

VOLUME 7 ISSUE 2 • SPRING 2014

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# Athletic Compression for the Athlete



by Gordon Gibbs, MD

**A common scenario at our clinic is for a physically fit male patient to be accompanied by his spouse. She is insistent that he address the large ropey varicosities in his legs: “They’re ugly and are getting worse!”**

**It’s not uncommon for this patient to be relatively asymptomatic with little that can appropriately be justified as lifestyle limiting symptoms. Our treatment algorithm naturally shifts toward conservative therapy. It is common for this patient to try compression stockings and say during a follow-up visit, “My legs don’t bother me at all, but they feel much better with the compression stockings on.” This contradictory response creates a situation where the endpoint in this patient’s care is sometimes difficult to find.**

As phlebologists, we want to rid him of his unsightly veins, and more importantly help him with any discomfort in his legs. We typically offer him traditional Class II medical grade graduated compression stockings. In our experience, this frequently creates a short-term solution where the patient is only briefly content and is not satisfied wearing stockings he feels are ugly or uncomfortable. To him, the socks aren’t much more appealing than his ugly varicose veins. We need to do better.

Fortunately there are a number of options that may serve as a better long-term solution for this type of patient. And recent medical research shows that there are more benefits to him than just mitigating symptoms of his venous reflux.

Athletic compression stockings with gradients of 18-24mmHg and 15-20mmHg calf height socks are available in a variety of colors, fabrics and manufacturers. Calf sleeves and tights, both of which stop at the ankle, provide a nice choice for hot summer days or for patients who have trouble donning stockings over their feet and ankles. All of these provide the same benefits of traditional compression garments and are free from the “medical” feel that many of our patients actively want to avoid. They look cooler and many patients feel better about wearing them. This psychological advantage translates into improved compliance.

Many athletic compression stockings are designed with fabric that is appropriate during or following exercise. Our patients comment that they don’t feel as hot and are more comfortable in the summer. The garments are meant to give and bend without impeding movement. I often ask, what would I want for myself? Indeed, I find myself wearing athletic compression socks and sleeves more often than traditional medical stockings. So for C2 and C3 patients where compliance is an issue, we may now offer our patients a variety of choices.

Research demonstrates improved venous return with graduated compression stockings by temporarily overcoming the effects of valvular reflux. There can also be improved arterial inflow by decreasing inflow resistance. Recent research also highlights some of the non-venous benefits that patients can expect. Benefits of compression are seen both during exercise and following exercise, with a majority of the data supporting benefits after exercise.

A study of 14 male recreational runners who ran a minimum of twice a week for 30 to 60 minutes while wearing compression stockings demonstrated a reduction in muscle soreness 24 hours after 10 km runs (Ali, 2007). These subjects wore the compression stockings only during the running period and did not wear them afterwards. Another study of 11 healthy subjects showed that wearing graduated compression after exercise, or the recovery period, significantly reduced muscle soreness after 48 hours (Davies, 2009). The effect was even more beneficial in female subjects. They found that these female subjects had evidence of increased muscle damage when they did not wear the compression stockings compared to when they did wear them.

Another study looked at cyclists wearing compression tights for 24 hours after a 40km ride (De Glanville, 2012). Mean power and performance time of riders were statistically improved on subsequent 40km rides after wearing the compression tights. Minimizing delayed onset muscle soreness has implications for athletes who are increasing their weekly mileage or are embarking on more rigorous training regimens.

Will compression stockings make you run faster? It depends who you ask. There have been several studies analyzing various aspects of athletic performance with compression stockings. Kemmler, 2009 showed a significant 2.1% improvement in maximum running speed in recreational and moderately trained athletes. Ali, 2011 failed to demonstrate any running performance change in 12 highly trained athletes who wore knee-high compression stockings during a 10 km run. This same study, however, did find improvement in the maintenance of leg power. Participants in this study were asked to perform squat-jumps before and after their 10 km run. Squat-jump height, or more specifically counter movement jump height, is a fairly accurate measurement of leg power. Results showed that the jump height increased 3.6% when wearing light compression, increased 4.9% when wearing medium compression, and decreased 8.5% when wearing a control stocking (no compression).

Compression stockings function by augmenting the calf muscle-pump by creating ideal pressure gradients and by physically supporting the limb involved. Improved structural support and compression to the involved muscle and joints

results in alignment of muscle fibers and facilitate clearing of inflammatory markers such as IL-6 (Kraemer, 2001). Preservation of muscle function, limiting edema formation and enhanced muscle regeneration are likely responsible for enhanced performance and reduction in delayed onset-muscle soreness. (French, 2008; Kraemer, 2001)

By giving our patients a choice and teaching them about the many benefits of compression therapy, we usually find they are more enthusiastic about making a stocking purchase. They are also pleasantly surprised at how many stocking choices we have for them and as a result, patient satisfaction has improved and compliance with stocking use is better. The bottom line: It has become much easier to prove to some of our more stoic patients how much better their legs should feel.

Benefits of wearing compression stockings during exercise:

- Reduces exercise induced muscle damage (EIMD)
- Equivocal performance improvement

Benefits of wearing compression stockings after exercise:

- Reduced lactate, creatine kinase (CK), and myoglobin – markers of muscle injury
- Less loss of muscle strength
- Limits edema formation
- Reduced delayed onset muscle soreness (DOMS)
- Decreased loss of joint range of motion
- Decreased perceived muscle soreness
- Quicker recovery
- Increased subsequent performance

Ali A, Creasy RH, Edge JA. The Effect of Graduated Compression Stockings on Running Performance. *J Strength Cond Res*. 25: 1385-1392, 2011.

Ali A, Caine MP, Snow BG. Graduated Compression Stockings: Physiological and Perceptual Responses During and After Exercise. *J Sports Sciences*. 25(4): 413-419, 2007.

De Glanville, Hamlin MJ. Positive Effect of Lower Body Compression Garments of Subsequent 40-km Cycling Time Trial Performance. *J Strength Cond Res* 26: 480-486, 2012.

Davies V, Thompson KG, Cooper S. The effects of compression garments on recovery. *J Strength Cond Res* 2009; 23(6): 1786-1794.

French DN et al. The effects of contrast bathing and compression therapy on muscular performance. *Med Sci Sports Exerc* 2008;40:1297-1306

Kemmler W et al. Effect of compression stockings on performance in men runners. *J Strength Cond Res* 2009;23:101-05.

Kraemer WJ et al. Influence of compression therapy on symptoms following soft tissue injury from maximal eccentric exercise. *J Orthop Sports Ther* 2001; 31:282-90.

Jakeman JR, Byrne C, Eston RG. Efficacy of lower limb compression and combined treatment of manual massage and lower limb compression on symptoms of EIMD in women. *J Strength Cond Res* 2010;24:3157-65. **V**