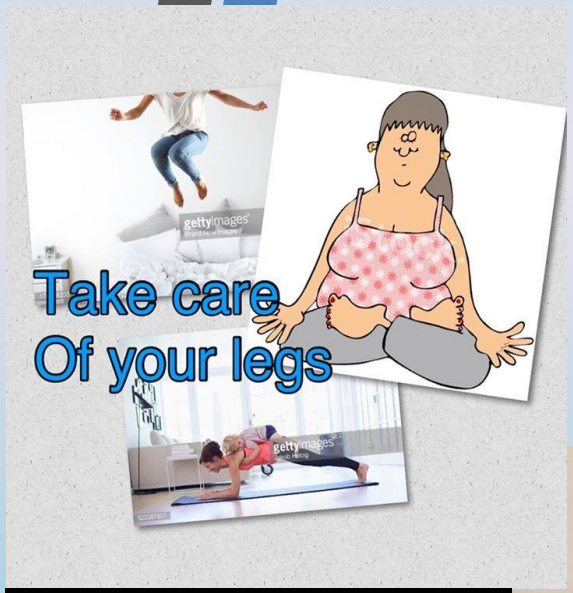
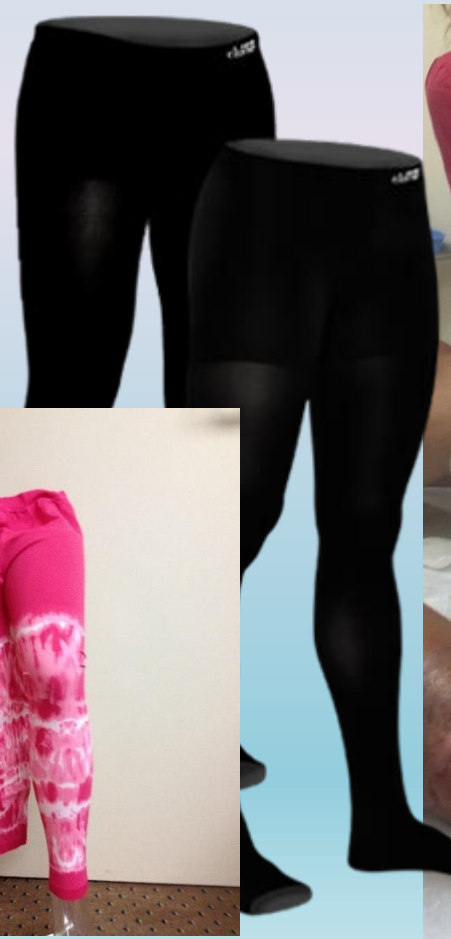
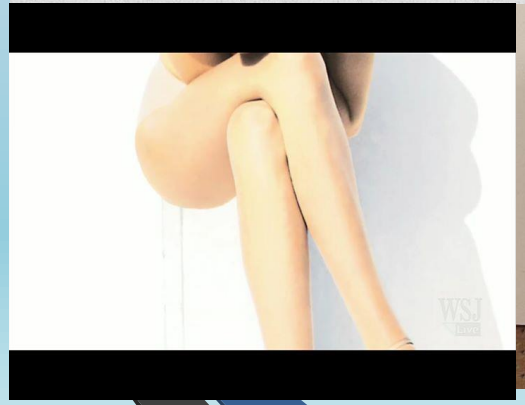
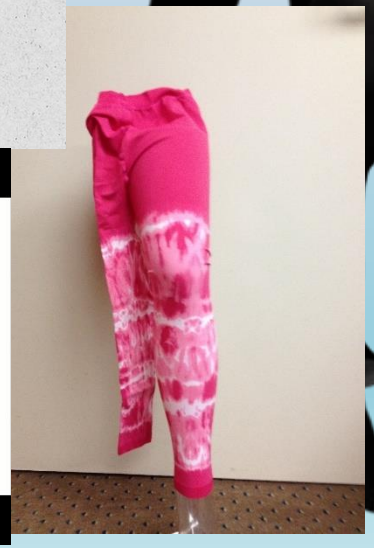
Compression Therapy: Winning the Battle









Terri Morrison, RN, BS

Disclosures

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Independent Consultant: Terri Morrison LLC

Fitter Class Consultant Sigvaris

Advisory Panel:

International Compression Club,

US Compression Alliance,

Chronic Venous Disease Advisory Board

The Spectrum of Venous Disease


Telangiectasias


Hemosiderin deposition*


Superficial phlebitis

Varicose veins


Lipodermatosclerosis


Venous ulcer

*with permission from www.regionalderm.com

Why do we use compression? Why Bother?

Chronic venous disease (CVD) and (CVI) Chronic Venous Insufficiency is **a major public health issue** carrying a high prevalence.

It is often associated with **debilitating** symptoms and complications.

Despite this, CVD and CVI are largely under-diagnosed and limited choices of efficient, effective, cost effective care is being provided to patients.

How Do We Win the Battle ?

Learn about compression.
Compression Vendors, National and International Conferences.

Use compression yourself.

Talk to your Patients Then LISTEN !!

Compression works with compliance – How do we make this possible.

If research is poor, how else do we learn? IE: Surveys, US compression alliance, International Compression Club.

Research Trials with research grants.

Smart fabrics, patient monitoring with smart phone and pressure monitors: embedded and external use.

SERGIO SAYS:
"Don't "Compress" the Patient into Compression?

WHY

What

How

WHY

You believe in compression therapy

You know patient lack of compliance is the worst obstacle

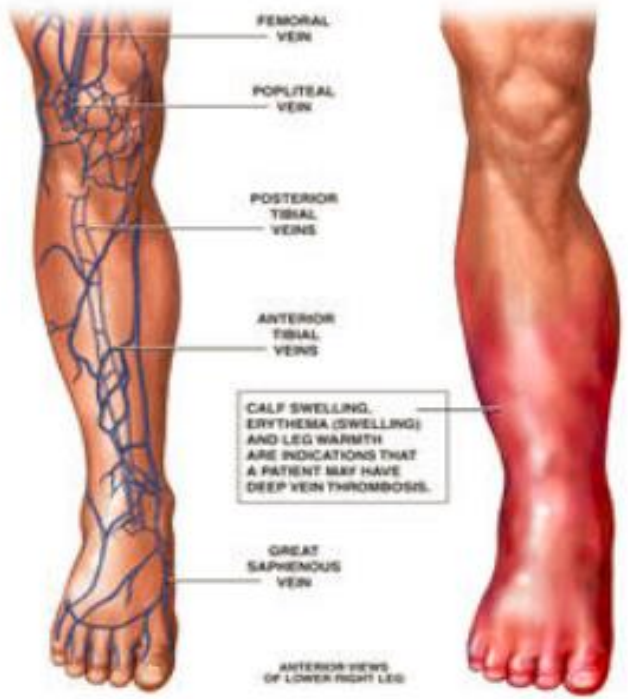
"When **you prescribed thigh high,** 30-40 mmHg stockings to be filled at a local DME vendor, the patient came back with **knee high,** light weight 15-20 stockings."

You think you can help patients and make a little $ for your effort

Italian depiction of why we compress?!

Di Nisio M, Wichers IM, Middeldorp S. **Treatment for superficial thrombophlebitis of the leg**. Cochrane Database Syst Rev 2012;(3):CD004982.

Revisione sistematica
Trattamento ***chirurgico + compressione***
porta a diminuita insorgenza di tromboembolismo e progressione della tromboflebite rispetto alla sola calza



EDUCATE and EXPLAIN

Level A Recommendations

Clear benefit for compression therapy:

a) Active venous ulceration

b) Prevention of PTS after DVT

c) Prevention of TE events after surgery when combined with anti-coagulant prophylaxis

d) Reduction of edema and inflammation

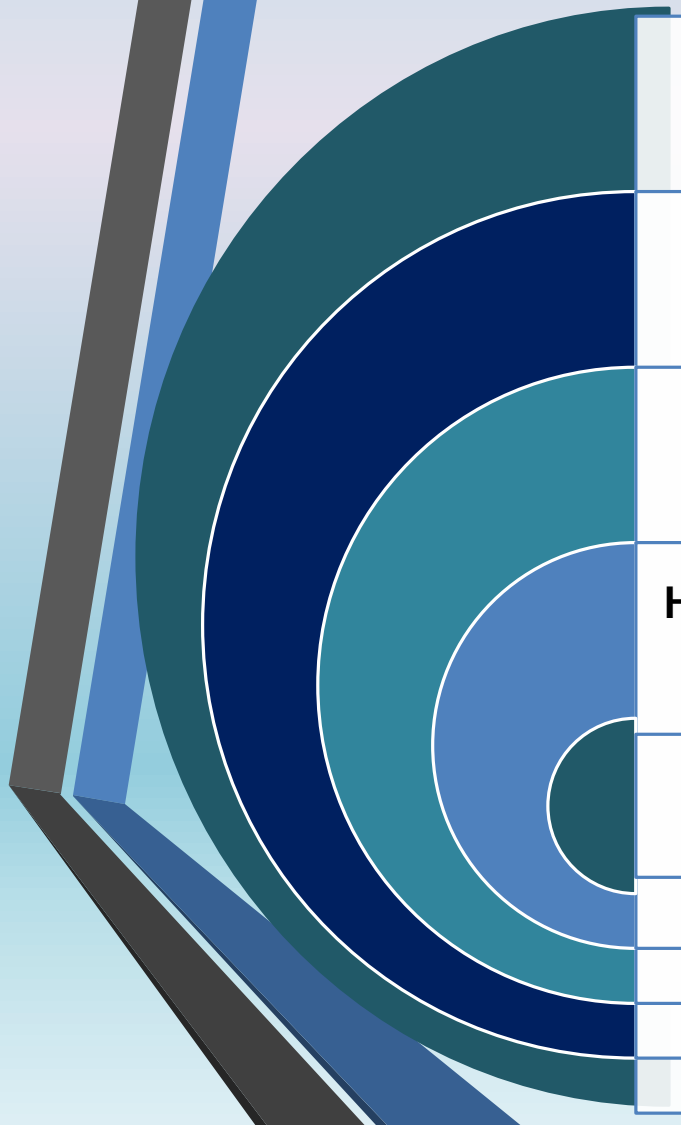
e) Better cosmetic outcome

Source: The Vein Book – Chapter 10

What Do We Do For Patient Compliance In Hot Environments

- Compression hose choices
- Weight, type, color
- lighter weight and color
- open-toe
- calf or thigh high rather than panty hose
- "Wicking" material rather than cotton

Which Goals of Compression Therapy ?



Help prevent thromboembolism in non-ambulatory hospitalised patients

Improve venous return from the lower extremities with venous stasis

Counter effects of ambulatory venous hypertension

Help control the progression of venous and lymphatic disease by increased contact of skin and dermal tissues with capillaries

Reduce and control edema and inflammation

Long Term and Post Procedures

Effects of Compression Therapy

Microcirculation	Improvement
Lymph drainage	Improvement
Central Blood shift	Increase
Venous pump	Improvement
Arterial flow	Increase (intermittent compression)

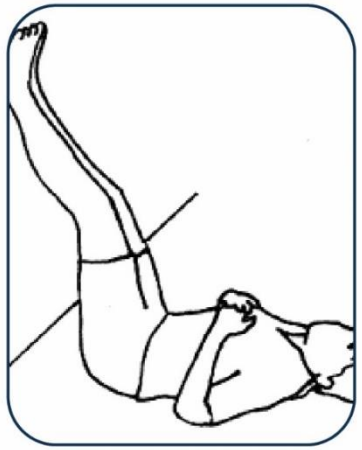
Sources: The Vein Book – Chapter 10

Partsch H. Phlebology 2006;21:132-138

Conservative Treatment of CVD

- Weight loss
- Leg elevation
- Increased exercise/ambulation (improve calf muscle pump)
- **Herbal medications:** aescin (horse chestnut seed), bioflavinoids, diosmin…may help symptoms
- Graduated compression stocking
- Relief without treatment of the primary problem

*Cochrane Database Syst Rev. 2011 9;(11): CD008819.



Hemosiderin Pigmentation

Indications for Compression

- Prevention of DVT
- Prevention of progression or exacerbation of venous conditions
- Prevention of post-thrombotic syndrome (PTS)
- Varicose Veins
- Chronic venous insufficiency including venous ulceration
- Edema
- Post sclerotherapy
- Post surgery
  - Vein harvest
  - Valvular repair
  - Surgeries of the limb where edema is anticipated (e.g. orthopedic, vascular, plastic/reconstructive)

C1 after sclerotherapy:

compression (E.S. 23-32 mm Hg) is more effective than no compression in getting better outcomes (more effectiveness, less pigmentation)

→ pressure counts (if we do not have comparison between 2 different pressure ranges)

Kern P, Ramelet AA, Wütschert R, Hayoz D. Compression after sclerotherapy for telangiectasias and reticular leg veins: a randomized controlled study. J Vasc Surg. 2007;45:1212-6.

Cochrane Review:
Endovenous thermal ablation for healing venous ulcers and preventing recurrence

Since long-term patient concordance with compression is relatively poor, it may prove more popular, effective and cost-effective to provide a single intervention to reduce recurrence, rather than life-long treatment with compression.

Samuel N, Carradice D, Wallace T, Smith GE, Chetter IC. *Cochrane Database of Systematic Reviews* 2013, Issue 10. Art. No.: CD009494. DOI:10.1002/14651858.CD009494.pub2. (Hull – UK)

Thank you to Nick Morrison, MD for slide

Level A Recommendations

- **Clear benefit for compression therapy:**

  a) Active venous ulceration

  b) Prevention of PTS after DVT

  c) Prevention of TE events after surgery when combined with anti-coagulant prophylaxis

  d) Reduction of edema and inflammation

Source: The Vein Book – Chapter 10

Compression

Partsch H, Flour M, Smith PC. Indications for compression therapy in venous and lymphatic disease consensus based on experimental data and scientific evidence. Under the auspices of the IUP. Int Angiol 2008;27:193-219.

***GRADE 1A*: Compression bandaging promotes healing of venous ulcers**

***GRADE 1B*: Strong compression hosiery (30-40 mmHg) is more effective than medium or low compression stockings**

***GRADE 1A:* 30-40 mmHg compression hosiery prevents recurrence of ulceration after healing**

Compression

Grade 2C

REVIEW

Compression Therapy for Occupational Leg Symptoms and Chronic Venous Disorders – a Meta-analysis of Randomised Controlled Trials

F. Amsler[1*] and W. Blättler[2]

The care of patients with varicose veins and associated chronic venous diseases: Clinical practice guidelines of the Society for Vascular Surgery and the American Venous Forum

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Thank you to Nick Morrison, MD for slide

A meta-analysis of 11 RCTs suggested that in healthy patients, in those with C1 to C3 disease, and in those after vv surgery, **medium** compression stockings (those with greater than 20 mmHg) have no *added benefit over that obtained with a compression of between 10 and 15 mmHg*

So until further data on appropriate tension of elastic garments are available, for C2 patients, the SVS AVF Guideline Committee suggests graded prescription stockings with an ankle pressure of 20-30 mmHg (Grade 2C).

Compression Hose

- Compression level
  - 15-20mmHg
  - 20-30 mmHg
  - 30-40 mmHg
  - 40-50 mmHg
  - 50-60mmHg
  - 60-100mmHg

*__best expressed in mmHG, as a dose__ rather than Class or Grade

- Long-Stretch Garments
  - Very elastic and exert a high resting pressure and a low working pressure

Short Stretch

- Inelastic wraps create opposite:

low resting pressure and high working pressure, for example: *healing leg ulcers, no pain when lying down*

Source: Disease of the Veins – Chapter 10

The Use of PicoPress Transducer to Measure Sub-Bandage Pressure

Jawad Al Khaburi, Abbas A. Dehghani-Sanij, E. Andrea Nelson and Jerry Hutchinson

Compression after Procedures

- Compression pressure not measured and what kind of pressure unknown??
- What kind of bandage (elastic-inelastic)??
- Who applied the bandage (level of expertise)??
- Adherence to treatment (is the patient allowed to remove and re-apply bandage by himself?)??
- Tourniquets? slippage? rolling? lead to DVT?

Choosing Compression Modality
Age of patient and how if affects choices

- **Lifestyle of Patient**
  - **Active Lifestyle**
    (can tolerate more compression)
  - **Professional Requirements**
    (lawyer vs. cocktail waitress)
  - **Sedentary lifestyle**
    (will require higher resting pressure)

Stiffness of compression products plays a major role for their hemodynamic efficacy.

In other words stiffness could be defined as the ability of the bandage/stockings to oppose the muscle expansion during contraction.
This massaging effect increases the calf muscle pump effectiveness, increases ejection fraction, improves circulation, decrease venous stasis.

Stockings with higher stiffness have a higher anti-edematous efficacy. A previous clinical trial disclosed: the superposition of two stockings did not only increase the interface pressure, but had a further additive effect to the stiffness of the final stocking combination." [Veins and Lymphatics 2013; 2:e13]

Stiff, Inelastic, multilayered Bandaging

Choosing Compression Modality

There are many fabrics, styles and colors available, both in ready-to-wear and custom-measured garments

Two facts become clear at once:

- **Nothing "fits like skin"**
- **No one fabric, style, brand, or type of compression is perfect for every patient**

Alternate Compression Modalities

Practical Factors

- Overcoming donning/doffing difficulties
- Silk slippers, butlers
- Is help available to patient?

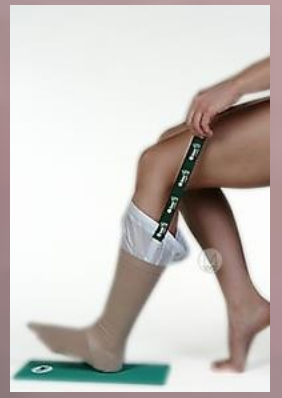
Sources: Rutherford Vascular Surgery
6th Edition – Chapter 156
Hugo Partsch – personal communication

Compression Therapy in Everyday Life: Let the Patients Have the Floor!

Patrick Carpentier, Jean-François Auvert, Sophia Bensédrine, Sophie Blaise, Myriam Chanut, Véronique Comté, Marie Christine Coqueran, Chantal Elbhar, Rolf Engelberger, Philippe Kern, Didier Lurel, Valérie Mascarel Maillet, Monira Nou, Gilles Miserey, Pierre Ouvry

Techniques of donning and doffing and different compression modalities can enhance patient compliance and treatment outcomes.

Pantyhose applicator



Donners and Doffers

Putting hose on:

- Make sure your legs are dry before putting on your hose, using baby powder on your legs, especially feet and ankles, may make it easier.
- NO lotion on legs, especially feet and ankles, makes it harder and POSSIBLE RASHES.
- Wear gloves, either latex, or Playtex-type gloves. The gloves give you traction, help your grip and helps prevent you from putting a hole or run in the stockings.
- Gather the hose to about the knee area. You won't be able to gather the hose down to the foot/ankle area as you can with regular hose – they are too strong.
- Pull them up over your foot and ankle like a trouser; try to keep them "unbunched"
- Then slowly work the remainder of the stocking up, a little at a time, until it is in place.
- Make sure you have no wrinkles or creases; those are a big "no-no" in hose wear.


SIGVARIS
SIGVARIS

Alternative Compression Options

This is compression

This is not !

Compression Stocking kit

Dose adjustable like a medicine:

Layer 15 mmHg stocking plus 10 mmHg plus 8-10 mmHg stocking plus a legging light weight, open foot

The dynamic pressure index is then comparable to heavy 30-40 mmHg stocking with a high stiffness index to counteract edema. This works with the foot pump and only 10% of patients get foot edema.

Inelastic Velcro Devices

Adjustable Velcro Compression Devices are More Effective than Inelastic Bandages in Reducing Venous Edema in the Initial Treatment Phase: A Randomized Controlled Trial

G. Mosti a,*, A.Cavezzi b, H.Partschc, S.Urso d, F.Campana e
Eur J Vasc Endovasc Surg (2015) ,1e7

Objective/Background: The objective of this study was to **compare the efficacy and comfort of inelastic bandages (IBs) and adjustable Velcro compression devices (AVCDs) in reducing venous leg edema in the initial treatment phase.**

Results: At T1, the median percent volume reduction was 13% for the IB group versus **19% for the AVCD group**; at T7 it was 19% versus 26%, respectively ($p < .001$). The pressure of the IBs was significantly higher compared with the AVCDs at T0 (63 vs. 43 mmHg) but **dropped** by > 50% over time, while it **remained unchanged with AVCDs owing to the periodic readjustment by the patient.** Comfort was reported to be similar with the two compression devices.

Conclusion: **Re-adjustable AVCDs with a resting pressure of around 40 mmHg are more effective in reducing chronic venous edema than IBs with a resting pressure of around 60 mmHg.**

AVCDs are effective **and well tolerated**, not only during **maintenance therapy**, and also in **the initial decongestive treatment phase** of patients with **venous leg edema.**

Complications or Side Effects of Compression:

Mild side effects, 30%: irritation and itch, feeling of constricted

Geriatric patients: Visual and cognitive impairment in addition to fragile skin and silent clotting or arterial problems, fragile skin, infection, inflammation

HOW? Choices Matter

MEN'S

Thank you to my mentors: Hugo Partsch, Giovani Mosti, Sergio Gianesini, and Advisors in the International Compression Club

We *have to find a way* to meet our patient's needs *with*

Education, Choices,

Donning and Doffing,
Tracking..
Pricing, Fighting
Reimbursement

<u>Then we can win the battle</u>!

THE BATTLE IS WORTH IT !
FOR HEALTHY LEGS

References:

Kahn SR et al Compression stockings to prevent post-thrombotic syndrome: a randomized placebo-controlled trial. Lancet 14 Mar 8;383(9920):880-8. Moffatt C., KommalaD, DourdinN, ChoeY

Factors that affect concordance with compression therapy. J Wound Care. 2004;13:291-294.
Raju S; et al. Use of compression stockings in CVD: patient compliance and efficacy Ann. Vasc. Surg. 2007 Nov; 21(6): 790-5

Jean-Patrick BENIGNI* CORNU-THENARD Jean-François UHL Criteria for non- compliance of Medical Compression Stockings Int. J Angiol. 2013 March;22 (1): 23-30 Calf Pump Influencing Venous Hemodynamics in the Lower Extremity C Receck.

Luire F. Kistner RL; Trends in patients reported outcomes of conservative and surgical treatment of primary chronic venous disease contradict current practices. Annals of Surgery 2011: 254:363-367

Hamel- Desnos CM, Guias BJ, Desnos, PR et al Foam Sclerotherapy of saphenous veins: randomized controlled trial with or without compression Eur J Vasc Endovasc Surg 2010; 39:500-7

Compression Therapy Versus Surgery in treatment of patients with varicose veins A RCT, Sell Et al., Journal of Vascular and Endovascular Surgery 2014

Adjustable Velcro Compression Devices are More Effective than Inelastic Bandages in Reducing Venous Edema in the Initial Treatment Phase: A Randomized Controlled Trial G. Mosti a,*, A. Cavezzi b, H. Partsch c, S. Urso d, F. Campana e Eur J Vasc Endovasc Surg (2015) ,1e7

Thank you to The ICC Organizers and Participants!

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