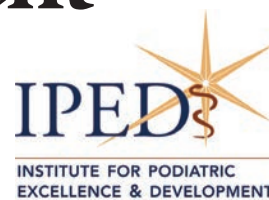




The Role of Compression Garments in Wound Care and Practice Management

Take advantage of new user-friendly compression garments.

BY ALEC HOCHSTEIN, DPM



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Compression therapy is “the recognized treatment of choice”¹ and “the mainstay of... management”² for venous leg ulcers, but its effectiveness depends on achieving optimal sub-bandage pressure. Maintaining the necessary pressure can be difficult, especially for patients or untrained home health workers and as a result, clinical outcomes of compression therapy have not been consistent. New technology in compression garments has removed some of the problematic variability, providing more stable outcomes for both patient and physician.

Therapeutic Action of Compression

As wrappings are tightened and the pressure underneath the skin increases, it has the effect of causing edematous fluid to re-enter the leg veins. The pressure counteracts the force of gravity and assists in drain-

age of blood and lymph fluids from the limb. Maintaining an appropriate pressure gradient also keeps the veins somewhat constricted, preventing blood from flowing backwards and creating congestion. Inadequate venous valve function results in chronic venous hypertension, and this in turn causes capillaries in the legs to develop abnormal permeability. Blood cells, fluids, and proteins are forced into the tissues, interfering with tissue oxygenation and creating conditions that lead to infection and ulcers.

Importance of Differential Diagnosis

Another impediment to optimal use of compression arises when practitioners lack confidence or training to assess the etiology of circulatory problems in the legs. A differential diagnosis is essential to distinguish between peripheral arterial disease (PAD) and chronic vascular insufficiency. Ulcers that result from ischemia can be worsened if they are mistakenly treated with compression. In PAD, tissue damage results from insufficient blood flow to the legs, rather than from the increased venous pressure and impaired drainage that characterize venous ulcers. If compression is used in cases of PAD, the already meager arterial blood supply is further compromised and serious damage can result.

Differentiating between ischemic ulcers and venous ulcers depends partly on knowledgeable clinical obser-

vation, but the most definitive testing method is a comparison of the respective blood pressure in legs and arms. This test, called the ankle-brachial index, or ABI, compares systolic blood pressure in the ankle and arm. The ratio of ankle to arm pressure in a healthy person is between 1.0 and 1.4. If this ratio is less than .9, it indicates the presence of arterial blockage. If it is .5 or lower, the condition is serious. Any ratio below 1.0, then, would be a strong contraindication for compression therapy. Septic phlebitis is also a crucial differential diagnosis, because using compression in the presence of infection in a vein can be life-threatening. It is important to note that some patients present with a combination of venous and arterial disease, and compression must be prescribed only when the practitioner can be confident that the wound being treated results from venous insufficiency.

Options for Compression

Communicating and utilizing the right vocabulary for compression bandages and garments has itself been a point of some deliberation. In 2008, *Dermatological Surgery*³ convened a meeting of physicians and manufacturers to clarify and standardize terminology for these therapies. At that meeting, the variables that were agreed on include pressure, layers, components, and elastic properties (making the mnemonic PLaCE).

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A research review published in May 2017 in the *Journal of Clinical Nursing*⁴ found that mixed-component compression bandages (those containing both elastic and inelastic components) proved to be the most effective in treating venous ulcers. That study did not take into account the skill of the person applying the item, but the authors do add the caveat that skill and training can be a determining factor in the efficacy of compression. In accordance with the advice given in the research review, it's advisable to use a compression garment that comes in different sizes and uses multiple closures in order to achieve the therapeutic pressure range. Sub-bandage pressure, while therapeutically essential, is rarely measured in real-life clinical practice—so it makes sense for the practitioner to place trust in an effective design.

Optimal Pressure and the Crisis in Technique

Judging the amount of sub-bandage pressure applied by any given bandage is not a simple matter even in ideal circumstances. Tests done⁵ in laboratory settings with artificial limbs find that variations in the radius of curvature around the circumference of a limb can result in large variations of pressure in different locations. The ability of a given fabric to maintain its elastomeric qualities also varies widely. When individual skill and training levels are added to these technical variables, especially when patients' quality of life depends on their ability to apply and remove bandages at home, it's not surprising that the effectiveness of compression can decrease sharply.

*JAMA Dermatology*⁶ published a cross-sectional study to establish whether home-care nurses were regularly able to apply and maintain therapeutic levels of sub-bandage pressure for their patients with leg ulcers. The study considered the nature of different bandaging products, as well as the experience and education levels of the practitioners. Given the fact that the optimum sub-bandage pressure is 30 to 50 mm Hg, it's worth noting that the bandage pressures as applied in

real-life situations turned out to range from 11 to 80 mm Hg. Only 63 percent of the nurses applying a two-component bandage were able to achieve pressures in this therapeutic range, and the percentage decreased to 41 percent for those using single-component elastic bandages. Using inelastic bandages alone resulted in 40 percent achieving the required pressure levels. In those cases, where the pressure failed to achieve optimal levels, the largest number of nurses applied the bandages too lightly. The journal's conclusion is that training programs should be implemented to aid nurses in improving their techniques of bandaging application.

The Promise of Compression Therapy is Compelling

The *Indian Journal of Plastic Surgery*⁷ highlights the exceptional effectiveness of compression therapy. The authors review two cases in which chronic leg ulcers due to multiple (non-arterial) causes yielded to compression therapy after all other forms of treatment had failed. In one case, the morbidly obese patient presented with an acute case of cellulitis in addition to recurrent lymphangitis. This combination had resulted in non-healing ulcers near the ankle and on the calf. The patient himself was instructed in the proper bandaging method, and after three months, his ulcers were entirely healed. A second case concerned post-traumatic ulcers which initially developed beneath a plaster cast, which was treating multiple fractures acquired in an automobile accident. In this case as well, multilayer bandaging and compression therapy resulted in the patient experiencing marked improvement.

The article's authors state that compression therapy should remain the treatment of choice for chronic leg and foot ulcers. They acknowledge that historically, compression therapy has not been notably effective, but they attribute this to the lack of adequate practitioner training. They make the point that new technology in constructing bandaging materials holds the promise of making compression therapy more viable, although they also point out the importance of adequate training as well.

More Effective Compression Garments Improve Patient Quality of Life

One of the roles of technology in society is to remove the need for expertise in manipulating tools or devices—in other words, to make the things we interact with more “user-friendly.” This applies to medical equipment as well, especially those items that may be handled by auxiliary caregivers, family members, or by patients themselves. When a compression garment is constructed in such a way as to provide the necessary gradient of therapeutic sub-bandage pressure, even when applied by a patient or caregiver who has received only basic consumer training, the patient's quality of life is improved.

The Extremity-Ease compression garment is an example of this new, user-friendly technology. It comes in 10 different ready-to-wear sizes, with a combination of elastic and non-elastic laminate materials, soft cushioning foam, zipper, and bungees that make it straightforward to establish and maintain therapeutic pressure. This unique combination of elastic and non-elastic materials follows the suggestions made by the cited research articles, and the unique closures are easy for patients to learn to put on for themselves.

Insurance Coverage Increases Patient Well-Being

The positive outcomes from sophisticated compression technology are recognized by insurers, making these compression garments cost-effective for both patient and provider. Aetna, for example, quotes research noting that this type of multi-component compression garment is proven effective for a wide range of complications from chronic venous insufficiency. In addition to being classified as medically necessary for venous stasis ulcers, Extremity-Ease garments are approved by Aetna for use in conditions of edema from various causes as well as post-thrombotic syndrome and prevention of thrombosis. These garments are classified differently than are over-the-counter elastic stockings or post-surgical leggings, and are treated as necessary medical items.

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Similarly, unlike consumable over-the-counter products, Extremity-Ease has been given Healthcare Common Procedure Coding System (HCPCS) codes for Medicare billing as Durable Medical Equipment. When billing Medicare, it's important to check on the fine print, such as the fact that practitioners cannot distribute more than one month's supply of compression garments at one time. Furthermore, the wound must have required either debridement or surgery prior to prescribing compression therapy. Also, the garment cannot be paid for under Medicare if it is being used in the absence of an open wound.

Practice Management Benefits of Office Dispensed Devices

Despite the ever-increasing complexity of Medicare compliance rules, it is still a worthwhile endeavor for podiatrists to make themselves familiar with the documentation needed for a durable medical equipment (DME) program. Along with ancillary services such as physical therapy and cosmetic treatments, dispensing prescribed devices is another way of strengthening a podiatric medicine practice. Today's medical environment is so confusing and stressful for patients that the fastest way to build their trust is by making their experience more simple and personal.

In a roundtable discussion published in *Podiatry Management*,⁸ the participating physicians noted that dispensing devices in-office results in improved patient compliance. When patients are sent elsewhere for device purchase, they frequently "forget" to fill their prescriptions (sometimes due to uncertainty about insurance coverage), or they return for a follow-up visit with the wrong item altogether. The entire step of having to go to a different provider to fill the prescription often means that the patient receives no instruction regarding how to use the item, and valuable therapeutic time may be lost. As the research cited earlier notes, compression therapy cannot be effective when the sub-bandage pressure is inadequate. The podiatrists in the roundtable discussion also agreed that patients appreciate

having individual brands handpicked by their own doctor, and there was general agreement that offering only one item of each kind makes life simpler and less stressful for patients. This also allows each practice to choose devices that are of higher quality than the patient might find at a local store, thus enabling better outcomes.

Even though the documentation rules for DME programs are a bit complex, they can largely be streamlined simply by having a set of pre-printed materials ready. These include patient acknowledgment forms, templates with diagnostic codes already listed for selection, and office staff ready to scan the forms so that patients can leave with their copies in hand.

Maintaining a sustainable practice requires an awareness of evolving technology and an agile willingness to adopt new clinical approaches. The options for wound care are better than they have ever been, due to a new generation of compression garments. Dispensing these garments directly to your patients enables you to achieve optimum outcomes in the health of your patients as well as your practice. **PM**

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Weblinks

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