Developing a nurse-led ‘red legs’ service

Rebecca Elwell describes one trust’s attempt to minimise the misdiagnosis of cellulitis by setting up a nurse-led service to treat patients with red legs.

Abstract

As the population ages, more complex care is required to manage multiple comorbidities. In response, a nurse-led service was developed to care for patients with ‘red legs’. This chronic inflammatory condition is often misdiagnosed as acute cellulitis and can result in unnecessary hospital admission and inappropriate treatment, with substantial resource and financial implications for trusts.

Setting up the service required a multi-agency group to analyse current provision and identify gaps in care. Integrated care pathways were developed to focus on patient experience through referral, diagnostics and treatment. Evaluation showed that much of the prescribed care for patients with red legs could be carried out by patients at home and only a small number required a follow-up appointment. High levels of patient satisfaction were recorded.

Keywords
cellulitis, lymphoedema, nurse-led clinics, older people, patient experience, red legs

NURSE-LED CLINICS first emerged in the late 1990s under prime minister Tony Blair’s government, prompted by a lack of sufficient numbers of doctors and a need to save money. The clinics were seen as a way to extend nursing roles to mirror those of junior doctors. Manley (1997) introduced the concept of ‘mini doctor’ and ‘maxi nurse’, and focused on the differences that nurses can make specific to their profession, training and experience. While it is difficult to define a nurse-led clinic, in many cases it involves nurses having an independent caseload and full responsibility for patient management, including discharge. Referral is an important component and clinics ensure adherence to an organised appointment schedule, which may be on a drop-in basis or by telephone (Hatchett 2008).

Much has been written about the success of nurse-led clinics, but gold standard research is required to affirm their value. A Cochrane systematic review (Laurant et al 2005) found that appropriately trained nurses in primary care could provide as high quality care and achieve as good health outcomes as doctors. However, the authors noted that only limited research was available.

Outcome measures for nurse-led clinics must be developed to collect data on patient experience and to use standards to audit against, for example, the Commissioning for Quality and Innovation payment framework, National Institute for Health and Care Excellence guidance and agreed care pathway indicators, such as patient dignity, waiting times and time given to ask questions.

The government’s response to the Francis report on care failings at Mid Staffordshire NHS Foundation Trust (Department of Health (DH) 2013) stated that there must be a comprehensive approach to capturing patients’ experiences of health care that involves families and carers. It recommended a focus on what happened in the course of receiving care or treatment. This objective and subjective feedback can help to demonstrate the true value of nurse-led clinics.

Difficulty in diagnosing cellulitis

Epidemiological studies have shown that chronic oedema affects 3.99 per 1,000 of the UK population (Moffatt and Pinnington 2012), increasing to 10.31 per 1,000 population in people aged between 65 and 74 and up to 28.57 per 1,000 population...
in the over-85s. Chronic oedema is the build-up of fluid in the tissues, which is caused by functional deficiency of the lymphatic system (Partsch and Moffatt 2012). It is often secondary to lymphatic damage or trauma, for example, during surgery or, commonly, secondary to chronic venous insufficiency (Bianchi et al 2000). Gravitational or dependency oedema, also known as ‘armchair legs’, is a type of chronic oedema often seen in patients who are immobile and spend most of their time sitting in a chair.

The build-up of fluid, which is rich in proteins and other macromolecules, increases the lymphatic load and can result in lymphatic dysfunction (Williams 2009). Chronic skin changes, limb shape distortion and the increased risk of cellulitis associated with chronic oedema can have a considerable negative effect on an individual’s quality of life (Whitaker et al 2015).

Cellulitis is defined as an acute, painful and potentially serious infection of the skin and subcutaneous tissue, usually involving the pathogens *Staphylococcus aureus* and *Streptococcus pyogenes* (Wingfield 2012). Figures for 2009-10 for inpatient management indicate that cellulitis costs the NHS an estimated £96 million each year (UK Dermatology Clinical Trials Network’s PATCH Trial Team 2012). This does not include the cost of antibiotics in the community or the increased number of healthcare appointments required by patients.

An audit by Levell et al (2011) identified that a number of patients admitted to acute trusts for intravenous (IV) antibiotics to treat suspected cellulitis were found to have another condition and not cellulitis. Of 635 patients referred with lower limb cellulitis in the audit, 33% had other diagnoses that did not require admission. This confusion in diagnosis resulted in the development of a dermatology consultant-led cellulitis clinic (Levell et al 2011).

A condition that may be confused with cellulitis is called ‘red legs’ among specialist clinicians. Drawing on clinical experience, it is described as uniform redness throughout both legs, usually below the knee only. There can be associated warmth and tenderness but no systemic upset or malaise. The symptoms of red legs may be caused by gravitational eczema, dermatitis or other chronic conditions. They will not respond to IV antibiotics and are dermatological in nature (Clinical Resource Efficiency Support Team (CREST) 2005).

An audit at the author’s trust found that patients with red legs were often placed on a standard cellulitis pathway without a process of differential diagnosis taking place to establish the most likely cause, as recommended by CREST (2005) guidelines on the management of cellulitis in adults.

As a result, a number of patients will not respond to standard treatment for cellulitis, will have a longer hospital stay and will have a less positive experience.

**Nurse-led service to treat red legs**

An application was made to the Foundation of Nursing Studies’ Patients First Programme to develop a nurse-led service to improve outcomes for patients with symptoms of red legs. The programme supports clinically-based nurse-led teams to implement and evaluate innovations. It helps nurses to bring a concept to fruition by providing support and facilitating the development of new skills in the workplace. A small bursary is also awarded with the assistance of the Burdett Trust.

The definition of people with red legs was agreed by a stakeholder group of patient representatives along with team members from dermatology, lymphoedema, tissue viability, vascular surgery, podiatry, microbiology/infectious diseases and the emergency department (ED). It was: ‘Bilateral redness of the legs, associated with warmth and tenderness but no systemic upset or malaise. The patient should be apyrexial with a normal C-reactive protein (CRP) measurement and white cell count (WCC).’ Referrals for unilateral leg redness would only be accepted if these criteria were met and deep vein thrombosis had been excluded.

A random sample of 50 sets of medical notes was reviewed in April 2012. Of the 50 patients, 28 had unilateral cellulitis of the leg (true cellulitis), 12 had bilateral symptoms and therefore not cellulitis according to the CREST (2005) guidelines, and ten had the episode of care missing from their notes due to other trust audits. The average length of stay was ten days, which reflected Todd et al’s (2010) estimate that the average length of stay for patients with a diagnosis of cellulitis was approximately ten days at a conservative cost of £2,300.

Based on the fact that at least 12 out of the 50 patients had red legs, it was projected that 125 patients would be referred to the red legs service in the first 12 months. This figure was used to populate the commissioning paper as a conservative estimate and was similar to that established by Levell et al (2011).

A further 15 sets of notes for patients with recurrent cellulitis were reviewed. Of these, seven (47%) had unilateral cellulitis of the leg (true cellulitis, with only one correctly documented as recurrent cellulitis), and eight (53%) had bilateral symptoms and therefore not cellulitis according to...
the CREST (2005) guidelines. Of the eight, three were listed as bilateral infected leg ulcers, three were listed as lymphoedema and two as bilateral redness. This means that these eight patients were likely to have been less than optimally treated on more than one occasion, with an average length of stay of 14 days. The costs to patients and the organisation were significant.

Once the patient numbers had been calculated, a care pathway was written. The patient journey was mapped by the stakeholder group along with ED staff, the directorate matron and directorate manager.

Once agreed, a referral form and referral pathway were set up and a direct email address created. It was agreed to accept referrals initially only from the ED. Training took place for all ED staff, and members of the lymphoedema team attended the ED wearing red jeans to promote the service. This visual aid worked well. The trust’s medical guidelines were also changed to reflect the CREST (2005) guidelines.

The stakeholder group worked together to develop diagnostic and treatment algorithms, and an atypical patient pathway was developed in case patients presented with symptoms that did not fit expected dermatological or vascular complaints. The lymphoedema team required a steep learning curve to become familiar with the common skin and vascular complaints they would be managing, and the atypical pathway offered some protection for staff and patients.

It was agreed that atypical patients would be photographed by the clinical photographer and that these photographs could be shared via the trust’s online software with an emailed summary of the patient’s initial assessment. In many cases the diagnosis could take place remotely and the patient could still be managed in the red legs service, which had been the original aim.

However, a number of patients were referred for patch testing in dermatology or duplex Doppler ultrasound in the vascular department.

While clinicians developed the algorithms with patients, the directorate manager focused on the figures and service specifications for the commissioning report and the lymphoedema CNS wrote the background and clinical components. There were differing viewpoints, with the clinical focus being on patients’ experience and quality of life and the manager’s focus on savings. A total annual saving of £232,890 was estimated to be achieved, based on an expected admission avoidance of 90%. The remaining 10% of patients would require admission because of another medical issue or comorbidity; however, they would be referred to the red legs service on discharge as they would be identified by a newly developed inpatient screening tool. These savings do not take into account wider health economics, including patient expenses and lost work days. Levell et al (2011) demonstrated savings of £818,000 over 40 months in bed days alone. This did not take into account savings made through reduced use of IV antibiotics or costs to the 210 patients who did not have cellulitis and may otherwise have been treated inappropriately. More importantly, for patients among the group whose underlying skin disease was treated, there was a significantly reduced risk of developing cellulitis that can lead to leg ulceration and lymphoedema.

The red legs service opened in October 2012 to run initially as a six-month pilot which was fully funded by the trust. It was commissioned one day a week (7.5 hours) with:

- 0.2 whole-time equivalent (WTE)
  - band 6 lymphoedema practitioner; it was agreed to have a nurse whose substantive post was in the ED on secondment to run the red legs service, to allow full integration between the two services and foster shared learning.
- 0.2 WTE band 4 lymphoedema associate practitioner.
- 0.2 WTE band 2 administrative support.

Of the 160 patients referred and assessed in the first year, 28% required a further appointment. During the pilot an Excel spreadsheet was developed to record the number of referrals received, where they originated and whether they were appropriate. A patient information leaflet was also written, along with a patient satisfaction questionnaire to be given to all patients on discharge from the service. This questionnaire was used to gather information not only about patients’ experiences of the service but also their previous experiences. This provides evidence to support the future of the red legs service.

### Table 1 Patient satisfaction questionnaire (n=85)

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
<th>Number</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>How satisfied were you with the level of care received?</td>
<td>Extremely</td>
<td>70</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>Very</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Satisfied</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Was the waiting time for the service excellent, acceptable or too long?</td>
<td>Excellent</td>
<td>77</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>Acceptable</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

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Case study

An 87-year-old man with bilateral red legs was referred to the red legs service by a dermatology practitioner. He had recently been treated for cellulitis with oral flucloxacillin and stated that the only symptom he experienced was redness to his legs. There was no pyrexia, tenderness or increase in warmth.

His past medical history and comorbidities included ischaemic heart disease, myocardial infarction, hypertension, chronic obstructive pulmonary disease, eczema and dermatitis.

His medication included atorvastatin, bisoprolol, digoxin, clopidogrel and ramipril. He gave a history of bilateral lower leg oedema for three years, which developed just before the eczema. On examination there was mild pitting oedema to both feet and ankles with thickening to the gaiter areas. His skin was intact but dry with patches of eczema. Both legs were dark red in colour with haemosiderin staining evident. Temperature to the lower limbs was normal and no sensory changes were detected. He was able to mobilise short distances and had no pain at rest or on mobilising.

Toe brachial pressure index was normal (right 0.83 and left 0.72). A diagnosis of chronic oedema was established and the following treatment plan prescribed:

- Emollient ointment to wash legs and emollient cream to moisturise. He was advised to do this in the evening after removing his compression hosiery.
- Emollients should be applied to reduce the redness. Ointments are often preferred as they contain fewer additives and the strength of the steroid can be reduced when improvement is seen.
- Class 2 (18-24mmHg) compression hosiery was advised along with a donning and doffing aid. The patient was advised to wear hosiery daily and remove it in the evening.

Advice was given to remove his hosiery and contact his GP if he experienced any of the following: increase in shortness of breath, any pain or discomfort, irritation, blue digits, numbness, ‘pins and needles’, or a change in temperature.

Written information and contact details for the red legs service were supplied and the patient was discharged.

Exercises were taught and he was advised to do these while seated as his mobility was limited.

Discussion

It is essential that antibiotics are never given ‘just in case’, which was noted to be a common occurrence in the red legs audit. Temperature must be recorded and patients should be encouraged to keep a record of their temperature when leg redness is present. A raised temperature is a clear indication that there may be infection. Blood results should be checked where possible to see if CRP or WCC is raised. If the patient is apyrexial with a normal blood count, excellent skin care should take place in the form of daily washing with a soap substitute, thorough drying, especially between the digits, and moisturising. Steroid cream can then be applied to reduce the redness. Ointments are often preferred as they contain fewer additives and the strength of the steroid can be reduced when improvement is seen.

Compression hosiery may be appropriate to prevent recurrence of the redness. Doppler ultrasound combined with clinical assessment should be carried out before application of any compression hosiery. Often British Standard class 1 (14-17mmHg) is suitable for older patients with red legs – off the shelf and made to measure options are available. In patients who require higher levels of compression, British Standard class 2 or German Standard RAL class 1-4 which is also widely used for compression hosiery, may be advised.

Many patients with dependent limbs develop chronic oedema, which can lead to skin changes and inflammation. Exercises should be encouraged. For example, if patients can mobilise, they should extend the amount of walking they do, but if they are largely sedentary, leg and foot exercises should be encouraged. Positioning is important; legs should be elevated wherever possible and patients should be encouraged to go to bed at night.

Certain medications can cause red legs and exacerbate lower limb symptoms of oedema, including calcium channel blocking...
antihypertensives, such as amlodipine, and neuropathic agents, for example, gabapentin and pregabalin. Where possible, these should be stopped or an alternative found. Information and advice can be found at Keeley (2008) and NHS Choices (2014).

**Conclusion**

Nurse-led clinics offer a significant number of advantages for patients, nurses and organisations. Nurses running their own clinics, however, should not be compared with medical colleagues but instead be recognised for the specialist skills they bring to the role. Nurse-led services, like many others, are under threat.

Commissioning changes and the introduction of ’any qualified provider’ (DH 2011) mean that others can submit an application to provide a service for less money, however, it may also provide less quality. Revalidation is creating uncertainty for all. Nurses must collect their own data to demonstrate their value and worth.

Chronic symptoms of leg redness, with or without oedema, are common and should not be assumed to be cellulitis. Instead, differential diagnosis should take place, ensuring the implementation of prompt and correct treatment to enhance patient experience. The importance of correct diagnosis is multidimensional; there are clear benefits for patients including a seamless journey, informed health care, timely, effective management, positive experience and promotion of self-management and independence. Benefits for the nurse include a sense of being a knowledgeable, skilled and competent practitioner who follows an evidence-based, clear patient pathway, which leads to effective time management, recognition of one’s expertise and limitations, thereby resulting in high levels of job satisfaction. For the organisation there are measurable outcomes that reflect the care given: a reduction in length of stay, admission avoidance, reduction in IV antibiotic therapy and associated hospital-acquired infection risks, which all result in cost savings.

**Implications for practice**

- A diagnosis of cellulitis should not be assumed when someone presents with red legs. Differential diagnosis should always take place to establish the exact cause.
- Antibiotics may not be the answer; consider excellent skin care and gentle exercise
- After vascular assessment, if compression hosiery is indicated consider garments with zips or Velcro fastenings to maximise ease of application and removal

**References**


