



## Operational Delivery of the Multi-Disciplinary Care Pathway for Diabetic Foot Problems

April 2016

### Joint Specialty Recommendations from:

British Orthopaedic Association, British Orthopaedic Foot and Ankle Society, Vascular Society, Diabetes UK, Association of British Clinical Diabetologists, Foot in Diabetes UK; British Association of Prosthetists and Orthotists

### Aim

The aim of this document is to provide a framework for the operational delivery of hospital Trust based diabetic foot services. Ensuring that patients with acute diabetic foot disease receive the same high quality of care irrespective of where they present.

### Background (from NG19)

Foot complications are common in people with diabetes. It has been estimated that between 5 and 7% of people with diabetes have current or previous foot ulceration<sup>1,2</sup>.

Diabetes is the most common cause of non-traumatic limb amputation, with diabetic foot ulcers preceding more than 80% of amputations in people with diabetes<sup>3</sup>. After a first amputation, people with diabetes are 23 times more likely to have a further amputation<sup>1</sup> as people without diabetes<sup>4</sup>. Mortality rates after diabetic foot ulceration and amputation are high, with up to 70% of people dying within 5 years of having an amputation. Around 50% die within 5 years of developing a diabetic foot ulcer<sup>5</sup>. This high mortality rate is believed to be associated with cardiovascular disease, and emphasises the importance of good diabetic and cardiovascular risk management.

Foot problems in people with diabetes have a significant financial impact on the NHS. A report published in 2012 by NHS Diabetes estimated that around £650 million (or £1 in every £150 the NHS spends) is spent on foot ulcers or amputations each year<sup>6</sup>.

### Patient Centred Care

Service provision should be geared towards meeting patient priorities at each step in the pathway. These priorities are:

1. To get better, as quickly as possible, whilst reducing risk of further morbidity.
2. To avoid hospital admission if possible, and certainly admission to a hospital that is distant from home.
3. To avoid major and minor amputation.

4. To be managed speedily, effectively and efficiently with management plans focused on the patient's individual circumstances and their personal needs.
5. To have their diabetes and other medical conditions well managed at the same time that their foot disease is being assessed and treated.

Commissioners should ensure that all patients with diabetic foot problems have rapid and equal access to services, regardless of location, in order to optimise care and reduce amputation rates. These recommendations describe the key systems, processes and standards needing to be in place to achieve this goal. Repatriation of patients from arterial centres to non-arterial centres is an important part of this process. This needs effective co-ordination to ensure bi-directional flow to deliver appropriate local aftercare and follow up, whilst maintaining capacity in the arterial centre for further urgent cases. This may necessitate an individual being assigned to co-ordinate the bidirectional flow.

### **Service Design**

Effective care requires multidisciplinary team working between professionals in different specialties and, in some cases, in different hospitals or across primary and secondary care. The pathway should have 3 integral components, a foot screening program, a foot protection service (FPS) and a multidisciplinary foot care service (MDFS). The components of each service are described in details in the new NICE guidance 'Diabetic foot problems; prevention and management' (NG19)<sup>7</sup>.

### **Foot Screening Service**

For adults with diabetes, their risk of developing a diabetic foot problem should be assessed at the following times:

- When diabetes is diagnosed and at least annually thereafter.
- On any admission to hospital, and if there is any change in their status while they are in hospital.

### **Foot Protection Service (FPS)**

There should be a foot protection service for preventing diabetic foot problems, and for treating and managing diabetic foot problems in the community. It should be led by a podiatrist with specialist training in diabetic foot problems.

### **Multidisciplinary Foot Service (MDFS)**

Every hospital Trust should have a MDFS, with experience of managing diabetic foot disease, offering both inpatient and outpatient care to quickly investigate and treat foot disease. This will mainly focus on foot ulcers, infection, ischaemia and charcot neuroarthropathy. The team should follow NICE guidance<sup>7</sup> and will comprise of a diabetologist, podiatrist, diabetic specialist nurse and orthotist. The team should have shared responsibility and accountability for patients under its care. Each MDFS should have a nominated clinical lead. This is most likely to be a consultant diabetologist in non-arterial centres and either a diabetologist and/or a vascular surgeon in arterial centres. Protocols will need to be in place to ensure that additional prompt clinical input is available from, orthopaedic surgery, vascular surgery, plastic surgery, plaster technicians, orthotic technicians, tissue viability, microbiology and interventional radiology when required.

There should be clinical outpatient and inpatient areas where care for patients is focussed and the MDFS is based. Within the MDFS there should be regular arrangements for combined diabetic foot outpatient clinics, ward rounds, and imaging review. Information needs to be communicated in a timely and effective manner when patients are transferred between teams, hospitals and on discharge, ensuring that patients are involved in and aware of their management plan.

Ensuring that the care provided meets the individual needs and circumstances of each patient is central to delivering person centred care. This requires discussion between the patient and clinical team to agree priorities and the content of their management plan. This management plan should ensure that all patients receive:

1. Prompt assessment of their foot and ankle, as well as their general needs.
2. Prompt completion of necessary investigations and review of the results.
3. Prompt initiation of any necessary new treatment.
4. Prompt consultation with and, if necessary, referral to other specialist members of the MDFS.
5. Regular, frequent multidisciplinary review of progress and initiation of any agreed change to management plan.
6. Information and education about their level of risk, treatment and management in relation to the agreed management plan.
7. An emergency contact number.

While it is expected that primary responsibility for the management of episodes of diabetic foot disease will be adopted by the MDFS, it should be noted that when last audited as part of the National Diabetes Inpatient Audit in 2013, only 72% of hospital Trusts had such teams<sup>8</sup>. These hospital Trusts need to work towards establishing a recognised MDFS in order to meet NICE guidelines, and have clear out of hours pathways.

The initial assessment of the diabetic foot problem will usually either be made by the acute on call medical team or the MDFS. Further daily care should continue under the care of the MDFS.

If patients with diabetes are admitted for reasons other than foot disease, it is essential to inspect their feet. If foot disease is present then expert assessment by a member of the MDFS at the earliest reasonable opportunity should be ensured.

Regular access to MDFS clinics with appropriate coordination between arterial and non-arterial centres could reduce the need for in-patient admissions and reduce the length of hospital stay, saving in-patient bed days. The MDFS clinic needs staffing and resources to facilitate well-co-ordinated “open” access for newly referred foot disease in order to comply with the requirements of NG19.

The aim of a MDFS service is to improve the outcomes associated with diabetic foot disease by reducing:

1. The geographic variations in minor and major amputations
2. The number of serious diabetic foot complications.
3. The number of people with diabetes admitted to hospital with diabetic foot complications.
4. The number of people developing hospital acquired pressure ulceration of the foot.

5. The number of people developing severe foot deformity as a result of Charcot neuroarthropathy.

### **Outpatient Management of Acute Diabetic Foot Complications**

Patients with non-emergency active diabetic foot problems should be referred within one working day to the MDFS or FPS.

Management should be in line with NICE guidelines NG19 – ‘Diabetic Foot Problems – prevention and management.’<sup>7</sup>

Many diabetic feet will have an ischaemic component but will not require emergency admission to the arterial centre. These patients can be managed in non-arterial centres with an urgent review by the vascular team. If there is uncertainty about the degree of urgency of the vascular problem, advice should be taken from the on-call network vascular surgeon.

For larger acute non-arterial centres there should be a vascular on site presence for 3 to 5 days per week. Vascular referrals can therefore be seen either on the wards or in clinic, within 48 hours of receipt of the referral. If a local vascular opinion cannot be obtained in the required timeframe, a referral should be made to the on call network vascular surgeon at the arterial centre.

The Vascular Society has produced specific guidance for the delivery of diabetic foot care in vascular networks to achieve high standards in both arterial and non-arterial hospitals<sup>9</sup>. Further vascular management at the non-arterial centres should follow the VS guidance.

### **Management of Diabetic Foot Emergencies**

If a person has a limb or life-threatening emergency diabetic foot problem, they should be referred immediately to the acute services and transferred to the MDFS within one working day, meeting NICE guidelines<sup>7</sup>. The patient should be assessed and an individualised treatment plan put in place by the acute services. The MDFS will take over care in the time scales specified above.

**1. Acute foot infection which does not need surgical drainage.** A patient with infection for whom no urgent surgical intervention is appropriate, and the pulses are present. This patient will be admitted under the on call medical team and transferred to the MDFS. This pathway is the same in arterial and non-arterial centres

**2. Acute foot infection which needs surgical drainage.** With a foot abscess or where surgical drainage is judged to be required, a surgical opinion should be obtained. The circulation should be assessed and if it is compromised the patient should be discussed with the on call vascular surgeon. Drainage procedures in the presence of vascular compromise should only be performed under the vascular team in the arterial centre since these will need to be co-ordinated with emergency revascularisation. However if pulses are present and there is no concern about the circulation, the foot can be drained according to local agreed protocols. There should be clear network agreements about who undertakes these emergency procedures in the non-arterial and arterial centres. The on call orthopaedic and vascular teams will usually provide this surgical care. The surgeon undertaking the procedure should have appropriate training and experience. Drainage should not be delegated to

inexperienced junior staff. Further care is transferred to the MDFS during normal working hours.

**3. The ischaemic foot:** If the admitting medical team is concerned that the foot is threatened by severe ischaemia, management should be discussed with the on call consultant vascular surgeon and arrangements made for prompt consultation, investigation and transfer of care to the arterial centre, if and when indicated.

It is important that treatment of ischaemia in the acute diabetic foot is not delayed. The above process of MDFS assessment, vascular opinion, imaging and finally a revascularisation procedure should not involve long delays. The urgency will require local assessment by the MDFS and will depend on the presenting symptoms and signs. However the principal that any delay runs the risk of on-going tissue damage must be considered in an effort to minimise tissue loss and reduce the risk of amputation.

There should be clear written vascular network guidelines regarding endovascular interventions at non-arterial hospitals. These will dictate what interventions can be undertaken locally in the non-arterial centre and those that require transfer to the arterial centre. Providing it does not result in undue delay, patients should be discussed in a vascular multidisciplinary meeting (local or network) in order to plan revascularisation.

Suggested maximum timelines from receipt of referral by the vascular service for urgent endovascular revascularisation at the NA hospital Trust are:

- a) In-patient MDFS assessment within 24 hours (NICE guidance).
- b) Vascular input and imaging within 48 hours.
- c) Local endovascular revascularisation within 8 days.

If endovascular revascularisation at the non-arterial centre cannot be performed within the required timeframe then the patient should be transferred to the arterial centre for earlier intervention by the emergency vascular team (surgeon and interventional radiologist). In-patients at the non-arterial centre requiring surgical revascularisation should be transferred to the arterial centre without delay.

If the patient is transferred, it is essential that non-vascular aspects of care are considered and treated according to best practice. It is important that the vascular team maintains close and effective communication with both the referring team and members of the MDFS in their own hospital Trust.

Post-surgery, the arrangements for the patient's prompt transfer, post-operative management, discharge and post-discharge care to the MDFS at the non-arterial centre, need to be discussed and agreed between the teams. This means that the non-arterial centres need to be in a position to ensure that patients can be repatriated promptly.

### **Discharge planning**

Effective discharge planning is an absolute pre-requisite to ensure appropriate follow-up and management post interventions. Co-ordination and communication between the patient, MDFS team members, both in the non-arterial and arterial centres and primary care, is essential for achieving planned discharge. The role of a diabetic foot

co-ordinator within the MDFS is an essential role to help facilitate the repatriation and timely transfer of patient information between teams.

Arterial centres should ensure:

- Prompt communication of the discharge to the MDFS at the non-arterial centre.
- If the patient is to be discharged directly from the arterial centre to the community this should be agreed with the MDFS at the non-arterial hospital prior to discharge.
- Ensure that discharge summaries include information on all aspects (vascular and non-vascular) of the patient's admission.

All patients admitted to hospital with acute diabetic foot complications should, at the time of discharge, have an outpatient appointment arranged at their local diabetic foot clinic as soon as clinically required. This will often be within 1 to 2 weeks of discharge. Other factors may need to be considered prior to discharge including:

- The need for continued outpatient antibiotics. This needs to be communicated to the ongoing care provider.
- Does the patient have appropriate offloading to accommodate any dressings and alleviate pressure from the wound?
- Have arrangements been made for community nursing to re-dress the foot?
- Does the patient need continued advice on their diabetes control?
- Ensure ongoing care plans are communicated to the local MDFS, general practitioners, community nurses and other healthcare providers.

Medium and long-term care should generally be coordinated by the local MDFS, FPS and the patient's usual healthcare professionals. If the patient is usually under the care of a non-arterial centre, the care of the patient should be handed back to the non-arterial centre once care at the arterial centre is complete.

### **Management of the patient undergoing major amputation**

In patients with ischaemia prior to any major amputation (above the ankle) the vascular team should explore all options for revascularisation. If a major amputation is required in a patient with an ischaemic foot or leg, the patient will usually be managed by the vascular surgeons and the procedure organised at the arterial centre.

Major amputations in neuropathic and infected cases without ischaemia may be performed in either the arterial or non-arterial centres by the orthopaedic or vascular teams, according to the locally agreed policy.

All patients with diabetes undergoing lower limb amputation should be reviewed both pre- and post-operatively by the specialist diabetes team to optimise control of diabetes and management of co-morbidities. This pre-operative review should not delay the operation in patients requiring emergency surgery<sup>10,11</sup>.

The care of amputees should follow the NCEPOD and amputation quality improvement framework guidance<sup>10,11</sup>. Prior to undergoing an elective/non-emergency major amputation a process of care planning should have been

undertaken. This should involve pre-operative assessment by the rehabilitation team. Each patient should have an individualised plan considering their medical needs and social circumstances in order to maximise independence and improve clinical outcomes. The same principles of care regarding management of non-surgery related problems apply during this phase. These include:

- Achieving good glycaemic control.
- Avoidance of hospital acquired pressure ulceration.
- Ongoing care of the remaining limb.
- Management of other non-amputation related conditions.

Many patients will benefit from rehabilitation post-amputation and should have access to these services<sup>10</sup> as identified in their individualised plan. Clear protocols for the repatriation of amputees back to the non-arterial centre should be in place to optimise the rehabilitation and ongoing diabetic care of these patients and the Foot Co-ordinator has a key role in facilitating this between centres.

Management of major amputees will depend on liaison with the rehabilitation team but may be centred in either the arterial, non-arterial or community hospital Trust.

Close contact with the MDFS, FPS and primary care colleagues is necessary to ensure on-going care of the amputee following discharge from hospital.

### **Monitoring implementation and the National Diabetes Footcare Audit (NDFCA)**

All services involved in the management of diabetic foot complications should participate in the National Diabetes Foot Care Audit (NDFCA). This will enable services to measure their performance against NICE clinical guidelines and peer units. The NDFCA is a system to ensure this Framework is delivered and NICE guidance<sup>7</sup> followed. CCGs and hospital Trusts should use the NDFCA to monitor adverse outcomes for people with diabetes who develop diabetic foot disease and to assess effectiveness of implementation in arterial and non-arterial centres.

Details of the National Diabetes Footcare Audit are available at:  
<http://www.hscic.gov.uk/footcare>

### **Training**

Effective multidisciplinary working requires each member of the team to be aware of the role and contribution made by every other member. All healthcare professionals, but particularly those who may be involved in the care of the diabetic foot, should be trained in disease of the foot in diabetes – its causes, presentation, investigation, treatment and aftercare. All trainees looking after the diabetic foot should be assessed as competent to treat these patients. Consideration needs to be given to enable the professional members of the foot team to gain experience across the network. Podiatrists, specialist nurses (diabetic, vascular, tissue viability), vascular scientists, orthotists can all benefit from experience in different hospitals. Joint appointments with job plans covering more than one site can help to meet these needs.

## **References**

1. Kumar S, Ashe, HA, Parnell LN, et al. The prevalence of foot ulceration and its correlates in type 2 diabetic patients: a population based study. *Diabetic Medicine*. 1994;11:480-484
2. Waltets DP, Garling W, Mullee MA, et al. The distribution and severity of diabetic foot disease: a community study with comparison to a non-diabetic group. *Diabetic Medicine*. 1993;9:354-358
3. Pecoraro RE, Reiber GE, Burgess EM. Pathways to diabetic limb amputation: basis for prevention. *Diabetes Care*. 1990; 13:513–521,
4. Holman N, Young RJ, Jeffcoate WJ. Variation in the Recorded Incidence of Amputation of the Lower Limb in England. *Diabetologia*. 2012 Jul;55(7):1919-25
5. Moulik PK, Mtonga WR, Gill GV. 2003 Amputations and mortality in new-onset diabetic foot ulcers stratified by aetiology. *Diabetes Care* 2003;26:491-494
6. Kerr M, Rayman, G Jeffcoate W. Cost of diabetic foot disease to the National Health Service in England. 2014;31(12):1498-1504
7. NICE. 2015 Diabetic foot problems; the prevention and management (NG19) Available at: <http://www.nice.org.uk/guidance/ng19>
8. Health and Social Care Information Centre (2013) National Diabetes Inpatient Audit. Available at: <http://www.hqip.org.uk/assets/NCAPOP-Library/NCAPOP-2014-15/NaDIAINTERACTIVE-PDF23-06-14.pdf>
9. All Party Parliamentary Working Group on Vascular Disease (2014) Tackling Peripheral Arterial Disease More Effectively: Saving Limbs, Saving Lives. Available at: [http://appgvascular.org.uk/media/reports/2014-03-tackling\\_peripheral\\_arterial\\_disease\\_more\\_effectively\\_saving\\_limbs\\_saving\\_lives.pdf](http://appgvascular.org.uk/media/reports/2014-03-tackling_peripheral_arterial_disease_more_effectively_saving_limbs_saving_lives.pdf)
10. NCEPOD (2014) Lower Limb Amputation: Working Together. Available at: <http://www.ncepod.org.uk/2014lla.htm>
11. Vascular Society Quality Improvement Framework for Major Amputation Surgery (2010) Available at: [https://www.google.co.uk/search?hl=en-GB&source=hp&q=quality+improvement+framework+amputation&gbv=2&oq=amputation+qualit&gs\\_l=heirloom-hp.1.1.0j0i8i30l2.781.12890.0.14015.35.18.10.7.10.0.93.1251.18.18.0.mse dr...0...1ac.1.34.heirloom-hp..7.28.1298.T2BpYLDxhYw](https://www.google.co.uk/search?hl=en-GB&source=hp&q=quality+improvement+framework+amputation&gbv=2&oq=amputation+qualit&gs_l=heirloom-hp.1.1.0j0i8i30l2.781.12890.0.14015.35.18.10.7.10.0.93.1251.18.18.0.mse dr...0...1ac.1.34.heirloom-hp..7.28.1298.T2BpYLDxhYw)