

# Compression Bulletin 30

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Members of the European Society for Vascular Surgery and several relevant experts formed a writing committee to create guidelines to promote a standard of care in the diagnosis and treatment of patients with chronic venous disease (CVD). This summary will focus on the recommendations for the use of compression therapy. The authors conclude that compression therapy remains the cornerstone of conservative treatment due to its ease of use, non-invasive nature and efficacy in managing venous hypertension.

## **Compression therapy: Scientific background and practical applications**

This study aimed to assess healthcare providers in Germany for their current knowledge and use of compression bandages. Despite the introduction in Germany of multi-component systems and ulcer stocking systems over 10 years ago, their use in practice is limited. The authors conclude that bringing the level of care in practice in line with scientific research is essential for the effective treatment of venous leg ulcers and improving patient quality of life.

## **A study of leg edema in immobile patients**

This study aimed to examine the pathophysiology of leg edema in patients who are immobile, but not bedridden, and review effective treatment options. The analysis of immobile patients with leg edema shows that calf muscle pump failure can cause CVI, and that the calf muscle dysfunction in these patients is due to their immobility, rather than any functional problem.

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## Editor's choice – Management of chronic venous disease: Clinical practice guidelines of the European Society for Vascular Surgery (ESVS)

*Eur J Vasc Endovasc Surg* 2015;49:678–737

### Aim

Members of the European Society for Vascular Surgery and several relevant experts formed a writing committee to create guidelines to promote a standard of care in the diagnosis and treatment of patients with chronic venous disease (CVD). This summary will focus on the recommendations for the use of compression therapy.

### Methods

To collate the scientific evidence, a literature search of PubMed, Embase, Cinahl, and the Cochrane Library up to January 1, 2013 was performed. Studies were then reviewed by the committee and selected for inclusion.

The guidelines are categorised based on the European Society of Cardiology grading system. For each recommendation, the letter A, B, or C marks the level of current evidence; where A is several randomized clinical trials or meta-analyses, B is a consensus derived from a single randomized study or several large non-randomized studies and C is expert opinion. Based on the level of evidence and expert opinion, every recommendation is subsequently marked as either Class I, IIa, IIb, or III; where Class I is evidence and/or consensus that the treatment is beneficial, useful, effective, Class IIa is where weight of evidence

is in favor of usefulness and Class IIb is where usefulness is less well established.

For patients with CVD without ulceration (C0-C4) the authors highlight that there are issues around stocking use, including difficulty in donning, suboptimal compliance and contraindications. However, the conclusion is that compression stockings do improve symptoms and quality of life.

They give the following recommendations:

**Recommendation 23:** Elastic stockings are recommended as an effective treatment modality for symptoms and signs of chronic venous disease. (Evidence IB)

**Recommendation 24:** Temporary use of elastic stockings may be considered in patients with chronic venous disease awaiting further investigation, and as a definite treatment in patients who are not managed by invasive methods. (Evidence IIbC)

When venous ulceration is present (C5-C6), compression bandages have been shown to improve healing rate compared to standard care without compression. However, further studies are needed to determine superior efficacy amongst the compression

systems currently available. Until then it is recommended that the therapy with which the person applying the compression is most familiar with should be used initially. Compression therapy is also vital in preventing ulcer recurrence, with high compression the most beneficial. However, this raises difficulties with compliance. Ongoing prevention of recurrence has been shown to be greater with surgery and compression therapy compared with compression alone in patients with medial and/or recurrent ulceration.

The guidelines recommend:

**Recommendation 25:** Compression bandages and walking exercises are recommended as the initial treatment modality to promote healing in patients with venous leg ulcers. (Evidence IA)

**Recommendation 26:** The use of high compression pressures of at least 40mmHg at the ankle level should be considered, to promote ulcer healing. (Evidence IIaB)

**Recommendation 27:** Compression with elastic or non-elastic bandages or other compression devices is recommended as the initial treatment modality for venous leg ulcers; however, the possibility of an active venous intervention should be explored and offered to maintain healing. (Evidence IB)

Although intermittent pneumatic compression has been shown to be effective in treating venous ulcers in patients not using compression, further studies as to its benefits in conjunction with various compression systems are needed.

The guidelines recommend:

**Recommendation 28:** Intermittent pneumatic compression is recommended to provide symptomatic relief in patients with chronic venous disease (C3-C6) if standard methods are not indicated or if they have failed. (Evidence IA)

**Recommendation 29:** Intermittent pneumatic compression should be considered in patients with venous ulcers after a 6 month treatment course when standard methods have failed. (Evidence IIaB)

Compression therapy after surgery has been shown to reduce post-operative pain, leg volume and complications, but the type (full length or knee length) and the duration of therapy needs to be established.

**Recommendation 30:** Post-procedural compression is recommended after superficial venous surgery, endovenous truncal ablation, and sclerotherapy. (Evidence IA)

### Conclusion

Despite developments in other areas of CVD management/treatment, the authors conclude that compression therapy remains the cornerstone of conservative treatment due to its ease of use, non-invasive nature and efficacy in managing venous hypertension. However, further studies are needed to clarify the efficacy of particular compression systems in varying situations.

### Comment of the Editors

These European guidelines by the ESVS concerning diagnosis and treatment of chronic venous diseases are very important as they give a European standard in this condition. One of the limitations is that the literature search ended in January 2013, thus missing a number of interesting recent publications.

The authors recommend elastic stockings as an effective treatment modality for symptoms and signs of chronic venous disease with a IB evidence. Therefore, the low level of the next recommendation which recommends temporary use of elastic stockings in patients with chronic venous disease awaiting further investigation, and as a definite treatment in patients who are not managed by invasive methods with a IIbC evidence, is hard to understand. It may be true that invasive treatment to correct haemodynamic pathologies should be preferred where possible but in those where this kind of treatment is not suitable, compression stockings are the best choice.

For venous ulcer patients the guideline only recommends compression bandages and intermittent compression at a high level of evidence. However, two layer ulcer compression stockings have demonstrated a very good effectivity in big randomized studies at least in moderate ulcer sizes. (Ashby RL, Gabe R, Ali S, Adderley U, Bland JM, Cullum NA et al: Clinical and cost-effectiveness of compression hosiery versus compression bandages in the treatment of venous leg ulcers (Venous leg Ulcer Study IV, VenUS IV): a randomised controlled trial Lancet 2014;383:871-79).

Also, the duration of postinterventional compression has been studied in several recent papers, showing a benefit especially during the first postinterventional week.

During the last 3 years many good scientific studies have added to our knowledge in diagnosis and treatment of chronic venous diseases. This is also true for compression treatment. This should be considered in an update of this recent guideline.

Protz K, Heyer K, Dörler M, Stücker M, Hampel-Kalthoff C, Augustin M

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## Compression therapy: Scientific background and practical applications

*J Dtsch Dermatol Ges.* 2014;12(9):794–801

### **Aim**

The importance of compression bandages for the treatment of venous leg ulcers is well known, and getting the application and pressure correct is vital. This study aimed to assess healthcare providers in Germany for their current knowledge and use of compression bandages.

### **Methods**

Whilst attending seminars on compression therapy or venous leg ulcers, nurses, medical staff, doctors and physical therapists were recruited for the study. A standardized questionnaire was used to assess participants' knowledge and use of compression therapy, including questions on padding, multi-component compression and ulcer stocking systems, and target pressure for treating venous leg ulcers.

To evaluate practical ability, participants applied bandages using a modified Sigg technique to a target of 50–60 mmHg, and the resting pressure under the bandage was measured using a Pico-Press probe. In 63 cases the resting pressure was also measured after dorsiflexion of the toes was performed four times.

### **Results**

Over the course of 41 seminars, 891 participants were assessed, the majority of whom were nurses (90.7%). Short-stretch bandages were applied for the practical test by 551 participants.

The questionnaire revealed that knowledge of multi-component systems, ulcer stocking systems and padding was poor, with 85–88% unfamiliar with any of the systems. Of those who were aware of the systems, 50% said they were only used occasionally due to their high cost. However, participants who knew about ulcer stockings used them regularly as they are approved for use and therefore don't affect budgets, are considered comfortable, do not slip, and allow the patient to wear normal shoes. When asked about target pressure for treating venous leg ulcers, 87.3% did not respond. The majority also replied that padding was not prescribed with short-stretch bandages (72.95%).

Of the 551 bandages applied, only 51 (9.3%) achieved the target pressure between 50-60 mmHg. 77% achieved pressures below 50 mmHg, whilst 13.7% applied a higher pressure, with a range of 6-143 mmHg. In the cases where dorsiflexion was performed, average resting pressure was 44 mmHg with an average, significant drop to 37.8 mmHg after dorsiflexion.

### **Conclusion**

Despite the introduction in Germany of multi-component systems and ulcer stocking systems over 10 years ago, their use in practice is limited. Bringing the level of care in practice in line with scientific research is essential for the effective treatment of venous leg ulcers and improving patient quality of life. The authors conclude that healthcare providers using compression therapy should be obliged to practice application to achieve the desired pressure.

### **Comment of the Editors**

This study shows the poor knowledge of healthcare providers concerning compression therapy. Considering that compression is the basic tool in the treatment of chronic venous and chronic lymphatic diseases, the knowledge of different compression systems and the ability to apply bandages and stockings with the correct pressure are essential. Like in drug treatment, also compression has a dosage which may differ from indication to indication and is essential for the success of compression treatment. The study demonstrated that the ability to apply a bandage with the correct pressure is poor. For many indications compression stockings can be a good alternative. This is also true for uncomplicated venous leg ulcers where special two-component ulcer stockings are available. However, more than 80% of the health care providers taking part in this study were unfamiliar with these

systems. Following these results, it seems mandatory to improve teaching of compression principles in the education of all health care professions including practical demonstrations and hands-on courses.

## A study of leg edema in immobile patients

*Circ J 2014;78:1733–1739*

### **Aim**

The aim of this study was to examine the pathophysiology of leg edema in patients who are immobile, but not bedridden, and review effective treatment options.

### **Methods**

This retrospective study included 30 patients with leg edema with or without skin lesions who had severe gait disturbance, no significant venous abnormalities detected by duplex ultrasound and no systemic diseases that could cause leg edema.

Duplex venous and subcutaneous ultrasonography was performed on the first visit. Lymphangioscintigraphy (LAS) and air plethysmography (APG) were carried out whenever possible. Patients were

prescribed compression therapy and physical therapy to strengthen the calf muscle and improve ankle range of motion (AROM). Elastic bandages delivering an interface pressure of > 30 mmHg and a static stiffness index of > 10 mmHg were used initially. Depending on symptoms or compliance, knee-high stockings delivering 30–40 mmHg were used as an alternative.

### **Results**

Patients had a median age of 75 years and a mean BMI of 26.3 kg/m<sup>2</sup>. 60% of patients were wheelchair-bound and the remainder walked with the aid of crutches or frames. Only 1 patient had unilateral lower limb edema. Symptoms of advanced chronic venous insufficiency, CEAP C4–6, were observed in 51% of legs.

The AROM and calf/ankle circumference was well-maintained in these patients, with an AROM less than 20 in only 5% of legs. In the 15 patients able to complete APG, the mean venous filling index (VFI) and residual volume fraction (RVF) were mildly elevated while the leaving ejection fraction (EF) was normal.

Compression therapy significantly reduced calf and ankle circumferences (calf: 37.4 ± 5.4cm vs 35.2 ± 4.5cm, P = 0.001, ankle: 25.5 ± 3.1cm vs 23.6 ± 2.6cm, P = 0.001). All cases of stasis dermatitis and acute lipodermatosclerosis resolved within 2 weeks of treatment and erosions in macerated skin healed within 18–33 days (n = 6). Ulcers in patients with chronic lipodermatosclerosis required a median of 165 days to heal.

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**Conclusions**

This analysis of immobile patients with leg edema shows that calf muscle pump failure can cause CVI, and that the calf muscle dysfunction in these patients is due to their immobility, rather than any functional problem. Importantly, the LAS showed that these patients did not suffer from lymphedema, a common misdiagnosis in immobile patients. However, as only 4 patients completed the full study (LAS, APG and venous duplex scan) the authors are unable to conclude with complete certainty that leg edema in immobile patients is not related to anatomical abnormalities of the venous or lymphatic system.

However, they do highlight the importance of awareness among physicians that leg edema of unknown cause could be related to venous stasis, especially in patients with gait disturbance, and that compression therapy is effective, without the need for prescription medication.

**Comment of the Editors**

In this paper the authors focus on the clinical entity of leg edema caused by immobility and show that compression therapy is the most appropriate treatment modality. Diuretics frequently prescribed in such patients may be counterproductive, especially in the long term run, since they may perpetuate leg

swelling. Passive movement of the ankle joint performed by physical therapists or by relatives of the patient may promote edema reduction by compression.

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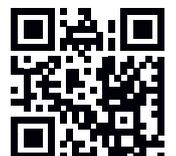
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