

Solutions to the chronic wounds problem in Australia: a call to action

Pacella RE, Tulleners R, Cheng Q, Burkett E, Edwards H, Yelland S, Brain D, Bingley J, Lazzarini P, Warnock J, Barnsbee L, Pacella T, Clark K, Smith M, Griffiths I, Sussman G, van Netten J, Gibb M, Gordon J, Harvey G, Hickling D, Lee X, Ploderer B, Vallejo A, Whalley S & Graves N

ABSTRACT

Background: Chronic wounds are a silent epidemic in Australia. They are an under-recognised public health issue, and their significant health and economic impact is underestimated. Evidence-based practice in wound care has significant health and economic benefits, yet there are still considerable evidence–practice gaps.

Methods: Stakeholders attended a national forum to refine and prioritise solutions to the chronic wounds problem in Australia. A survey was administered to identify key priorities and recommendations.

Results: Stakeholders agreed on 17 recommendations and strategies to improve the outcomes of Australians with chronic wounds. The identified priorities for immediate action were to raise awareness of the significance of chronic wounds, and to make chronic wounds a strategic priority for governments. The Chronic Wounds Solutions Collaborating Group was established to encourage, support and monitor action on the implementation of these recommendations.

Conclusions: Large health and economic gains can be achieved with modest investments in evidence-based strategies for the prevention and control of chronic wounds in Australia. We call for a critical and sustained national effort to prevent and treat chronic wounds in Australia. Urgent action is needed at all levels if Australia is to reduce the significant preventable burden of chronic wounds and improve patient outcomes.

Keywords: Chronic wounds, Australia, evidence-based wound care, cost-effectiveness, awareness, recommendations, call to action.

Rosana E Pacella^{1,2}, Ruth Tulleners^{1,2}, Qinglu Cheng^{1,2}, Ellen Burkett³, Helen Edwards⁴, Stephen Yelland⁵, David Brain^{1,2}, John Bingley⁶, Peter Lazzarini^{7,8}, Jason Warnock⁸, Louise Barnsbee^{1,2}, Tamzin Pacella^{1,2}, Kevin Clark⁹, Michele Smith¹⁰, Ian Griffiths⁶, Geoff Sussman^{11,12}, Jaap van Netten⁷, Michelle Gibb¹³, Jodie Gordon¹⁴, Gillian Harvey¹⁵, Donna Hickling⁸, Xing Lee^{1,2}, Bernd Ploderer¹⁶, Alison Vallejo¹⁷, Sharon Whalley¹⁸, and Nicholas Graves^{1,2} on behalf of the Chronic Wounds Solutions Collaborating Group.

1. Australian Centre for Health Services Innovation (AusHSI), Queensland University of Technology, QLD, Australia
2. School of Public Health and Social Work, Queensland University of Technology, QLD, Australia
3. Princess Alexandra Hospital
4. Faculty of Health, Queensland University of Technology
5. Bundall Medical Centre, Bundall, QLD, Australia
6. Wound Management Innovation Cooperative Research Centre
7. Queensland University of Technology
8. The Prince Charles Hospital, Metro North Hospital and Health Service
9. Metro North Hospital and Health Service
10. Brisbane North Primary Healthcare Network
11. Faculty of Medicine, Nursing and Health Science, Monash University
12. Wounds Australia
13. Wound Specialist Services
14. Redcliffe Hospital, Metro North Hospital and Health Service
15. University of Adelaide
16. School of Electrical Engineering and Computer Science, Queensland University of Technology
17. Blue Care
18. Wound Innovations Clinic, Wound Management Innovation Cooperative Research Centre (WMI CRC)

INTRODUCTION

Chronic wounds are an under-recognised issue in Australia. They are under-considered in terms of research and public policy, receiving little attention and investment compared to other chronic conditions¹. This apathy is unjustified given the associated disease and economic burdens. Chronic wounds severely reduce quality of life and capacity to work, and they increase social isolation^{2,3}. They also impose substantial costs on patients and the health care system. The implementation of evidence-based wound care coincides with large health improvements^{4,5} and cost savings⁴⁻⁷, but research has demonstrated that the majority of Australians with chronic wounds do not receive evidence-based treatment^{4,8,9}. Furthermore, as wound management is not recognised as a discrete health care field or a national health priority, securing impetus for change is challenging.

Wound management and funding in Australia is complex, involving a multitude of service providers with poor continuity of evidence-based prevention and treatment along the health service continuum⁴. Key barriers to the implementation of evidence-based wound care include: lack of awareness of the significance of chronic wounds, complex and

Box 1: Key messages

1. Chronic wounds impact on quality of life and are expensive to treat, but are seriously under-considered in the Australian public health agenda.
2. Achievement of improved wound management at a lower cost remains a sensible goal for Australia.
3. The barriers to implementation of evidence-based wound care in Australia include lack of awareness of the significance of chronic wounds, poor coordination and communication between health care providers, limited access to evidence-based wound management, poor education and training in evidence-based wound care and the high costs of wound services and consumables.
4. Stakeholder engagement resulted in 17 recommendations to overcome barriers and increase uptake of evidence-based wound care.
5. Stakeholders agreed that chronic wounds must become a strategic priority for governments to ensure the delivery of affordable, accessible, timely and high-quality services to all Australians.
6. The Chronic Wounds Solutions Collaborating Group was established to encourage, support and monitor action on the implementation of recommendations and evidence-based efforts to prevent and control chronic wounds.
7. We provide evidence that this goal is achievable and call for a critical and sustained national effort to increase access to best-practice wound management, improve efficiency and value in health services and gain higher health benefits for all Australians with chronic wounds.

uncoordinated services with poor communication between health care providers, poor access to wound services, poor education and training of healthcare professionals and the high costs of wound services and products¹⁰ (Figure 1). The poor implementation of evidence-based care means chronic wounds take longer to heal, require more intensive intervention, often result in hospitalisation through infection and other complications, and have high recurrence rates. They also represent a significant burden of avoidable costs¹.

There is a lack of current, reliable data on the prevalence and costs of chronic wounds in Australia. Based on data from several high-income countries¹¹, it is estimated that there are 420,000 cases of chronic wounds in hospital and residential care settings in Australia each year. Pressure injuries are the most common wound type, comprising 84% of all wounds, followed by venous leg ulcers (VLUs) (12%), diabetic foot ulcers (DFUs) (3%) and arterial insufficiency ulcers (AUs) (1%)¹². Regardless of wound type, the treatment costs are substantial. Chronic wounds are estimated to cost US\$2.85 billion (about A\$3.7 billion) annually, or approximately 2% of Australian national health care expenditure¹². These recorded costs only include those incurred in hospitals and residential care settings, but not general practice and community nursing costs, indirect costs of lost productivity, the intangible costs of pain and suffering, and travel or other costs of consumables to individual patients¹.

There are many studies which have demonstrated the effectiveness of different chronic wound treatment options and product-oriented interventions^{4,7,13-16}. Evidence-based

wound care has also been found to be cost-effective and even cost-saving¹⁷⁻²¹.

Unfortunately, in general, this has not resulted in a widespread or sustained change to practice in Australia. This research aimed to investigate solutions, through stakeholder engagement, to the current knowledge translation challenges.

METHODS

Stakeholder Engagement Part 1 — Chronic Wounds Solutions Forum

Stakeholders were invited to attend the Chronic Wounds Solutions Forum held on 31 August 2017 in Brisbane, Queensland, Australia. This national forum was organised by the Australian Centre for Health Services Innovation (AusHSI), with support from Queensland Government, Metro North Hospital and Health Service, Clinical Excellence Division, Brisbane North Primary Health Network, and the Wound Management Innovation Cooperative Research Centre (WMI CRC). Invited stakeholders included policy makers, chronic wound specialist clinicians, general practitioners, representatives of Primary Health Networks and Hospital and Health Services, consumers with previous or ongoing chronic wounds, private health insurers, consumer advocates, private sector and pharmaceutical industry representatives, health economists and university academics from across Australia.

The aim of the forum was to provide an opportunity for key stakeholders to bring together their knowledge and expertise to: firstly, explore the identified barriers to evidence-based wound management and the delivery of wound

Figure 1: Summary of barriers to implementation of evidence-based wound care in Australia

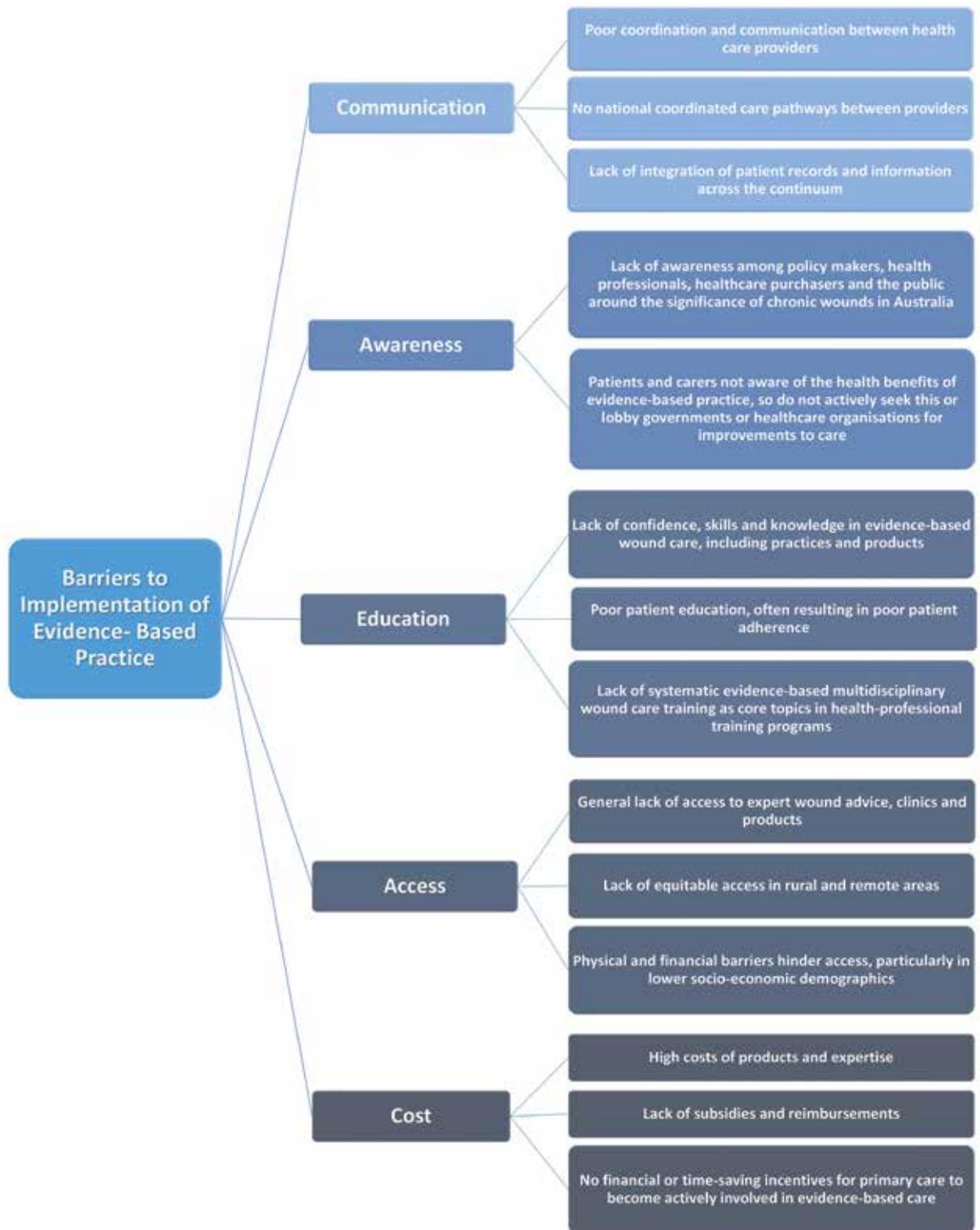
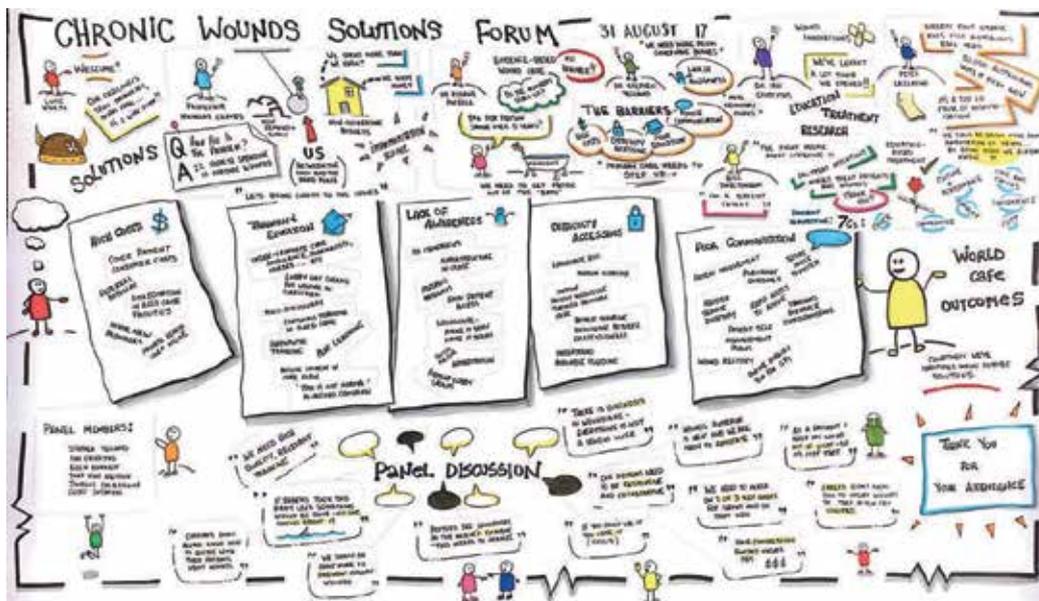


Figure 2: Graphic recording during the Chronic Wounds Solutions Forum



services in Australia, and secondly, discuss solutions to the chronic wounds problem. The forum consisted of didactic presentations of identified barriers¹⁰ from the perspective of select national experts, followed by active participation and sharing of ideas using the World Café method²². A panel of experts summarised the recommendations arising from the forum with input from the larger group of participants. This discussion was recorded through non-identifiable notes. Content generated throughout the forum, including the presentations and panel discussion, was also captured by a graphic recording artist.

Stakeholder Engagement Part 2 — Online survey to identify priority recommendations

Stakeholders were contacted by email approximately two months after attending the forum, and asked to complete an online survey. Data were collected through the online platform SurveyMonkey²³, using a secure account. Settings within the survey tool were configured to ensure that personal information, beyond the questions in the survey, was not recorded, thus ensuring that all responses remained anonymous. The aim of the survey was to identify priorities for action to overcome barriers and increase uptake of evidence-based wound management, in the areas of education, access and financial support for wound services and products. The survey consisted of ranking questions asking survey respondents to compare a list of different recommendations to one another as follows: “Please rank each of the following items in order of importance with #1 being the most important recommendation to #6 being the least important.”

Stakeholder Engagement Part 3 — Establishment of The Chronic Wounds Solutions Collaborating Group

The Chronic Wounds Solutions Collaborating Group emerged from a partnership between the chronic wound stakeholders, experts and consumers attending the Chronic Wounds Solutions forum and was modelled on the success of the Chronic Disease Action Group²⁴, adopting their framework and call to action to encourage, support and monitor the implementation of evidence-based efforts. The group consists of the participants who attended the forum and agreed to join the group, along with external researchers, academics and experts who are closely involved in the project.

Approval for this research was obtained from the Queensland University of Technology (QUT) Human Research Ethics Committee (Approval Number: 1700000960).

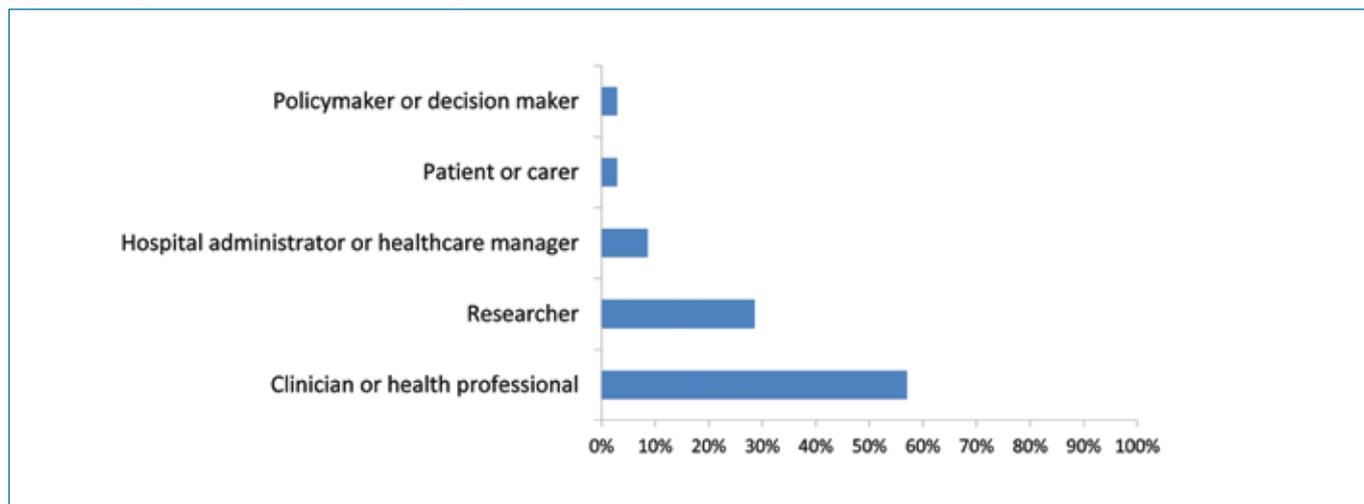
RESULTS

An image depicting the visual recording of the Chronic Wounds Solutions Forum is shown in Figure 2. A total of 121 stakeholders were invited to attend the forum, with 87 of these invitees attending on the day. As forum participants were those at the forefront of Australian wound management, they were able to provide useful information from a variety of perspectives and make recommendations to benefit patients and improve health service delivery. When drafting the 17 key recommendations arising from discussion at the forum (Table 1), the focus was on capturing what participants considered attainable and achievable. The recommendations were designed to incite action and encourage uptake. We

Table 1: Recommendations arising from Chronic Wounds Solutions Forum

Recommendations
<p>Advocacy and awareness</p> <ul style="list-style-type: none"> • Chronic wounds should be one of Australia's National Health Priority Areas, with recognition by government of the health and economic impact of chronic wounds. • Launch a widespread public health campaign to raise awareness of the significance of chronic wounds. • Improve national leadership of chronic wound stakeholders and work together in strong partnerships.
<p>Intensify and improve education and training</p> <ul style="list-style-type: none"> • Incentivise the undertaking of further training by primary health care workers by assigning continuing professional development (CPD) points to accredited programs. • Increase evidence-based practice training that is affordable and accessible, and spread awareness of existing resources, modules and programs available. • Upskilling of the multiple disciplines required to treat or monitor chronic wounds.
<p>Accreditation/credentialling</p> <ul style="list-style-type: none"> • Accreditation for training/education programs delivering evidence-based wound management practice. • Implement a credentialling process for transdisciplinary clinics providing evidence-based wound management. • Nominate a governing body to perform and monitor the accreditation and credentialling of wound care activity, to ensure consistency and transparency, in consultation with other accrediting bodies.
<p>Access to wound care products and services (improving physical access and financial support)</p> <ul style="list-style-type: none"> • Public funding and adequate reimbursement or subsidy plans for evidence-based wound products and services based on outcomes of care. • Implement models of transdisciplinary wound care teams across the country and promote wound management in primary health care as a priority. • Encourage the use of telehealth particularly within rural/remote areas, and for residents of aged care facilities whose frailty may increase the burden of travel to appointments.
<p>Transdisciplinary patient-centred care</p> <ul style="list-style-type: none"> • A transdisciplinary and patient-focussed approach should be taken with all patients, encouraging open communication between providers, patients and carers. • Develop clear referral pathways to ensure patients are referred to the right service in a timely manner. • Develop an efficient interface or platform to improve communication and efficiency across wound care services.
<p>Surveillance and research</p> <ul style="list-style-type: none"> • Conduct a nationally representative prevalence survey at regular intervals and in line with international best practice to identify baseline prevalence and size of the problem, measure costs and track changes over time, enabling assessment of the impact of policy and practice changes. • Establish a national wound registry linked to international wound registries as a tool for enabling evidence-based wound management research, analysis and evaluation.

Figure 3: Respondents to stakeholder survey



acknowledge that many of these recommendations are interconnected and could address more than one barrier.

Out of the 87 forum participants contacted by email, 38 completed the online survey with a response rate of 43.68%. Figure 3 displays the breakdown of respondents. Most respondents who completed the online survey were clinicians or health care providers (57.14%), followed by researchers (28.57%), hospital administrators (8.57%), policy and decision makers (2.86%), and patients or carers (2.86%).

Figures 4 and 5 display the results of the online survey. When asked to prioritise recommendations regarding education and provision of services, stakeholders identified increasing awareness among clinicians about chronic wounds and their management as the highest priority for action.

With regard to financial barriers and access to services, stakeholders identified making chronic wounds management a strategic objective for governments as the highest priority, followed by adequate reimbursement for patients for wound care products, and better incentives for healthcare professionals to engage in preventative care and improve patient outcomes.

DISCUSSION

Through this process of stakeholder engagement, we were able to determine consensus as to where to prioritise action, forming the basis of key recommendations. Evidence-based care for all Australians with chronic wounds relies on the availability of resources, political and community support and improved cohesion of state and national health systems.

Figure 4: Results of stakeholder survey — Education and Provision of Services in chronic wound care

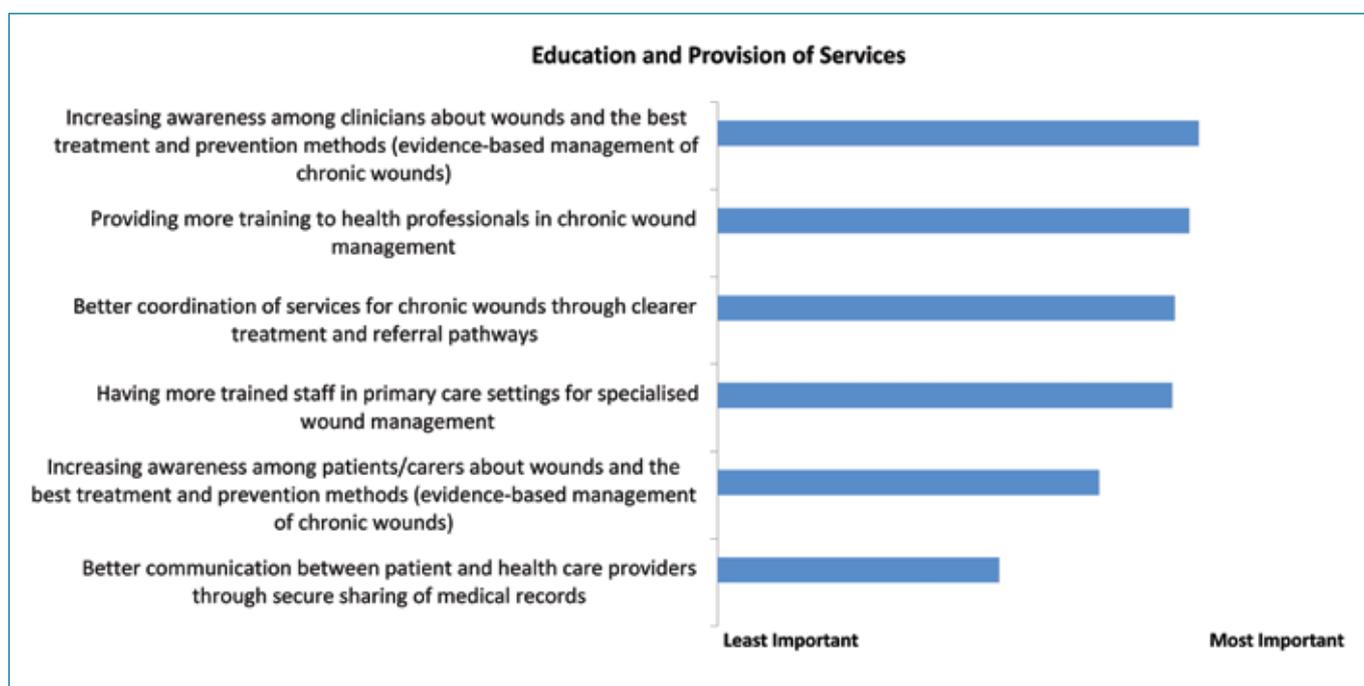
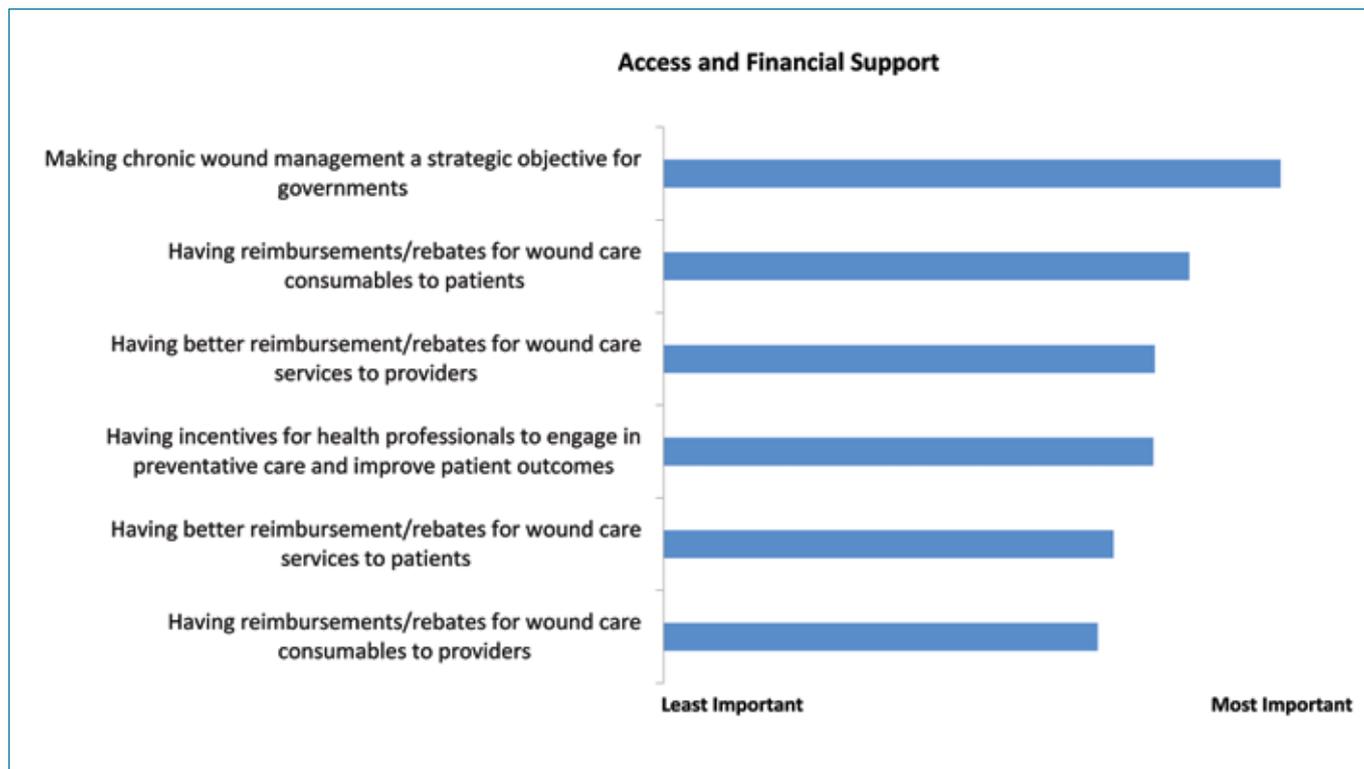


Figure 5: Results of stakeholder survey — Access and Financial Support



We also need an approach that draws on evidence from high-quality research. Achievement of the recommendations should ultimately lead to improved health outcomes for all Australians with chronic wounds. Suggested strategies to achieve the recommendations listed in Table 1 draw on successful existing local and international initiatives for chronic wounds and other chronic diseases, discussed in more detail below.

Advocacy and awareness

Chronic wounds should be one of Australia’s National Health Priority Areas

Stakeholders agreed that there is a critical need to raise awareness of the significance of chronic wounds and for improved wound management at a lower cost to be made a strategic objective for government. There is also a need to raise awareness of the important links between chronic wounds and the Australian National Health Priority Areas, and to recognise chronic wound management as a National Health Priority Area in its own right²⁵. This has the potential to secure increased support from policy-makers and research funders²⁵, as has already occurred for other National Health Priority areas, such as diabetes^{26,27}.

Launch public health campaign

Australia has been a world leader in several public health campaigns, resulting in raised awareness, behaviour changes and reductions in associated mortality and morbidity. Examples include the ‘Reduce the Risks’ sudden infant

death syndrome campaign^{28,29}, the ‘FAST’ stroke awareness campaign³⁰⁻³², various anti-smoking campaigns³³⁻³⁵, and the ‘Slip! Slap! Slap!’ sun safety campaign³⁶. This last campaign proved particularly effective, with programs currently operating in each state and territory of Australia by respective Cancer Councils, all using common principles but tailored to jurisdictional priorities³⁷. The campaign has achieved a steady decline in the incidence of invasive melanoma³⁶ and is estimated to have resulted in a net cost saving of A\$92 million nationwide^{37,38}.

The success of this campaign may be attributed to the evolving nature of the messages it presented. Initially the importance of sun safety was not understood by members of the community³⁹; similarly, the impact of chronic wounds is not currently well understood. Until there is widespread concern and interest in chronic wounds, there will be limited efforts to resolve the problem³⁹. Chronic wounds mass media campaigns should target the broader population and as the campaign evolves, the focus of the message should too, as with the ‘Slip! Slap! Slap!’ campaign³⁶.

Additionally, the Australian public’s perception of the Cancer Council’s credibility had a positive impact on the reception of the ‘Slip! Slap! Slap!’ campaign. It has also given weight to the advice, training and resources which are used to communicate the campaign’s key message³⁹. This creates a strong argument for a chronic wounds awareness campaign to be delivered by a reputable national governing body such as Wounds Australia, with a focus on evidence-based

guidance and research building on the annual 'Wound Awareness Week' campaign.

Improved national leadership

Although the Australian Government has made an important first step in raising the profile of chronic wounds by funding the WMI CRC, much remains to be done in this area. National leadership and a strong political will are prerequisites for the collaborative implementation of evidence-based wound care, but these are still missing in Australia. We also need non-governmental national organisations such as Wounds Australia to intensify leadership.

Intensify and improve education and training in wound management

There is an urgent need for improvements in the education and training of healthcare professionals to increase the uptake of evidence-based practice. Forum participants agreed that an overhaul of education and training in a variety of sectors was required. Wound management should be a part of the routine training for healthcare professionals and incorporated into the national curriculum for all Australian medical, nursing and allied health schools, with ongoing comprehensive and accessible education available to all health care providers¹. Monash University is currently the only University in the Southern Hemisphere that has postgraduate courses to master's level on wound care.

Education and training should also be provided to consumers; however, a recent Australian study found only 6% of chronic wound patients had training in self-management⁴⁰. Education is necessary to allow patients the option of self-management, resulting in better outcomes and a reduced strain on funding⁴⁰.

Increasing evidence-based practice training and upskilling that is affordable and accessible

Where innovative wound management upskilling programs have been implemented in Australia, there have been improvements in health care providers' knowledge, confidence and skills⁴¹⁻⁴⁴. One such program, focussed on DFUs, achieved significant improved knowledge, skill and competency among health care providers⁴², key factors in improving evidence-based clinical practice⁴⁵. It also resulted in reductions in diabetes-related amputation rates⁴⁶. Internationally, telehealth programs are used to create local content experts in primary care clinics in rural or remote areas⁴⁷⁻⁴⁹. A range of education modes should be available to meet the needs of all levels of providers in all settings including unregulated workers particularly in the residential aged care or remote setting, such as developed by the '*Champions for Skin Integrity Program*'⁵⁰. Workforce capabilities growth, including plans for growth and recognition of wound care as a specialty, research opportunities, and skills sharing with community partners — as currently demonstrated by the University of the Sunshine Coast partnership with Blue Care wound services — is also recommended.

Incentivise the undertaking of further training and upskilling by primary health care workers

Healthcare professionals often rely on continuing professional development (CPD) to upskill, and for some it is a compulsory aspect of continued registration with their accrediting bodies^{51,52}. However, with so many competing chronic diseases, wound care is not high on the CPD agenda. There is a need to assign CPD points to accredited wound management programs. Models that have proven to be effective for other chronic diseases could be replicated; these require practitioners to complete accredited activities in order to access Medicare Benefits Schedule (MBS) items⁵³. Related recommendations are discussed in 'Accreditation/Credentialling'.

Accreditation/credentialling

The use of highly trained wound specialists has been fundamental to the successful implementation of evidence-based chronic wound care⁵⁴⁻⁵⁶. The credentialling of wound specialists aims to ensure the quality of education, improves consistency across practice and promotes continuous quality improvement⁵⁷. It also contributes to a clearer definition of the profession, with individuals meeting certain requirements before they are permitted to practise. Patients accessing credentialled healthcare professionals can feel confident the clinician is competent⁵⁸.

There is a large number of professional organisations whose collaboration will be essential in accreditation and credentialling. However, we need a single accrediting body to be responsible for accreditation and setting wound care standards, or at the very least enable consistent collaboration between existing bodies. In the United States, the American Board of Wound Management (ABWM) performs credentialling for clinicians specialising in wound care⁵⁹. While ABWM accreditation is not compulsory, it does create a high standard of care, and guarantees that knowledge of best practice care is continually assessed in line with current research. Such accreditation must be performed by the peak body (or bodies) in the area of practice.

Access to wound care products and services (improving physical access and financial support)

Concerns about access to wound products and services stem from two main issues — barriers to the physical access to service providers and products, and the financial barriers surrounding the need for costly ongoing care.

Improving physical access

Static and mobile wound management clinics are needed. There is a need to implement standard models of wound care nationwide, and to promote wound management in primary health care settings as a priority. Improving education, skills and financial incentives in primary care can prevent wounds, increase recognition of complications and reduce hospitalisations; indeed, one study showed that primary care could reduce the incidence of VLU's by 50% in 10 years⁶⁰.

Box 2: Chronic Wounds Directory

In Queensland, Metro North Hospital and Health Service (MNHHS) has developed a Chronic Wounds Services Directory with assistance and input from members of the Brisbane North Chronic Wounds Governance group, comprised of wound specialists and researchers from within the Brisbane North Primary Healthcare Network (PHN). The webpage was launched on 16 October 2017, and has seen increasing traffic and usage since it became live.

This directory is featured as a page on the MNHHS website, and details a list of public and private clinics that provide treatment or management of acute and chronic wounds in the Brisbane North PHN region. It is designed for use by referrers and patients, and incorporates a user-friendly interactive map. Users also have the option to search for a specific clinic, or to search generally within a specified area (for example, using a suburb name or a postcode).

For each clinic on the list, information is provided on the clinic's contact details (including phone and fax numbers, and direct links to emails and websites), types of referrals required, payment options and any other information that may be important for patients or clinicians.

The list is made up of a variety of clinics, including specialists in wound management, dermatology and skin integrity clinics, podiatry, lymphoedema specialists, and community health services who provide wound management as part of their care.

The website and directory is managed by MNHHS administrative staff with providers encouraged to inform them of updates to existing or new clinics with the PHN region.

To view the webpage, visit:

<https://www.health.qld.gov.au/metronorth/health-professionals/chronic-wounds-directory>

Transdisciplinary outpatient clinics can improve wound healing rates at a reduced cost to the health care system⁶¹, and secondary-level wound specialty clinics would fill referral gaps in the community¹. For those patients experiencing difficulties in accessing specialist care, telemedicine — including digital imaging wound assessment⁶²⁻⁶⁵ — may be particularly appropriate and effective⁶⁶.

Mobile wound clinics and clinicians can also deliver wound management expertise to support residential aged care facilities, peripheral hospitals and regional/remote communities. For example: the Mobile Wound Care Program in Victoria⁶⁷ recorded significant decreases in time to wound healing and treatment costs. The participating organisations also saw skills development with consequent improved workforce capacity to manage chronic wounds⁶⁸. An online chronic wounds specialist services directory, such as the one developed by MNHHS (Box 2), is a user-friendly option for referrers and patients to locate information on local wound specialists including payment options.

Financial support

The lack of reimbursement for wound management products means that people with chronic wounds outside of residential aged care facilities and the acute hospital system incur high personal out-of-pocket costs⁶⁹. For many, the lack of access to affordable products could compromise care decisions. Given the strong evidence that guideline-based wound care is cost-saving and improves health outcomes in Australia, subsidising evidence-based treatments via government

funding was identified as an important priority. Stakeholders recommended that a subsidy should be implemented through the MBS for the total cost of evidence-based wound care^{70,71}.

With regard to VLU management in particular, specific MBS item numbers for the prescription of compression bandaging and for the time component of the wound management procedure are needed. In addition, new item numbers are needed to recognise wound management practitioners working in primary care, to reduce avoidable hospital presentations and admissions. Economic modelling estimated that the cost savings to the Australian government through reduced health service utilisation as a result of improved healing of venous leg ulcers, and ulcers and hospitalisations avoided, would be about A\$1.2 billion over five years²⁰.

Financial support remains a challenge, however, when health care budgets are already constrained. Health purchasers must identify opportunities for disinvestment in low-value care to redirect savings towards high-value services. A major obstacle is that health care spending has strong political implications. Innovative funding models — such as those developed for other chronic diseases, where a portion of tobacco taxation is used to fund effective prevention programs — are also needed to support government funding in the area of chronic wounds.

Another challenge is that we are seeking investment by the Australian government in primary health care while savings

Box 3: Wound Innovations Clinic

The Wound Innovations clinic was established by the Wound Management Innovation Cooperative Research Centre in January 2017. It provides a specialist, holistic service for patients, their carers and clinicians to improve wound outcomes. Each patient sees a transdisciplinary team comprising of a vascular specialist, a wound nurse practitioner candidate, an advanced clinical podiatrist, an occupational therapist and a registered nurse and is charged a consultation fee for this service. All clinicians work together with the patient and other health care teams to provide the best wound care possible. This is provided through a tailored wound dressing plan that is managed in the community, through further clinic visits, or augmented through telehealth. Referrers receive a detailed report outlining the diagnosis, treatment provided and recommendations for follow-up care.

Wound Innovations provides the option of a telehealth service to all patients which is bulk-billed for eligible patients. A telehealth consultation is a real-time video consultation between healthcare professionals, the clinical team at Wound Innovations and the patient. This valuable service helps to reach those who may not be able to attend the clinic, but require specialised care — for example: those in rural and remote settings, or those in residential aged care facilities.

Wound Innovations also offers education and training for healthcare professionals to provide them with the latest, evidence-based treatment methods and approaches for wound management. The clinic offers specialist training to nurses, doctors, allied healthcare professionals, pharmacists and students to maximise the translation of wound research evidence into clinical care. Training is delivered through a variety of approaches, including seminars, wound education workshops, clinical skills development programs, clinical placement opportunities and online education modules. Wound Innovations also collaborates with various health organisations to conduct research to advance wound knowledge and treatment.

A transdisciplinary team equipped with specialist knowledge and training has resulted in extremely positive patient outcomes within this clinic. Although this clinic is also equipped with specialist equipment and dressings, the foundation of a transdisciplinary, patient-centred methodology with effective communication between all parties is an effective approach that can be implemented in any clinic. It may be achieved through simple changes to policy and targeted professional development.

are perceived to be accrued predominantly in the acute sector. We recognise a need for a cohesive health system with better collaboration, with the vision that investing in primary care and prevention avoids downstream costs. We also need to incentivise cost-effective care and prevention within the MBS, moving from a fee-for-service to a more proactive service that incentivises positive patient outcomes.

Transdisciplinary, patient-centred care

Stakeholders agreed that there was a need for improved coordination and communication between health care providers, patients and carers. There is evidence that when practitioners from different disciplines come together with a shared, patient-focussed goal, enhanced clinical outcomes can be achieved⁷². There are a range of professions that could be included in a patient's wound care journey⁷³. With such an approach, the team is interdependent and team members from different professions share responsibility and accountability for attaining positive patient outcomes⁷². An example of a fee for service wound clinic providing transdisciplinary, patient-centred care is provided in Box 3.

The patient should be an active participant in all decisions about their care. In addition to costs, major contributors to patient non-adherence include a lack of understanding of wounds aetiology, pain and discomfort, aesthetic and

cosmetic factors (such as unattractive and burdensome products), inability to bathe frequently, psychological issues, and poor relationships with health care providers⁷⁴. Acknowledgement of these concerns can help tailor a plan that addresses them, thereby empowering the patient with a feeling of control⁷².

In a transdisciplinary approach the use of a 'wound navigator', or team leader who acts as an advocate for the patient, is important⁷⁵. This person — often, the patient's primary physician or initial practitioner — takes responsibility for the coordination of care services based on the patient's needs and treatment aims⁷². Organised interdisciplinary communication is essential; this may come in the form of in-clinic service provision, or via the development of electronic databases such as the Australian Government's 'My Health Record' (*My HR*)⁷⁶.

A relevant example of ongoing efforts to improve patient pathway access through policy change is the Metro South Health 'Value Based Wound Care — Chronic Venous Ulcer' project. This project aims to develop a framework for the provision of consistent evidence-based service delivery, clear referral pathways across Metro South Health, and policies and procedures to ensure uniform documentation, digital photography and follow-up of chronic wound and

Box 4: Chronic Wounds Solutions Collaborating Group Call to Action**We call for:**Federal, state and territory and local governments to:

- Recognise that chronic wounds cause a significant burden to the national health budget, as well as a deeply negative impact on patients and their families/carers.
- Increase financial support for evidence-based wound products and services to harvest appropriate economic savings and improve outcomes.
- Provide stronger leadership and coordination for the prevention and management of chronic wounds.
- Make policies and funding for evidence-based initiatives that focus on the prevention and treatment of chronic wounds a priority, involving all relevant stakeholders.
- Support integrating health service approaches to prevention and management with an emphasis on primary health care to help people manage their health across the life course.
- Improve the coordination of services through development of an efficient interface across wound care providers to drive down the number of avoidable hospital admissions.
- Strengthen the commitment to work together with Indigenous leaders to improve outcomes for Indigenous Australians as a priority.
- Fund research into chronic wounds particularly to strengthen data collection and surveillance and support a national wound prevalence survey for monitoring progress in prevention and treatment.

National non-governmental organisations such as Wounds Australia to:

- Intensify leadership and work closely together with relevant stakeholders to support goals.
- Promote evidence-based advocacy to support health authorities in their planning, implementation and assessment of prevention and treatment efforts.

Medical and nursing governing bodies to:

- Ensure the availability of skilled healthcare professionals with adequate education and training in evidence-based wound management.
- Represent all practitioners when lobbying to address these barriers, while actively supporting the implementation of solutions within their practice.

Academics and researchers to:

- Recognise that more progress can still be made in this field.
- Focus on knowledge translation and disseminate evidence on the cost-effectiveness of guideline-based wound management and ensure end users of research (policy-makers and healthcare professionals) are involved in the research process from design to dissemination.
- Participate fully in the development, implementation and assessment of evidence-based wound management.
- Focus on implementation science to promote the adoption and integration of evidence-based wound practice, interventions and policies into routine health care and public health settings.
- Drive the establishment of a national wound registry and develop a national wound prevalence survey for monitoring progress in prevention and treatment.

Private health insurance companies and pharmaceutical industry to:

- Become more aware of the chronic wounds issues and facilitate partnerships with healthcare professionals and academics.
- Ensure the availability, affordability and accessibility of low-cost wound care products.
- Subsidise wound management procedures and products outside the hospital setting, particularly in areas such as compression therapy and negative pressure therapy to reduce hospital admissions.
- Use powerful marketing forces to support evidence-based wound prevention and treatment.

*Box 4 (continued): Chronic Wounds Solutions Collaborating Group Call to Action*Healthcare professionals to:

- Collaborate with internal and external stakeholders.
- Ensure effective communication with patients and their carers and that the patient is an active participant at the heart of all shared decisions and care plans.
- Ensure effective communication and continuity of care within multidisciplinary teams of healthcare professionals.
- Understand the importance of accessing growth opportunities and upskilling in wound management.
- Make every effort to ensure best outcomes for patients by referring to the right service in a timely manner.

Affected individuals, carers and the public to:

- Understand that wounds are not just part of the normal ageing process but are treatable.
- Engage more seriously with national and local efforts in education, and in the prevention and treatment of chronic wounds.
- Ensure that the needs of disadvantaged and remote and rural populations are met as a priority through participation in appropriate partnerships.

discharge planning. Although still in the planning stages, the development of an efficient and effective interface between general practice, community wound care services and acute services is expected to improve the coordination and navigation of services, and reduce hospital presentations and admissions. The primary driver for these changes is to improve patient outcomes and satisfaction, while also improving fiscal and clinical efficiency.

Surveillance and research needs

There is an urgent need for an improved understanding of the size of the chronic wounds problem and the population affected. Researchers and health policy makers often rely on outdated statistics on the prevalence of chronic wounds in Australia, but with population ageing and the obesity epidemic⁷⁷⁻⁷⁹, prevalence has probably increased in recent years. The effective implementation and evaluation of evidence-based chronic wound prevention and management strategies depend on the availability of reliable and comparable information.

Conducting a national wound prevalence survey that clearly identifies the magnitude of the problem is imperative. The development and rollout of a national wound registry, similar to the model developed for the Welsh Wound Registry and the United States Wound Registry, would provide a comprehensive electronic data collection system, and an opportunity for identifying the national scope of the wound burden and healing and cost outcomes^{1,80}. It could also validly predict the likelihood of wound healing, facilitate comparative effectiveness research to identify patients needing advanced therapeutics, and inform future clinical trials^{80,81}. However, for this to be achieved in the Australian context it would be necessary to overcome barriers to collaboration between sectors because of jurisdictional funding issues, sensitivities

around the sharing of data, establishment costs and the challenge of service sustainability.

Chronic Wounds Solutions Collaborating Group call to action

We call for urgent and strengthened action from all stakeholders to respond to the chronic wound problem in Australia based on all the available evidence, and including the recommendations presented in this paper. Our call to action is summarised in Box 4.

CONCLUSION

This paper calls for a critical and sustained national effort to prevent and treat chronic wounds in Australia. Large health and economic gains can be achieved with modest investments in evidence-based strategies for the prevention and control of chronic wounds in Australia. This paper presents 17 stakeholder-driven recommendations to reduce the economic burden and improve clinical outcomes for patients with chronic wounds. All recommendations are interdependent — no single recommendation is strong enough on its own, and all need to be implemented to support sustainable improvements in wound care and patient outcomes across the care continuum.

Ultimately, all of our recommendations are underpinned by an urgent need for an increased awareness of the significance of chronic wounds, and the imperative that chronic wounds management be made a strategic objective for government. However, we all share responsibility and urgent action is needed not only by federal, state and local governments, but also non-governmental organisations, medical and nursing governing bodies, industry, healthcare professionals, academics and the public to address these recommendations

if Australia is to reduce the significant preventable national burden of chronic wounds and improve patient outcomes. We have established the Chronic Wounds Solutions Collaborating Group to encourage, support and monitor action on the implementation of these recommendations to prevent and control chronic wounds in Australia. We provide evidence that this goal is achievable and call for a critical and sustained national effort to increase access to best-practice wound management, improve efficiency and value in health services and gain higher health benefits for all Australians with chronic wounds.

ACKNOWLEDGEMENTS

This Chronic Wounds Solutions Forum was organised by the Australian Centre for Health Services Innovation (AusHSI), with support from Queensland Government, Metro North Hospital and Health Service, Clinical Excellence Division, Brisbane North Primary Health Network, and the Wound Management Innovation Cooperative Research Centre (WMI CRC). The authors would like to acknowledge the support of the Australian Government's Cooperative Research Centres Program. The Wound Management Innovation Cooperative Research Centre (WMI CRC) received funding from the Australian Government, Curtin University of Technology, Queensland University of Technology, Smith & Nephew Pty Limited, Southern Cross University, University of South Australia, Wounds Australia Ltd, Blue Care, the Department of Health South Australia, the Department of Health and Human Services Victoria, Ego Pharmaceuticals Pty Ltd, Metropolitan Health Service/Wounds West, Queensland Health, Royal District Nursing Service Limited as part of the Bolton Clarke Group, Royal Melbourne Institute of Technology, Silver Chain Group Ltd, 3M Australia Pty Ltd, KCI Medical Australia Pty Ltd, Capital Health Network Pty Ltd, Mölnlycke Health Care Pty Ltd, Paul Hartmann Pty Ltd, Swinburne University of Technology, The University of Queensland, University of Melbourne, University of Tasmania and The University of Western Australia. The funding sources played no role in study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the article for publication.

CONTRIBUTORS

RP, RT and QC prepared the first draft. RP, RT, TP finalised the draft based on comments from other authors and reviewer feedback. RP, NG, KC, IG, MS conceived of the study and provided overall guidance. RT performed final statistical analyses. All other authors reviewed results, provided guidance, and reviewed the manuscript.

DECLARATIONS OF INTEREST

RP, RT, LB, TP, QC, DB are employed by the Queensland University of Technology with grant funding from the Wound Management Innovation Cooperative Research Centre (WMI CRC). JB is the Clinical Director at the Wound Innovations Clinic. All other authors declare no conflicts of interest.

REFERENCES

1. Norman R, Gibb M, Dyer A *et al.* Improved wound management at lower cost: A sensible goal for Australia. *Int Wound J* 2016;13(3):303–16.
2. Phillips T, Stanton B, Provan A, Lew R. A study of the impact of leg ulcers on quality of life: financial, social and psychological implications. *J Am Acad Dermatol* 1994;31:49–53.
3. Kapp S, Santamaria N. The financial and quality-of-life cost to patients living with a chronic wound in the community. *Int Wound J* 2017;14(6):1108–19.
4. Edwards H, Finlayson K, Courtney M, Graves N, Gibb M, Parker C. Health service pathways for patients with chronic leg ulcers: identifying effective pathways for facilitation of evidence based wound care. *BMC Health Serv Res* 2013;13(1):86.
5. Graves N, Finlayson K, Gibb M, O'Reilly M, Edwards H. Modelling the economic benefits of gold standard care for chronic wounds in a community setting. *Wound Practice & Research* 2014;22(3):163–8.
6. KPMG Commissioned by Australian Wound Management Association. An economic evaluation of compression therapy for venous leg ulcers [Internet] 2013 [cited 11 December 2017]. Available from: http://www.awma.com.au/publications/kpmg_report_brief_2013.pdf.
7. National Health and Medical Research Council (NHMRC). National evidence-based guideline: Prevention, identification and management of foot complications in diabetes (Part of the guidelines on management of type 2 diabetes). Melbourne: Baker IDI Heart & Diabetes Institute; 2011 [cited 4 December 2017]. Available from: <http://www.nhmrc.gov.au/guidelines/publications/subject/Diabetes>.
8. Kruger A, Raptis S, Fitridge R. Management practices of Australian surgeons in the treatment of venous ulcers. *ANZ J Surg* 2003;73(9):687–91.
9. Woodward M. Wound management by aged care specialists. *Primary Intention* 2002;10:70.
10. Pacella R; AusHSI chronic wounds team. Chronic Wounds in Australia Issues Paper. Brisbane: Australian Centre for Health Service Innovation (AusHSI), Metro North HHS, Brisbane North PHN and Wound Management Innovation CRC, 2017 [cited 20 November 2017]. Available from: <https://eprints.qut.edu.au/118020/>.
11. Graves N, Zheng H. The prevalence and incidence of chronic wounds: A literature review. *Wound Practice & Research* 2014;22(1):4–12, 4–9.
12. Graves N, Zheng H. Modelling the direct health care costs of chronic wounds in Australia. *Wound Practice & Research* 2014;22(1):20–4, 6–33.
13. de Carvalho M. Comparison of outcomes in patients with venous leg ulcers treated with compression therapy alone versus combination of surgery and compression therapy: A systematic review. *J Wound Ostomy Continence Nurs* 2015;42(1):42.
14. Mauck K, Asi N, Elraiyah TA *et al.* Comparative systematic review and meta-analysis of compression modalities for the promotion of venous ulcer healing and reducing ulcer recurrence. *J Vasc Surg* 2014;60(S2):S71–S90.
15. Nelson E, Bell-Syer, SEM. Compression for preventing recurrence of venous ulcers. *Cochrane Database Syst Rev* 2014(9):CD002303.
16. O'Meara S, Cullum N, Nelson EA, Dumville JC. Compression for venous leg ulcers. *Cochrane Database Syst Rev* 2012;11:CD000265.
17. Ragnarson Tennvall G, Apelqvist J. Prevention of diabetes-related foot ulcers and amputations: a cost-utility analysis based on Markov model simulations. *Diabetologia* 2001;44(11):2077–87.
18. International Working Group on the Diabetic Foot. 2007 [cited 4 December 2017]. Available from: <http://www.iwgd.org>.

19. Ortegon M, Redekip W, Niessen L. Cost-effectiveness of prevention and treatment of the diabetic foot: A Markov analysis. *Diabetes Care* 2004;27(4):901–7.
20. Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. *BMC Health Serv Res* 2018;18(1):421.
21. Padula W, Mishra M, Makic M, Sullivan P. Improving the quality of pressure ulcer care with prevention a cost-effectiveness analysis. *Medical Care* 2011;49(4):385–92.
22. The World Café Community Foundation. The World Café 2018 [cited 25 January 2018]. Available from: <http://www.theworldcafe.com/about-us/>.
23. SurveyMonkey Inc. San Mateo, California, USA2018 [cited 18 January 2018]. Available from: www.surveymonkey.com.
24. Beaglehole R, Ebrahim S, Reddy S, Voûte J, Leeder S; Chronic Disease Action Group. Prevention of chronic diseases: a call to action. *Lancet* 2007;370(9605):2152–7.
25. Kapp S, Santamaria N. Chronic wounds should be one of Australia's National Health Priority Areas. *Australian Health Review*, 2015.
26. Colagiuri S, Colagiuri R, Ward J. National Diabetes Strategy and Implementation Plan. Canberra: Diabetes Australia, 1998.
27. National Health Priority Action Council (NHPAC). National Service Improvement Framework for Diabetes. Canberra: Australian Government, Department of Health and Ageing, 2006.
28. d'Espaignet E, Bulsara M, Woldenden L, Byard R, Stanley F. Trends in sudden infant death syndrome in Australia from 1980 to 2002. *Forensic Sci Med Pathol* 2008;4:83–90.
29. Linacre S. Australia's Babies: Australian Social Trends 2007 (Catalogue No. 4102.0). Canberra: Bureau of Statistics, 2007.
30. Bray J, Johnson R, Trobbiani K, Mosley I, Lalor E, Cadilhac D. Australian public's awareness of stroke warning signs improves after national multimedia campaigns. *Stroke* 2013;44(3540–3543).
31. Bray J, Mosley I, Bailey M, Barger B, Bladin C. Stroke public awareness campaigns have increased ambulance dispatches for stroke in Melbourne, Australia. *Stroke* 2001;42:2154–7.
32. Bray J, Straney L, Barger B, Finn J. Effect of public awareness campaigns on calls to ambulance across Australia. *Stroke* 2015;2015(46):1377–80.
33. Dessaix A, Maag A, McKenzie J, Currow D. Factors influencing reductions in smoking among Australian adolescents. *Public Health Research and Practice* 2016;26(1):1–4.
34. Wakefield M, Coomber K, Durkin S *et al.* Time series analysis of the impact of tobacco control policies on smoking prevalence among Australian adults, 2001–2011. *Bull World Health Organ* 2014;92(6):413–22.
35. Hurley S, Matthews J. Cost-effectiveness of the Australian national tobacco campaign. *Tobacco Control* 2008;16(6):379–84.
36. Aitken J, Youlden D, Baade P, Soyer H, Green A, Smithers B. Generational shift in melanoma incidence and mortality in Queensland, Australia, 1995–2014. *Int J Cancer* 2017.
37. Cancer Council Victoria. SunSmart program, 2017.
38. Shih S, Carter R, Heward S, Sinclair C. Skin cancer has a large impact on our public hospitals but prevention programs continue to demonstrate strong economic credentials. *Aust N Z J Public Health* 2017;41(4):371–6.
39. Montague M, Borland R, Sinclair C. Slip! Slop! Slap! and SunSmart, 1980–2000: Skin Cancer Control and 20 Years of Population-Based Campaigning. *Health Education & Behaviour* 2001;28(3):290–305.
40. Kapp S, Santamaria N. How and why patients self-treat chronic wounds. *Int Wound J* 2017;14(6):1269–75.
41. Lazzarini P, Mackenroth E, Rego P *et al.* Is simulation training effective in increasing podiatrists' confidence in foot ulcer management? *J Foot Ankle Res* 2011;4(1):16.
42. Lazzarini P, Ng V, Rego P, Kuys S, Jen S. Foot ulcer simulation training (FUST): Are podiatrists FUST with long-term clinical confidence? *J Foot Ankle Res* 2013;6(S1):22.
43. Ng V, Lazzarini P, Rego P, Cornwell P. Is foot ulcer simulation training (FUST) really effective? Participants' supervisors speak out. *J Foot Ankle Res* 2013;6:24.
44. Damien C, Reed L, Kinnear E, Lazzarini P. Evaluating the impact of high risk foot training on undergraduate podiatry students. *J Foot Ankle Res* 2013;07.
45. Lazzarini P, O'Rourke S, Russell A, Derhy P, Kamp M. Standardising practices improves clinical diabetic foot management: the Queensland Diabetic Foot Innovation Project, 2006–09. *Aust Health Rev* 2012;36(1):8–15.
46. Lazzarini P, O'Rourke S, Russell A, Derhy P, Kamp M. Reduced incidence of foot-related hospitalisation and amputation amongst persons with diabetes in Queensland, Australia. *PLoS One* 2015;e0130609.
47. Anderson D, Zlateva I, Davis B *et al.* Improving Pain Care with Project ECHO in Community Health Centers. *Pain Med* 2017;18:1882–9.
48. Lopez M, Baker E, Milbourne A, Gowen Rea. Project ECHO: A Telementoring program for Cervical Cancer Prevention and Treatment in Low-Resource Settings. *J Glob Oncol* 2017;3(4):658–65.
49. Colleran K, Harding E, Kipp B *et al.* Building capacity to reduce disparities in diabetes: Training community health workers using an integrated distance learning model. *Diabetes Education* 2012;38:386–96.
50. Edwards H, Chang A, Finlayson K. Creating champions for skin integrity: final report. Brisbane: Queensland University of Technology, 2010.
51. Nursing and Midwifery Board of Australia. Registration standard: Continuing professional development, 2016.
52. Royal Australian College of General Practitioners. QI & CPD Program: 2017–19 triennium handbook for general practitioners, 2016.
53. General Practice Mental Health Standards Collaboration (GPMHSC). Mental health education standards 2014–2016: A handbook for GPs. Melbourne: The Royal Australian College of General Practitioners, 2013.
54. Ghauri A, Taylor M, Deacon J *et al.* Influence of a specialized leg ulcer service on management and outcome. *Br J Surg* 2000;87:1048–56.
55. Harrison M, Graham I, Lorimer K, Friedberg E, Pierscianowski T, Brandys T. Leg-ulcer care in the community, before and after implementation of an evidence-based service. *Can Med Assoc J* 2005;172:1447–52.
56. Zulkowski K, Ayello EA, Wexler S. Certification and education: Do they affect pressure ulcer knowledge in nursing? *Adv Skin Wound Care* 2007;20(1):34–8.
57. Blouin D, Tekian A. Accreditation of medical education programs: Moving from student outcomes to continuous quality improvement. *Acad Med* 2017.
58. Boulet J, van Zanten M. Ensuring high-quality patient care: the role of accreditation, licensure, speciality certification and revalidation in medicine. *Medical Education* 2014;48:75–86.
59. American Board of Wound Management. Certification Statistics, 2017.
60. Yelland S. General practice and primary care: making a difference at the coalface of wound management in Australia. *Wound Practice & Research* 2014;22(2):104–7.
61. Müller M, Morris K, Coleman K. Venous leg ulcer management: The Royal Brisbane Hospital leg ulcer clinic experience. *Primary Intention* 1999;7(4):162–6.

62. Halstead LS, Dang T, Elrod M, Convit RJ, Rosen MJ, Woods S. Teleassessment compared with live assessment of pressure ulcers in a wound clinic: a pilot study. *Adv Skin Wound Care* 2003;16:91–6.
63. Murphy RX, Bain MA, Wasser TE, Wilson E, Okunski WJ. The reliability of digital imaging in the remote assessment of wounds — Defining a standard. *Ann Plast Surg* 2006;56:431–6.
64. Salmhofer W, Hofmann-Wellenhof R, Gabler G *et al.* Wound teleconsultation in patients with chronic leg ulcers. *Dermatology* 2005;210(3):211–7.
65. Lazzarini P, Clark D, Mann R, Perry V, Thomas D, Kuys S. Does the use of store-and-forward telehealth systems improve outcomes for clinicians managing diabetic foot ulcers? A pilot study. *Wound Practice & Research* 2010;18:164–72.
66. Gray LC, Armfield NR, Smith AC. Telemedicine for wound care: Current practice and future potential. *Wound Practice & Research* 2010;18(4):158–63.
67. Walker J, Cullen M, Chambers H, Mitchell E, Steers N, Khalil H. Identifying wound prevalence using the Mobile Wound Care program. *Int Wound J* 2014;11(3):319–25.
68. Khalil H, Cullen M, Chambers H, Steers N, Mitchell E, Carroll M. Mobile Wound Care Project — Third year and final report. Victoria, Australia: School of Rural Health, Monash University, 2013.
69. Smith E, McGuinness W. Managing venous leg ulcers in the community: personal financial cost to sufferers. *Wound Practice & Research* 2010;18(3):134–9.
70. Bergin S, Alford J, Allard B *et al.* A limb lost every 3 hours: can Australia reduce lower limb amputations in people with diabetes? *Med J Aust* 2012;197:4.
71. Lazzarini P, Gurr J, Rogers J, Schox A, Bergin S. Diabetes foot disease: the Cinderella of Australian diabetes management? *J Foot Ankle Res* 2012;5(1):24.
72. Moore Z, Butcher G, Corbett L, McGuinness W, Snyder R, van Acker K. AAWC, AWMA, EWMA Position Paper: Managing Wounds as a Team. *J Wound Care* 2014;23(Sup5b):1–38.
73. Gottrup F. A specialized wound-healing center concept: importance of a multidisciplinary department structure and surgical treatment facilities in the treatment of chronic wounds. *Am J Surg* 2004;187:38S–43S.
74. Brown A. Implications of patient shared decision-making on wound care. *Wound Care* 2013;June:S26–S32.
75. Abrahamyan L, Wong J, Pham B, *al e.* Structure and characteristics of community-based multidisciplinary wound care teams in Ontario: An environmental scan. *Wound Repair Regen* 2015;23:22–9.
76. Australian Digital Health Agency. My Health Record Statistics, 2017.
77. Anderson K, Hamm RL. Factors that impair wound healing. *J Am Coll Clin Wound Spec* 2012;4(4):84–91.
78. Australian Government. A picture of overweight and obesity in Australia. Australian Institute of Health and Welfare, 2017.
79. Australian Government. Older Australia at a glance. Australian Institute of Health and Welfare. 2017.
80. Horn S, Fife C, Smout R, Barrett R, Thomson B. Development of a wound healing index for patients with chronic wounds. *Wound Repair Regen* 2013;21(6):823–32.
81. Harding K. Wound registries — a new emerging evidence resource. *Int Wound J* 2011;8(4):325.

3M
Cavilon™
Skin Care Solutions

To learn more,
and to request a demo,
please visit our website
[3M.com.au/
CavilonAdvanced](http://3M.com.au/CavilonAdvanced)

Experience
the power
of ultimate
protection

Introducing 3M™ Cavilon™ Advanced Skin Protectant, featuring
3M's revolutionary polymer-cyanoacrylate technology.

What makes it so revolutionary;	Lasts up to 7 days ² , reducing frequency of reapplication ¹	Even attaches to wet, weepy damaged skin ¹ to provide waterproof ² , irritant-proof skin protection ¹
Ultra-thin, transparent barrier protects patients from caustic, corrosive body fluids ¹	Has been shown to reduce the pain of managing incontinence- associated dermatitis ¹	Does not require removal

References: 1. Brennan MR, Milne CT, Agrell-Kann M, Ekholm BP. Clinical evaluation of a barrier film for the management of incontinence associated dermatitis (IAD) in an open label, non-randomized, prospective study. Accepted for publication in *Journal of Wound, Ostomy, and Continence Nursing (JWOCN)*. (n=9). 2. 3M data on file.

3M Australia Pty Limited
ABN 90 000 100 096
Phone 1300 363 878

3M and Cavilon are trademarks
of 3M Company. © 3M 2018.
All rights reserved.