Pathway to ending avoidable diabetes-related amputations in Australia

A new Australian strategy should finally reduce the significant national burden of diabetes-related foot disease

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Diabetes-related foot disease (DFD) is "common, complex, and costly"[1] and underappreciated in Australia.[2] With DFD not even rating a footnote mention in recent national chronic disease strategies,[3] it is arguably Australia's least known major health problem.[2] If Australia is to reduce avoidable amputations, major improvements in the way we approach DFD are urgently needed.[2,4]

The problem

DFD is Australia's leading cause of amputations,[2,5] is within the top 20 causes of all hospitalisations,[6] has mortality rates worse than many cancers,[7] and costs Australia an estimated $1.6 billion each year.[6] Patients who develop DFD also need more consultations, referrals and hospitalisations than patients with heart disease, kidney disease or cancer.[1]

Best estimates show that about 50 000 Australians have DFD (ulcers, infections and ischaemia) and 300 000 have major risk factors (peripheral neuropathy and peripheral arterial disease) for developing DFD.[4] Indigenous Australians are disproportionally affected, with a 3–6-fold increased likelihood of developing DFD.[8]

DFD is a complex condition that is not easily identified, prevented or treated.[1,9] It commonly develops from trauma in the presence of peripheral neuropathy or peripheral arterial disease and is complicated by infection.[1,9] Neuropathy is arguably the critical factor in DFD as it results in patients "losing the gift of pain".[1,9]

Without pain, patients often underappreciate the severity of DFD and delay presenting for health care.[1,9] Without painful presentations, health professionals often underappreciate the severity and incidence of DFD and do not prioritise advocacy for the services needed to manage DFD.[1,9] We estimate that less than 10% of the 540 interdisciplinary DFD services needed to manage the 50 000 Australians with DFD are available.[4] Ultimately, without awareness and advocacy from patients and health professionals, governments underappreciate and do not address the severity of the national DFD burden.[1,2,9]

Even once DFD is identified, prevention and treatment is also not as simple as prescribing a particular medication.[1,9,10] DFD necessitates a coordinated, interdisciplinary approach that harnesses the complementary skills of medical, surgical, nursing and allied health disciplines across primary, secondary and tertiary care systems.[1,9,10] Without access to such coordinated interdisciplinary systems, more patients end up in hospital, stay longer, and undergo more amputations.[1,2,9]

Australia reported the second highest diabetes-related amputation rate of OECD nations.[2] This was partially attributed to the lack of coordinated interdisciplinary DFD services in Australia.[2] This was in stark contrast to the European nations that had the lowest diabetes-related amputation rates in the OECD, such as the United Kingdom, Belgium and the Netherlands.[2,11] The low rates in these nations have been attributed to coordinated nationwide systems that recognise and reimburse accredited interdisciplinary DFD services.[4,11] Additionally, these nations' systems regularly monitor and report DFD outcomes for national clinical benchmarking and research network purposes.[11] Germany, for example, has nearly 300 accredited DFD services monitoring outcomes and contributing to research in their system,[11] whereas Australia is yet to even enact a system.[4]

The solution

Over the past two decades, a number of peak national bodies have published position statements aiming to stimulate awareness and action to reduce the national DFD burden.[2,12] These brief statements typically consisted of several broad recommendations to improve national DFD care based on evidence from other nations.[2,12] Unfortunately, they provided scant detail on the national DFD burden, actions to achieve these recommendations, measures to monitor progress, and forecasts on the impact of achieving these recommendations. The last of these statements — *A limb lost every 3 hours: can Australia reduce amputations in people with diabetes?* — was published in 2012 in the *MJA* by the Australian Diabetic Foot Network.[12] Regrettably, this peak body disbanded in 2013 because of a lack of government funds and was unable to monitor progress. Ironically, government data now show that a limb is lost to diabetes every 2 hours in Australia.[5]

1 Key recommendations from the Australian Diabetes-related Foot Disease Strategy 2018–2022[4]

Priority	Recommendation
Access to affordable and effective care	1. All people with diabetes should have access to annual diabetes-related foot disease screening and understand their risk of developing diabetes-related foot disease
	2. All people at risk of diabetes-related foot disease should have access to preventive evidence-based health care from appropriately trained health professionals
	3. All people with diabetes-related foot disease should have access to evidence-based health care from specialised interdisciplinary foot disease services
Provision of safe, quality care	4. All health professionals and specialised interdisciplinary foot disease services caring for people with, or at risk of, diabetes-related foot disease should demonstrate that they meet minimum Australian evidence-based standards
	5. All health service regions should report their diabetes-related foot disease outcomes annually to monitor progress towards ending avoidable amputations
	6. Australian national diabetes-related foot disease guidelines should continually reflect the most up-to-date robust evidence to guide standards for health care provision and outcome reporting
Research and development to improve patient outcomes	7. An Australian research agenda for diabetes-related foot disease should be developed and endorsed to guide national research priorities
	8. An Australian diabetes-related foot disease clinical trials network should be established to provide national research support and leadership
	9. Investments in research and development for diabetes-related foot disease should be proportionate to the national health burden caused by the disease

While previous statements relied on international evidence, Australia has subsequently produced local evidence to support such recommendations.[4] For example, Australian studies have now demonstrated that the introduction of interdisciplinary DFD services have coincided with a halving of regional hospitalisation and amputation rates.[13] Further, a 2017 Australian cost-effectiveness analysis reported that nationwide investments in access to evidence-based DFD care[10] would not only improve patient outcomes, but after accounting for upfront investments would still save $10 000 per patient and $2.7 billion for the nation over 5 years.[14]

The new strategy

In 2016, a new peak national body — Diabetic Foot Australia — was established with the goal of "ending avoidable amputations within a generation".[4] Diabetic Foot Australia was a key initiative of the government-funded Wound Management Innovation Cooperative Research Centre, led by an interdisciplinary steering committee of nationally recognised DFD experts from medicine, surgery, nursing, podiatry, clinical research, basic science and industry.[4] Recently, Diabetic Foot Australia launched the *Australian diabetes-related foot disease strategy 2018–2022: the first step towards ending avoidable amputations within a generation*.[4]

The methodology to develop this new strategy included performing a systematic review of Australian DFD literature,[15] exploring DFD strategies from other nations,[11] investigating international evidence-based DFD guidelines,[9] and aligning the strategy with the Australian National Diabetes Strategy 2016–2020.[3] Feedback on a draft was obtained from stakeholders via a public online survey and incorporated into the final strategy.[4]

The new strategy outlines nine key recommendations (Box 1) that should put Australia firmly on an evidence-based pathway towards ending avoidable amputations within a generation.[4,9] Some recommendations are similar to those published by previous peak national bodies,[2,12] including increasing access to care (recommendations 1–3), subsidising evidence-based treatment (recommendations 2 and 3), implementing national models of interdisciplinary care (recommendation 4), and reporting national outcomes (recommendation 5).[2,4,12] However, the need to repeat these recommendations indicates a national failure to act, either because the national DFD burden was considered not severe enough to prioritise, or the recommendations lacked actionable detail or evidence to implement. The new strategy should rectify these failures.[4]

First, the new strategy presents the most robust estimates of the national DFD morbidity, mortality and cost burden and makes a strong case for health professionals, researchers and governments to prioritise DFD action above other well known conditions with lower burdens. Second, unlike previous statements, the strategy outlines many potential areas for action and measures to monitor progress towards achieving each recommendation that can be undertaken by health professionals, researchers and governments; all supported by extensive local and international evidence-based rationale (Box 2). Third, it details the national workforces required to enact evidence-based actions to achieve recommendations. Fourth, it forecasts the impact of achieving such

2 Example: potential areas for action and measures for improvement[4]

Recommendation 3

All people with diabetes-related foot disease (DFD) should have access to evidence-based health care from specialised interdisciplinary foot disease services

Potential areas for action

- Establish innovative incentives and funding model agreements to significantly increase the number of interdisciplinary foot disease services in the public and private sector
- Establish a Medicare Benefits Schedule, Pharmaceutical Benefits Scheme or similar publicly funded scheme item number to reimburse offloading devices for all people with DFD, in line with Australian evidence-based guideline recommendations
- Establish a Medicare Benefits Schedule, Pharmaceutical Benefits Scheme or similar publicly funded scheme item number to reimburse wound dressings for all people with DFD, in line with Australian evidence-based guideline recommendations
- Consider tying ongoing reimbursement of interdisciplinary foot disease services for DFD care to improvements in regional clinical processes and outcomes
- Implement public awareness campaigns and patient-friendly tools to encourage people with DFD to seek early access to evidence-based care in their community

Potential measures of progress

- Number and proportion of interdisciplinary foot disease services available across Australia and in each health service region
- Proportion of people with DFD treated in interdisciplinary foot disease services
- Proportion of people with DFD receiving offloading devices
- Proportion of people with DFD receiving wound dressings
- Proportion of people with DFD receiving telehealth consultations with interdisciplinary foot disease services
- Perform cost-effectiveness analyses of increased DFD ambulatory clinical care costs compared with decreased hospital DFD outcome (ie, hospitalisation and amputation) costs to report on return of investments ◆

recommendations on reducing the future national DFD burden. Last, with DFD causing up to 33% of all diabetes-related clinical costs and receiving less than 0.2% of diabetes-related research funding,[1,4] it sets out for the first time research recommendations in this overwhelmingly underfunded field (recommendations 7–9). These include developing an Australian DFD research agenda prioritising research that targets ending avoidable amputations; establishing a national clinical research network to drive such an agenda, nurture the next generation of DFD researchers and perform the large-scale research and development that is critical to reducing the future national DFD burden; and advocating for changes in government research funding so that the proportion of research funding granted reflects the proportion of the national health burden caused by the condition.[4]

The call for action

The new strategy is the first comprehensive national evidence-based DFD plan that describes in detail how health professionals, researchers and governments can implement actionable change now to ensure that all people with DFD have access to care; receive safe, quality, evidence-based care; and benefit from research that continually strives to improve their care. Australian research has demonstrated that investments in these three priority areas may save 50% of all DFD hospitalisations and amputations,[13] and $2.7 billion to the Australian taxpayer over 5 years.[14] The new strategy describes how this can be done nationally to put us on the pathway to "ending avoidable amputations in a generation".[4]

We call on Australian health professionals, researchers and governments to finally act on one of our least known major health problems and invest in these detailed actions to achieve the recommendations in the Australian Diabetes-related Foot Disease Strategy 2018–2022.[4] Investments in this plan should ensure not only a significant financial return on investment to the health budget but, more importantly, save the limbs and lives of Australians.[4,9]

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