

## Critical Appraisal Topic

### Compression with Venous Leg Ulcers

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**Clinical Scenario:** A 91 year old, diabetic patient being treated for venous leg ulcerations. Treatment has included wound culture and sensitivities with multiple antibiotic therapies to treat underlying infection. Patient is currently wrapping her legs with ACE wraps to promote venous compression and ulceration healing. Leg swelling has decreased, but ulcer healing is currently not improving.

**Clinical Question:** In the diabetic patient with venous ulcers is there a compression bandage or stocking system that is the most effective in promoting venous ulcer healing?

#### **Articles:**

Coleridge-Smith, P. (2009). Leg ulcer treatment. *Journal of Vascular Surgery*, 49(3), 804-808.

doi:10.1010/j.jvs.2009.01.003

O'Meara, S., Cullum, N., & Nelson, E. (2009). Compression for venous leg ulcers. *Cochrane Database of*

*Systematic Reviews*, (1). doi:10.1002/14651858.CD000265.pub2

#### **Critical Review of Key Points:**

- I. Are the results valid?

Coleridge-Smith, (2009) completed a review of literature in PubMed and Cochrane Database evaluating the effect of compression on venous ulceration healing (also included effects of surgical intervention and drug treatment). The data search included a multitude of compression treatments, surgical treatment including saphenous stripping, and pharmacologic treatment. In evaluation of this literature review concentration was placed on effects of different compression devices as the main result. The results are validated by a large consensus of patients and studies, with outlined inclusion criteria. A table identifies for the first systematic review included 174 articles with 2,548 patients. The second systematic review included 7 randomized control trials' (RCTs), with inclusion of 367 patients.

O'Meara, Cullum, & Nelson (2009) completed a systematic review of literature of all randomized controlled trials (RCTs) that investigated the effectiveness of single versus multi-component compression systems in the treatment of venous leg ulcerations. They also reviewed data for evidence of rapid venous ulceration healing with versus without. Data was summarized using a data extraction table reviewed by one review author, verified independently by a second author. 47 comparisons were included from 39 RCTs; trials had reported an objective measure of ulcer healing. Secondary outcomes of the review of literature included ulcer recurrence, costs, quality of life, pain, adverse events, and withdrawal from study.

## II. What are the results?

O'Meara et al. (2009) identified a relation in the review of literature that the use of compression increased the rates of ulcer healing compared to the alternative, no compression; seven RCTs identified reasonable evidence to support this statement. 3 trials involving two compression components and 4 trials with three compression components suggested improved outcomes when an elastic component was included. O'Meara et al. (2009), concluding that use of multi-component

systems rather than single-component systems is more effective. Lacking strength in the specific components that are effective, assumptions cannot be made that all multi-components are of the same effectiveness. Evidence also identified that the additional use of an elastic bandage along with the multi-component system is more effective than those composed of mainly inelastic constituents. The comparison of the difference in effectiveness between the adjustable compression boot and compression bandages in two trials (O'Meara et al., 2009). There was a possible conclusion that stockings could be associated with less pain than the bandages, but due to the small implication of this specific data there is further evaluation needed. The data in this review of literature is limited due to the small groups that compared effectiveness of similar components, strong evidence conclusions are unable to be concluded. There is a need for more evidence comparing specific components linearly within a larger population study.

Coleridge-Smith (2009) identified the efficacy of compression (bandaging or stockings) in the healing of leg ulcers (Level 1A Evidence). In the systematic review of 174 articles including 2,548 patients compression bandaging was noted to be effective (Level 1A evidence) as well as strong compression hosiery, 30-40 mmHg (Level 1B evidence). Evidence also indicated that compression hosiery (30-40 mm Hg) prevents recurrence of ulceration after healing (Level 1A Evidence).

Coleridge-Smith (2009) also identified in the systematic review of 7 RCTs including 367 patients that the use of intermittent pneumatic compression may improve healing versus no compression, with no noted level of evidence. This group of RCTs was unable to conclude sufficient data to support either bandaging or stocking compression devices or specific components. This study reviewed two large patient population groups. A weakness noted in this study is the gap in evidence with the comparison of specific compression devices. An appropriate future research question would investigate specific components against one another noting the difference in effectiveness in healing

venous ulcers. This study supports the unwritten hypothesis that compression promotes healing in venous ulcers.

III. Will the results help me in caring for my patients?

There is sufficient data with an appropriate level of evidence (Level 1A & Level 1B) to support the use of compression to promote venous ulcer healing. The data is limited in the support of one compression system over another, although conclusion was made to support multi-component compression versus single component (O'Meara et al., 2009). In clinical practice unless otherwise contraindicated, patients at risk for venous ulcers or those with venous stasis should be prescribed a compression stocking or bandage to promote ulcer healing or prevention of ulcer formation. In this case of my 91 year old diabetic patient, consideration into a multi-component compression system that will offer a cost-effective approach which she can effectively use will be priority.