



## **Use of Intermittent Pneumatic Compression in Management of Venous Disease**

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Lower extremity venous disease, also known as chronic venous insufficiency and chronic venous disorders, encompasses a broad spectrum of functional abnormalities of the venous system. The severity of chronic venous insufficiency can range from spider veins and edema to more complicated findings like lip dermatosclerosis, hemosiderin staining, brawny edema and venous leg ulcers.

Venous leg ulcers are wounds located below the knee that are difficult to treat due to the nature of controlling edema and the result of chronic venous insufficiency and lymphedema. A 2014 study published in the *Journal of Vascular Surgery* found that 80% to 90% of all leg ulcers are venous leg ulcers and that 1% of people will develop a venous leg ulcer in their lifetime. A 2016 *Journal of Wound, Ostomy, and Continence Nursing* study found that venous leg ulcers affect 4% of adults 65 years or older; and ulcers in this Medicare population account for 90% of all leg ulcers. Ninety-seven percent of patients with venous leg ulcers experience prolonged healing and often will develop recurrent leg ulcers, according to the study.

The venous leg ulcer population represents a significant economic burden to the health care system. A 2014 study found that vascular leg ulcer patients had increased inpatient stays, emergency department visits and home health care days. They incurred additional annual incremental medical costs as well. The total economic burden of venous leg ulcers was found to be \$14.9 billion annually. Venous leg ulcer patients had 77% more hospitalizations, 50% more emergency room visits and 27% more physician office visits.

### **Edema Management:**

Management of edema is a challenge in the majority of these patients who have fluid accumulation in the extra-vascular space. Traditional diuretics are only minimally effective in reducing this chronic edema. Intermittent pneumatic compression devices work to improve overall circulation and to move the fluid into the intra-vascular space. Compression can produce positive hemodynamic effects in patients with chronic leg ulcers, which leads to improved healing rates in patients with venous leg ulcers.

### **Non-Surgical Management:**

The gold standard of treatment for venous leg ulcers is multi-layered compression bandaging (Unna boots) with 30 to 40 millimeters of mercury (mmHg) at the ankle. Advanced wound dressings are placed beneath the bandaging to address the wound characteristics. Correctly

applied compression is the foundation of venous leg ulcers treatment and has shown improved healing rates and outcomes in patients who are compliant with properly applied multi-layer bandaging.

However, chronic disease management fatigue takes a toll in this patient population. A number of patients who need compression, or who require higher levels of compression, fail to utilize it for many reasons. Standard of care multi-layered compression dressings unfortunately may be fraught with issues - pain, discomfort and exudate can cause poor patient compliance or the application of less than the desired 30 to 40 mmHg compression at the ankle. Patients have reduced strength and difficulty applying their hosiery or reusable Velcro type of compression. Once a patient needs compression, it becomes a lifelong challenge to manage.

A 2020 study found that the use of intermittent pneumatic compression in addition to Unna boots therapy has been shown to improve circulation to lower extremity wounds, thus decreasing pain and edema and improving healing rates and patient outcomes. Intermittent pneumatic compression is not routinely utilized in every wound care clinic. In June 2022, the Wound Ostomy and Continence Nurses Society (WOCN) updated a consensus on venous leg ulcers. The document summarizes the data for venous leg ulcers management and provides a decision tree that recommends intermittent pneumatic compression be used in addition to standard of care therapy to increase circulation, decrease pain and edema and improve wound healing for venous leg ulcers.

Intermittent pneumatic compression can be a game changer for patients with venous leg ulcers. Improving blood flow to wounds is imperative for healing. The use of intermittent pneumatic compression can improve wound healing to lower extremity ulcers two times faster than use of just standard of care alone.

Chronic venous insufficiency and lymphedema are difficult disease processes to manage from both the patient and clinician perspective. Pain, increased exudate and discomfort are barriers to management of venous leg ulcers with standard of care (Unna boot) therapy alone. Intermittent pneumatic compression should be a non-invasive addition to the treatment plan. Getting Intermittent pneumatic compression on patients with venous leg ulcers early in the disease process improves healing rates, decreases pain and edema, decreases costs associated with venous leg ulcers, decreases the burden to health care and enhances patient quality of life.