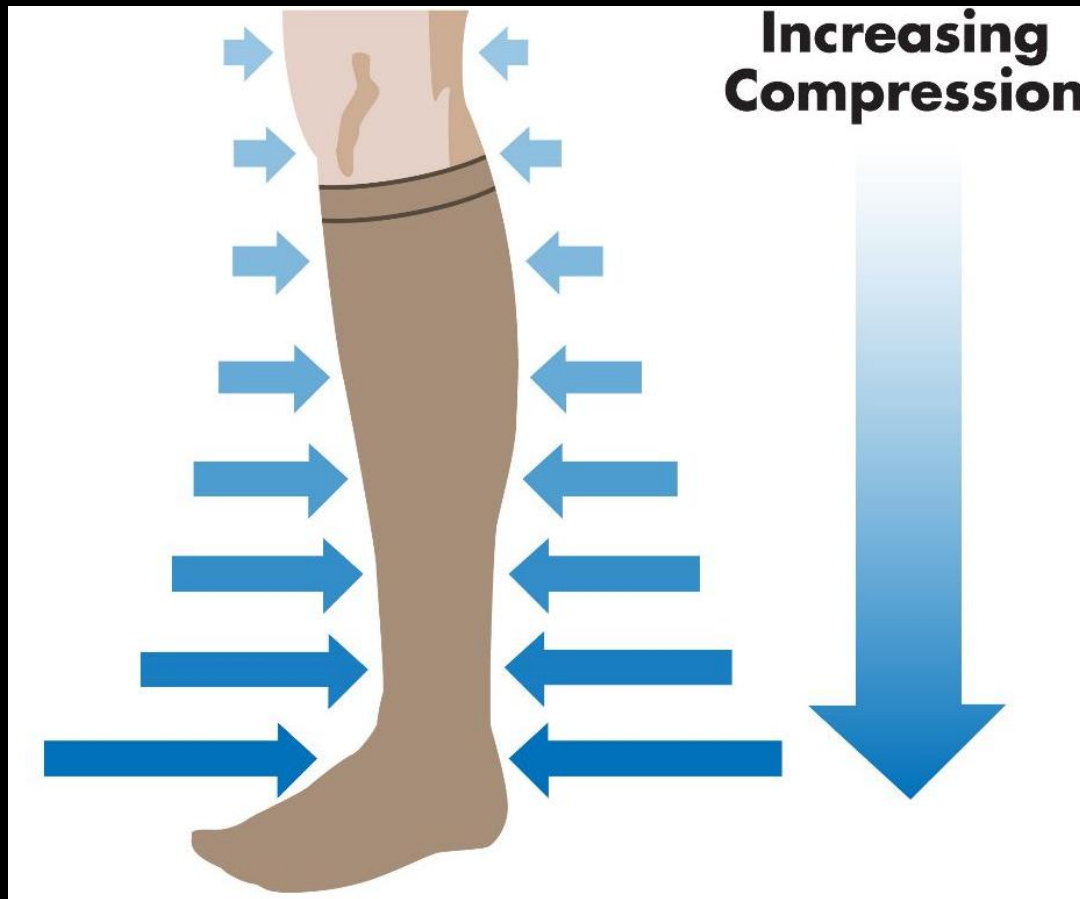
Stocking

USG-Sclero

ELVT/Surgery

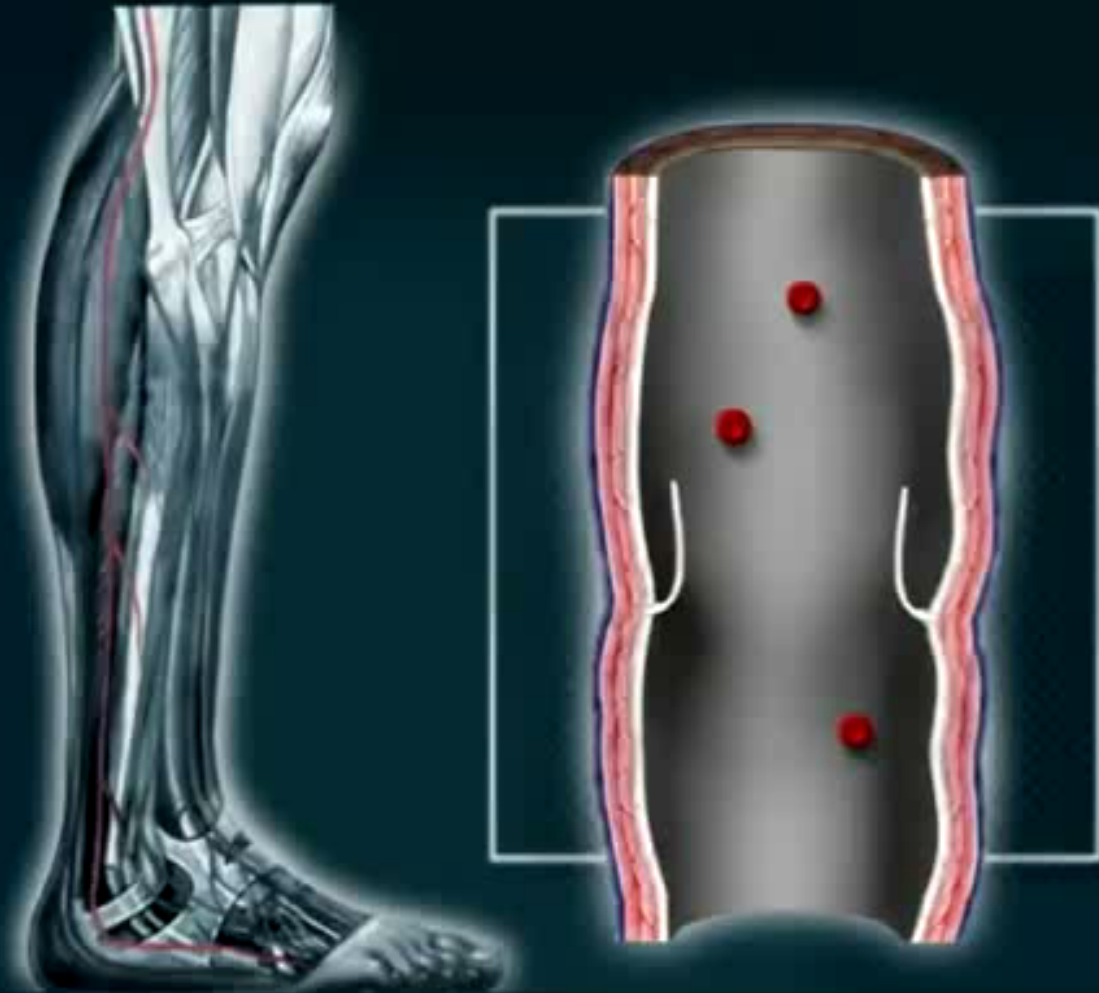


# Compression Stockings

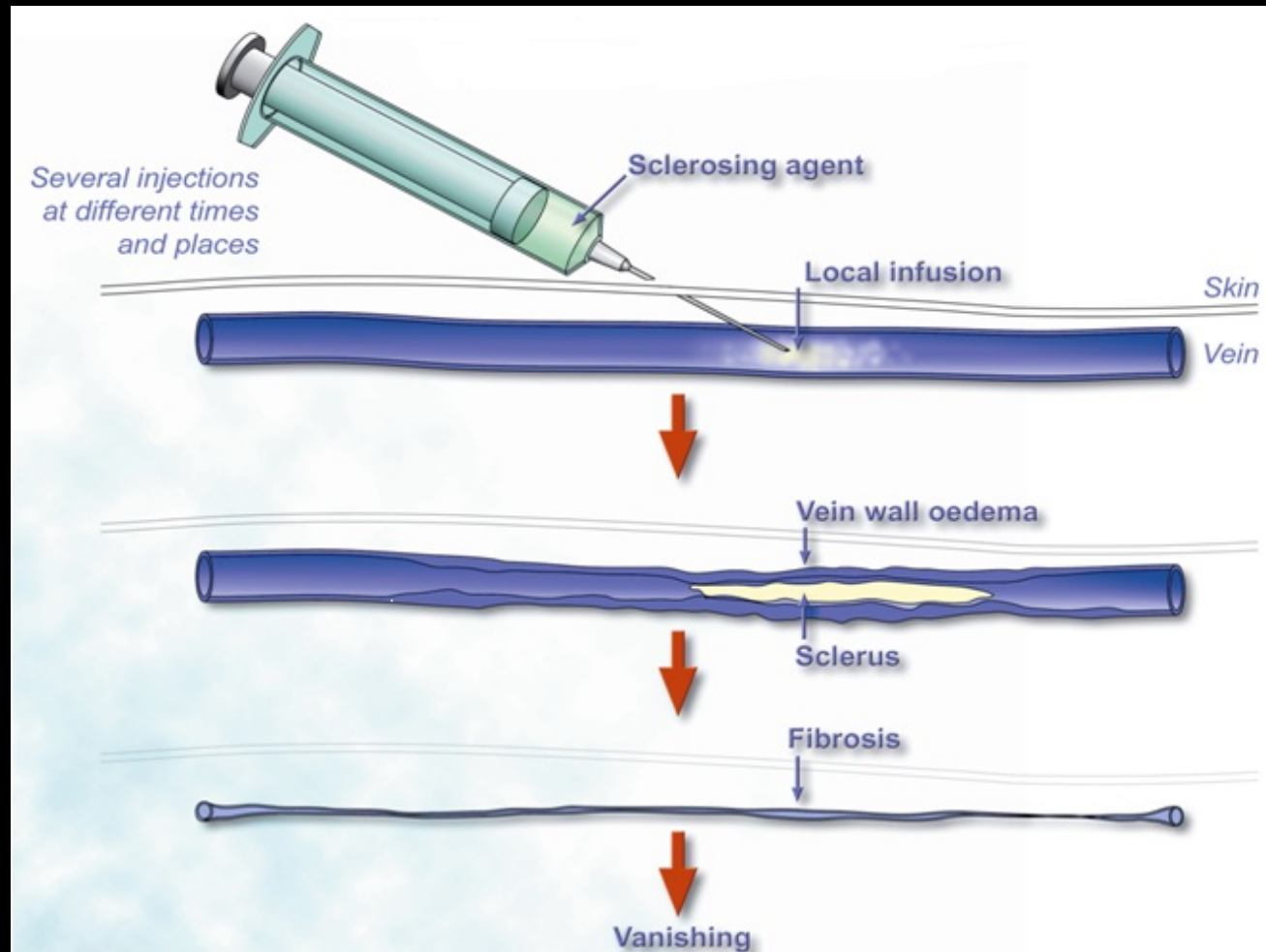




# Compression Stockings



# Sclerotherapy



**PPT NOTE:**

Sclerotherapy is the injection of a sclerosing agent into a vein, causing an inflammatory reaction in the endothelium of the vein wall. The vein walls adhere together under compression and form a scar (fibrotic tissue) that is absorbed by the body.

# Sclerotherapy



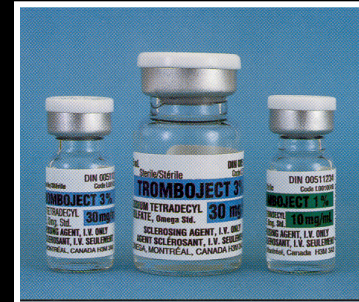
## SCLERODEX<sup>®</sup>

5 vials of 10 mL  
 Dextrose USP 250mg/mL  
 Sodium Chloride USP  
 100mg/mL



## SCLERODINE<sup>®</sup> 6

Iodine 600mg/10mL (60mg/mL)  
 Sodium Iodine  
 900mg/10mL (90mg/mL)



## TROMBOJECT<sup>®</sup>

Sodium Tetradecyl Sulfate Omg.Std.  
 10mg/mL 10 vials of 2mL  
 30mg/mL 10 vials of 2mL  
 30mg/mL 10 vials of 5mL



## SALIJECT<sup>®</sup>

Sodium Salicylate Omg.Std.  
 5.7g/10mL (570mg/mL)



# Sclero-Rx - Complications

Solution	Pigmentation	Allergic reaction	Necrosis	Pain
Sodium morrhuate	++	++	+++*	+++
Sodium tetradecyl sulfate	++	+	++*	+
Ethanolamine oleate	+	++	++*	++
Polidocanol	+	+	+*	0
Hypertonic saline	+	0	+++*	+++
Sclerodex(10% saline + 5% dextrose)	+	0	+	++
Chromated glycerin	0	+	0	++
Polyiodinated iodine	++	+	+++*	+++

+, Minimal; ++, moderate; +++, significant.

\*Concentration dependent.



# Endovenous Ablation Techniques

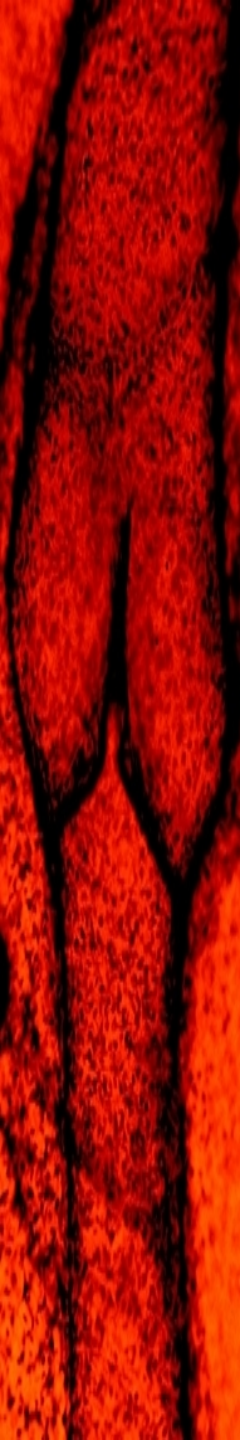
Denaturation of vein wall collagen



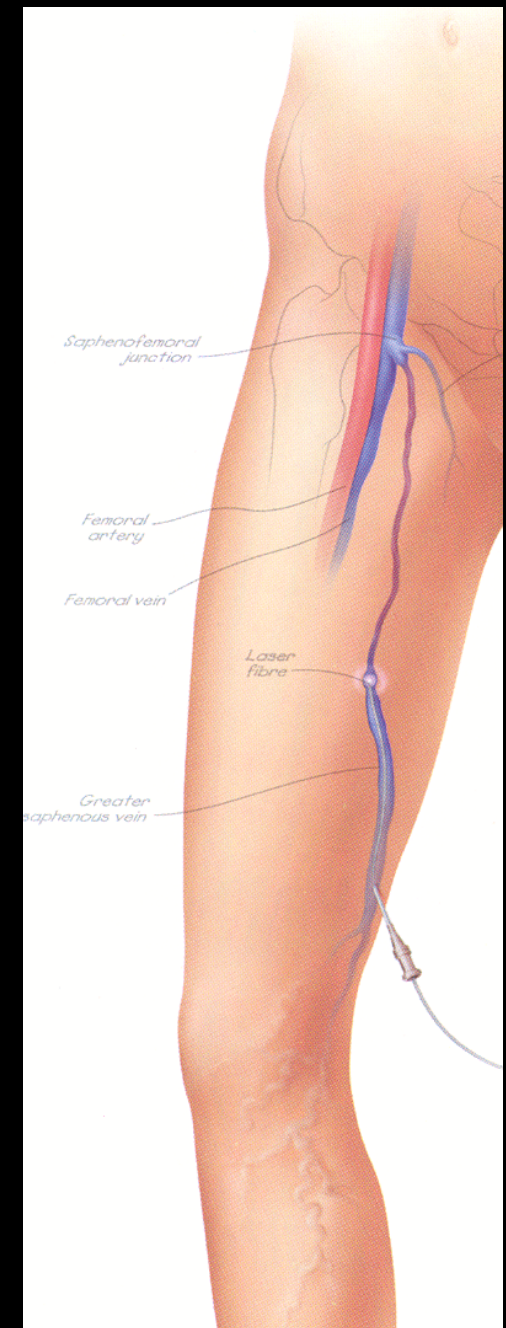
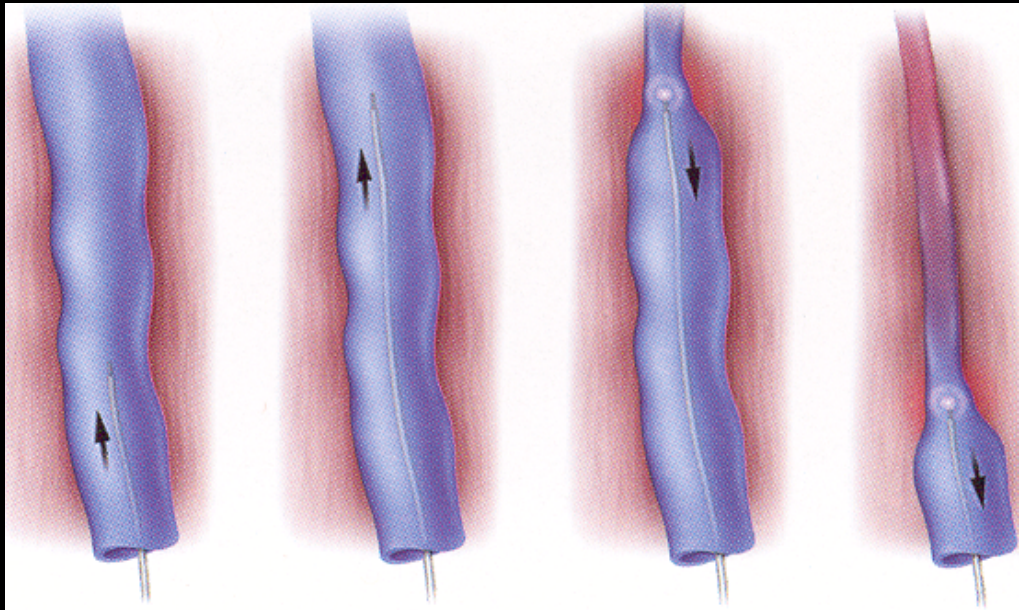
Contraction



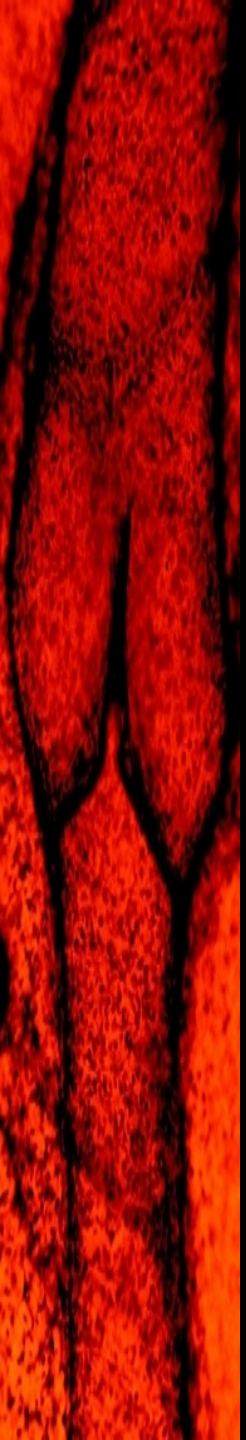
Fibrous obliteration



# EndoVenous Laser Therapy(EVLT)

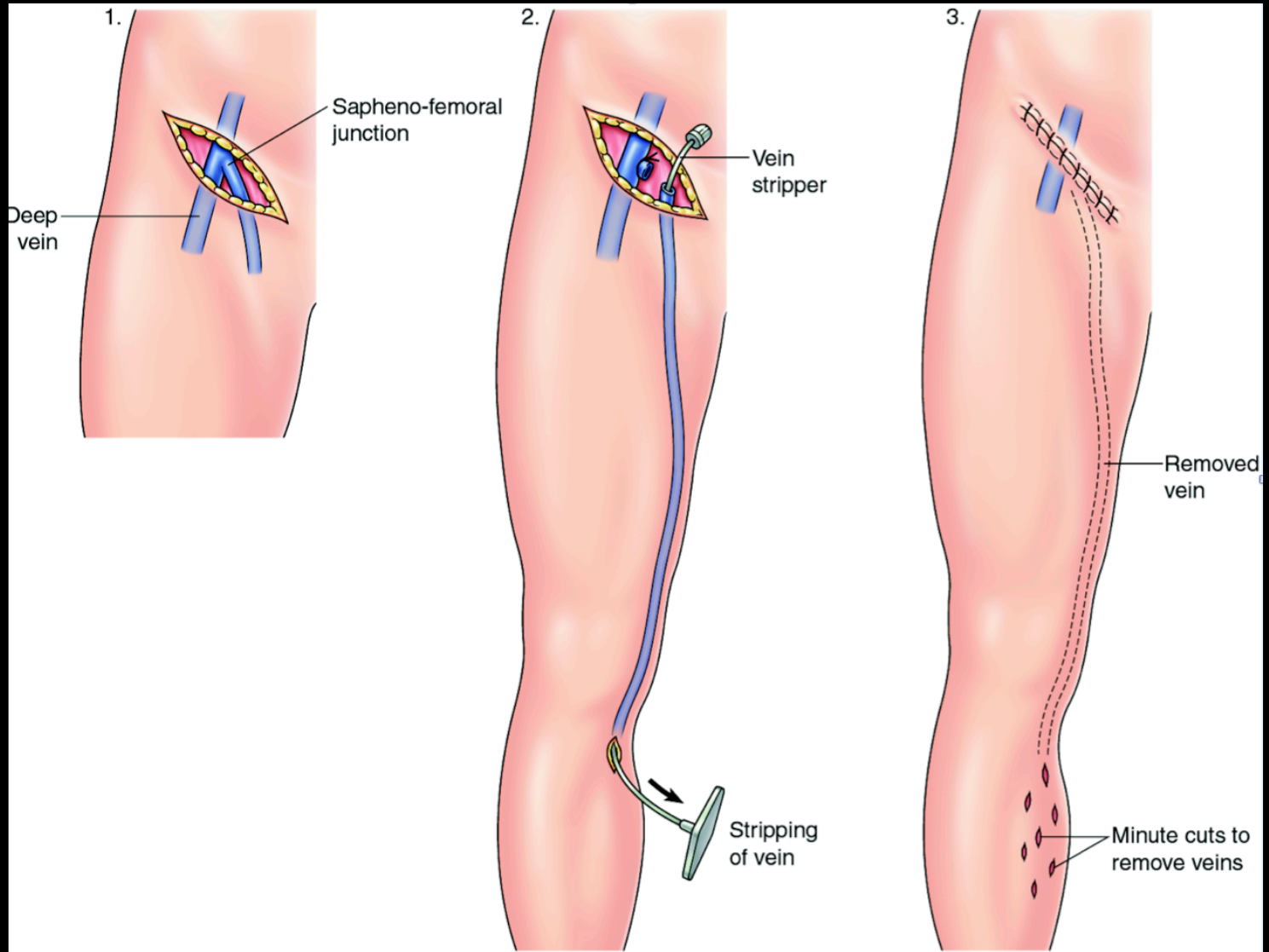


# EndoVenous Laser Therapy(EVLT)





# Surgery







*Thank You*