Reducing variation in leg ulcer assessment and management using quality improvement methods

KEY WORDS
- Ankle brachial pressure index
- Cost saving
- NHS
- Quality improvement
- Venous leg ulcer

The NHS is facing significant financial and operational pressures, with services struggling to deliver high-quality care due to increasing demands and limited resources (Dowsett, 2016; McKenna, 2018). Now, more than ever, local and national NHS service leaders and services need to focus on improving the quality of care provided, reducing variation and delivering better-value care (NHS England, 2017). Improving quality is about making healthcare safe, effective, patient-centred, timely, efficient and equitable (Department of Health [DH], 2016). In terms of leg ulcer care, this means ensuring patients receive evidence-based leg ulcer assessments and treatments to ensure their leg ulcer heals in an optimum timeframe and that they have a good experience of their care (Wounds UK, 2016). Improving leg ulcer healing not only benefits the patient but also the health economy with costs reducing when complications are prevented and the patient's leg ulcers heal in a shorter timeframe (NHS RightCare, 2017). This paper outlines a project that focused on improving venous leg ulcer (VLU) assessment and management for housebound patients, using quality improvement (QI) methods.

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Evidence (Guest et al, 2017; Gray et al, 2018; EWMA, 2016) suggests that patients with leg ulcers do not always receive effective, efficient and equitable care, which results in prolonged ulceration and impacts negatively on their quality of life. A recent cross-sectional survey of 3,179 patients with complex wounds in the community found that 40% of people with leg ulcers either had not received the recommended assessment of ankle brachial pressure index (ABPI) or it was unclear whether a recording had been taken. Furthermore, 31% who had a VLU were not receiving compression therapy (Gray et al, 2018). The Burden of Wounds Study (Guest et al, 2015; Guest et al, 2017) showed that despite published guidelines and best practice statements many of these deficiencies continue in current practice, with 30% of wounds lacking a differential diagnosis and only 16% of cases with leg or foot ulceration having a Doppler ABPI recorded.

VLUs have been found to have a significant impact on patients' quality of life, with associated personal, social and psychological effects (Briggs and Fleming, 2007; Upton et al, 2014). This also has considerable financial implications for health care providers, as well as a wider social and economic impact (EWMA, 2016). The annual NHS cost attributed to VLUs and associated comorbidities was estimated to be £921.9 million with the mean cost estimated at £7,600 for each VLU over a 12-month period (Guest, 2017). Patients with VLUs often present with repeated cycles of ulceration, healing, and recurrence (Franks et al, 2014). Such ulcers can take weeks or months to heal, and 12-month recurrence rates are estimated to be between 18% and 28% (Ashby et al, 2014). Evidence from Ousey et al (2013) suggests that wounds of more than 6 months' duration are at a greater risk of admission or extended hospital stay compared with wounds of a shorter duration resulting in increased cost. Inappropriate or delayed treatment adversely affects the time it takes a wound to heal, impacting quality of life, and increasing the burden on patients (Vowden and Vowden, 2016).

BEST PRACTICE RECOMMENDATIONS

The Best Practice Consensus recommends that

Table 1. Simple and complex VLUs	
Simple VLUs	**Complex VLUs**
APBI 0.8–1.3	APBI outside of 0.8–1.3
Wounds <100 cm^2	Wound >100 cm^2
Present for <6 months	Present for >6 months
Expected to heal in 12 weeks	Current or recurrent infection
Size reduction by 20–40% in 4 weeks	Controlled/uncontrolled cardiac failure
	Non-concordance
	Fixed ankle or foot deformity
	Non-healing by 20–40% at 4 weeks

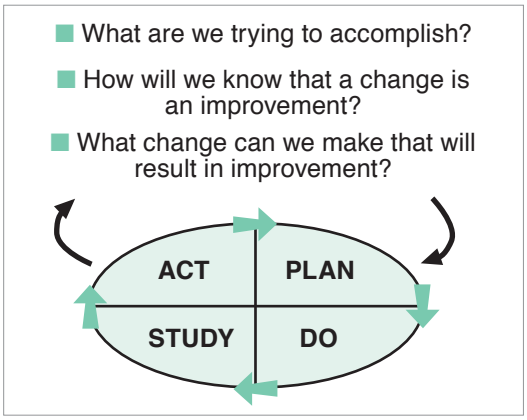

Figure 1. Model for improvement (adopted from Langley et al, 2009)

all patients who present with a leg ulcer should have a thorough, holistic assessment in order to obtain an accurate diagnosis and progress to appropriate management (Wounds UK, 2016). After the initial assessment has been completed and a VLU diagnosed, VLUs should be classified as simple or complex (Harding et al, 2015) *(Table 1)*. This classification helps to ensure that patients are placed on the correct pathway to optimise wound healing and to manage expectations in terms of healing time and outcomes. Gold standard treatment for VLUs includes the use of compression therapy to reduce venous hypertension and expedite healing (Scottish Intercollegiate Guidelines Network [SIGN], 2010; O'Meara et al, 2012; Wounds UK, 2016, National Institute for Health and Care Excellence [NICE], 2016). Despite existing guidance, many patients with a VLU do not receive compression therapy. In the UK, only 20% of patients in a primary care database who had a VLU were recorded as having received compression therapy (Petherick et al, 2013). In contrast, in specialist centres compression therapy may be used in up to 88% of VLU patients (Probst et al, 2014).

Best practice is not always implemented and evidence suggests that there are knowledge gaps in leg ulcer assessment and management. Also, clinicians do not always have the necessary skills required to assess patients appropriately; there is a disparity between care in the community and at specialist centres, as well as across geographical areas (European Wound Management Association [EWMA], 2016). Many community services provide leg ulcer care under a traditional model of nurse-led community leg ulcer clinics that are organised and run by the tissue viability service and demonstrate good patient outcomes (Dowsett, 2011; Probst et al, 2014; EWMA, 2016). However, patients who are unable to attend specialist clinics may experience care that is less favourable. QI methods offer clinicians the opportunity to address these gaps in the delivery of leg ulcer care and improve outcomes for patients as outlined in this project.

METHODS

This QI project aimed to use the model for improvement as a tool to address inequalities in care between patients with VLUs attending the leg ulcer service and those receiving care in their own homes from the community nursing service. The model for improvement is a framework to drive continuous improvement. It is essentially a method for structuring an improvement project consisting of two parts *(Figure 1)*. The first part consists of three questions that help to define what we want to achieve and what changes we should make to achieve it. The second part is the Plan-Do-Study-Act (PDSA) cycle, outlining the steps for testing the change ideas (Langley et al, 2009).

The first part of the model for improvement is based on the following three fundamental questions:

- What are we trying to achieve?
- How will we know that a change is an improvement?
- What changes can we make that will result in improvements (Langley et al, 2009).

The second part of the model for improvement is to try out/implement/change ideas to help achieve the aim and to measure the outcomes to see if they are beneficial to improving care. Measurement can include counting, for example, the number of

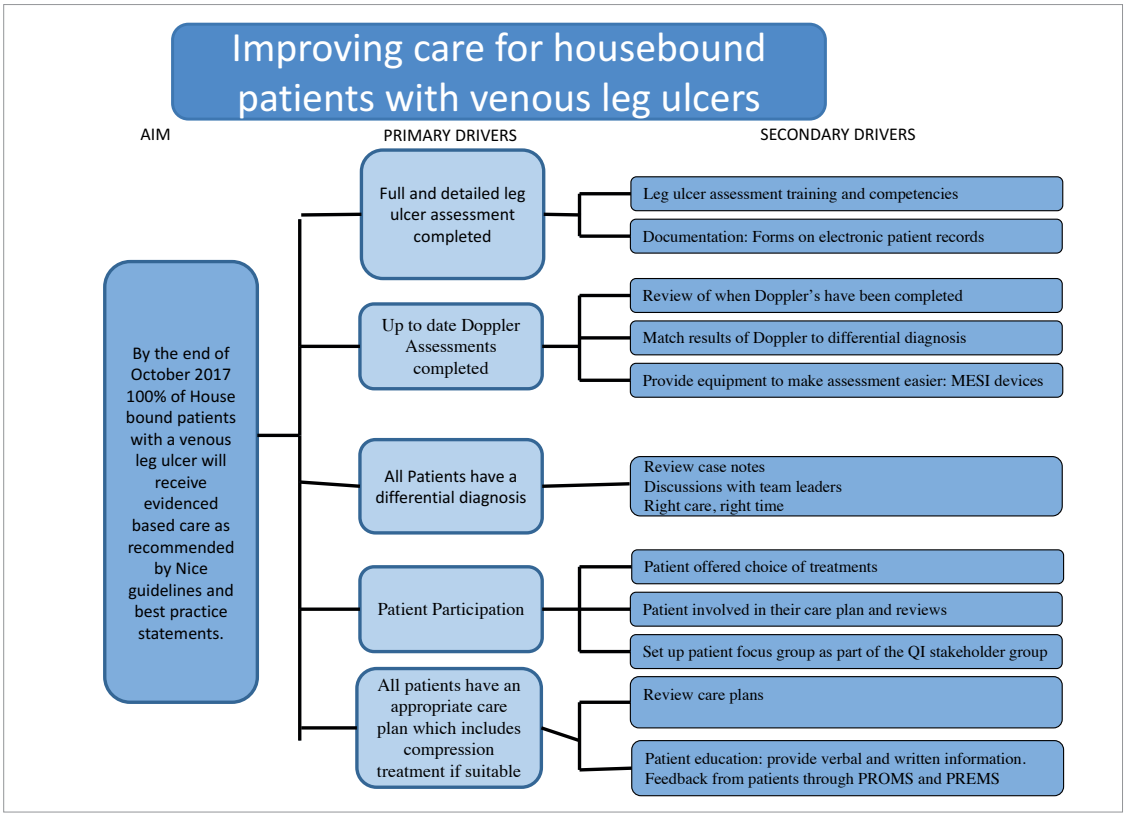

Figure 2. Driver diagram for leg ulcer QI project

patients who have had a full leg ulcer assessment or the number of patients with VLUs in compression therapy. Measurement is a key element of QI so that we can identify what changes have resulted in improvement and can spread and sustain these ideas. Some changes may require capital investment, for example, purchasing equipment to facilitate leg ulcer assessment. Other changes may involve doing things in a different way, for example, allocating a member of the tissue viability team to work with a community nursing team to undertake reviews of patients with VLUs. Both of these are examples of change ideas for this project.

The QI project was led by the tissue viability service and the project group was made up of representation from the tissue viability service, community nurses and QI service with input from patients attending the leg ulcer clinic and receiving leg ulcer care in their home. The aim of the project was for 100% of housebound patients with leg ulcers to receive evidence-based care within a 12-month timeframe (project period). The primary and secondary drivers that would support achievement of this aim were identified along with outcome measures in the form of a driver diagram (Figure 2). These changes identified by the QI group focused on ensuring patients were receiving evidence-based leg ulcer assessment and management.

Primary drivers included ensuring that all patients had a current full and detailed leg ulcer assessment including measurement of ABPI and a differential diagnosis. If they had a diagnosis of a VLU then the expectation was that the plan of care would include the use of compression therapy, that the patient had participated in their care plan and the plan was reviewed every four weeks or sooner if their condition changed. Secondary drivers included ensuring that community nurses had the knowledge, skills, resources and support to carry out a full assessment and commence compression therapy. Some of the change ideas that were implemented included:

- Tissue viability specialist nurses undertaking caseload reviews with the community nursing teams to identify the number of patients on the caseload with leg ulcers and the number with VLUs who were in receipt of best practice interventions and undertaking joint visits to support teams
- Reduce the complexity and time to undertake leg ulcer assessments by purchasing MESI ABPI screening devices for each community nursing team and training teams on their use
- Developing a link nurse group specifically for leg ulcers and promoting and training this group to support their teams in leg ulcer assessment and management.

To determine the impact of the change ideas baseline data was gathered to identify the scale of the problem and highlight areas of good practice and areas where practice could be improved using QI methods. The tissue viability team undertook

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Table 2. Improvements reviews

Date	Leg ulcer assessment complete	ABPI measured (current)	Receiving compression therapy	Care plan reviewed in the last 4 weeks
Baseline data	50%	50% (handheld Doppler)	50%	20%
November 2017	100%	100% (MESI available)	100%	35–100%
April 2018	100%	100% (MESI available)	100%	88%
July 2018	100%	100%(MESI available)	100%	90%

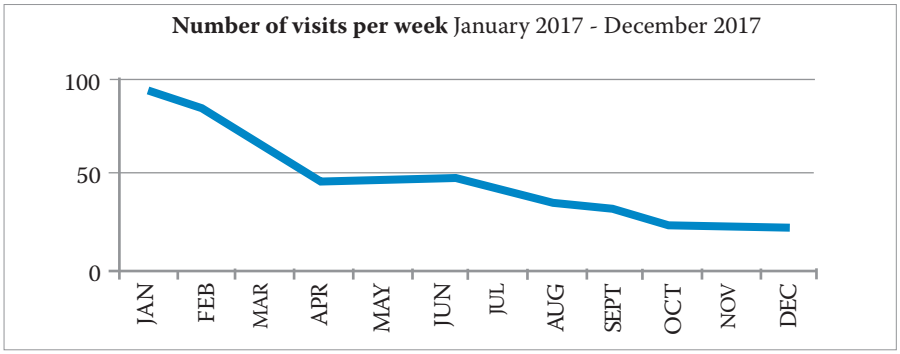

Figure 3. Frequency of nurse visits

caseload reviews with the community nurses to identify the number of patients on their caseload who were being treated for leg ulceration and specifically those who had venous leg ulceration. The patient's records were audited to determine if the patient had:

- A full leg ulcer assessment undertaken, and recorded in their electronic records
- Measurement of ABPI
- Received compression therapy if they had a diagnosis of VLU
- An up-to-date care plan in place that reflected evidence-based practice for VLU
- To determine the number of visits per week by the community nurses.

RESULTS

The initial caseload reviews showed that the community teams had caseloads of up to 290 patients receiving treatment. A significant number of patients were receiving wound care for a variety of wound types including leg ulcers, pressure ulcers, diabetic foot ulceration, surgical wounds and traumatic wounds. Patients with VLUs made up between 3–6% of the caseload. On reviewing these patients' electronic patient records and benchmarking against best practice, only 50% had evidence of up-to-date assessments including measurement of ABPI and only 20% had up-to-date care plans. Patients who were in receipt of up-to-date assessments and care plans were known to the tissue viability service and were having shared care between the two services. A number of patients were receiving reduced or no compression resulting in an increased frequency of visits by the community teams. The number of visits per week to patients with leg ulcers was 95 visits a week at baseline.

Following implementation of the QI change ideas, the caseloads were reviewed to see the impact of the investment in resources of both new equipment (MESI ABPI devices) and the tissue viability team time and support visiting patients. At this first review in November 2017, 100% of patients had up-to-date assessments including measurement of ABPI. The percentage of patients with up-to-date care plans in place (reviewed in the last 4 weeks) that reflected best practice were low (35%) for some teams and high (100%) for the other teams, improving to 88–100% by April 2018 *(Table 2)*. All patients with leg ulcers on the community nurses' caseload had been reviewed by the tissue viability team and had specialist advice and support so that they had a differential diagnosis and were receiving compression therapy. The frequency of nurse visits reduced to once a week as patients were receiving appropriate compression therapy and therefore required a visit once a week. Visits reduced to 25 per week *(Figure 3)*. This freed up nurse time to allocate to their increasing workload demands. The leg ulcer link nurse group was set up and the link nurses have received support from the tissue viability team to develop their knowledge and competencies in leg ulcer care so they can provide ongoing support to the community nursing teams. The feedback from the link nurses has been very positive with some of them using their link nurse learning and development to support their re-validations.

One of the key challenges identified by the community nurses was lack of time and confidence to undertake ABPI assessments. This was addressed by submitting a capital bid to purchase MESI ABPI index screening devices for each team, which have led to more patients

being assessed in less time. Use of the MESI has also led to identifying patients on the caseload with peripheral arterial disease and appropriate referral of these patients to vascular services.

The most recent caseload reviews for April and July 2018 show that the improvements have been sustained with 100% of patients with VLUs on the community nurses' caseloads having full and detailed leg ulcer assessments to include measurement of ABPI. Care plans continue to be an area for service improvement with 90% of patients reviewed having up-to-date care plans.

CONCLUSION

This QI project aimed to address inequalities in the assessment and management of patients with VLUs receiving care in their homes using QI methodology. This framework offered a structured approach that facilitated implementing and testing change ideas that led to service improvements and improved patients outcomes. By collecting baseline data, the team were able to show significant improvements over time in the number of patients who had a full leg ulcer assessment, measurement of ABPI and appropriate compression therapy. The project was welcomed and supported by the community nursing teams who have increasing demands on their time and are expected to deliver a high-quality service. Utilizing new technologies (MESI ABPI device) simplified leg ulcer assessment and increased the community nurses' confidence to undertake assessments and commence compression therapy for patients with VLUs. Integration of the tissue viability team members into the community nursing teams has been a critical factor for the success of the project, allowing for prompt referral for advice and support. Additionally, the role of link nurses in supporting their teams and enabling best practice has been recognised.

Sustaining change is one of the key challenges going forward as demands increase and the community nursing workforce changes. This model for QI is now integrated into service delivery and is 'business as usual'. Improvement and sustained improvement will only continue when services work collaboratively in the best interest of patients and constantly seek opportunities to improve outcomes. WUK

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