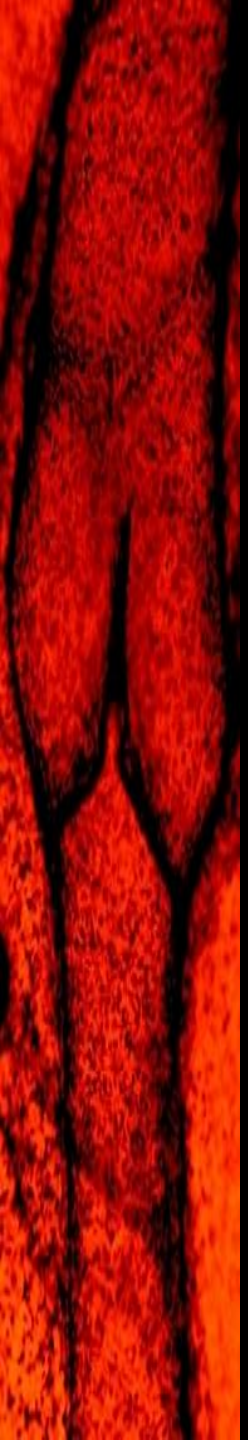
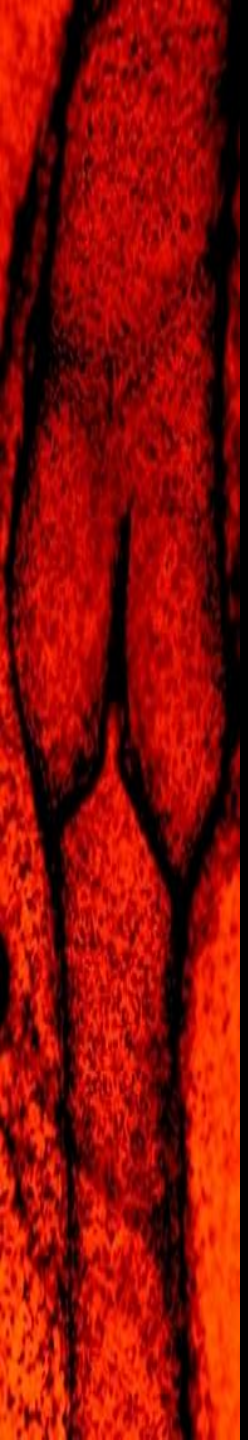


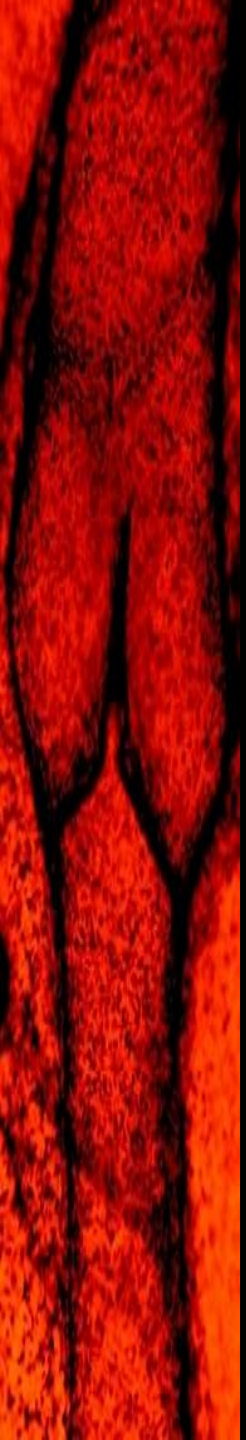
Chronic Venous Insufficiency

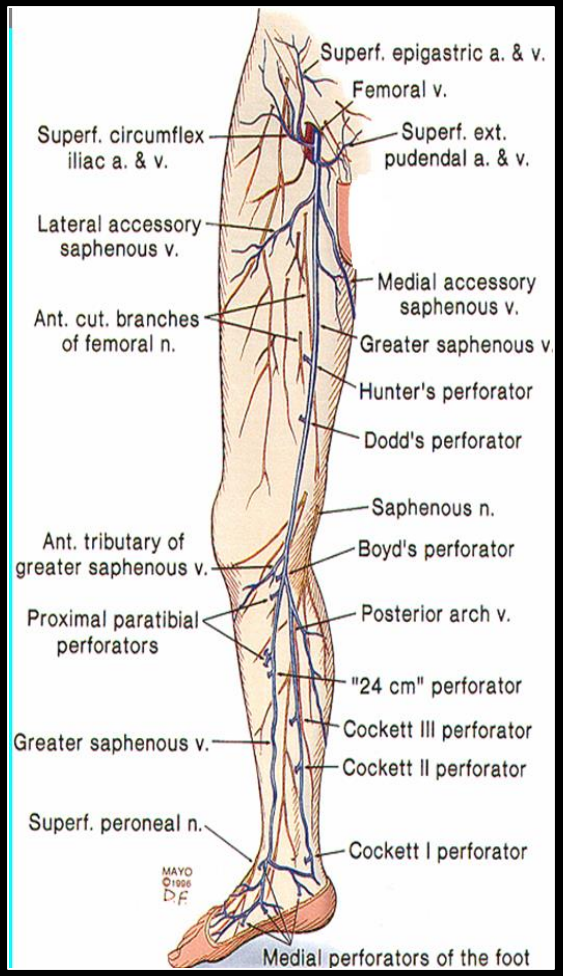
Talal A. Altuwaijri, MD

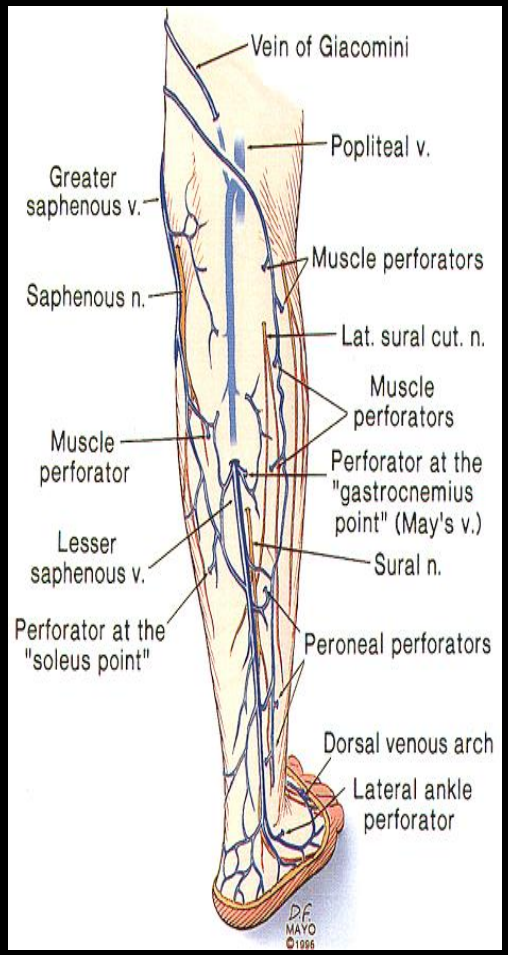
Assistant professor and Consultant
Vascular Surgery

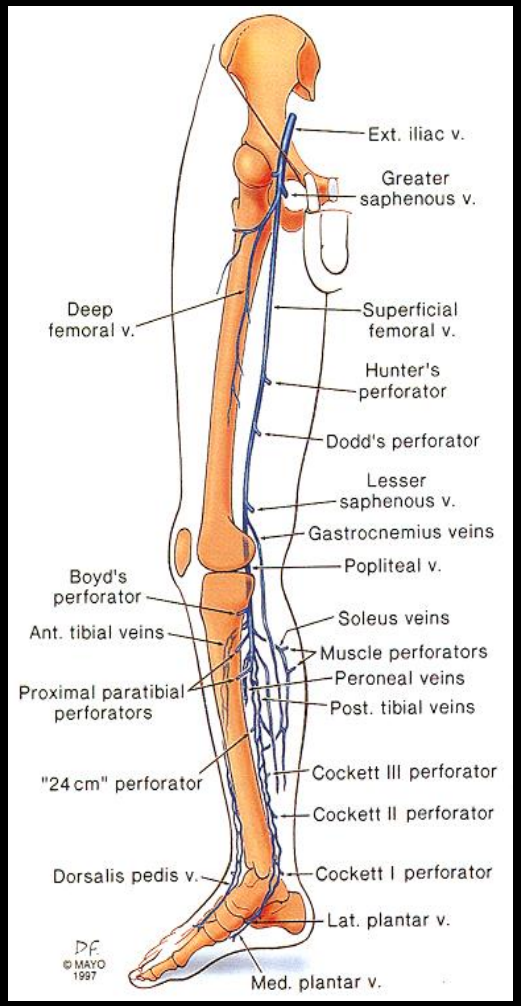


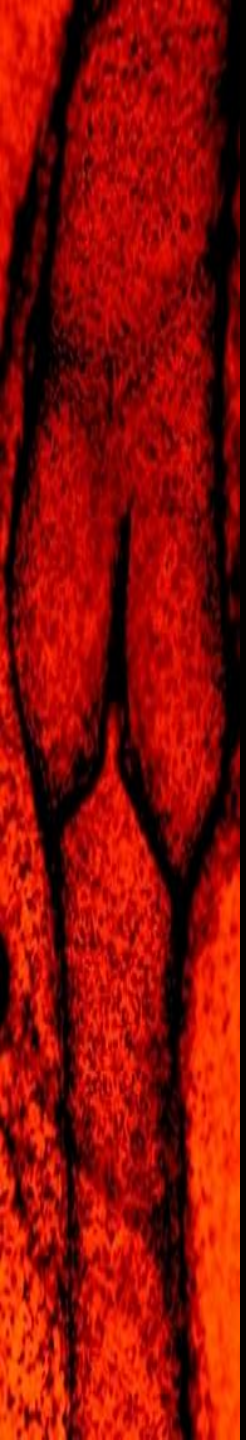
Anatomy

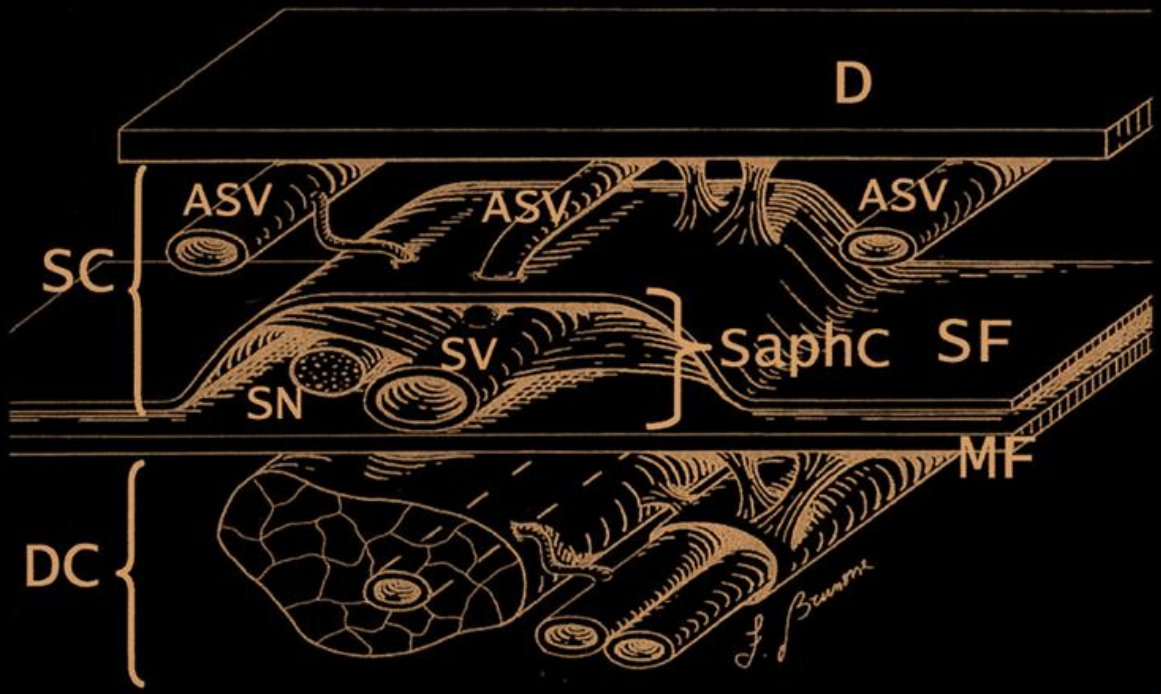


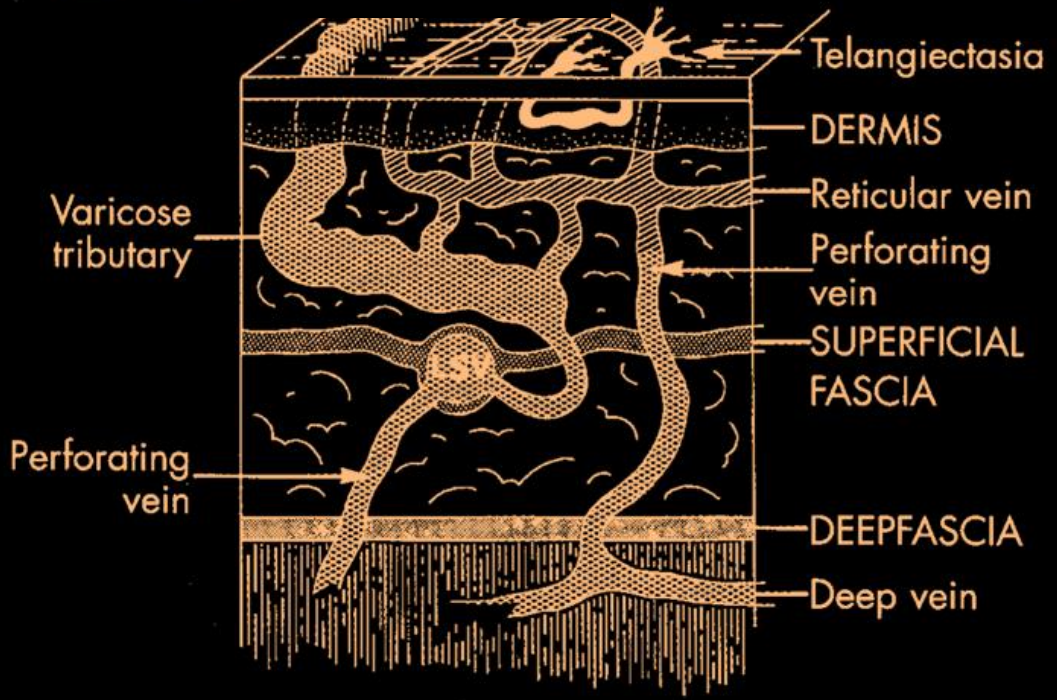

Superf. epigastric a. & v.
Femoral v.
Superf. circumflex iliac a. & v.
Superf. ext. pudendal a. & v.
Lateral accessory saphenous v.
Medial accessory saphenous v.
Ant. cut. branches of femoral n.
Greater saphenous v.
Hunter's perforator
Dodd's perforator
Saphenous n.
Ant. tributary of greater saphenous v.
Boyd's perforator
Proximal paratibial perforators
Posterior arch v.
"24 cm" perforator
Cockett III perforator
Greater saphenous v.
Cockett II perforator
Superf. peroneal n.
Cockett I perforator
MAYO ©1996 DF
Medial perforators of the foot

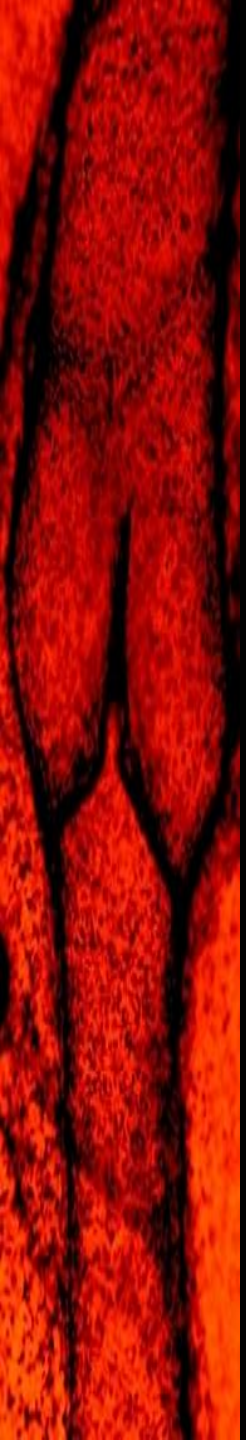

Vein of Giacomini
Popliteal v.
Greater saphenous v.
Muscle perforators
Saphenous n.
Lat. sural cut. n.
Muscle perforators
Muscle perforator
Perforator at the "gastrocnemius point" (May's v.)
Lesser saphenous v.
Sural n.
Perforator at the "soleus point"
Peroneal perforators
Dorsal venous arch
Lateral ankle perforator
DF MAYO ©1996

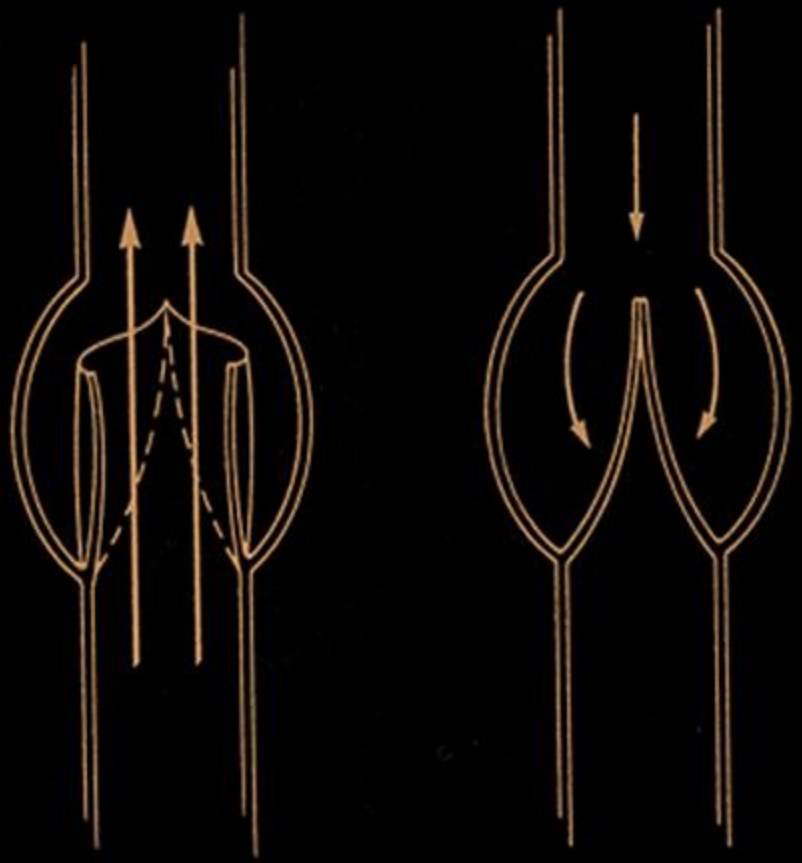

Ext. iliac v.
Greater saphenous v.
Deep femoral v.
Superficial femoral v.
Hunter's perforator
Dodd's perforator
Lesser saphenous v.
Gastrocnemius veins
Popliteal v.
Boyd's perforator
Soleus veins
Ant. tibial veins
Muscle perforators
Peroneal veins
Proximal paratibial perforators
Post. tibial veins
"24 cm" perforator
Cockett III perforator
Cockett II perforator
Dorsalis pedis v.
Cockett I perforator
Lat. plantar v.
DF ©MAYO 1997
Med. plantar v.

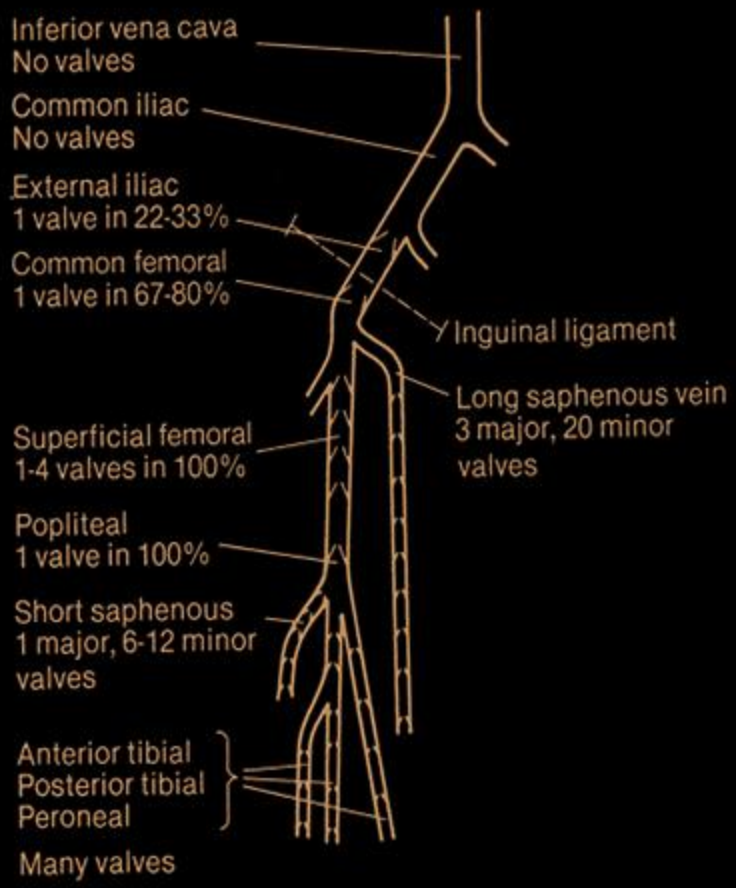


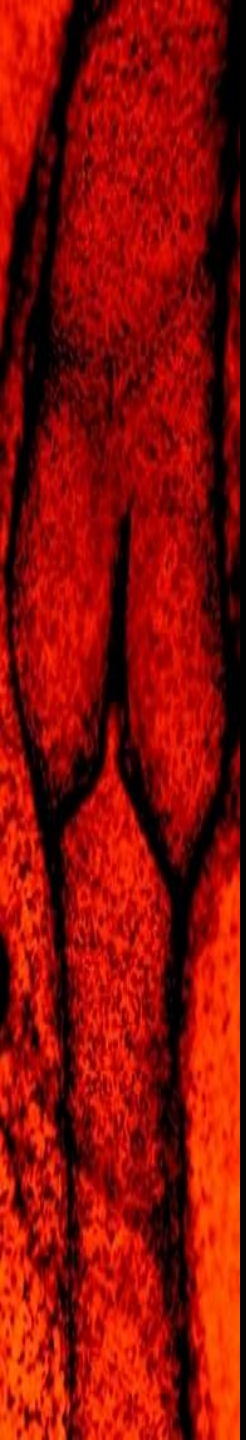

D
ASV
ASV
ASV
SC
Saphc
SF
SV
SN
MF
DC

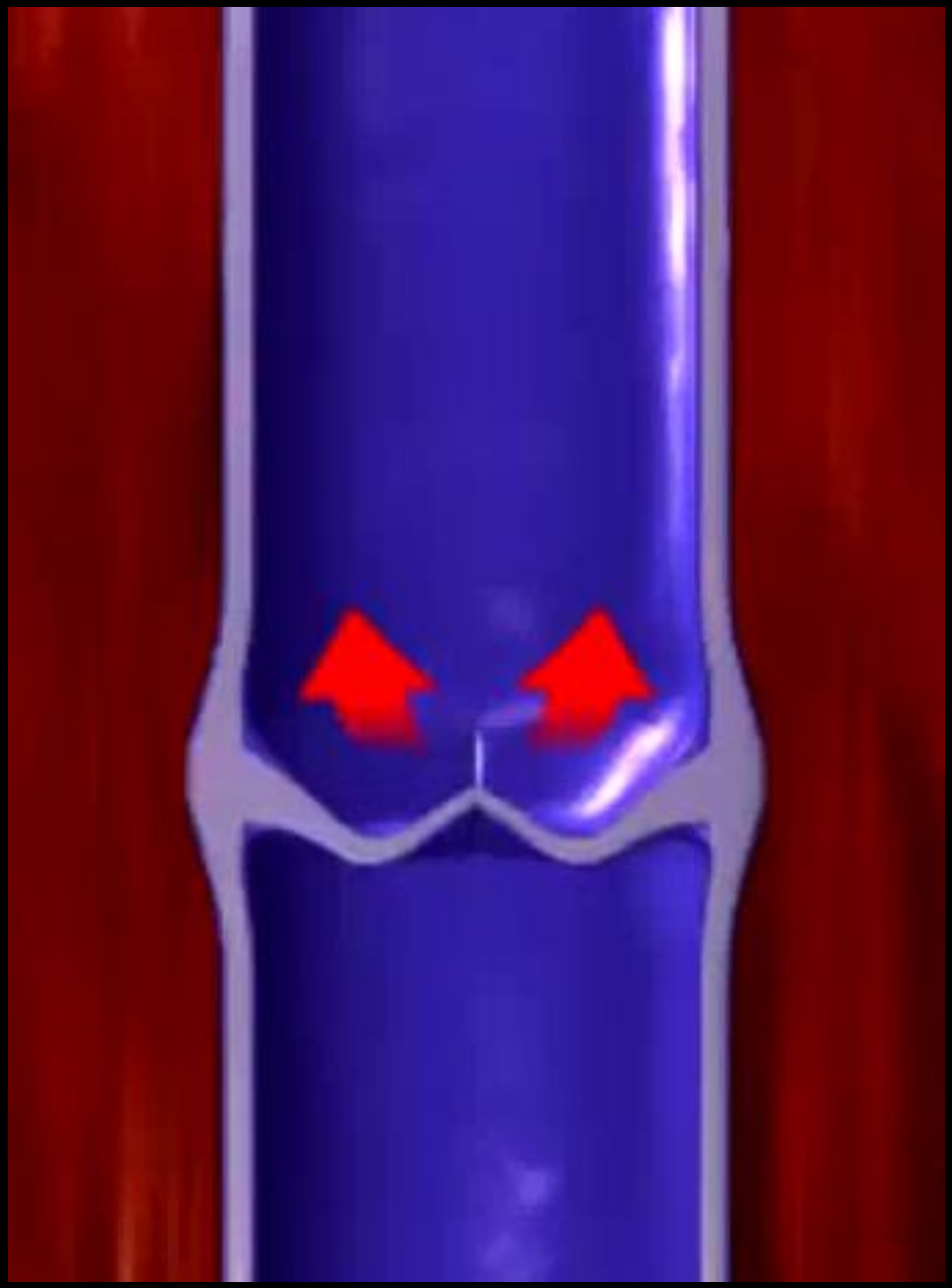

Telangiectasia
DERMIS
Reticular vein
Varicose tributary
Perforating vein
SUPERFICIAL FASCIA
LSV
Perforating vein
DEEPFASCIA
Deep vein

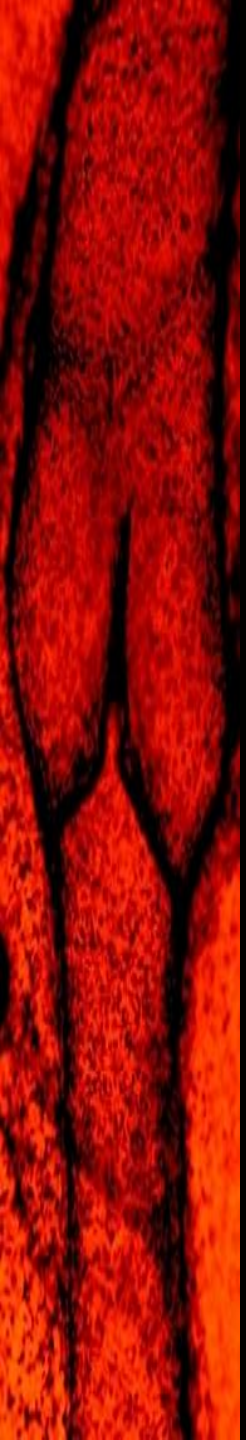


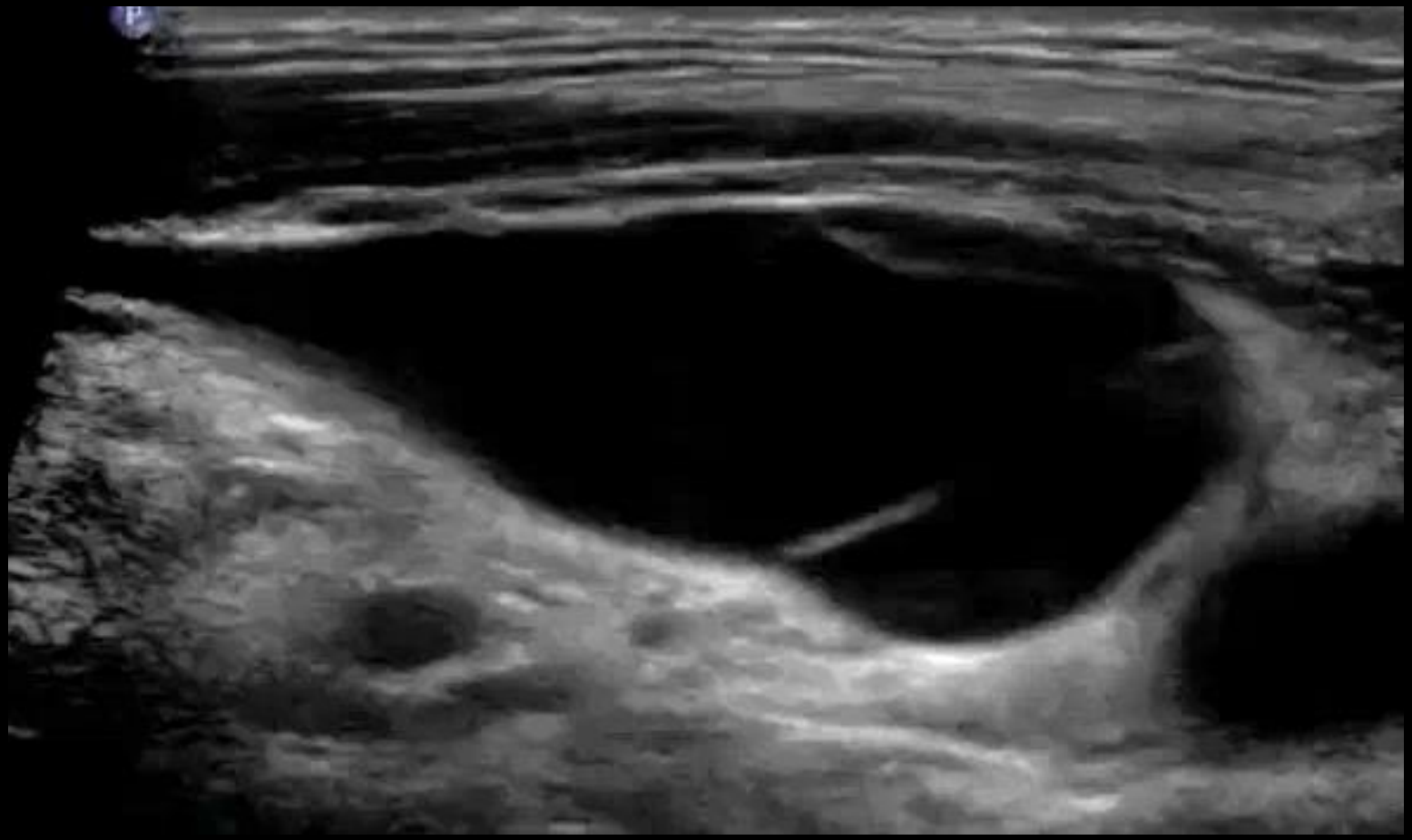


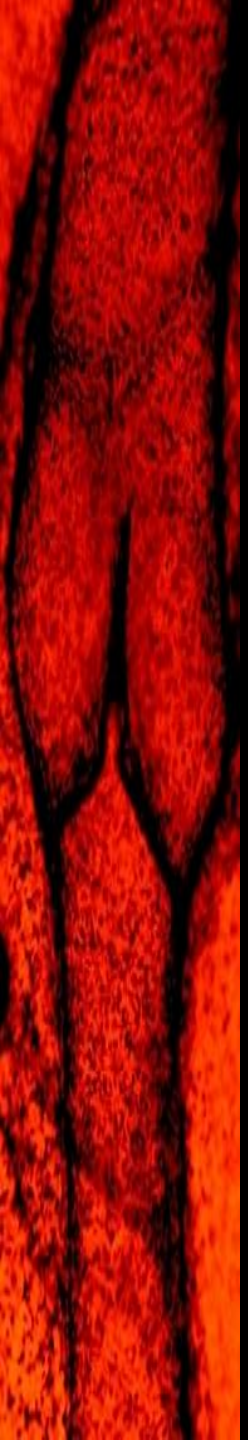

Inferior vena cava
No valves
Common iliac
No valves
External iliac
1 valve in 22-33%
Common femoral
1 valve in 67-80%
Inguinal ligament
Long saphenous vein
3 major, 20 minor
valves
Superficial femoral
1-4 valves in 100%
Popliteal
1 valve in 100%
Short saphenous
1 major, 6-12 minor
valves
Anterior tibial
Posterior tibial
Peroneal
Many valves



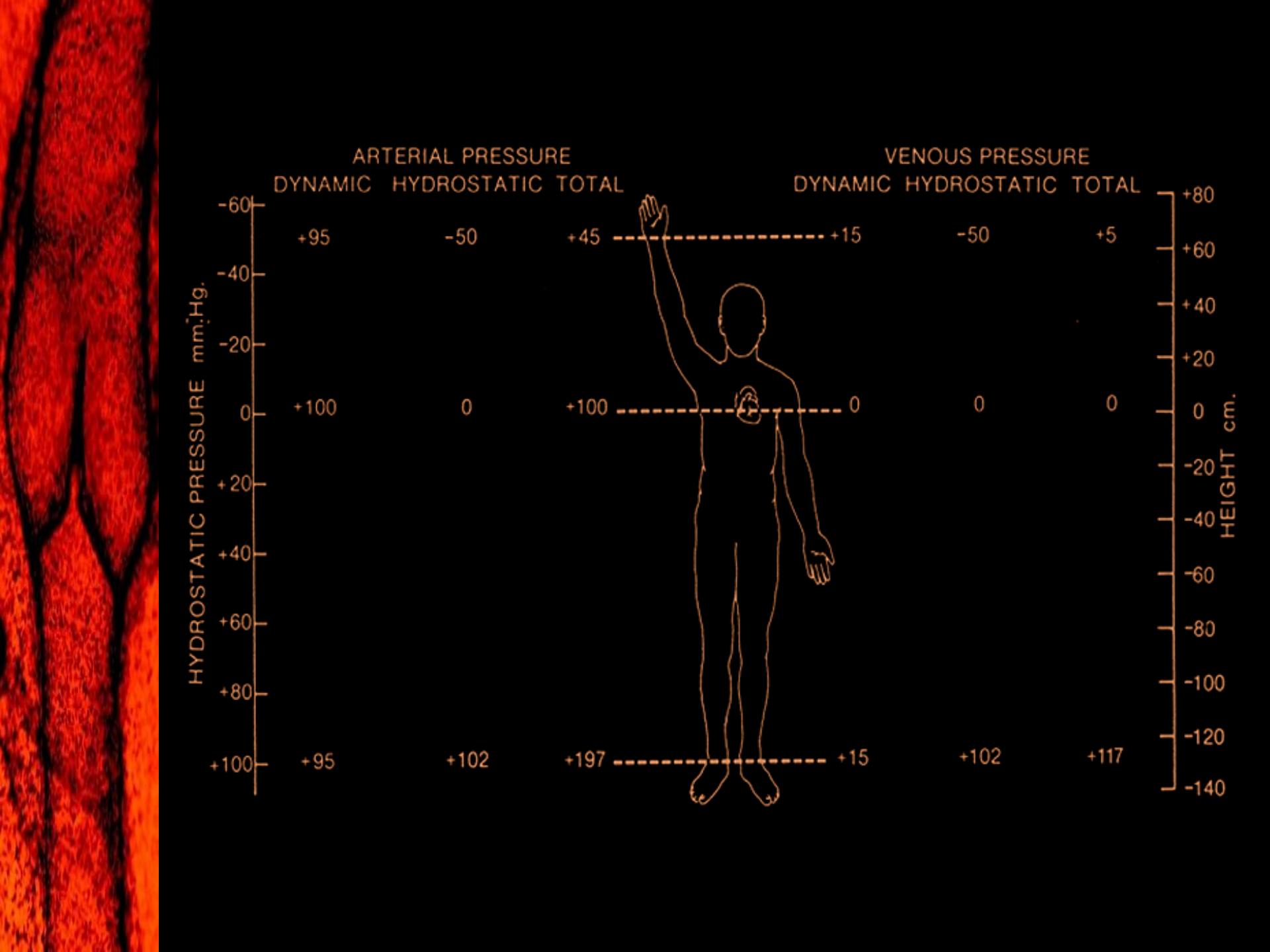


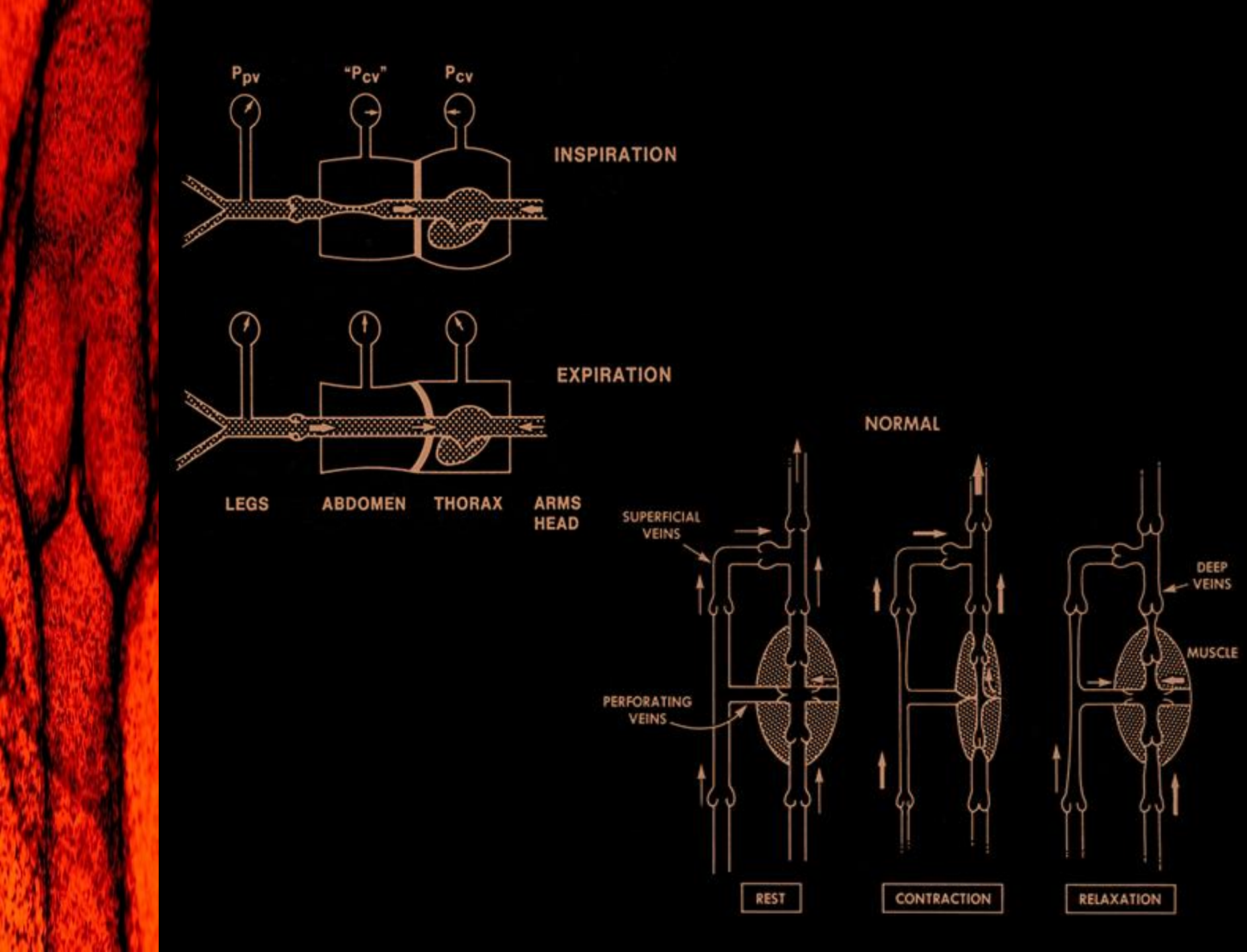






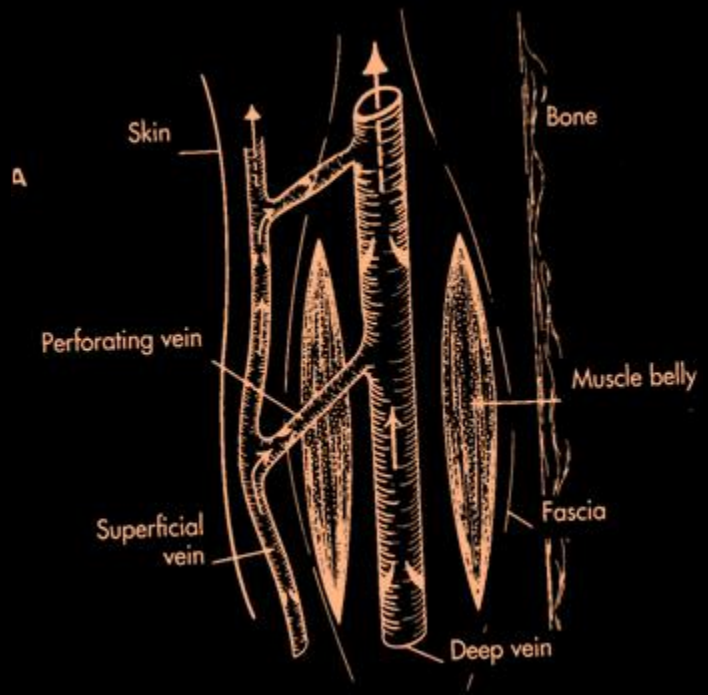
Physiology


ARTERIAL PRESSURE
DYNAMIC HYDROSTATIC TOTAL
VENOUS PRESSURE
DYNAMIC HYDROSTATIC TOTAL
HYDROSTATIC PRESSURE mm. Hg.
HEIGHT cm.
-60
-40
-20
0
+20
+40
+60
+80
+100
+95
-50
+45
+15
-50
+5
+100
0
+100
0
0
0
+95
+102
+197
+15
+102
+117
+80
+60
+40
+20
0
-20
-40
-60
-80
-100
-120
-140

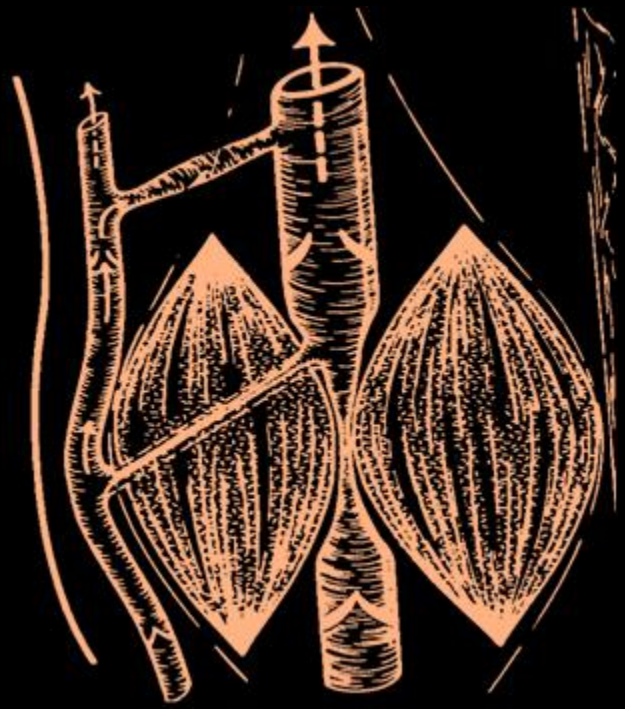

Ppv
"Pcv"
Pcv
INSPIRATION
EXPIRATION
LEGS
ABDOMEN
THORAX
ARMS
HEAD
NORMAL
SUPERFICIAL VEINS
PERFORATING VEINS
DEEP VEINS
MUSCLE
REST
CONTRACTION
RELAXATION

Calf Muscle Pump

Rest



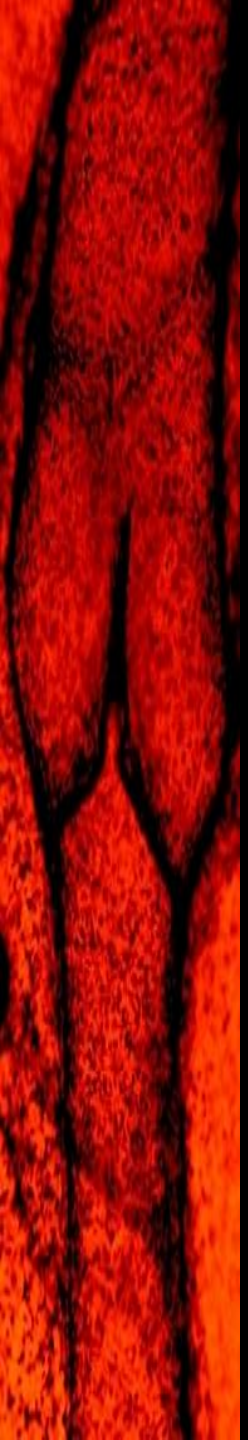
Contraction



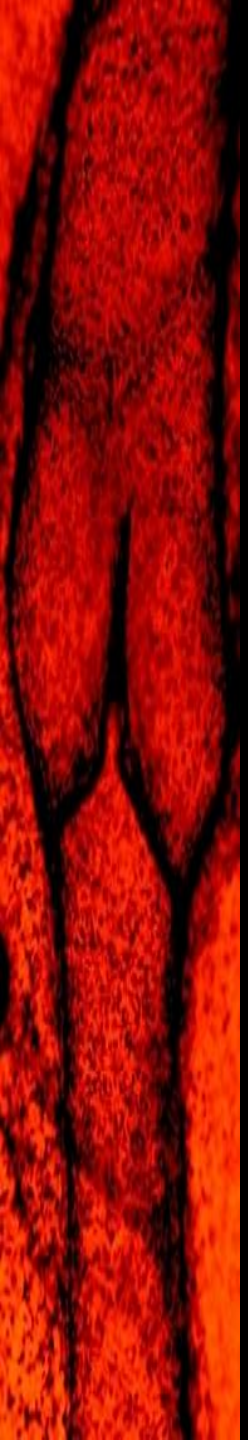
Ambulatory Venous Pressure

Position	mm Hg
Supine	10
Standing	90
Walking*	25

* 7 steps = maximum effect



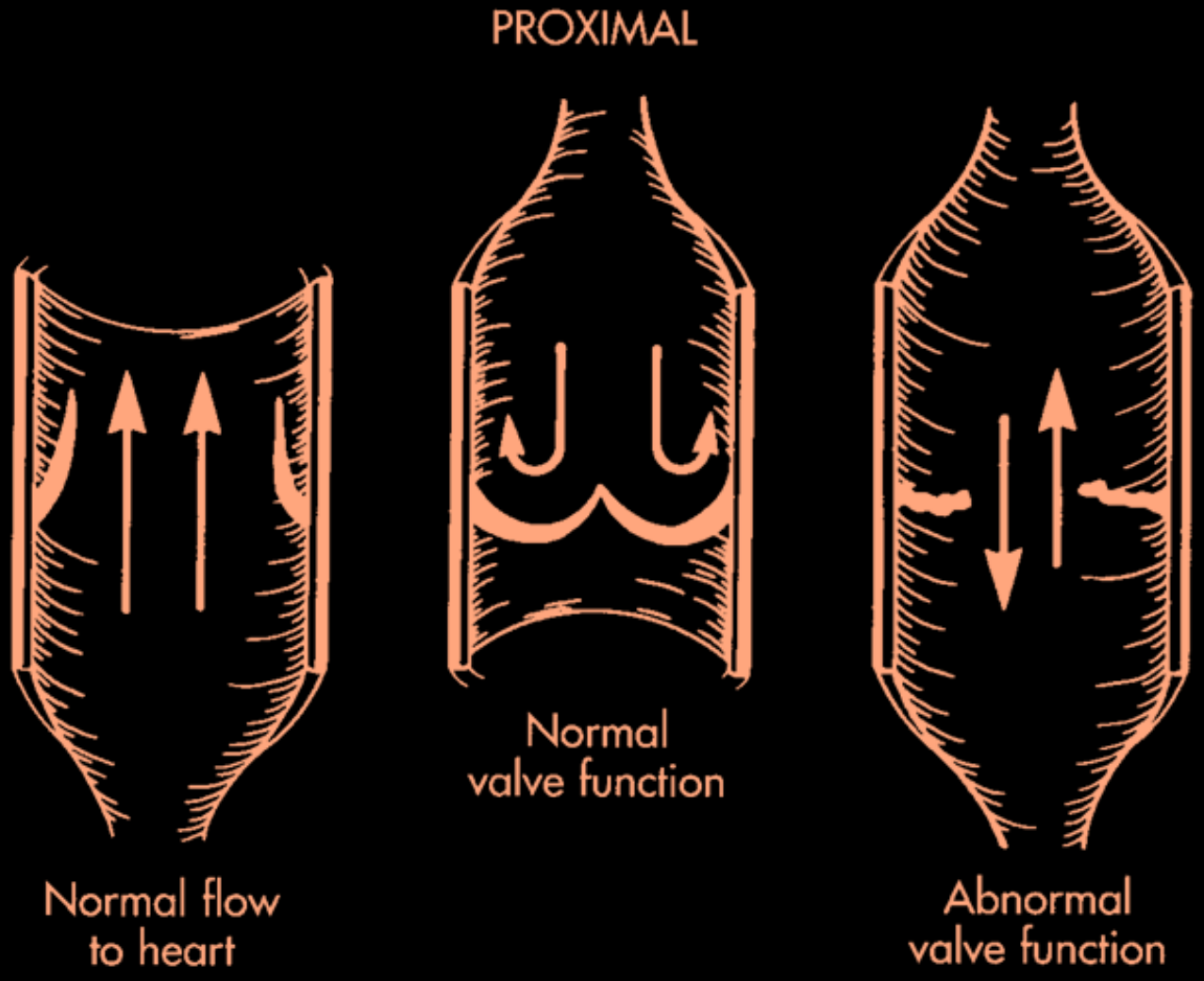
What is Chronic venous insufficiency?

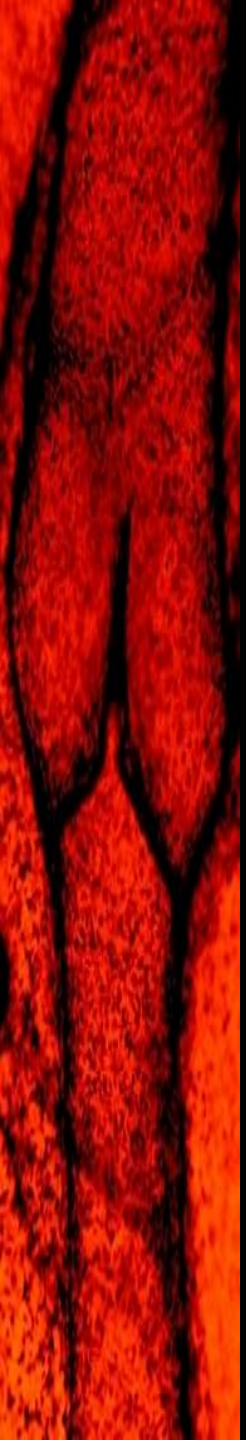


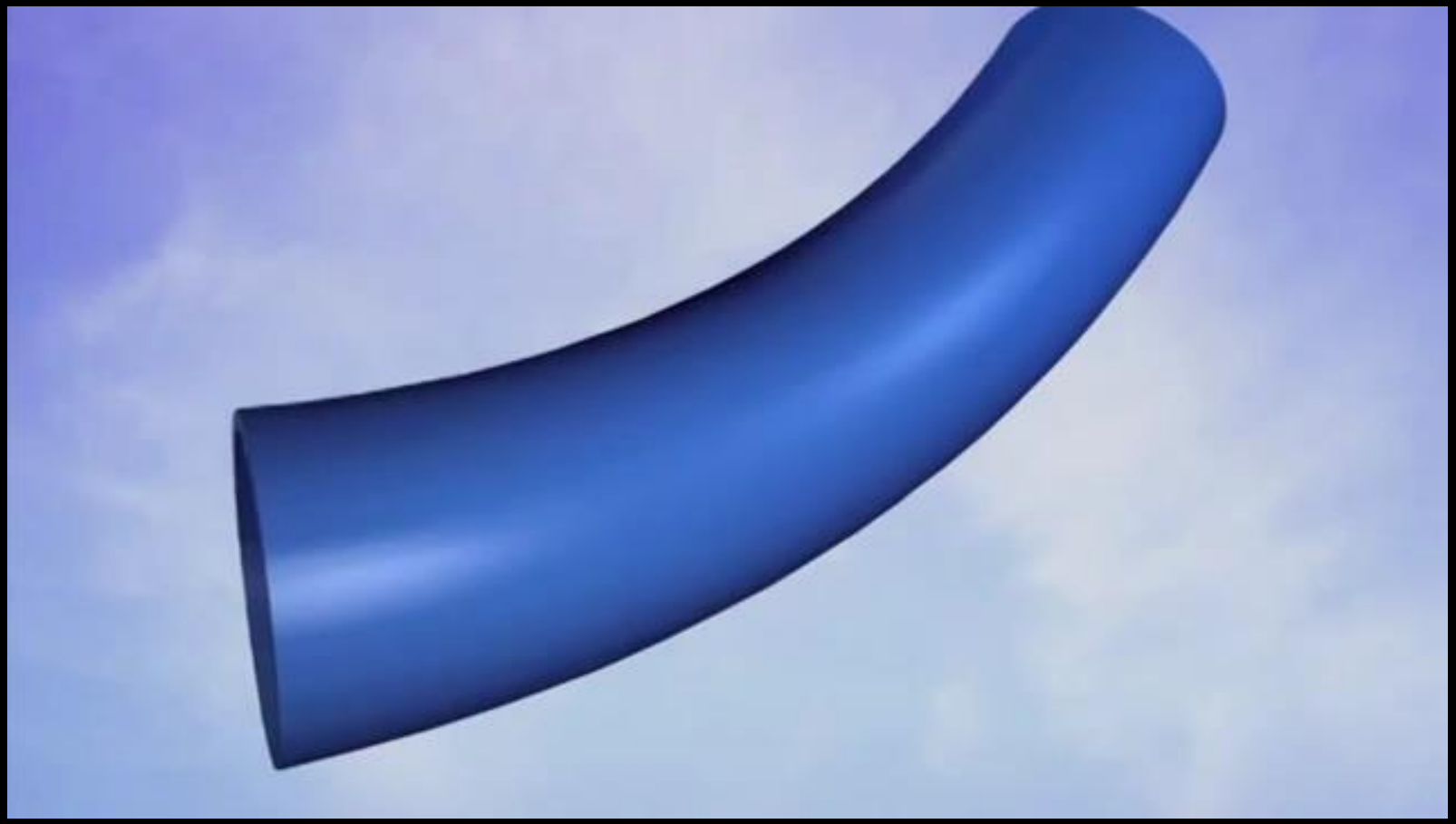
Pathophysiology

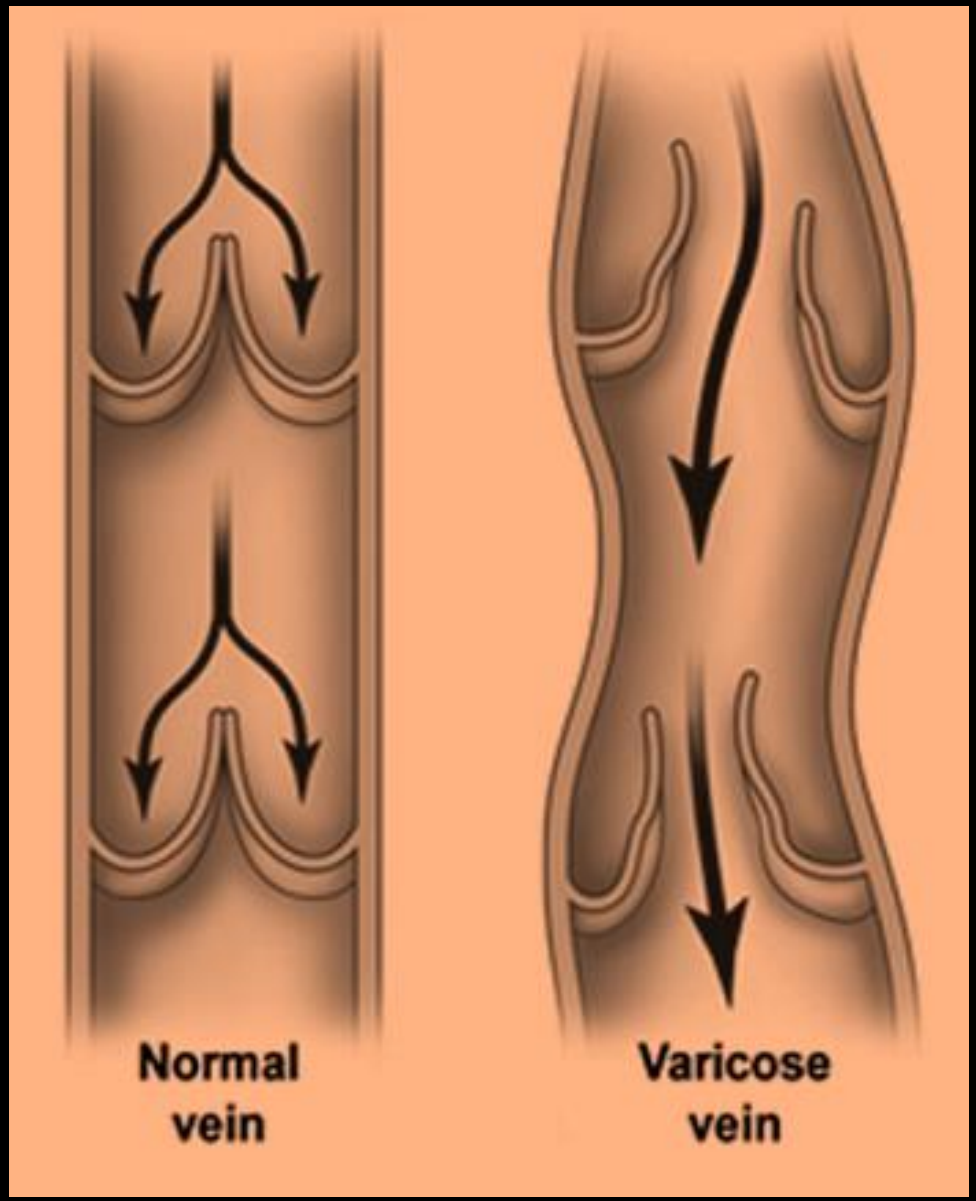
Reflux (90%)

Obstruction (10%)





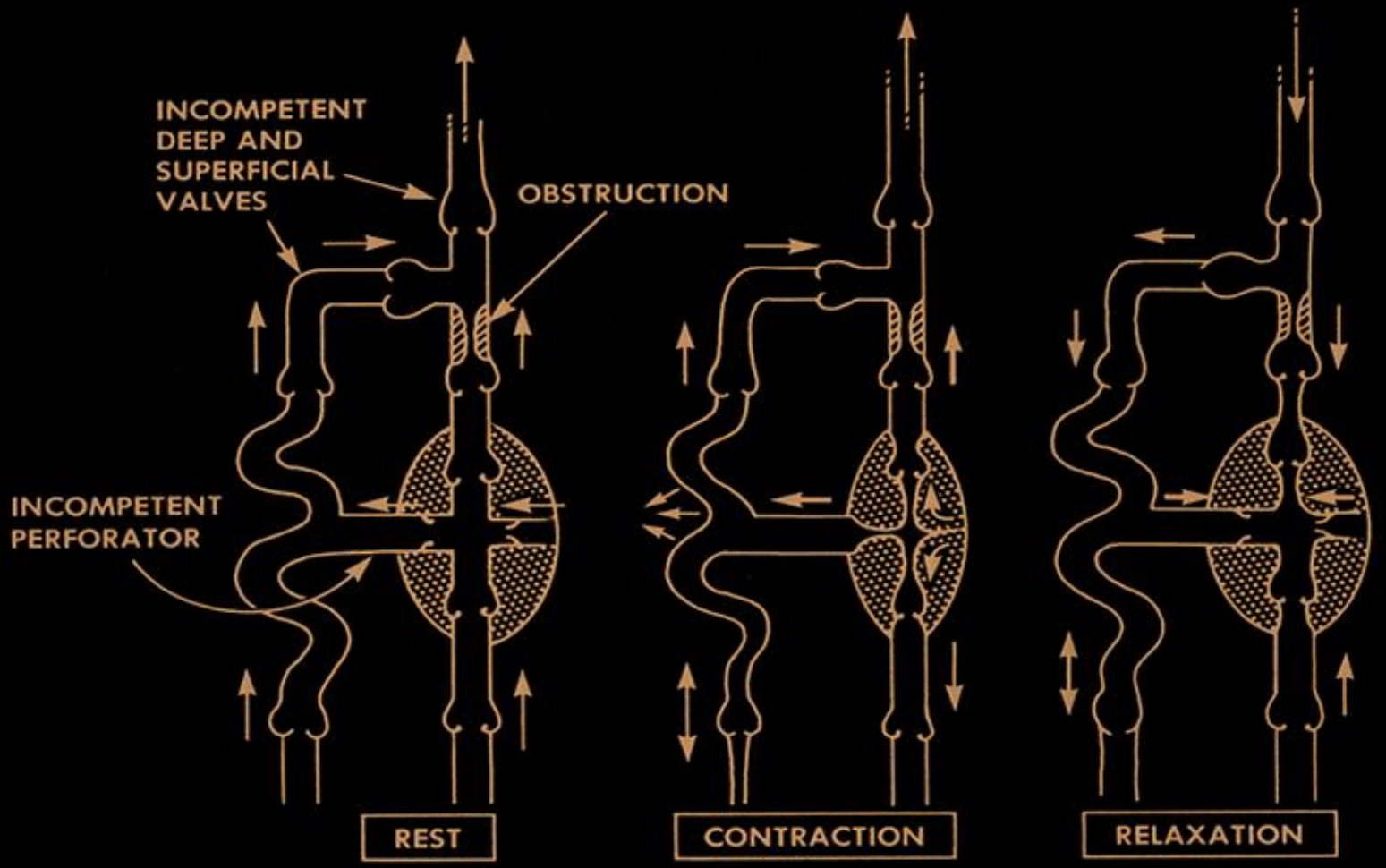



Normal
vein
Varicose
vein

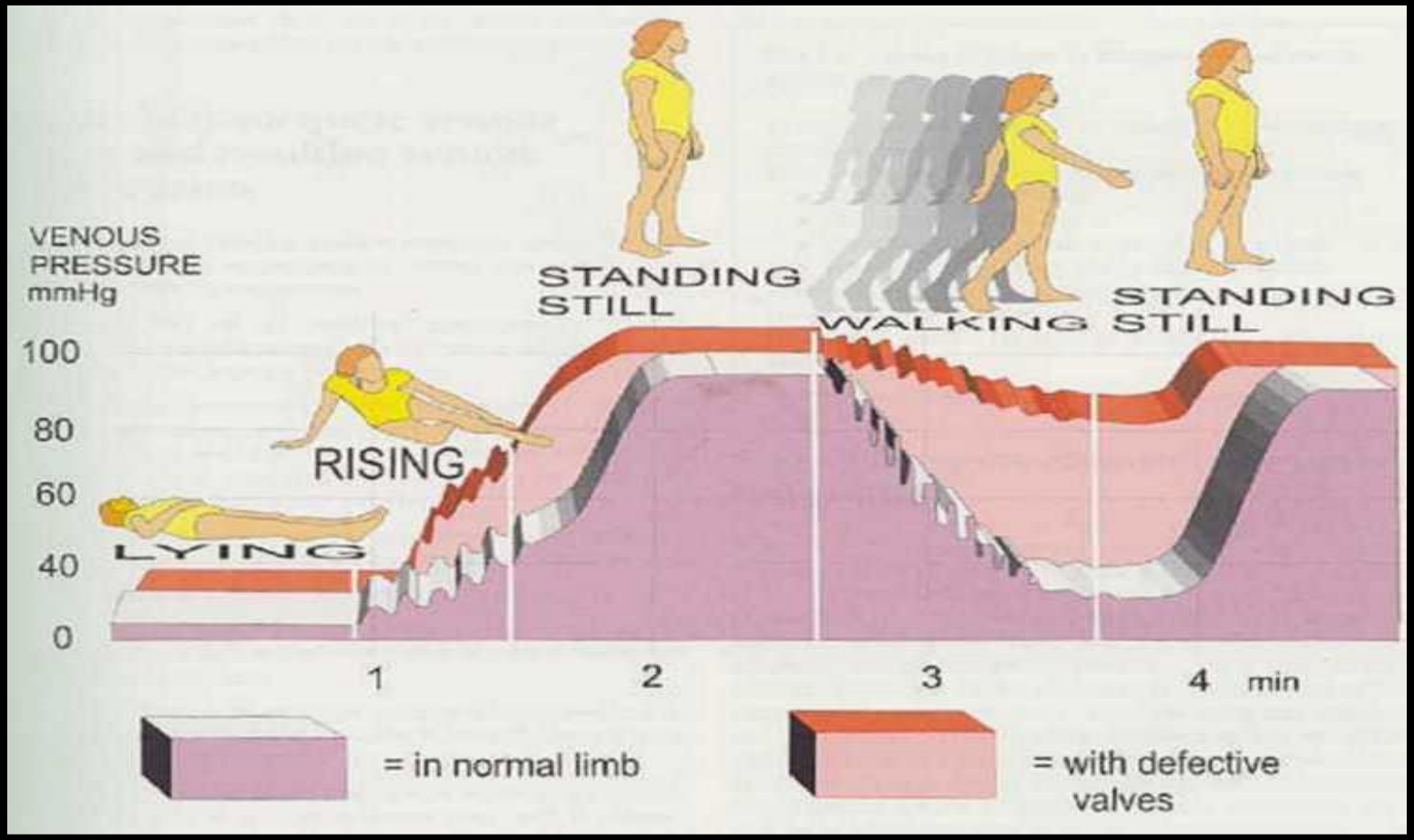
Primary Valvular Incompetence

" floppy valve "

Secondary Valvular Incompetence



SO, Waht happens to the Venous Pressure?



Evaluation

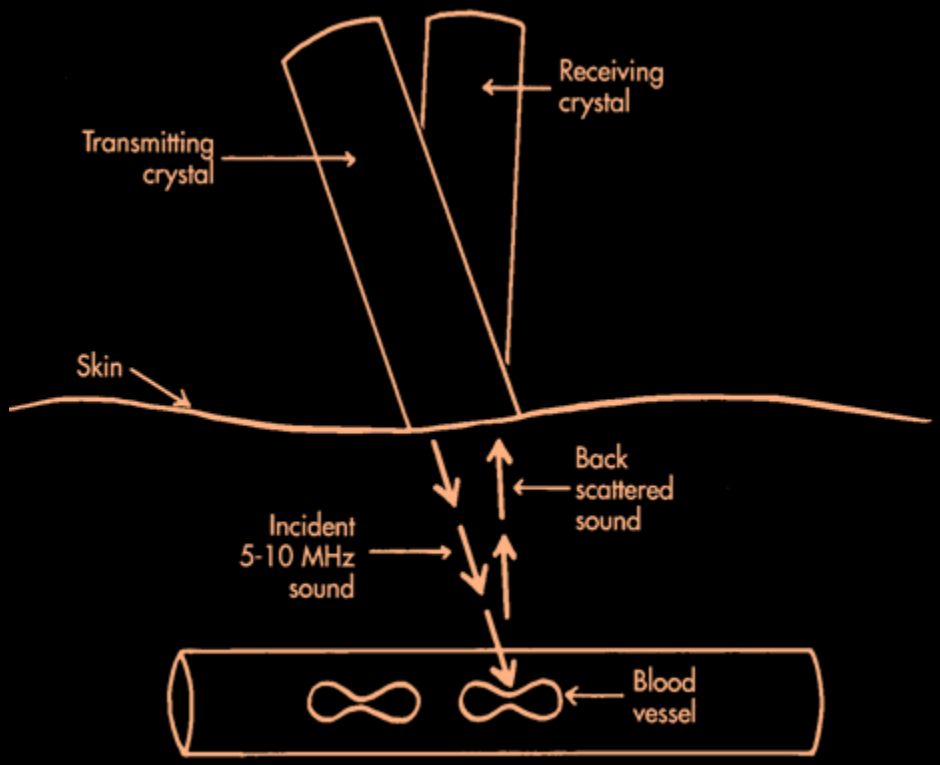
- History
- Physical Examination
- Investigations:

  Non-invasive (Doppler/Duplex)

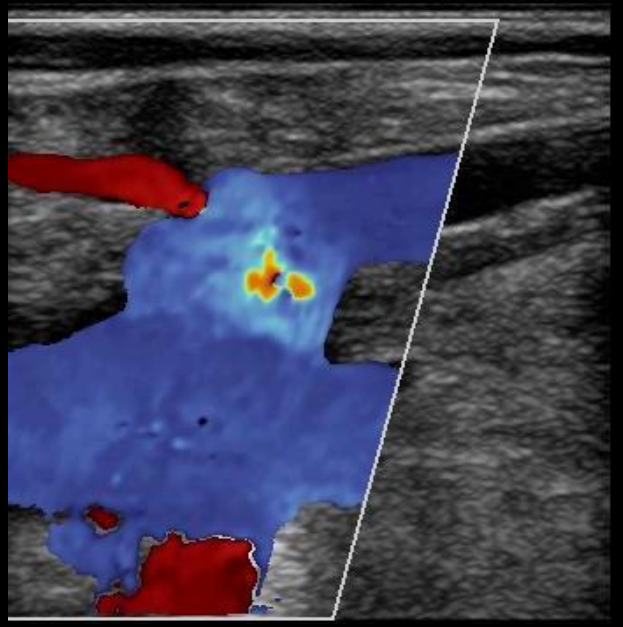
  Invasive (AVP/ Venography)

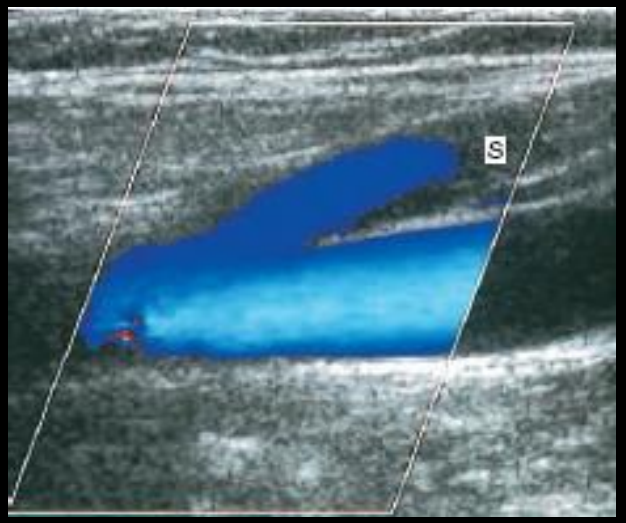
Clinical Presentation

Doppler

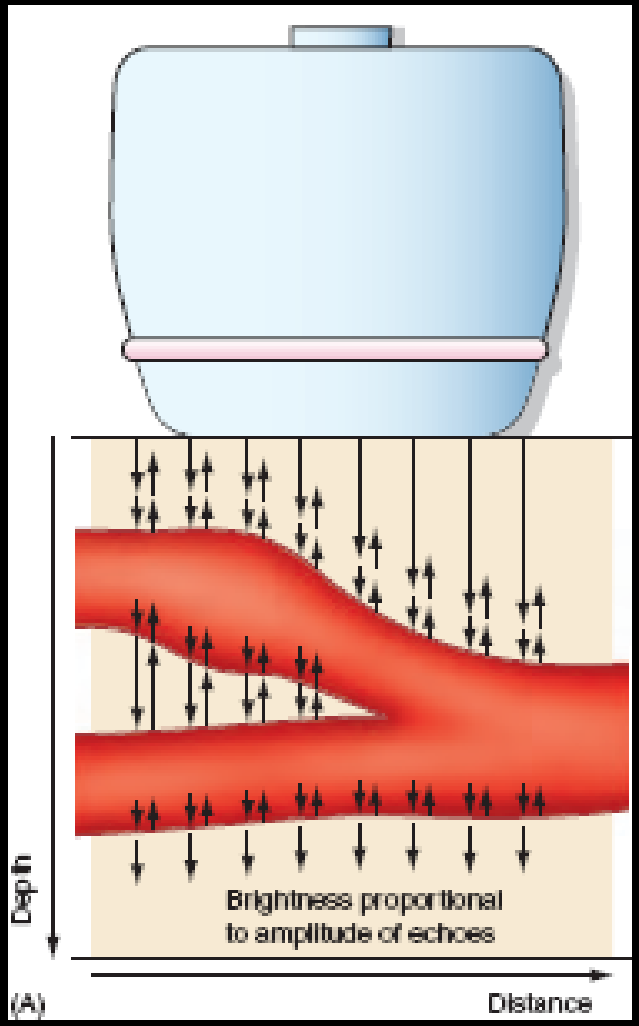

Receiving crystal
Transmitting crystal
Skin
Back scattered sound
Incident 5-10 MHz sound
Blood vessel

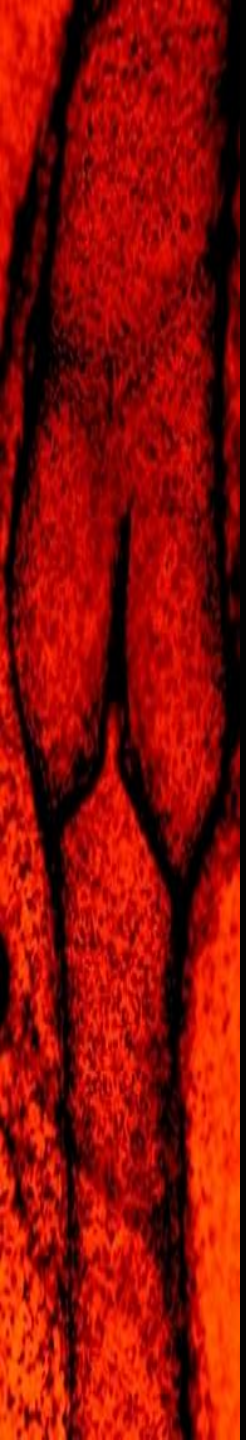
Duplex-Scanning

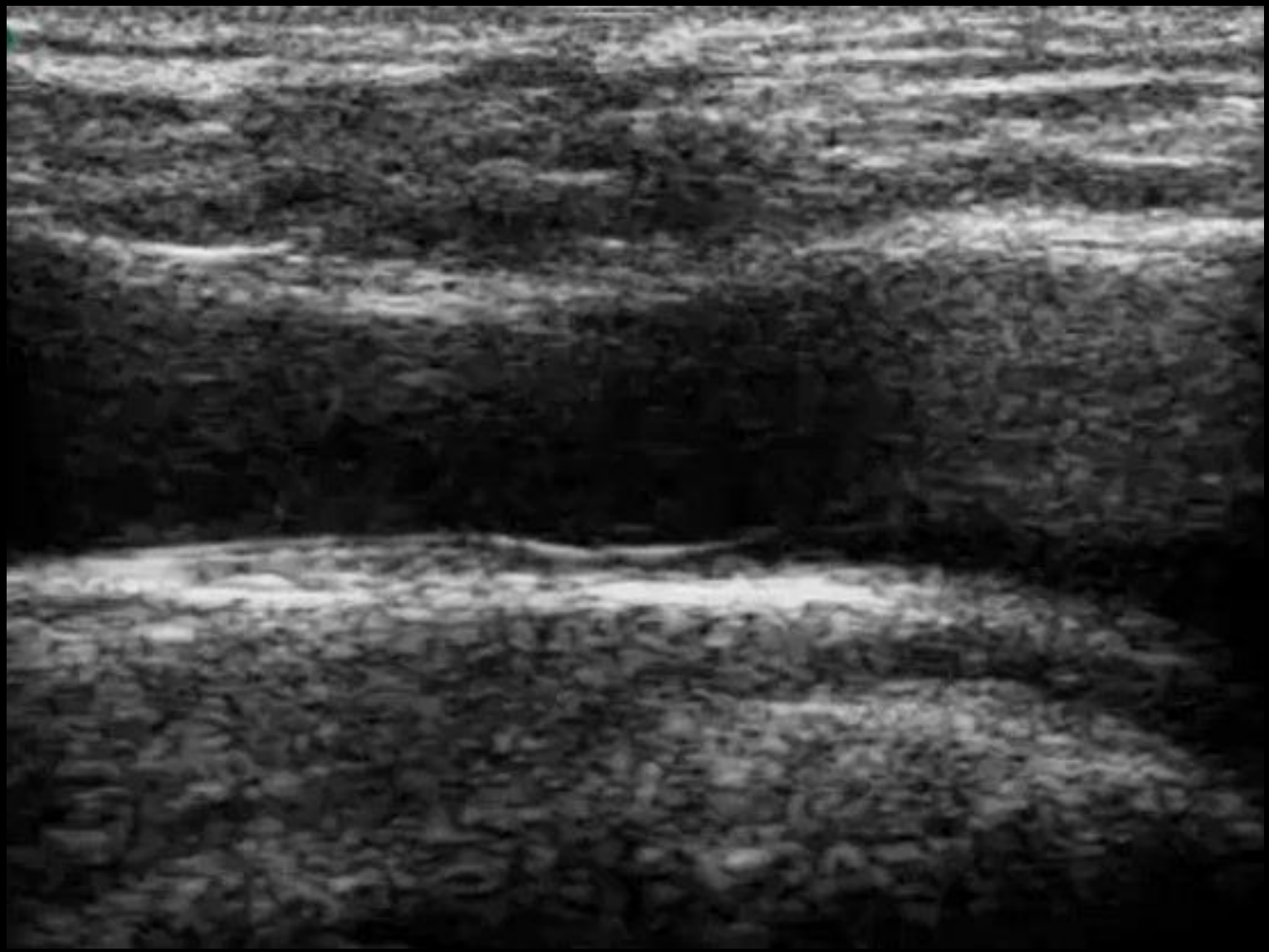


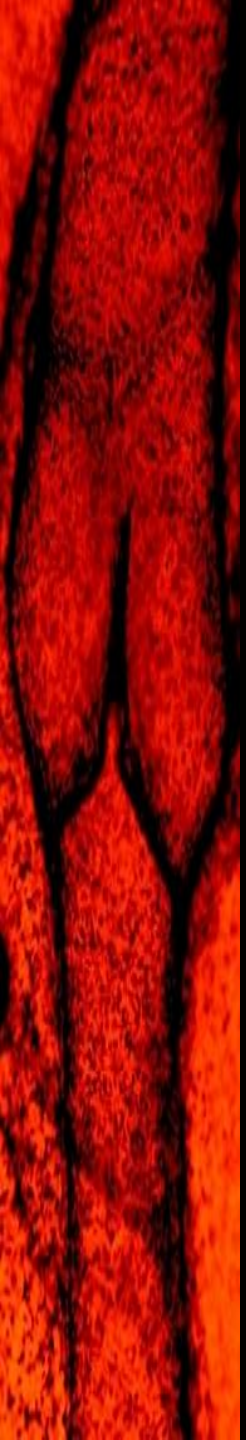


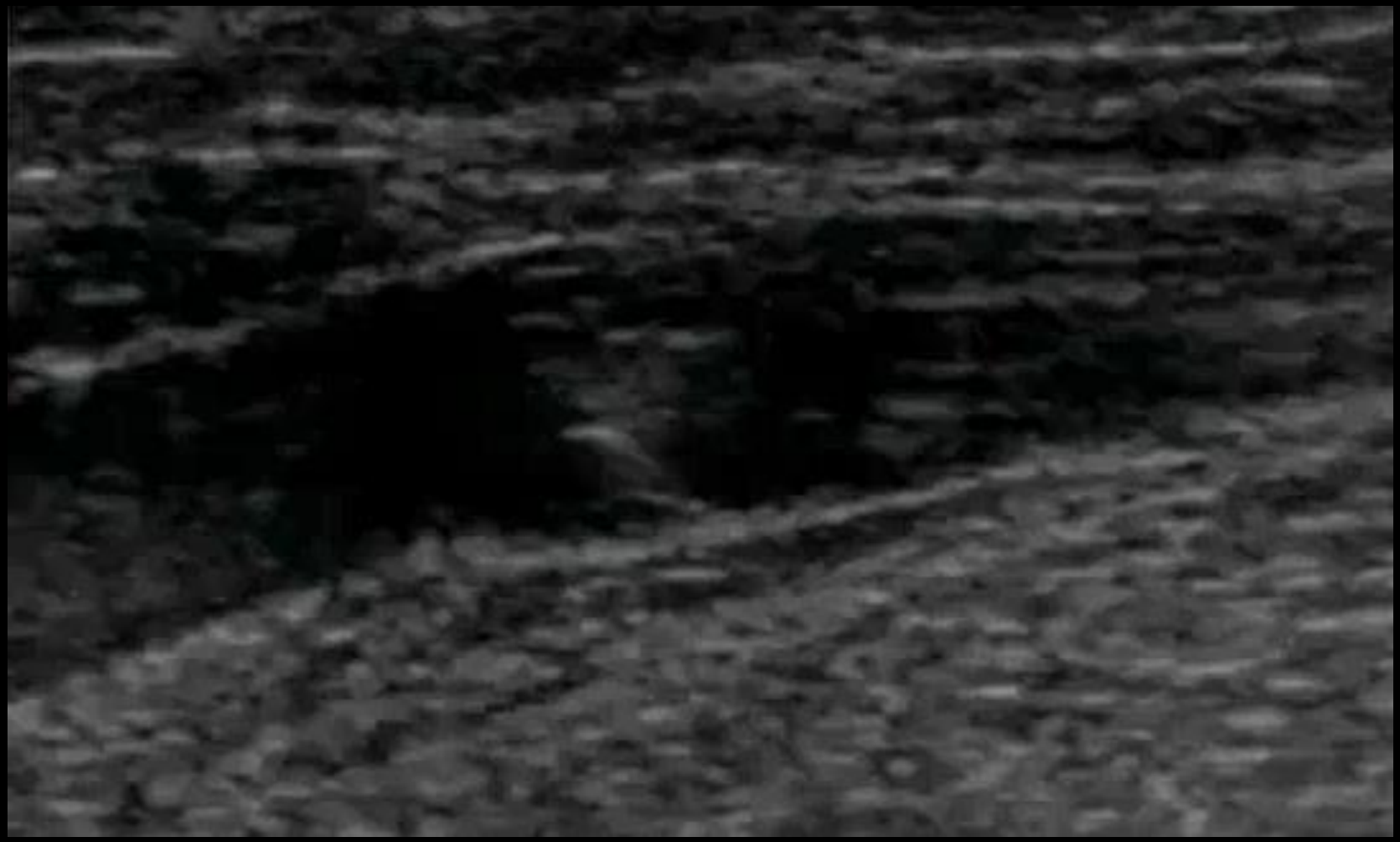
Duplex-Scanning



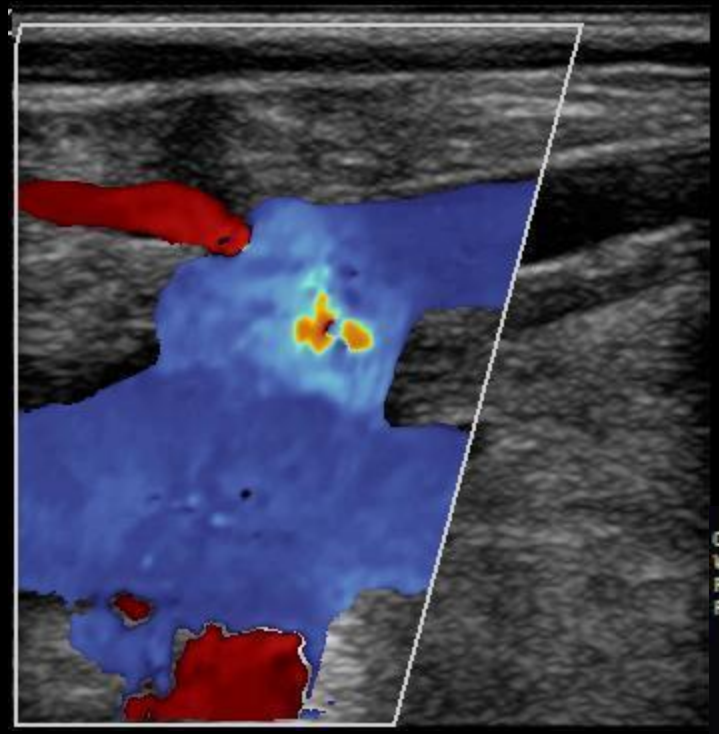


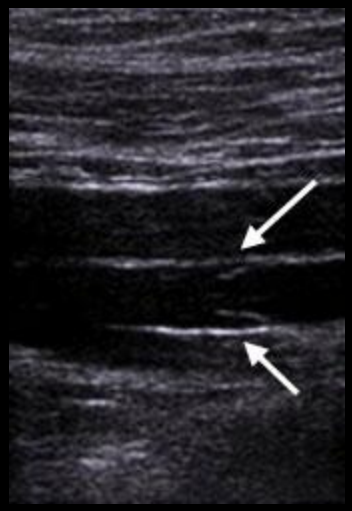


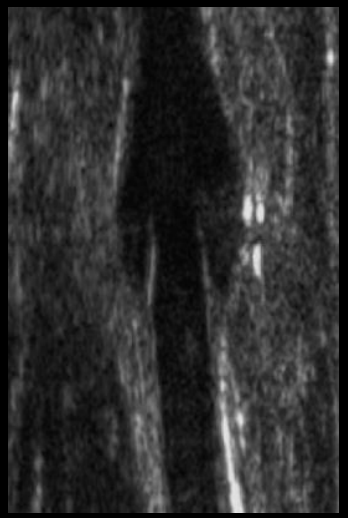


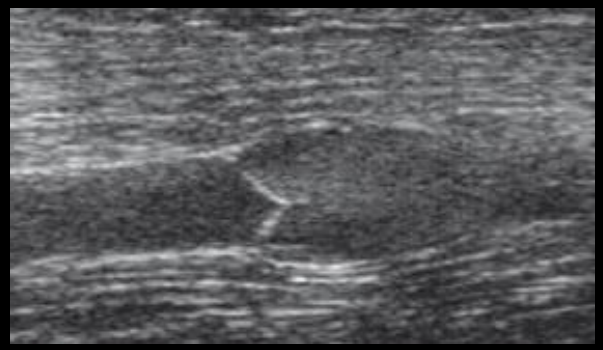


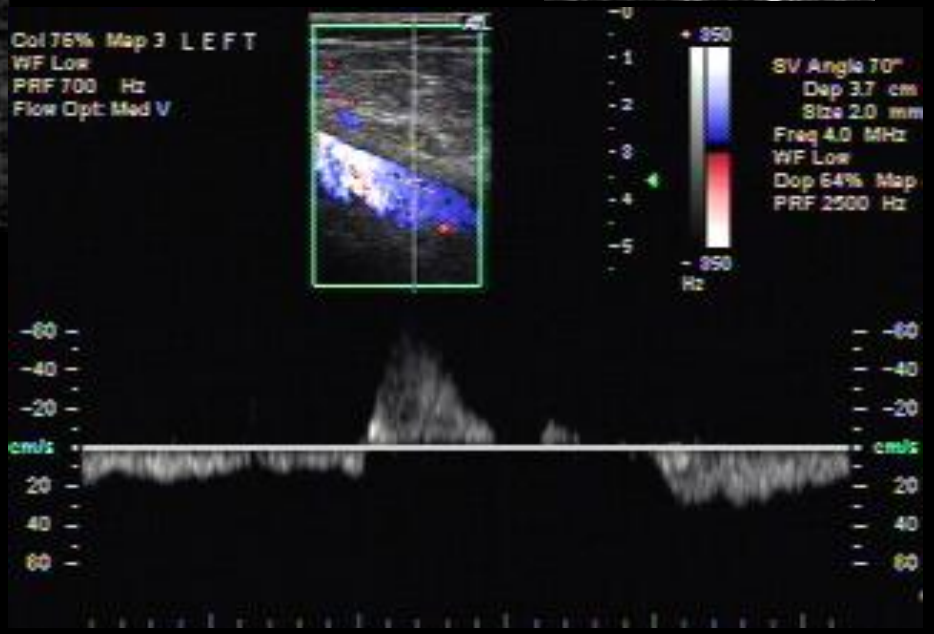
Duplex-Scanning



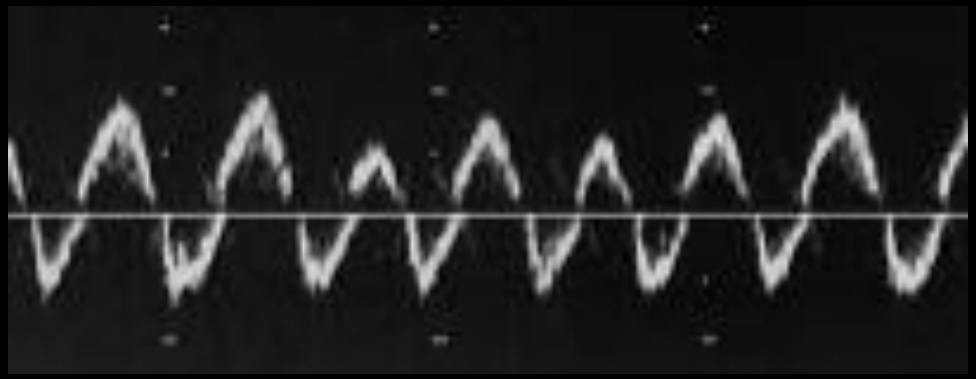


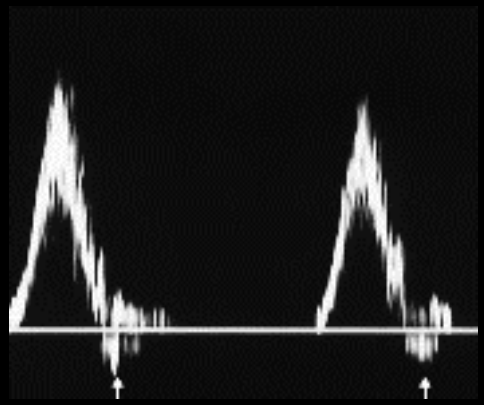


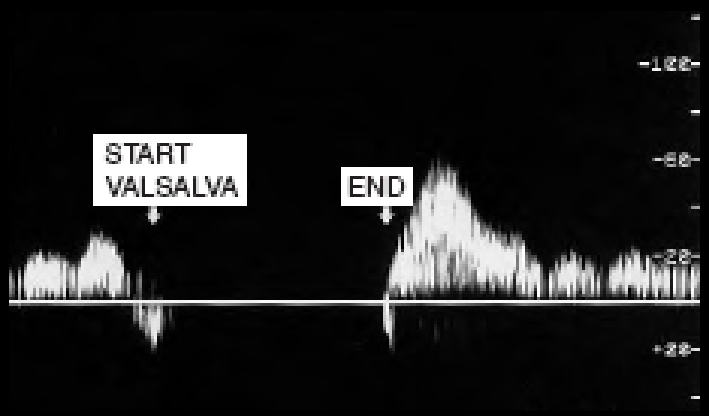


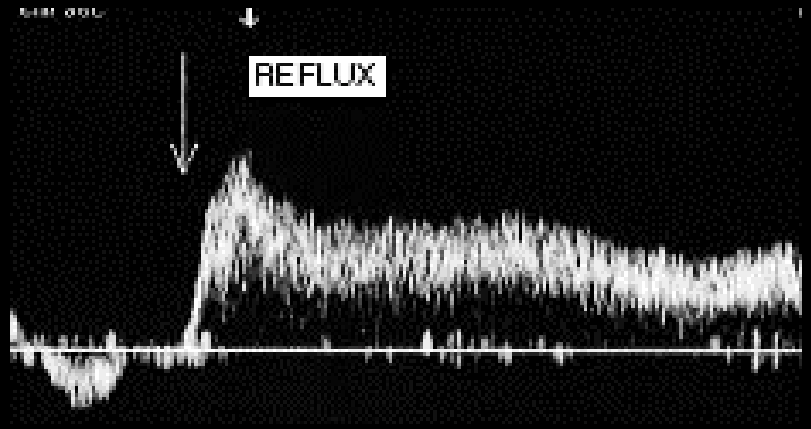


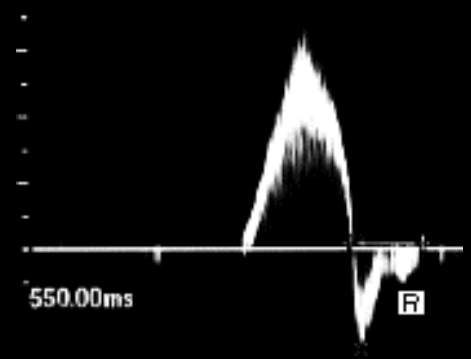
Duplex-Scanning

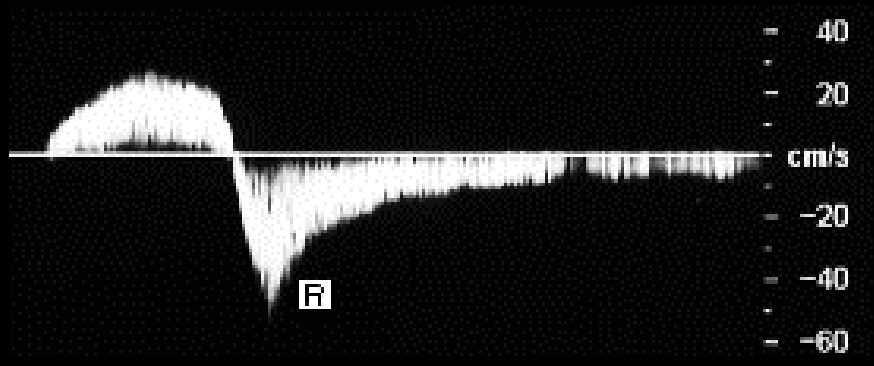




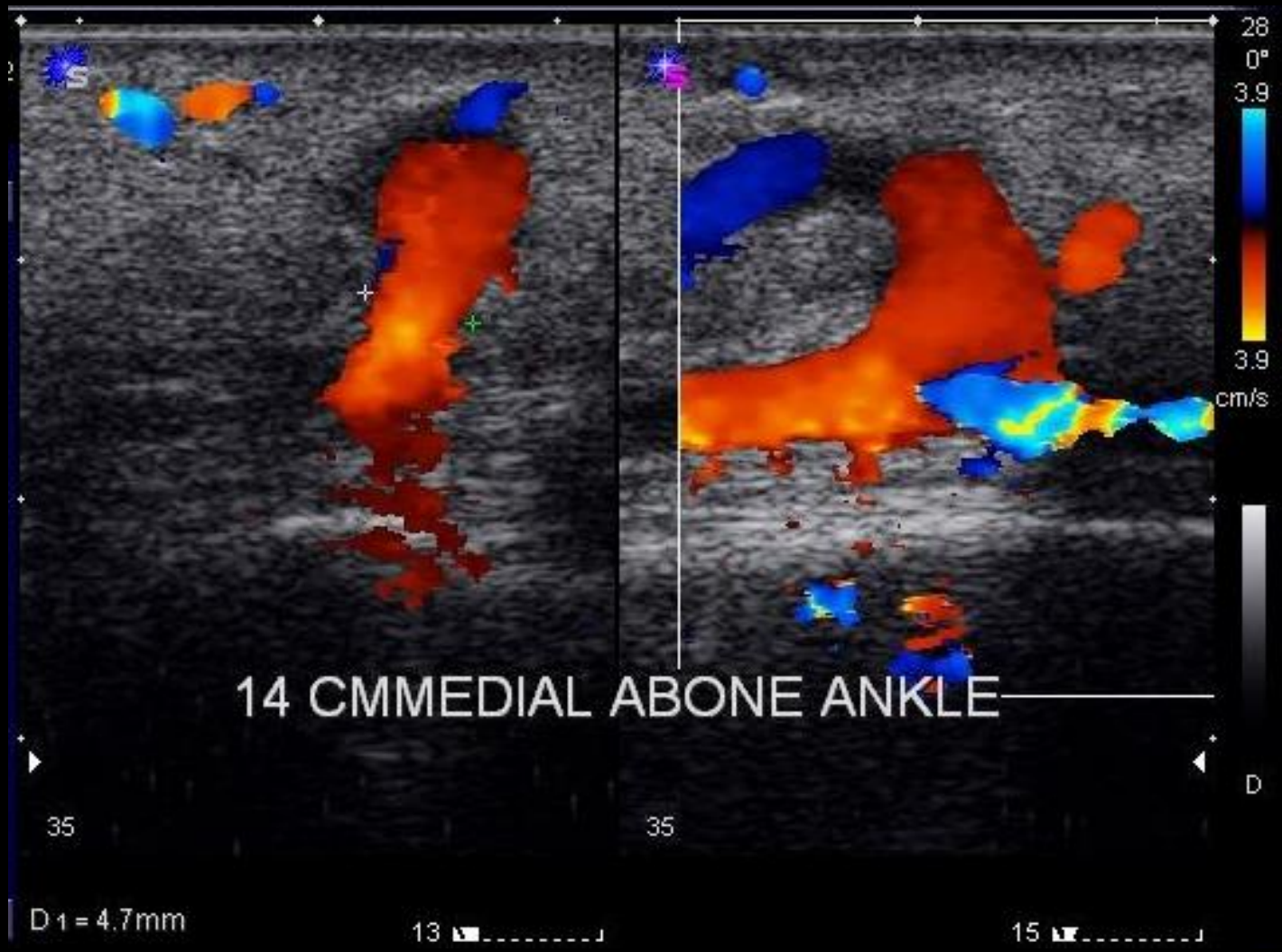




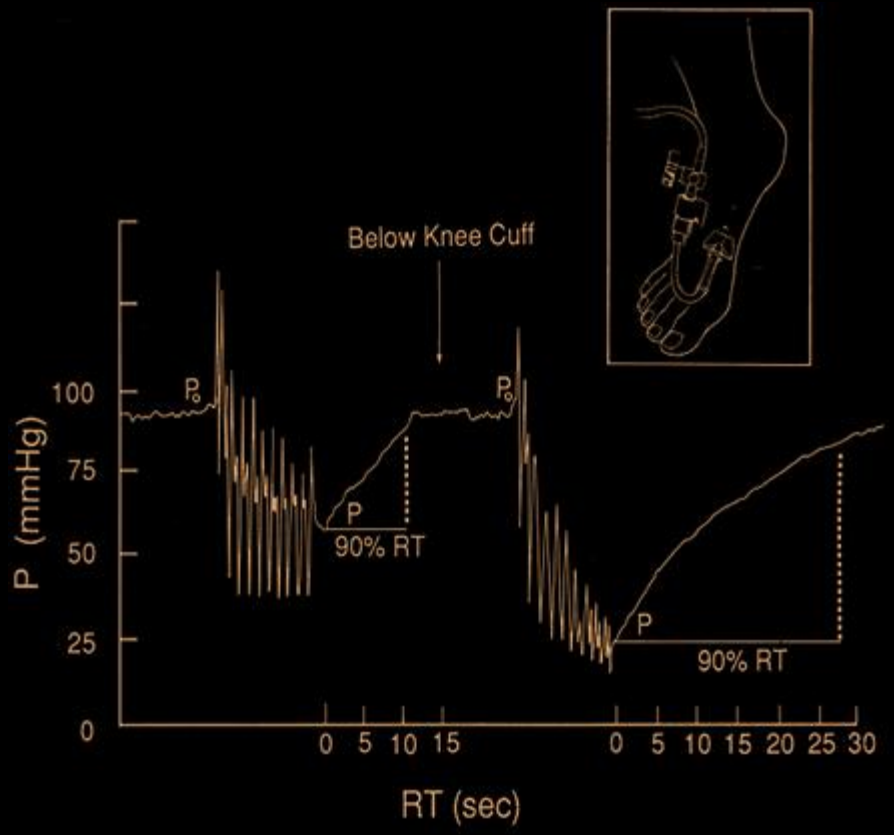




Incompetent Perforator Vein



Ambulatory Venous Pressure

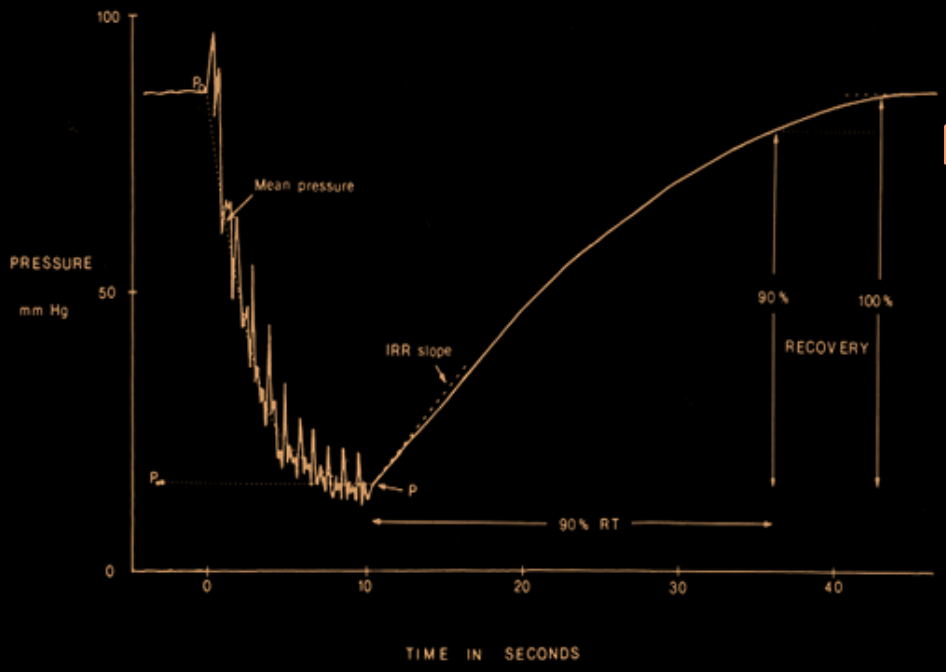


Reflux

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: ≥20 SEC

Abnormal AVP

I

Lack of sufficient drop in pressure with ambulation

- **P < 50%**

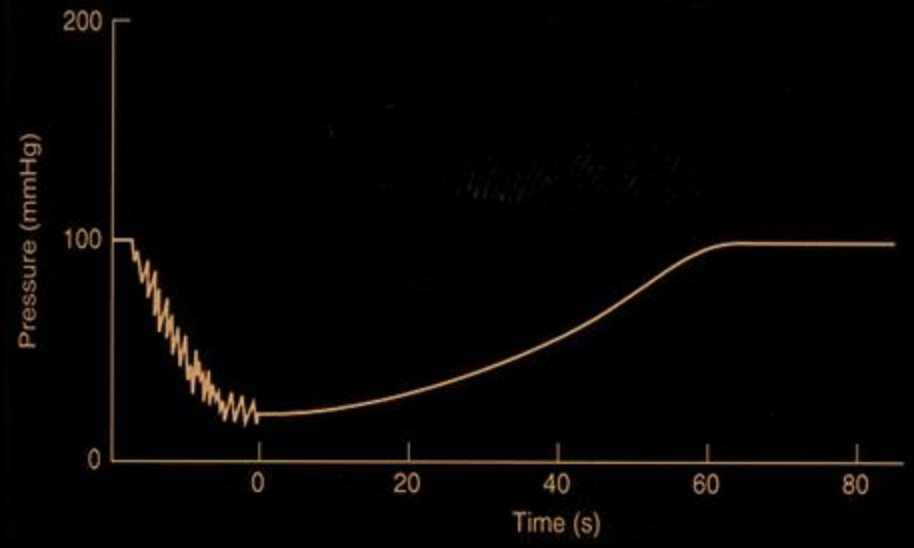
II

Short Venous Refill Time

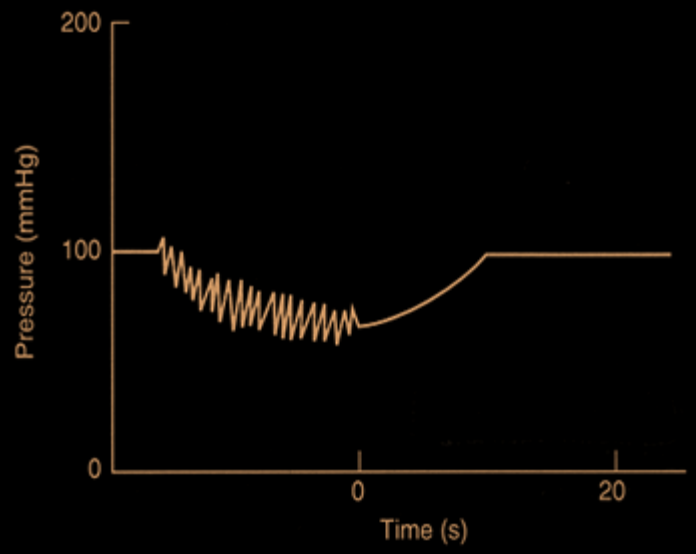
- **VRT < 20 sec**

AVP

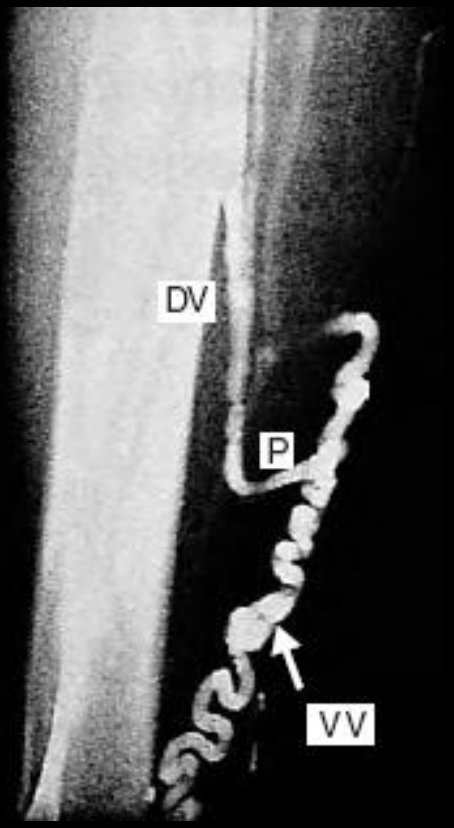
Normal

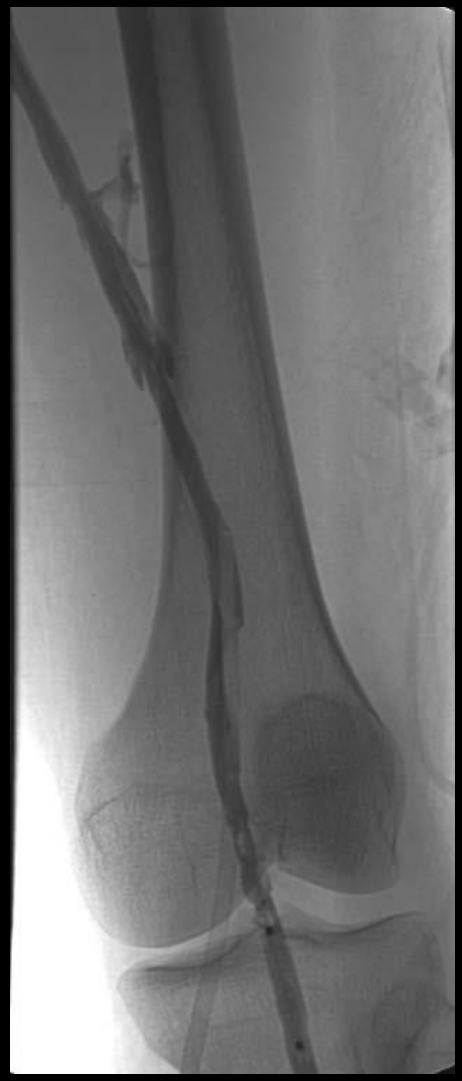


Deep venous incompetence



Phlebography





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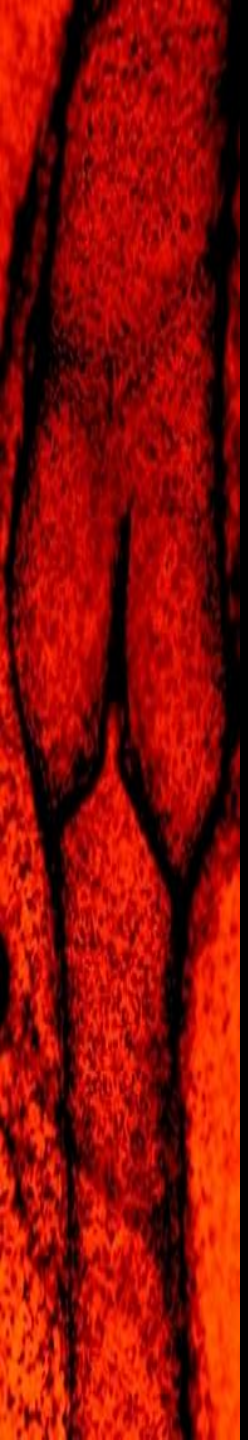

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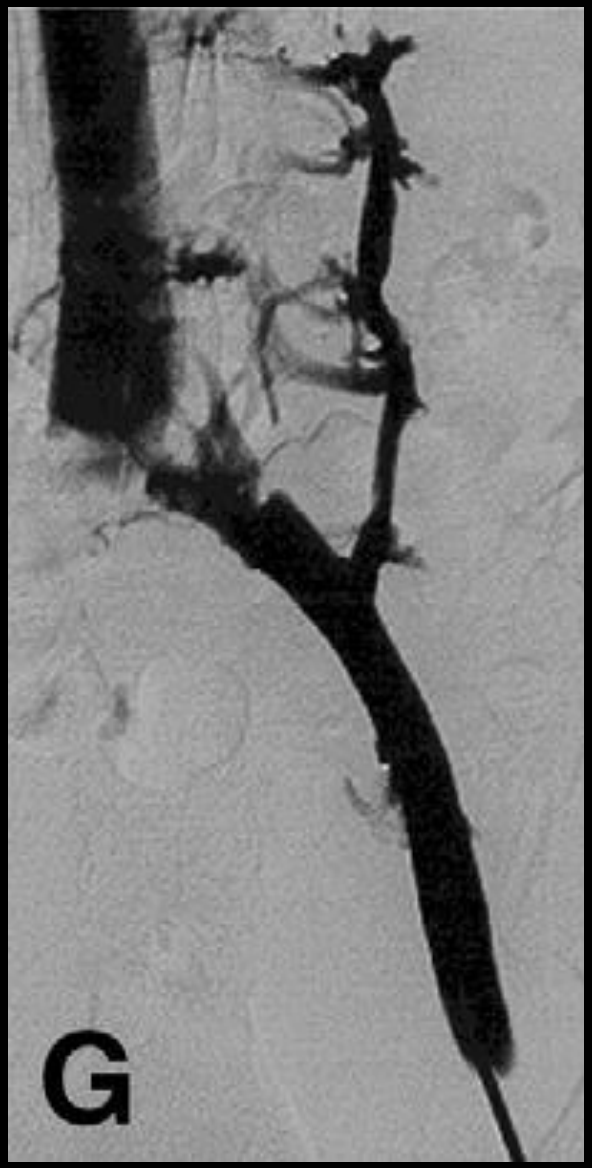
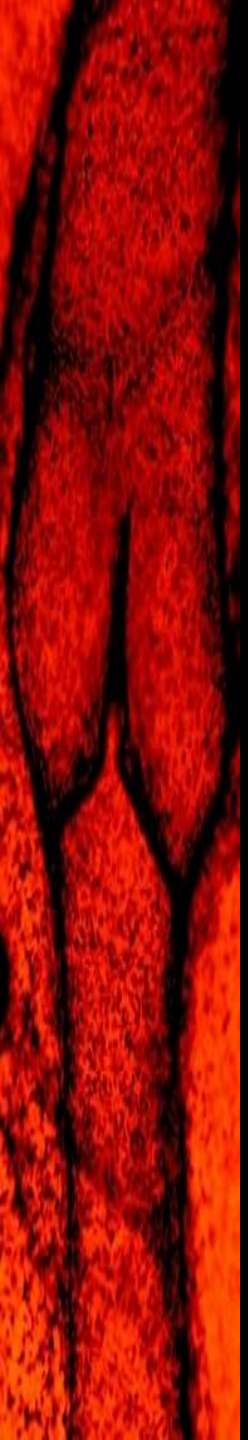




Treatment

Treatment

Telangiectasias

& Reticular veins

Stocking and/or Sclero-Rx

Treatment

Varicose Veins

↓

Stocking

USG-Sclero-Rx

EVLT/Surgery

Edema

Cutaneous Ulcer

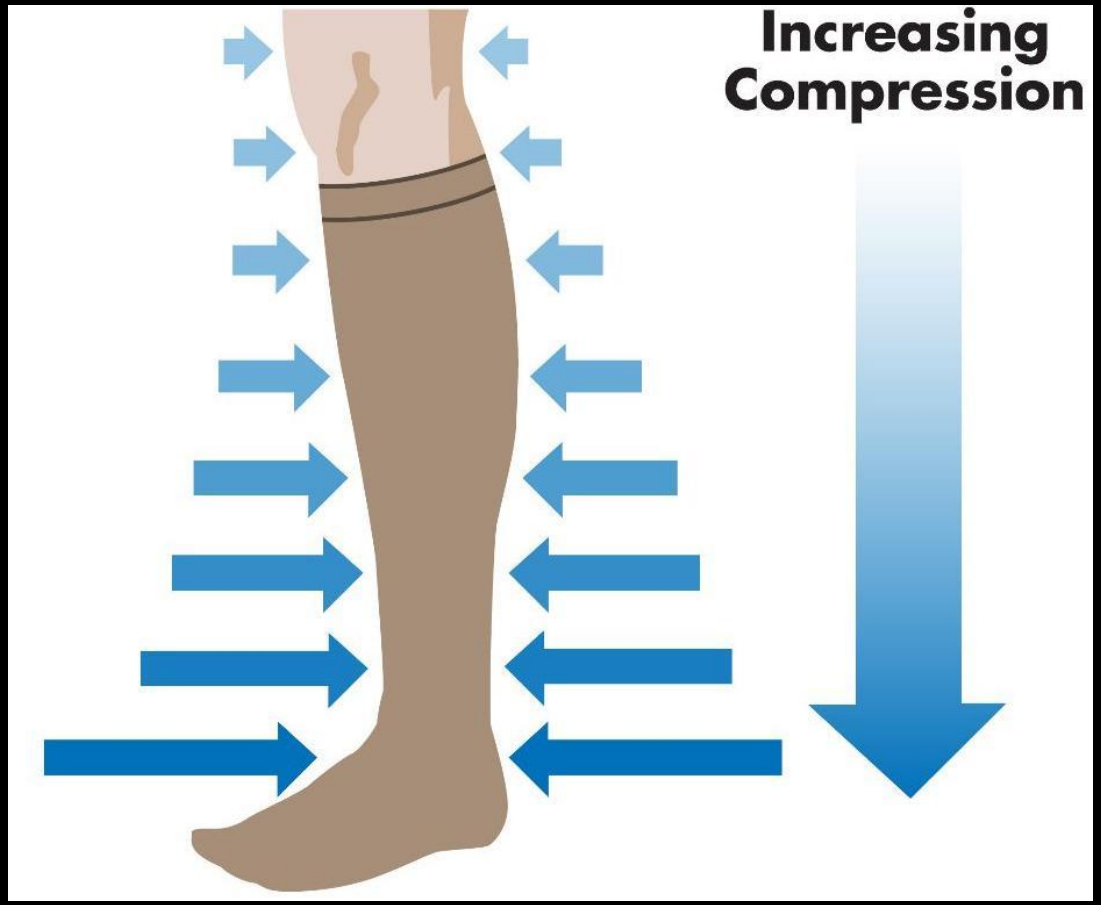
Local Wound

Stocking

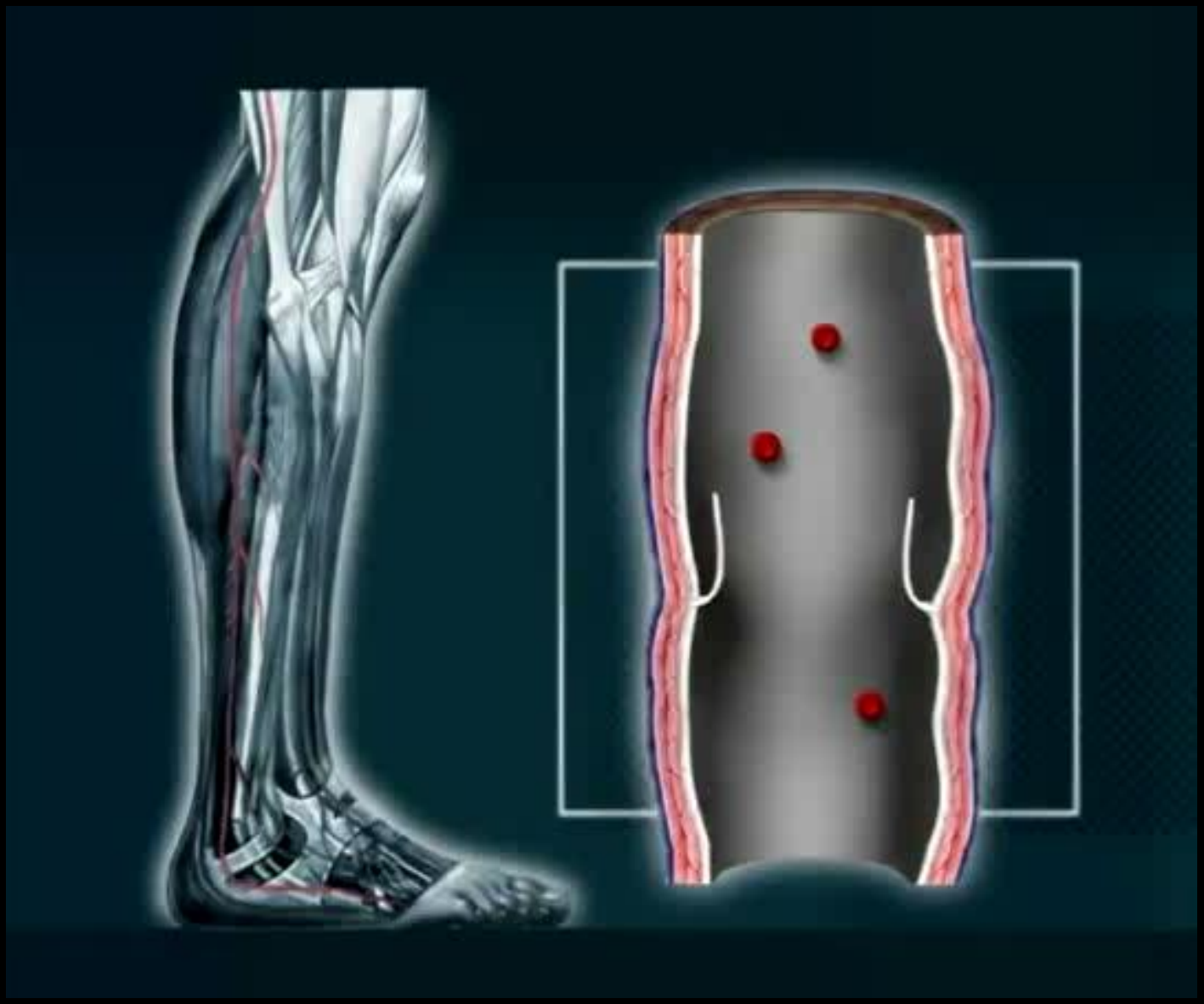
USG-Sclero

ELVT/Surgery

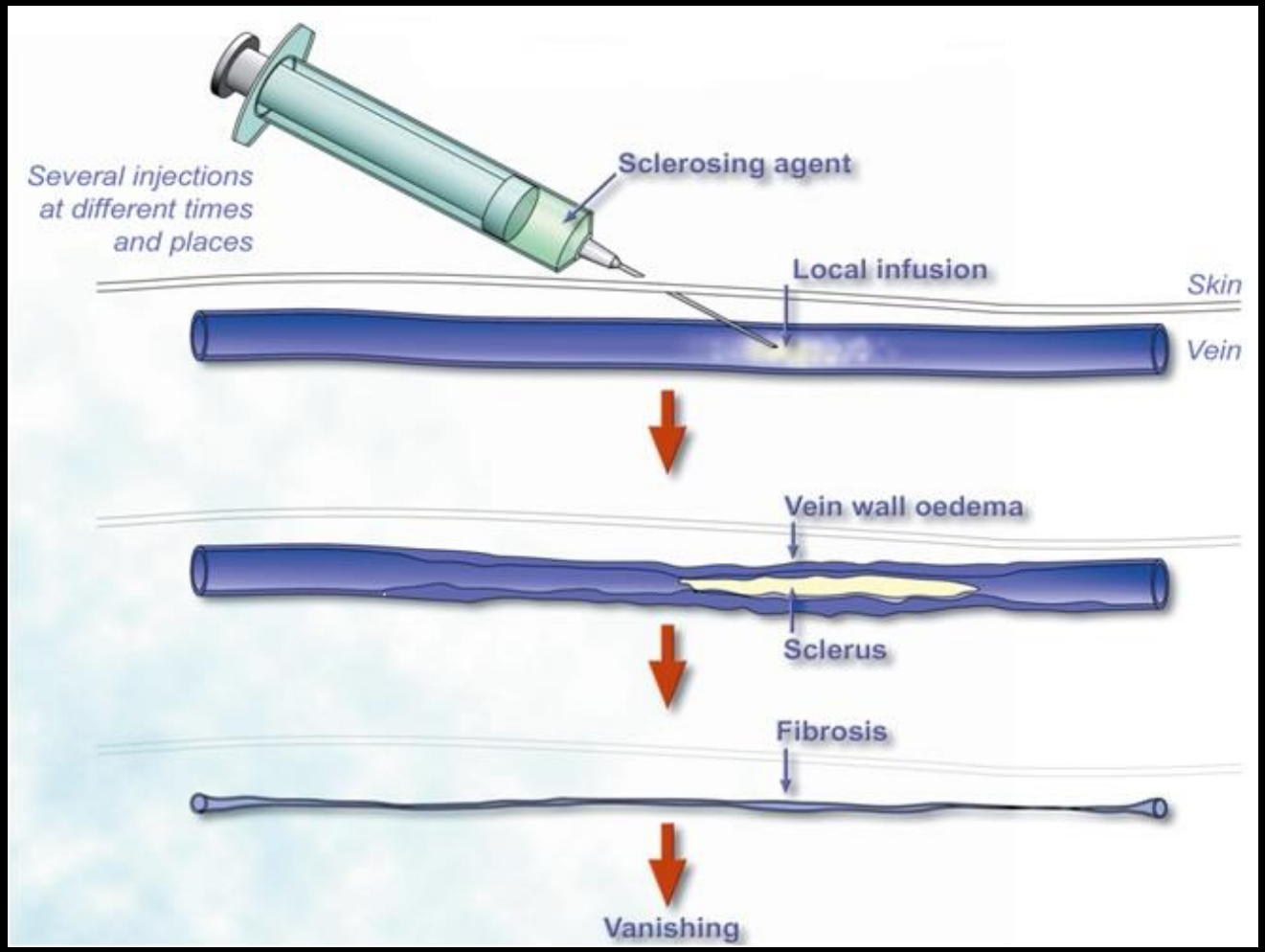
Compression Stockings



Compression Stockings



Sclerotherapy



Sclerotherapy

SCLERODEX®

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

TROMBOJECT®

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

SCLERODINE® 6

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

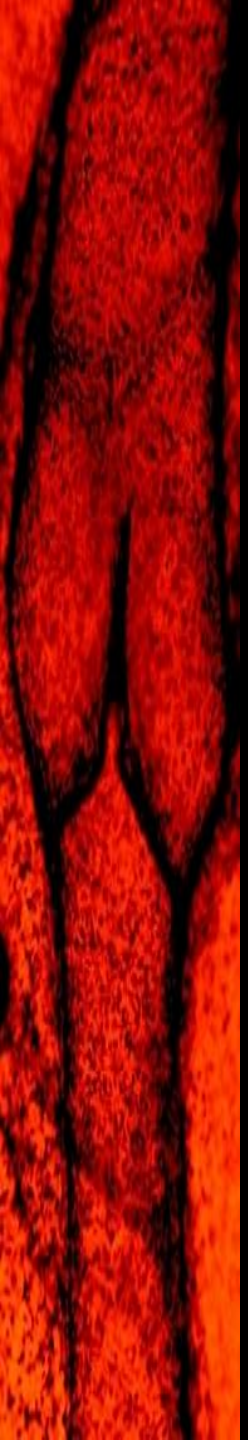
SALIJECT®

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

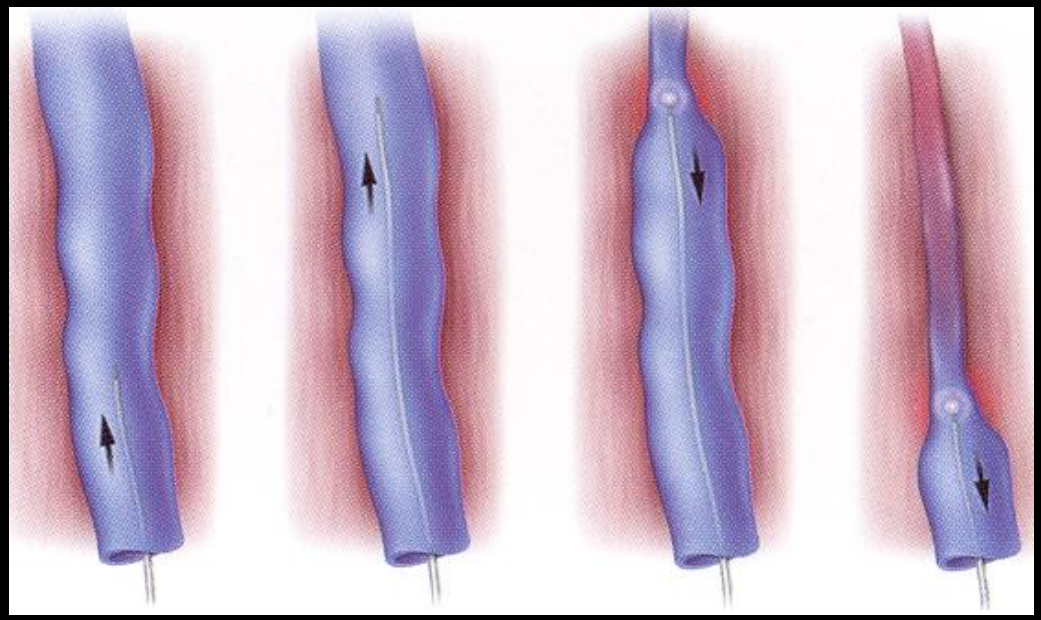
↓

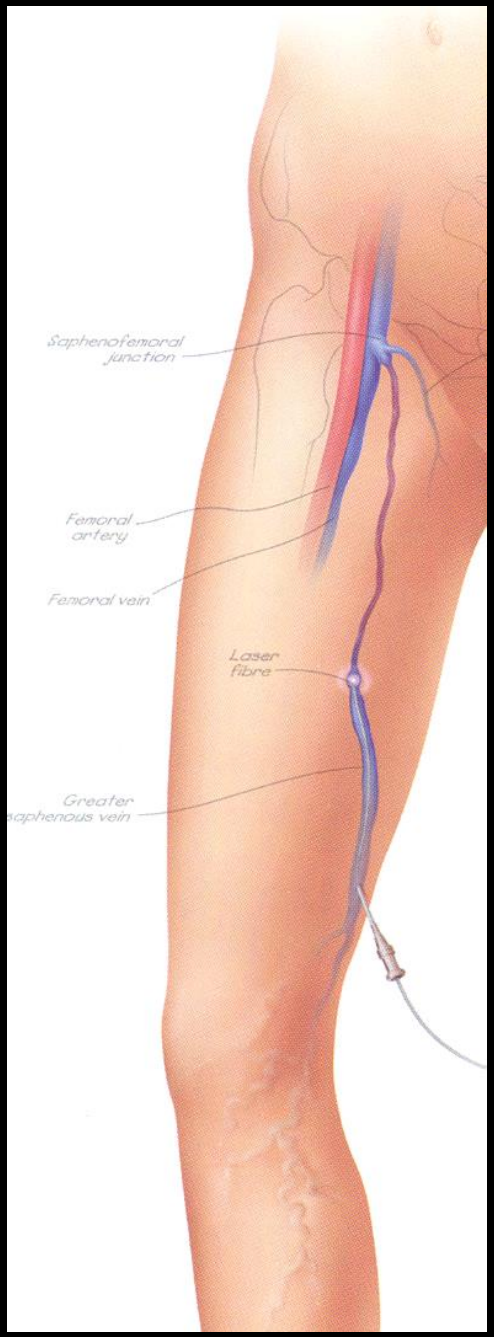
Contraction

↓

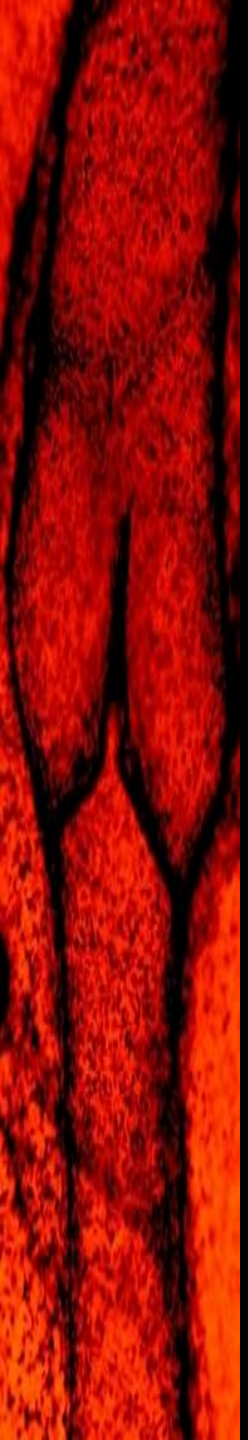
Fibrous obliteration

EndoVenous Laser Therapy(EVLT)

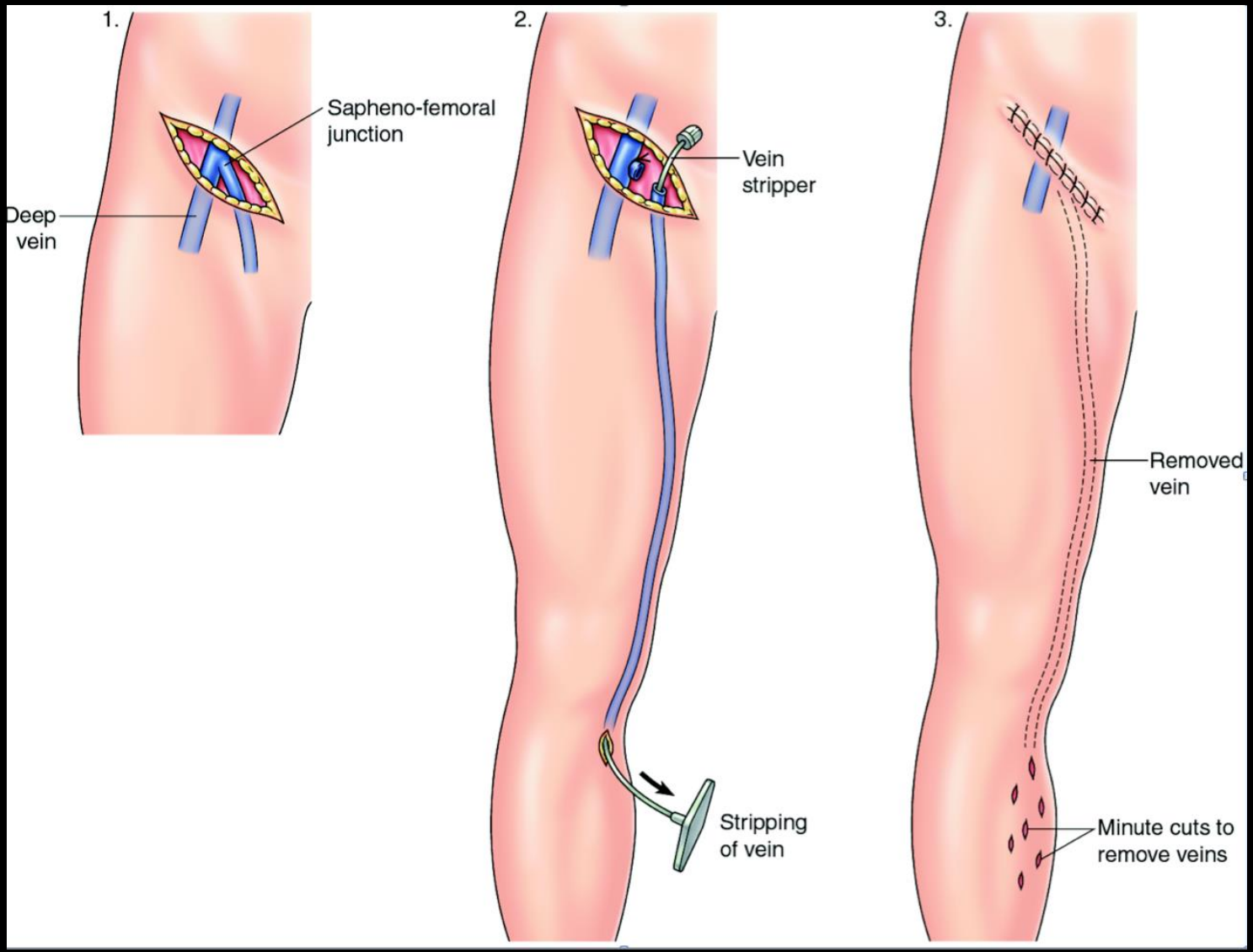


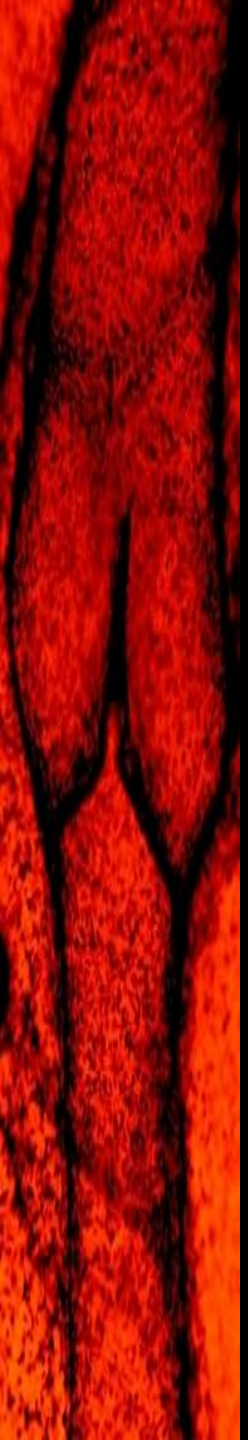


EndoVenous Laser Therapy(EVLT)



Surgery


1.
Sapheno-femoral junction
Deep vein
2.
Vein stripper
Stripping of vein
3.
Removed vein
Minute cuts to remove veins



Thank You