

Availability and service provision of multidisciplinary diabetes foot units in Australia: A cross-sectional survey.

Uyen Giao Vo

Fiona Stanley Hospital <https://orcid.org/0000-0002-6340-9263>

Molly Gilfillan

Fiona Stanley Hospital

Emma Jane Hamilton

Fiona Stanley Hospital

Laurens Manning

University of Western Australia Medical School

Bijit Munshi

Fiona Stanley Hospital

Jonathan Hiew

Fiona Stanley Hospital

Paul Edward Norman

University of Western Australia Medical School

Jens Carsten Ritter (✉ jc.ritter@web.de)

Fiona Stanley Hospital <https://orcid.org/0000-0001-8818-9079>

Research

Keywords: diabetic foot, multidisciplinary, survey

Posted Date: February 10th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-163449/v2>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Version of Record: A version of this preprint was published at Journal of Foot and Ankle Research on April 7th, 2021. See the published version at <https://doi.org/10.1186/s13047-021-00471-x>.

Abstract

Background: With growing global prevalence of diabetes mellitus, diabetes-related foot disease (DFD) is contributing significantly to disease burden. As more healthcare resources are being dedicated to the management of DFD, service design and delivery is being scrutinised. Through a national survey, this study aims to investigate the current characteristics of services which treat patients with DFD in Australia.

Methods: An online survey was distributed to all 195 Australian members of the Australian and New Zealand Society for Vascular Surgery investigating aspects of DFD management in each member's institution.

Results: From the survey, 52 responses were received (26.7%). A multidisciplinary diabetes foot unit (MDFU) was available in more than half of respondent's institutions, most of which were tertiary hospitals. The common components of MDFU were identified as podiatrists, endocrinologists, vascular surgeons and infectious disease physicians. Majority of respondents (84.3%) identified vascular surgery as being the primary admitting specialty for DFD patients that require hospitalisation. This finding was consistent even in centres with MDFU clinics. Less than 20% of MDFUs had independent admission rights.

Conclusions: Most tertiary centres in Australia provide their diabetic foot service in a multidisciplinary environment however their composition and function remain heterogeneous. The findings of this study provide an opportunity to evaluate current practice and, to initiate strategies aimed to improve outcomes of patients with DFD.

Background

Diabetes is recognised as the world's fastest growing chronic condition, with an estimated global prevalence of 422 million (1). It is among the top ten causes of death in adults globally, with approximately four million deaths worldwide in 2017 (2). Diabetes-related foot disease (DFD), which affects approximately 6% of the world population (3), contributes significantly to individual patient morbidity and mortality, and impacts heavily upon the wider public health system. DFD manifests as ulcers, infection, and Charcot foot in the presence of peripheral neuropathy and/ or peripheral arterial disease (4). Compared to those without diabetes, patients with diabetes are ten times more likely to require an amputation (5). It is estimated that the annual costs of DFD to the Australian health system is approximately AUD 1.6 billion (6). The economic costs and mortality rates exceed that of many common cancers (7); the 5-year mortality rate of patients with diabetic foot infections is approximately 50% (8).

Over the past 20 years, evidence has accumulated in support of the multidisciplinary care model for prevention and management of diabetes-related foot complications; and use of multidisciplinary teams in managing DFD is well recognised as standard of care (9, 10). Whilst there are regularly updated guidelines on best management of DFD, particularly the guidance documents published by the global

peak body for diabetic foot disease, the International Working Group on the Diabetic Foot (IWGDF) (4, 11), there is no universally accepted guideline to define the ideal composition of a multidisciplinary team for the management of DFD (12-14). Indeed, a review of eight national diabetic foot disease guidelines in Western Pacific region, including Australia, emphasised limited similarity to recommendations made by IWGDF (15). In Australia, although the National Health and Medical Research Council produced guidelines which identify a need for improved multidisciplinary care planning, these documents did not provide any specific detail on the inpatient team composition (16). Only recently a national accreditation standard for high risk diabetic foot centres was introduced (17). Furthermore, Australia has the highest incidence of major limb amputations (MLA) across the Western World (18). Although these numbers are not diabetes-specific previous, research has shown that 50% of all amputees have diabetes (19).

These sobering statistics suggest that the provision of dedicated multidisciplinary diabetic foot unit (MDFU) across the country is heterogeneous with major gaps in service provision in some areas.

By conducting a survey among Australian vascular surgeons, the authors aimed to determine the current management of DFD across Australia. The purpose of this study was to describe multidisciplinary team composition and function in in- and outpatient settings, and to gain an overview of the Australian real-world management of DFD.

Methods

Survey design

A twenty-part survey was designed, comprising of multiple choice and opt-in free-text responses regarding the management of patients with DFD in each respondent's institution. Vascular surgeons were identified as the primary target group for such a survey as they are an integral part of a functioning MDFU service and in many hospitals people with diabetes related foot complications are admitted under the care of vascular surgery. Questions were directed towards establishing hospital size and patient volume, the specialties responsible for admitting patients with DFD, and availability of a dedicated MDFU. The questionnaire also investigated MDFU's access to different specialists and whether those specialists had regular sessions in inpatient and outpatient contexts. The complete survey is attached in Additional file 1.

Survey distribution

Non-random (purposive) technique was used to distribute the online survey. In 2017, the online survey was emailed to all 195 Australian members of the Australian and New Zealand Society for Vascular Surgery. The survey remained open for a period of three months. A single reminder email was sent out six weeks after the initial email. Participants were advised that the survey was voluntary and anonymous.

Statistical analysis

Returned data were collated and analysed using Microsoft Excel (Microsoft Corporation, Washington, USA). Descriptive statistics were used to display variable data, with numbers and proportions used for

categorical data, unless otherwise indicated.

Results

Baseline characteristics of respondents

Responses were received from 52 surgeons (26.7%). Thirty-five vascular surgeons (67.3%) worked in tertiary metropolitan hospitals. Less than 10% of respondents worked in private sectors (5/52, 9.6%), (table 1).

The majority of respondents saw more than 100 DFD patients per year as inpatients (33/51, 64.7%) and outpatients (38/50, 72.0%). Of surgeons seeing more than 100 DRFD patients per year, three-quarters worked in metropolitan hospitals (25/33, 75.8% and 30/38., 79.0% for inpatient and outpatient respectively).

Multidisciplinary diabetes foot unit's activities

An overview of MDFU services was displayed in table 2. Approximately three in five respondents reported availability of MDFU in their institutions (31/52, 59.6%). Most of these institutions were tertiary metropolitan hospitals (26/31, 83.9%). Four regional/rural hospitals and one secondary metropolitan hospital, all with more than 100 DFD presentations per year, had dedicated MDFU. None of the private hospitals included in this survey had a multidisciplinary service for patients with DFD.

Of those with available MDFU, all but one institution provided a multidisciplinary outpatient clinic (30/31, 96.8%). A dedicated MDFU ward round was only available in about half of the institutions (17/31, 54.8%), most of which were tertiary metropolitan hospitals (14/17, 82.4%).

There was heterogeneity in the admitting teams. Only nine MDFU (9/33, 27.3%) functioned as an independent unit with admission rights; while majority of patients with DFD requiring hospitalisation were admitted under vascular surgery (33/52, 63.5%).

Multidisciplinary diabetes foot unit's composition

Eighteen respondents responded to further questions regarding composition of their MDFU ward round (figure 1). The key members participating in MDFU ward rounds were identified as podiatrists (17/18, 94.4%), vascular surgeons (16/18, 88.9%), infectious disease physicians (16/18, 88.9%), and endocrinologists (15/18, 83.3%). Approximately half of the units included a diabetes nurse specialist (8/18, 44.4%) to provide diabetes education, or a wound management nurse specialist (10/18, 55.6%) to optimise wound care.

Twenty-nine responses were received in terms of MDFU composition in the outpatient settings. The attendance rates of vascular surgeons, endocrinologists and podiatrists were similar to those in inpatient

settings (23/29, 79.3%; 22/29, 75.9%, 27/29, 93.1% respectively); while infectious disease specialty was available in less than half of the MDFU outpatient clinics (14/29, 48.3%).

Orthopaedic surgeons were only involved in a much lesser extent (3/18, 16.7% for inpatient; 6/29, 20.7% for outpatient), whilst there was no affiliated plastic, reconstructive or general surgery services at all.

Outpatient follow-up of DFD patients

Patient follow-up varied according to the degree of intervention and whether an outpatient MDFU clinic was available in each institution (figure 2).

In institutions without MDFU service, the majority of patients were followed up by the vascular surgery service. Rates of vascular follow-up ranged from over half of the patients who did not undergo any intervention (13/20, 65%), to 100% in those requiring vascular reconstruction (20/20, 100%).

In institutions with MDFU, nearly a quarter of patients who required no intervention or minor amputation would be followed up in MDFU outpatient clinic (7/29, 24.1%). Vascular surgery clinic was still responsible for a significant proportion of these patient follow-up. Almost all patients that underwent revascularisation attended dedicated follow-up with vascular surgery (27/29, 93.1%).

Endocrinology, podiatry, and general practitioner each contributed to approximately 10% of patient follow-up after a hospital admission for DFD.

Discussion

Although it is widely accepted that a multidisciplinary approach improves outcomes of DFD, at the time of the survey there has been no clear guidance how this care team should be structured. There are no baseline data on how the existing MDFUs are currently functioning. Recently Australian interdisciplinary high risk foot service standards have been introduced and there is a strong interest to establish these throughout the country (17). This survey helps to establish the status quo of multi-disciplinary diabetes foot services in Australia and opens the opportunity for further research in the future to investigate whether the introduction of standards has led to any changes in service provision/ composition of MDFU teams and more importantly if that leads on to improved outcomes for Australian patients with DFD. There are four key findings from this study, which are i) gaps between available services in metropolitan vs. rural areas; ii) gaps in service provision between public and private sectors; iii) inconsistent rate of involved specialties; and iv) inconsistent services provision between in- and outpatient setting.

Only 60% of the participants indicated that a dedicated MDFU service is available in their institution of which the vast majority is located in metropolitan areas. As a direct consequence of this the rural MDFU availability is underdeveloped. In Australia distances are great and long travel times plus cost may prevent DFD patients to seek specialist management early. Furthermore, the Australian Indigenous population with its high prevalence of diabetes and high diabetes related complication rates is mainly located in rural parts of the country (20). This may have a direct influence on the high national MLA rate.

An increase in MDFU services outside metropolitan areas where specialist services are available would therefore be desirable.

In Australia privately insured patients have access to a dedicated private hospital system. This survey demonstrates an uneven distribution of multidisciplinary management of DFD between public and private sectors. In fact, all MDFUs identified in this survey were located in public hospitals. By contrast, none of the private hospitals included in this survey had an established MDFU. The reasons for this are unclear but may reflect challenges in delivery of interdisciplinary care cost-effectively in a private billing environment. Also, the DFD prevalence in patients with a lower socio-economic status may lead to diminished demand for such a service in the private sector (21). However, this finding suggests that privately insured patients with DFD may benefit from direct referrals into the public system regardless of their insurance status.

The National Institute for Health and Care Excellence guidelines published in 2015 recommended that a MDFU should consist of specialists in the following areas: diabetology, podiatry, diabetes specialist nursing, vascular surgery, microbiology, orthopaedic surgery, biomechanics and orthoses, and interventional radiology (13). Notably, less than 20% of MDFUs in this survey reported having a regular orthopaedic surgeon's input. This is despite the importance of early corrective surgery especially in Charcot's neuropathy being recognised in several studies as well as guidelines (13, 22, 23). Therefore, integration of a foot and ankle surgeon into MDFU should be encouraged. More specifically a recent systematic review investigated the impact of MDFU on major limb amputation and identified four key tasks that these units need to address: glycaemic control, local wound management, vascular disease, and infection (12). This implies that endocrinologists, podiatrists, vascular surgeons and infectious diseases physicians should make the core of such a service. Data from this survey suggests that the majority of Australian MDFU involve these craft groups. However, there is a notable discrepancy between inpatient and outpatient services. More than half of the respondents indicated available MDFUs in their centres. Among these units, all but one had regular outpatient clinics; whereas only half of them provided inpatient ward rounds. The prevalence of MDFU outpatient clinics in our study is similar to the finding of a survey of Australasian infectious diseases clinicians in managing diabetic foot infections (24). The key members were widely available for in-patient ward rounds, whilst specialist outpatient attendance was below 80% and in the case of infectious diseases even less than 50%, which would raise the question of efficacy of the existing outpatient clinic model. The collected data suggests that the inpatient service is of high quality when available, whilst the outpatient service despite being widely available may still lack adequate access to multidisciplinary expertise. Interestingly the majority of patients were followed up in vascular surgical outpatient clinics even in centres with MDFU service despite 96% of these offering dedicated outpatient clinics. Whether this is a result of admission practice or a reflection of the lack of specialist availability in the outpatient setting remains unclear. Despite its availability of inpatient MDFU in more than half of the respondents' institution in this survey, only a few of MDFUs had dedicated bed allocations (17.3%). Inpatients with DFD were admitted under various primary admitting specialties, most commonly vascular surgery (63.5%). Similar findings were noted in a retrospective audit of patients admitted with DFD in Royal Melbourne Hospital (25). The benefits of an inpatient MDFU have been

widely shown (26) and it also has been demonstrated that multidisciplinary diabetes foot outpatient clinics lead to a reduction in hospital admissions, mortality and cost (19). Hence the results of this study highlight target areas for improvement of existing models in both, in- and outpatient settings.

Overall, the survey observed heterogeneity in Australian multidisciplinary care models for DFD. This may have been largely attributed to the lack of coordination and a nationally uniform system to accredit MDFUs. Although several recommendations and statements had been published by peak national bodies (16), they often did not contain detailed strategies to achieve these recommendations and outcome measures to monitor the progress. Germany and Belgium have been on the forefront of standardisation for diabetic foot care since early 2000. Both countries set a world-wide standard by introducing stringent criteria to gain national accreditation as Diabetic Foot Centre (27). Since conducting this survey in 2017, there has been strong efforts to improve MDFU models in Australia. Notably, the National Association of Diabetes Centres published the “Interdisciplinary High Risk Foot Services Standards” in 2018 (17). These standards allow certification of ‘Interdisciplinary High Risk Diabetes Foot Centres’ and ‘Interdisciplinary High Risk Diabetes Foot Centres of Excellence’. Selection criteria in comparison to the German and Belgian model are displayed in table 3. It can be expected that the practice is subsequently changing, and the national survey should therefore be repeated in the coming years to monitor and document the progress in delivery of care to patients with DFD.

There are several limitations to this study. Being a survey with voluntary response, the study captured only a quarter of practicing vascular surgeons in Australia. However, average response rates to e-mail questionnaires are approximately 25% to 30% (28), so this survey lies within expected levels. The low response rate may reflect the limited numbers of vascular surgeons with an interest in the management of DFD. However, surveying is still considered a methodology for gaining a snapshot of current clinical practice. Furthermore, there is a potential selection bias by sending out the survey to a single group of specialists. Vascular surgeons were thought to be a representative group as most patients with DFD would be admitted under vascular surgery or require consultation from vascular surgery. For the purpose of surveying, vascular surgeons can be easily identified and contacted via their professional body; the Australian and New Zealand Society of Vascular Surgery.

Conclusion

In Australia, the multidisciplinary model for managing DFD was heterogeneous. There were significant differences in MDFU services between the public and private sectors, as well as between outpatient and inpatient settings. Since conducting the survey, new national standards for interdisciplinary high-risk diabetes foot centres have been introduced. A future survey may provide valuable insights into the effect of these standards on MDFU composition and availability.

List Of Abbreviations

DFD – diabetes-related foot disease, MDFU – multidisciplinary diabetes foot unit, IWGDF – International Working Group on the Diabetic Foot.

Declarations

Ethics approval and consent to participate: This project was conducted as a quality initiative benchmarking current practice against national and international standards and recommendations. All participants were active vascular surgeons and aware of the nature of the project. No real patient information was captured, and all data was non-identifiable. Ethical approval was not required for this survey of health professionals as it was assessed to have no ethical risk according to current recommendations (29).

Consent for publication: not applicable

Availability of data and materials: The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' contributions: All authors designed, contributed to discussion and reviewed/edited the manuscript. JCR designed the overall concept and supervised the project. MG researched the data, UGV wrote the manuscript. All authors read and approved the final manuscript.

Acknowledgements: The authors thank all Vascular Surgeons who participated in the survey.

References

1. World Health Organization. Global report on diabetes Geneva, Switzerland;: World Health Organization; 2016 [Available from: http://apps.who.int/iris/bitstream/10665/204871/1/9789241565257_eng.pdf].
2. Cho NH, Shaw JE, Karuranga S, Huang Y, da Rocha Fernandes JD, Ohlrogge AW, et al. IDF Diabetes Atlas: Global estimates of diabetes prevalence for 2017 and projections for 2045. *Diabetes Res Clin Pract.* 2018;138:271-81.
3. Martins-Mendes D, Monteiro-Soares M, Boyko EJ, Ribeiro M, Barata P, Lima J, et al. The independent contribution of diabetic foot ulcer on lower extremity amputation and mortality risk. *J Diabetes Complications.* 2014;28(5):632-8.
4. Schaper NC, Van Netten JJ, Apelqvist J, Lipsky BA, Bakker K, International Working Group on the Diabetic Foot. Prevention and management of foot problems in diabetes: a Summary Guidance for

- Daily Practice 2015, based on the IWGDF Guidance Documents. *Diabetes Metab Res Rev.* 2016;32:7-15.
5. Reiber G, Boyko E, Smith D. Lower Extremity Foot Ulcers and Amputations. *Diabetes.* 2 ed1995.
 6. Diabetes Foot Australia. Australian diabetes-related foot disease strategy 2018-2022: The first step towards ending avoidable amputations within a generation Brisbane, Australia;2017 [Available from: <https://diabeticfootaustralia.org/wp-content/uploads/National-Strategy-to-end-avoidable-amputations-in-a-generation-final-1.pdf>].
 7. Armstrong DG, Swerdlow MA, Armstrong AA, Conte MS, Padula WV, Bus SA. Five year mortality and direct costs of care for people with diabetic foot complications are comparable to cancer. *J Foot Ankle Res.* 2020;13(1):16.
 8. Huang YY, Lin CW, Yang HM, Hung SY, Chen IW. Survival and associated risk factors in patients with diabetes and amputations caused by infectious foot gangrene. *J Foot Ankle Res.* 2018;4(11):1.
 9. Jupiter DC, Thorud JC, Buckley CJ, Shibuya N. The impact of foot ulceration and amputation on mortality in diabetic patients. I: From ulceration to death, a systematic review. *Int Wound J.* 2016;13(5):892-903.
 10. Bergin SM, Alford JB, Allard BP, Gurr JM, Holland EL, Horsley MW, et al. A limb lost every 3 hours: can Australia reduce amputations in people with diabetes? *Med J Aust.* 2012;197(4):197-8.
 11. Bus SA, Lavery LA, Monteiro-Soares M, Rasmussen A, Raspovic A, Sacco ICN, et al. Guidelines on the prevention of foot ulcers in persons with diabetes (IWGDF 2019 update). *Diabetes Metab Res Rev.* 2020;36 Suppl 1:e3269.
 12. Musuuza J, Sutherland BL, Kurter S, Balasubramanian P, Bartels CM, Brennan MB. A systematic review of multidisciplinary teams to reduce major amputations for patients with diabetic foot ulcers. *J Vasc Surg.* 2020;71(4):1433-46 e3.
 13. National Institute for Health and Care Excellence. *Diabetic Foot Problems: Prevention and Management.* National Institute for Health and Care Excellence: Clinical Guidelines. London, UK;2015.
 14. Khan N, Sapsed S. Diabetes foot complication: assessing primary and secondary outcomes of multidisciplinary team versus standard care (a systematic review). *Int J Diabetes Dev Ctries* 2017;37(2):129-36.
 15. Parker CN, Van Netten JJ, Parker TJ, Jia L, Corcoran H, Garrett M, et al. Differences between national and international guidelines for the management of diabetic foot disease. *Diabetes Metab Res Rev.* 2019;35(2):e3101.
 16. National Health and Medical Research Council. National evidence-based guideline: Prevention, identification, and management of foot complications in diabetes Melbourne, Australia;2011 [Available from: https://extranet.who.int/ncdccs/Data/AUS_D1_National%20Evidence-Based%20Guideline%20-%20Prevention,%20Identification%20and%20Manag....pdf].
 17. National Association of Diabetes Centres. NADC Collaborative Interdisciplinary Diabetes High Risk Foot Services (HRFS) Standards Sydney, Australia;2018 [Available from:

<https://diabetessociety.com.au/documents/HRFS-Standards-FINAL-9.7.18.pdf>.

18. Hughes W, Goodall R, Saliccioli JD, Marshall DC, Davies AH, Shalhoub J. Editor's Choice - Trends in Lower Extremity Amputation Incidence in European Union 15+ Countries 1990-2017. *Eur J Vasc Endovasc Surg.* 2020;60(4):602-12.
19. Joret MO, Osman K, Dean A, Cao C, van der Werf B, Bhamidipaty V. Multidisciplinary clinics reduce treatment costs and improve patient outcomes in diabetic foot disease. *J Vasc Surg.* 2019;70(3):806-14.
20. West M, Chuter V, Munteanu S, Hawke F. Defining the gap: a systematic review of the difference in rates of diabetes-related foot complications in Aboriginal and Torres Strait Islander Australians and non-Indigenous Australians. *J Foot Ankle Res.* 2017;10:48.
21. Secrest AM, Costacou T, Gutelius B, Miller RG, Songer TJ, Orchard TJ. Associations between socioeconomic status and major complications in type 1 diabetes: the Pittsburgh epidemiology of diabetes complication (EDC) Study. *Ann Epidemiol.* 2011;21(5):374-81.
22. Kilicoglu OI, Demirel M, Aktas S. New trends in the orthopaedic management of diabetic foot. *EFORT Open Rev.* 2018;3(5):269-77.
23. Shen W, Wukich D. Orthopaedic surgery and the diabetic Charcot foot. *Med Clin North Am.* 2013;97(5):873-82.
24. Commons RJ, Raby E, Athan E, Bhally H, Chen S, Guy S, et al. Managing diabetic foot infections: a survey of Australasian infectious diseases clinicians. *J Foot Ankle Res.* 2018;11:13.
25. National Association of Diabetes Centres. HRFS Accreditation Sydney, Australia;2020 [Available from: <https://nadc.net.au/hrfs-accreditation/>].
26. Wukich DK, Armstrong DG, Attinger CE, Boulton AJ, Burns PR, Frykberg RG, et al. Inpatient management of diabetic foot disorders: a clinical guide. *Diabetes Care.* 2013;36(9):2862-71.
27. Morbach S, Kersken J, Lobmann R, Nobels F, Doggen K, Van Acker K. The German and Belgian accreditation models for diabetic foot services. *Diabetes Metab Res Rev.* 2016;32 Suppl 1:318-25.
28. Yun GW, Trumbo CW. Comparative response to a survey executed by post, e-mail, & web form. *J Compu-Mediated Com.* 2000;6.
29. Whicher D, Wu AW. Ethics Review of Survey Research: A Mandatory Requirement for Publication? *Patient.* 2015;8(6):477-82.

Tables

Table 1 Characteristics of the survey's respondents

Total respondents (N)		52
State	Australia Capital Territory	2 (3.9%)
	New South Wales	22 (42.3%)
	Northern Territory	0 (0%)
	Queensland	7 (13.5%)
	South Australia	1(1.9%)
	Tasmania	2 (3.9%)
	Victoria	12 (23.1%)
	Western Australia	6 (11.5%)
Primary location of practice	Tertiary metropolitan hospital	35 (67.3%)
	Secondary metropolitan hospital	3 (5.8%)
	Regional/rural hospital	8 (15%)
	Private metropolitan hospital	4 (7.7%)
	Private regional/rural hospital	1 (1.9%)
	Annual DRFD inpatient caseload	<20
	21-50	7 (13.7%)
	51-100	11 (21.6%)
	>100	33 (64.7%)
Annual DRFD outpatient caseload	<20	1 (2%)
	21-50	7 (14%)
	51-100	4 (8%)
	>100	38 (76%)
Values are presented as n (%), unless otherwise indicated.		

Table 2 Availability of and services provided by Multidisciplinary Diabetic Foot Unit

Institution with MDFU	Yes	31 (59.6%)
	No	21 (40.4%)
Admitting team for DFD	Dedicated MDFU	9 (17.3%)
	Vascular Surgery	33 (63.5%)
	Orthopaedic surgery	1 (1.9%)
	Endocrinology	2 (3.9%)
	General medicine	3 (5.8%)
	General Surgery	0 (0%)
	Other	4 (7.7%)
	Services provided by MDFU	Dedicated MDFU ward round
	Dedicated MDFU outpatient clinic	30 (96.8%)
	MDT meeting	17 (54.8%)
Values are presented as n (%), unless otherwise indicated.		
MDFU: multidisciplinary diabetic foot unit, DFD: diabetes-related foot disease.		

Table 3 Comparison of Belgian, German, and Australian accreditation systems (17, 27)

	Belgium	Germany	Australia
Members	Diabetologist, surgeon on call, podiatrist, diabetes nurse, footwear technician	Diabetologist, at least four of the following: orthopaedic surgeon, vascular surgeon, diabetologist, chiropodist, orthotist, shoemaker, microbiologist	The minimum core staffing is: diabetologist, senior podiatrist, and a credentialled diabetes educator. Patients should have access to vascular surgery and orthopaedic surgery services.
Emergency service	Permanent (24/7) availability of a diabetologist on call	24/7 availability of service	N/A
Outpatient clinic	At least 4 hours of consultation per week	N/A	At least one session per week
Dedicated ward round	N/A	N/A	N/A
Evidenced-Based Clinical Management	N/A	Treatment according to guidelines	All members agreed upon treatment guidelines and protocols which are based on published evidence-based best practice guidelines.
Defined intake criteria	N/A	N/A	Evidenced-based intake criteria are clearly defined and articulated to referrers for both urgent and non-urgent referrals.
Coordination	N/A	N/A	A member is appointed as the coordinator to provide overall coordination of the team
Continuity of Care and Communication	Continuity of care during hospitalization Feedback to GPs and home care providers	N/A	Management plans are communicated in a timely manner (within 5 business days) to the referrer and all relevant health professionals involved in the patient's care including the GP.
Quality improvement	Compulsory audit	Compulsory audit	Compulsory audit

Figures

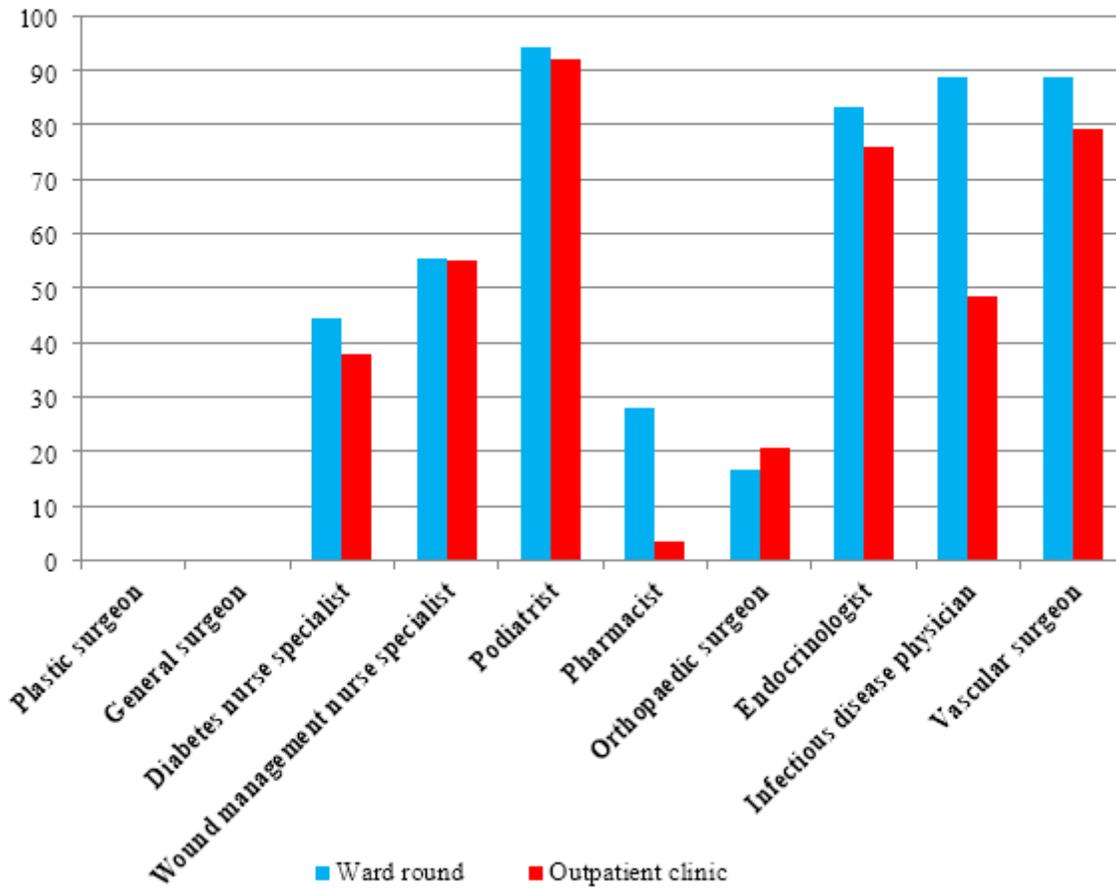
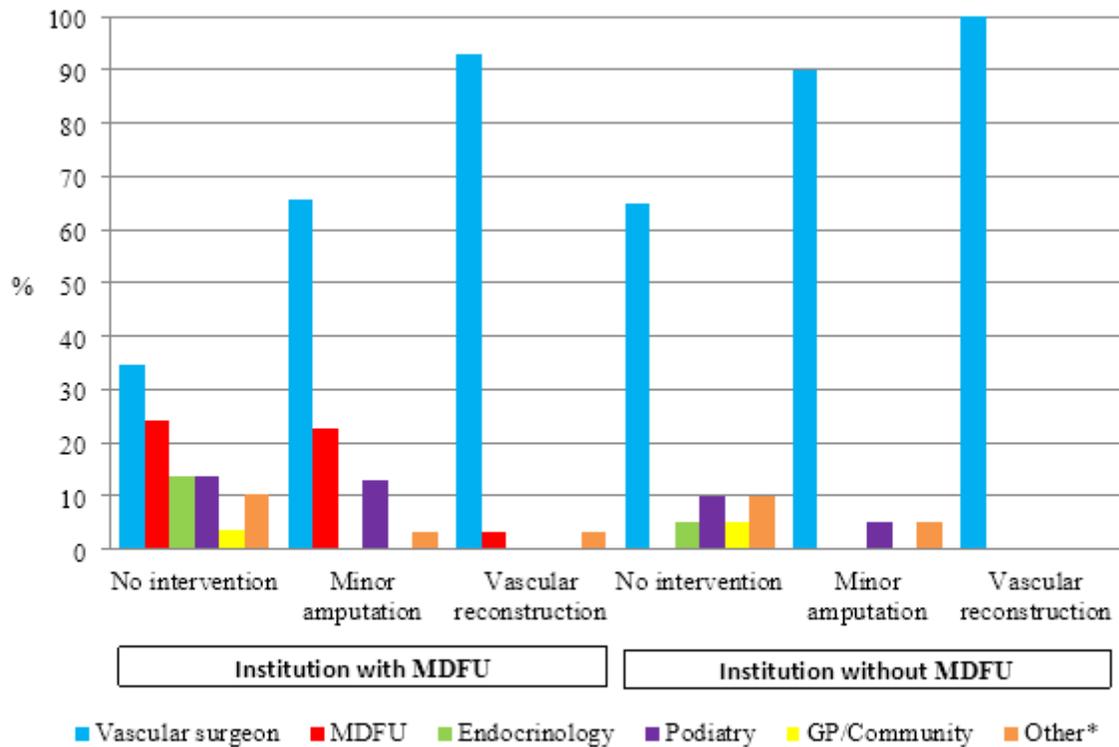


Figure 1

Specialists involved in MDFU ward round and outpatient clinic. (MDFU: Multidisciplinary Diabetes Foot Unit)



*Follow-up service varied depending by primary admitting team.

Figure 2

Specialists responsible for follow-up of DFD patients. (DFD: diabetes-related foot disease, MDFU: Multidisciplinary Diabetes Foot Unit)

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [AdditionalFile1.docx](#)