



■ FOOT & ANKLE

The engagement of orthopaedic surgeons in diabetic foot care in England

**A. H. N. Robinson,
P. Garg,
S. Kirmani,
P. Allen**

*From Addenbrookes
Hospital, Cambridge
University NHS Hospital,
Cambridge, UK*

Aims

Diabetic foot care is a significant burden on the NHS in England. We have conducted a nationwide survey to determine the current participation of orthopaedic surgeons in diabetic foot care in England.

Methods

A questionnaire was sent to all 136 NHS trusts audited in the 2018 National Diabetic Foot Audit (NDFa). The questionnaire asked about the structure of diabetic foot care services.

Results

Overall, 123 trusts responded, of which 117 admitted patients with diabetic foot disease and 113 had an orthopaedic foot and ankle surgeon. A total of 90 trusts (77%) stated that the admission involved medicine, with 53 (45%) of these admissions being exclusively under medicine, and 37 (32%) as joint admissions. Of the joint admissions, 16 (14%) were combined with vascular and 12 (10%) with orthopaedic surgery. Admission is solely under vascular surgery in 12 trusts (10%) and orthopaedic surgery in 7 (6%). Diabetic foot abscesses were drained by orthopaedic surgeons in 61 trusts (52%) and vascular surgeons in 47 (40%).

Conclusion

Orthopaedic surgeons make a significant contribution to both acute and elective diabetic foot care currently in the UK. This contribution is likely to increase with the movement of vascular surgery to a hub and spoke model, and measures should be put in place to increase the team based approach to the diabetic foot, for example with the introduction of a best practice tariff.

Cite this article: *Bone Jt Open* 2022;3-8:618–622.

Keywords: Diabetic foot, Foot and ankle, Orthopedics, NHS

Introduction

The cost, morbidity, and mortality of treating diabetic foot disease is considerable. In England and Wales at any one time, more than 64,000 patients are thought to have a foot ulcer.^{1,2} These ulcers are the precursor of the annual 7,000 minor and major diabetic foot amputations in England.^{2,3} The five-year mortality rate for those with a diabetic foot ulcer is around 40%, increasing to around 50% for those undergoing a major amputation.^{2,4} The annual cost of ulceration and amputation in the diabetic foot in England is estimated to be almost £1 billion, or almost 1% of the NHS budget.^{2,5}

To manage this burden of disease efficiently, NHS Digital set up a National Diabetic Foot Audit (NDFa) in 2014.⁶ The

National Institute for Health and Care Excellence (NICE) published national guidelines for diabetic foot care structure (NG-19) in 2015 and 2019.^{7,8}

The NDFa states that, "optimized structures and pathways of care are necessary to achieve the best outcomes for people with diabetic foot ulcers. Without this care infrastructure it is not possible to treat diabetic foot disease efficiently and effectively." The NICE guideline aims to reduce variation in practice and proposes structures to achieve this. NICE recommends that commissioners should ensure that there is a foot protection service (FPS) to prevent diabetic foot problems. The FPS should be led by a podiatrist and manage diabetic foot problems in the community. There should also be a hospital-based

Correspondence should be sent to A. H. N. Robinson; email: fred.robinson@addenbrookes.nhs.uk

doi: 10.1302/2633-1462.38.BJO-2022-0025.R1

Bone Jt Open 2022;3-8:618–622.

multidisciplinary foot care service (MDFS) for managing more complex diabetic foot disease. A collective paper by British Orthopaedic Association, British Orthopaedic Foot and Ankle Society, Vascular Society, Diabetes UK, Association of British Clinical Diabetologists, Foot in Diabetes UK and British Association of Prosthetists and Orthotists recommends that the MDFS service must include surgical specialities, including orthopaedic and vascular surgery.⁸

The NDFA monitors the provision of diabetic foot services and proposes strategies to overcome service deficiencies. The latest audit from 2018 involves 136 NHS trusts with 221 specialist foot care services, who were asked about the provision and structure of care.² The audit reports that targets are being achieved with 91% of providers having a FPS in place. Nevertheless, specialist services are less well provided, with 69% of services providing urgent vascular assessment, 66% having dedicated time to discuss patients with vascular services, and 54% an urgent referral pathway.

Orthopaedic surgeons, and in particular orthopaedic foot and ankle surgeons, have not been included in the NDFA, despite being traditionally involved in diabetic foot care. The 2018 NDFA provider survey makes no mention of orthopaedic surgeons in the team providing expert assessment of the diabetic foot ulcer, nor is any orthopaedic surgeon acknowledged in the participating advisory groups. This is despite the NICE 2015 guidelines specifying orthopaedic surgical expertise as part of the MDFS. Similarly, the diabetes 'Get It Right First Time' (GIRFT) programme national speciality report published in 2020,⁹ which provides a comprehensive summary of the current state of diabetic foot care and recommendations to improve the care structure, makes scant mention of orthopaedic surgical input. Furthermore, there are diabetic foot problems which are exclusively dealt with by orthopaedic surgeons. These include the neuroarthropathic, or Charcot, foot and ankle, simple foot and ankle fractures in diabetics, and reconstructive surgery for deformity.¹⁰⁻¹²

The role of orthopaedic surgery in the structure of diabetic foot care is ill-defined, with little data available documenting orthopaedic participation. We have conducted a nationwide study in England, the aim of which is to document the existing infrastructure and involvement of orthopaedic surgeons in diabetic foot care. This should help policy makers to determine the future role and involvement of orthopaedic surgeons in diabetic foot care.

Methods

The 2018 NDFA audited 136 trusts. We sent an email questionnaire to the orthopaedic foot and ankle consultants in the orthopaedic department of these 136 trusts to determine the structure of diabetic foot care in their trust; 78 trusts replied. In those trusts where the orthopaedic

Table I. The number of orthopaedic foot and ankle specialists in the 113 of 123 trusts responding.

Number of surgeons	Total, n
None	10
1	11
2	50
3	21
4	12
5	10
6	1
Total	278

surgeons did not respond, we contacted the diabetic foot clinic directly and asked other personnel involved in diabetic foot care, including diabetologists and podiatrists, to fill in the questionnaire. Vascular surgeons were not contacted for this survey.

The data collected included the number of orthopaedic foot and ankle surgeons in the trust, the speciality responsible for the admission of the patient with acute diabetic foot disease, and the speciality undertaking drainage of the diabetic foot abscess. The participating specialties making up the FPS and MDFS were recorded, as was the frequency of the clinics and ward rounds.

Statistical analysis. Excel 2010 (Microsoft, USA) was used to tabulate the numbers and calculate the percentages. We have documented exclusive and joint admissions separately. There was also a free text section to allow respondents to provide us with further commentary and to include relevant information regarding the service.

Results

A response was obtained from 123 trusts in total, of which 117 admitted patients with diabetic foot disease.

Overall, 113 out of the 123 trusts (92%) have an orthopaedic foot and ankle specialist, and 102 of the 113 trusts (91%) have two or more foot and ankle consultant orthopaedic surgeons (Table I). In all, 11 trusts have podiatrists practicing surgery: six trusts have one, three have two, and two trusts have more than two podiatrists practicing surgery contributing to the care of the diabetic foot. In seven of these 11 trusts, the podiatrists practicing surgery work in conjunction with the orthopaedic foot and ankle team. They are independent in the other four trusts. Two of these four trusts do not have a dedicated foot and ankle orthopaedic consultant. In response to the question, 'Who admits patients presenting with acute diabetic foot disease?', 80 trusts admitted the patients under a single speciality, and 37 under joint care (Table II). A total of 90 trusts (77%) stated that the admission involved medicine, with 53 (45%) of these admissions being exclusively under medicine, and 37 (32%) as joint admissions. Of the joint admissions, 16 (14%) were combined with vascular and 12 (10%) with orthopaedic surgery. Admission

Table II. 117/123 trusts responding admit patients with diabetic foot disease, with their response to two questions: 'Who admits patients presenting with acute diabetic foot disease?', and 'Who would drain a diabetic foot abscess acutely?'.

Variable	n (%)
Department of admission, single team (n = 80)	
Medicine/diabetes	53 (45)
Vascular	12 (10)
Orthopaedic surgery	7 (6)
General surgery	6 (5)
Other	2 (2)
Department of admission, multiple team (n = 37)	
Medicine + vascular	16 (14)
Medicine + orthopaedic surgery	12 (10)
Medicine + others	9 (8)
Who drained the acute abscess	
Orthopaedic surgery	61 (52)
Vascular surgery	47 (40)
General surgery	7 (6)
Other	2 (2)

Table III. When asked, 'Does your trust have a multidisciplinary foot service?', 111 said that they had a service.

Variable	n (%)
Speciality attending MDFS clinic	
Medicine/diabetes	106 (95)
Nonoperative podiatrist	100 (90)
Podiatrist practising surgery	11 (10)
Vascular surgery	64 (58)
Orthopaedic surgery	50 (45)
Diabetic nurse	32 (29)
Orthotist	28 (25)
Microbiologist	18 (16)
Plaster technician	20 (18)
Tissue viability nurse	9 (8)
Others	8 (7)
Frequency of clinic	
Weekly	78 (70)
Fortnightly	15 (14)
Monthly	11 (10)
More than once a week	7 (6)

MDFS, multidisciplinary foot care service.

is solely under vascular surgery in 12 trusts (10%) and orthopaedic surgery in seven (6%).

In response to the question, 'Who would drain a diabetic foot abscess acutely?', the answer was orthopaedic surgeons in 61 trusts (52%) and vascular surgeons in 47 trusts (40%) (Table II).

For the question, 'Does your trust have a podiatrist run diabetic foot protection clinic?', the answer was yes in 117 trusts (100%). The frequency of FPS services was five days a week in 87 trusts (74%), with 103 (88%) providing an FPS on three days or more.

In all, 111 trusts (95%) had an MDFS (Table III). Non-operating podiatrists were present in 100 (90%) of MDFS, and podiatrists practising surgery in 11 (10%) of MDFSs.

Table IV. Overall, 64 trusts had a multidisciplinary foot care service (MDFS) ward round. The specialities attending and frequency are shown.

Speciality attending MDFS clinic	n (%)
Medicine/diabetes	64 (100)
Nonoperative podiatrist	60 (94)
Podiatrist practicing surgery	4 (6)
Vascular surgery	31 (48)
Orthopaedic surgery	26 (40)
Diabetic nurse	14 (22)
Microbiology	14 (22)
Orthotics	6 (9)
Tissue viability nurse	3 (5)
Frequency of clinic	
Weekly	58 (90)
Fortnightly	3 (5)
Monthly	3 (5)

A diabetologist is present in 106 trusts (95%), a vascular surgeon in 64 (58%), and an orthopaedic surgeon in 50 (45%). The MDFS clinics were held on more than one occasion per week in seven trusts (6%). In 78 of trusts (70%), the clinic is weekly, 15 (14%) fortnightly, and in 11 (10%) monthly (Table III).

Overall, 64 (55%) undertake a MDFS ward round (Table IV). In 58 of the 64 trusts (91%) with an MDFS, the round is weekly. Podiatrists and diabetologists attend 100% of these rounds. Vascular surgeons are present in 31 (48%), and orthopaedic surgeons are present in 26 (40%) (Table IV).

Discussion

This paper audits the structures of the diabetic foot services in the NHS of England, with particular regard to surgical provision.

NICE published national guidelines (NG-19) in 2015, which were updated in 2019.^{7,8} These guidelines created a working model for diabetic foot care, which includes orthopaedic surgeons in the MDFS.⁸ To monitor and evaluate diabetic foot care, an NDFA was launched in July 2014.⁶ The 2018 NDFA report identified the ten services with the highest proportion of severe (SINBAD 3+) ulcer patients who were alive and ulcer free at 12 weeks.² The common feature leading to success of these services was direct access to a MDFS. This emphasizes the importance of a robust diabetic foot care structure. Unfortunately, the NDFA does not assess the contribution of orthopaedic surgeons, and hence the importance of the audit reported here. The 2018 NDFA obtained a response from 110 trusts.² We have obtained a response from 123 trusts, 117 of which admitted patients with diabetic foot disease.

The provision of foot protection seems to be good. To the question, 'Does your trust have a podiatrist run diabetic foot protection clinic?' the answer was yes in 117 trusts (100%). The frequency of FPS services was five days a week in 87 trusts (74%), with 103 (88%) providing

an FPS on three days or more. The answer to a similar question, 'Is there an established pathway for referral of all people with diabetes who are defined as being at increased risk during annual foot examination to a designated foot protection service (FPS)?' in the NDFA was positive in 90.7%.² Therefore, it appears that the guidelines' recommendations are being implemented.

However, in its most recent report, the NDFA reported difficulty with accessing vascular surgical services and urgent referral pathways, with only 69% of providers being able to access an urgent vascular assessment, 66% having dedicated vascular discussion time and 54% an urgent referral pathway. This is unsurprising as the GIRFT report on vascular surgery's first recommendation was to 'ensure all units are operating within a hub and spoke network model.'¹³ With such a nationally mandated move of vascular services to a 'hub and spoke' model the vascular surgical review of the diabetic foot within 24 hours, for example at weekends, is potentially undeliverable, without the transfer of patients to the hub hospital. Such a model also ignores the issue of the patient with normal circulation who requires surgery, for example a well vascularized foot with an abscess requiring drainage-with no vascular surgeons; in the spokes-who is going to provide this service?

A potential solution to this problem is to involve trauma and orthopaedic surgeons in the evaluation and treatment of these patients. Our data show that 113 of the surveyed trusts (92%) have an orthopaedic foot and ankle surgeon, with 102 having more than one surgeon (Table I). The total number of orthopaedic surgeons with a subspecialist interest in foot and ankle was 278. This is a significant specialised resource, the use of which should be maximized for the provision of diabetic foot care.

Orthopaedic surgeons are trained in vascular assessment of the limb. This skill should be true of all orthopaedic surgeons, whether they be foot and ankle subspecialists, or not. With the subspecialization of general surgery into breast, upper gastrointestinal, and so on, in spoke hospitals, orthopaedic surgeons may be the only specialists operating on the limb in a hospital. The general orthopaedic curriculum includes training and a critical workplace-based assessment of the treatment of the diabetic foot. Thus the on-call orthopaedic surgeon has competency to treat the patient with acute diabetic foot disease.¹⁴ In this study we have shown that orthopaedic surgeons are already draining abscesses in 52% of trusts (Table II), which is more than any other speciality. There is a perception that there is a lack of interest from orthopaedic surgeons in the treatment of the diabetic foot. We believe that the figure of 52% reflects the willingness of orthopaedic surgeons to provide acute care for patients with diabetic foot disease.

It is important that the patients are admitted under the most appropriate speciality, and GIRFT dictates that a

'named consultant should be accountable for the overall care of the person with easy access to other specialties as required.' In this study, the majority are admitted under the sole, or combined care, of a diabetologist. We believe that this is appropriate. Vascular surgeons admit patients in 10% of the hospitals and orthopaedic surgeons admit patients in only 6% of the trusts (Table II).

Patients with diabetic foot disease are best admitted under a medical team, as the medical care of the patient with diabetic foot disease is complex.⁸ Furthermore, orthopaedic wards are microbiologically ring fenced, to reduce the risk of periprosthetic infection. Indeed, ring fencing is mandated as the GIRFT national report on orthopaedics states that 'ring-fencing has contributed to the decreasing infection rates,' for example post-arthroplasty.¹⁵

In most hospitals, it may be that the role of the orthopaedic surgeon is as part of the MDFS. Encouragingly, this study shows that orthopaedic surgeons are contributing to the inpatient care of admitted patients, contributing in 40% of the 64 trusts undertaking multidisciplinary ward rounds, which is only slightly below the 48% of vascular surgery (Table IV).

Much of the care of the diabetic foot is undertaken in the outpatient setting. Our study shows that the MDFS is functioning in 111 trusts. Vascular surgeons are present in 64 (58%), orthopaedic surgeons in 50 (45%), and podiatrists practicing surgery in 11 (10%) of clinics (Tables III and IV).

In conclusion, we believe that not only are orthopaedic surgeons the primary providers of some aspects of diabetic foot care, for example treatment of Charcot neuroarthropathy and deformity, but that they should also be involved in care of the acute diabetic foot.¹⁶⁻¹⁹ This paper shows that orthopaedic surgeons already provide acute surgical care, for example they already undertake abscess drainage in majority of the hospitals.

Orthopaedic surgeons are increasingly involved in the multidisciplinary care of the diabetic foot. We would encourage increased collaboration and integration of orthopaedic surgeons into this multidisciplinary environment. Indeed, in a state-funded organization, such as the NHS, this integration of the orthopaedic surgeon into diabetic footcare can be encouraged by setting a level of care and rewarding this – this is widely used in the NHS and is badged as best practice tariff'.²⁰ We would encourage such a tariff to be used in the optimization of diabetic foot care to encourage multidisciplinary, including orthopaedic, surgical input. Including orthopaedic surgeons makes logistical sense, especially as vascular services change to a hub and spoke model of provision.



Take home message

- Orthopedic surgeons provide a significant percentage of acute and achronic diabetic foot care in the UK.

- There is also a significant orthopedic participation in the MDFS clinics and rounds which should be further encouraged.

- Diabetic foot has significant morbidity, mortality, and financial impact. Further increase of orthopedic participation is warranted to manage this epidemic effectively.

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Author information:

- A. H. N. Robinson, FRCS(Orth), Consultant
- P. Garg, FRCS(Orth), Foot and Ankle Fellow
Department of Trauma and Orthopaedics, Cambridge University Hospital NHS Trust, Cambridge, UK.
- S. Kirmani, FRCS (Orth), Consultant, Department of Trauma and Orthopaedics, Kettering General Hospital, Kettering, UK.
- P. Allen, FRCS(Orth), Consultant, Department of Orthopaedics, University Hospitals of Leicester NHS Trust Leicester General Hospital, Leicester, UK.

Author contributions:

- A.H.N Robinson: Conceptualization, Methodology, Supervision, Writing – review & editing.
- P Garg: Conceptualization, Data curation, Formal Analysis, Validation, Visualization, Writing – original draft.
- S. Kirmani: Conceptualization, Data curation, Formal analysis.
- P. Allen: Conceptualization.

Funding statement:

- The author(s) received no financial or material support for the research, authorship, and/or publication of this article.

ICMJE COI statement:

- The authors report that they have no disclosures to declare.

Acknowledgements:

- The authors wish to acknowledge Mr Sayyied Kirmani (FRCS (Orth), Consultant, Trauma and Orthopaedics, Kettering General Hospital) for his contribution to the collection and organization of data.

Open access funding

- The authors report that they received open access funding for this manuscript from Addenbrooke's Charitable Trust.

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