Compression: 
HOW MUCH 
HOW HIGH 
HOW LONG 

ACP May 16, 2015

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ACP Sclerotherapy Course

DISCLOSURE OF CONFLICTS OF INTEREST

PARTNER in the MORRISON TRAINING INSTITUTE

Delegate of ACP for International Compression Club
Myths and Pitfalls

- Compression is standardized all over the world
- Patients won’t wear stockings in a hot climate
- Ted hose can be used as post treatment support
- Post-op pain is not affected by compression*
- Non-adherance is the most important factor limiting the effectivity of compression therapy**

*RCT of Compression Therapy after Varicose Vein Surgery

**Compression therapy: Hugo Partch
Compression therapy, to be effective, necessitates the understanding of the venous system and graduated medical support stockings.
Definition Of Pressure

- Pressure is a force exerted either from inside to outside, or from outside to inside, against the resistance of a fabric or a tissue
- Either continuous or intermittent

Source: The Vein Book – Chapter 10
“Compression therapy is a treatment modality which is several thousands years old. Only during the last years, its clinical efficacy in several indications has been proved by randomized controlled trials.”

Hugo Partsch
Venous physiology

- The deep venous system is surrounded by muscles.

- When our leg muscles contract, venous blood should flow out of the leg up to the heart.

- Weight of the column of blood between the foot and the heart in its resting phase is 80-100 mmHg

- Our deep vein pressure falls as our muscles contract

- Retrograde or backward flow of blood in the legs is prevented by closure of the deep vein valves
Compression limits or prevents leakage of blood into surface venous system during calf muscle contraction, so it will not leak out to the superficial system.

This compression pressure must exceed ambulatory deep venous pressure so blood will go up in the deep system to the heart.
Compression therapy

• Provides support that helps compensate for the loss of skin or vein wall elasticity due to lymphatic or venous damage
But the question is: What type of compression?

The point is obvious when you order Class 2, 30-40 mmHg Medical Elastic Stockings on varying body types, sizes, young, old, skinny feet or large ankles, etc. and wonder why compliance is an issue???

The range of a 20-29 cm ankle in the same 30-40 mmHg prescription by the provider is going to cause a “wide variation in compression” and probably cause pain in the patient with skinny feet, due to simple mechanical principles.
So what do we do now?
Ask our peers?
Compression Stockings: How Much, How Long, How High?

1. How long do your patients wear compression after cosmetic sclerotherapy?

2. How long do your patients wear compression after EVTA, EVCA, Phlebectomy?

3. What amount (mm hg) of compression do you use for post-cosmetic procedures?

4. What amount (mm Hg) of compression do you use for post-medical procedures?

5. What type of compression do you use for the following: Cosmetic Medical

REPORT RESULTS OF MONKEY SURVEY SENT OUT BY ACP TO ALLIED MEMBERS
1. How long do your patients wear compression after cosmetic sclerotherapy?

<table>
<thead>
<tr>
<th>Duration</th>
<th>Response Count</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 days</td>
<td>12</td>
<td>31.6%</td>
</tr>
<tr>
<td>3 days to 1 week</td>
<td>29 of the “other”</td>
<td></td>
</tr>
<tr>
<td>2 weeks</td>
<td>11</td>
<td>28.9%</td>
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<tr>
<td>3 weeks</td>
<td>16</td>
<td>42.1%</td>
</tr>
<tr>
<td>4 answered “no compression”</td>
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<td></td>
</tr>
<tr>
<td>OTHER:</td>
<td>44</td>
<td></td>
</tr>
</tbody>
</table>

answered question: 38
2. How long do your patients wear compression after EVTA, EVCA, Phlebectomy?

<table>
<thead>
<tr>
<th>Duration</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 days</td>
<td>5.7%</td>
<td>3</td>
</tr>
<tr>
<td>2 weeks</td>
<td>67.9%</td>
<td>36</td>
</tr>
<tr>
<td>3 weeks</td>
<td>26.4%</td>
<td>14</td>
</tr>
</tbody>
</table>

13 wore for 1 week - 3 for 3 months - 4 six weeks
One “for the rest of their lives”

53 answered question
26 skipped question
3. What amount (mm hg) of compression do you use for post-cosmetic procedures?

<table>
<thead>
<tr>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-20</td>
</tr>
<tr>
<td>20-30</td>
</tr>
<tr>
<td>30-40</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-20</td>
<td>26.0%</td>
<td>19</td>
</tr>
<tr>
<td>20-30</td>
<td>43.8%</td>
<td>32</td>
</tr>
<tr>
<td>30-40</td>
<td>32.9%</td>
<td>24</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Depends on the size of vein, depends on brand of stockings, 20-30 better for some pts.&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

answered question 73
4. What amount (mm hg) of compression do you use for post-medical procedures?

<table>
<thead>
<tr>
<th>Response</th>
<th>Percent</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-20</td>
<td>3.9%</td>
<td>3</td>
</tr>
<tr>
<td>20-30</td>
<td>50.0%</td>
<td>38</td>
</tr>
<tr>
<td>30-40</td>
<td>48.7%</td>
<td>37</td>
</tr>
</tbody>
</table>

Non-elastic wrap only for mini phlebectomies, 7

answered question, 76

skipped question, 3
5. What type of compression do you use for the following:

<table>
<thead>
<tr>
<th></th>
<th>Knee high</th>
<th>Thigh high</th>
<th>Pantyhose</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cosmetic</td>
<td>19.4% (14)</td>
<td>84.7% (61)</td>
<td>45.8% (33)</td>
<td>72</td>
</tr>
<tr>
<td>Medical</td>
<td>13.5% (10)</td>
<td>86.5% (64)</td>
<td>40.5% (30)</td>
<td>74</td>
</tr>
</tbody>
</table>

answered question 77

skipped question 2
6. What type of reference did you use to set up your protocols for the questions above?

<table>
<thead>
<tr>
<th>Reference</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article by Weiss &amp; Goldman 1999</td>
<td>32.7%</td>
<td>16</td>
</tr>
<tr>
<td>Kern Study 2007</td>
<td>2.0%</td>
<td>1</td>
</tr>
<tr>
<td>Training facility for Phlebology</td>
<td>77.6%</td>
<td>38</td>
</tr>
</tbody>
</table>

Other (please specify)“:
*Changed as we treated pts and got better results with higher compression,*  
*We've been using compression since 1989. The experience has evolved over time, ACP guidelines”*  
*........*
“SOME compression is better than no compression”

“Compression of the lower limb can be provided by the use of hosiery, bandages, inelastic or elastic wrapping systems, and intermittent pneumatic compression; all offer clinical benefits over the use of no compression in the management of a range of lower leg circulatory problems.”

“Minimally invasive superficial venous surgeries, ablations and foam sclerotherapy procedures combined with effective compression for CVI and leg ulcers can heal them faster and with fewer recurrences. “

Mosti, et al. Vol. 23, No. 5 May 2011; WOUNDS 2011;23(5):126-134
Ted Hose are only 8-18 mm.

- These can only prevent pooling in bed rest patients. They do not work in ambulatory patients.

- The pressure is not great enough to overcome ambulatory venous pressures. This is particularly true in patients with venous disease. The same is true for prolonged sitting and standing.

- “TEDS are for Bed”
Class 1, 20-30mm Hg support hose

- Airline passengers without venous disease
- Patients without swelling
- Arterial compromised patients
- Some facilities use this strength for small telengectasias, post sclerotherapy
- Varicose veins of pregnancy
- Acute phase of deep vein thrombosis
Class 2, 30-40mm Hg

“30 mm Hg support stockings worn for 3 weeks post sclerotherapy has been researched in the United States and found to be not only effective for closing veins, immediately post injection, but also for better long term outcome.”

“23mmHg to 32mmHg for 3 weeks enhance the efficacy of sclerotherapy of leg telengectasias by improving clinical vessel disappearance.**

SO DO WE USE 20-30 or 30-40?


**Compression after sclerotherapy for telengectasias and reticualr veins: a randomized controlled study J Vascular Surgery, 2007;45:1212-16
Strong Compression vs. Lightweight?
30-40 mmHg vs. 20 mmHg
Telengectasias

“80mm Hg Compression pressure is required to produce a complete emptying of blood as the patient is standing” *

Compression is measured at the ankle

Compression at the thigh is only 40% to 74% of the ankle

20-30 mmHg are 10-18mm at the thigh

30-40 mmHg stockings are 16-31mm at the thigh

“We tried 2 pair 30-40 mmHg= 24-59 mm at the thigh”
Abandoned after study

Inflammation post treatment

- Inflammation post treatment may be the cause of matting and angiogenesis
- How do we control the inflammatory response?
- Compression has an anti-inflammatory action at the peri-venous space
We want to prevent this..

Trapped Blood leads to phlebitis–
Patient needs aspiration, anti-inflammatories and of course- Compression!
Possible causes of inflammation (phlebitis) and blood clots can be caused if:

- No compression has been applied.
- The applied compression has not been enough.
- You are on the contraceptive pill or hormone replacement therapy.
- There is an underlying tendency to clotting.
- The treatment has been performed just after long distance travel or a major operation.
- The underlying source of leakage in the vein has not been treated adequately.
- The inflammation extends to the deep veins, causing deep vein thrombosis (DVT).
WE want to prevent this...
Staining after sclerotherapy from lumps, bumps, inflammation
The causes of staining then are thought to be both in the technique of the sclerotherapy and the intrinsic qualities of the patient.

The factors related to the sclerotherapist are: vessel chosen, the solution, the concentration of the solution, the injection pressure exerted and the immediate post injection compression (both manually and then with support hose.)

The factors related to the patient are vessel depth, diameter, wall fragility, total body iron stores, altered iron transport mechanisms, histamine sensitivity or release, post treatment compression compliance and concurrent medicines.”

Post Sclerotherapy Hyper pigmentation: Can It Be Prevented? Kathy Melfy, BSN, RN Co- Chair ACP Nursing Section and Nick Morrison MD: ACP Vein line
Sclerotherapy is meant to cause endothelial destruction, resulting in inflammation and then closing down of the vein.

Staining is thought to develop as endothelial destruction, depending on its degree, allows for extravasation of RBCs through the damaged vessel wall: most likely in those vessels under significant gravitational pressure or injection pressure.

Resulting inflammation contributes to the ineffective digestion or hemolysis of iron blood products such as hemosiderin and ferritin.

“Sclerotherapy Treatment of Varicose and Telangiectatic Leg Veins by Dr.s M.Goldman, J.Bergan and J.J.Guex, and Vein Diagnosis and Treatment, a Comprehensive Approach by Drs R. Weiss, M. Weiss and C. Feied. “
Compression pads with visual sclero: 30% more pressure at site

*Increases compression at local injection site & minimizes bruising*
Obstacles for compression therapy!
So what do we do now?

Work within your patients tolerances

- If they can’t put on their 30-40mm stockings - teach with a Butler or various other application devices.

- If they won’t wear them, try two 15-20mm stockings, a different brand, or 20-30 mm - believing yourself that compression works; also helps the patients!

- Strive for a “low rate of discomfort claims” and a high rate of compliance
Consensus Document, Description #28

“A large majority see a necessity of compression after foam sclerotherapy in GSV, SSV, Tributaries, Recurrent VV, Perforating veins and Venous Vascular malformations.

There is a tendency for longer compression: 3-4 weeks and to the complete leg for GSV, SSV, Recurrent veins, and Venous vascular malformations.”
Compression after sclerotherapy for telangiectasias and reticular leg veins

**CONCLUSION:** Wearing compression stockings (23 to 32 mm Hg) for 3 weeks enhance the efficacy of sclerotherapy of leg telangiectasias by improving clinical vessel disappearance.

Publication Types: Randomized Controlled Trial

PMID: 17467226 [PubMed - indexed for MEDLINE]


Kern P, Ramelet AA, Wütschert R, Hayoz D. Department of Angiology, CHUV, Vevey, Switzerland. phkern@bluewin.ch
What do we use now?

How High?

- Thigh high or panty hose, 30-40 mm Hg for 3 weeks after any endovenous procedure, phlebectomy, USG Sclerotherapy, and Visual sclerotherapy that involves the leg above the knee.

- Knee high stockings, 30-40 mm Hg for 3 weeks after and USG or cosmetic, visual sclerotherapy involving only the lower legs
What do we all want to learn?

How to effectively close veins with long term outcomes

Can we meet the needs of our patients?

Can we achieve effective compression combined with patient comfort?
Our Compression Objectives:

- To determine the relative efficacy of compression following endovenous ablations and visual sclerotherapy
- Evaluate effects: strength of compression and duration of time in stockings post Rx.
- Determine its impact on general QOL in a prospective, randomized study
- Require outside observers evaluate photos taken of our patients
- Evaluate rate of complications
- Evaluate patients’ view of successful treatments
Custom Fit / Variants of Compression

Treatment options
Non Elastic Support

- Non stretch
- Legging
- Semi rigid
- Class III compression
- Donning ease
- Velcro
They ain’t your grandma’s stockings!

Graduated compression socks and hosiery come in fashionable fabrics, colors and styles.

You can find graduated compression in dress socks or casual socks, calf-length, thigh-high or pantyhose styles in sheer fabrics or opaque.

They are designed to fit into your everyday life and should be considered as “medicine for your legs”.

Newer high tech fabrics make graduated compression stockings easier to don than ever before.
For more information:

Email: Contact Terri: info@morrisonvein.com

Toll free 1-866- GRT- LEGS

Thank you for coming!
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San Leandro, California