

An evaluation of community-based resources for management of diabetes-related foot disorders in an Australian population

Shan M Bergin, Caroline A Brand, Peter G Colman and Don A Campbell

Abstract

We aimed to evaluate service model configuration, service capacity and accessibility of diabetes-related footcare in an Australian community health setting. Eighty-eight community-based podiatry clinics were surveyed using the self-administered Footcare Provider Survey. Survey domains included communication, resources, service coordination and barriers to service provision. Sixty-nine from a possible 88 Victorian community podiatry clinics (78%) responded. Sixty-one (88%) provided ongoing care to individuals with diabetes-related foot disorders. Communication with vascular and orthopaedic specialists was reported to be readily available in 37% and 27% of cases respectively. Overall, communication with general practitioners was deemed readily available in 62% of cases. Just 39% of podiatrists statewide agreed overall resources were sufficient, with 26% agreeing staffing levels were adequate. Thirty-nine percent of community podiatrists used clinical care pathways, and onsite collaboration was deemed appropriate in just 30% of cases. Perceived barriers to provision of care included inadequate staffing and resources, lack of confidence from other health professionals in the podiatrists' ability to manage diabetes-related foot disorders, and lack of access to specialists.

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DIABETES-RELATED FOOT DISORDERS (DRFD) encompass a range of pathologies that are largely chronic in nature.^{1–3} While these pathologies may at times require hospital-based management, a significant proportion of those affected will be cared for in the community. Well defined, evidence-based clinical practice guidelines applicable to the Australian setting are available to guide clinical care of diabetes-related foot disease.^{4,5}

What is known about the topic?

Community-based care is important for individuals with diabetes-related foot disorders.

What does this paper add?

This study outlines a substantial lack of services and limited communication among providers, which have the potential to have a negative impact on clinical outcomes.

What are the implications for practitioners?

Current service configuration and resourcing of community-based health services for individuals with diabetes-related foot disorders may be inadequate to ensure provision of evidence-based recommendations for clinical care.

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Implementation of such guidelines within best practice models of care has demonstrated improved health outcomes for people with DRFD.⁵⁻¹⁰ Incorporated within successful service models is access to a multidisciplinary team comprising medical and allied health professionals with expertise in management of DRFD.⁶⁻⁸ The ideal constitution of multidisciplinary teams would include medical (endocrinology or general) and surgical (orthopaedic and vascular) specialities, podiatry, nutrition, diabetes education, prosthetics and orthotics and psychology, according to assessed need for each individual.⁶⁻¹⁰ While most of the professional specialties that comprise the desired multidisciplinary team can be found in the acute care setting, many have no links to the community health sector.

The overall impact of diabetes is widely documented in relation to Australian populations, however there are little local data pertaining to DRFD in any context. It is therefore unclear whether the current configuration of community-based care in Victoria affords individual community health centres the capacity to provide evidence-based diabetes-related footcare.

The aim of this study was to map service model configuration and service capacity, using the Footcare Provider Survey (FPS) in order to inform future health services planning and policy development and to assist with long-term management of DRFD. In particular, we aimed to assess access to, and ease of communication between, specialist medical and paramedical professionals and community-based podiatrists. The survey also assessed resource capacity, service coordination and perceived barriers to the provision of best practice care.

Methods

Ethics approval was granted by the Melbourne Health Human Research Ethics Committee, and the Monash University Standing Committee on Ethics in Research Involving Humans.

Participant population

As an integral part of the health care team required to effectively manage DRFD within the

community, podiatrists from Victorian community health centres (CHCs) were targeted with this review. Victorian CHCs were identified using the Department of Human Services, Victoria (DHSV) public and community health directories. "Ongoing podiatry services" were defined as the long-term availability of clinical podiatry care that included one or more of the following; routine foot care, wound management, pressure redistribution and orthotic therapy. These services may provide concurrent education and/or footwear assessment.

Availability of podiatry services at individual CHCs was established using information available on the DHSV services directory and individual CHC websites. Where the availability of podiatry services was unclear, individual centres were contacted by telephone and service provision confirmed. The eight CHCs that did not provide ongoing clinical podiatry care were excluded.

Survey instrument

The FPS is a modified version of the previously validated Foot Systems Assessment Tool (FootSAT) which has proven reliable when adapted to different health care settings.¹¹ The FootSAT was modified for this study to make it applicable to the Australian health care context.

The FPS covers three domains — communication, resources, and service coordination. Each of these domains is assessed using a series of closed questions scored on a 5-point Likert scale. The survey aims to establish the ease with which local podiatrists can communicate with specialist health care professionals regarding management of individuals with DRFD. Communication pertains to contact with any member of the multidisciplinary team (medical, surgical or allied health) and may be in the form of a telephone call to discuss patient care, written communication or opportunities for joint consultation. The survey also evaluates perceived suitability and availability of current resources for management of DRFD within the community setting, particularly in terms of staff numbers and availability of costly modalities such as wound dressings. Level of care coordination within each CHC is also appraised, with podiatry

staff asked to comment on such things as use of clinical care guidelines within their clinical setting. Words and phrases such as “expert” and “high risk feet” were defined for the purposes of the study. The final section of the survey instrument used open-ended questions to ascertain perceived barriers to provision of care for this patient group within the community. Funding sources and number of staff were also collected for each site. Face and content validity of the modified survey instrument were established using a panel of experts with recognised expertise in podiatry, DRFD, community health management, general practice and health education.

Dissemination

The FPS was mailed to all community-based podiatry departments. One podiatrist from each site was asked to complete the survey and return it within the allotted timeframe in the reply-paid envelope provided. Non-respondents were sent a follow-up survey with a maximum of three surveys issued per site.

Analysis

Survey data were analysed using Stata, version 9 (StataCorp, College Station, Tex, USA) and reported as descriptive summaries of overall survey responses. Significance of discrepancies between metropolitan and rural/regional survey responses was calculated using χ^2 and reported as *P* values (with significance set at 0.05) and odds ratios. Confidence intervals were set at 95%.

Results

Eighty-eight CHCs were identified statewide. Of these, 32 CHCs were located in metropolitan Melbourne and 56 CHCs in rural or regional areas of Victoria. Sixty-nine responses were received (78.4%); 45 were from rural and regional areas (response rate, 80%) and 24 from metropolitan Melbourne (response rate, 75%).

Access and funding

Of the 69 respondents, 61 (88%) provided ongoing podiatry care to individuals with diabetes

while 8 (11.6%) reported that they provided no clinical podiatry care to this patient group. Of those who reportedly did not provide ongoing care, seven were rural or regional services and one was metropolitan. Of the 61 who did provide clinical care, 6 (10%) utilised the services of private podiatrists who were contracted to provide community-based care. All six services were located at rural sites. Contracted podiatrists attended at varying intervals ranging from one day per week to one day per month. Outside of these scheduled visits no podiatry was available at these six sites. Of the eight responding CHCs providing no ongoing clinical care, seven provide no podiatry services at all; six of these were rural or regional services and one was in metropolitan Melbourne.

Seven of the 69 respondents reported having funding for additional podiatry staff, however they had been unsuccessful in attracting staff to these positions. Total podiatry EFT for the responding CHCs was 101.21, with 54.2 located in metropolitan Melbourne and 47.0 in rural and regional Victoria. Results for respondent CHCs have been grouped as statewide, metropolitan Melbourne and rural or regional Victoria.

Communication

On a statewide basis, specialist medical and surgical health care professions were reported as the least available for patient-based communication with community podiatrists. Vascular and orthopaedic surgeons and endocrinologists were reported as “never available” by 22 (37%), 16 (27%) and 18 (29%) podiatrists, respectively. In contrast, those health professionals traditionally employed in the community setting were reported as more readily available for communication. Diabetes educators were reported as being “readily available” by 48 community podiatrists (79%) while dietitians were deemed “readily available” by 50 podiatrists (82%). Interestingly, only 37 community-based podiatrists (62%) reported that general practitioners were “readily available” to them to discuss patient care.

Availability of some health care professions differed significantly when comparing rural and

regional areas to metropolitan Melbourne. While 27 rural/regional community podiatrists (71%) reported general practitioners were “readily available” for patient-based communication, only 10 metropolitan podiatrists (45%) reported the same level of general practitioner availability ($P=0.049$; OR, 2.95; 95% CI, 1.00–8.7). Other podiatrists were “readily available” for communication according to 15 metropolitan community podiatrists (65%), compared with just 11 rural and regional podiatrists (29%) ($P=0.005$; OR, 0.22; 95% CI, 0.07–65). Ready availability of specialist medical and surgical professionals (endocrinology, vascular and orthopaedic surgery) was reported by less than 11% of community podiatrists in rural and regional areas, with only a minimal increase in availability reported within metropolitan areas.

Resources

Overall resources for management of DRFD in the community, were reported to be adequate by just 24 podiatrists statewide (39%) (Box 1). With regard to staffing levels, only 15 community podiatrists overall (26%) agreed there was adequate staff to provide clinical care to those with DRFD. Seven rural and regional podiatrists (18%) agreed staffing levels were adequate compared with eight (35%) from metropolitan Melbourne ($P=0.153$; OR, 0.42; 95% CI, 0.13–36) (Box 2). For the state as a whole, 32 CHC podiatrists (52%) agreed with the perception that current staff had adequate clinical expertise to appropriately manage DRFD and 19 (31%) strongly agreed. These findings were consistent across geographical regions, with 13 metropolitan community podiatrists (56%) agreeing that the level of clinical expertise was adequate and 19 (50%) within rural and regional areas in agreement. Perceived expertise in the area of wound management was reported as being adequate by 25 podiatrists (41%) statewide, with 18 (29%) strongly agreeing this was the case. Within the metropolitan area, 10 podiatrists (43%) agreed with the perception that there was sufficient expertise in the area of wound management within their centre, with 15 (39%) of outer

metropolitan staff also in agreement. However, 5 urban community podiatrists (22%) and 11 rural and regional podiatrists (29%) indicated they neither agreed nor disagreed with the statement regarding levels of expertise in wound management at their CHC.

Service coordination

Just 24 community podiatrists (39%) statewide reported using clinical care pathways or guidelines to direct clinical care at their CHC (Box 3 and Box 4). Similarly, only 18 podiatrists surveyed (30%) agreed that all onsite health care professionals involved in the care of their high-risk patients worked well together and communicated openly. Patient referral was also an issue with just 19 (31%) of all community podiatrists across the state reporting they have no difficulty referring individuals with DRFD to other facilities for clinical care when required. There was no difference between metropolitan and rural and regional areas in terms of ease of referral, with almost half reporting this is problematic in both regions.

Barriers

Perceived barriers to the provision of adequate and appropriate clinical care to individuals with DRFD were reported consistently across both metropolitan Melbourne and rural and regional areas. Forty-six CHC podiatrists (75%) claimed staffing levels and/or resources were inadequate. Forty-five (74%) also claimed that the provision of footcare to individuals with DRFD compromised availability of care for those without diabetes, thus disadvantaging other members of the community. Other common barriers identified included an inability to attract staff to available positions, particularly in rural and regional areas, a lack of confidence in the ability of the podiatrist to manage DRFD and lack of access to specialists, particularly in outer metropolitan areas.

Discussion

Many patients with DRFD require ongoing community-based care. The findings of this survey of Victorian community-based podiatry services

I Resources — statewide

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Adequate staff to provide clinical care	16.39%	44.26%	9.84%	25.59%	4.92%
Adequate expertise in management of DRFD	0	3.28%	13.11%	52.46%	31.15%
Adequate expertise in wound care	0	3.28%	26.23%	40.98%	39.51%
Adequate and appropriate clinic space	6.56%	21.31%	14.75%	39.34%	16.39%
Waiting time for high-risk foot care too long	11.48%	29.51%	16.39%	29.51%	11.48%
Adequate resources to provide care as required	9.84%	31.15%	16.39%	39.34%	3.28%
Adequate provision of orthopaedic footwear	19.67%	36.07%	18.03%	22.95%	3.28%
Adequate provision of orthotic devices	9.84%	18.03%	18.03%	47.54%	6.56%
Appropriate equipment/supplies are available	1.64%	13.11%	19.67%	45.9%	19.67%
Appropriate wound dressings are available	1.64%	4.92%	16.39%	49.18%	27.87%
Medical support is readily available	8.2%	18.03%	24.59%	32.79%	16.39%

DRFD = diabetes-related foot disorders. Respondents were asked to indicate their level of agreement with a series of statements regarding resources required to provide certain aspects of patient care.

2 Resources — metropolitan Melbourne v rural and regional Victoria*

	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly Agree	
	M	R/R	M	R/R	M	R/R	M	R/R	M	R/R
Adequate staff to provide clinical care	8.7	21	39.1	47.3	13	7.9	34.8	18.4	4.3	5.2
Adequate expertise in management of DRFD	0	0	0	5.2	8.7	15.8	56.5	50.0	34.8	28.9
Adequate expertise in wound care	0	0	0	5.2	21.7	28.9	43.5	39.47	34.8	26.3
Adequate and appropriate clinic space	4.3	7.9	34.8	13.1	17.4	13.1	34.8	42.1	8.7	21.0
Waiting time for high-risk foot care too long	17.4	7.9	34.8	26.3	17.4	15.8	13.0	39.47	13.0	10.5
Adequate resources to provide care required	8.7	10.5	21.7	36.8	17.4	15.8	47.8	34.2	4.3	2.6
Adequate provision of orthopaedic footwear	8.7	26.3	43.5	31.6	13.0	21.0	34.8	15.8	0	5.2
Adequate provision of orthotic devices	4.3	13.1	21.7	15.8	17.4	18.4	52.1	44.7	4.3	7.9
Appropriate equipment/supplies are available	0	2.6	17.4	10.5	17.4	21.0	56.5	39.47	8.7	26.3
Appropriate wound dressings are available	0	2.6	8.7	2.6	17.4	15.8	60.9	42.1	13.0	36.8
Medical support is readily available	17.4	2.6	17.4	18.4	17.4	28.9	30.4	34.2	17.4	15.8

DRFD = diabetes-related foot disorders. M = metropolitan Melbourne. R/R = rural and regional Victoria. * All responses are reported as percentages.

would suggest that appropriate, community-based clinical care, specific to individuals with diabetes and foot complications, is not readily available in Victoria. Community-based health care professionals providing footcare to this patient group appear isolated from other profes-

sionals across health care settings, effectively excluding them from the preferred multi-disciplinary care setting. The findings also suggest that community-based resources, including appropriately skilled staff, are not sufficient to provide effective, evidence-based clinical care.

3 Service coordination — statewide*

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Our centre uses clinical guidelines and pathways	0	24.59	13.11	39.34	22.95
There is good agreement regarding management of DRFD onsite	1.64	19.67	24.59	44.26	9.84
There is good agreement regarding wound care onsite	3.28	24.59	21.31	47.54	3.28
Other care providers identify DRFD and refer to us promptly	1.64	29.51	26.23	36.07	4.92
It is easy to refer clients to other facilities for treatment of DRFD	4.92	37.7	22.95	31.15	3.28
It is easy to refer clients with complicated ulcers to other facilities	9.84	29.51	22.95	32.79	4.92
Clients with DRFD and complications can be seen within 24 h	16.39	37.7	9.84	31.15	4.92
All care providers work well together and communicate openly	1.64	21.31	37.7	29.51	9.84
All care providers treating ulcers communicate openly	3.28	24.59	31.15	34.43	6.56

DRFD = diabetes-related foot disorders. Podiatrists were asked to indicate their level of agreement with a series of statements relating to care coordination. * All responses are reported as percentages.

4 Service coordination — metropolitan Melbourne v rural and regional Victoria*

	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree	
	M	R/R	M	R/R	M	R/R	M	R/R	M	R/R
Our centre uses clinical guidelines and pathways	0	0	13.0	31.5	13.0	13.1	43.5	36.8	30.4	18.4
There is good agreement regarding management onsite	4.3	0	4.3	28.9	17.4	28.9	56.5	36.8	17.4	5.2
There is good agreement regarding wound care onsite	8.7	0	4.3	36.8	13.0	26.3	65.2	36.8	8.7	0
Other care providers quickly identify DRFD and refer	0	2.6	22.7	34.2	27.2	26.3	40.9	34.2	9.0	2.6
It is easy to refer clients to other facilities for treatment	0	7.9	39.1	36.8	17.4	26.3	43.5	23.6	0	5.2
It is easy to refer clients with ulcers to others for care	0	15.8	30.4	28.9	22.7	23.6	47.8	23.6	0	7.9
Clients with complications can be seen in 24 h	13.0	18.4	22.7	47.3	13.0	7.9	47.8	21.0	4.3	5.2
All care providers work/communicate well together	0	2.6	30.4	15.8	27.2	44.7	30.4	28.9	13.0	7.9
All care providers treating ulcers communicate openly	4.3	2.6	27.2	23.6	27.2	34.2	34.8	34.2	4.3	5.2

DRFD = diabetes-related foot disorders. M = Metropolitan Melbourne. R/R = Rural and regional Victoria. * All responses are reported as percentages.

The apparent lack of communication across acute and community-based health care settings must ultimately impact on the clinical care continuum and would imply that the consistency and quality of care provided would be greatly affected. Indeed, a 2003 American study conducted by Wrobel and associates, who developed and first utilised the FootSAT survey tool, found those centres that scored lowest in the areas of program coordination and staff commu-

nication demonstrated higher amputation rates among their patients with diabetes.¹¹ Issues with communication would be expected to impact to a greater degree on those podiatrists providing contracted services on a weekly to monthly basis. Intermittent service provision such as this would make it difficult for the podiatrist to attend team meetings, follow up on particular cases and be readily available for communication regarding patient care from either within

their own organisation or from other organisations.

While it is acknowledged that permanent placement of specialist medical personnel within community-based services is both impractical and financially non-viable, greater integration of patient care across health care spectrums is undoubtedly achievable and is essential if quality care is to be made available to those accessing community-based health care.

The FPS results for “Resources” and “Service Coordination” are no more encouraging and depict a service model that lacks appropriately skilled staff in sufficient numbers and therefore struggles to provide appropriate diabetes-related footcare. Only one-quarter of all podiatrists surveyed believed their health centre had sufficient staff to provide clinical care to patients with diabetes, and less than 50% agreed that required equipment and supplies were available as required.

Accessibility to podiatry care for individuals with diabetes has been enhanced somewhat by the introduction of the Medicare Enhanced Primary Care (EPC) initiative. This program, coordinated via the individual's general practitioner, allows for the cost of five private podiatry visits per year to be redeemable through Medicare. While this scheme will, in theory, improve accessibility to podiatry care for those with diabetes, the overall impact this has had on public podiatry services has yet to be evaluated. Other issues also surround Medicare EPC, including the limitation applied to the number of podiatry visits provided for under the scheme. For those individuals requiring care for chronic wounds, five visits would be insufficient given the long-term requirement for weekly review, debridement and redressing.

Of particular concern is the low numbers of podiatrists (39%) using clinical guidelines or pathways to manage their clients with diabetes, particularly in rural/regional areas (37%) where professional isolation is reportedly greater. While service configuration can be improved, there may be additional reasons for poor uptake of clinical guidelines and pathways.¹² Clinicians may be unaware of the existence of guidelines, or may not be oriented towards their use.^{13,14} Podiatrists may

not be familiar with the use of clinical guidelines as these have not traditionally been incorporated into undergraduate training in Australia.

Lack of use of clinical guidelines combined with the high number of respondents who were non-committal in the areas of wound management expertise, level of agreement among involved health care staff, and ease of referral may also indicate a lack of clarity as to what is required to effectively manage this group of complications.

The problems identified here appear to be inherent across many health systems worldwide, including those providing community-based foot care. Winocour et al utilised a self-administered survey in order to collect data regarding the provision of diabetes-related footcare from within 238 National Health Service Trusts in the United Kingdom.¹⁵ The survey found that a coordinated team approach to footcare was applied in less than 50% of centres and clear regional differences in service availability could be identified. The study also determined that bids for improvements to existing services were rare and the success rate of such bids was extremely low.

Research published by Chin et al identified low rates of appropriate diabetes care in 70 CHCs across America's midwest.¹⁶ Following a review of 2865 patient records, Chin et al reported that the provision of footcare appropriate to diabetes status occurred in just 51% of cases and overall diabetes care fell short of the American Diabetes Association recommended standards. Although 18 Victorian CHCs did not complete a survey, we feel that with 75% of metropolitan and 80% of rural and regional centres responding, our findings are generalisable across those community services that did not participate. We also acknowledge the pitfalls in using self-administered surveys and the impact this method may have on outcomes. Individual interpretation of questions and phrases is unavoidable as is the difficulty individuals have in being openly critical of their own performance as well as that of their place of employment. A further possible confounder is the years of experience or seniority of the podiatrist who completed the survey.

Our survey findings reveal glaring discrepancies in both availability of services and effective communication between service providers across health care settings. These findings have profound implications for policy development, if appropriate services are to be made available in the community setting. Availability of such services has the potential to reduce reliance on the acute health care system, improve overall quality of care and, importantly, reduce the amputation rate among those with DRFD. The role of each health care setting must be defined in terms of its obligations to this patient group and a seamless and collaborative model of care established within and across all settings. Also essential is a greater integration of the provision of health care to those living outside major urban cities into the overall health system. Greater effort is required to move towards a system that is based upon proven methods for maximising patient outcomes and that functions well within the community health care setting.

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Competing interests

The authors declare that they have no competing interests.

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