

An advanced self-care delivery model for leg ulcer management: a service evaluation

Background: Lower limb ulceration is a common cause of suffering in patients and its management poses a significant burden on the NHS, with venous leg ulcers (VLUs) being the most common hard-to-heal wound in the UK. It is estimated that over one million patients in the UK have lower limb ulceration, of which 560,000 were categorised as VLUs, with a cost burden of over £3 billion each year.

Objective: The aim of this service evaluation was to assess the effects of implementing a self-care delivery model on clinical outcomes with the intention of limiting face-to-face health professional contact to one appointment every 6 weeks.

Method: A suitability assessment was conducted and a cohort of patients were moved to a self-care delivery model. Patient data were collected, anonymised and independently analysed, comparing time to healing against data on file from a previous report.

Results: This highlighted that, in 84 of the 95 patients selected, the

VLUs had healed by week 24 on the pathway, a further 10 patients' VLUs had healed by week 42 and only one remaining patient reached 42 weeks without healing.

Conclusion: These results support the hypothesis that patients with VLUs can self-care and deliver clinical effectiveness. It is recommended that all services explore the possibility of introducing a self-care model for VLU care.

Declaration of interest: This study was made possible with funding from L&R Medical UK, who supported the initiation of the service evaluation, as well as training and education of key staff. An external data analyst consultancy (Niche Health and Social Care Consulting, UK) collected, anonymised and analysed the data to ensure the audit was robust, accurate and without influence or bias. Editorial and writing support was provided by the MA Healthcare projects team. This paper was prepared by the JWC projects team.

care pathway • delivery model • dressing • hard-to-heal wounds • infection • self-care • service evaluation • ulcer • venous leg ulcer • wound

In 2018, South West Yorkshire Partnership Trust (SWYT) tissue viability (TV) leg ulcer service conducted a review of its existing lower limb management pathway. It was a traditional pathway, consisting of multiple patient contacts per week by healthcare staff.

The results of this review indicated improvements could be made, and subsequently the TV team introduced the best practice leg ulcer pathway, which was adapted from Atkin and Tickle, 2016. Key elements of the adapted pathway are outlined in Box 1.¹ The main differences between the two pathways were improved clarity on process (this was supported by education and training if required), improved pathway hand-off points to each team and less frequent patient contact. This resulted in improved wound healing times and reduced costs (driven by less healthcare time being used on patient visits).

In recent years, there has been growing national recognition of the need to improve healing outcomes for the lower limb and thus reduce costs. In 2015, Guest et al. published a study, commonly referred to as the 'Burden of wounds to the UK NHS in 2012/13', which highlighted the scale of the challenge of caring for patients with wounds.² It sparked a long overdue parliamentary debate in the House of Lords, which highlighted the need for a national strategy to improve the standards and delivery of wound care in the NHS.³

This led to NHS England and NHS Improvement

forming a group known as the National Wound Care Strategy Programme (NWCSP) in 2018 (NHS England, National Wound Care Strategy Programme).⁴ Guest et al.⁵ repeated their earlier study in 2017/18, with concerning outcomes: their results indicated that the number of patients with a wound managed by the NHS had increased from 2.2 million in 2012/13 to 3.8 million in 2017/18, resulting in a 71% increase in the annual prevalence of wounds since 2012/2013. The annual cost of wound management had increased from £5.3 billion to £8.3 billion⁵—more than the annual cost incurred by obesity and the combined cost for managing alcohol and smoking-related diseases.

During the roll-out of the best practice leg ulcer pathway in 2018 (Box 1), the TV service hypothesised that it would be possible to introduce a self-care delivery model (Fig 1). This would focus on patient self-care or supported self-care, thereby further reducing the burden on health professionals, with little or no reduction in patient healing outcomes. Overall costs per patient were

Laura Hallas-Hoyes,¹ Senior investigator, Lead Tissue Viability Nurse Specialist; **Stephanie Williamson**,¹ Tissue Viability Nurse; **Andrew Kerr**,² Director, Lower Limb Consultancy Services Ltd, UK, Honorary Tissue Viability Clinical Nurse Specialist; **Trevor Andrews**,³ Independent Advisor; **Leanne Calladine**,³ Omni-Channel Communications Manager

*Corresponding author email: Laura.Hallas@swyt.nhs.uk

1 South West Yorkshire partnership Foundation Trust, UK. **2** Sandwell and West Birmingham Hospitals NHS Trust, UK. **3** L&R Medical UK Ltd.

Box 1. Key elements of the adapted version of the best practice leg ulcer pathway¹

Holistic assessment
If signs of venous disease/oedema are present, perform an ABPI*†
If the ABPI is 0.8–1.3 and exudate is not controlled by the topical dressing, implement the following exudate management plan and re-assess weekly: - mechanical debridement with a monofilament pad - use of a superabsorbent dressing - application of a two-layer inelastic compression bandaging system
If the ABPI is 0.8–1.3 and exudate is controlled by the topical dressing, but there is a large amount of reducible oedema and limb distortion present and no skin folds, apply an adjustable inelastic wrap system. If there are skin folds, apply two-layer inelastic compression bandages
When the oedema, limb distortion and exudate have been controlled, use a compression hosiery kit
* Refer to the tissue viability service if there is extensive cellulitis
† If the ABPI is <0.5 refer to vascular centre. If it is 0.5–0.8, refer to the vascular centre/tissue viability team; apply reduced compression following specialist advice. If it is >1.3, consider referral to vascular centre and/or tissue viability
ABPI—ankle brachial pressure index

expected to reduce due to lower health professional/patient-contact frequency. A prospective real-world audit was therefore proposed to test this hypothesis. This article describes the results.

Background: local experience

SWYT is a specialist NHS foundation trust that provides community, mental health and learning disability services to a population of >1.2 million people in and around Barnsley, Calderdale, Kirklees and Wakefield. The community TV service covers the Barnsley area and provides specialist advice, treatment and therapy for patients with compromised skin conditions and wounds. It also provides education to health professionals and runs weekly specialist nurse-led clinics for patients with hard-to-heal wounds and leg ulcers.

Hard-to-heal wounds and leg ulcers present a significant burden on the TV service within SWYT. At any one time, the service manages a caseload in excess of 1500 patients, with an average of 170 new patients per calendar month. As highlighted by Guest et al.,^{2,5} these numbers are rising year on year, with the majority of new cases being diagnosed with VLU.

Aims and objectives

SWYT is a typical community provider in that it has a shortage of healthcare staff to meet patient needs, as currently seen nationally. In view of the social restrictions necessitated by Covid-19, any innovation that enables improved use of staff resource warrants prioritisation. It was hypothesised that a self-care delivery model had potential to reduce the burden on the health service and improve patient empowerment

with little or no reduction in healing outcomes.

The service evaluation objectives were to observe changes in clinical provision and patient outcomes using prospective real-world data. This would investigate how the model could enhance resource allocation and VLU management without compromising outcomes.

NHS England⁶ and the lower Limb Clinical Workstream within the NWCSP⁴ highlight the need to promote patient self-care and self-management. As we continue to work through a global pandemic, the NWCSP has focused efforts on developing documents to support self- and shared-care, with support materials including patient diaries, advice on how to look after a wound, and on how to apply compression therapy safely and effectively.⁴ Coalitions such as Legs Matter (legsmatter.org), along with medical device industries such as L&R Medical UK (lselfcare.co.uk), are also producing materials to support this.

Effective long-term self-care is one of many strategies that can change management of the lower limb. A better understanding of the impact of an evidence-based leg ulcer pathway, used in conjunction with a self-care delivery model for the management of VLUs, can provide important evidence to inform structural service redesign and improve patient outcomes.

Method

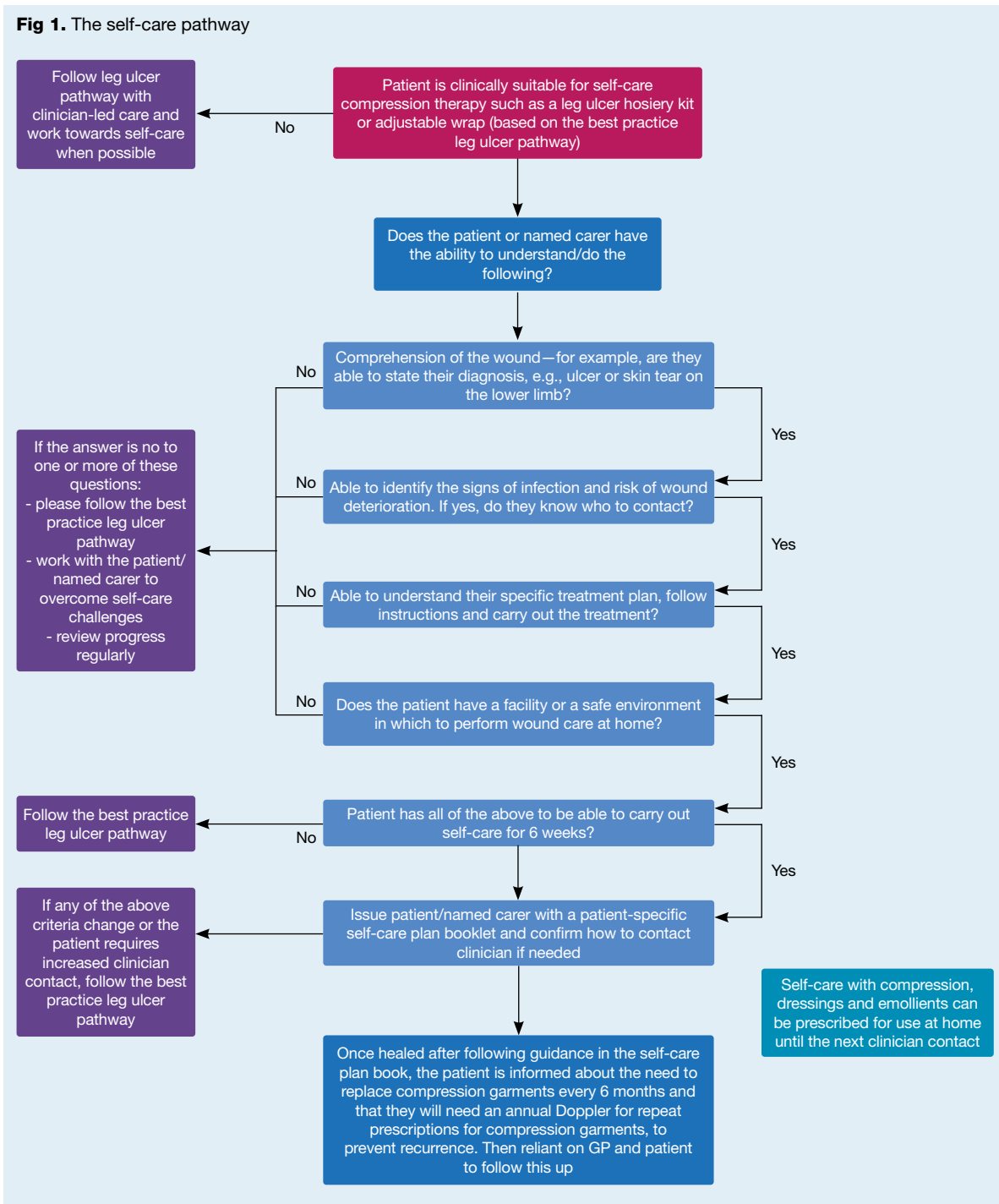
An audit was conducted involving local patients with leg ulcers, aged over 18 years, from the community nursing and TV caseload. With the aim of implementing the self-care delivery model and limiting face-to-face health professional contact to one appointment every six weeks, patients were required to have a differential diagnosis of a VLU, a recorded ankle-brachial pressure index (ABPI) and to be on the best practice leg ulcer pathway (Box 1).

Patients were considered clinically suitable for self-care compression therapy if they were able to use a leg ulcer hosiery kit, such as an Activa or Actilymph hosiery kit (L&R, UK) or an adjustable compression system such as ReadyWrap (L&R, UK), as per the adapted version of the best practice leg ulcer pathway.¹ To be deemed suitable, the patient or named carer also had to be able to provide appropriate responses to the following questions:

- Comprehension of the wound: were they able to state their diagnosis (leg ulcer/skin tear on lower limb?)
- Could they identify infection and were they aware of the risk of wound deterioration? If so, did they know who to contact?
- Did they know their specific treatment plan and could they follow instructions and carry out the treatment?
- Did they have a safe environment in which to undertake wound care at home?
- If yes to all of the above, could they carry out self-care for six weeks?

At this stage, if the health professional was satisfied, they issued the patient/named carer with a

Fig 1. The self-care pathway



patient-specific self-care plan booklet and confirmed how to contact their named health professional, if needed. The patient instruction booklet provided clear support and expectations for the patient, so there were few face-to-face contacts.

The patient or named carer followed a patient-specific care plan agreed with the patient's clinician, and was assessed for further treatment, if needed, at six-weekly intervals. Self-care compression, dressings and

emollients were prescribed to cover the period of self-care until the next health professional contact. If the patient needed additional dressings, they would telephone, and these would then be provided. If the patient needed support, they would be triaged by clinicians before a face-to-face meeting took place.

During the height of the Covid-19 pandemic, many patients declined to attend clinic, or the clinics were closed, requiring telephone consultations for review.

Approximately 20–30 patients used a telephone review and forwarded photographs by email, especially if they were shielding, but, at most, only one face-to-face visit was missed. During the telephone review, the patient or their carer would report any changes to their wound, including if it was improving and reducing in size. All patients or their carer carried out dressing changes during the six-week self-care period.

If any of the above criteria changed, or the patient required increased clinician contact, or the patient was not able to meet the criteria for self-caring, the health professional and patient followed the adapted version of the best practice leg ulcer pathway (Box 1).

Patient and staff safety was a primary concern throughout the self-care delivery model evaluation. Therefore, support and education were provided to staff on implementation and audit. Additional education and support were provided to all patients and any named carers in the form of an informative patient/carer-friendly guide, 'My leg ulcer treatment plan'. This included information on the causes of leg ulceration, treatment, the signs of deterioration and long-term care requirements. The patient's management record and health professionals' contact details were also provided.

Data collection and protection

An independent data analyst consultancy, Niche Health and Social Care Consulting, UK (Niche), and SWYT managed patient information in line with local data-protection guidelines. The SWYT team extracted patient data from SystemOne and captured them within a password-protected collection tool. This was written in Excel and excluded patient-identifiable information. At each six-week data point, the data collection tool was saved and sent to Niche for analysis.

During the evaluation, clinical data outlined in Box 2 were collected. A 'simple' VLU was defined as the presence of the following patient or wound characteristics:⁷

- ABPI 0.8–1.3
- Wound area <100cm²
- Wound present for <6 months.

A 'complex' VLU was defined as the presence of the following patient or wound characteristics:⁷

- ABPI outside of 0.8–1.3 range; unable to obtain ABPI
- Wound area ≥100cm²
- Wound present for >6 months
- Controlled/uncontrolled cardiac failure
- Current infection and/or history of recurrent infections
- Patient history of non-adherence to treatment
- Wound had failed to reduce in size by 20–30% at 4–6 weeks, despite best practice
- Fixed ankle or reduced range of motion
- Foot deformity
- Unmanaged pain
- Severe lymphoedema.

The data were anonymised and analysed by Niche to ensure the audit was robust, accurate and without

Box 2. Clinical audit parameters

Clinical audit parameters
Overall healing rates
Complex versus simple leg ulcer outcomes
Number of visits/dressing changes
Cost of pathway and possible savings, based on less nursing time used and less product use

influence or bias. The data were analysed for statistical relevance and for comparison against data held on file, previously collected by the same independent third party.

These original data points were collected in 2018 and submitted to Getting It Right First Time (GIRFT), the national programme to improve the treatment and care of patients.⁸

Although there were instances of data being unavailable for each stage within the pathway, this reflected the challenge of carrying out an evaluation during an unprecedented global pandemic. The missing data were categorised under two causes:

- Missing data (for a particular pathway point)
- The patient had not reached a point on the pathway at that particular time.

Measuring clinical impact

Making changes to long-standing work practices can present challenges to both staff and patients.⁹ Adopting a self-care model was a significant change to the working practices of many staff, and so the TV service sought staff feedback on the impact the changes had on individual health professionals. An online staff survey was sent to 150 staff members across several district nurse bases to assess the effect of implementation of the self-care delivery model on them and the service parameters listed in Box 3. The data were collated and anonymised to provide clinical validation of the model.

The service evaluation design was submitted to the local SWYT ethical standards group and senior management, where approval to start was given, and implementation of the self-care pathway began in January 2020.

Data collection was planned every six weeks. However, due to the Covid-19 pandemic, this frequency was unable to be consistently maintained. The pandemic made the delivery of any wound care difficult as many patients did not want to attend clinic or see their health professional in their home, for fear of catching coronavirus. This made patient continuity particularly challenging and added a layer of complexity to this service evaluation, as the design was conducted from a real-world prospective.

The cost of VLU wound care for each patient was calculated using an average unit cost for health professional time and an average unit cost of wound-care products.

Verbal consent for all audit participants was obtained by their health professional and documented in the patient notes.

Box 3. Staff survey parameters

Study parameters
Resource reallocation
Staff motivation and work satisfaction
Staff wellbeing and ergonomics
Productivity
Timely documentation
Health professional time
Product costs

Time consumed by travel, whether by the health professional visiting a patient or a patient attending a clinic, is also a significant burden on a service. Travel has been viewed as an unavoidable aspect of working in district nursing, and it can be problematic for patients when expected to attend a clinical setting. When the patient is immobile, geography (for example, rural or urban) can affect time spent travelling between patient visits. This evaluation did not set out to audit this in detail; however, the ongoing Covid-19 pandemic and the ambition of the NHS to reduce its emissions to net zero by 2040 increase the relevance of travel time. Basic travel data were obtained to enable commentary. These data were not independently audited and are not used in the total costs of patient management.

Results

Overall, 110 patients were enrolled into the service evaluation, and were recruited within the first five months of starting the evaluation (January to May 2020; pathway 1; Fig 2). Of these 110 patients, 12 exited the self-care pathway and so were withdrawn from the evaluation. The reasons for exit broadly fit into the following categories:

- Declined further treatment or neglected wound hygiene (n=3)
- Patient no longer able to self-care (n=4)
- Change of living situation/personal circumstances (n=3)
- Patient death or crisis (n=2).

Data were collected on the remaining 98 patients. However, of these, three had inconsistent data entries and were withdrawn from the final data, leaving a total of 95 patients (Fig 3). Of the remaining patients:

- The VLU of 84 had healed by week 24 on the pathway
- The VLUs in a further 10 had healed by week 42
- The remaining patient reached 42 weeks without healing.

The results indicate that the healing outcomes for the self-care delivery model are similar to those observed when the best practice leg ulcer treatment pathway is used in isolation. By week 42, VLU healing rates were 99% for the self-care delivery model, compared with 98% for the adapted best practice leg ulcer pathway. The adapted best practice pathway is similar to the pathway used by clinical sites in the 2018 GIRFT audit carried out by L&R. These data are held on file.

The data analysts (Niche) tested and compared the results of the SWYT service evaluation against both the previous SWYT pathway data results and the GIRFT audit. This was possible as they used a similar data-collection methodology. Niche reported that the healing rates for the self-care delivery model and the adapted best practice leg ulcer pathway were almost identical.

This confirmed SWYT's original premise that patients with VLUs can use a self-care delivery model, which uses less HCP resource and maintains healing rates.

Fig 3 shows the healing-rate profile. Table 1 shows the highlighted 18-week point, which indicates that

Fig 2. Patient recruitment pathway (pathway 1)

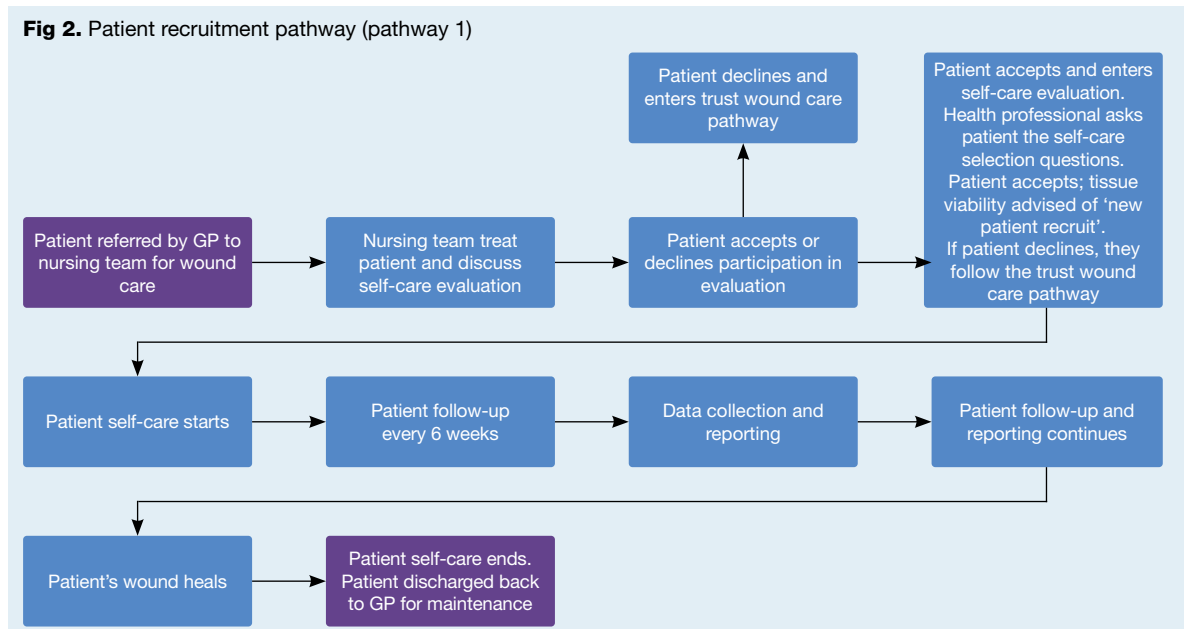
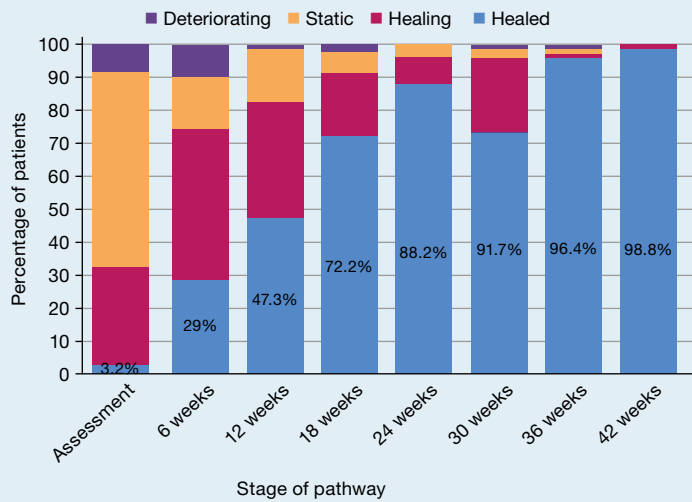


Fig 3. Healing rate profile for completed episodes using the self-care pathway. Healing status based on last entry of data collection



68 (72%) patients enrolled were healed by this time point. This correlates with previously collected audit data held on file at L&R Medical UK and Niche.

Based on unpublished audit data previously generated by L&R Medical UK and Niche, an analysis of patient records found that, on average, the number of nursing hours required to enable a patient's VLU to heal was 24.5 hours (or 1470 minutes). This correlates with recent data published by Guest et al.¹⁰

Using the self-care delivery model, the recorded mean number of nursing hours required to achieve VLU wound healing was 1.3 hours. This equates to >90% reduction in health-professional contact time, representing a mean saving of 23.2 nursing hours per healed patient. Fig 4 illustrates the clinical time distribution.

Although this may seem particularly low, it is worth highlighting that 83 of the 95 (88%) patients were placed onto six-weekly visits immediately after assessment, and most of them healed within 18–24 weeks. Of the remaining 12 patients, six progressed to a six-weekly clinic and therefore, also contributed towards savings in health-professional

Table 1. Healing rate of all self-care participants (n=95)

Point on pathway	Patients healed	
	(%)	(No.)
Assessment	3.4	3
6 weeks	29.0	28
12 weeks	47.3	45
18 weeks	72.2	68
24 weeks	88.2	84
30 weeks	91.7	86
36 weeks	96.4	91
42 weeks	98.8	94

time. The recorded schedules for these six patients were:

- Two patients: six weeks
- Two patients: 12 weeks
- One patient: 18 weeks
- One patient: 24 weeks.

Although the remaining six patients were not able to fully move into a six-week visit schedule, they were supported via a weekly telephone consultation or face-to-face visit schedule.

To understand barriers to self-care and the impact of a patient's age and gender on nursing time, an analysis of nursing time spent per patient was conducted. This calculated the mean number of nursing-time minutes used to achieve full wound healing for a specific patient profile. These data suggest that age or gender was not necessarily a barrier to self-care within the self-care delivery model, and that nursing time does not increase as patient age increases (Table 2).

Following the introduction of the self-care delivery model, the TV service underwent a cost audit to understand the efficiency savings across Barnsley. The cost audit was inclusive of all health-professional costs, including the total wound-care product spend. A service cost analysis compared the previous pathway against the new self-care delivery model, and demonstrated a positive financial impact (Table 3).

As reported, a time saving within the self-care delivery model was observed and wound-healing outcomes were maintained. The mean total cost was £361, with an overall reduction of £3975.00 when the traditional pathway was compared with the self-care delivery model, and a saving of £1807.00 when compared against a best practice leg ulcer pathway model of care.

Health-professional time included initial patient assessment costs at a standard unit cost of £50 per hour, based on patient appointment times of 20 minutes. Wound-care product use was driven by the number of dressing changes carried out. Product use did not vary significantly per patient and an average cost per patient was calculated. The main driver for the reduction in each case was lower nursing time needed to deliver care, compared with previous nurse-led pathways (Table 4).

In both the traditional and best practice leg ulcer pathways, the ratio for distribution of health-professional cost to wound-care product spend was approximately 70:30. However, the self-care delivery model cost distribution shifted health professional cost to 51% and wound-care product spend to 49%. This reflects both the decrease in health professional time and the decrease in product usage.

Lower-limb leg ulcer healing times are often compromised by wound infection.¹¹ This service evaluation assessed infection rates following the introduction of the self-care delivery model, highlighting whether they increased, decreased or remained static. The analysis found infection rates did not increase following the introduction of the model. Generally, rates of infection reduced from around 5% at

initial assessment to 0% at week 6. At the 12-week point, two patients experienced infection, and at 30 weeks, one patient was affected, leading to a respective infection rate of 3% and 13% at these pathway points. The majority of patients either recovered from infection after assessment and entry into the self-care model, or entered the model infection-free and remained so for their course of treatment.

The staff survey feedback was qualitative and anonymised. It unanimously supported the ability of a self-care delivery model to steer their work practice and the care given to patients. The feedback may suggest that implementation of the model improved their job satisfaction as care was able to be delivered in a more thoughtful and timely manner. The feedback may also indicate that the model could benefit staff wellbeing by reducing the ergonomic impact leg ulcer management can have on employees, such as that caused by kneeling while bandaging a patient's wound.

Also, within this service evaluation, it was calculated that a maximum of 5932 miles might be driven—from the start of care to wound healing—based on a weekly clinical visit schedule. Although simplistic, this service evaluation explored travel times per journey, indicating that it might be possible to avoid some travel and to save more time if a self-care delivery model is followed. This is likely to generate further financial saving and reduce carbon dioxide emissions.

Discussion

The national picture of delivering wound care has been in the spotlight following the initial 'burden of wounds' publication in 2015.² The findings of a follow-up study by the same authors, published five years later, although predicted, were nonetheless alarming.⁵ The overall number of wounds increased from 2.2 million to 3.8 million over the five-year period, with the overall cost of managing wound care rising from £5.3 billion to £8.3 billion per year. The total number of VLUs in 2017/18 rose from 258,000 to 560,000. Guest et al.⁵ also highlighted the wound-care resource consumption of health professional time as significant. In 2017/18, there were an estimated 136 million visits to patients with wounds; of these visits, 81% took place in a community setting (>110 million). A high percentage of these community contacts related to leg ulcer care (54.5 million), with an estimated 49.5 million visits (45%) specifically documented as relating to VLU care. This indicates, on average, that each patient would receive an estimated 70 health professional contacts.

This service evaluation set out to assess the effectiveness of a self-care model of care. It aimed to evaluate if it would be possible to deliver existing patient healing times with fewer face-to-face health professional/patient visits, and subsequently demonstrated this was possible.

In SWYT, up to 2000 new patients are referred to TV services every year. The visit schedule could generate over 20 clinical visits per day, per member of the

Fig 4. Clinical time distribution

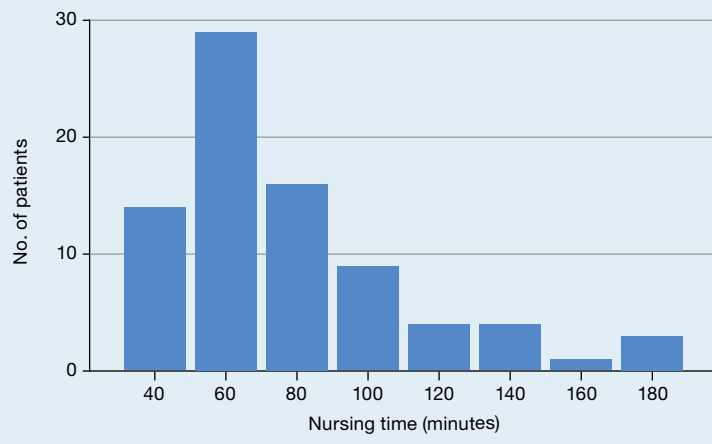


Table 2. Mean number of nursing minutes consumed to achieve full healing (by patient age and gender)

Age (years)	Time (minutes)	
	Male	Female
Under 40	68	40
40–59	88	80
60–79	76	74
≥80	84	77

community team. With an estimated 144,000 visits per year, this represents a significant workforce challenge—one that is potentially unsustainable. Time needed to care for a patient with a VLU can be reduced by nearly 90% if a self-care model is followed. This would enable ongoing service delivery, and suggests that the overall cost of managing an individual with a VLU with the self-care delivery model could reduce to £361 per wound, with no negative impact on healing outcomes.

Based on these findings, if a clinical team has a caseload of 2000 new patients per year, and a service provider enrolls ≥40% of new patients into a self-care delivery model, it will allow the capacity of nearly two full-time equivalents (FTEs) to be assigned to other essential healthcare duties. It may not be possible to fully release this time saving, but it will enable the service provider to prioritise and deliver other necessary care, especially to patients with multiple comorbidities or more complex presentations.

Using the self-care delivery model in conjunction with the best practice leg ulcer pathway was important, as together they provide a steer for both the service and the patient. Implementation of a self-care delivery model needs support from a range of stakeholders, including commissioners, directors of services and innovation leads, along with access to diagnostic devices and specialist staff. When embedded within service delivery, the results can be significant.

The authors have considered what the resource

Table 3. Cost overview per patient

Pathway of care	Health professional time	Product	Total	Saving per patient	Saving
Traditional pathway	£3078.56	£1257.44	£4336.00	Traditional pathway cost minus self-care delivery model cost	£3975.00
Best practice leg ulcer pathway	£1539.28	£628.72	£2168.00	Best practice leg ulcer pathway cost minus self-care delivery model cost	£1807.00
Self-care delivery model	£184.11	£176.89	£361.00		

impact might be to the UK healthcare system if a significant percentage of patients could self care. Guest et al.⁵ estimate that the number of VLU in the UK is about 560,000. If the SWYT findings are applied to the total number of VLUs cited by Guest et al., (560,000 patients), the overall care cost reductions would equate to £1 billion.

This scale of reduction is unrealistic, as a self-care delivery model or supported self care is unlikely to be suitable for all patients. However, if 40% of the total VLU population (224,000) were enrolled onto a self-care treatment plan, the overall UK cost burden would reduce to £809 million, delivering a system saving of £400 million (Table 5).

Applying the same 40:60 model to the new patient population of Barnsley (2000 per year) could generate a local system saving or capacity release of approximately £1.5m per year. The SWYT TV team consider this achievable, assuming the self-care delivery is implemented, successfully embedded and updated accordingly. This would recur annually and would deliver consistent resource and cost improvements (Table 6).

Using the same UK extrapolation allows an estimated calculation of time released through a self-care model. Moving to a self-care/health professional care distribution of 40% and 60%, respectively, would release the same amount of time that 3123 full-time equivalent members of staff would entail (Table 7).

This service evaluation focused on two cost levers:

- Cost of health professional time taken to deliver care
- Cost of wound care products used.

The reduction in wound-care products used to care for patients with VLUs, such as polyurethane foam, superabsorbent dressings, compression bandaging, leg ulcer hosiery kits or adjustable compression wrap systems, was due to a lower frequency of dressing change. It suggests that previous dressing-change frequencies

may not have been adding value to wound healing outcomes and could be partly due to ritualistic practice. None of the reductions reported were driven by local savings, an efficiency imperative or influenced through a local procurement scheme, and savings were delivered through an efficient and balanced use of resources.

Travel

Reducing the need for travel could potentially create additional time savings, depending on whether the health professional or patient travelled. Travel time, either by the health professional visiting a patient or a patient attending a clinic, is significant (Table 8). These data were not independently analysed and are not used in the total costs of patient management. It should also be emphasised that this is based on estimated data. The review uses cautious travel distances, plus, for the sake of caution, the distance for one-way mileage only; the review was unable to take into account that patients' wounds heal at different times. In addition, it was not possible to say if the travel was undertaken by a health professional to a patient, or a patient to a clinic. The implementation of the self-care delivery model resulted in a reduction in travel (mileage), fuel costs and carbon dioxide emissions. Per 100 patients this equates to:

- 1471kg saving in carbon dioxide
- £535 saving in fuel costs
- 60% reduction in miles driven (where patients are treated on the self-care delivery model).

Limitations

The patients' journey to wound healing is likely to incur other costs, such as use of antibiotics, which were not included in the model. Another possible limitation is that the patient sample was limited to 95. However, the use of an independent third-party group to assess the accuracy of the data ensures these are robust.

Table 4. Spend per patients: product and health professional time

Cost data from Southwest Yorkshire Trust (SWYT)	Cost per patient pathway	Product spend apportionment percentage	Health professional spend percentage	Product spend per patient	Health professional spend per patient
Traditional	£4336.00	29%	71%	£1257.00	£3079.00
Best practice leg ulcer pathway	£2168.00	29%	71%	£629.00	£1539.00
Self-care delivery model	£361.00	49%	51%	£177.00	£184.00



Table 5. UK cost–resource extrapolation

No. of patients with VLUs in the UK: 560,000 ⁵								
Cost data from Barnsley	Cost per patient per pathway	Product spend apportionment percentage	HCP apportionment spend percentage	Product spend per patient	HCP spend per patient	Total UK cost	HCP cost	Product cost
Traditional pathway	£4336.00	29%	71%	£1257.00	£3079.00	£2,428,160,000.00	£1,723,993,600.00	£704,166,400.00
Best practice leg ulcer pathway	£2168.00	29%	71%	£629.00	£1539.00	£1,214,080,000.00	£861,996,800.00	£352,083,200.00
Self-care delivery model	£361.00	49%	51%	£177.00	£184.00	£202,160,000.00	£103,101,600.00	£99,058,400.00
System savings								
Traditional pathway versus best practice leg ulcer pathway						£1,214,080,000		
Traditional pathway versus self-care delivery model						£2,226,000,000		
Best practice leg ulcer pathway versus self-care delivery model						£1,011,920,000		
40:60 model of care								
Estimated no. of patients with VLU that could self-care: 40%	224,000					£80,864,000.00	£41,240,640.00	£39,623,360.00
Remaining patients with VLU on best practice leg ulcer pathway: 60%	336,000					£728,488,000.00	£517,198,080.00	£211,249,920.00
System cost						£809,312,000.00	£558,438,720.00	£250,873,280.00
System saving: best practice leg ulcer pathway versus self-care delivery model						£404,768,000.00		
VLU–venous leg ulcer; HCP–healthcare professional								

Table 6. Rolling cost extrapolation for the Barnsley population with venous leg ulcers

Total number of new patients with VLUs in SWYT: 2000								
SWYT rolling cost resource extrapolation using 40:60 care model	Cost per patient pathway	Product spend apportionment percentage	HCP apportionment spend percentage	Product spend per patient	HCP spend per patient	Total cost	HCP cost	Product cost
Traditional care pathway	£4336.00	29%	71%	£1257.00	£3079.00	£8,672,000.00	£6,157,120.00	£2,514,880.00
Best practice leg ulcer pathway	£2168.00	29%	71%	£629.00	£1539.00	£4,336,000.00	£3,078,560.00	£1,257,440.00
Self-care delivery model	£361.00	49%	51%	£177.00	£184.00	£722,000.00	£368,220.00	£353,780.00
Estimated no. of patients with VLU that could self-care	40%	800				£288,800.00	£147,288.00	£141,512.00
Remaining % of patients with VLU on the best practice leg ulcer pathway	60%	1200				£2,601,600.00	£1,847,136.00	£754,464.00
System cost						£2,890,400.00	£1,994,424.00	£895,976.00
Financial saving using 40:60 model against best practice leg ulcer pathway per year						£1,445,600.00		
VLU–venous leg ulcer; SWYT–South West Yorkshire Partnership Trust								

Conclusion

This real-world service evaluation was initiated in January 2020 and ran to December 2020. The ongoing Covid-19 pandemic was present in the local SWYT

population from March 2020. Nationally and locally, wound care clinics were cancelled and patient attendance dropped. Some patients did not want health professionals to visit them in their homes as they were

Table 7. Time-release extrapolation

		Minutes	Hours
Total number of patients with VLUs in the UK: 560,000⁵			
Time needed (minutes) to deliver HCP care using the best practice leg ulcer pathway to wound healing (per patient)	1470 minutes	823,200,000.00	13,720,000.00
Time needed (minutes) to deliver patient-led self-care to wound healing (per patient)	77 minutes	43,120,000.00	718,667.00
Total system time saving using self-care delivery model (hours)			13,001,333
If total system time saving could be released, it would release this number of HCPs for other care duties:			7809
40:60 model of care			
Estimated 40% of UK patients with VLU that could self care	224,000		
Total care minutes to wound healing	77	17,248,000.00	287,467.00
Remaining 60% of UK patients with VLU on best practice leg ulcer pathway	336,000		
Total care minutes to wound healing	1470	493,920,000	8,232,000
Total care hours			8,519,467
System saving using 40:60 model of care compared with best practice leg ulcer pathway in care hours			5,200,533
If total 40:60 care model time could be saved, it would release this number of HCPs from VLU wound-care work			3123
Model assumes 45 working weeks per year, and 37 hours per week			

isolating, which presented many challenges to continuity of care. Although running a service-level evaluation in a pandemic is challenging, due to the nature of the self-care delivery model, the evaluation was able to continue throughout this time. It could be argued that it was a much-needed service requirement at this time. Health professionals had to make some minor modifications, such as the use of telephone feedback rather than face-to-face contact, but the provision of wound care continued, and patient care was not affected. This suggests that, with correct and careful implementation, self-care delivery models could be an essential part of 21st century healthcare, and are robust as well as efficient. Careful implementation should involve support from internal and external stakeholders (including managers and commissioners) to ensure implementation of education for team colleagues on the required knowledge and skills, along with access to the right products for use.

Both nursing time resource (time) and product use reduced substantially as the pathway of care was refined. As patient outcomes did not deteriorate during the implementation of the self-care delivery model, this suggests that some of the health professional resource could be released to other important care responsibilities

Table 8. Travel time

Total time	Actual travel time in hours	Travel time avoided in hours
418	160	258

in line with patient comorbidity.

Notwithstanding the limited size of the evaluation cohort number, the audit report data are clear that the use of the self-care delivery model could reduce total VLU wound healing costs (time and product) by over 80%.

These results support the SWYT TV service team's aspirations that patients can self-care for their leg wounds and experience the same or better clinical outcomes than with the previous, conventional best practice leg ulcer pathway. Due to the success of the service evaluation, the self-care delivery model has been adopted and implemented. At the time of writing, over 200 patients are on the self-care delivery model, with self-care now becoming a normal pathway choice. SWYT expects the total number of patients to increase towards the 40% mark in the coming months.

The recommendation is for all TV and community services to actively explore the possibility of implementing a self-care delivery model. **JWC**

References

1 Wounds UK. Best practice statement: holistic management of venous leg ulceration. 2016. <https://tinyurl.com/48xa55se> (accessed 12 August 2021)
 2 Guest JF, Ayoub N, McIlwraith T et al. Health economic burden that wounds impose on the National Health Service in the UK. *BMJ Open*

2015; 5(12):e009283. <https://doi.org/10.1136/bmjopen-2015-009283>
 3 Browning P. The House of Lords debates wound care strategy. *J Wound Care* 2016; 26(12): 707-711. <https://doi.org/10.12968/jowc.2017.26.12.707>
 4 The AHSN Network. National Wound Care Strategy Programme. 2020. <https://tinyurl.com/hpccu8> (accessed 12 August 2021)

- 5** Guest JF, Fuller GW, Vowden P. Cohort study evaluating the burden of wounds to the UK's National Health Service in 2017/2018: update from 2012/2013. *BMJ Open* 2020; 10(12):e045253. <https://doi.org/10.1136/bmjopen-2020-045253>
- 6** NHS England. The NHS Long Term Plan 2019. <https://www.longtermplan.nhs.uk/> (accessed 12 August 2021)
- 7** Wounds UK. Best practice statement: addressing complexities in the management of venous leg ulcers. 2019. <https://tinyurl.com/ujzeart> (accessed 12 August 2021)
- 8** NHS Providers. The Getting it Right First Time Programme. Early views from the provider sector. 2018. <https://tinyurl.com/dntaazrb> (accessed 12 August 2021)
- 9** Craig J, Dowding D. Evidence-based practice in nursing. 4th edition. Elsevier Limited, 2019
- 10** Guest J, Fuller G, Vowden P. Venous leg ulcer management in clinical practice in the UK: costs and outcomes. *Int Wound J* 2018; 15(1):29–37. <https://doi.org/10.1111/iwj.12814>
- 11** Wounds UK. Best practice statement: holistic management of venous leg ulceration. 2016. <https://tinyurl.com/48xa55se> (accessed 12 August 2021)

Notes

