

CHRONIC VENOUS DISEASE IN THE COMMUNITY



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OVERVIEW

- Definition
- Basic Anatomy
- Epidemiology & Etiology
- Clinical History & Physical Findings
- Investigations
- Management Options
- Clinical Vignette

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CLINICAL VIGNETTE

- 75 MALE
- HTN
- CHRONIC VENOUS INSUFFICIENCY

- RECURRENT VENOUS ULCERS
- POORLY COMPLIANT TO COMPRESSION

- Comes in through the AnE because of fever and leg pain...

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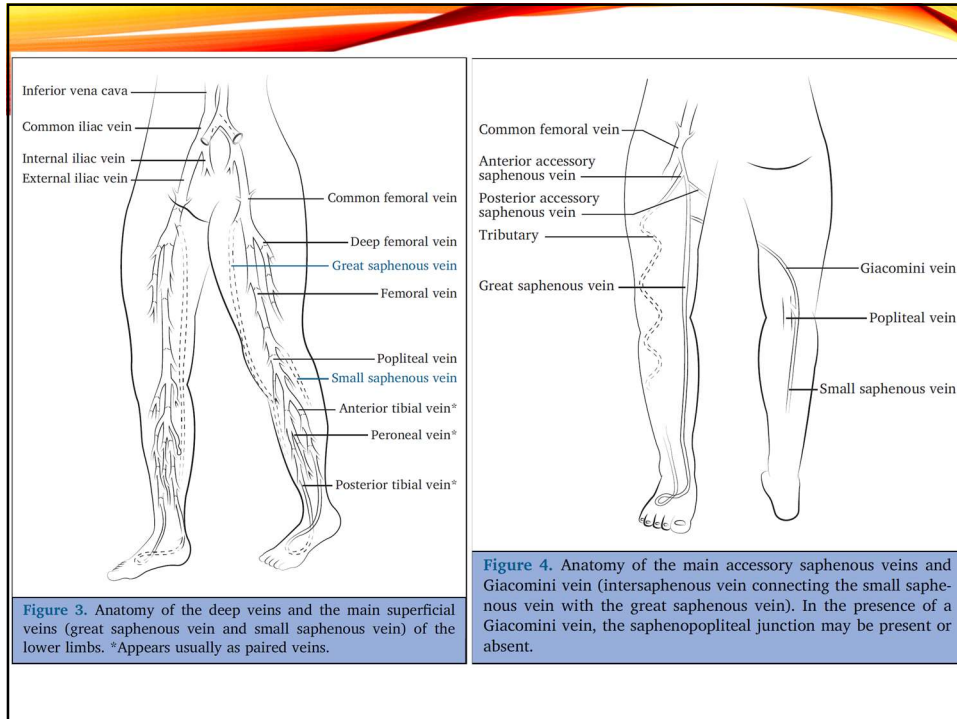
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CHRONIC VENOUS DISEASE

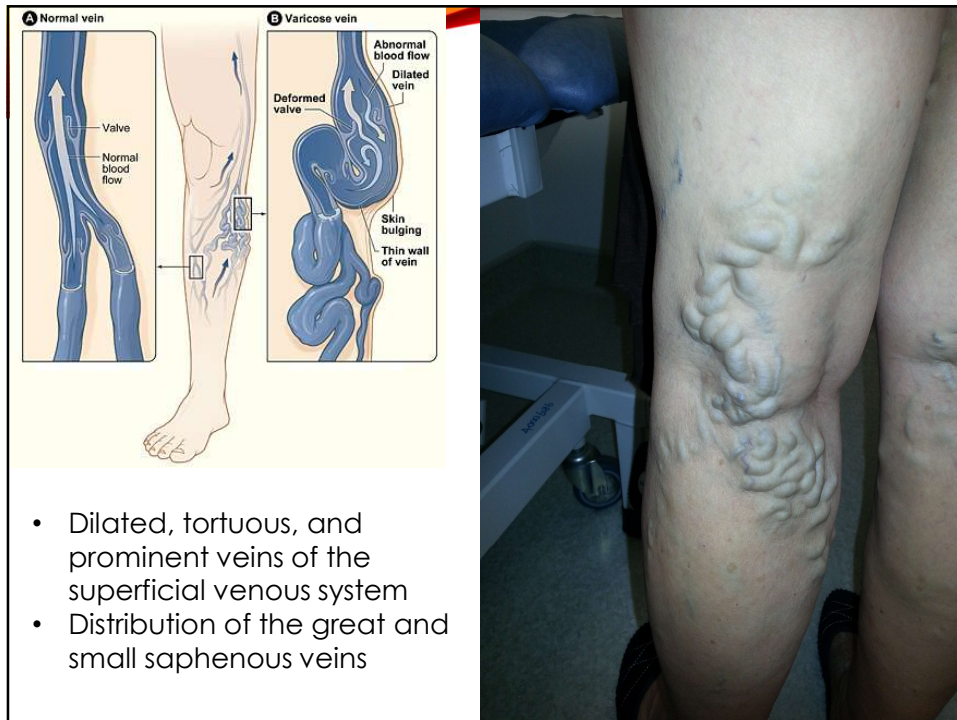
VEIN-TERM Transatlantic Interdisciplinary Consensus:

- Chronic venous disease (CVD) is defined as:
 - any morphological and functional abnormalities of the venous system of long duration manifest either by symptoms and/or signs indicating the need for investigation and/or care
- Chronic venous insufficiency (CVI) is reserved for:
 - Advanced CVD – C3-C6
 - Edema
 - Skin changes
 - Venous ulcers

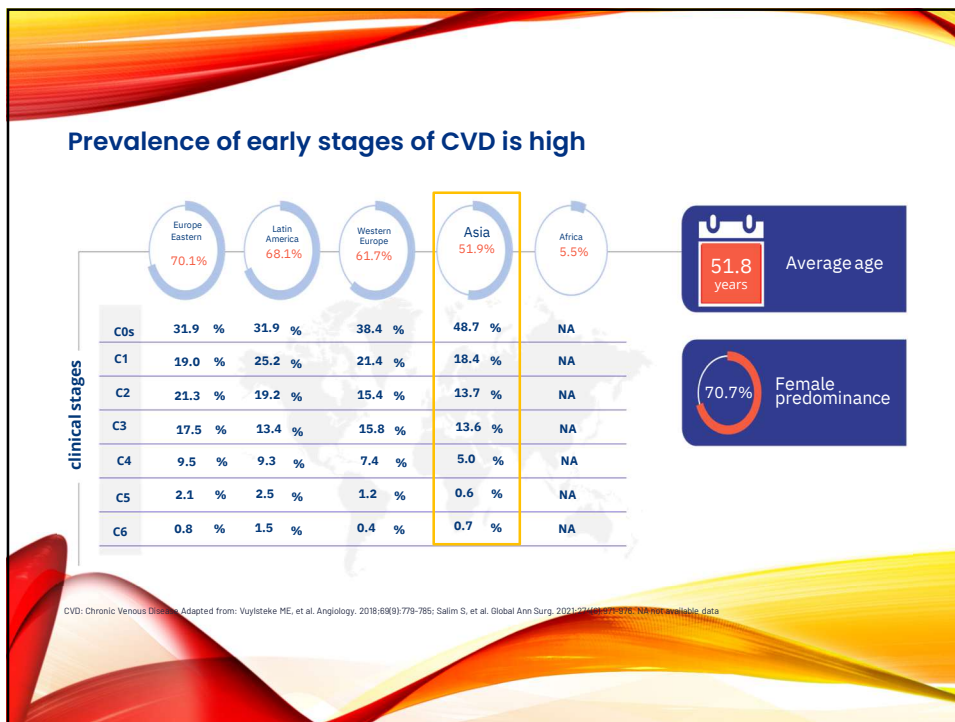
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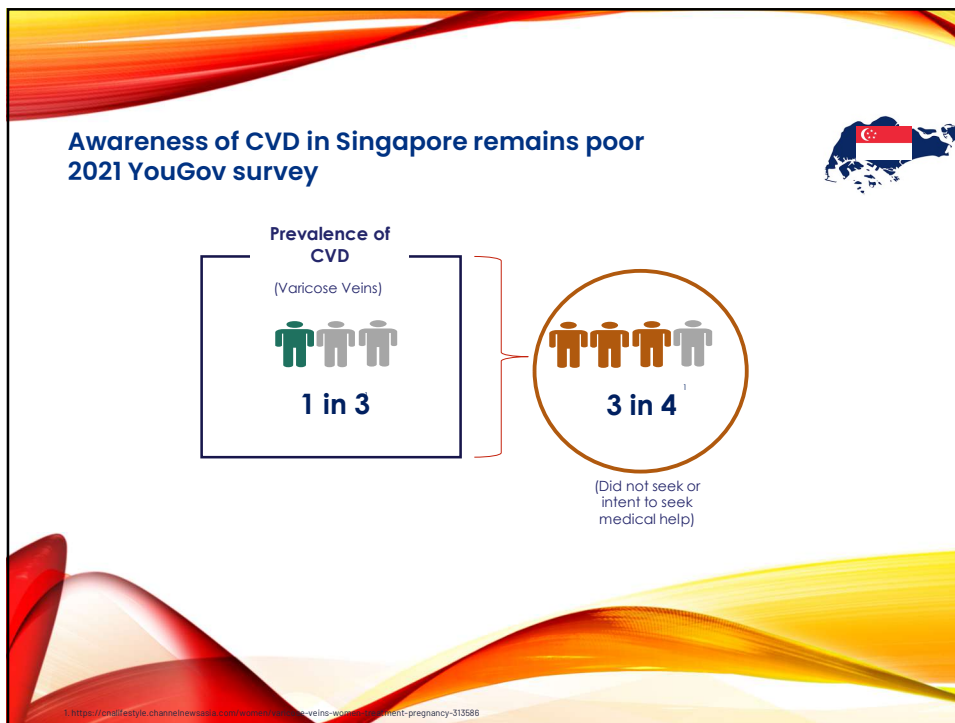
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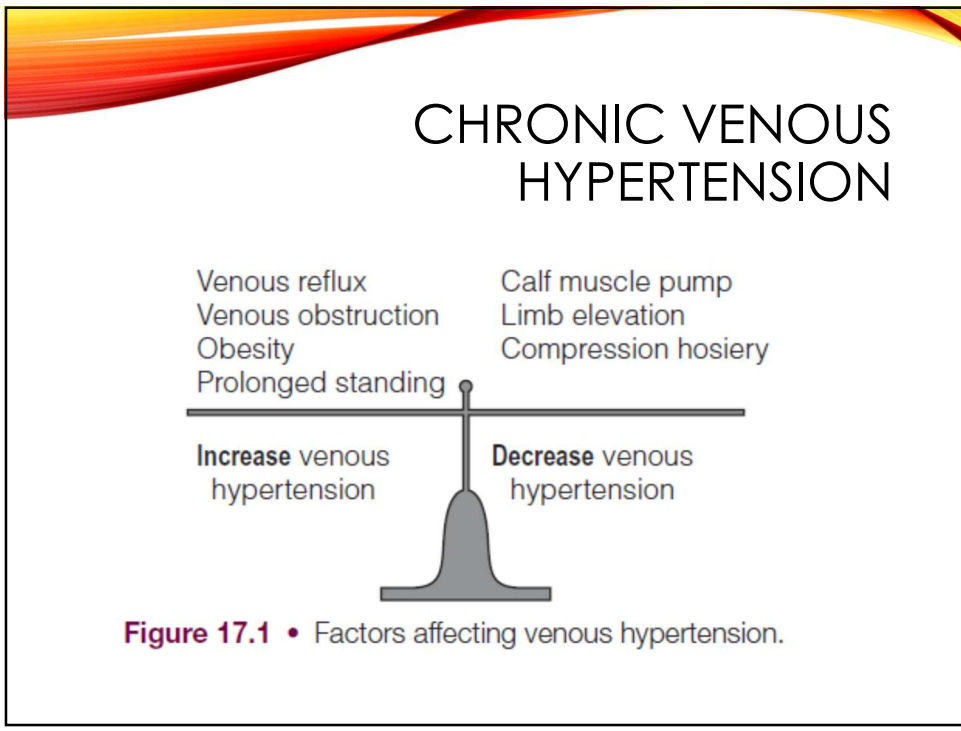
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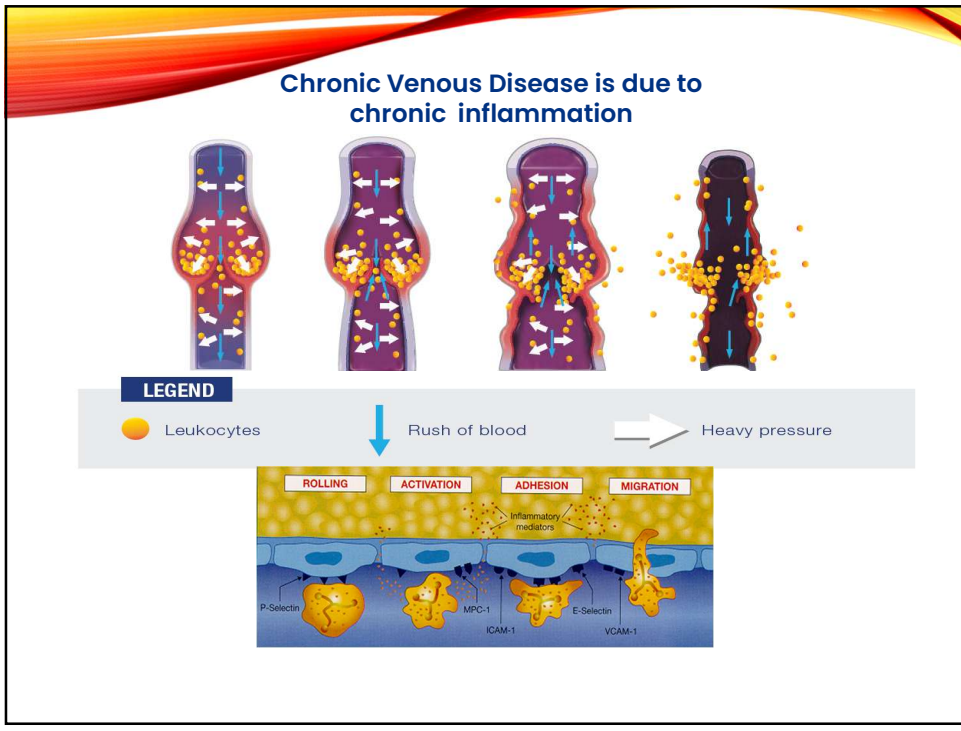
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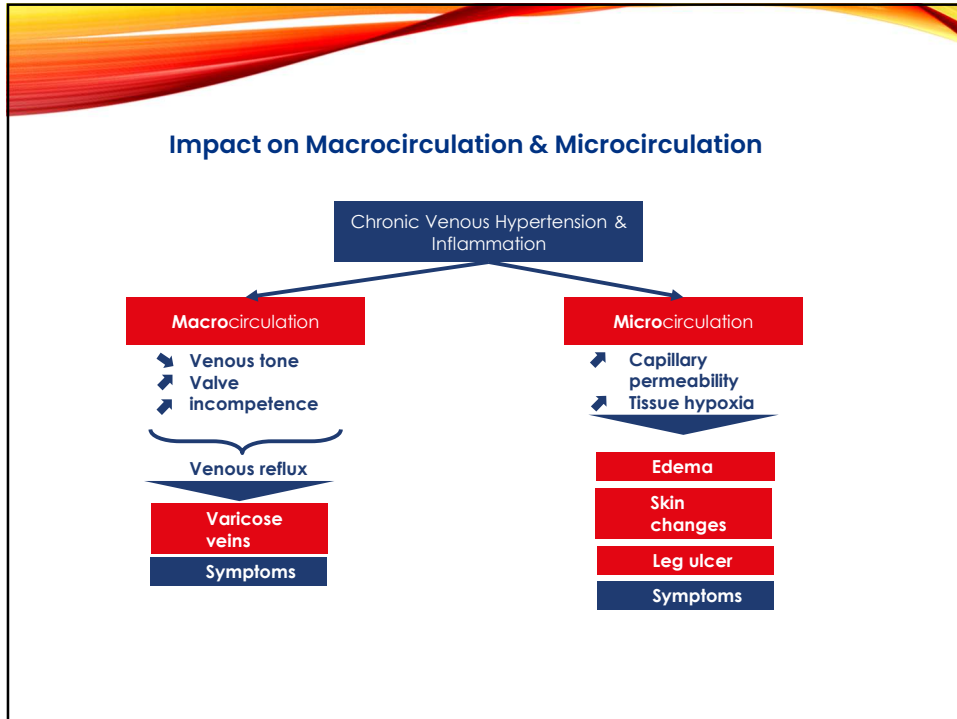
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- ## ETIOLOGY / CAUSES
- Primary
 - Reflux and valvular incompetence arises in the venous system from nonobstructive causes
 - Hereditary
 - Hormonal
 - Connective tissue disorders
 - Secondary
 - Intravenous: Incompetence arises in deep venous system (usually due to prior thrombosis)
 - Deep veins obstructed → perforators dilate and become incompetent
 - Extravenous
 - Congenital

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Box 17.1 • CEAP classification

Clinical classification
 C0: no visible or palpable signs of venous disease
 C1: telangiectasies or reticular veins
 C2: varicose veins
 C3: oedema
 C4a: pigmentation or eczema
 C4b: lipodermatosclerosis or atrophie blanche
 C5: healed venous ulcer

S: symptomatic, including ache, pain, tightness, skin irritation, heaviness and muscle cramps, and other complaints attributable to venous dysfunction


Anatomical classification
 As: superficial veins
 Ap: perforator veins
 Ad: deep veins
 An: no venous location identified

Pathophysiological classification
 Pr: reflux
 Po: obstruction
 Pr,o: reflux and obstruction
 Pn: no venous pathophysiology identifiable


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HISTORY


- HASTI symptoms:
 - Heaviness
 - Achiness
 - Swelling
 - Throbbing
 - Itching
- Pain
 - Burning
 - Throbbing
 - Cramping
 - Aching
 - ? Venous claudication




Heaviness




Swelling



Itching



Achiness



Throbbing


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HISTORY

- Leg fatigue
- Rash / Ulcers
- Varicosities
- NO SYMPTOMS
- Differentiate from orthopaedic & arterial disorders
- Abdominal mass?
- Prior abdominal/pelvic surgery

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HISTORY

- Early onset may suggest a congenital abnormality such as Klippel-Trenaunay syndrome
- Occupation
- Prior DVT, immobilization, thrombophlebitis, bleeding episodes
- Family history present in over 1/3 of patients.
- Previous VV surgery and result (20% recurrent)
- OCP use
- Hypercoagulability
- Any arterial disease / intermittent claudication / tissue loss
→ cannot use Grade 2 compression stockings

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SYNDROMES ASSOCIATED WITH VARICOSE VEINS


- Klippel-Trenaunay-Weber syndrome
 - Vascular malformations / Varicose veins in unusual position, classically over lateral aspect of thigh
 - Port-wine stains
 - Bony/soft-tissue hypertrophy of limb
 - Peripheral edema as deep venous system may be abnormal



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SYNDROMES ASSOCIATED WITH VARICOSE VEINS

- Parkes-Weber syndrome
 - Multiple arteriovenous fistulae with risk of cardiac failure
 - Limb hypertrophy



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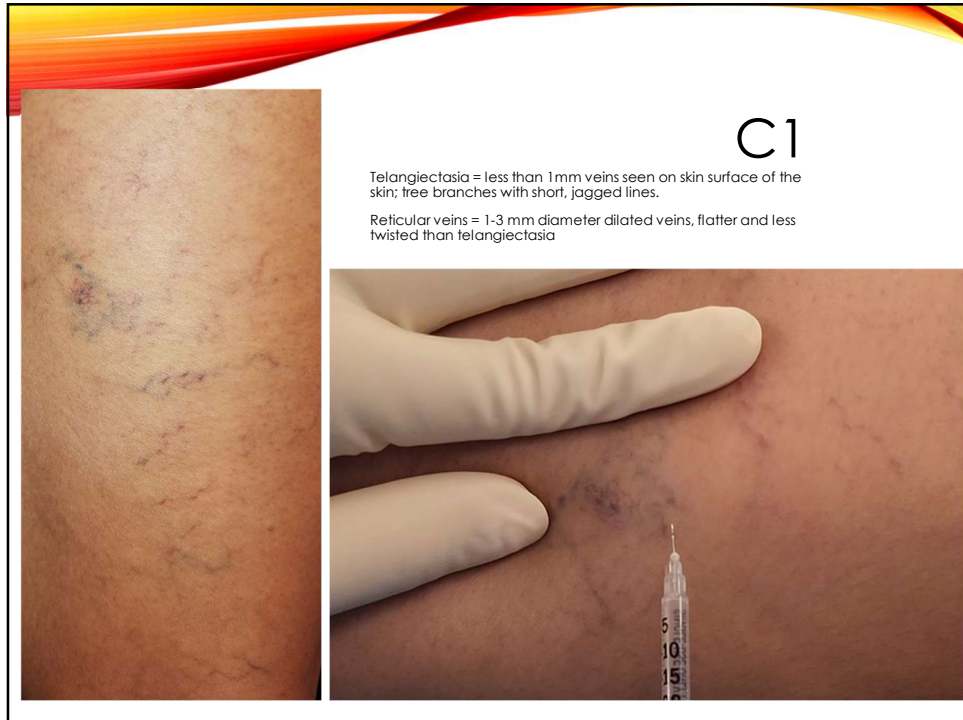
CEAP Classification System and Reporting Standard Revision 2020

C (Clinical Manifestations), **E** (Etiology), **A** (Anatomic Distribution), **P** (Pathophysiology)

C0	No visible or palpable signs of venous disease
C1	Telangiectasias or reticular veins
C2	Varicose veins
C2r	Recurrent varicose veins
C3	Edema
C4	Changes in skin and subcutaneous tissue secondary to chronic venous disease
C4a	Pigmentation or eczema
C4b	Lipodermatosclerosis or atrophie blanche
C4c	Corona phlebectatica
C5	Healed
C6	Active venous ulcer
C6r	Recurrent active venous ulcer

JVS-VL Journal of Vascular Surgery Venous and Lymphatic Disorders
 Lurie et al. *J Vasc Surg Venous Lymphat Disord*, May 2020
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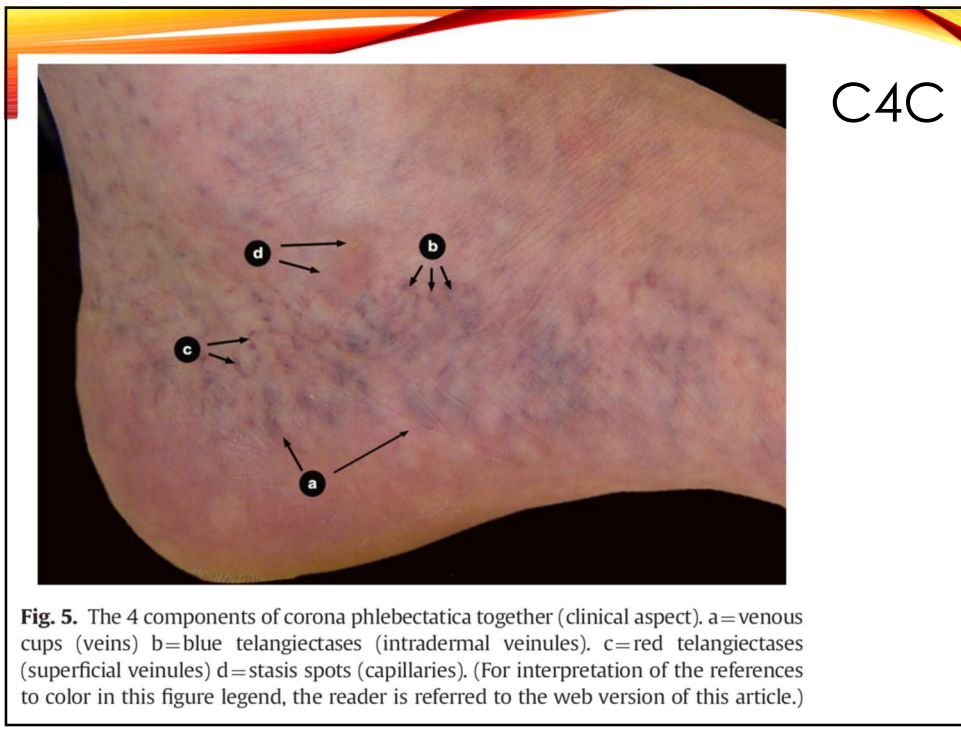


Fig. 5. The 4 components of corona phlebectatica together (clinical aspect). a=venous cups (veins) b=blue telangiectases (intradermal veinules). c=red telangiectases (superficial veinules) d=stasis spots (capillaries). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

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INVESTIGATIONS

- Hand-held Continuous Wave Doppler
- US Venous Duplex
 - LSV reflux ($>0.5s$) / SFJ incompetence
 - SSV reflux / SPJ incompetence
 - Deep venous reflux / DVT
 - Diameter of veins $> 3mm$
- Ankle brachial pressure index / Toe pressures
- US Arterial Duplex if mixed arteriovenous ulcer
- Biopsy if long-standing ulcer

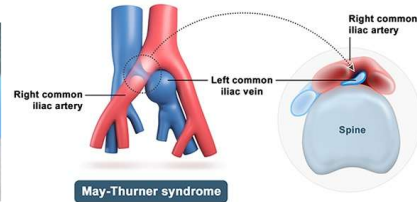
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INVESTIGATIONS

- Abdominal US / CTV / MRV for suprainguinal pathology
 - History: previous extensive DVT, VTE
 - Clinical findings: C3 – C6, abdominal wall collaterals
 - Duplex ultrasound findings: absence of phasic flow in common femoral vein, post-thrombotic fibrosis
- May-Thurner?
- Cancer?
- Baby?



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TREATMENT OPTIONS

- Conservative
 - No treatment (unfortunately too common!)
 - Lifestyle advice
 - Regular exercise ~ 30 minutes every day
 - Maintain a Healthy Body Weight
 - Quit Smoking
 - Give Up the Sedentary Lifestyle + Add regular movements to your routine.
 - Keep Your Legs Elevated for 10-15 minutes every day
 - Avoid Excessive Salt or Sodium Consumption
 - Refrain from Wearing Tight Clothing and High Heels
 - Avoid excessively long and hot showers
 - Compression stockings/bandaging
 - Phlebotonics / Venoactive drugs

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COMPRESSION STOCKINGS

- Action:
 - Remedies impaired calf muscle pump
 - Reduces venous reflux
 - Improves venous outflow
- Provides a gradient of pressure
 - highest at the ankle, decreasing upwards
 - 70% reduction just below knee
- Beneficial effect lasts only as long as they are worn
- Compliance is a major problem
- **C1-C2: At least 15 mmHg at ankle**
- **C3-C6: 20-40 mmHg**



Compression Class	Pressure
1	18-21 mmHg
2	23-32 mmHg
3	34-46 mmHg
4	>49 mmHg

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TRIVIA!

What Giraffes Can Teach Us About Compression Therapy

Giraffes do not suffer from edema — even though the distance between a giraffe’s heart and feet is twice that of humans. Why?

Because a giraffe’s skin is extremely tough, fibrous and non-elastic, it creates a rigid sleeve that maximizes the effect of every muscle movement — big and small, moving and resting — to optimize venous return.^{1,2}

A compression system designed with materials that work together to create a rigid sleeve, much like giraffe skin, to consistently provide the right amount to compression to reduce edema and optimize venous return, define an ideal compression system.

Compression therapy mimics the giraffe’s skin

Compression therapy is considered the gold standard of care for managing patients’ lower extremity edema and venous leg ulcers, also referred to as venous stasis ulcers, yet, compression therapy remains underused.³



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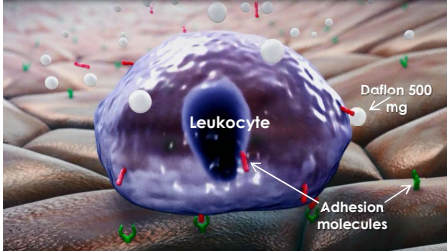
Table 7. Contraindications to compression treatment (modified with permission from Rabe *et al.*, 2020⁷⁴)

Severe lower extremity atherosclerotic disease with ABI < 0.6 and/or ankle pressure < 60 mmHg
Extra-anatomic or superficially tunneled arterial bypass at the site of intended compression
Severe heart failure, NYHA Class IV
Heart failure NYHA Class III and routine application of compression devices without clinical and haemodynamic monitoring
Confirmed allergy to compression material
Severe diabetic neuropathy with sensory loss or microangiopathy with the risk of skin necrosis*

ABI = ankle brachial index; NYHA = New York Heart Association; NYHA Class IV: fatigue, palpitations, dyspnoea and/or angina at rest; NYHA Class III: ordinary physical activity causes undue fatigue, palpitations, dyspnoea and/or angina - comfortable at rest.
 * May not apply to inelastic compression exerting low levels of sustained compression pressure (modified compression).

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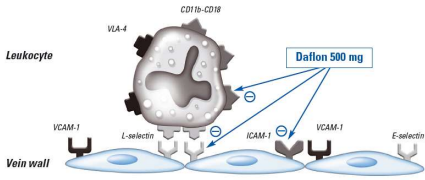
DAFLON INHIBITS THE EXPRESSION OF ADHESION MOLECULES ON THE SURFACE OF LEUKOCYTES



Leukocyte

Daflon 500 mg

Adhesion molecules



Leukocyte

Daflon 500 mg

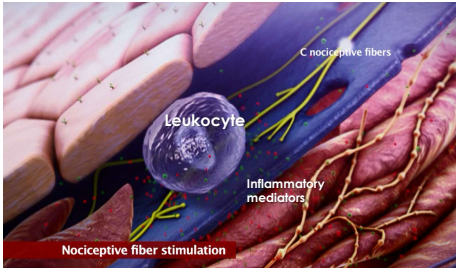
Vein wall

By inhibiting the expression of adhesion molecules, Daflon breaks the vicious circle of inflammation in chronic venous disease

Shoab SS, Porter JB, Scurr JH, Coleridge-Smith PD. Effect of oral micronized purified flavonoid fraction treatment on leukocyte adhesion molecule expression in patients with chronic venous disease: a pilot study. *J Vasc Surg.* 2000 Mar;31(3):456-61.

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DAFLON REDUCES INFLAMMATORY MARKERS AND RESTORES THE ANTIOXIDANT IMBALANCE

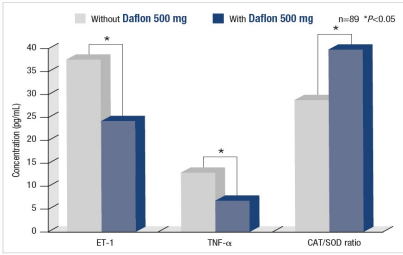


Leukocyte

Inflammatory mediators

Nociceptive fiber stimulation

C-nociceptive fibers



Marker	Without Daflon 500 mg	With Daflon 500 mg
ET-1	~38	~25
TNF-α	~15	~8
CAT/SOD ratio	~28	~40

n=89 *P<0.05

By reducing inflammatory markers concentration, Daflon reduces the stimulation of C-nociceptive fibers and therefore pain.

Pietrzycka A, Kozka M, Urbaneck T, Stepiński M, Kucharzewski M. Effect of micronized purified flavonoid fraction therapy on endothelin-1 and TNF-α levels in relation to antioxidant enzyme balance in the peripheral blood of women with varicose veins. *Curr Vasc Pharmacol.* 2015;13(6):801-808.

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MPFF has the highest number of strong recommendations for the improvement of symptoms, signs, and quality of life in CVD

Strength of recommendations based on magnitude of effects on individual symptoms or signs vs side effects

	MPFF	Ruscus	Oxerutins	HCSE	Calcium dobesilate
Pain	Strong	Strong	Strong	Strong	Weak In view of the possibility of inducing agranulocytosis
Heaviness	Strong	Strong	Strong	-	
Feeling of swelling	Strong	Strong	-	-	
Functional discomfort	Strong	-	-	-	
Cramps	Strong	Weak	Strong	Strong	
Leg redness	Strong	-	-	-	
Skin changes	Strong	-	-	-	
Edema	Strong	Strong	Weak	Strong	
Quality of life	Strong	-	-	-	
Paresthesia	Weak	Strong	-	-	
Burning	Weak	-	-	-	
Leg fatigue	-	Strong	-	-	
Pruritus	-	Weak	-	Strong	

Nicolaidis A, Kakkos S, Baekgaard N et al. Int. Angiol 2018, June;37(3):232-254

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MPFF has the highest number of evidence in grade A/B for the improvement of symptoms, signs, and quality of life in CVD

Grade A or B levels of evidence for the effects of the main VADs on individual symptoms, signs, and QoL

Symptom/sign	MPFF	Ruscus	Oxerutins	HCSE	Calcium dobesilate
Pain (NNT) SMD	A (4.2) -0.25	A (5) -0.89	B -1.07	A (5.1)	B (1.4)
Heaviness (NNT) SMD	A (2.9) -0.80	A (2.4) -1.23	B (7) -1.00		A (1)
Feeling of swelling (NNT) SMD	A (3.1) -0.99	A (4) -2.27			
Functional discomfort (NNT) SMD	A (3.0) -0.87				B (4)
Leg fatigue (NNT) SMD	NS	B -1.18			
Cramps (NNT) SMD	B (4.8) -0.45	B/C	B -1.7		
Paresthesia (NNT) SMD	B/C (3.2) -0.11	A (1.8) -0.88			B (2)
Burning (NNT) SMD	B/C -0.46	NS			
Pruritus/itching (NNT)		B/C	A (6.1)		
Tightness (NNT)	NS				
Restless legs (NNT)	NS				
Leg redness (NNT) SMD	B (3.6) -0.32				
Skin changes (NNT)	A (1.6)				
Ankle circumference (NNT) SMD	B -0.59	A -0.74	NS	A (4)	
Foot or leg Volume (NNT) SMD	NS	A -0.61	NS	A (4) -0.54	A -1.4
Quality of life SMD	A -0.21				NS

Nicolaidis A, Kakkos S, Baekgaard N et al. Int. Angiol 2018, June;37(3):232-254

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MPFF has the highest level of evidence among VADs for the healing of leg ulcers (grade A)

Grade A or B levels of evidence for the effects of the main medications on the healing of leg ulcers

	MPFF	Pentoxifylline	Sulodexide	Hydroxyethyl rutosides
Healing of leg ulcers	Grade A	Grade A	Grade A	Grade B

⊗ No available data for Ruscus, HCSE or calcium dobesilate

Nicolaides A, Kakkos S, Baekgaard N et al. Int Angiol 2018, June;37(3):232-254

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TREATMENT OPTIONS

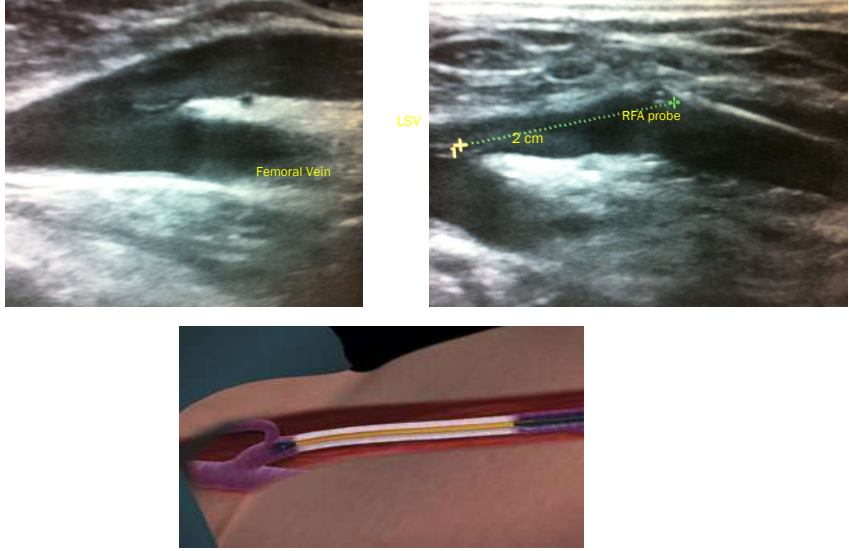
- Endovenous Thermal Ablation – gold standard
 - Radiofrequency Ablation (RFA)
 - Endovenous Laser Therapy (EVLT)





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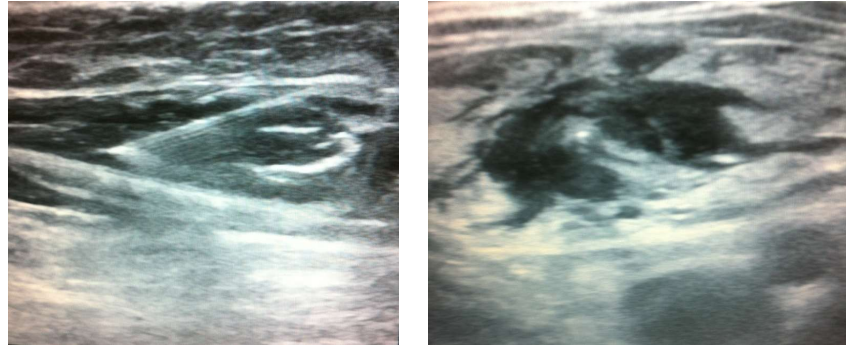
RFA : PROBE POSITIONING



The slide illustrates the probe positioning for Radiofrequency Ablation (RFA). It features three images: a longitudinal B-mode ultrasound of the femoral vein labeled 'Femoral Vein'; a longitudinal B-mode ultrasound showing the 'LSV' (lateral saphenous vein) and 'RFA probe' with a '2 cm' distance marked between them; and a 3D anatomical diagram of the leg showing the probe's placement relative to the vein.

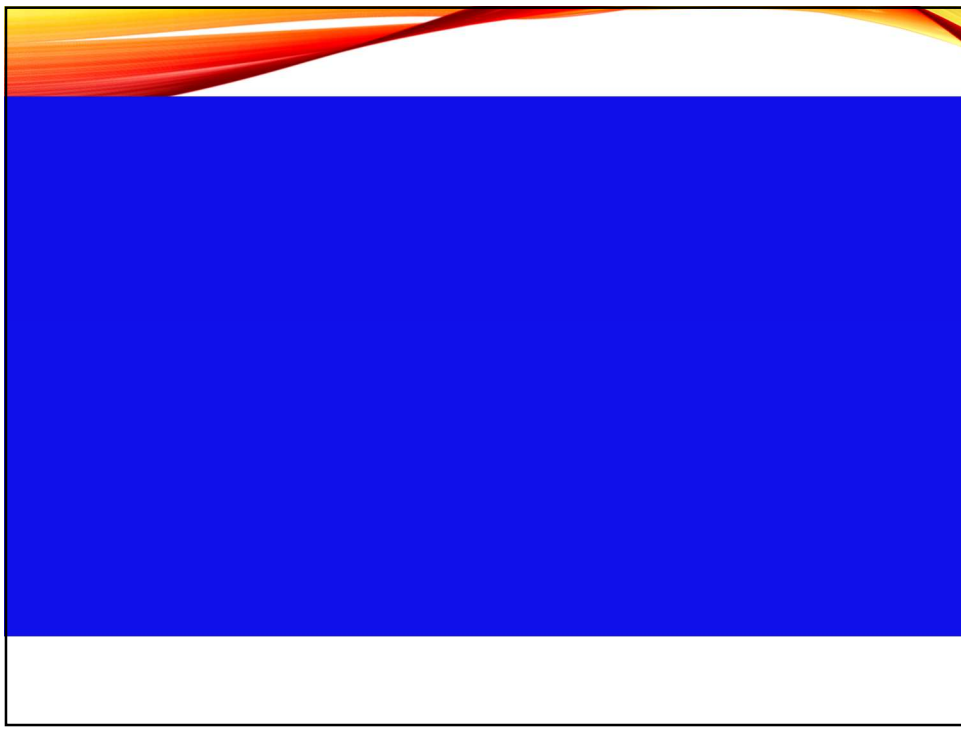
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GIVING THE TUMESCENT ANESTHESIA



The slide shows two B-mode ultrasound images demonstrating the application of tumescent anesthesia. The images show a cross-section of the vein and surrounding tissue, with the tumescent fluid creating a clear space around the vein.

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TREATMENT OPTIONS

- Non-Thermal, Non-Tumescent Ablation
 - MechanicO Chemical Ablation (MOCA) – Clarivein, Fleibogrif
 - Non-Sclerosant / Cyanoacrylate-based - Venaseal



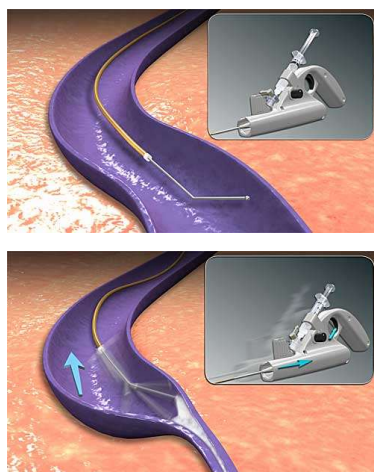
FLEBOGRIF
Set for varicose veins treatment



VenaSeal™ Closure System
A NEW TREATMENT PARADIGM

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MOCA- MECHANICO CHEMICAL ABLATION



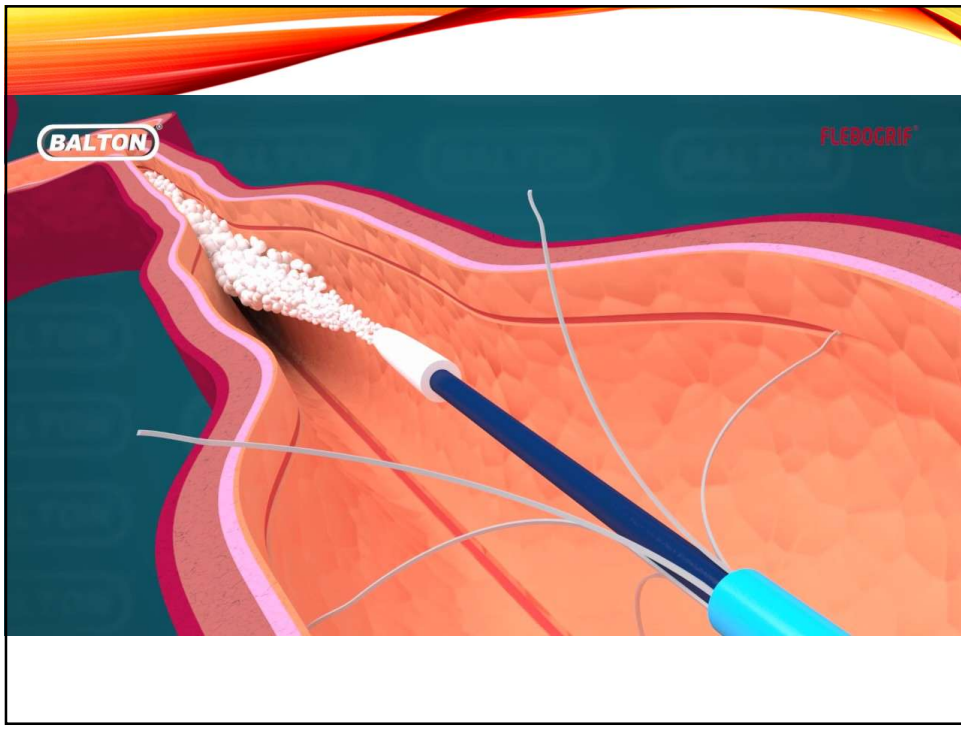
The Non-Thermal Vein Ablation System

- Safe & effective
- Excellent clinical results
- No thermal ablation - No risk of thermal injury
- No nerve damage / paraesthesia
- No tumescent anesthesia
- Minimal discomfort and minimal bruising



Self-contained disposable system - no capital equipment expenditure or maintenance costs.




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VENASEAL™ CLOSURE SYSTEM
 CYANOACRYLATE ADHESIVE TO CLOSE THE DISEASED VEIN
 SAFELY AND EFFECTIVELY

- Proprietary catheter engineered to be inert to adhesive – “doesn’t stick”
- Proprietary dispenser assembly designed to deliver a precise amount of adhesive in 3 sec.

DC00003906


8 Proebstle, T et al., The european multicenter cohort study on cyanoacrylate embolization of refluxing great saphenous veins. JVS: Venous and Lymphatic Disorders 2014; Accepted for publication.

Medtronic

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VENASEAL


- Closure rates comparable to current endothermal treatments
- No use of tumescent anaesthesia
- No risk of thermal injury
- Postprocedure compression stockings generally not required
- Rapid return to normal activity
- Recurrence
 - 5% at 5 years
 - 10% recurrence at 10 years



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TREATMENT OPTIONS

- Open Surgery
 - SFJ (saphenofemoral junction) ligation, GSV (great saphenous vein) stripping, MSA (multiple stab avulsions) (“High tie, stripping, stabs”)
 - SPJ (saphenopopliteal junction) ligation



The image shows several medical instruments used in vein surgery, including a long, thin, flexible vein stripper, a saphenofemoral junction (SFJ) ligation device, and several small, oval-shaped surgical clips or ties.

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TREATMENT OPTIONS

- Injection sclerotherapy (US guided)
 - Foam sclerosant superior to liquid
 - Postoperative recurrence of veins
 - Below knee varicosities if the GSV and SSV are not involved



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COMPLICATIONS OF SURGERY


- Anaesthetic complications
- Wound complications
 - Infection / Cellulitis
 - Hyper/hypopigmentation
 - Scarring
- Bruising/Hematoma
- Phlebitis
- Nerve injury <1%
- DVT
- Recurrence
- Hypersensitivity



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TREATMENT OPTIONS

- For patients with venous ulceration,
- Superficial venous ablation results in
 - Reduced risk of recurrent ulceration
 - Shorter ulcer healing time



THE NEW ENGLAND JOURNAL OF MEDICINE

A Randomized Trial of Early Endovenous Ablation in Venous Ulceration

May 11, 2014

THE LANCET

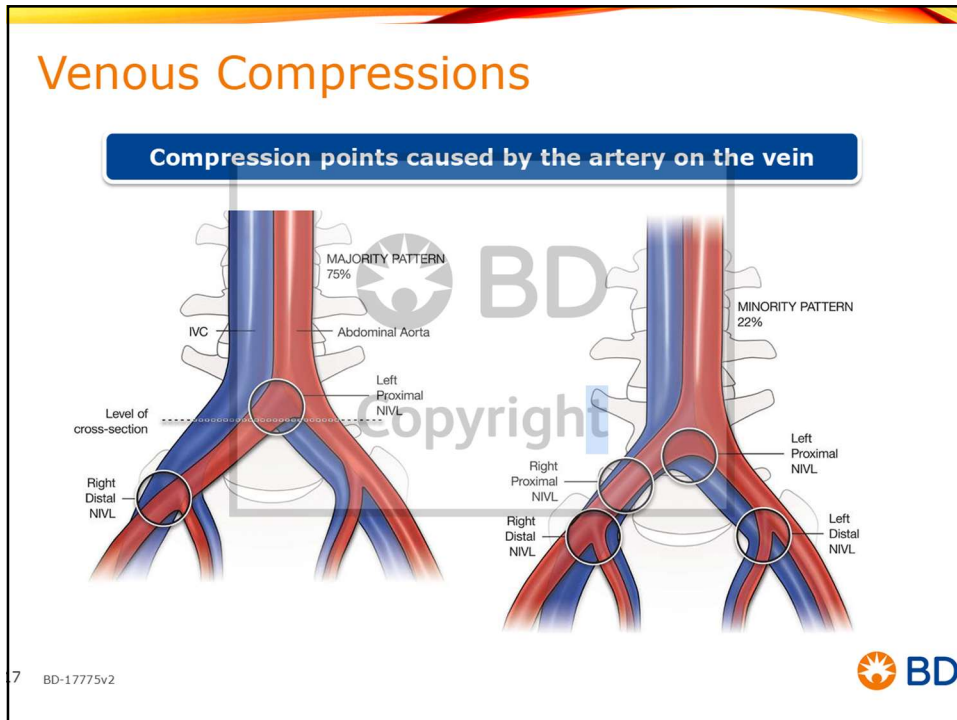
ARTICLES | VOLUME 363, ISSUE 9424, P1854-1859, JUNE 05, 2004

Comparison of surgery and compression with compression alone in chronic venous ulceration (ESCHAR study): randomised controlled trial

Jamie R Barwell, MD • Colin E Davies, BSc • Jane Deacon • Kate Harvey, BSc • Julia Minor • Antonio Sassano, MSc • et al. Show all authors

Published: June 05, 2004 • DOI: [https://doi.org/10.1016/S0140-6736\(04\)16353-8](https://doi.org/10.1016/S0140-6736(04)16353-8)

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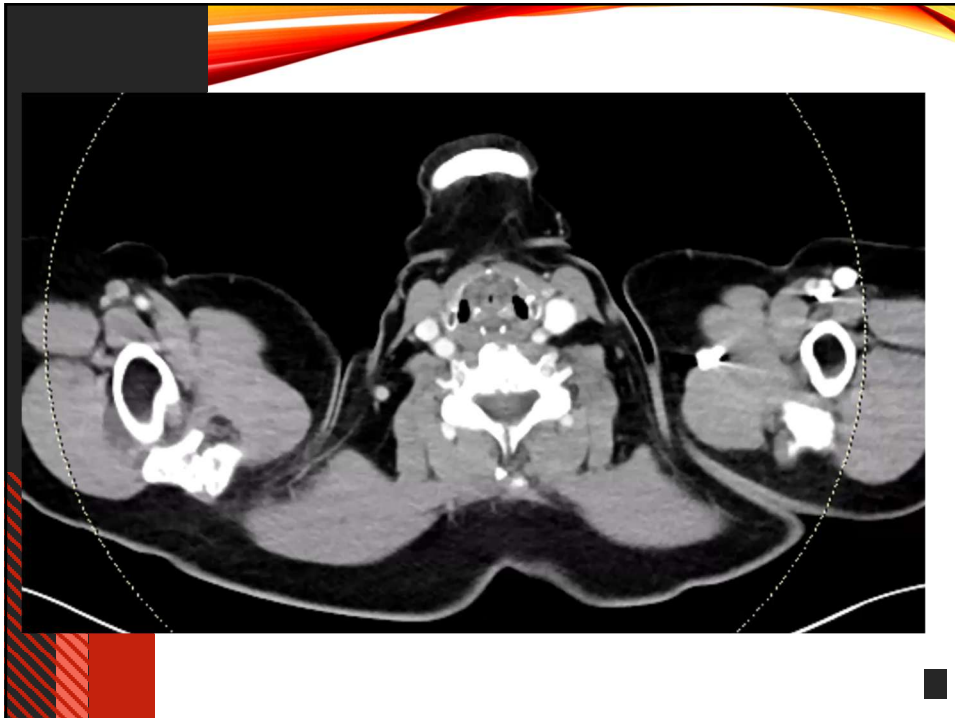


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INTERVENTION FOR ILIAC VEIN COMPRESSION MAY THURNER SYNDROME

- Address underlying stenosis/obstruction e.g. May Thurner pathology
 - IVUS
 - Dedicated venous stents (Medtronic ABRE, BD Venovo)
 - Bard Atlas large diameter balloons
- Anticoagulation
 - DOAC

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ITEMS

OPERATIVE STEPS

GA Supine
Left ankle PTV USG micropuncture

- 5Fr sheath
- 6Fr sheath if need to Angiojet Pop to PTV

Cross from PTV to CIV lesion to IVC

- 4Fr BER2 / CXI catheter
- Terumo 0.035" glidewire
- Amplatz/Supracore 0.035" wire

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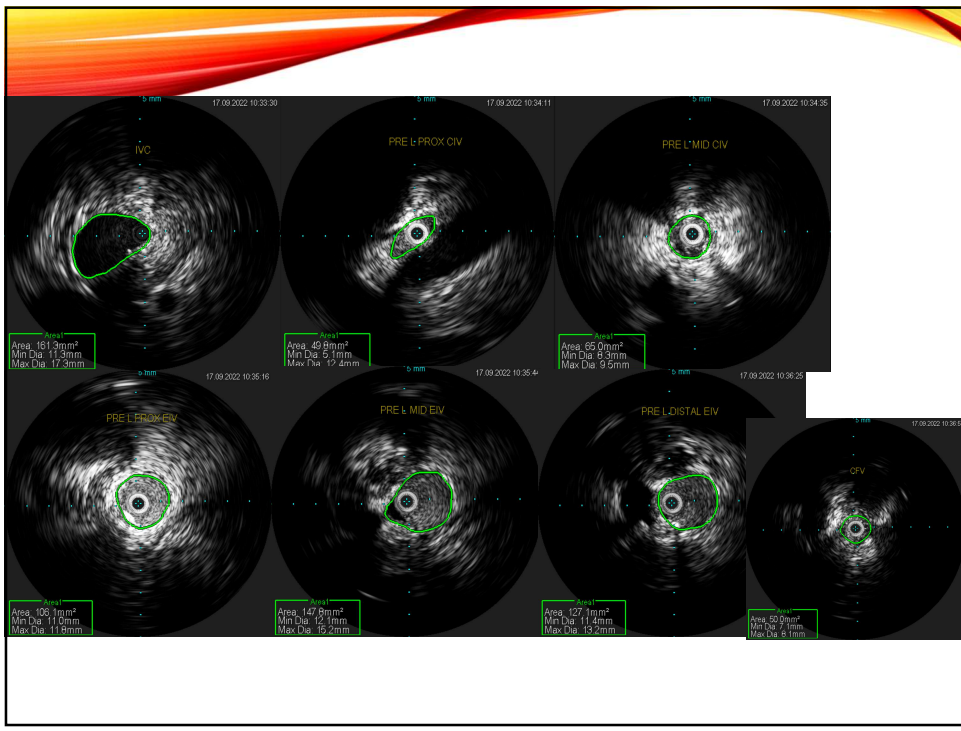


ITEMS

OPERATIVE STEPS

- Right CFV USG puncture
 - 6Fr sheath
 - Preclose Proglide
 - IVC sheath + filter insertion e.g. Bard Denali
- Left thigh FV puncture
 - 5Fr sheath (look for Suprawire)
 - Preclose Proglide
 - 9-10Fr sheath
- IVUS

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OPERATIVE STEPS

- PowerPulse Thrombolysis using Angiojet ZelanteDVT
 - 2 passes minimum – remember to change the catheter facing
 - Dwell time 15-20 minutes
- Rheolytic thrombectomy
 - 240 seconds run time with
 - 480 total run time

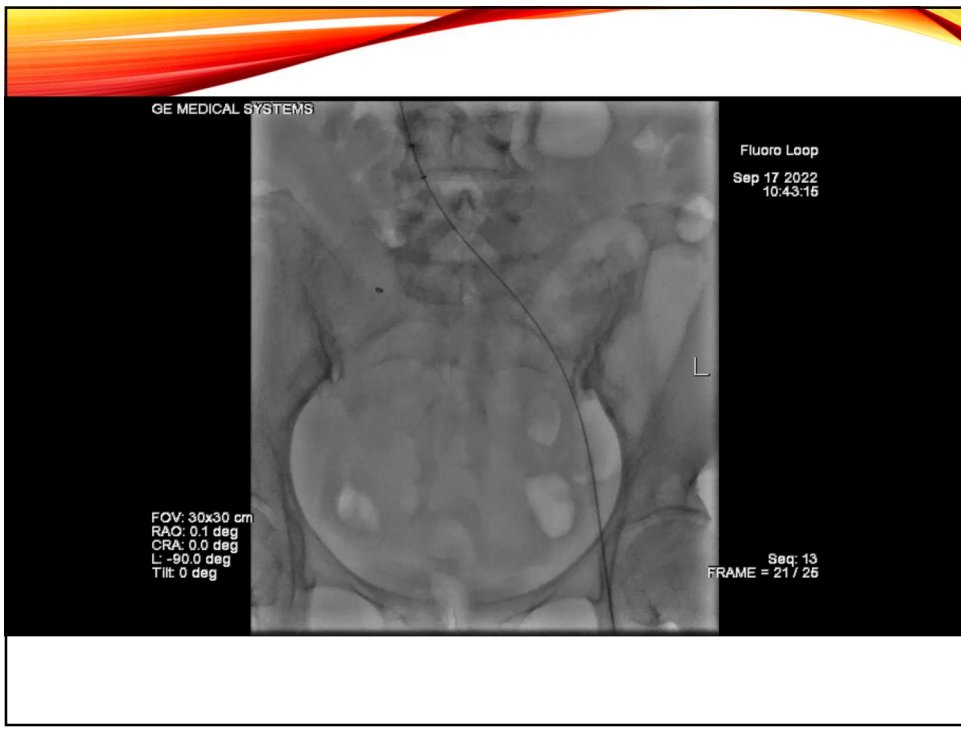
Window Indicator Band

Catheter Direction/Rotation Knob

Dedicated Guidewire Lumen

Contrast Injection Port

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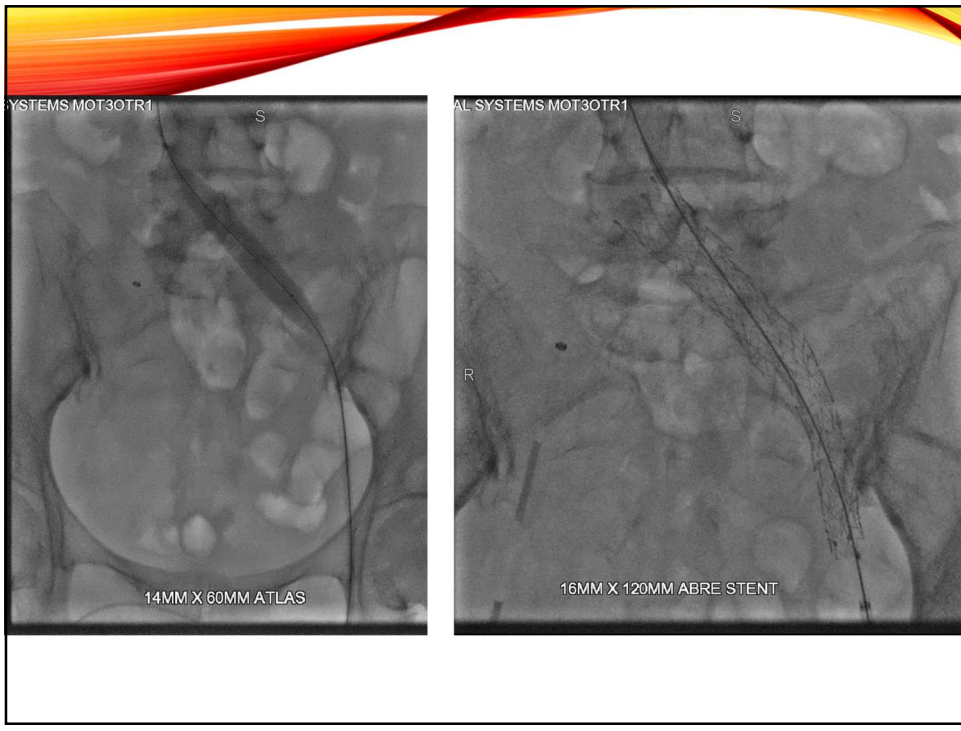
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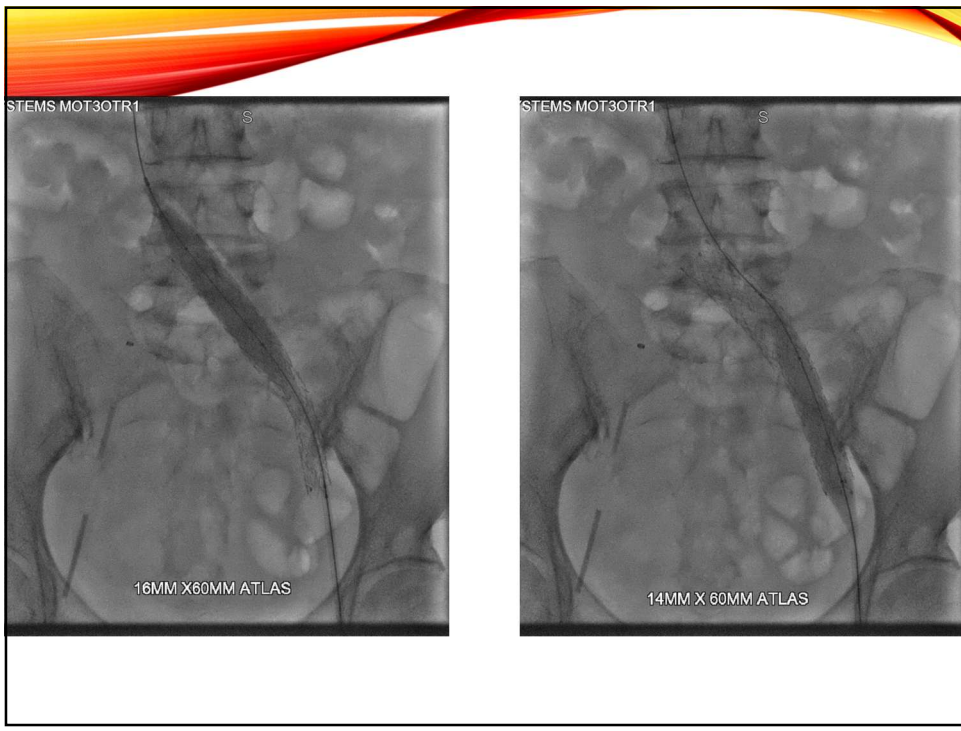
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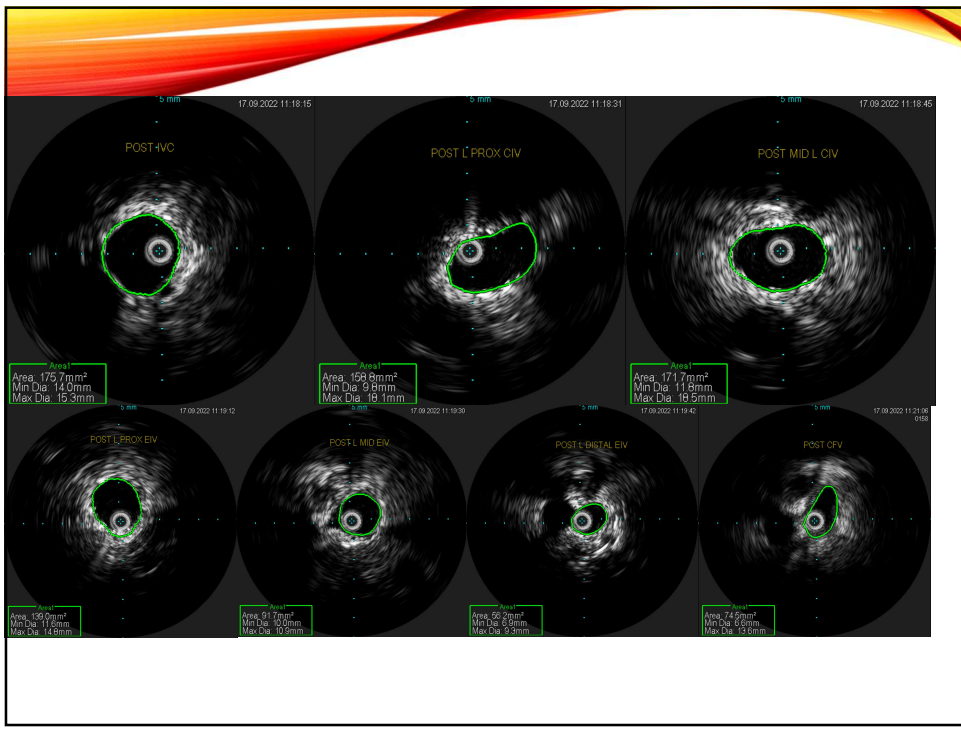
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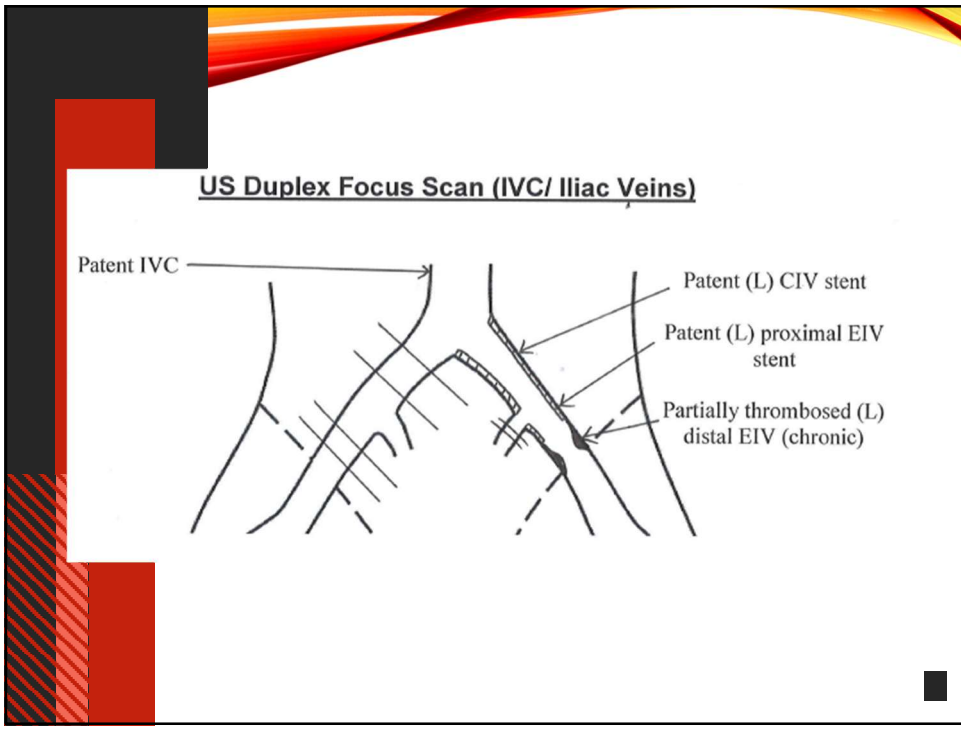
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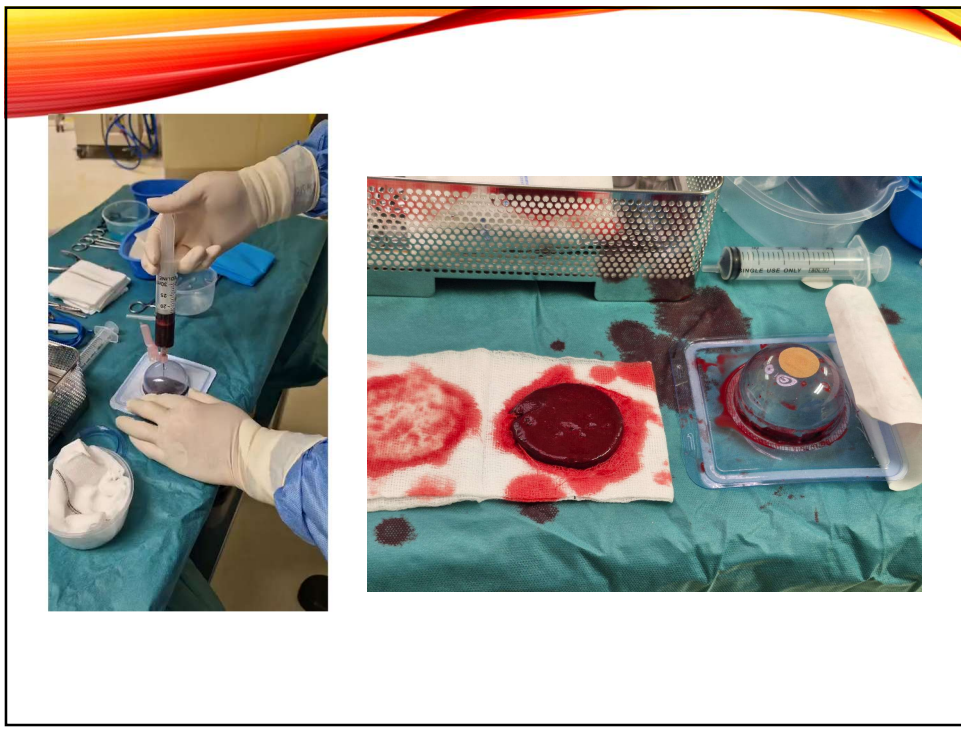
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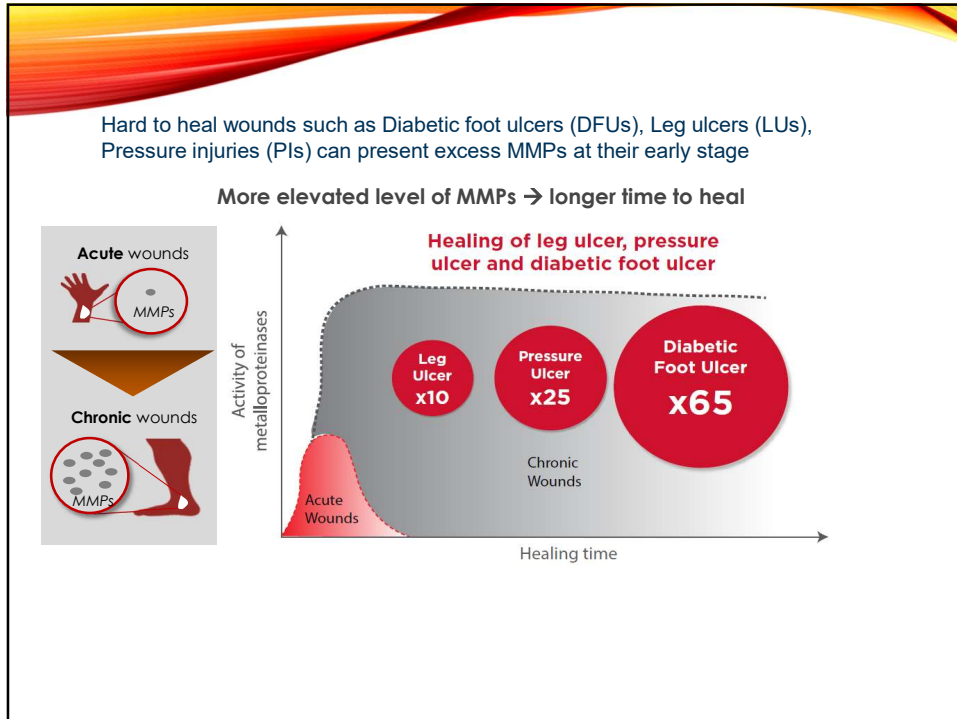
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NICE recognizes that UrgoStart :

“UrgoStart dressing are proven to **reduce healing time** for patients, **improving patients’ quality of life**, and are associated with **significant cost savings for the NHS** compared to non-interactive dressings”
NICE¹

- Reduces healing time**
- Enhances quality of life**
- Easy to implement**
- Cost saving**
 - £342 per year for DFU
 - £541 per year per VLU

1. UrgoStart for treating leg ulcers and diabetic foot ulcers, <https://www.nice.org.uk/guidance/mtg42>, January 2019

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REALITY STUDY:

► **The UrgoStart Treatment Range reduces healing time by 100 days on average.**

- 10,220 Patients
- Leg ulcers, diabetic foot ulcers and pressure ulcers

UrgoStart Treatment Range (TLC-NOSF) reduces healing time by 100 days on average

Time to closure (days)

The sooner the UrgoStart Treatment Range (TLC-NOSF) treatment is initiated, the shorter the healing time


Time to closure (days)

KEY TAKEAWAYS

- Patients heal 100 days sooner with the UrgoStart Treatment Range (TLC-NOSF), which improves their quality of life
- Be confident that the unique efficacy of the UrgoStart Treatment Range (TLC-NOSF) has been observed on a large population, which is representative of your case load

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UrgoStart : What is the TLC-NOSF ?



TLC

Technology Lipido-Colloid: a jellified matrix of hydrocolloids and fatty substances

- Long lasting **moist environment** to promote healing
- Dressing keeps its **coating integrity** over time
- **Pain-free & atraumatic** removal
- **Optimizes wound healing** results

TLC-NOSF

NOSF = Nano-Oligosaccharide Factor / Sucrose octasulfate potassium salt

- **Reduces levels of MMPs** to restore wound healing trajectory

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TLC-NOSF (URGOSTART® RANGE): A VERY HIGH LEVEL OF EVIDENCE, CONSISTENT OUTCOMES

NICE¹ recommends the **UrgoStart** treatment range for DFUs & VLUs.

IWGDF² guideline includes Sucrose octasulfate impregnated dressings.

EXPLORER³ double-blind RCT (vs neutral dressing) Neuro-ischæmic diabetic foot ulcers - 240 Patients.

CHALLENGE^{4,5} double-blind RCT (vs neutral dressing) Venous and mixed aetiology leg ulcers - 187 Patients.

WHAT⁶ RCT (vs Promogran) Venous and mixed aetiology leg ulcers - 117 Patients.

NEREIDES/CASSIOPEE⁷ clinical studies - 92 Patients.

REALITY⁸ pooled data analysis DFUs, LUs & PUs, 10220 Patients.

UrgoStart Plus real-life obs study⁹ DFUs, LUs & PUs - 1140 Patients.

UrgoStart Plus real-life obs study 2¹⁰ DFUs, LUs & PUs - 961 Patients.

In vitro study¹¹ on MMP reduction

Recommended by the NICE (National Institute for Health & Care Excellence) **in first intention for leg ulcers and diabetic foot ulcers.**

IWGDF The only dressing recommended by international guidelines to treat diabetic foot ulcers

✓ Recommended by authorities ✓ Clinically proven ✓ Confirmed in real life

UrgoStart plus
Treatment Range

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QUESTIONS?

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