

# Pictures and telemedicine to promote communication and improve concordance in leg ulcer care

The cornerstones of leg ulcer healing are diagnosis and treatment of the underlying aetiology of the ulcer. Patient concordance plays a crucial part in the success of treatment, which often involves a profound change in lifestyle. Patients and carers need to understand their condition and be motivated to accept the treatment plan. The use of pictures, graphs and schematic drawings can not only help to improve communication between patients, nurses and specialist services, but also enhances the quality of care and empowers patients to cope better with their condition.

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## KEY WORDS

Leg ulcers  
Pictures  
Communication  
Concordance

Patients with leg ulcers generally receive a Cinderella service and are often cared for by practice and district nurses. Communication between patients, nurses, GPs and hospitals can often be unsatisfactory and can impede care.

In the vascular clinic at Salisbury NHS Foundation Trust, nurse specialists have developed a way to improve communication when caring for people with leg ulcers which is having a positive effect on treatment. A telemedicine system has been employed using photographs of wounds, measurements and graphs to illustrate the progression of ulcer healing. This allows patients to be actively involved in their care, which

the authors have found helps them to concord with treatment plans. It also facilitates communication between the parties involved in the patient's care. Schematic drawings of the individual patient's venous and arterial systems, which are used as a reporting method for duplex scan results for other healthcare professionals, help to explain the condition to patients and their carers, thereby improving their understanding of the underlying cause of their leg ulcers.

A rural GP practice in the authors' area uses the telemedicine system both to communicate with other healthcare professionals and teach patients about their condition and the progress of their treatment.

## Burden of leg ulcers

Leg ulcers have been defined as 'an open lesion between the knee and ankle joint which remains unhealed for at least four weeks' (Scottish Intercollegiate Guidelines Network [SIGN], 1998). They are a major cause of morbidity with a prevalence of 1.2–3.2 per 1,000 (Posnett and Franks, 2006). Leg ulceration is more commonly seen in older people and it is estimated that 1% of the population will suffer leg ulceration at some stage of their life, many suffering more than one episode (Dale et al, 1983; Callam et al, 1985).

Leg ulcer treatment costs the NHS an estimated £600m per year (Posnett and Franks, 2006). There is also the personal financial burden to patients who have to take time off work to attend clinics, as well as incurring travel costs.

To treat leg ulcers effectively, it is essential that the healthcare professional determines the underlying aetiology (Moffatt and Franks, 1994). Another prerequisite is the patient's willingness to comply with treatment. The treatment prescribed for ulcers caused by venous hypertension involves wearing tight, bulky bandages. This can have an adverse impact on many aspects of a patient's daily life, including body image, choice of clothing and footwear, and their ability to work and drive a car (Krasner, 1988).

Motivation to persevere with the recommended treatment can be difficult to encourage in view of the profound impact that compression bandaging has on many aspects of daily life (Moffatt, 2004). Ulcers of arterial aetiology can be treated with angioplasty, which is sometimes seen as invasive and frightening, causing some patients to decline treatment. In addition, patients often arrive for treatment with preconceived ideas about their health which need to be considered. If the treatment plan does not suit the patient's lifestyle it will inevitably fail. Therefore,

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it may be necessary to negotiate and compromise with the patient (Moffatt, 2004; Bourne, 2004).

### Concordance

More recently the term 'concordance' has replaced 'compliance' in the literature. Concordance implies a partnership between the healthcare provider and the patient, with a move away from the authoritarian and paternalistic model of care to a more egalitarian biopsychosocial care model (House et al, 1996; Bentley, 2003; Brooks et al, 2004; Moffatt, 2004). This model is patient-centred and treats the patient as an autonomous and equal partner in their care.

The Medicines Partnership (Department of Health [DoH], 2005) cites three essential factors for concordance:

- ▶ Patients have knowledge to participate as partners
- ▶ Consultations involve patients as partners
- ▶ Patients are supported during their treatment.

The first factor can be achieved by using language that the patient can understand (Moffatt, 2000; Wong, 2003). Moffatt (2004) states that perceived unmet needs and misunderstandings that stem from bad communication are often the cause of 'difficult patients' non-concordant' behaviour.

Edwards et al (2002) found that patients frequently fail to understand the underlying cause of their ulceration. Chase et al (1997) describe a resignation found in many patients that their wounds will never heal or that recurrence is inevitable. Any tool that helps communicate information to patients and motivates them to persevere with prescribed treatments is valuable.

In the vascular clinic at Salisbury Hospital, graphic representations of duplex results are used to help patients understand the aetiology of their condition. To involve patients as partners in their care, healing graphs, plans of care and photographs are shared between patients, carers and healthcare workers. Giving a patient the opportunity to

see on a graph that a wound is healing can be a strong motivating factor to continue with treatment, and offers the reassurance that if there is no improvement, this will be quickly realised and acted upon by changing the treatment plan (Cooper, 2007).

In today's healthcare climate there has been a move from the traditional 'doctor knows best' style to accepting patients as autonomous individuals. By involving patients as equal

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partners in their care and accepting their experiences as valid and true, consultations become patient-centred. A treatment plan can thus be jointly formulated to suit the patient's lifestyle, as well as reflecting best available treatment (Brown et al, 1992).

### Leg ulcer telemedicine

Leg ulcer telemedicine (LUTM) is a dedicated patient record system which can be used to monitor the progress of wounds such as leg ulcers. It was developed in 1999 by a vascular team in Birmingham (Cooper, 2007). The images, care records and treatment plans are sent securely via the NHSnet (NHS Connecting for Health, 2006) and, as said, are used in the authors' area in the vascular unit and in one GP practice leg ulcer clinic to facilitate fast and effective communication for advice or referral between the two.

An assessment record from the patient's initial consultation forms the basis for treatment. At the first visit and all subsequent consultations, the ulcer is photographed with a ruler graduated

in centimetres to give a scale factor for future reference.

The wound perimeter is outlined on screen, allowing the software to calculate and record accurate measurement of the wound size. After the first two visits the results are plotted to a graph to show the healing rate. Ulcers heal at a predicted rate, so it is possible using this software to make a prediction of the expected date for complete healing (Prince and Dodds, 2006).

A treatment plan is formulated at each visit, documenting wound appearance and current treatment, as well as any recommendations (Figure 7). Printouts of care plans, graphs and photographs from the LUTM system are shared with patients, primary care nurses, GPs and ward nurses to ensure effective communication. The printouts are added to the patient held medical records from primary care, or are given to the patient to pass on to primary care nurses to avoid delay in postage. This ensures that the printouts are received by the appropriate person. In the case of patients from the GP surgery using the LUTM system, their carers can access records electronically.

### Duplex ultrasound

A duplex ultrasound which uses two different imaging techniques is performed on every new leg ulcer referred to the vascular unit. The test is used as part of a multidisciplinary team approach to determine the cause of ulceration and to identify treatment options. Patients are shown their images to help them understand the cause of their ulceration and why certain treatment options have been suggested. The position of the blood vessels is located using conventional black and white ultrasound (B mode) imaging. The operator can simultaneously assess the direction and speed of blood flow using the Doppler effect which is identified in colour. As the moving images are visualised on the screen, the operator can start to explain and show the patient the extent and position of the disease (Figure 1).

Arterial disease is present in about 20% of patients with leg ulceration

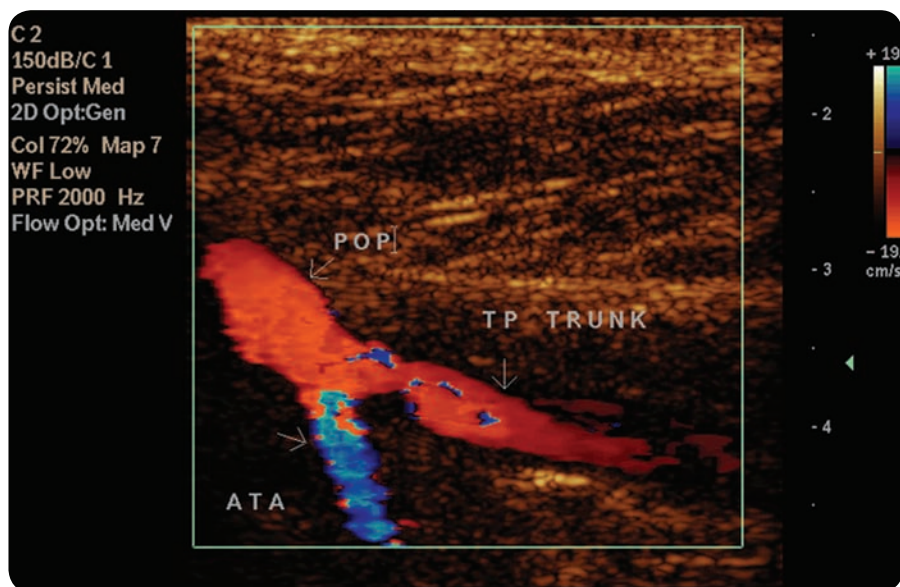


Figure 1. Duplex scan showing a normal junction of popliteal, tibio-peroneal trunk and anterior tibial arteries.

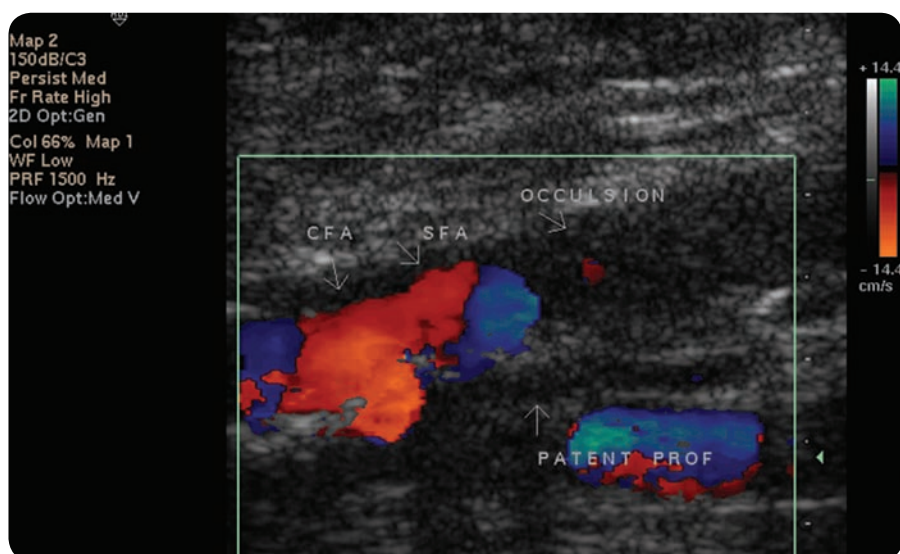


Figure 2. Arterial duplex scan showing a total occlusion of the superficial femoral artery.

(Callam et al, 1987) and must be identified to ensure optimum treatment options are explored. The duplex examination allows the operator to map out narrowing or blockages (Figure 2), and determines which vessels are normal and which are diseased.

Traditionally, the operator would have reported the findings of the examination in a word document, describing the position and extent of disease pattern in a long and technical way, which only healthcare professionals with specialist training would understand. In the vascular unit the use of a bespoke software package which schematically identifies the

level and extent of disease is more easily interpreted by healthcare professionals and can also be used to reinforce the patient's understanding of the problem.

Treatment for arterial disease often involves angioplasty (stretching of the arteries) using a wire and balloon technique by radiologists. Stretching of certain blood vessels carries more risk than others. The authors have found the duplex reports to be invaluable at multidisciplinary meetings when identifying access points and safer options for treatment. Clear imaging and interpretation by healthcare professionals also ensures that the

patients are fully informed about the risks and benefits of their proposed treatment.

After treatment, patients are followed up by the nursing team using the telemedicine system to document the healing rate of the ulcer. If ulceration is deteriorating or the healing rate is slowing according to the telemedicine graph, a further duplex is performed. Arterial disease can be aggressive and frequently recurs so a patient may need a second treatment to aid healing. Without the use of the telemedicine graph it can be difficult for healthcare professionals to notice a reduction in the healing rate. This system allows for more timely reinvestigation using duplex and further intervention if needed.

Following arterial assessment patients have a venous duplex scan to assess the presence of venous disease. The operator can identify where valves have failed and report this on a schematic diagram. This allows healthcare professionals to determine whether surgery, endovenous treatment or compression bandaging are treatment options to assist healing and prevent ulcer recurrence.

The following case reports illustrate how patients' understanding of the aetiology of their condition has been improved by using images of their duplex results, and how healing graphs have been a strong motivating factor for concordance with therapy and enabled patients to be active participants in their care. Together, these modalities help healthcare professionals to determine the best treatment options, monitor their effectiveness and identify when reinvestigation of leg ulceration is needed.

### Case report one

The patient was an 85-year-old woman who fell on concrete steps and sustained an injury. She presented at her local surgery with a haematoma on her right leg (Figure 3).

Following assessment by the nurse practitioner (Figure 4) (including Doppler assessment), an email referral was sent

to the secondary care clinic (Figure 5). A decision was made by the specialist nurse and consultant at the hospital to de-roof the haematoma and apply compression bandaging (the specialist nurse came to the patient's GP surgery to perform this procedure). This type of wound would normally be outside the scope of primary care nurses, but with the help of instant communication with the specialist hospital clinic this patient's care was managed at her GP surgery. Help with a treatment plan (Figure 7) was given by secondary care.

The wound outline was also traced (Figure 6) for ease of future monitoring of the size of the wound. This happened at each surgery appointment so that progress of wound healing could be closely followed on a graph (Figure 8). This was important as the patient was initially reluctant to have compression bandaging, which, in the presence of varicose veins and venous hypertension, was essential to her treatment. This is often the case with traumatic wounds, as the patient expects the wound to heal normally. When at three weeks this had not happened and the wound was in fact larger; this was easily demonstrated with the graph and the patient reluctantly agreed to have compression bandaging applied. On measuring the wound the next day there was a dramatic improvement and the patient was happy to continue with the prescribed treatment (Figure 8).

At week six the wound graph showed a sudden reversal. The GP prescribed antibiotics and, again, the graph showed the effects of this treatment. Around weeks 15–17 the wound again enlarged. After an e-referral to secondary care and a change in dressing choice, the wound finally healed after 19 weeks of treatment, as shown by the photograph (Figure 9) and graph (Figure 8).

The graph showed immediately and sensitively when healing was delayed, allowing a prompt change in treatment. The change in wound size was so subtle that without the graph it would not have been possible to detect from one week to the next.



Figure 3. Haematoma at first presentation.

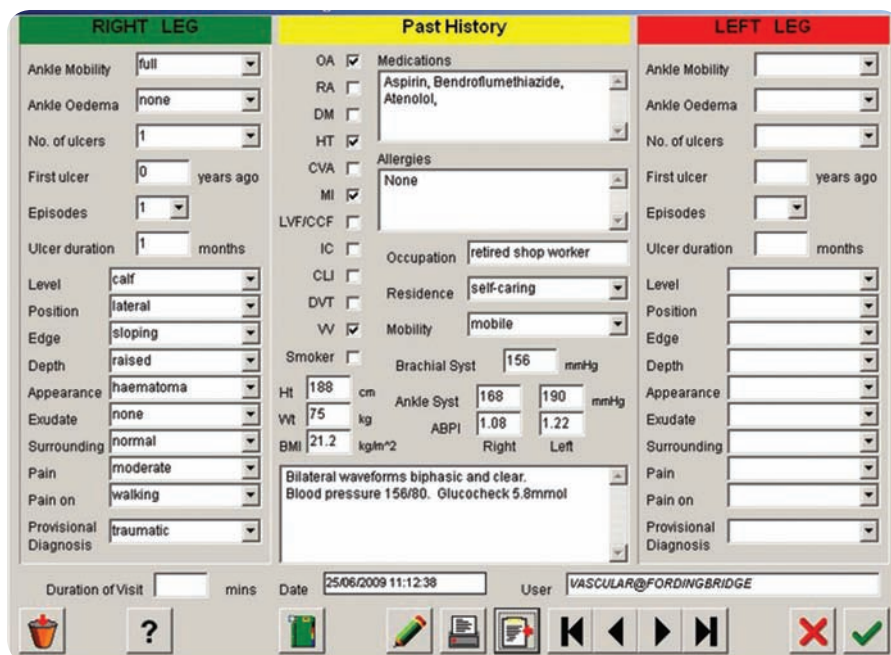


Figure 4. Leg ulcer assessment record.

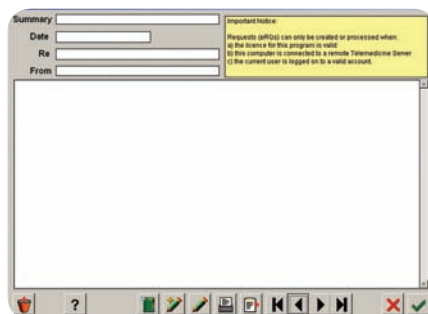


Figure 5. Electronic communication from secondary to primary care.



Figure 6. Wound tracing and wound measurement.

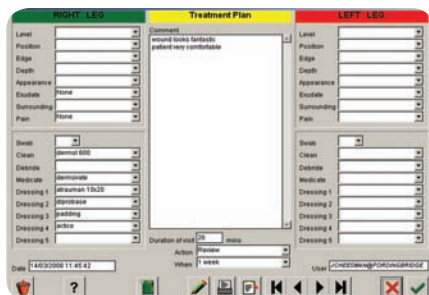


Figure 7. Treatment plan.

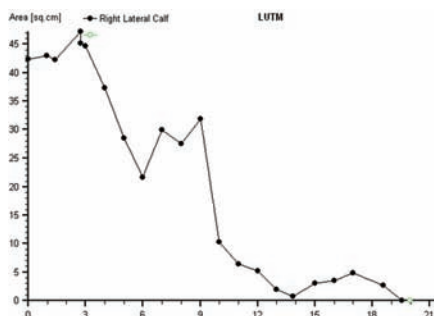


Figure 8. Wound healing graph.



Figure 9. Healed leg.

### Case report two

The patient was an 85-year-old man with a leg ulcer on the medial aspect of the left ankle, which had been present for a month when he was referred to the specialist leg ulcer clinic at the hospital.

The patient suffered from chronic renal failure, osteoarthritis and Paget's disease, particularly affecting his left hip. His mobility was limited and he used a wheelchair when out and a walking frame at home. He also suffered from anxiety. When he arrived at the clinic an assessment was made and a duplex scan performed (Figure 10). This showed a small focal stenosis in the superficial femoral artery. The patient was reluctant to have any invasive treatment, but after using the image to explain the aetiology of his ulcer, he was able to understand why treatment

### Left leg ulceration ? arterial supply

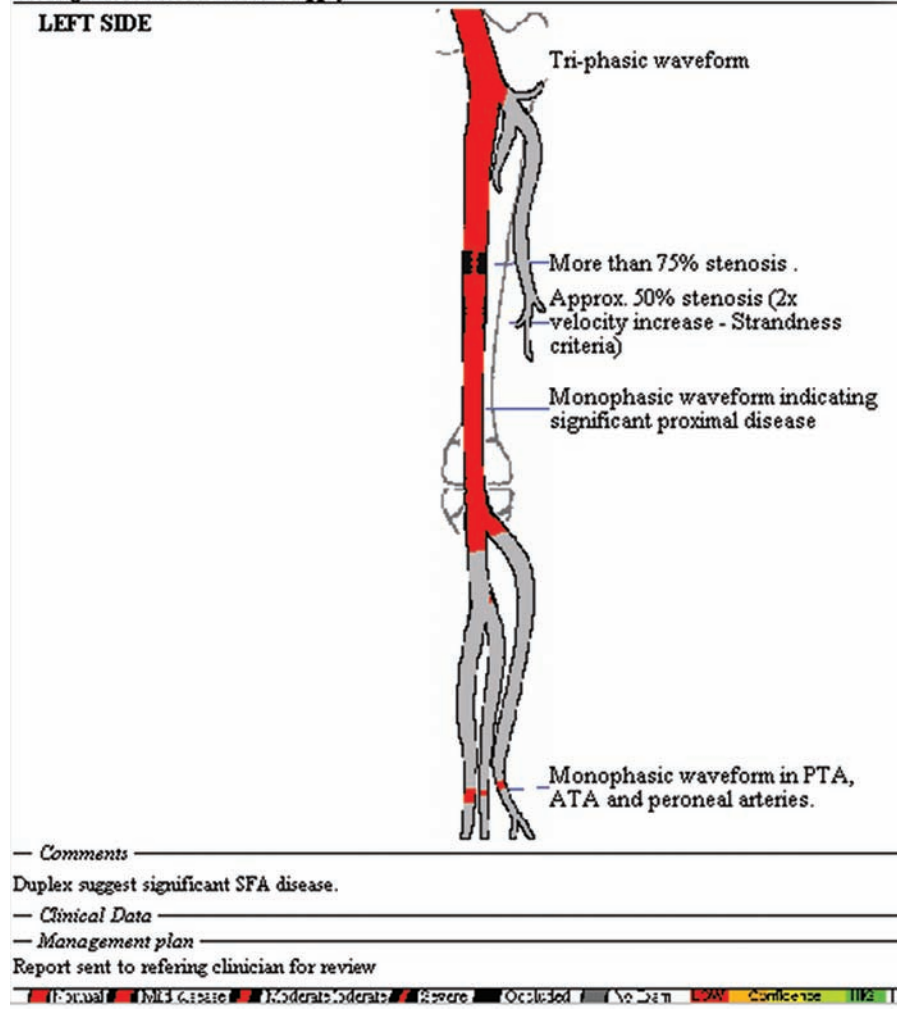


Figure 10. Duplex scan report, showing stenoses of the mid superficial femoral artery.

of his artery was recommended and he agreed to have an angioplasty.

This was performed 10 weeks after referral and the graph showed almost instant improvement (Figure 11). The predicted healing date using the software was 26th June 2009 (Figure 12), and a telephone call on that date to the patient confirmed that the leg ulcer, although not entirely healed, had greatly improved and the patient was pleased with its progress.

### Discussion

As a result of being shown duplex scan results, patients are better informed about their condition which enables them to take positive steps to improve their situation. Duplex scans are easy to understand by patients and healthcare professionals alike, and it is possible to show patients with leg ulcers of arterial

aetiology why ulcer healing will not take place without improving the blood flow with angioplasty.

The LUTM documentation helps to motivate patients to participate in their own care. It reassures them when treatment is effective, and if it is not, that the treatment can be immediately changed. It allows nurses to react to any deterioration in the wound or the patient's arterial status.

The duplex scan results and LUTM documentation inform and educate the patient's usual healthcare professionals both on the wards and in primary care. The graphic illustrations facilitate communication between the vascular unit and the patient's carers. As assessment and treatment results are kept electronically, records are always available to staff.

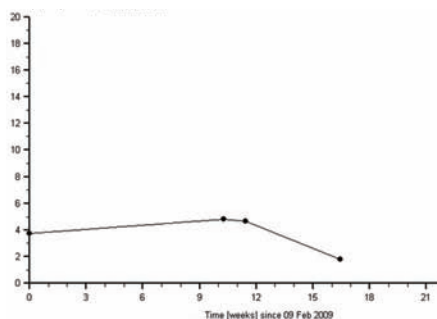


Figure 11. Wound healing graph showing improvement after angioplasty

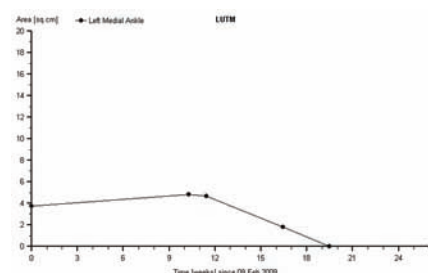


Figure 12. Wound healing graph, showing a date for predicted healing.

The leg ulcer clinic in the GP practice discussed in this article which is using the LUTM is run by two healthcare support workers with NVQ level 3. They are supervised and managed by a nurse practitioner at the practice. They use the LUTM to ask advice from the vascular unit staff when necessary and this has reduced the GP contact time. They have commented that they feel supported and enabled to better look after the patients in their care, and have experienced a higher level of job satisfaction.

The duplex results and LUTM documentation have enabled healthcare professionals to communicate and agree on best practice which ensures that patients receive the correct messages and remain confident in their care providers.

The importance of working in partnership with the patient, as well as having good communication between all those involved in a patient's care cannot be overemphasised. A holistic assessment to ensure correct diagnosis and treatment is the cornerstone of care, but without patient concordance

and participation treatment will fail, resulting in further morbidity which is costly both in terms of the patient's well-being and NHS resources. **WUK**

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## Key points

- ▶▶ Leg ulcer treatment often involves lifestyle changes and invasive treatments.
- ▶▶ Leg ulcer telemedicine (LUTM) is a dedicated patient record system which can be used to monitor the progress of wounds such as leg ulcers.
- ▶▶ Patients' understanding of their condition has been improved by using images of their duplex results, and healing graphs have been a strong motivating factor for concordance with therapy and enabled patients to be active participants in their care.
- ▶▶ A holistic assessment to ensure correct diagnosis and treatment is the cornerstone of care, but without patient concordance and participation treatment will fail, resulting in further morbidity which is costly both in terms of the patient's well-being and NHS resources.

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