Compression therapy for venous leg ulcers

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This paper summarises the findings of a recent issue of *Effective Health Care* Vol 3. Leg ulcers are areas of "loss of skin below the knee on the leg or foot which take more than six weeks to heal".¹ They are a common chronic, recurring condition which is a major cause of morbidity, suffering, and health service costs.²⁻⁴ About 1.5-3.0 per 1000 population have active leg ulcers and prevalence increases with age up to around 20 per 1000 in people older than 80 years.⁵⁻⁷ Leg ulceration is strongly associated with venous disease; however, arterial disease is present (alone or with venous problems) in about 20% of cases.⁸

Leg ulcer disease is typically chronic and patients with active ulceration for more than 60 years have been documented.⁹ There is wide variation in recurrence with reulceration rates of 26%¹⁰ to as high as 69% at one year being reported.¹¹ Variation in recurrence rates and the chronicity of leg ulcers partly reflect the uneven quality of care. Surveys have shown wide variation in their clinical management^{3 12} and numerous types of wound dressings, bandages, and stockings are used in treatment and prevention of recurrence.¹³

This paper summarises the findings of a recent issue of the *Effective Health Care* bulletin¹⁴ based on a systematic review of research on the effectiveness and cost effectiveness of different forms of compression in the treatment of venous ulceration;¹⁵ on interventions to prevent recurrence; and on methods of diagnosing venous ulceration.

The review was based on a search of 18 databases including MEDLINE, CINAHL, and EMBASE with no restriction on date or language. Relevant journals and conference proceedings were handsearched and experts consulted. Published and unpublished randomised controlled trials which measured ulcer healing were included. More details are given in the Cochrane library.

Diagnosis

Careful assessment of all patients is important, particularly as considerable damage can be caused by inappropriately applying high compression in patients with arterial and small vessel disease.¹⁶ However, a survey reported that 50% of nurses made a diagnosis of the cause of the ulcer based on visual assessment alone.¹⁷ There is debate about how arterial status should be assessed and whether this assessment should be undertaken routinely by nurses. Arterial disease of the leg is most commonly detected by combination of general

clinical examination and either manual palpation of foot pulses or by the use of hand held Doppler ultrasound together with a sphygmomanometer to measure the ratio of the systolic blood pressure at the ankle to that in the arm (the ankle to brachial pressure index, ABPI).⁹ An ABPI ratio <1.0 is viewed as indicative of some arterial impairment. The cut off point below which compression is generally not applied in clinical practice is often quoted as 0.8⁹; however, many trials use the higher cut off of 0.9.

There is generally poor agreement between manual palpation of foot pulses and ABPI. Two large studies have shown respectively that 67% and 37% of limbs with an ABPI <0.9 had palpable foot pulses, with the consequent risk of applying compression to people with arterial disease.^{9 16} Even though ABPI measurement seems to be better than manual palpation for excluding arterial disease, it has been shown to be unreliable when carried out by inexperienced operators.¹⁸ Reliability can be considerably improved if people are highly trained.^{19 20}

Compression for treatment of leg ulcers

Below the knee, graduated compression from toe (highest) to knee (lowest), in the form of bandaging or stockings, is viewed as a key component of treatment when venous leg ulceration occurs in the absence of relevant arterial disease. A range of compression systems are used, which apply varying levels of compression, with different materials with varying degrees of elasticity. There is considerable uncertainty, however, as to the most effective method. The preferred treatment for leg ulcers in the United States is Unna's boot, in parts of Europe other than in the United Kingdom short stretch bandaging is more popular, whereas four-layer bandaging is increasingly advocated in the United Kingdom. Twenty randomised controlled trials evaluated different forms of compression bandaging on venous ulcer healing in a wide range of age groups.²¹⁻⁴⁰ Two of these incorporated economic evaluations,^{22 40} two compared compression stockings with compression bandages,^{41 42} and two evaluated intermittent pneumatic compression.^{43 44}

COMPRESSION VERSUS NO COMPRESSION

Six randomised controlled trials assessed whether compression therapy was better than no compression.²¹⁻²⁶ These showed that compression provided either by Unna's boot,^{24 25}

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Table 1 Randomised controlled trials of elastic high versus low compression bandaging

Study	Patients and interventions	Initial ulcer size and duration	Results
Callam <i>et al</i> 1992 ²⁷	132 Patients from leg ulcer clinics (multicentre) Male and female I1: Elastic compression: Soffban + Tensopress + Tensoshape I2: Non-elastic compression: Soffban + Elastocrepe + Tensoplusforte Follow up: 3 months	Mean ulcer area (cm ²) I1: 8.2 I2: 11.0 Mean duration (months) I1: 11.3 I2: 11.5	Complete healing I1: 35/65 (54%); I2: 19/67 (28%) (<i>p</i> = 0.01) However, patients were only followed up for 12 weeks and at this point many I2 patients were almost healed Attrition: I1: 8; I2: 20
Northeast <i>et al</i> 1990 ²⁸ UK	106 Patients presenting to outpatient clinic I1: Three-layer bandage (Calaband + Elastocrepe + Tensogrip) I2: Three-layer bandage (Calaband + Tensopress + Tensogrip) Follow up: 3 months	Not stated	Complete healing I1: 51%; I2: 64% (<i>p</i> = 0.01) Attrition: 3
Gould <i>et al</i> ²⁹ UK	39 Ambulatory patients (46 ulcers) from general practices attending outpatient clinic I1: Elastic compression (Setopress) + medicated paste bandage + elasticated viscose stockinette I2: Inelastic bandage (Elastocrepe) + medicated paste bandage + elasticated viscose stockinette One week before treatment patients wore Setopress bandage Follow up: 16 weeks	Mean ulcer area (cm ²) 7.44 Median duration (months) 10	Healed or progressed I1: 11 (58%); I2: 7 (35%) (<i>p</i> >0.05) Attrition: 7 Patients (10 ulcers)
Duby <i>et al</i> 1993 ³⁰ UK	67 Patients (76 legs) I1: Orthopaedic wool + short stretch bandage (Comprilan) + Tricofix net covering I2: Four-layer bandage (orthopaedic wool + crepe bandage + Elset + Coban) I3: Paste bandage (Iethopaste) + support bandage (Elastocrepe and Tubigrip)	Mean ulcer area (cm ²) I1: 13.1 I2: 11.9 I3: 12.3 Mean duration (months) I1: 26.7 I2: 20.5 I3: 34.5	Complete healing (ulcers) I1: 40%; I2: 44%; I3: 23% Attrition: none

Table 2 Comparing different multilayer high compression systems

Study	Patients and interventions	Initial ulcer size and duration	Results
McCollum <i>et al</i> ³⁴ UK	232 Patients from community leg ulcer services I1: Original Charing Cross four-layer I2: New proprietary four-layer (Profore system) Follow up: 6 months	Percentage <10cm ² I1: 82%; I2: 84% Median duration: (weeks) I1: 8; I2: 7	Complete healing I1: 82%; I2: 84% (<i>p</i> >0.05) Attrition: I1: 16%; I2: 15%
Wilkinson <i>et al</i> 1997 ³⁵ UK	35 Legs in 29 patients recruited through district and practice nurses I1: Charing Cross four layer bandage I2: Trial bandage: Tubifast + separate strips of lint applied horizontally + Setopress + Tubifast (to secure bandage) (patients were stratified by ulcer size) Follow up: 3 months	Mean ulcer area (cm ²) I1: 11.2; I2: 8.6	Complete healing I1: 8/17 (47%); I2: 8/18 (44%) OR 1.1; 95% CI 0.2 to 5.2 Attrition: I1: 4; I2: 2

two-layer,²¹ four-layer,²² or short stretch bandages²³ improve healing rates compared with treatments with no compression. One study showed that compression therapy was more cost effective because the faster healing rates saved nursing time.²²

HIGH COMPRESSION VERSUS LOW COMPRESSION

Three randomised controlled trials comparing elastic high compression three-layer bandaging (two with Tensopress and one with Setopress as a component) with low compression (with Elastocrepe) showed that more patients were healed at 12–15 weeks with high compression (odds ratio (OR) 2.26; 95% confidence interval (95% CI) 1.4 to 3.65; table 1).^{27–29} The advantage of higher compression was confirmed in another randomised controlled trial in which patients with either four-layer or short stretch bandaging healed faster than those who received a paste bandage with outer support.³⁰

DIFFERENT TYPES OF HIGH COMPRESSION

Several types of high compression systems are available, some of which have been compared directly in randomised controlled trials. The original “Charing Cross” four-layer bandage has been compared with both a kit that

provides all the constituents to make up a four-layer bandage,³⁴ and a regimen adapted to achieve similar levels of compression with materials available on prescription.³⁵ No significant difference in outcome was found in either study, although the second trial was very small (table 2).

Four-layer bandaging has also been compared with short stretch^{30–31} and with Unna's boot^{32–33} in four randomised controlled trials. No differences were found in the healing rates. However, because these studies were small, this does not mean that there are not clinically important differences in effectiveness (table 3).

The advantage of multilayer high compression systems over single layer systems is shown by one large and three small trials which found more ulcers healed at 24 weeks with four-layer bandaging than were healed using a single layer, adhesive compression bandage (table 4).^{36–38} Even though three-layer, two-layer, and other compression bandages have been shown to be effective, they seem not to have been directly compared with four-layer bandaging in randomised controlled trials, although trials are in progress.

Compression stockings have also been used to treat current ulcers.⁴⁵ A combination of two

Table 3 Randomised controlled trials of elastic high compression bandaging versus inelastic compression

Study	Patients and interventions	Initial size and duration	Results
Inelastic compression versus elastic high compression:			
Duby 1993 ³⁰	See table 1	Median ulcer area (cm ²)	Healing rate
London and Scriven ³¹	30 Ambulant patients	I1: 12.4; I2: 8.16	I1: 60%; I2: 60%
UK	I1: Four-layer bandage (orthopaedic wool, crepe, Elset, Coban)	Median duration (months)	Attrition I1: 4
	I2: Short stretch (orthopaedic wool, short stretch, Coban)	I1: 18; I2: 24	
	Follow up: 1 y		
Cogan <i>et al</i> ³²	30 Patients at routine venous ulcer out patient clinic	Median ulcer area (cm ²)	Complete healing:
Ireland	I1: Modified Unna's boot (paste bandage + Elastocrepe + Elastoplast + class II compression sock)	I1: 7; I2: 9; I3: 20	I1: 6/10 (60%)
	I2: Four-layer bandage (Profore) (4LB)	Median duration (months)	I2: 7/10 (70%)
	I3: Lyfoan dressing + Setopress compression bandage	I1: 24; I2: 10; I3: 12	I3: 2/10 (20%)
	Follow up 3 months		Mean bandage costs in IR£
			I1: £82.54
			I2: £66.24
			I3: £58.33
Knight and McCulloch 1996 ³³	10 Patients randomly chosen from patients at a wound care centre	Not stated	Average rate of ulcer healing (cm ² /week)
USA	I1: Four-layer bandage (Profore)		I1: 1.14; I2: 0.34
	I2: Unna's boot		Attrition: not stated
	Follow up: 6 weeks		
Inelastic compression versus single layer bandage:			
Cordts <i>et al</i> 1992 ³⁹	43 Patients, > 18 y, male and female, outpatient clinic	Median ulcer area (cm ²)	Complete healing
USA	I1: Hydrocolloid dressing (Duoderm) + graduated compression (Coban wrap)	I1: 9.1	I1: 8/16 (50%); I2: 6/14 (43%)
	I2: Unna's boot	I2: 6.0	(p = 0.18)
	Follow up: 3 months	Mean duration (weeks)	Attrition: I1: 7; I2: 6
		I1: 95 I2: 96	

Table 4 Randomised controlled trials of multilayer high compression systems versus single layer bandage systems

Study	Patients and interventions	Initial ulcer size and duration	Results
Nelson <i>et al</i> 1995 ³⁶	200 Patients referred by GPS and community nurses, age > 18 years, attending leg ulcer clinic	Mean ulcer area (cm ²)	Complete healing
UK	I1: Four-layer bandage (orthopaedic wool + crepe + Elset + Coban)	I1: 7.8; I2: 12.4	I1: 69%; I2: 49%
	I2: Single layer bandage (Granuflex adhesive compression bandage)	Mean duration (months)	OR 2.4; 95% CI 1.3 to 4.3
	(Primary dressing randomised to knitted viscose dressing or hydrocolloid dressing)	I1: 15.5; I2: 11	Attrition: greater in I1 than I2
	Patients were also randomised to oxpentifylline or placebo)		
	Follow up: not stated		
Kralj and Kosicek ³⁷	40 Inpatients and outpatients	Mean ulcer area (cm ²)	Complete healing
Slovenia	I1: Four-layer bandage (Profore)	I1: 18.6; I2: 17.2	I1: 7/20 (44%); I2: 8/20 (44%)
	I2: Single layer bandage (Porelast) + hydrocolloid dressing (Tegasorb)	Mean duration (months)	Attrition: I1: 4; I2: 2
	Follow up: 6 months	I1: 7.9; I2: 6.9	
Travers <i>et al</i> 1992 ³⁸	27 Patients attending leg ulcer clinic	Mean ulcer area (cm ²)	Reduction in ulcer area
UK	I1: Self adhesive one layer bandage (Panelast Acryl)	I1: 31; I2: 23	I1: 86%; I2: 83% (NS)
	I2: Three-layer bandage (Calaband + Tensopress + Tensogrip)	Mean duration (months)	Bandage costs equivalent
	Follow up: 6 months	I1: 23; I2: 23	Attrition: none

Table 5 Randomised controlled trials of compression stockings versus compression bandaging

Study	Patients and interventions	Initial ulcer size and duration	Results
Hendricks and Swallow 1985 ⁴¹	21 Patients attending outpatients' clinic	Median ulcer area (cm ²)	Complete healing
USA	I1: Unna's boot + Kerlix roll + elastic bandage	2.55	I1: 7/10 (70%); I2: 10/14 (71%) but three of these were transferred from I1
	I2: Open toe, below knee graduated compression stockings	Median duration	Patients cross between arms depending on progress
	Follow up: 18 months	4.5 y	No intention to treat analysis carried out
Horakova and Partsch 1994 ⁴²	59 Patients attending a dermatology clinic	Median ulcer area (cm ²)	Complete healing
Austria	I1: Short stretch bandage (Rosidal K)	I1: 3.2; I2: 6.0	I1: 13/25 (52%); I2: 21/25 (84%)
	I2: Thrombo stocking + compression stocking (Sigvaris - removed at night)	Mean duration (months)	(p<0.05)
	Follow up: 3 months	I1: 2; I2: 5 (p<0.05)	Attrition: I1: 6; I2: 3

compression stockings (Thrombo plus Sigvaris 503) has been shown to increase the rate of healing compared with a short stretch bandage (OR 4.9; 95% CI 1.3 to 18.3; table 5).⁴²

sion was used as well as compression stockings or Unna's boot (pooled OR 10.0; 95% CI 2.96 to 33.8; table 6).⁴³⁻⁴⁴

Prevention of recurrence of leg ulcers

COMPRESSION STOCKINGS
No randomised controlled trial was found which compared recurrence rates achieved with and without compression stockings in

INTERMITTENT PNEUMATIC COMPRESSION TREATMENT

Two small studies showed that more ulcers healed when intermittent pneumatic compres-

people with healed ulcers. One trial, however, showed that 35 year recurrence rates were lower in patients who used strong support from class 3 compression stockings (21%) than in those randomised to receive medium support from class 2 compression stockings (32%) ($p=0.034$); class 2 stockings, however, were better tolerated by patients (table 7).⁴⁶

Table 6 Randomised controlled trials of intermittent pneumatic compression treatment

Study	Patients and interventions	Initial ulcer size and duration	Results
Coleridge Smith <i>et al</i> 1990 ⁴³ UK	45 Patients (48 ulcers) attending venous ulcer outpatient clinic I1: Graduated compression stockings I2: I1 + Intermittent sequential gradient pneumatic compression used daily in the home Follow up: 3 months	Median ulcer area (cm ²) I1: 17.3; I2: 49.8 Median duration (y) I1: 3.5; I2: 3.9	Completely healed I1: 1/24 (4%); patients: I2: 10/21 (48%) patients ($p = 0.009$) I1 contained patients with 2 ulcers Attrition none
McCulloch <i>et al</i> 1994 ⁴⁴ USA	22 Patients attending vascular surgery clinic I1: Unna's boot only I2: I1 + Intermittent one cell pneumatic compression applied for one hour, twice a week after cleansing Follow up: 6 months	Median ulcer area (cm ²) I1: 0.4–59.4 I2: 0.4–45.0	Completely healed I1: 8/10 (80%); I2: 12/12 (100%) Attrition: none

Table 7 Randomised controlled trials of prevention of recurrence of venous ulceration with compression stocking and venous surgery

Study	Patients and interventions	Initial ulcer size and duration	Results
Franks <i>et al</i> 1995 ¹⁰ UK	166 Patients from community leg ulcer clinics with newly healed ulcers, mean age 72 y I1: Class 2 below knee stockings (Medi, UK) I2: Class 2 below knee stockings (Scholl) New stockings prescribed every 3 months	Median ulcer (cm ²) I1: 3.3; I2: 3.5 Median ulcer duration (months) I1: 5.7; I2: 2.0 Mobility (chairbound: walk + aid: walk freely) I1: 4 (4%); 27 (29%); 61 (67%) I2: 1 (1%); 23 (31%); 50 (68%)	Recurrence rate at 18 months I1: 24% I2: 32% Adjusted RR = 1.16, 95% CI 0.65 to 2.04 Attrition: none stated Overall 83% all day wear (no difference)
Harper <i>et al</i> 1995 ⁴⁶ UK	300 Patients with newly healed venous leg ulcers I1: Class 2 stockings I2: Class 3 stockings Refitting and supply of new stockings every 4 months Follow up: 5 y	Not stated	Recurrence within 36–60 months I1: 32%; I2: 21% ($p=0.034$)
Stacey <i>et al</i> 1988 ⁵¹ UK	30 Patients with 41 previously ulcerated limbs attending surgical outpatients I1: Surgery - ligation of incompetent communicating veins and ablation of incompetent superficial veins plus permanent below knee elastic stockings (Sigvaris) I2: Stockings - below knee stockings (Sigvaris) NB Limbs rather than patients were randomised Follow up: 1 y	I1: 8 Had evidence of past DVT I2: 10 Had evidence of past DVT	Ulcer recurrence I1: 1 (5% limbs); I2: 5 (24% limbs)

Table 8 Randomised controlled trials of pharmacological interventions for the prevention of recurrence of venous ulceration

Study	Patients and interventions	Initial ulcer size and duration	Results
Lagatolla <i>et al</i> 1995 ⁵⁰ UK	136 Patients with healed venous ulcers attending outpatients clinic I1: Stanazolol 5 mg twice daily for 12 months plus compression stockings I2: Surgery - ligation of calf perforating veins plus compression stockings Follow up: 5 y	Not stated	I1: 10/42 Recurrences (24%) I2: 13/41 Recurrences (32%) Life table analysis: increased ulcer-free survival in surgery group (NS) Attrition: I1: 9; I2: 13
McMullin <i>et al</i> 1991 ⁴⁷ UK	48 Limbs with healed venous ulcers out of a total of 85 limbs in 60 patients being treated for lipodermatosclerosis I1: Stanazolol 5 mg twice daily + below knee class 2 graduated compression stocking (Venosan, Switz) I2: Placebo tablet + stockings as in I1 Follow up: not stated how much beyond 6 months of treatment	Not stated	Recurrence of ulceration: I1: 7/25 limbs (20%) I2: 4/23 limbs (17%) ($p>0.6$) Recurrence of ulceration: I1: 7/25 limbs (20%) I2: 4/23 limbs (17%) ($p>0.6$) Attrition: I1 6/30; I2: 3/30
Stacey <i>et al</i> 1990 ⁴⁹ UK	68 Limbs of 54 patients with healed venous ulcer I1: Stanazolol 5 mg twice daily for 9 months + below knee graduated stockings (Sigvaris) I2: Ligation of the incompetent communicating veins and eradication of all visible varicose superficial veins + stockings as I1 (stockings worn continuously and replaced every 6 months) Follow up: 12 months	Number of limbs with normal deep veins I1: 9/49; I2: 13/49 Number of limbs with post-thrombotic changes I1: 15/49; I2: 12/49	Limbs in which ulcers recurred within 12 months I1: 6/24 limbs (5/17 patients) I2: 1/25 limbs (1/20 patients) Attrition I1: 8; I2: 9
Wright <i>et al</i> 1991 ⁴⁸ UK	138 Patients with recently healed venous ulcer recruited at first follow up appointment I1: Oxerutins (Paroven, Zyma, UK) 500 mg twice daily + below knee class 2 graduated elastic stockings I2: Identical placebo + stockings as in I1 Stockings replaced where necessary at 3-monthly intervals, equal numbers in each group randomised to surgery Follow up: 18 months	Mean duration (months) I1: 8.9; I2: 8.8 Additional illnesses No significant differences between groups	Cumulative recurrence at 18 months I1: 34%; I2: 32% Cumulative recurrence at 18 months I1: 34%; I2: 32% ($p = 0.93$ log rank test) Attrition: not stated

Table 9 Randomised controlled trials of compression from trained nurses and/or specialised clinics versus usual district nurse treatment

Study	Patients and interventions	Initial ulcer size and duration	Results
Morrell <i>et al</i> ⁴⁰ UK	233 Ambulant patients from 8 clinics who had suspected venous ulcers I1: Four-layer bandaging delivered by project nurses in clinic I2: Usual care from district nurses at home Follow up: 1 y	Mean ulcer area (cm ²) I1: 16.2; I2: 16.9 Mean duration (months) I1: 27.5; I2: 29.7	Complete healing at 12 months I1: 65%; I2: 55% Difference in percentage healed = 11; 95% CI -0.02 to 0.24 Overall there is a statistically significant difference in healing rate (p = 0.03 log rank test) Attrition: I1: 16; I2: 13
Taylor <i>et al</i> ²² UK	30 Patients referred to the clinic by GPS Community setting I1: Four-layer bandage I2: Conventional treatment (FP10 non-compression)	Mean ulcer area (cm ²) I1: 5.4; I2: 4.2 Mean duration I1: 7 ulcers <6 months; 9 ulcers >6 months I2: 9 ulcers <6 months; 5 ulcers >6 months	Complete healing I1: 12 (75%); I2: 3 (21%) (p = 0.003) Median time to healing (days) I1: 55; I2: >84 (p = 0.003) Total average weekly treatment costs and cost of district nursing time were less in I1 (p = 0.04)

PHARMACOLOGICAL AND SURGICAL INTERVENTIONS

Two drugs have been investigated for their effects on recurrence of leg ulcers: stanozolol, an anabolic steroid which increases fibrinolysis; and rutoside (Paroven), an oxerutin which is said to decrease capillary permeability (table 8). These drugs have been compared with placebo in two randomised controlled trials in which all patients also received class 2 compression stockings.^{47 48} Both trials found that neither drug reduced recurrence.^{47 48}

Surgery in which incompetent communicating veins are ligated and varicose veins are eradicated has been compared in two small trials with the drug stanozolol (both combined with compression stockings; table 8). These gave conflicting results; one showing a lower recurrence rate with surgery within one year⁴⁹ and the other a reduced recurrence with drug treatment at five years.⁵⁰ One trial seemed to show a moderately reduced rate of recurrence when surgery was carried out as well as the use of elastic stockings; however, the study was small and poorly reported.⁵¹

Organisation of care

Two trials have evaluated community leg ulcer clinics (table 9). A recent trial in Sheffield, England, showed that delivering care in leg ulcer clinics, by trained nurses who followed a treatment protocol which included use of "Charing Cross" four-layer bandaging resulted in better healing at one year (65%) than in patients who continued their usual treatment at home provided by a district nurse, who did not routinely have access to four-layer bandages (55%).⁴⁰ The clinic was also more cost effective. Improved healing associated with specialist clinics with four-layer bandaging was also shown in a second small trial.²² It is possible, however, that similar improvements in healing could be achieved without the use of clinics or other high compression treatments.

Surveys have found that district nurses' knowledge of the assessment and management of leg ulcers is often inadequate. Large variability in the way bandages are applied and the pressures achieved has been found. More experienced or well trained bandagers obtain better and more consistent pressure results.⁵² Training of nurses can result in an

improved bandaging technique, but there is some evidence that maintenance of good practice requires monitoring, feedback, and supervision.⁵³

Conclusions

Diagnosis of arterial status (to determine eligibility for compression treatment) is more accurate when trained operators use the ABPI than manual palpation of foot pulses alone. The most effective intervention for the treatment of venous leg ulcers is high compression provided by four-layer or three-layer (multilayer) or short stretch bandages, Unna's boot, or compression stockings, possibly with the addition of intermittent pneumatic compression. The use of compression stockings should be encouraged for the prevention of recurrence. However, there is little evidence to support the use of drug treatment with stanozolol or oxerutins. The role of surgery in preventing recurrence of leg ulcers has not been adequately studied.

Routine application of one of these high compression techniques in people with venous ulcers should have a considerable impact on healing rates and save time spent by community nurses. Whichever high compression approach is used, it is important that it is used correctly so that sufficient (but not excessive) pressure is applied. Community nurses and other practitioners should be better trained in assessment of patients and application of bandages. Systems should also be put in place to monitor standards of care as measured by structure (for example, the proportion of appropriately trained staff) process (for example, the proportion of patients whose arterial status has been determined by ABPI measurement), the proportion with uncomplicated venous ulcers receiving high compression therapy, and outcome (for example, the prevalence of active ulceration, proportion of patients healed, rates of healing, and adverse outcomes due to incorrectly treated arterial disease or excessive compression).

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