Compression Therapy: Winning the Battle

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Disclosures

Educational Grant: Medi USA
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.regionalerm.com

The Fundamentals of Phlebology: Venous Disease for Clinicians
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?!

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
<table>
<thead>
<tr>
<th>Which Goals of Compression Therapy?</th>
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<tbody>
<tr>
<td>Help prevent thromboembolism in non-ambulatory hospitalised patients</td>
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<tr>
<td>Improve venous return from the lower extremities with venous stasis</td>
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<tr>
<td>Counter effects of ambulatory venous hypertension</td>
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<tr>
<td>Help control the progression of venous and lymphatic disease by increased contact of skin and dermal tissues with capillaries</td>
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<tr>
<td>Reduce and control edema and inflammation</td>
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<tr>
<td>Long Term and Post Procedures</td>
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Effects of Compression Therapy

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

Sources: The Vein Book – Chapter 10
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

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)

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.


Thank you to Nick Morrison, MD for slide
Level A Recommendations

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  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
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. Amsler¹ and W. Blättler²

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

Peter Gloviczki, MD, Anthony J. Comerota, MD, Michael C. Dalsing, MD, Bo G. Eklof, MD, David L. Gillespie, MD, Monika L. Gloviczki, MD, PhD, Joann M. Lohr, MD, Robert B. McLafferty, MD, Mark H. Meissner, MD, M. Hassan Murad, MD, MPH, Frank T. Padberg, MD, Peter J. Pappas, MD, Marc A. Passman, MD, Joseph D. Raffetto, MD, Michael A. Vasquez, MD, RVT, and Thomas W. Wakefield, MD, Rochester, Minn; Toledo, Ohio; Indianapolis, Ind; Helsingborg, Sweden; Rochester, NY; Cincinnati, Ohio; Springfield, Ill; Seattle, Wash; Newark, NJ; Birmingham, Ala; West Roxbury, Mass; North Tonawanda, NY; and Ann Arbor, Mich

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 *best expressed in mmHG, as a dose* rather than Class or Grade
  - 30-40 mmHg
  - 40-50 mmHg
  - 50-60mmHg
  - 60-100mmHg

- 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

 détail Lifestyle of Patient

듭 Active Lifestyle
(can tolerate more compression)

 derp Professional Requirements
(lawyer vs. cocktail waitress)

 derp 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

**ReadyWrap® Lower Extremity Garments**

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Thigh</td>
<td>Low stretch material provides low resting and high working pressures from superior padding to the groin.</td>
</tr>
<tr>
<td></td>
<td>Proximal strap helps accommodate rough and conical thighs.</td>
</tr>
<tr>
<td></td>
<td>Overlays three units to help prevent gaping.</td>
</tr>
<tr>
<td>Knee</td>
<td>Easy, three strap design provides a comfortable in reducing pitting and high pressure on patella.</td>
</tr>
<tr>
<td></td>
<td>Overlaps calf and thigh units to help prevent gaping.</td>
</tr>
<tr>
<td>Calf</td>
<td>Can be worn with compression knee for additional support and protection.</td>
</tr>
<tr>
<td></td>
<td>Blended spandex reduces stretch and improves structural support.</td>
</tr>
<tr>
<td></td>
<td>Overlays knee and three units to help prevent gaping.</td>
</tr>
<tr>
<td>Foot</td>
<td>Left/Right specific design and medial/cut on bunion contouring.</td>
</tr>
<tr>
<td></td>
<td>Easy to don, two strap design fits inside most shoes.</td>
</tr>
</tbody>
</table>
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 Bensedrine, Sophie Blaise, Myriam Chanut, Véronique Comté, Marie Christine Coquieran, 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.

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.
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
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
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

Then we can win the battle!
THE BATTLE IS WORTH IT!
FOR HEALTHY LEGS
References:


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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