

Under the microscope: Inpatient care of diabetic foot complications

Joelle Baynham, Debbie Sharman

Acute foot complications in people with diabetes continue to be a frequent reason for admission to hospital in the UK and are associated with an increased length of stay. Outcomes have improved where there is access to an inpatient podiatry team. The development of clear referral and management pathways is critical to improving outcomes. An education package supporting simple foot-check risk assessments on admission should also be in place, in order to aid timely identification of people admitted with diabetic foot ulcers. There are increasing numbers of patients for whom further revascularisation options may not be possible, or appropriate. A palliative approach may need to be considered and should be planned for. The progression of advanced clinical practice and consultant-level practice in podiatry lends itself to developing novel future care models. Podiatrists are in a strong position to provide highly advanced autonomous care to inpatients, utilising their expert clinical and leadership skills to enhance future service delivery.

It is estimated that approximately 18% of hospitalised patients have a diagnosis of diabetes (Dhatariya et al, 2020). Acute foot complications continue to be the most frequent reason for admission to hospital if you have diabetes in the UK (McInnes, 2012).

Diabetic foot disease costs around 0.9% of the NHS budget for England, exceeding the combined cost of breast, prostate and lung cancers. It is associated with an increased length of stay: approximately 8.04 days longer than those admitted without ulceration (Kerr et al, 2019; Armstrong et al, 2020).

Early identification of foot complications on admission, along with clear referral and management pathways, are critical to improving outcomes. This would include the aggressive management of infection and ischaemia with appropriate offloading (International Working Group for the Diabetic Foot, 2019; NHS Digital,

2019; NICE, 2019, Ousey et al, 2018). NICE (2019) recommends the following for a person with diabetic foot problems being admitted to hospital:

- A care pathway for diabetic foot problems.
- A named consultant to assume accountability for overall care.
- Referral to the diabetic foot multidisciplinary team (DFMDT) within 24 hours of identification of a diabetic foot problem.
- Transfer of responsibility of care to a consultant member of the DFMDT if a diabetic foot problem is the dominant clinical factor for inpatient care.

There remains considerable postcode variation in access to specialist DFMDTs (Boulton and Williams, 2020). In England, 18.2% of hospitals did not have access to an inpatient podiatry team in 2019 (NHS Digital, 2019). Inpatient DFMDTs should, as a minimum, include a consultant

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Article points

1. Acute foot complications continue to be a frequent reason for hospitalisation in people with diabetes and are associated with an increased length of stay.
2. Early identification of foot complications on admission, along with clear referral and management pathways, are critical to improving outcomes.
3. The development of advanced and consultant-level practice in podiatry presents opportunities for novel care models and improved access for emergency diabetic foot cases.

Key words

- Diabetic foot
- Inpatient care
- Service delivery

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diabetologist, a specialist diabetes podiatrist and a surgical specialist (vascular/orthopaedic), with access to a diabetes nurse specialist, microbiology and orthotic services. Podiatrists play a unique role in the DFMDT, being able to assess vascular and neuropathic status, undertake debridement, classify the severity of ulceration and infection, and advise on appropriate offloading.

Following peer reviews in the south west of England, DFMDTs were extended to recruit inpatient podiatrists, contributing towards a reduction in lower limb amputation (Paisey et al, 2019). Furthermore, a review of the impact of new podiatry inpatient services by Bolton and Williams (2020) showed a positive impact on care for inpatients, achieved by raising the professional profile of podiatry and the diabetic foot, improved appropriate referrals, and coordinated discharge planning.

In 2011, only 26.8% of people with diabetes admitted to hospital had a foot exam (NHS Digital, 2011). Foot examination at admission identifies unknown ulceration, which is often diagnosed as “sepsis of unknown origin”. Locally, in Bournemouth, a quality improvement project sought to improve ulcer identification on admission. A foot exam template was added to the admission clerking form, but subsequent audit showed a failure to improve the number of foot exams at admission beyond 32%. In 2018, an inpatient task and finish group designed a mandatory foot exam, for completion within the daily electronic nursing assessment (ENA). Audit data from 2019 showed an improvement in compliance to 77.3%. Further work is ongoing to add an “identifier flag” for all ulcerated patients to the ENA. This will be viewable via a remote dashboard by the inpatient DFMDT, enabling earlier remote identification of patients with ulceration, by reducing time from identification to referral and enabling remote review of patient progress across sites.

In 2012, following poor aneurysm surgery outcome data, a national redesign of vascular services, utilising a spoke and hub model, arose. An associated effect was to reduce on-site access to revascularisation to some DFMDTs, with resultant transfer delays (Paisey et al, 2019). In Dorset, the Vascular Surgical Network hub is sited in Royal Bournemouth Hospital (part of University

Hospitals Dorset [UHD] NHS Foundation Trust), with Poole Hospital (also part of UHD), Dorset County Hospital and Salisbury Hospital acting as spokes. The local result has shown increased pressure on beds in the vascular hub at Royal Bournemouth Hospital, which sometimes affects the transfer of patients admitted with DFUs from the spoke hospitals. Monthly and, more recently, weekly DFMDT meetings have helped to improve communication between sites.

Inpatient MDT service development

Peer reviews can be insightful in identifying key areas of service success and weakness. They also offer scope for development and change, with support at the Trust Board level. Dorset hospitals participated in local peer reviews in 2018 and a GIRFT (Getting It Right First Time) review in 2019. Inpatient recommendations identified from the reports included:

- Appointment of a specialist inpatient podiatrist (full-time) at Dorset County Hospital, where there was no inpatient podiatry provision.
- Redesign process for root cause analysis for major amputation across Dorset.
- Improve robustness of identifying inpatients with diabetes and at-risk feet in UHD.
- Appoint a vascular lead for diabetic foot to collaborate with the consultant diabetologist foot lead.
- Job plan further time for the consultant diabetologist foot lead to steer and develop the inpatient service in UHD.
- Job plan further time for the consultant foot and ankle trauma surgeon to support the DFMDT.

Dorset County Hospital appointed a full-time specialist podiatrist for inpatients in 2019, ensuring that patients now have access to specialist podiatry. UHD did have some specialist podiatry ward input, but this was only a handful of sessions each week. Development of the UHD inpatient multidisciplinary foot service was hindered by having two vacant consultant diabetologist posts. Insufficient consultant-level foot leadership in the DFMDT exposed a risk for patients. This was added to the risk register and escalated to management level. An evaluation of the workforce supported the opportunity to develop a consultant

podiatrist role for inpatients with diabetes. This post would combine autonomous and advanced expert knowledge of diabetic foot management, with advanced leadership skills to develop a novel service model. Funding for the role came from one of the vacant consultant diabetologist posts. Additionally, it is anticipated the role will:

- Improve the process for root cause analysis of major amputations across Dorset.
- Define and disseminate the admission pathway for diabetic foot complications, including pre-admission and out-of-hours advice and guidance.
- Develop clear guidance for emergency care of diabetic foot ulcers.
- Provide tailored education for inpatient teams.
- Develop Royal Bournemouth Hospital as the vascular and diabetic foot hub to ensure all diabetic foot admissions have immediate access to the specialist teams.
- Work with the teams within the diabetic foot spoke hospitals to ensure timely and appropriate management of foot complications identified during admissions.
- Ensure that wards are supported to implement assessment of the feet of all patients with diabetes within 24 hours of admission.
- Review and update the inpatient diabetes electronic foot assessment tool to include an active ulcer flag for remote review.
- Act as the care coordinator of inpatients with diabetic foot complications, ensuring timely review by other members of the DFMDT.
- Strengthen links with tissue viability and therapy teams across the hospitals.

In essence, the inpatient consultant podiatrist will take the care and expertise offered in outpatient diabetic foot clinics to the wards, thereby acting as the pivot at the centre of the inpatient DFMDT, as shown to be of benefit by Musuuz et al (2020). The post will enable daily ward rounds, supporting the specialist podiatrists and wider DFMDT over the two hospital sites, utilising technology to offer urgent remote cross-site review where required.

Time is tissue: foot ulcer pathways

Delays can be experienced when patients with foot ulceration are cared for as “outliers” within the hospital, or by a non-specialist team. Diabetic foot

ulcer infection may not be recognised as the primary reason for admission, observed when patients are initially coded as having “sepsis of unknown origin”. This can lead to admission under the wrong team or hospital. Diabetic foot ulcer pathways must include advice for weekend/out-of-hours care, urgent care centres/ambulance teams and GP/primary care settings to ensure timely admission to the most appropriate team and site. Targeted education packages should be included to support the pathway. A lack of podiatry inpatient services to support smaller spoke/community hospitals can also be a barrier to timely care of diabetic foot ulcers.

The DFMDT and education

Education for hospital staff and patients is essential in supporting early identification and referral of foot ulcers to the DFMDT. Simple foot-check risk assessment tools have evolved, such as “[Check Protect Refer](#)” from the Scottish Diabetes Foot Action Group (Stang and Leese, 2014), and the Ipswich Touch Test (Rayman et al, 2011). They are designed to identify people either at risk of or with foot ulceration. Both have the following in common, enabling spread, replication and embedding:

- Foot check regimens aimed at getting staff to remove socks and shoes.
- Supportive education packages.
- Ease of repeatability and no special equipment.
- Clear, simple referral pathways.

Simple education of inpatients is also key. Some patients have never encountered diabetes ulceration or foot services before admission to hospital. Podiatrists are able to offer advice and education, explain the process of healing wounds or other intervention processes, and offer temporary footwear and offloading devices. The positive impact of podiatry inpatient services, DFMDTs and foot assessment at admission has been shown in the most recent National Diabetes Inpatient Audit report (NHS Digital, 2020), with a reduction in numbers developing foot ulcers during admission from 2.2% of inpatients audited in 2010 to 1.1% in 2019.

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and peripheral arterial disease risk factors. As a result, many DFMDTs are increasingly caring for inpatients whose ulcers are unlikely to heal. Further revascularisation options may not be available or appropriate. Once the decision has been made for conservative management, a palliative approach that plans to reduce the complexity of care and minimise the risk of infection and need for hospitalisation should be developed. A referral should be considered to local inpatient or community palliative care services, and an escalation plan developed in discussion with the patient and their family. These are difficult conversations, requiring a team approach to planning, and giving the patient and their family time to ask questions.

Advances in delivery of care for inpatients

The progression of Advanced Clinical Practice has led to extended-scope specialist and advanced practice roles for podiatrists. Consultant-level practice for nurses and allied health professionals is an extension of this, although there are still very few non-surgical consultant podiatrist posts in existence. This level of practice is designed to transform and modernise pathways of care, enabling the safe and effective sharing of skills across traditional professional boundaries delivered by experienced, registered healthcare practitioners. It is a level of practice characterised by a high degree of autonomy and complex decision making, underpinned by a Master's-level award or equivalent (Health Education England, 2017).

This highly advanced-level practice, provided by consultant podiatrists, can bring huge benefits to the management of patients admitted with diabetic foot complications. Autonomous skills can provide essential high-level support to medical and surgical teams, allowing them to focus on their most critically ill patients. The consultant podiatrists are able to provide education and training to junior doctors, junior podiatrists, nursing staff and allied health professionals; provide antimicrobial guidance; prescribe; and liaise with other specialists (e.g. vascular, microbiology, diabetes specialist nurses and therapists). They can request and follow up on investigations such as MRIs, x-rays and ultrasound doppler arterial scans. They are also able

to support discharge planning, arranging outpatient follow-up in diabetic foot clinics and community foot protection services.

There are many opportunities for future care models utilising Advanced Clinical Practice. The development of novel care pathways will improve access for emergency diabetic foot cases and reduce inpatient bed days through coordination of care within the DFMDT. Podiatrists are in a strong position to develop their specialist and advanced practice roles, and to provide expert clinical and strategic leadership to enhance service delivery and care for patients in hospital. ■

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