The efficacy of four-layer compression bandaging, seen as the gold standard treatment for venous leg ulcers, was compared with that of two-layer compression stockings.

Stockings or bandages for leg-ulcer compression?

In this article...

- The rationale behind the comparison study
- How the study research was conducted
- Implications for nurses treating venous leg ulcers

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Background Four-layer bandaging is the standard treatment for venous leg ulcers but is bulky and can restrict mobility. Two-layer compression stockings have recently been marketed but their clinical and cost effectiveness were unknown.

Aim To compare the clinical and cost effectiveness of four-layer bandaging with two-layer compression stockings.

Method In a pragmatic, open, randomised controlled trial 454 participants were randomly allocated two-layer compression stockings or four-layer bandages and followed for up to 12 months after healing.

Results The median time to ulcer healing was almost identical (stockings group: 99 days, bandaging group: 98 days). More patients allocated stockings changed treatment but ulcer recurrence rates were higher in the bandaging group. Stockings cost £302 less per participant per year and had more than 95% probability of being the most cost-effective treatment.

Conclusion Two-layer compression stockings are a viable, cost-effective alternative to four-layer bandaging but may not be suitable for all patients.

Venous leg ulcers (VLUs) are chronic open wounds caused by poor venous return (venous insufficiency). They often recur and take months or years to heal (Valencia et al, 2001), can be painful, malodorous, prone to infection and impair mobility and quality of life (Hickie et al, 1998).

There is good evidence to support using multicomponent systems that deliver high compression (defined as 40mmHg of compression at the ankle) to promote VLU healing (O’Meara et al, 2012). Various multicomponent bandaging systems are available in the UK, but four-layer bandaging is considered the gold standard (O’Meara et al, 2012; Iglesias et al, 2004). However, its bulk can cause discomfort, problems with footwear and reduced ankle and leg mobility (Adderley and Thompson, 2007); it also requires skill to apply correctly.

In recent years two-layer compression stockings have been marketed to treat VLUs. These consist of an under- and over-stocking that, together, deliver graduated compression with ankle compression of 40mmHg. Less bulky than bandages they may be more comfortable and make it easier to wear shoes. Nurses do not need specialist skills to apply them and patients with the mobility and dexterity to remove/reapply their own may need less nursing input.

There has been limited research comparing compression stockings with four-layer compression bandaging to promote ulcer healing (Finlayson et al, 2012); other studies compared stockings with short-stretch bandages (Taradaj et al, 2009; Marian et al, 2008; Junger et al, 2004; Polignano et al, 2004). The VenUS study, therefore, aimed to compare the clinical and cost effectiveness of two-layer compression stockings with the four-layer bandage for healing VLUs. Ulcer recurrence was also assessed because compression stockings are recommended after healing to prevent recurrence (Scottish Intercollegiate...
We randomly allocated eligible patients two-layer compression stockings or four-layer compression bandaging and, as ulcer size and duration are known healing predictors, stratified them by ulcer duration (>6 or >6 months) and area (5 or 5cm). We could not blind patients or nurses to treatment.

The trial specified using bandaging systems aiming to deliver 40mmHg of compression at the ankle; stockings were eligible if they were two-layer treatment systems that, with both layers worn together, aimed to deliver 35-44mmHg. Participants received their allocated treatment from their usual nurse in their usual setting at intervals decided by their nurse. This continued until their ulcer healed, they could not continue with the allocated treatment and changed to a different treatment, they were lost to follow-up or died.

Healing was defined as complete epithelial cover with no scab. When nurses judged them healed, ulcers were photographed weekly for four weeks; the photographs were independently assessed for healing by two assessors blinded to treatment group. We followed up for 12 months all those who healed, except those recruited in the final year, who were followed for 4-12 months. Nurses recorded when and why participants changed from their allocated treatment to a non-trial one; after healing they assessed ulcer recurrence every month.

To analyse cost effectiveness, we collected data at baseline and quarterly using participants’ self-completed EQ5D health outcome questionnaires and reports of consultations with NHS health professionals.

Results
In total, we recruited 457 participants and allocated 227 to bandaging (B) and 230 to stockings. We excluded three after randomisation so analysed data from 454 participants (B: n=224, S: n=230).

There was no difference in median time to healing between bandaging (98 days) and stockings (99 days); the proportion of ulcers healed was also similar (B: 70%, S: 71%). More participants changed treatment from stockings (28%) than bandaging (28%), the most common reason cited being discomfort. Of those who experienced ulcer recurrence, more were in the bandaging group (23%) than the stockings group (14%). Average costs were about £3,000 per participant per year lower for the stockings group, mainly because these patients required fewer nurse consultations; this group also reported slightly higher average quality-adjusted life year scores.

Our findings suggest hosiery has a 95% probability of being the most cost-effective treatment.

Discussion
There was no difference in healing rates but as stockings are less bulky and were more compatible with shoes, we were surprised more patients allocated stockings changed treatment. This suggests stockings may be less comfortable than bandaging.

People with a history of VLUs may be unwilling to continue using compression stockings after healing (Raju et al, 2007; Jull et al, 2004); this may be related to a belief that wearing compression stockings to prevent VLU recurrence is not worthwhile (Jull et al, 2004). Before the study, we hypothesised that patients who got used to wearing stockings for ulcer healing would be more likely to wear them to prevent recurrence. Information on treatments used after healing was not recorded but VLU recurrence was less in those allocated stockings.

Little is known about how compression stockings are used to treat open VLUs in the UK and only 6.5% of our sample had been treated with them before joining the trial. 49% had been treated with compression bandaging. If this reflects UK practice, greater use of stockings to treat VLUs should lead to substantial cost savings.

Conclusion
Although two-layer compression stockings are not suitable for all patients, our results suggest they are an effective alternative to four-layer bandaging to heal VLUs. Such stockings also appear to reduce recurrence rates and are more cost effective than four-layer bandaging. NT


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References


