

# An action plan for the inpatient management of diabetic foot disease in line with 'Feet First'

Diabetic foot complications are the commonest cause of non-traumatic lower limb amputation in the UK. To help prevent unnecessary amputations, in June 2009, the Diabetes UK specialist foot care working services group produced a report issuing guidance to enable proper management of acute onset, or deteriorating, disease of the diabetic foot in the secondary care setting. This article summarises the results of a baseline audit, and describes the actions taken to address the weaknesses within the systems of care to improve the outcomes for this group of patients.

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## KEY WORDS

Diabetic foot complications

Ulceration

Neuropathy

Amputation

Diabetic foot complications can result in amputations if not treated effectively. A recent study showed that there has been a 43% increase in the number of above ankle amputations in the UK between 1996 and 2005 (Vamos, 2005). Those at higher risk can often be identified by history of previous ulceration, evidence of neuropathy or circulatory dysfunction. With the knowledge that over 85% of amputations are preceded by active foot ulceration (Boulton et al, 2005), if such patients were managed appropriately from first presentation with prompt input from specialist teams, such amputations could often be avoided. In June 2009, the Diabetes UK specialist

foot care working services group produced a report issuing guidance to enable proper management of acute onset, or deteriorating, disease of the diabetic foot in the secondary care thereby helping to prevent unnecessary amputations (Putting feet first Diabetes UK specialist foot care services working group June 2009; [www.diabetes.org.uk](http://www.diabetes.org.uk), 3531/0609/a).

**With the knowledge that over 85% of amputations are preceded by active foot ulceration (Boulton et al, 2005), if such patients were managed appropriately from first presentation with prompt input from specialist teams, such amputations could often be avoided.**

The working group defines active foot disease as either of recent onset or chronic but deteriorating, and includes anyone with diabetes who has an ulcer, blister or break in the skin of the foot; inflammation or swelling of any part of the foot, or any sign of infection; unexplained pain in the foot; fracture or dislocation in the foot with no preceding history of significant trauma or gangrene of all or part of the foot. A pathway of care has been devised comprising three phases with

standards which should be met in all units (Table 1):

- ▶▶ The first phase focuses on immediate care, which covers management within the first four hours of admission
- ▶▶ The second phase continues care up to 48 hours
- ▶▶ The third phase involves continuous specialist care thereafter.

A self-audit tool was presented at the Foot in Diabetes conference 2009 (Fox and Jeffcoate, 2009) and was described by Martin Fox. This tool assesses if these quality standards are being met. The results of a baseline audit performed using the FDUK audit tool, are described in detail by Paisley and Chadwick (2010).

The aim of this article is to provide a summary of the results and the subsequent actions taken to improve the service for this at risk group.

## Summary of the results

The results of the audit clearly highlighted the lack of appropriate management in patients with diabetic foot problems presenting to a secondary care facility. It was particularly evident that such patients were not being examined and assessed properly when first seen. At first presentation patients were usually

assessed by an emergency physician or non-specialist junior medical physician, who often neglected to examine the patient's foot sensation or pulses. This reflects a lack of knowledge with failure to recognise the importance of such assessments when determining the cause of any ulceration in the diabetic patient, for example ischaemic, venous or neuropathic. However, this is vital to ensure proper and prompt management, particularly if vascular/orthopaedic intervention is required (National Institute for Health and Clinical Excellence [NICE], 2011).

In the audit, the majority of patients were assessed and diagnosed correctly when they had signs and symptoms of infection. Alarmingly, there was a delay in two patients; the first, an 86-year-old female who was admitted following a fall with confusion. Although the confusion was considered to be due to sepsis, the origin of this was thought to be a urinary tract infection, and it was not until the following day when a senior review noted cellulitis surrounding her neuropathic ulcer that the correct diagnosis was made and intravenous (IV) antibiotics commenced. Another 76-year-old female also presented with increasing confusion on a background of dementia. Although ischaemic ulceration was listed in the patient's medical history, it was not until the following day when the patient was seen by the tissue viability nurse that bandages were removed demonstrating obvious cellulitis.

During the immediate and also second stage of care, the majority of patients were not reviewed by the specialist foot team. Unfortunately, there is no provision in the author's hospital for an on call 'foot' service and patients are transferred from accident and emergency to the emergency assessment unit where they may stay for up to 24 hours, occasionally longer. It is often not until the patients are later admitted to the medical wards that they are referred for specialist input, leading to a significant delay before they are reviewed. This could be several days if they are admitted on

<b>Immediate phase: first four hours of admission</b>	<ul style="list-style-type: none"> <li>» Both feet should be examined for pulses and sensation</li> <li>» Assess the foot for infection</li> <li>» If there are signs of infection, antibiotics should be given promptly</li> <li>» If there is unexplained swelling and inflammation of the foot, acute Charcot neuroarthropathy must be considered</li> <li>» The advice of a specialist diabetes foot care team should be obtained as soon as possible</li> <li>» The need for urgent surgery should be assessed by an experienced surgeon</li> <li>» Other aspects of diabetes, including glycaemic control, should be attended to</li> </ul>
<b>Second phase care: 4–48 hours of admission</b>	<ul style="list-style-type: none"> <li>» Review of the results of investigations and response to treatment</li> <li>» Consult with specialist diabetes foot care team</li> <li>» Provide accurate information for the patient/family, and general practice, including contact details for those responsible for specialist care</li> <li>» Follow-up by specialist diabetes foot care team as appropriate</li> </ul>
<b>Continuing specialist care of active disease of the foot for 48 hours +</b>	<ul style="list-style-type: none"> <li>» Continued review of emergency management</li> <li>» Assess the need for specialist debridement</li> <li>» Provide appropriate pressure relief</li> <li>» Assess the need for vascular intervention</li> <li>» Optimisation of diabetes care, including glycaemic control and cardiovascular risk reduction</li> <li>» Provide accurate information for the patient/family and general practice, including contact details for those responsible for specialist care</li> </ul>

a Friday afternoon before the weekend.

It was clearly evident that involvement from the specialist foot team resulted in appropriate and optimal care with regards to debridement, antibiotics, dressings and vascular/surgical intervention if necessary. This suggests that outcomes could be improved if the specialist team were involved at an earlier stage. Although no significant adverse outcomes arose within this audit, the potential for adverse outcomes needs to be recognised. Further, as a result of these delays, it is likely that healing times were prolonged, an additional drain to NHS resources. As well as a failure in appropriate

assessment, the audit also identified a failure to provide information for the patients. In all cases, recording of relaying information to the patient and family was negligible. It is likely that some information had been discussed with the patient/relatives and that there was poor documentation of this. However, in the author's opinion, it probably also demonstrates how inadequate healthcare professionals are at communicating management plans with patients concerned. This was apparent in all stages of care.

To follow the audit cycle correctly (Figure 1), it is necessary to implement changes to achieve the standards of care that have not been met, as demonstrated by the audit, and

improve the system of care. The next part of this article examines the changes that have been made in the author's hospital in an attempt to improve the system of care.

**Feet First subgroup**

The first stage of improving the systems of care was to create a subgroup to look at the deficiencies within the system. This group comprised all the necessary stakeholders involved in the care of this group of patients, including: podiatrist, diabetologist, tissue viability nurse, surgical nurse and representation from the accident and emergency department. The aim of this group was to develop a cost-effective, pragmatic strategy to improve the identified problems. The sub-group developed a five point action plan.

1. Addition of an extra question to the Waterlow scale. The Waterlow scale is the trust's standard assessment tool for the risk of pressure ulceration and is mandatory within six hours of admission. This question asks the nurse who is undertaking the assessment to determine initially whether the patient has diabetes. If they have diabetes, the nurse is asked to remove shoes, socks and any dressings and bandages and establish whether there are any signs of damage and, if damage is present, to make the necessary referrals. The second component of this question prompts the nurse to identify whether the patient has established risk factors for foot ulceration. This can be achieved via the Salford Integrated Care Record which shows the patient's most recent foot screening and risk status. If the patient is known to have an elevated risk of foot ulceration due to the presence of neuropathy or peripheral vascular disease, the nurse is prompted to take extra precautions to protect the patient's feet, particularly the heels. The aim of this part of the action plan is to address the issues of poor assessment and to provoke early appropriate referrals.

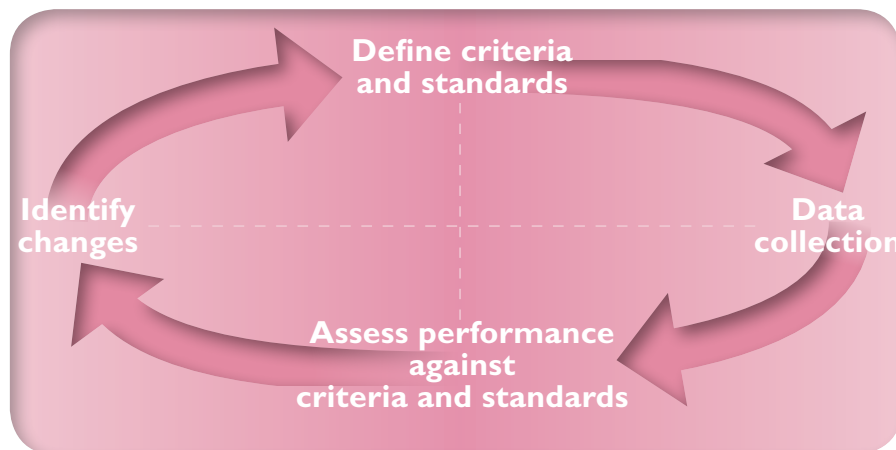


Figure 1. Audit cycle.

**It is imperative that early appropriate management is commenced in diabetic patients with active foot disease to improve outcome, in terms of healing foot ulceration and infection. Appropriate assessment should be undertaken when patients first present to ensure proper treatment.**

2. Raising awareness from 'board to ward'. Taking a strategic approach to the condition is vital. Enlisting support from the hospital management team and ensuring it is a permanent agenda item on the relevant committees. Inpatient management is discussed quarterly at the pressure ulcer prevention group which reports to the trust board, it is also a standing agenda item on Salford Diabetes Care which is the commissioning group for diabetes across Salford, and it is driven by the matron meetings who ensure the message is taken to the ward level where patients receive their care.
3. Development of 'Feet First' policy. In order that the initiative had 'teeth', it was enshrined in a trust policy document. This outlines what is required of all staff and, as such, it is not guidance but a 'must do'.
4. Development and availability of a health education information

leaflet. One of the key findings of the audit was the failure of any documented health education being given to the patient or their carer. The trust had just produced a leaflet on guidance around foot ulceration. This leaflet gives the patient advice on what a foot ulcer is, how they develop and the common management options. This was introduced into the Podiatry Department in 2009. Following the audit, this leaflet is now available in the accident and emergency department and the emergency admissions unit. It is also given to patients following their first interaction with a podiatrist.

5. Improved education of healthcare professionals. It is imperative that early appropriate management is commenced in diabetic patients with active foot disease to improve outcome, in terms of healing foot ulceration and infection. Appropriate assessment should be undertaken when patients first present to ensure proper treatment. A way of implementing this would be to educate those healthcare professionals who see patients when they first present. In an attempt to do this, the author's trust used the tissue viability link nurse group as a vehicle to achieve maximum impact in the shortest possible time. Link nurses were educated on each ward in order that they could distribute the message and education at a local level.

## Discussion

Chronic foot disease should be managed by a suitably skilled team. The audit showed that Salford had this suitably skilled team but access to them was often delayed. The action plan developed should hopefully improve this serious deficit. The prompting of referrals and the improvement in knowledge for both healthcare professionals and patients should go some way to addressing this. To further improve the system may require a significant change in approach to providing care, and having seven-day access to the specialist foot team and diabetes professionals at all times. This would mean providing an on-call service. In the current underfunded NHS this may not always be possible, but provisions should be made. However, given the drain on resources and cost of admission for amputation, it would make sense to invest at an early stage as a preventative measure. Many patients with active foot disease may be successfully managed as out-patients and early specialist input would facilitate this, again reducing cost. Further, many of the patients in the audit have required longer admissions to hospital and it could be that these stays could have been shortened, or even prevented, had the specialist team been involved from the start.

The ongoing and rapid pace of change in the current NHS has led to further guidance in this area with the

development of the recent National Institute for Health and Clinical Excellence guideline, *Diabetic foot problems: inpatient management*, which has further strengthened much of the 'Feet First' initiative, and has also added other requirements such as named people and 24-hour referral to the multidisciplinary foot care team (NICE, 2011). The work undertaken in Salford has prepared the area for compliance with the new NICE (2011) guideline, with the next stage being to audit against this new guidance. **WUK**

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## Key points

- ▶▶ It is important that the feet of any person with diabetes are examined within four hours of admission.
- ▶▶ Active foot disease should be managed by a suitably skilled team, and systems need to be in place to ensure prompt referral to this team.
- ▶▶ The introduction of any new standards should involve a baseline audit and a subsequent action plan to remedy any deficit.
- ▶▶ A change in working practice for podiatrists to include availability across seven days may be required to meet this guidance.

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