

An audit of lower limb scanning and the provision of bespoke hosiery on 20 patients in a Primary Care Trust

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Introduction

Around 1% of people in industrialised countries will suffer from a leg ulcer at some time. This would equate internationally to 490,000- 1.3 million patients with lower limb ulceration at any one time and 70,000 to 190,000 in the United Kingdom alone (Posnett et al 2009).

The majority of these leg ulcers are due to problems in the veins, resulting in an accumulation of blood in the legs (OMeara et al 2009). The main treatment has been a firm compression garment (bandage or stocking) in order to aid venous return. Advanced Therapeutic Materials Ltd (a medical device manufacturer) researched which informed the development of an advanced, hand held 3D imaging unit. This enables the scanning of a limb and the generation of a "point cloud output file- this creates the computer image". A pressure map is then produced which measures limb volume and is used to produce the bespoke hosiery as requested by the prescribing nurse. This may be Class1, 2, or 3 seamless, compression garment made using a flat bed which is knitted on a specifically developed knitting machine. This delivers the prescribed pressures accurately and reliably over the whole of the treatment area and allows for an easy and comfortable fit.

Method

This audit was commissioned on behalf of Birmingham City University with Worcestershire Primary Care Trust and given clinical governance approval. The aim of the audit was to:

- Evaluate the effect of the bespoke compression hosiery on patients who were unable to tolerate, the compression did not stay in place or when standard hosiery does not adequately fit.

Patients included:

- Patients with confirmed venous disease
- Patients with healed ulceration
- Patients for whom standard hosiery did not fit, stay in place or was not tolerated
- Patients who were willing to have a scan and to wear the bespoke made garment
- Patients who were able to consent to the scan

Exclusion Criteria

The following subjects were not included into the study:

- Subjects with a history of skin sensitivity to any of the components of the study product.
- Subjects whose leg ulcers were clinically infected or erysipelas, malignant, or who had had recent deep venous thrombosis or venous surgery within the last 3 months.
- Subjects who had progressive neoplastic lesion treated by radiotherapy or chemotherapy
- On-going treatment with immunosuppressive agents or high dose

Scanning machine in use



Hosiery applied to lower limb



Results

Based on 20 patients who wore hosiery for 6 weeks to 9 months.

- 20 Patients skin was maintained following scanning and the application of bespoke hosiery
- Patients evaluated the hosiery as being comfortable to wear
- Patients and staff were confident in the hosiery as a bespoke garment
- Ease of application and removal was reported by all study patients

Discussion

To be effective, compression bandages need to be applied according to manufacturers' instructions. Nurses experienced in bandaging are more likely to be able to apply bandages in a way that meets the manufacturers' requirements than nurses with less or no experience. The experience of, and differences between bandagers is more influential on healing rates than differences in individual bandages. Compression may also be applied using hosiery which negates the variance of applied compression.

The scanning of the lower limb allows for the accurate measurement of limb size and volume which can be used in the monitoring of a patient's condition including venous insufficiency, ulceration, lymphoedema and DVT. This innovative scanning technology allows for the development of bespoke hosiery which is clinically appropriate for the patient and allows them to wear compression. The alternative could be the continued application of compression bandaging or untreated venous hypertension which can lead to ulcer recurrence (RCN 2006). The bespoke hosiery can be used for both the treatment of venous ulceration and prevention of ulcer recurrence and offers benefits to the patient in comfort, compliance and financially within the NHS.

References

- Hafner HM, Junger M (2000) The haemodynamic efficacy of six different compression stockings from compression class 2 in patients suffering from chronic venous insufficiency. *Phlebology* 15(3-4): 126-30
- O' Meara, S, Cullum, N, Nelson, E. (2009) *Compression for venous leg ulcers. Cochran database systematic review*. Jan

Posnett, J, Gottrup, F, Lundgren, H, Saal, G. (2009) The resource impact of wounds on health-care providers in Europe. *Journal of Woundcare*. Vol 18, No4 p154-161

Royal College of Nursing (2006) *Clinical practice guidelines. The nursing management of patients with venous leg ulcers*. 2nd ed. London: RCN.