




## BRIEF COMMUNICATION

## Management of diabetes-related foot disease in the outpatient setting during the COVID-19 pandemic

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### Key words

diabetes-related foot ulcer, COVID-19, outpatient service, hospital, quality improvement.

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### Abstract

The use of telephone and/or video consultation in routine management of acute diabetes-related foot disease (DFD) before the coronavirus disease 2019 (COVID-19) pandemic at a tertiary hospital is unprecedented. In March 2020, the Diabetes Feet Australia (DFA) released a national guideline to inform DFD management during the COVID-19 pandemic. The present study aimed to describe the adherence to the DFA guideline of managing acute DFD using telephone and/or video consultation at a Western Australian tertiary hospital during this period. We found >80% adherence rate to the DFA guideline and the management of active DFD using telephone and/or video consultations was feasible and acceptable in carefully selected patients.

Coronavirus disease 2019 (COVID-19) is a highly infectious disease with symptoms ranging from fever and sore throat to severe respiratory illness.<sup>1</sup> COVID-19 was first confirmed in Australia in late January 2020, and by January 2021 there have been >28 000 reported cases and >900 deaths.<sup>2</sup> The pandemic has led to significant stress on hospital systems worldwide and delays to acute hospital care for people with diabetes and diabetes-related complications.<sup>3,4</sup> People with diabetes are at higher risk of COVID-19 and its complications.<sup>3-5</sup>

It is estimated that 50 000 Australians are currently living with diabetes-related foot disease (DFD) including 12 500 people with diabetes-related amputations.<sup>6</sup> International guidelines recommend that diabetes-related foot ulcer (DFU) management should include regular podiatry care with examination, sharp peri-wound debridement, application of dressings and provision of pressure offloading footwear.<sup>7</sup> Interdisciplinary high-risk foot (IHRF) services are strongly recommended.<sup>7</sup> Delays in DFU care may increase the risk of severe infection, lower extremity amputation and death.<sup>3</sup> Even during the pandemic, timely podiatry and IHRF services should be maintained for this vulnerable group.

Fiona Stanley Hospital (FSH) is a tertiary teaching hospital in Western Australia (WA). The podiatry and multidisciplinary diabetes foot ulcer (MDFU) teams provide

comprehensive IHRF care to patients with active DFU and other high-risk foot conditions. In March 2020, the WA Department of Health advised clinical services to institute physical distancing in response to the COVID-19 pandemic and, when clinically appropriate, telephone and/or video consultations for outpatient consultations were recommended. To provide a consistent national voice, the Diabetes Feet Australia (DFA) COVID-19 guideline (published in March 2020) recommended that patients with an active DFU should continue to attend consultations in person, but that telephone and/or video consultations could be provided for patients without active DFU, stable DFU or where the clinician deemed suitable.<sup>6</sup>

To align with both WA Department of Health and DFA recommendations, podiatry and MDFU outpatient services commenced telephone consultations in late March 2020 for selected patients. Although consultations through telephone and video are not uncommon in healthcare, they are not routinely used in acute DFD management due to the importance of clinical

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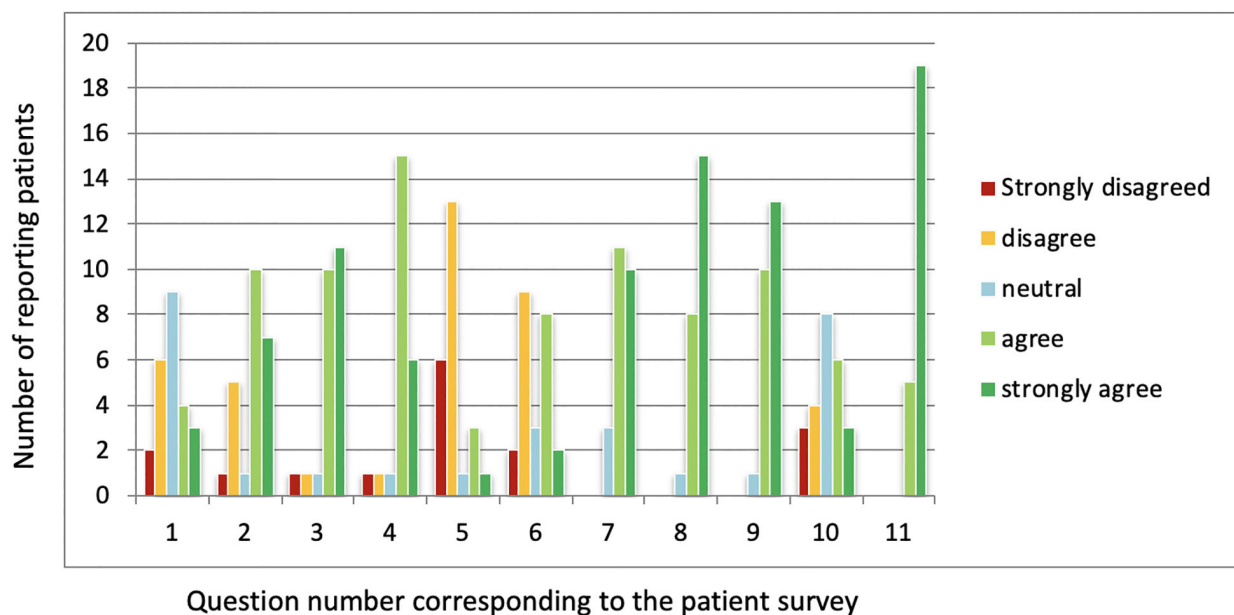
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assessment. Therefore, we aimed to report our experience in adhering to the DFA recommendations in an outpatient setting and the feasibility of telephone consultations for patients with acute DFD as well as patient willingness to attend appointments during a pandemic which would be beneficial for future service planning.

The FSH MDFU service is a National Association of Diabetes Centres accredited IHRF Centre of Excellence comprised of a multidisciplinary inpatient service and outpatient clinic division. Typically, patients with active DFU or Charcot neuroarthropathy attend the MDFU clinic every 2–8 weeks depending on the clinical need. During the pandemic, patients attending the MDFU clinic with healed or nearly healed DFU were converted to telephone appointments. In addition, due to within-state travel restrictions, most rural patients were converted to video consultation. All patients had the option subsequently to attend in person if required.

The FSH Podiatry service operates within a multidisciplinary team in the treatment of complex foot issues with an emphasis on DFD management and amputation prevention. Ordinarily, patients attend the podiatry clinics every 1–4 weeks, depending on the clinical need. The COVID-19 pandemic resulted in a sudden change to the delivery of podiatric services at FSH. Patients with a healed ulcer were converted to a telephone consultation. Patients with an active DFU had the frequency of face-to-face appointments reduced with a telephone consultation between occasions-of-service. As podiatry care has substantial procedural elements, the option to attend clinics was maintained if necessary. In addition, some patients with active DFU requested telephone consultations to minimise COVID-19 exposure.

Hospital records were reviewed and data were recorded detailing podiatry and MDFU outpatient services including consultation types, attendances, DFD risk



Patient survey and corresponding questions to the chart:

1. I am anxious about my foot ulcer all the time.
2. I can look after my foot ulcer during COVID-19.
3. I can recognise signs of infection on my foot ulcer.
4. I need to attend podiatry in person for my foot ulcer during COVID-19 pandemic.
5. I worry my foot ulcer management will be delayed at the hospital during COVID-19.
6. I feel telephone consultations work as well as attending in person when it comes to management of my foot ulcer.
7. I have no difficulties contacting podiatry if issues arise with my foot ulcer.
8. I am happy to attend appointment in person at Fiona Stanley Hospital for my foot ulcer during COVID-19.
9. If COVID-19 situations become worse in Western Australia, I am still happy to attend appointment in person at Fiona Stanley Hospital for my foot ulcer.
10. My foot ulcer is getting better during COVID-19 because I have walked less.
11. The level of podiatry care from Fiona Stanley Hospital for my foot ulcer meets my expectation during COVID-19.

**Figure 1** Patient survey regarding living with a diabetes-related foot ulcer during the COVID-19 pandemic.

**Table 1** Attendance at MDFU and podiatry clinics† categorised by appointment type and DFA risk category¶

	Appointment type received		
	Telephone/telehealth only‡	Combination of telephone/ video and face-to-face	Face-to-face only
23 March 2019 to 23 June 2019			
Number of MDFU outpatients, <i>n</i> (%)	0	11 (100)	142 (34.8)
Number of podiatry outpatients, <i>n</i> (%)§	0	0	266 (65.2)
Total	0	11	408
23 March 2020 to 23 June 2020			
Number of MDFU outpatients DFA category, <i>n</i> (%)			
Critical	6 (15.8)	5 (33.3)	30 (28.8)
Highly serious	4 (10.5)	4 (26.7)	62 (59.6)
Serious	17 (44.7)	6 (40)	0
Stable	11 (28.9)	0	12 (11.6)
Total	38	15	104
Number of podiatry outpatients in DFA category, <i>n</i> (%)			
Critical	0	2 (3.1)	45 (22.2)
Highly serious	0	17 (26.6)	45 (22.2)
Serious	8 (16)	21 (32.8)	78 (38.4)
Stable	42 (84)	24 (37.5)	35 (17.2)
Total	50	64	203
23 June to 23 September 2020			
MDFU outcome, <i>n</i> (%)††			
Healed ulcer or amputation wound	9 (23.7)	0	13 (12.5)
Persistent ulcer/amputation wound	25 (65.8)	14 (93.3)	79 (76.0)
Minor amputation	0	1 (6.7)	2 (1.9)
Major amputation	0	0	4 (3.8)
Healed or stable Charcot	2 (5.3)	0	4 (3.8)
Death	2 (5.3)	0	2 (1.9)
Total	38	15	104
Podiatry outcome, <i>n</i> (%)††			
Healed ulcer or amputation wound	33 (31.4)	15 (14.3)	57 (54.3)
Persistent ulcer/amputation wound	11 (5.98)	37 (20.1)	136 (73.9)
Minor amputation	1 (33.3)	2 (66.7)	0
Major amputation	0	1 (25)	3 (75)
Healed or stable Charcot	1 (6.25)	6 (37.5)	9 (56.25)
Death	1 (20)	1 (20)	3 (60)
Total	47	62	208
Number of patients with acute hospital admissions for DFD for the entire patient cohort, <i>n</i> (%)			
23 March to 23 June 2020	6 (50)	5 (55.6)	30 (55.6)
23 June to 23 September 2020	6 (50)	4 (44.4)	24 (44.4)
Total	12	9	54

†Multidisciplinary foot ulcer and podiatry clinics at Fiona Stanley Hospital only offer services to patients with 'high-risk' foot status.

‡All patients who had telephone/telehealth-only consultations were carefully selected and screened. Telehealth consultations are common for patients who live in regional and remote WA. Telehealth consultations were needed during COVID-19 pandemic for patients living in regional and remote WA due to within-state travel restrictions.

§Podiatry did not offer telephone/telehealth-only consultations prior to the COVID-19 pandemic.

¶The risk categories in this table refer to the Australian Clinical Triage Guide for people with DFD during the COVID-19 pandemic by the DFA, first published in March 2020.

††MDFU and podiatry outcomes were the patient outcomes from the last clinic attendance that occurred during the 3-month follow-up time period. COVID-19, coronavirus disease 2019; DFA, Diabetes Feet Australia; DFD, diabetes-related foot disease; MDFU, multidisciplinary diabetes foot ulcer; WA, Western Australia.

categories and hospital admission associated with DFD between 23 March and 23 September 2020. Patients who did not attend any podiatry or MDFU outpatient

appointments during the initial 3 months study period were excluded. Patients who had a podiatry or MDFU telephone consultation during the initial 3 months study

period were invited to participate in a survey at a subsequent face-to-face podiatry or MDFU consultation. Informed consent was obtained prior to survey participation. The survey (Fig. 1) included 11 questions and utilised a standardised 5-point Likert scale. To compare the frequency of the usage of telephone/telehealth consultations, data on consultation type from a similar period in 2019 were extracted through outpatient business management system. The South Metropolitan Health Service Human Research Ethics Committee (Reference: 15-037-1) and quality improvement approval was obtained (No. 35091) for this project.

During the first 3 months of the study period, podiatry outpatient service was provided to 317 patients. As outlined in Table 1, 114 (36.0%) podiatry patients received at least one telephone consultation. Of these, 50 (15.8%) received telephone consultations only, while 64 (20.2%) received a combination of consultation type. The remainder (203; 64.0%) continued to attend podiatry services in person only. Podiatry telephone/telehealth-only consultations were offered to patients within serious and stable DFA categories. During the second half of the study period, one patient who received purely podiatry telephone/telehealth consultation had a minor amputation.

MDFU outpatient consultations were delivered to 157 patients, most (144; 91.7%) were in serious, highly serious and critical DFA categories. Thirty-eight (24.2%) patients received purely telephone/telehealth consultations, while 15 (9.6%) and 104 (66.2%) had a combination or face-to-face appointments only, respectively. During the second half of the study period, 118 (75.2%) patients had a persistent ulcer/amputation wound and there were no reported amputations in patients who received purely MDFU telephone/telehealth consultations.

During the initial pandemic period (23 March to 23 June 2020), hospitalisation for acute DFD was required for 41 patients who had at least one appointment with either the Podiatry or MDFU clinics at FSH. Six (14.6%) of these received telephone-only consultations during the study period, but on two of these occasions, the initial telephone consultation revealed acute DFD infection and urgent hospitalisation was subsequently arranged with our MDFU inpatient unit. Immediately after the initial 3-months study period, among the same cohort of patients, there were 34 hospitalisations due to DFD including six (17.6%) patients who received purely telephone/telehealth consultations. Over 70% of hospitalisations in our cohort occurred in patients seen face-to-face only, with relatively few hospitalisations amongst those who had telephone consultations alone. This provides some initial reassurance that patients with DFD managed by telephone consultation, who were appropriately stratified for risk category, did not appear to be over-represented

amongst patients requiring hospitalisation for acute DFD complications.

Out of 64 podiatry patients who received a combination of consultation type, 24 (37.5%) completed the survey (Fig. 1). Four patients were worried that services would be delayed due to COVID-19. All patients who completed the survey were satisfied with the FSH Podiatry service during COVID-19. Our survey findings indicated that the majority of patients with DFU believed they could recognise signs of infection and would contact FSH Podiatry Department for review when needed. Most people living with DFU were willing to attend podiatry and MDFU services in person during the COVID-19 pandemic and were still willing to attend in person if the COVID-19 restrictions intensified. Patients felt that telephone consultations were effective; however, they preferred to attend face-to-face consultations.

## Discussion

Podiatry and MDFU services at FSH achieved >80% adherence rate to the DFA recommendations in managing high-risk DFD in the outpatient setting during the pandemic. More than 80% of patients with active DFU continued to attend in-person consultations where possible, and those with stable DFD were offered telephone consultations. Due to intrastate travel restrictions in WA, people who lived in rural and remote areas were offered telephone/telehealth services regardless of their DFD category. However, access to immediate medical attention and inpatient care for highly serious and critical DFD complications was maintained. Patients were willing to attend in-person consultations for DFD where clinically appropriate and were satisfied with the podiatric care received during the COVID-19 pandemic.

FSH MDFU and Podiatry services provided consultations to similar numbers of patients during the initial 3 months of the study period in 2020 compared with 2019 (Table 1). There was a fivefold increase in the usage of MDFU telephone/telehealth consultations in 2020. To our knowledge, this is the first account of DFD management during the pandemic in an Australian setting. There are few international studies with which to compare our data. A report detailing experiences from IHRF service in Manchester and Los Angeles demonstrated a marked increase in the use of telecare consultations for DFU in response to COVID-19 lockdowns at both sites, with greater reductions for in-person clinic visits than reported here; this difference is likely due to the lower impact of COVID-19 to healthcare systems in WA compared with the UK and United States.<sup>8</sup>

Several other studies have reported different responses for managing DFU during COVID-19. A COVID-19

screening protocol for people with DFU requiring hospitalisation, postponement of elective surgeries, effective care plan communication and ongoing management of people with DFU by IHRF services was reported from China.<sup>3</sup> Similar strategies have been adopted in the United States, Turkey and India.<sup>4,9,10</sup> A multidisciplinary team in Zhejiang, China, developed an internet-based programme to manage people with DFU which included regular instant messaging and remote consultations.<sup>11</sup> A report from Italy, from a region which experienced severe impacts from COVID-19, including strict lockdown and significant interruption to outpatient services, described a marked increase in gangrene and amputations amongst patients hospitalised for DFU, highlighting the risk to patients with DFU from interruptions to usual podiatry and IHRF care.<sup>5</sup>

The present study has several limitations. WA did not experience a long period of lockdown due to COVID-19; therefore, it is possible that the results may not be generalisable to regions where COVID-19 has had a larger impact on patients and health systems. There is potential reporting bias of the patient surveys as they were conducted in person at the podiatry outpatient clinic which may have also influenced reporting on their willingness to attend clinic. In addition, this study did not include a control group.

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Podiatry and MDFU services at FSH adhered to both local and national COVID-19 guidelines in managing DFD in the outpatient setting during the COVID-19 pandemic. Telephone/video consultations were utilised to reduce contact in the hospital for patients with stable DFD where possible. Patients managed through telephone were not over-represented amongst patients hospitalised for DFU, suggesting that adverse events were uncommon in selected patients with telephone management of DFU. Patients were willing to attend podiatry services in person for DFU management during COVID-19 and were highly satisfied with the level of care provided by FSH podiatry and MDFU teams. We have found DFA COVID-19 DFD management guidelines to be achievable and acceptable to our patient group. Ongoing management of DFD using telephone/telehealth consultations is likely to be a safe option in carefully selected patients; however, further investigation is required.

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