

Under the microscope — inpatient care of diabetes foot complications

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Key words

- Diabetes foot complications
- Inpatient care
- Palliative approach

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 diabetes foot cases.

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Acute foot complications in people with diabetes continue to be a frequent reason for admission to hospital in the UK, 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 (ACP) 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).

Diabetes foot disease costs around 0.9% of the National Health Service (NHS) budget for England, exceeding the combined cost of breast, prostate and lung cancers. It is associated with an increased length of stay of 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; National Diabetes Footcare Audit, 2019; NICE, 2019, Ousey et.al.2018). NICE (2019) recommends the following for a person with diabetes foot problems being admitted to hospital:

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

There is still considerable 'post-code' 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 DFMDT's should, as a minimum, include a consultant diabetologist, specialist diabetes podiatrist, and 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, DFMDT's were extended to recruit inpatient podiatrists, contributing towards a reduction of 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 and care for inpatients achieved by raising the professional profile of podiatry and the diabetic foot, improved appropriate referrals, and co-ordinated discharge planning.

In 2011, only 26.8% of people admitted to hospital had a foot exam (NHS Digital, 2011). Foot examination at admission identifies unknown ulceration 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 enable remote review of patient progress across site.

In 2012, a national redesign of vascular services utilising a spoke and hub model following poor aneurysm surgery outcome data arose. An associated effect was to reduce on-site access to revascularisation to some DFMDT's, with resultant transfer delays (Paisey et al, 2019). In Dorset, the Vascular Surgical Network hub is sited in the 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 RBH that sometimes affects the transfer of patients admitted with DFUs from 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 successes and weakness. They also offer scope for development and recommend change with support at 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 diabetes foot to collaborate with consultant diabetologist foot lead
- Job Plan further time for consultant diabetologist foot lead to steer and develop the inpatient service in UHD
- Job Plan further time for consultant foot and ankle trauma Surgeon to support 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 DFMDT foot service was hindered by having two vacant consultant diabetologist posts. Insufficient MDFT consultant-level foot leadership 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 diabetes inpatients. This post would combine autonomous and advanced expert knowledge of DF management, with advanced leadership skills to develop a novel service model. Funding for the role came from one of the vacant consultant diabetologist

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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 DF complications, including pre-admission and out-of-hours advice and guidance
- Develop clear guidance for emergency care of DFUs
- Provide tailored education for inpatient teams
- Develop RBH as the vascular *and* diabetes foot hub to ensure all DF admissions have immediate access to the specialist teams
- Work with the teams within the diabetes foot ‘spoke’ hospitals to ensure timely and appropriate management of DF 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 co-ordinator of inpatients with DF complications, ensuring timely review by other members of the MDFT
- Strengthen links with tissue viability and therapy teams across the hospitals.

In essence, the in-patient consultant podiatrist will take the care and expertise offered in outpatient diabetes foot clinics to the wards. Thereby acting as the pivot at the centre of the inpatient DFMDT, as shown to be of benefit by Mususa 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 ... DFU pathways

Delays can be experienced when patients with foot ulceration are cared for as ‘outliers’ within the hospital, or by a non-specialist team. DFU infection may not be recognised as the primary reason for admission; observed where patients are initially coded as having “sepsis of unknown origin”. This can lead to admission under the wrong team or hospital. DFU pathways must include advice for weekend/out of hours care/urgent care centres/ambulance teams and GPs/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 DFU.

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” for Diabetes feet from the Scottish Diabetes Foot Action Group (SDFAG) (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 patient 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, DFMDT and foot assessment at admission is shown in the most recent NaDIA 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.

Palliative care

Patients with diabetes are living longer; in part due to successful medical management of cardiovascular 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, 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 to enable the patient and their family time to ask questions.

Advances in delivery of care for in-patients

The progression of Advanced Clinical Practice (ACP) 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 health and care 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 a consultant podiatrist, can bring huge benefits to the inpatient management of patients admitted with DF 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 podiatrist is able to provide education and training of junior doctors, junior podiatrists, AHPs, and nursing staff; antimicrobial guidance, prescribe, liaise with other specialists e.g., vascular, microbiology, diabetes specialist nurses and therapists. They can request and follow-up on investigations such as MRI, X-ray and ultrasound doppler arterial scans. They are also able to support discharge planning, arranging outpatient follow-up in diabetes foot clinics and community foot protection services.

There are many opportunities for future care models utilising ACP. The development of novel care

pathways will improve access for emergency diabetes foot cases and reduce inpatient bed days through co-ordination of care within the DFMDT. Podiatrists are in a strong position to develop their specialist and advance practice roles, and provide expert clinical and strategic leadership to enhance service delivery and care for patients in hospital. ■

- Armstrong DG, Swerdlow MA, Armstrong AA et al (2020) Five year mortality and direct costs of care for people with diabetic foot complications are comparable to cancer. *J Foot Ankle Res* 13(1): 16
- Boulton Z, Williams L (2020) The role of inpatient podiatry in the care of the diabetic foot: establishing and implementing services in the South West. *The Diabetic Foot Journal* 23(4): 42–7
- Dhatariya K, Mustafa OG, Rayman G (2020) Safe Care for people with Diabetes in Hospital. *Clinical Medicine* 20(1): 21–7
- Health Education England (2017) What is Advanced Clinical Practice? Available at: <https://bit.ly/3pjtC7u> (accessed 08.03.2022)
- Kerr M, Barron E, Chadwick P et al (2019) The cost of diabetic foot ulcers and amputations to the National Health Service in England. *Diabet Med* 36(8): 995–1002
- McInnes AD (2012) Diabetic foot disease in the United Kingdom: about time to put feet first. *J Foot Ankle Res* 5(1): 26
- Mususa J, Sutherland BL, Suleyman K et al (2020) A systematic review of multidisciplinary teams to reduce major amputations for patients with diabetic foot ulcers. *J Vasc Surg* 71(4): 1433–1446.e3
- NHS Digital (2011) *National Diabetes Inpatient Audit (NaDIA) – 2011*. Leeds: NHS Digital. Available at: <https://bit.ly/37dk89w> (accessed 08.03.2022)
- NHS Digital (2019a) *National Diabetes Foot Care Audit Report Fourth Annual Report. England and Wales: 01 April 2015 to 31 March 2018*. Leeds: NHS Digital. Available at: <https://bit.ly/3603b6m> (accessed 08.03.2022)
- NHS Digital (2020) *National Diabetes Inpatient Audit Report, 2019. England: 13 November 2020*. Available at: <https://bit.ly/3tDZl5F> (accessed 08.03.2022)
- National Institute for Health and Care Excellence (2019) *Diabetic Foot Problems: Prevention and Management. NICE Guideline [NG 19]*. London: NICE. Available at: <https://bit.ly/3KxsBrj> (accessed 08.03.2022)
- Ousey K, Chadwick P, Jawien A et al (2018) Identifying and treating foot ulcers in patients with diabetes: saving feet, legs and lives. *J Wound Care* 27(Sup5): S1–S52
- Paisey R, Abbott A, Levenson R (2019) Peer review and follow-up to enhance diabetic foot services throughout the patient journey. *The Diabetic Foot Journal* 22(4): 42–7
- Stang D, Leese G (2014) CPR for diabetic feet. *The Diabetic Foot Journal*. 17(1): 16–8
- The International Working Group on the Diabetic Foot (2019) *IWGDF Guidelines on the Prevention and Management of Diabetic Foot Disease*. Available at: <https://bit.ly/3vPLamD> (accessed 08.03.2022)