

# An alternative to compression bandaging in venous leg ulcers

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Leg ulcers present a common clinical problem for community nurses. The need for assessment and maintenance can take up a lot of nursing time and issues such as pain, exudate and compression bandaging have a significant effect on the quality of life of patients. This article describes an evaluation of two new compression devices, one for people with venous insufficiency resulting in leg ulcers who need compression therapy (Juxta CURES; medi UK); another for those with leg ulcers, venous insufficiency and lymphoedema (Juxta-Fit; medi UK). This evaluation involved 16 patients and demonstrated the impact of quality of life and the potential for savings in a community nursing team, both financially and in terms of reduced nursing time.

## KEYWORDS:

■ Leg ulcers ■ Wound care ■ Skin care ■ Compression

Venous leg ulcers are defined as an open lesion between the knee and the ankle joint that remains unhealed for at least four weeks and occurs in the presence of venous disease (Scottish Intercollegiate Guidelines Network [SIGN], 2010). They are a significant health burden, making up a large proportion of community nurses' caseloads and can have a significant impact on quality of life, particularly as they are prone to recurrence (Walter et al, 1999; Herber et al, 2007) — approximately 26–69% of patients with a healed venous leg ulcer will experience recurrence within a year (National Institute for Health and Care Excellence [NICE], 2012). They are often associated with infection, pain and malodour and can limit mobility. Individuals with chronic leg ulcers experience multiple problems, including pain, leakage of exudate and associated odour, altered

body image, reduced mobility, and discomfort associated with wearing bulky bandages (Maddox, 2012).

## COMPRESSION THERAPY

The 'gold standard' treatment for venous leg ulcers has long been multilayer compression therapy (NICE, 2012). This is a time-

consuming and often costly treatment and involves the application of compression bandaging by nurses who require extensive skills training, supervision and a competency assessment to be able to practice safely (Chamanga, 2014).

As with any other skilled technique, compression bandaging expertise can vary, meaning that bandaging does not always reach the optimum sub-bandage pressures, which results in a reduced impact on venous hypertension. In addition to this, patients can find multilayer compression bulky and concordance can be an issue. However, with the advent of innovative Velcro-adjustable compression therapy, there is an alternative to traditional compression bandaging, which may alleviate some of these issues associated with multilayer bandaging.

## QUALITY OF LIFE

Leg ulcers can have a significant effect on patients' quality of life, with



Figure 1.  
The Juxta CURES compression system.

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one systematic review of the evidence finding that the following were particularly significant (Herber et al, 2007):

- ▶ Pain
- ▶ Lack of sleep
- ▶ Social isolation
- ▶ Physical mobility.

However, not only do ulcers result in significant quality of life issues for patients, the treatment can also have an effect on their physical and psychological status. Compression bandaging in particular can be ‘bulky’ and ‘hot’, resulting in problems such as odour and difficulty in application, with a resulting reluctance on behalf of patients to concord with the treatment (International Lymphoedema Framework [ILF], 2012).

Similarly, problems such as exudate leakage, skin care, pain and odour can result in self-esteem problems, low mood and even depression (ILF, 2012). This is supported by Lay-Flurrie (2005) who stated that patient outcome will be poor if assessment is inadequate or bandaging is sub-optimal, resulting in bandage slippage, distortion, pressure damage and infection, all of which may lead to functional limitations and reduced quality of life.

### PRODUCT INNOVATION

Juxta CURES (medi UK) is a Velcro adjustable compression device that can be easily applied with minimal training and has a built-in pressure guide, which indicates the level of compression that is being provided (see *Figure 1*).

The system can be instantly checked and adjusted to ensure consistent compression levels are maintained. Patients can be in control of the device between nurse visits and can ensure that pressure levels

remain constant. Juxta-Fit (medi UK) is a similar device that is suitable for patients with venous leg ulcers who also have lymphoedema.

### EVALUATION BACKGROUND

This evaluation involved 16 patients and was carried out by two community nursing teams in Trowbridge and Melksham/Bradford on Avon. The Juxta CURES and Juxta-Fit were both used in this evaluation — Juxta CURES for venous ulcers and Juxta-Fit where chronic oedema/lymphoedema was present.

#### Aim

The aim of this evaluation of the Juxta CURES and Juxta-Fit products was two-fold:

- ▶ Firstly: to consider the impact of any change in practice on the community nursing team, particularly in relation to clinical time spent, and ease and consistency of application
- ▶ Secondly: to consider the impact of these new techniques on the quality of life of patients with regards comfort; reduction in bulk compared to compression bandaging; time spent with nursing staff; ease of application; the effectiveness of the devices in the reduction of oedema; comfort; and whether patients were able to wear their own shoes.

#### Method

The evaluation included all patients on the community nursing teams’ caseloads who had a venous leg ulcer and were deemed fit for compression therapy. Each patient included in the evaluation had undergone a recent Doppler assessment, had a leg ulcer and was already undergoing compression bandaging as part of their plan of care. Patients with chronic venous leg ulcers make up a significant number of the community nursing teams’ caseload. In a wound

prevalence audit carried out in June 2015, across all of the Wiltshire community nursing teams, the prevalence of patients with venous leg ulcers was 0.25%. This equated to 99 patients with venous leg ulcers and collectively equated to 308 community nursing visits in one week.

Before the evaluation, training was provided for the teams as part of the tissue viability leg ulcer training days. The community nurse team leaders identified 16 patients for the evaluation and they all gave consent for this evaluation to take place. A full explanation of the evaluation was given to each patient along with written information about the product and its application.

The initial limb circumferences and pressure settings were recorded for each patient at the outset of the evaluation. The manufacturer’s (medi UK) training team was present to support the nurses during each patient assessment and to advise them during the change from compression bandaging to Juxta CURES and Juxta-Fit.

The patients had their calf and ankle circumferences measured and the Juxta CURES was adapted by placing the spine at the appropriate calf and ankle measurements on the body of the device. The excess fabric was then cut off and discarded. The comfort liner was applied to the lower limb over the primary dressing, and the device was applied to the limb. The Velcro straps were then stretched to provide the appropriate compression and checked using the Juxta CURES built-in pressure system (BPS) guide — this helped to ensure that correct and consistent pressure (20, 30, 40 or 50mmHg) was applied to the lower leg. This adjustable pressure system enabled the patients to reset the pressure levels when necessary.

The manufacturer’s training team accompanied the community nurses to each patient follow-up visit to review the responses to the new treatment and provide further training and offer support where required. A full confidential record of each visit was maintained in addition to the routine patient records, which

**Table 1:** Number and duration of visits throughout the evaluation

	Total visits per week	Total time per visit	Total time per week
Before Juxta CURES	47 (average three)	40 minutes	31 hours, 40 minutes
With Juxta CURES	31 (average two)	22 minutes	11 hours, 22 minutes
Time savings	One visit per week per patient	18 minutes	20 hours, 18 minutes

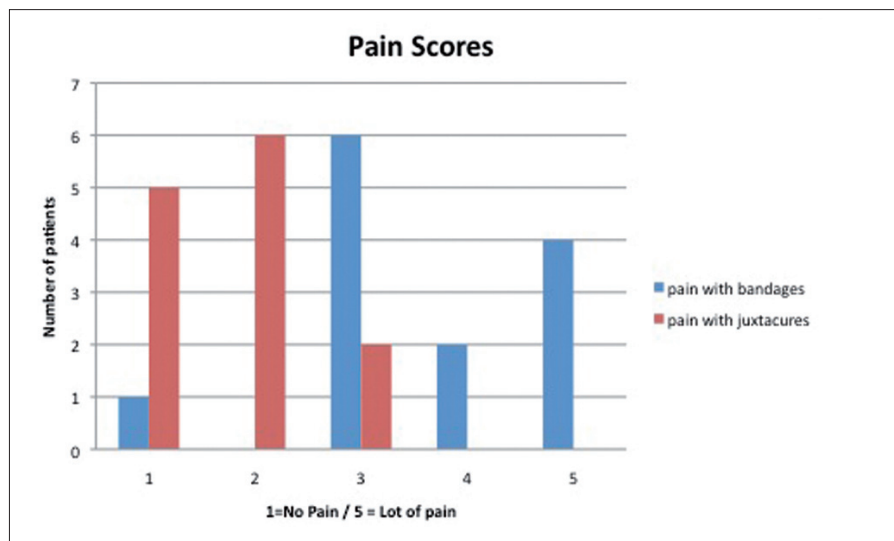


Figure 2.  
Pain scores — bandages and Juxta CURES.

recorded the following:

- ▶ Ankle and calf circumference
- ▶ Wound site
- ▶ Wound dimensions
- ▶ Tissue type, e.g. the presence of granulation or slough, and the percentage of these tissue types
- ▶ Exudate volume and consistency
- ▶ Health of periwound skin
- ▶ Clinical signs of infection.

Patients and their carers were encouraged to contact the district nurse team if they had any further questions or concerns about their new treatment before their next planned visit.

Questionnaires were completed at each visit — in addition to updating the patient notes — and the results logged anonymously. All the patients

were asked to rate the devices using a scale of 1–5, where 1 indicated 'very happy' and 5 indicated 'very unhappy'. Patients were asked to rate a range of elements including:

- ▶ Mobility
- ▶ Comfort
- ▶ Use of conventional footwear.

Patients were also asked if they were 'happy' or 'unhappy' at their initial Juxta CURES and Juxta-Fit fitting. Similarly, pain was monitored using a pain scale where 1 indicated 'no pain' and 5 indicated 'a lot of pain' — the pain involved in the use of Juxta CURES and Juxta-Fit was compared to that of bandages (see below and in *Figure 2*).

## Results

Overall, 16 patients were enrolled

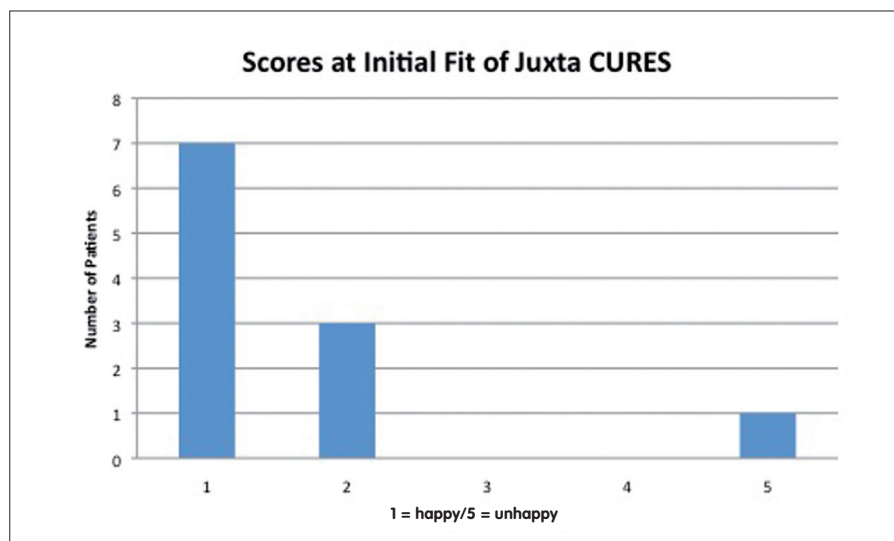


Figure 3.  
'Happiness' scores at initial fitting of Juxta CURES.

into the evaluation and two of these had bilateral leg ulcers, which meant that in total 16 Juxta CURES and two Juxta-Fit were used. There were 44 follow-up visits in total.

The average duration of a venous leg ulcer among the 16 participants was 23 months and one week. This average included four ulcers that had been present for more than five years.

Of the patients surveyed, 11 were able to answer the questions and only one gave a score of 5 ('unhappy') at the initial visit as he was reluctant to change to a new regimen. However, after a second visit from the community nursing team he changed his mind and progressed rapidly over the course of the evaluation, particularly with regards to oedema reduction. This meant that he was able to wear his own shoes again and the nurse observed that he was 'excited' and happy that he could visit his son. He also asked if he could take 'a stroll around the garden'.

As a result of the improvements in his oedema he arranged for a mechanic to fix his car so that he could go out and do his own shopping again — this helped relieve some of the care responsibilities from his son and daughter-in-law.

All other patients who were able to respond to the question stated that they were either 'happy' or 'very happy' with the initial fitting (*Figure 3*).

Although not all of the patients were able to answer the questions, the general impression from the nurses' interactions with the patients was that the Juxta CURES and Juxta-Fit system was less painful than bandaging (*Figure 2*).

For the nursing staff, the key factor was reduction in clinical time spent on bandaging, with less visits required, and the duration of visits shorter due to the ease of removing and reapplying Juxta CURES and Juxta-Fit compared to compression bandages.

## Cost savings

Cost savings were demonstrated with the reduced number and duration of



**Table 2:** Quantity and duration of visits pre- and post-evaluation for case report one

	Visits per week	Time per visit	Total per week
Pre-evaluation:	7	60 minutes	Seven hours
Post-evaluation:	2	35 minutes	One hour, 10 minutes
Saving	Five hours, 50 minutes		

**Table 3:** Cost of treatment pre- and post-evaluation for case report one

	Cost of dressings and compression per week	Cost of nursing visits per week?	Total per week
Was	£128.80	£420.00	£548.80
Now	£11.66	£120.00	£131.66
Saving	£417.17		

**Table 4:** Ankle and calf circumference (in cm) for case report one

	Left		Right	
	Ankle	Calf	Ankle	Calf
Start of pilot	33	52	35	54
End of week one	30	46	30	49
End of week nine	29	46	30	48
Reduction	4cm	6cm	5cm	6cm

visits, the reduced cost of providing compression and the reduction in the use of superabsorbent dressings (Table 1). At the beginning of the evaluation several patients' wounds exhibited very high exudate volumes and these were being dressed with superabsorbent dressings.

However, over the course of the evaluation the Juxta CURES and Juxta-Fit reduced these patients' oedema levels — and in turn their exudate volumes — so successfully that the superabsorbent dressings were no longer required.

**Cost savings on bandaging and dressings**  
Compression bandages are

disposed of after a single-use, whereas Juxta CURES and Juxta-Fit are guaranteed by the company (medi UK) to provide effective compression for six months.

The average cost of applying compression bandages at the time of writing was £27.60 per week (the average weekly cost of bandaging in the 16 patients at the beginning of the evaluation, calculated using NHS Supply Chain prices). This did not include nursing time. Conversely, Juxta CURES and Juxta-Fit costs £6.25 per week (this figure was calculated from the cost of purchasing Juxta CURES and Juxta-Fit (£150) and dividing this by 24 weeks.

**Table 5:** Quantity and duration of visits pre- and post-evaluation for case report two

	Visits per week	Time per visit	Total per week
Pre-evaluation	Seven	50 minutes	Five hours, 50 minutes
Post-evaluation	Seven	20 minutes	Two hours, 20 minutes
Time saving	Three hours, 30 minutes		

**Table 6:** Cost of treatment pre- and post-evaluation for case report two

	Cost of dressings and compression	Cost of visits	Total per week
Pre-evaluation	£263.48	£420	£686.34
Post-evaluation	£13.36	£420	£433.36
Weekly Saving	£252.98		



**BOX 1: PATIENT COMMENTS**

- ▶ 'I now feel able to walk down to the communal dinner for my meals'
- ▶ 'I can now get into proper clothes rather than staying in my pyjamas'
- ▶ 'Finding the socks painful and as there is no swelling in feet, trying without socks. Legs very comfortable'
- ▶ 'Find it very comfortable unlike the bandages'
- ▶ 'Holds better than bandages'
- ▶ 'Legs now feel lovely'
- ▶ 'On initial application I didn't like them as I was used to the nurses coming in and changing bandages and throwing them away. I didn't like the idea of washing them and adjusting them. Juxta CURES slipped-down for the first week'
- ▶ 'I previously needed three dressing changes between 3–9PM each day, due to high exudate'
- ▶ One patient's reaction to getting his shoes on: 'Whoopee, I can go and visit my son tonight'. He then asked if the door could be left on the latch so he could take a stroll around the garden. Since then he has asked a mechanic to come and get his car started so he can get out and do his own shopping again, relieving his son and daughter-in-law.

When using Juxta CURES and Juxta-Fit the pressure can be checked, adjusted and maintained as required, thereby encouraging healing and reducing the need for absorbent dressings. Cost savings for dressings are realised through two routes — reduced reliance on superabsorbent dressings (as mentioned above); and a reduced frequency of dressing change.

**CASE REPORTS**

**Case report 1**

This patient was an 86-year-old

**Table 7: Ankle and calf circumference (in cm) for case report two**

	Right	
	Ankle	Calf
Start of pilot	40	61
End of week two	36	48
Reduction	4cm	13cm

woman with a history of 'wet' and 'leaky' legs and venous eczema, which had not resolved despite having two years of superabsorbent dressings and two-layer compression bandaging. The patient presented with advanced lipodermatosclerosis and her gaiter area was indurated and shaped like an inverted champagne bottle. Her ABPI results indicated a normal arterial flow into the limb and therefore it was deemed safe to use compression as an aid to venous return.

Before the evaluation, the patient was having daily hour-long nurse visits to dress her legs and reapply compression. This cost approximately £60 per visit (£420 per week). The dressings cost £0.44 each and the nurses were using a total of 14 per week at a cost of £6.16. The compression bandaging cost £9.20 each — 14 per week came to a cost of £128.80.

The patient switched to Juxta CURES in February 2015. At her initial visit, she was unhappy with the change but agreed to the trial after a short discussion about the possible benefits. After one week she was happy to continue, mainly due to a reduction in the volume of her legs and improvement in her skin condition. The nurses were initially attending every day, but over the course of the treatment the frequency of visits reduced to twice-weekly, equating to a cost saving of £120 per week in nursing time.

The change in regimen involved one leg being dressed with Atrauman® (Hartmann) (costing £0.44 each; the patient needed seven per week — a total of £3.08), and both legs then being compressed with Juxta CURES (costing £5.83 per leg per week — a total of £11.66).

The nursing time reduced from daily visits to two visits per week to dress the patient's legs and reapply the Juxta CURES system. The visits reduced from one hour per visit to 35 minutes, reducing the weekly nursing time by five hours and 50 minutes in total (Tables 2 and 3).

Measurements were taken of the ankle and calf circumferences throughout the evaluation (Table 4), showing a marked reduction in circumference by the end of week one. The patient commented:

*'I am thrilled as I now have an ankle that I haven't seen for years.'*

Overall, this patient's mobility score improved from 2 to 1 on the five-point scale; her pain level reduced from 5 to 1; and her legs 'dried-up' for the first time in four years.

### Case report 2

This patient was a 79-year-old man with a two-year history of venous ulceration to his right leg which had not improved despite compression bandaging. There was oedema in his leg and it was also very wet. Compression bandaging and absorbent dressings were required but the venous ulcer had remained static.

The patient was distressed by the lack of progress, as he constantly had wet legs and malodour. ABPI measurements to the left leg were 1.25 and the right leg 1.2, both with biphasic signals.

Before the evaluation the patient was receiving a daily leg and foot wash, application of two honey dressings (to reduce odour and aid debridement) and two-layer compression bandaging (x2 due to the length of his legs). The cost of this was £37.64 per day, with a weekly cost of £263.48.

The nursing input was seven hours per week at a cost of £420.00. The total cost of managing the bilateral leg ulcers was £683.48 per week (Tables 5 and 6).

The patient began using Juxta CURES at the beginning of February, 2015. The daily visits continued due



### BOX 2: NURSE COMMENTS

- ▶ 'I was able to check the level of compression at each visit but not disturb the Juxta CURES unless the leg was being cleaned.'
- ▶ 'The advantage of Juxta CURES is that we don't have to remove the whole garment from the leg when we are doing the foot dressing, we only have to remove the sock.'
- ▶ 'Easier for podiatry when they see the patient weekly. With compression bandages, the podiatrist has to remove them all to access the foot but is not able to reapply them. Therefore, the nurse has to do a further visit.'

to the rapid reduction in the oedema throughout the trial and this allowed clinicians to adjust the device to match the reduction (Table 7). As the evaluation progressed the exudate was greatly reduced, allowing simpler dressings to be used, which were changed three times per week. The dressing costs at the end of the evaluations had been reduced to £7.53 because the dressings only needed to be changed three times per week. The odour had resolved and the wound beds had been debrided. The cost of Juxta CURES was £5.83 per week.

The patient had fully healed eight weeks after the evaluation began. He was then measured for hosiery and was discharged from the nursing caseload with a saving of £686.34.

Patient and nurse comments regarding the new regimen can be seen in Boxes 1 and 2.

### DISCUSSION

During the evaluation, signs of healing were observed within four days in ulcers that had previously been static under compression bandages. This healing process is expected to continue with continued use of the system, leading to more patients being discharged.

The benefits of the Juxta CURES and Juxta-Fit devices that were found during this evaluation were:

- ▶ Patients were able to return to normal footwear as their feet no longer needed to be bandaged. This had a big psychological impact and encouraged even balance, an improved gait and stability, all of which improved and promoted mobility
- ▶ Slimmer and lighter compression therapy
- ▶ Full range of flexion and extension at the ankle promoted effective calf muscle pump action
- ▶ The drying of 'wet legs' with associated reduction of malodour
- ▶ The option to check and adjust pressure by the patient increased self-care which improved feelings of being 'in control'
- ▶ Inelastic fabric ensured effective compression with minimum discomfort, high working pressures and low resting pressures
- ▶ Cost savings were made due to the reduction in dressing usage. The average saving in dressing and compression therapy costs in the evaluation of the 16 patients was £60.88 each per week. The system was less time-consuming for the nurses, reducing the time for each patient visit. The time saved was an average of 87 minutes per patient per week.

In a Wiltshire-wide wound survey carried out in June 2015, there were 99 venous legs on the community nursing caseloads. If all of these were switched to the new regimen there would be a potential cost saving of £6,027.12 per week and a potential time saving of 143 hours per week. This time saving would allow the nurses to carry out full assessments and documentation and give patients time to ensure they were receiving the best possible quality of care.

## CONCLUSION

The average saving in dressing and compression therapy costs in the evaluation of these patients was £60.88 per patient, per week.

The time saved was an average of 87 minutes per patient per week. The potential for savings across primary care could also result in a significant saving both financially and in nursing time. Juxta CURES and Juxta-Fit also appear to be well-tolerated and able to improve quality of life for patients who have previously had non-healing venous leg ulcers. The results of this small evaluation indicate that Juxta CURES and Juxta-Fit could be a good alternative to multilayer compression.

This compression system is now being rolled out across Wiltshire and a further article of the results, savings and effect on patients' quality of life will follow this introductory evaluation. **JCN**

*This evaluation was supported by medi UK.*

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## KEY POINTS

- Venous leg ulcers are defined as an open lesion between the knee and the ankle joint that remains unhealed for at least four weeks and occurs in the presence of venous disease.
- The 'gold standard' treatment for venous leg ulcers has long been multilayer compression therapy.
- As with any other skilled technique, compression bandaging expertise can vary, meaning that bandaging does not always reach the optimum sub-bandage pressures.
- Patients can find multilayer compression bulky and concordance can be an issue.
- The advent of innovative Velcro-adjustable compression therapy is an alternative to traditional compression bandaging and may alleviate some of these issues associated with multilayer bandaging.
- This evaluation involved 16 patients and used the Juxta CURES and Juxta-Fit systems, Juxta CURES (medi UK) for venous ulcers and Juxta-Fit where chronic oedema/lymphoedema was present.
- Patients were able to return to normal footwear during the evaluation as their feet no longer needed to be bandaged. This had a big psychological impact and encourages even balance, an improved gait and stability, all of which improve and promote mobility
- For the nursing staff, the key gain was reduced clinical time spent on bandaging due to the ease of removing and reapplying Juxta CURES and Juxta-Fit compared to compression bandages.
- Nurses found that the average saving in dressing and compression therapy costs in the evaluation of these patients was £60.88 per patient, per week.