

Are short-stretch bandages better than long-stretch?

Compression therapy is the mainstay of treatment for venous ulcers and the following debate highlights some of the key questions posed by specialist clinicians and their generalist colleagues. The points raised by the authors underscore the fact that there are no easy answers and maybe that is actually the point — that there is no right answer as such.

The debate clearly reflects the EWMA Position Document on *Understanding Compression Therapy (2003)*. What this discussion draws attention to is the need for clinicians to know their bandages; their properties, the effect they have on the limb (on their own or layered) and the opportunities and challenges they provide for the patients. It is essential that specialist practitioners understand these key elements if they are to enable people to tolerate a difficult therapy (Hopkins and Worboys, 2005) and to provide a rationale for their choice of bandage. As footwear is a major issue for patients with venous ulcers (Hareendran et al, 2005) this needs to be accounted for when choosing therapy. As our skills and technology improve, hopefully this will be a diminishing problem.

This debate reveals that there is a lot of common ground and that each type of compression bandage has its merits. Practitioners should not be prescriptive and this is emphasised in the discussion on wear time. It is hoped that this debate will contribute to a more flexible approach to compression bandage therapy. AH

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Is there any evidence that short-stretch bandages are different to long-stretch bandages in terms of healing rates?

CA: It is always going to be difficult to prove one therapy is more effective than another in terms of healing rates. Each patient is different and each clinician applies bandages in a different way. Sub-bandage pressures are not only difficult to measure but are hugely variable. Short-stretch and long-stretch bandages are proven to heal venous leg ulcers (Moffatt, 1992) but perform in different ways and are used for a wide variety of different reasons. The new clinical practice guidelines for the management of patients with venous leg ulcers (RCN, 2006) state that no real difference in healing rates between the two systems has been found, following a review of recent literature.

HC: The comparison of short-stretch bandages with long-stretch in terms of healing rates needs to consider the types of bandage material and the actual application of the bandages. Several new compression materials and textile weaving techniques have been recently introduced. These introductions have made the differentiation between 'elastic' or long-stretch from 'inelastic' or short-stretch bandages more difficult. In addition, when more layers of an elastic bandage material are applied, the effect is to decrease the overall elasticity. Multi-layer application tends to reflect the properties that are similar to those of an inelastic short-stretch bandage. Additional layers of bandage material bind the application so there is less scope for bandage expansion. Partsch (2005) has explained this with the stiffness index or rigidity of a bandage system.

When a long-stretch bandage is applied at less than full stretch, the force produced by the action of the calf muscle as it expands will stretch the bandage, thereby losing some of its therapeutic pressure. It is vital that long-stretch bandages are not applied at full stretch because the resulting high pressure can cause serious damage to the circulation in the limb (this caution is noted in the manufacturers' instructions). Short-stretch bandages are applied at full stretch. Full stretch can be recognised when the bandage 'locks out'. The bandage does not expand when the calf muscle expands, therefore the muscle's force is directed back into the leg and not wasted by expanding the bandage.

There is no great difference in the healing rates between the two systems. Research supports the concept of bandage stiffness or the rigidity of the multi-layer systems, which would explain the similarity of healing rates between the two types of bandages. Therefore, it would be interesting to investigate not only healing rates but healing rates in terms of the number of bandage layers and the type of bandaging technique used, e.g. spiral, figure of eight, Pütter and St. Charles. Certainly a full holistic assessment must be carried out before any form of compression bandaging is introduced. This needs to include Doppler assessment in order to determine the resting ankle brachial pressure index.

Can both type of bandage be applied safely by health care assistants (HCAs) and spouses/carers with minimal training?

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underlying aetiology of leg ulceration and the ability to identify risk factors and deterioration. Neither group have this depth of knowledge and this may need to be addressed with adequate competency-based training for HCAs and better training and support for family and carers.

HC: Only a trained and competent practitioner should apply compression bandages. This is particularly important for long-stretch bandages and is noted with caution by their manufacturers. Excessive pressure can restrict arterial blood flow and insufficient pressure does not aid venous return. Successful training is dependent on the individual skills of the learner but supervision and support are essential aspects for any training programme. Research has shown that practice nurses managing people with leg ulcers typically receive only two hours training or less on the assessment and management of the condition (Schofield and Flanagan, 2000). It has been documented that inexperienced nurses or those without adequate training with compression bandaging may apply bandages at widely varying pressures. In our clinical practice, HCAs do not apply compression bandages but we have taught some spouses/carers how to bandage. In these situations close supervision and support are always given. This might be done when the patient is unable to get professional and trained care, e.g. an extended holiday.

Short-stretch bandages do not dictate the forced 7-day wear time, thus enabling frequent wound assessment and reducing the likelihood of strike through. Is this an advantage?

CA: No products should enforce a certain wear time. Many venous leg ulcers when initially assessed and when

compression begins, require more frequent changes until the venous hypertension is reversed and the levels of exudate subsides.

Each patient should be assessed on an individual basis and consultation with the patient and the compression system chosen should reflect this. If a wound requires more frequent observation, the choice of dressings and compression therapy should reflect this and the reasons should be documented after a full assessment. All too often we stick rigidly to what the manufacturers tell us, what we read and what our peers say. However, decision-making should be based on sound clinical judgement and individual patient assessment.

HC: Short-stretch compression bandaging applied at full stretch acts to reflect the calf muscle force back into the leg, thereby producing an intermittent massage effect. This reduces oedema more rapidly than a bandage that expands when the calf muscle is active. I have regularly seen cases at the leg ulcer clinic where there has been leg circumference reduction of 2.0–2.5cm in 24 hours. This means that the bandage needs to be re-applied after 24 hours to maintain therapeutic compression.

The frequency of re-application of the bandage depends on the amount of oedema reduction, wound and skin condition, and patient comfort. Bandage re-application is necessary when the leg circumference is reduced, otherwise the bandage will tend to slip down the leg. This slippage can cause damage to the leg. At the beginning of the treatment, i.e. the first 2–3 weeks, short-stretch

bandages need to be applied more frequently, i.e. 2–3 times weekly until oedema is no longer present, the wound exudates are controlled and the skin does not cause any problems for the patient. Once the leg's condition is stabilised, the short-stretch bandage can be left in place for 5–7 days at a time until there is complete wound closure. More frequent monitoring of the patient's wound in the early stages of treatment is certainly a beneficial part of a successful management regimen. It is also at this stage that a primary application can be assessed, rather than waiting for a week. This additional contact gives the patient more confidence in the treatment.

Are long-stretch bandages better suited to patients with limited mobility and poor ankle dorsiflexion?

CA: Long-stretch bandages are versatile and are suitable for patients with good mobility and those with limited mobility. However, each patient should be given the appropriate compression therapy based on their individual assessment.

HC: The definition of mobility is often inconsistent among practitioners. Lindsay et al (2003) devised an assessment tool for measuring mobility. Immobility is defined as 'an individual's inability to support their own weight or move without assistance'. In this situation, neither the foot pump nor the calf pump will function. However, people with restricted mobility (ranging from 'assisted mobility' to 'independent with supervision') will have some beneficial function of both pumps. If a patient is immobile

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according to the above definition then another method of providing compression could be considered in conjunction with compression bandaging. Intermittent pneumatic compression (IPC) is another way to achieve compression therapy.

Are short-stretch bandages more cost-effective than long-stretch bandages?

CA: Long-stretch bandages are made from robust material so that they can withstand constant wear for seven days. In this sense it is a very cost-effective treatment option. Many patients find long-stretch bandages very comfortable and versatile as they can be used as a multilayer or a single layer; depending on what the clinician and patient decide is the most suitable treatment.

HC: If the short-stretch compression bandage is applied at full stretch the reduction of oedema in venous leg ulceration is often rapid. In practice this means that the bandage needs to be applied more frequently at the beginning of the treatment episode. When oedema is reduced, the wound exudates are generally minimal, if there are no other contraindications, and the bandage can safely be left on the leg between 5–7 days, taking into consideration the comfort of the patient.

The number of bandage layers depends on the leg circumference. One short-stretch bandage is usually sufficient if the ankle circumference is between 20–25 cm. If the circumference is greater than 25cm then two bandages are usually required. The patient's comfort must always

be considered and also provides an indication of the treatment's progress.

Once there is no strike-through the bandage can be washed and reused. This has certainly reduced the cost of bandage material and has also had the beneficial effect of positive patient involvement.

In recent years new cohesive and adhesive short-stretch compression bandages have been manufactured which have been as effective as the washable short-stretch compression bandage. Washable and re-usable ones are more cost-effective than single use. Always refer to the manufacturer's instructions.

Do short-stretch bandages give the patient a better quality of life than long-stretch bandages?

CA: Any patient who suffers with leg ulceration suffers with reduced quality of life for a variety of reasons. Once the patient has been fully assessed and understands the nature of the condition they have and a treatment plan with clear goals has been set, their quality of life improves whatever the treatment option chosen.

HC: Quality of life studies have been carried out to investigate patients' experience of living with a leg ulcer in conjunction with compression therapy. In clinical practice we find that when patients first come for treatment they are often in severe pain and their quality of life is greatly reduced compared with life before the ulceration. This is characterised by sleep disruption, pain, wound odour, restricted mobility, anxiety, loss of social contact and self-confidence. We have found that with short-stretch compression bandaging pain is rapidly diminished once

the oedema is reduced. There appears to be a strong and direct link between oedema reduction and reduced pain.

As stated earlier, the full-stretch application of short-stretch bandages provides maximum reflective pressure. Patients often report that once the pain associated with venous leg ulceration is eliminated or reduced, living with a leg ulcer becomes tolerable. There is also research evidence in quality-of-life investigations to support this (Charles, 2004).

Some of our patients do not elevate their legs while resting during the day. In these situations the combination of compression bandaging and intermittent pneumatic compression (IPC) are beneficial techniques in wound healing and the subsequent promotion of life quality. **WUK**

Charles H (2004) Does leg ulcer treatment improve patients' quality of life. *J Wound Care* **13(6)**: 209–13

EWMA (2003) *Understanding Compression Therapy*. MEP Ltd, London

Hopkins A, Worboys F (2005) Understanding compression therapy to achieve tolerance. *Wounds UK* **1(3)**: 26–34

Hareendran A et al (2005) Measuring the impact of venous leg ulcers on quality of life. *J Wound Care* **14(2)**: 53–7

Lindsay ET, Muldoon J, Hampton S (2003) Short-stretch compression bandages and the foot pump: their relationship to restricted mobility. *J Wound Care* **12(5)**: 185–9

Moffatt C (1992) Compression bandaging — the state of the art. *J Wound Care* **1(1)**: 45–50

Partsch H (2005) The static stiffness index: a simple method to assess the elastic property of compression material in vivo. *Dermatol Surg* **1(31)**: 625–30

Royal College of Nursing (2006) *Clinical Practice Guidelines. The Nursing Management of Patients with Venous Leg Ulcers*. RCN, London

Schofield J, Flanagan M (2000) The provision of leg ulcer services by practice nurses. *Nurs Stand* **14(26)**: 54–60