

Wound Care

C A N A D A

SUMMER 2025
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THE OFFICIAL PUBLICATION OF WOUNDS CANADA

**To Heal Or Palliate:
Wound Care In Hospice**

**Diabetic Foot Wound:
Treating A Complicated Case**

**Patient Safety
And Wound Care**

**Decreasing Pressure
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Wounds Canada (www.woundscanada.ca) is a non-profit organization of health-care professionals, industry participants, patients and care partners dedicated to the advancement of wound prevention and care in Canada.

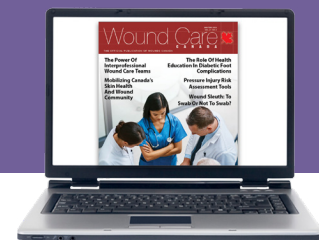
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30 Years Of Advancing Skin Health And Wound Management - And Building Community

This year, Wounds Canada proudly celebrates 30 years of serving the Canadian wound care community - a milestone shaped by our commitment to advancing skin health, improving wound management and strengthening the community of patients who are at risk for, or living with, wounds, along with their families, health-care providers, health decision makers and related organizations and companies.

Since our founding in 1995 by a small group of passionate clinicians, Wounds Canada, originally known as the Canadian Association of Wound Care, has evolved into Canada's leading national charity in skin health and wound care. At the heart of our work is a vision for a healthier Canada where preventable wounds do not occur and everyone receives - equally - the best care.

Our efforts have always been grounded in four strategic areas: education, research, advocacy, and awareness. These pillars provide a foundation for our initiatives and partnerships.

Our focus on education has equipped tens of thousands of health-care providers and public members with the evidence-based knowledge and practical tools they need to deliver high-quality care and self-management. Our programs - whether in the form of conferences, online courses, workshops or community-based learning - have significantly enhanced clinicians' ability to provide care that is not only safe and effective, but also timely, patient-centred and equitable. Education is the foundation for long-term change, helping providers move beyond treatment to emphasize prevention and early, effective intervention.

In parallel, the action-oriented research we have prioritized has played a critical role in informing our work and driving the evolution of care standards nationwide. We have consistently championed the integration of scientific evidence into clinical practice and policy development. Our commitment to research ensures that care delivery today and in the future has, and will have, optimum benefits for patients and their families, care providers and health-care systems, regardless of where they are across the country. Each set of best practice recommendations we develop and each initiative we support is anchored in evidence and aimed at improving health outcomes for all Canadians.

In alignment with the principles that inform our education and research activities, our advocacy is rooted in the principles of high-quality care for all. It involves safety, effectiveness, patient-centredness, timeliness, efficiency and equity. Through strategic engagement with governments, health system leaders and not-for-profit allies, we continue to call for action that reflects these values and addresses the real needs of patients and caregivers.

Awareness ties all this work together. We believe that changing outcomes begins with changing mindsets. Through storytelling, public education campaigns and media engagement, we've helped bring the realities of wound prevention and care into the public consciousness over our entire 30 years. We've highlighted the challenges people face, their resilience and strength and the critical role that informed, compassionate care can play in their lives. In doing so, we've built a national community connected by shared knowledge and humanity.

Our new 10-year strategic plan calls on us to expand our reach and deepen our impact as we look to the future. We are committed to becoming Canada's most prominent and credible wound prevention and management voice. We will continue to grow a strong and sustainable organization, form influential partnerships and lead with innovation and empathy.

This 30th anniversary is a celebration of our past and a reaffirmation of our purpose. We are here for the long haul; to advance care, support providers, patients and families and build a healthier, more connected Canada. Thank you to our staff, volunteers, board members, partners, clinicians and, most importantly, the people we serve. You are the reason we've come this far, and you are the reason we will go even further.

Together, we are advancing skin health and wound care. Together, we are building a healthier Canada.

A handwritten signature in black ink, appearing to read 'M. Botros', with a stylized flourish at the end.

Mariam Botros DCH DE IIWCC

Chief Executive Officer

Wounds Canada



Latest BPRs Engages Health-care Professionals

In February of 2025, *the Best Practice Recommendations for Skin Health and Wound Management 2025 (BPRs)* was released, accompanied by a comprehensive promotion plan to ensure a high level of pick-up. In just two months, a total of downloads of over 30,000 have been recorded and the number continues to rise steadily.

The new *Best Practice Recommendations* are available free of charge at: <https://www.woundscanada.ca/news/752-bpr-new>



Caribbean Wound Network Joins LPA



The Limb Preservation Alliance (LPA) has recently welcomed a new member, the Caribbean Wound Network (CariWN).

The Caribbean Wounds Network is a non-profit association. It's primary objective is to emphasize the significance of prevention and awareness in wound care, ensuring these aspects take centre stage in the provision of health care. CariWN joins founding members of the LPA; Wounds Canada, Canadian Podiatric Medical Association, D-Foot International and the American Limb Preservation Society.

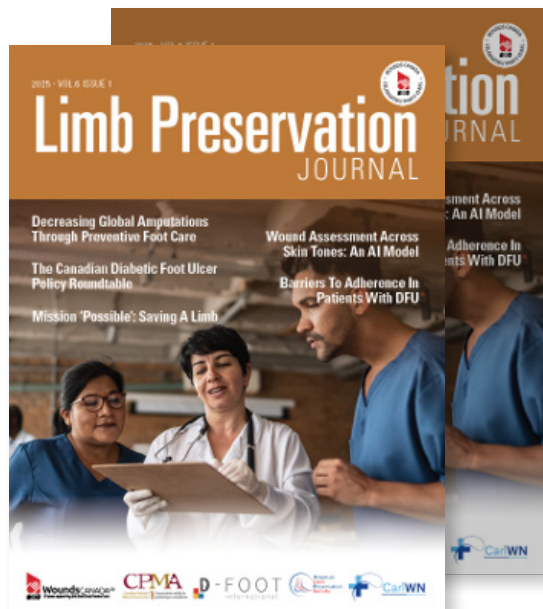
Spring Awareness Campaigns Launched

April was *Limb Loss and Limb Difference Awareness* month and May was *Foot Health Awareness* month. Wounds Canada ran dedicated campaigns with its partners in the Limb Preservation Alliance, including images, videos and resources.



More information can be found on the Wounds Canada website under Awareness Campaigns.

Latest Issue Of *Limb Preservation Journal* Now Online



The 2025 edition of *Limb Preservation Journal* is now available online at: <https://www.woundscanada.ca/news/782-lpj-2025-vol-6-no-1>

This issue features a range of educational and thought-provoking articles on wound care as it relates to reducing amputation rates, written by experts from Canada, the US, Tanzania, Barbados and the UK. Articles include: Mission Possible: Saving A Limb; Global Preventive Foot Care And A Decrease In Amputations: A Positive Step

For Diabetes-Related Foot Complications; A Mission With A Vision: The Canadian Diabetic Foot Ulcer Policy Roundtable and more

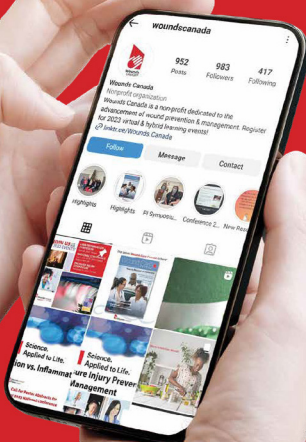
In Memoriam

Wounds Canada is saddened by the recent loss of two valuable members.

Rob Stephen, who served Wounds Canada for many years, first as a volunteer advisor and then as a contracted CPA, passed away in March. Rob will be fondly remembered for his dedicated service and valuable contributions to the organization.

Larry Sawyer, a communication specialist who had been hired only a few months before, passed away suddenly in February. Even though he was with us for only a short time, he had become an effective and beloved member of our team.

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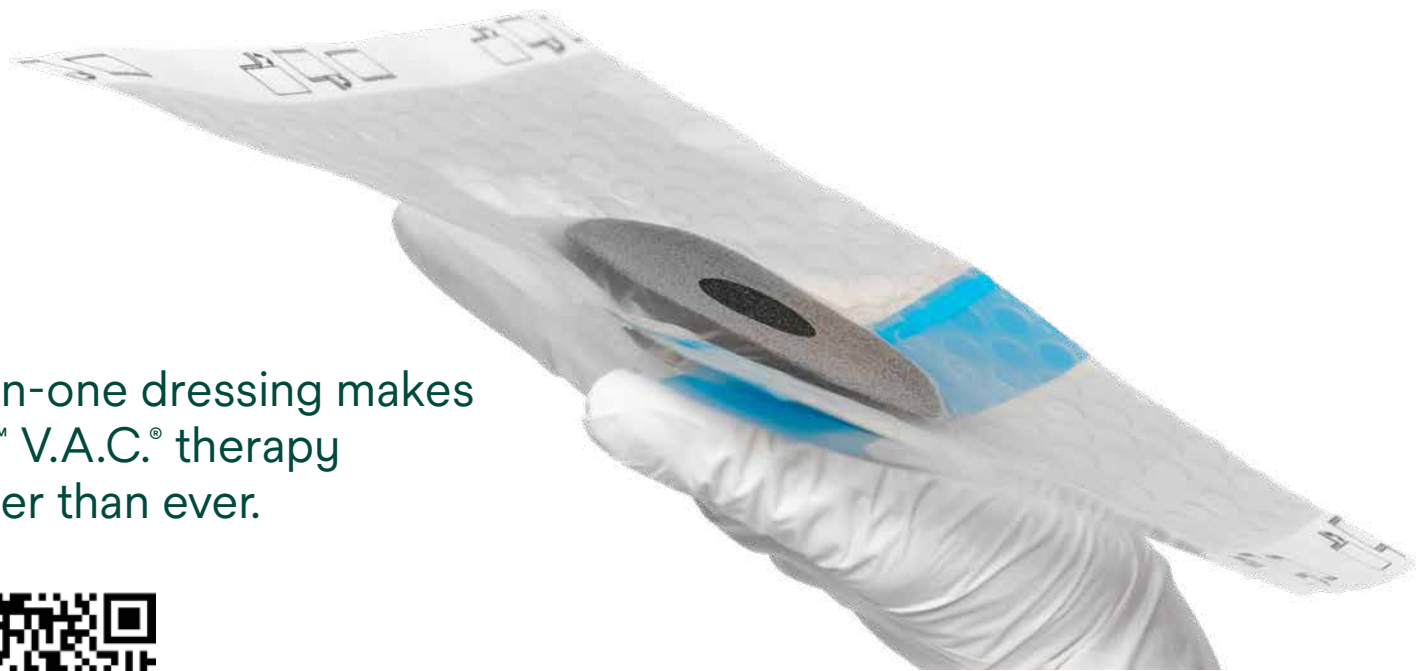
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³ Source: Allen D, Robinson T, Schmidt M, Kieswetter K. Preclinical assessment of novel longer-duration wear negative pressure wound therapy dressing in a porcine model. Wound Rep Reg. 2023;31:349-359. Information contained within conducted animal studies has not been evaluated by the U.S. Food & Drug Administration.

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Diabetic Foot Wound Heals With Early Detection And Care: A Complicated Case

By Catharine Gray BSc PGCE MHLthSc D Ch

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This case study describes the importance of accurately finding the etiological causative agents of a foot wound, considering all aspects of the patient's health and external factors. As age increases, geriatric patients have experienced much more of life, which can often contribute directly to external complicated healing factors that need to be considered. Having type 2 diabetes can be problematic enough, but when treating an individual, it is critical to listen and have good history-taking skills to avoid any assumptions. Building the patient rapport by gaining trust allows for a multifaceted health history to unfold.⁴

People living with diabetes are at an elevated risk for foot wounds, especially those who do not regularly receive preventative measures with or who have multiple co-morbidities. If wounds do not heal, an amputation of the foot or lower limb can ensue, with a mortality rate for those with amputations noted at the five-year mark.⁵ In Ontario alone, there is a lower limb amputation rate of one every four hours.⁶ Prevention and education are keys for early detection and improved health outcomes, by empowering the patient to take care of themselves and their feet.^{7,11}

Obtaining a thorough and complete patient history is a cornerstone of effective medical care. It can never be overstated by those performing care. Excellent patient-practitioner communication skills are necessary to build a framework for healing that connects all the

patient's health conditions.

According to Statistics Canada, Canadians are living longer with an average life expectancy of 81.6 years of age.¹ Mount Sinai Hospital in Toronto defines a geriatric patient as anyone over age 65.² Those who were born in the 1930's may have been exposed to diseases during a time when appropriate vaccinations were not yet developed. As such, consideration must be given to these early conditions when obtaining a good health history. Combining the patient's current health status with the years of life experiences allows for a complete picture, and results in a better treatment regimen. Foot experts, such as chiropodists, combine all the information gathered to put together complete patient management plans.

When a foot wound presents, and a patient is diabetic, assumptions may be made about the

cause of the wound. The patient in this particular case had polio as a child, as well as other conditions that added to a complex care plan to heal the wound. The patient's foot biomechanics loaded pressure onto the area of the wound.³ Without addressing the biomechanical changes and with the presence of diabetes, a different outcome may have prevailed.

Facts About Diabetes Foot Ulcers

- There are approximately 5.7 million Canadians living with diabetes (type 1 & type 2 diagnosed + type 2 undiagnosed).
- There are 11.7 million Canadians living with diabetes or prediabetes, a condition that, if left unmanaged, can develop into type 2 diabetes.
- Approximately \$30 billion CAD per year is spent on diabetes services.
- The lifetime risk for foot ulceration in people with diabetes is higher, at 19–35%, compared with the general population.
- Up to 25% of the nearly 5.7 million Canadians living with diabetes will develop a diabetic foot ulcer in their lifetime.
- Collectively, the health-care costs associated with diabetic foot ulcers amounts to \$750 million annually.

Source: Best Practice Recommendations For Skin Health And Wound Management 2025. Toronto (ON): Wounds Canada; 2025

Presentation

This clinical case is based on an elderly male diabetic patient's foot wound. The patient had a history of polio and is living with post polio syndrome (PPS).⁸ As a child, the polio affected his left limb. He was also hit by a car in the late 1940's. The motor vehicle accident (MVA) required reconstruction surgery of the left limb, and he was in rehab for a year, with extreme physiotherapy. The results left him with plates in the femur and screws in the hip; with no feeling remaining in the foot of the affected left limb. Muscle atrophy was also a result that left him with an abnormal gait pattern, and permanent neuropathy in his left foot.

Type 2 diabetes was his the most recent contributory factor for a wound to develop; however, the wound could also be related to his childhood health issues. The patient was educated by the chiropodist to focus on his diabetes for any foot-related complications. Since polio had preceded the MVA, it was not the foremost concern to the patient compared to the MVA. When giving responses to his health history, polio therefore was not mentioned.

Clinical Findings

The patient's foot wound occurred during the COVID-19 pandemic. Virtual phone visits to the family physician were being conducted at the time, adding the complexity of lacking access to a quicker source of action. Many challenges persisted during that time to keep the patient's wound from healing.⁹ The patient did contact COVID-19 post vaccinations, however, no long-term effects have been experienced.

At the time the patient sought treatment for the foot wound, he was an 85-year-old healthy male with type 2 diabetes and had a varied health history. His diabetes was controlled with diet and

metformin for 16 years. He is now in his 89th year and stays very physically active.

The presentation of a left first plantar wound appeared post-debridement during the COVID-19 pandemic.

The patient had also suffered with bouts of gout attacks in both first digits for many years and was on allopurinol for prevention of flare ups. The patient was diagnosed with diabetes in 2009. There was no familial history of diabetes. Diet was controlled for a few years and he graduated to increased dietary changes and metformin. Currently, he takes Jardiance™. He checks his blood twice a week, averaging 6.5mmol/L in his blood sugar readings.

Other major ailments that affect his gait and were job related include osteoarthritis in both knees, with replacements to the left in 2000, and to the right in 2008. Occupations throughout his life included odd jobs as a teen, a journeyman plumber for his father's business and factory worker in a winery, before become a firefighter for 30 years. At the time there were no work accommodations made for his physical limitations. Resilience and fortitude encompassed all aspects of fulfilling employment expectations. He has been married for 67 years with two children and two grandchildren.

Care Plan

The patient is a member of a family health team and is fortunate to have an interdisciplinary care team at his disposal. Dietitians, nurse practitioners, chiropody and the family doctor were some members of the primary care team following his health status. The *Inlow's 60-Second Diabetic Foot Screen* tool was regularly used as a screening tool for the patient's foot health.¹⁰ Both feet were systematically checked using the tool in order to note any changes to his foot health.¹²

During COVID-19, the foot in question, became an issue with disruptive changes to routine care, and healthy exercise habits. Upon noticing changes to the integrity of the skin, a visit to the chiropodist helped in early detection. Debridement of the wound and overlying tissue callus took place weekly. The wound was dressed by the chiropodist, and the patient followed until he could more manage the treatments of dressing and checking the wound himself.

At the height of the wound breakdown, offloading by a walking cast aided in taking the pressure completely off the wound of the affected toe. Custom-made orthotics were manufactured by the chiropodist to accommodate, and deflect pressure away from the wound, thereby offloading pressure from it.³ The wound went on to healing in six months time, delayed by some patient compliance issues and poor footwear that did not accommodate the orthotics.



Figure 1: Open Toe Wound **Figure 2:** Closed Toe Wound

Discussion

Practitioners are often quick to see what presents in front of them with a patient and can combine this with their knowledge of body systems. Obvious connections can be made when a patient presents with diabetes and a foot wound is located around the highest pressure. When

the practitioner is formalizing treatment of the condition, all other social and health factors are essential and must be considered by the practitioner; otherwise, vital pieces of the healing puzzle can be missed.

Excellent communication skills are needed by the professionals when a patient presents with a complicated historical past. Listening to the patient for 'cues' could aid in a faster positive health outcome for them. In gaining the trust of the patient, more open dialogue is encouraged and can lead to a full, and complete patient history.⁴

This patient has lived to a good age, with a long history of complicated ailments, such as polio and post polio syndrome (PPS), as well as a major car accident that changed his musculature and affected his biomechanics and the gait cycle. An increased amount of pressure distributed onto the toe during push off in the gait cycle contributed to the formation of the wound. Diabetes alone was not the sole causative factor in this patient's case. Understanding the complete historical picture of the patient allowed for a prognosis that took all factors needing to be addressed into account and was thus believed to be particularly appropriate and good for him.

Footcare protocols for diabetics were followed using the *Inlows 60-second Diabetes Foot Screen*, initially to set up the baseline of foot health for this patient. Once changes to the area presented, immediate treatment by a chiropodist (for debridement), dressing of the wound and offloading were performed. This treatment regime allowed for the tissues to heal in an abbreviated period. Long-term planning incorporated the PPS biomechanic effects from the MVA changes. Orthotics in improved footwear reduced the increased pressure and redistributed it so that the foot and limb would function closer

to 'normal.' A healthy foot that continues to be checked by the patient and professional team was the result.

Five years on, and there has been no reoccurrence of a wound to the area.

The question remains: was it a true diabetic wound

or the effect of a complex patient history of PPS, and other contributing factors combined? More research in post polio syndrome, and the intersection with diabetes is needed.



Figure 3: Patient from the back

Catharine Gray BSc PGCE MHLthSc D.Ch is the emeritus Academic Chair and Discipline Head of Chiropody at The Michener Institute of Education at University Health Network, Toronto. She is clinical faculty at the Michener Chiropody Clinic and practices at the Niagara Medical Group Family Health Team in Ontario.

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30 Years of Publishing At Wounds Canada: Sharing Ideas And Making A Difference

By Sue Rosenthal BA MA

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Started in 1995 with the initial purpose of holding an annual conference for health-care professionals, Wounds Canada, known until 2017 as the Canadian Association of Wound Care, really started to experience significant growth in 2002.

At that time, the need was growing within the professional wound care community for made-in-Canada information, and Wounds Canada was particularly well suited to meet it. By then the organization had strong connections to clinical

experts from across the country who were able and willing to share their expertise with the wider community. Organizational viability and the expertise of internal personnel provided the platform and support for expansion into an exciting new area of activity: publishing.

Now, in 2025, we are thrilled to present highlights of 30 years of communicating about skin health and wound care to Canadian and global communities through our

major publications. This is a chance to celebrate the authors—from first-timers to seasoned veterans—who have contributed to the many thousands of pages created to advance our common cause. They have come from all across the country—and around the world. They are health-care professionals, administrators, decision makers, patients and family members, who together bring a richness of voices with important information and perspectives to share.

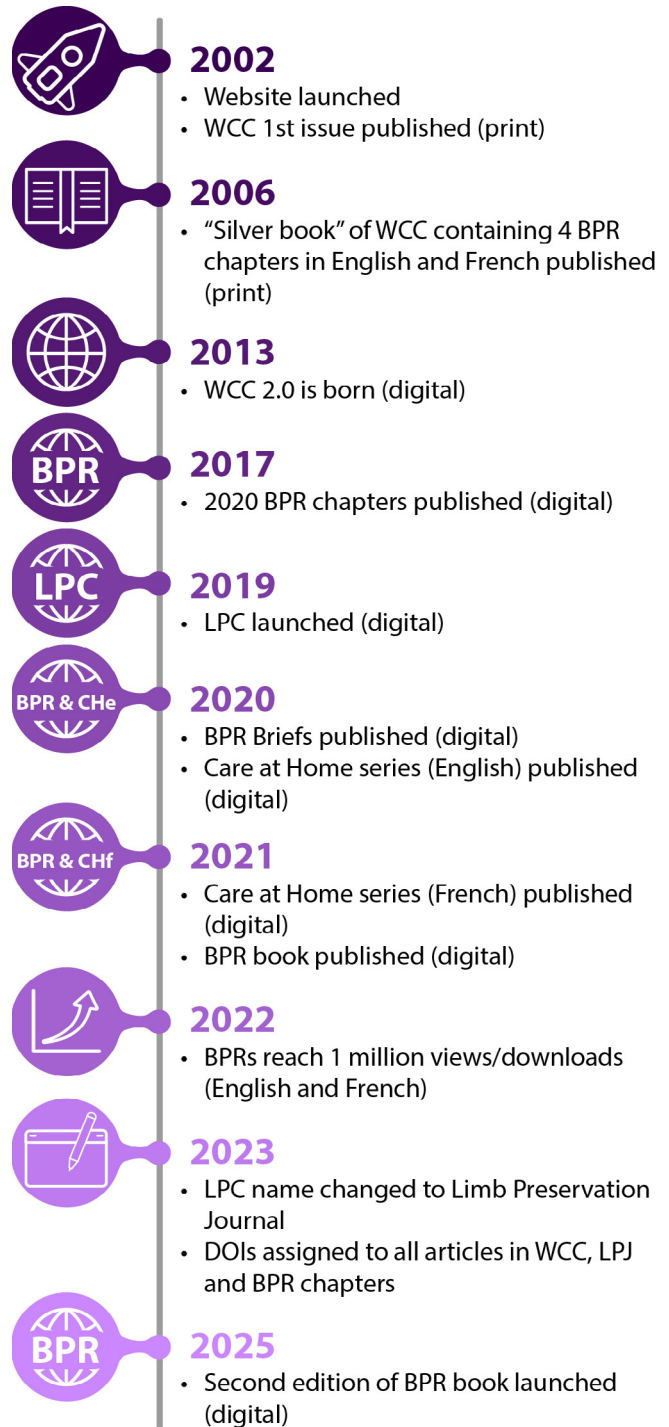
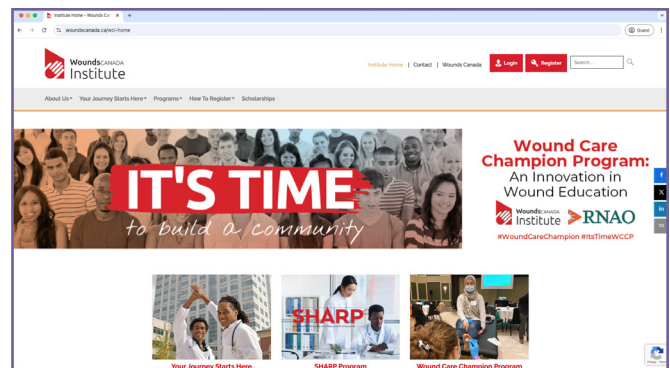
The contributions of our advisory/editorial board members—all volunteers—cannot be overstated, as these dedicated individuals have continuously provided their expertise over the decades to ensure that the content of every issue is of high quality.

It is also our opportunity to acknowledge the many behind-the-scenes experts without whom the publications wouldn't be possible. These are our editors, education specialists, graphic artists and technical wizards who turn the authors' words into the finished article, book or resource and then make it available for all to access.

Another essential element has been the sponsors who contribute to two of our major publications through ads and sponsored content. Many of them have been supporters since the beginning, allowing Wounds Canada to build its publishing capacity over the years.

None of the publications could have existed and flourished without the visionary leadership of the Executive Directors/CEO of Wounds Canada, who fearlessly supported our move into the world of publishing.

Following is a quick walk down memory lane for our four major publications: the Wounds Canada website, *Wound Care Canada (WCC)*, the *Best Practice Recommendations* and *Limb Preservation Journal (LPJ)*.



By the early 2000s, public use of the internet had been steadily growing, even though the technologies to create pages and access them were very crude (remember dial-up?). Always looking for opportunities to provide more and better information and to reach more members of the wound care community, then-Executive Director Cary Steinman, the board and I decided to jump on the 'World Wide Web' bandwagon and create our first website. Shane Inlow, a board member (and instigator of the *Inlow 60-second Diabetic Foot Screen* tool) and I worked together to create what would become the first of many versions, each with more content and better functionality. Launched in 2002, the site has become Wounds Canada's 'storefront', a virtual space that grows and changes constantly, responding to the communities' needs for articles, tools, videos, education and more. It's open 24 hours a day, seven days a week, so please drop by any time (<https://www.woundscanada.ca>).

Website Facts

- The site contains many thousands of pages of material—most available for free download—to address the needs of the multiple audiences of Wounds Canada.
- Most areas of the website have open public access but some sections, like the members-only area, require registration and/or membership.
- In the past 10 years alone, over 16 million web "articles" have been requested from the site by users.
- The majority of users are from Canada, followed by the U.S.; China and India make up a growing audience; Europe remains a small but consistent group.

Wound Care Canada (WCC)



The website wasn't the only major publishing event of 2002. That was the year *Wound Care Canada* was launched as well.

In 2001 I started thinking about how Wounds Canada could better serve our health-care professionals looking for best-practice-based Canadian content. My first thought was to create a peer-reviewed journal. But as there were already several excellent—and long-standing—journals out there (though not based in Canada) this didn't feel like a viable or useful approach. Over the year I determined that what was missing was a bridge between the type of research-focused articles featured in these journals and the needs of generalist frontline practitioners. The majority of clinicians doing wound care were non-experts, and they needed a publication that translated the latest research into reader-friendly content that was clear, understandable and easily applied to their practice.

Once again, Executive Director Cary Steinman provided full-on support and created the publication team that put together the first issue,

which came out in 2002. From 2002 until 2009, I was Editor. Cathy Harley was the Associate Editor, ensuring optimum connection with the other major wound care organization in Canada, NSWOCC, known at the time as Canadian Association for Enterostomal Therapy (CAET), for which she was, and still is, Executive Director/Chief Executive Officer. BCS, a communications company based in Toronto, was hired to oversee the layout, printing and mailing.

A subsequent change of leadership at Wounds Canada resulted in a change for *Wound Care Canada* too, when Fiona Hendry took over as Editor, from 2010 to 2013.

In 2013 new Executive Director Peggy Ahearn asked me to come back as Editor. Wounds Canada's Art Director Robert Ketchen agreed to take over the graphic design, and we were able to move all production in house. We decided it was time for a friendlier design, so after some retooling *WCC 2.0* was born. The magazine switched formats to digital only and was free for anyone to download from the website, significantly expanding our reach and lowering costs.

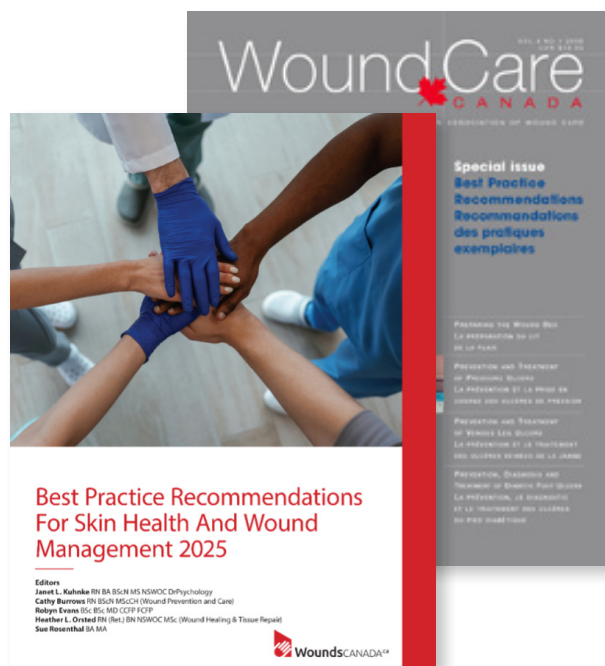
In mid 2022 Ian Corks took over from me as Editor. I had first met Ian some 20 years earlier, when he was part of the team at BCS Communications working on *WCC*. It is wonderful that I could pass the major publications into the very capable hands of someone whose connection to Wounds Canada spans decades.

Beginning in 2007 and continuing through today the *Wound Care Canada* team produces occasional supplements to *WCC* that provide information on specific topics. Issues have included *Our Voices, Our Stories: A Patient Journey Initiative* and *An Overview of Advanced Therapies in the Management of Diabetic Neuropathic Foot Ulcers*

WCC Facts

- Two issues of *WCC* are produced annually.
- 56 issues (including this one) have been produced since 2002.
- The first *Best Practice Recommendations* Wounds Canada produced were considered a supplement to *WCC*—nicknamed “the silver book”—before they became their own publication.

Best Practice Recommendations (BPRs)



The *Best Practice Recommendations* (BPRs) are, without doubt, the most-read wound care publication in Canadian history, with the 2017–2019 edition alone reaching well over 1 million views/downloads. They have existed in some form at Wounds Canada since 2006, first delivered through *Wound Care Canada* and then on their own starting in 2017. Updated on a five-year cycle to keep them relevant and current, the second

full edition—with new chapters, hundreds of links and additional appendices—was launched in February 2025.

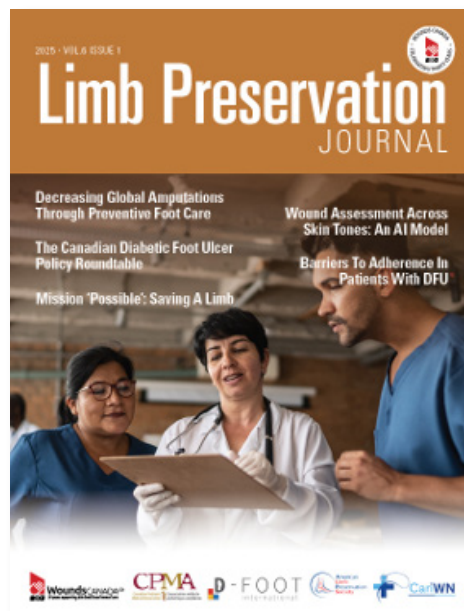
Chapters include best practice recommendations for moisture-associated skin damage, skin tears, pressure injuries, burns, surgical wound complications, arterial ulcers, diabetic foot complications, venous leg ulcers and lymphedema, as well as chapters how to use the recommendations documents, and overviews of skin physiology and wound healing and an essential overview of general skin health and wound management.

Chapter 1: Introduction provides a short history of the evolution of the BPRs, if you'd like to read further.

BPR Facts

- 112 clinical expert authors contributed over the history of the BPRs, building on and updating the work of their predecessors.
- For every chapter over the years, there was also a team of specialists that included multiple editors, graphic designers, illustrators and education experts.
- The recommendations are presented as a complete book and as chapters that can be downloaded individually.
- The *BPR Briefs* are a condensed version of the full *BPR* chapters and serve as a quick reference guide for clinicians and policy makers.

Limb Preservation Journal (LPJ)



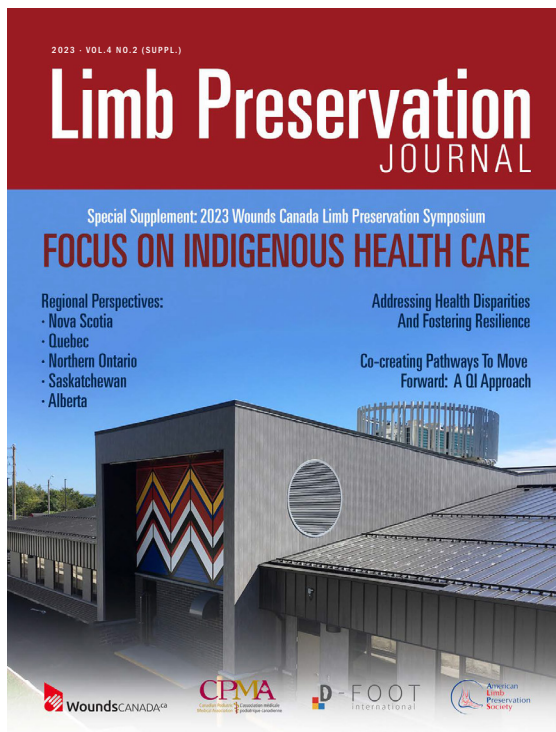
The newest member of Wounds Canada's major publications family is *Limb Preservation Journal*, which was launched in 2019. It began as a supplement to *Wound Care Canada* to provide a summary of the sessions offered in the *New Perspectives in Diabetic Limb Preservation* symposium held in Toronto in May of that year. In my editorial in that first issue I wrote: "... we knew a single supplement wouldn't satisfy the knowledge needs of Canadian researchers, clinicians and policy makers working in this area - and especially the needs of those not yet involved with this very serious and complex topic. As a result, we decided to create an annual, standalone publication - *Limb Preservation in Canada* - and turn it into a peer-reviewed journal aimed at advancing knowledge and its application to practice, research and policy making for this growing community."

As always, the support and contributions of the CEO, Mariam Botros, our internal team and the community at large were essential. Vascular surgeon, wound care clinician and researcher Dr. Ahmed Kayssi came on as Editor-in-Chief for

the second issue and has remained in place to drive the journal's direction. Ian Corks took over as Editor in 2023 and oversaw the name change to *Limb Preservation Journal* to better reflect the nature of the content and increased global scope of the publication.

LPJ Facts

- 1 issue per year
- In 2023 a special supplement of *LPJ*, *Focus on Indigenous Health Care*, highlighted the work of groups from across Canada who are working hard to improve the amputation prevention supports available to Indigenous and other communities.
- Current publication partners include: Canadian Podiatric Medical Association, D-Foot International, American Limb Preservation Society and CariWN.



Care At Home Series



At the start of the COVID-19 pandemic, many patients were unable to access the care they needed. We decided to help to fill the gap by creating a set of resources patients and their families could use to enhance their skin health and prevent or care for wounds at home. The *Care at Home* series, an 82-page book or 10 separate chapters, is available for free download in English or French at <https://www.woundscanada.ca/patient-or-caregiver/resources/care-at-home-series>. Apparently, the need for this type of information continues, as *Care at Home* book and individual chapters have been downloaded or viewed over 170,000 times to date. We encourage you to share them with your patients.

Always Improving

Over the 30 years the number and types of publications have grown and changed. We've always looked to innovative technologies to add improved functionality (like hyperlinks to other resources), increase our reach and lower our production costs (printing and mailing are very expensive!).

Find It Fast!

Beginning in 2023 DOIs have been added to all new articles and chapters in our major publications. DOIs (Digital Object Identifiers) are valued by authors and help readers locate articles regardless of where they reside on the internet, even if they have moved from an originally linked location.

What's Right For You?

The publications showcased in this article are tailored to specific audiences, though readers outside the targets might find them useful too.

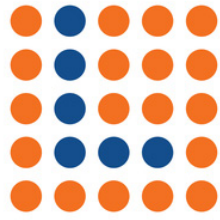
- The website has something for everyone, but it is divided by reader 'type.' When you explore the site, you may find it useful to check out every area. For example, if you are a clinician, visit the *Patient* or *Caregiver* section to see what resources are available for your patients. This section contains easy-to-use tools that can help you communicate with your patients or that you can refer them to to support their self-management.
- *Wound Care Canada* (WCC) is aimed at any clinician or health decision maker looking for a wide variety of useable skin health and wound management information. The articles are of different lengths and are presented in

different formats to best support the content and enable application to practice.

Wound-related news is also featured.

- The *Best Practice Recommendations* combine the latest research, consensus documents, guidelines and more into practical recommendations for clinical practice and policy development. They are essential reading for any frontline clinician doing skin health and wound care, as well as for relevant administrators and policy makers. The very specific information provided is not directed at patient and caregiver readers, but they may nonetheless benefit from reading about the general processes outlined.
- *Limb Preservation Journal* provides a deeper dive into lower limb health than *WCC* would. As it is more specialized, its community of readers tends to be as well. This publication has a more academic perspective but still conveys information in a way that the average clinician or policy maker with an interest in limb health would be able to understand and apply in real-world settings.
- *Care at Home* offers a set of resources for patients and their families to use to enhance their skin health and prevent or care for wounds at home.

Sue Rosenthal BA MA started working with Wounds Canada in 2000. She is founding editor of *Wound Care Canada* and *Limb Preservation Journal* and Co- Editor (with Heather Orsted) of *Foundations of Best Practice for Skin and Wound Management* (2021). She is currently Strategic Advisor for Wounds Canada.

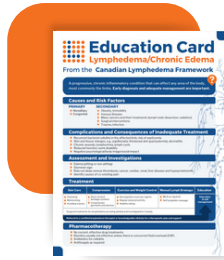


Resources for Lymphedema



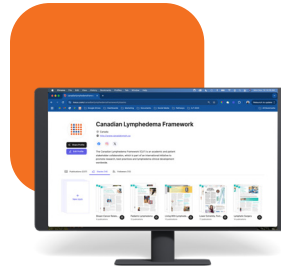
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Wound Cleansing vs. Wound Hygiene: What Is The Difference?

By Melissa Gosse RN BN MSc (Wound Management & Skin Integrity)
IIWCC-CAN

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Clinicians across all care settings are frequently faced by 'healable' wounds that simply will not heal, despite the fact that, by definition, these 'healable' wounds have adequate blood supply and the causative factors can be eliminated, managed or treated with the goal being full wound closure.¹ These hard-to-heal wounds are those that do not progress through the

four phases of wound healing: hemostasis, inflammation, proliferation and maturation without complications.¹ The term hard-to-heal will be utilized throughout this article to refer to wounds that are not progressing towards healing as expected.² Recent literature is refraining from using the term 'chronic', as it imparts a message that the wounds condition is irreversible and

non-healable.² Previously, literature stated that biofilm was present in 60-90% of hard-to-heal wounds, however, recent literature suggests that all hard-to-heal wounds are presumed to have biofilm, as there is no gold standard to diagnostically identify the presence of biofilm.³

Hard-to-heal wounds and non-viable tissue are an ideal environment for bacteria and the formation of biofilm.⁴ Biofilm is an aggregate of bacteria in a matrix of extracellular material tolerant to antimicrobial treatment and the host defense.⁵ Wounds burdened with biofilm typically experience a dysregulated, hyper-inflammatory response as bacteria evades the immune response and disables skin barrier function.² Wound biofilm can be embedded in non-viable tissue, debris and the wound dressing itself, as well as both superficial and deep tissue.³ Although biofilm is suspected when a thick slimy clear substance is apparent in the wound bed, current science has demonstrated that biofilms cannot be seen by the naked eye.³ Biofilm has a detrimental impact as it leads to tissue damage and delayed wound healing.⁴

Given its impact, there is a consensus on the need to remove biofilm and then prevent its reformation. How does one do this? Wound management is a complex process, as highlighted when considering all of the components of the Wound Bed Preparation Paradigm.⁷ (See box.) The Wound Bed Preparation Paradigm was first published in 2000 and has gone through periodic updates, with the most recent being 2021. This paradigm was developed to optimize chronic, or hard-to-heal, wound treatment through the management of the wound to promote healing and facilitate the effectiveness of therapeutic interventions.⁷ Often, the basics, such as thorough wound cleansing, are underestimated, despite the fact that wounds must be clean to heal.

Wound cleansing is defined as actively removing surface contaminants, loose debris, nonattached non-viable tissue, microorganisms, and remnants of previous dressings from the wound surface and its surrounding skin.³

The *Wound Bed Preparation Paradigm* can be accessed at:

https://journals.lww.com/aswcjournal/fulltext/2021/04000/wound_bed_preparation_2021.4.aspx

Although fundamental, is wound cleansing alone enough to tackle biofilm? For decades, dental literature has focused on oral hygiene and inflammation caused by biofilm, defined as gingivitis. It is recognized that adequate oral hygiene encompasses measures beyond simply brushing one's teeth to prevent and manage gingivitis. Comparatively, wound hygiene was introduced to combat wound biofilm. An anti-biofilm approach needs to be implemented when wounds are unable to be prevented and are hard-to-heal, despite being considered healable. Wound hygiene aligns with the Wound Bed Preparation Paradigm, as it is a practical approach in preparing wounds for healing, specifically those determined to be hard-to-heal, through cleansing, debridement, refashioning and dressing.⁸

Not only do hard-to-heal wounds have a detrimental impact on quality of life, while increasing morbidity and mortality, they have a crippling impact on the health-care system. In addition to the impact on the workflow, the cost of wound care in Canada in 2022 was over \$11 billion CAD.⁹ Wound management efforts need to adopt a more proactive approach.

Discussion

For decades Canada's population has been aging and is projected to keep aging; the number and proportion of older adults has been steadily rising placing additional pressure on several sectors, including health care. In 2021, 7.3 million Canadians were over the age of 65, representing nearly 20% (or 1 in 5) of the Canadian population.¹⁰ Also, the number of seniors over 80 years of age is growing rapidly, as the average 65-year-old Canadian can expect to live an additional 21.0 years, although the risk of developing chronic diseases increases with age.¹¹ As we know, increased age and comorbidities increase the risk for wounds and wound complications.¹²

It has been established in the literature that the management of complex hard-to-heal wounds primarily occurs at home, whether that is by home care services or health-care teams in long-term care settings.¹³ In 2021, 7.1% of seniors in Canada lived in long-term care facilities with a number of Canadians awaiting placement.¹⁴ Also in 2021, 8.4% of Canadians aged 65 and older used home care services.¹⁵ The number of, and need for, long-term care beds in Canada is expected to increase as the population ages, along with the need for home care services.¹⁴ As we can see, many senior Canadians living with complex wounds are receiving care to manage their wounds at home, whether that is their home in long-term care or the community; therefore, the following discussion will have a focus on the long-term care and home care settings.

Wound cleansing is an instrumental part of wound bed preparation to optimize the wound environment by removing debris and reducing bacterial load, preventing biofilm activity.¹⁶ However, due to the tenacity of biofilm, wound cleansing is not enough. The removal of biofilm

is of clinical importance due to its impact on delayed wound healing and hard-to-heal wounds, and will require a multifaceted anti-biofilm approach, through targeted wound hygiene.³

Wound hygiene was formally introduced in 2019 and has gained its own identity as an anti-biofilm approach.⁸ This comprehensive four-step protocol of proactive wound healing has been proven effective in research studies and is being increasingly used across wound care as a direct result.³ Wound hygiene encompasses cleansing the wound and peri-wound, debridement to remove non-viable tissue, foreign bodies, and biofilm, refashioning the wound to refresh the edges and dressing the wound to manage moisture.⁸

Although the importance of wound hygiene is highlighted throughout the local wound care component of the Wound Bed Preparation Paradigm, it's critical to remember the importance of all components of the holistic assessment and ensure all causes of delayed healing are identified and addressed.¹⁷

Implications For Practice

Wound bed preparation supports clinicians in identifying and addressing the barriers of healing to create an optimal healing environment.³ This approach focuses on cleansing and debridement to prepare the wound bed for healing.⁷ For healing to occur, biofilm must be managed, therefore wound hygiene is necessary for the local wound care component of the Wound Bed Preparation Paradigm and implemented at every episode of wound care until full healing occurs.⁶ The term hygiene was selected as an intuitive term to resonate with clinicians as the expected standard, as general hygiene activities are accepted as repetitive, regular, frequent and necessary - rather than something done on

occasion.¹⁷ Wound hygiene is a flexible strategy that can be implemented by all practitioners on some level, regardless of their expertise or specialty.¹⁷

A Four-step Process

This four-step process involves wound cleansing, debridement, refashioning the edges, and product selection, and is imperative for all wounds, especially hard-to-heal ones.⁸

1. Wound Cleansing

Cleansing the wound and periwound skin is fundamental to decontaminate the area and prevent recolonization of the wound originating in the wound bed, or on the surrounding skin.⁸ There are many practice considerations regarding cleansing, as wound hygiene was designed to be non-specific and individualized, therefore the wound cleanser and method is based upon the comprehensive assessment by the clinician.¹⁷

Clean versus sterile technique: There is no consensus in cleansing techniques for hard-to-heal wounds.³ The decision regarding the appropriate aseptic technique is made based on clinical condition, the wound etiology, the wound location, the invasiveness of the dressing procedure, the goals of care and facility or agency policy.³ However, hard-to-heal wounds require vigorous therapeutic cleansing to dislodge loose devitalized tissue and biofilm, which is a form of mechanical debridement;³ another example regarding how all clinicians are able to provide some level of wound hygiene. Research supports cleansing the wound with as much vigour as the individual can tolerate, as pinpoint bleeding will stimulate the release of growth factors

to kickstart the formation of healthy tissue.¹⁷

Clinicians must also consider current best practices, as well as the wound assessment and goals of care.¹² For example, when moist wound healing principles do not apply, cleansing products are selected to maintain a dry wound environment. There are several other considerations regarding wound cleansing. For hard-to-heal wounds, antimicrobial cleansers may have some limitations due to the tenacity of biofilm. However, when biofilm has been disrupted, for example after debridement, there is a window of opportunity for antimicrobial cleansers to take effect.³ Research also supports the use of surfactants for wound cleansing.¹⁷

Consider the risk versus benefit.⁷ For example, cleanse a skin tear gently as initially it is an acute wound, and the aim is to maintain flap viability, versus a pressure injury that has developed over time, and you expect there to be biofilm. Balance the priority of new tissue growth with removal of bacteria.⁷ Such factors will determine the vigour, the solution and the technique.³ Hard-to-heal wounds require purposeful, thorough and frequent cleansing for an anti-biofilm approach, in addition to debridement and use of topical antimicrobial agents through cleansers and dressings.¹⁶

2. Wound Debridement

Debridement involves the physical removal of biofilm, devitalized tissue and foreign debris through biological, enzymatic, mechanical, autolytic and sharp debridement methods.¹² Additionally, methods need to align with the individuals goals of care, the wound assessment,

including classification and healability, as well as available resources, the clinicians scope of practice and limitations of the environment and health-care system.¹⁸ There are several considerations when making decisions regarding debridement, as not all wounds should be debrided by all methods. It is important to note that debridement of a wound that does not have adequate perfusion is not supported by best practice.¹² Other considerations include pain management, risk of infection, care setting, cost and availability of resources, as well as the medical status of the individual, including comorbidities.³ An additional consideration is whether the method is selective, in targeting only non-viable tissue, or non-selective by removing non-viable tissue and potentially damaging surrounding viable tissue.⁷

Due to the increased tolerance to antimicrobials that biofilms have, debridement is a necessary intervention in managing adherent biofilm within a wound.³ In hard-to-heal wounds, at least some form of conservative debridement of non-viable tissue is required to manage moisture, promote comfort, and prevent the wound from deterioration or infection.⁷ For example, vigorous cleansing is considered a form of mechanical debridement.⁸ There is often controversy and confusion regarding 'who' can debride. Wound hygiene is a flexible strategy so it can be implemented by all practitioners on some level, regardless of their expertise or specialty - even if it is as simple as vigorously cleansing a wound or collaboration with the interprofessional team to ensure hard-to-heal wounds are adequately and appropriately debrided.¹⁸

There is always something that can be done as long as clinicians work within their scope of practice and local policy and procedure.⁸

Debridement remains essential for promoting healing, preventing and controlling infection and inflammation by reducing bacterial load, as well as facilitating proper visualization of the wound bed, allowing the clinician to properly assess and make appropriate treatment decisions.¹⁸ Sharp debridement should not be used as the sole treatment modality, as it does not remove all biofilms and prevent the reformation, highlighting the importance of all four of the wound hygiene steps.¹⁹

3. Refashion the Edges

Refashioning the wound involves the removal of irregular, necrotic and crusty non-viable wound edge tissue that may be nurturing or sustaining biofilm.⁸ Properly maintaining wound edges to reduce the bacterial load and remove the physical barriers of epithelial growth is recognized as an integral component of the Wound Bed Preparation Paradigm.⁷ Decontaminating and refreshing of the edges, ensuring the skin edges are even with the wound bed, promotes epithelial advancement and facilitates wound contraction.¹⁷

4. Product Selection

Dressing the wound involves the selection and application of a product that will maintain a healthy wound environment until the next episode of care.⁸ A common misconception is that product selection and application is the key to successful wound management. Remember, if the wound is hard-to-heal and not responding to standard wound care practices, it should be assumed that

tolerant microorganisms within a biofilm are present.³ Therefore, product selection and application are insufficient without first cleansing, debriding, and refashioning the edges.¹⁶ These activities, supplemented with appropriate antimicrobials, during a therapeutic window while biofilm is disrupted, is imperative.⁵ Given that a wound with biofilm is not clinically infected, antibiotics cannot eradicate biofilms. Therefore, antimicrobials are the preferred treatment to effectively manage residual bacteria to prevent and delay the regrowth of new biofilm.⁵ Another fundamental consideration is the amount of wound exudate. Moisture management is imperative as exudate supports the proliferation of biofilm.³ It is also critical to select products to protect the periwound.¹⁷ Consider the goals for the individual and their wound.⁷ Is this wound healable, non-healable, or maintenance requiring? Is the priority addressing bacterial burden or preventing tissue toxicity? This could be a healable wound where the goal is to promote granulation, or this could be a palliative wound where the focus is on moisture control, odour and keeping it free from infection.

As demonstrated, there is no preferred product as wound hygiene was designed to be non-specific.¹⁷ It is simply about navigating through the Wound Bed Preparation Paradigm and making decisions based on the comprehensive assessment.⁷ What works for one wound may not work for the other. It is paramount to understand the assessment findings and the products available. Consider the wound size and location to choose something that will

appropriately dress the wound and stay in place. Other core considerations include cost, availability and wear time.¹²

Just because a wound has a biofilm doesn't necessarily mean that it's infected or needs to be clinically treated as an infection.³ Inflammation does not mean infection.⁶ Remember, biofilm is an organization of bacteria and microorganisms that build up in a wound.⁵ Generally, micro-organisms pose no threat to the host, unless the skin is damaged, such as by a wound, allowing entry into the system.³ If a biofilm is not managed correctly, it can lead to infection.¹⁶ However, the presence of biofilm does not mean that the wound is clinically infected.⁵ Wound hygiene is a relatable concept supporting diligent wound management practices to address barriers to wound healing, such as biofilm, while aligning with antimicrobial stewardship.¹⁷

Conclusion

Hard-to-heal wounds contribute to morbidity, mortality and increased health-care costs.¹² Given the microscopic nature of biofilm, research supports that clinicians assume all hard-to-heal wounds that have failed to respond to standard treatment contain biofilm, especially as there is no gold standard diagnostic test to confirm the presence of wound biofilm.¹⁶ Furthermore, the increase in antimicrobial resistance has placed an even greater emphasis on managing biofilm early, requiring standard wound care practices to adopt an anti-biofilm approach.⁵ A proactive anti-biofilm approach acknowledges that there is no one-step solution to manage biofilm, however aims to reduce the burden and prevent reformation.¹⁶

An extensive review of the literature reveals that it is evident that reducing, removing, and preventing biofilms through wound hygiene is a logical, non-specific approach when caring for those with hard-to-heal wounds.¹⁹ Wound hygiene can be implemented by various members of the interprofessional team in multiple care settings, dependent on factors such as skill, training, scope of practice and local regulations.⁸ This flexibility allows care to take place in environments with professionals most accessible to the individual and their wound.⁸ Wound hygiene is structured, yet flexible, and can be performed to some extent by clinicians with varying levels of wound care experience and training.

Failure of clinicians to understand the adverse effects of biofilms can result in suboptimal management of hard-to-heal wounds.⁶ Don't underestimate your role and the importance of thorough wound hygiene through cleansing, debridement, refashioning the edges and product selection.

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Association Nova Scotia/igility

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Wound Care in Hospice: To Heal Or Palliate?

By Anne Walsh ANP-BC CWOCN ACHPN

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Patients often present to hospice and palliative care programs with wounds of varying etiologies which may include pressure injuries, skin tears, vascular wounds, malignant wounds, Kennedy terminal ulcers (KTU) and/or Trombley-Brennan terminal tissue injuries (TB-TTI), among others. (For more information on the final two, see sidebar on following page.)

The wound is often a symptom of the underlying disease process. The skin, being the largest organ in the body, may fail along with other organs during multisystem organ failure.¹⁻⁴ The visual nature of skin failure may overwhelm

patients, caregivers and clinicians.

A multidisciplinary team approach is needed to address the complex physical, psychosocial and spiritual needs often accompanying the patient with advanced disease.

Although it may come as a surprise to some, many patients receiving hospice and palliative care do achieve wound healing, as demonstrated in the first two case studies below. There are, however, times when wound healing is not a realistic expectation, and the goals of care need to shift to symptom management. It is important for the team to have a united front and to discuss

A **Kennedy terminal ulcers (KTU)** is thought to be an ulcer/lesion that occurs/progresses rather rapidly because of the dying process and hypoperfusion. While they can occur on any part of the body, they typically occur at the sacral area. They may be pear, butterfly, horseshoe or heart-shaped and occur days to weeks before death. See examples below at the sacral regions.



A **Trombley-Brennan terminal tissue injuries (TB-TTI)** appears like a deep tissue pressure injury but may develop on areas not exposed to pressure. They may occur hours to days before death. See examples below at the left lower back and sacral/left hip regions.



this with the patient and caregivers to avoid disappointment if healing is expected.

Distressing symptoms to be managed may include wound pain, odour, bleeding and/or excessive exudate. Non-healing wounds may include malignant wounds and extensive vascular wounds, as demonstrated in the last two case studies.

Pressure injuries may develop in the frail patient due to multiple factors, including poor mobility, incontinence, poor nutrition/hydration, multiple comorbidities and advanced disease.

Case 1

Case 1 involves an 86-year-old female with end-stage vascular dementia and multiple comorbidities including diabetes mellitus and respiratory failure. She had a tracheostomy and was tube fed. She presented to hospice with a sacral stage 4 pressure injury (PI) with bone exposed. Pressure injury prevention

measures were instituted, including obtaining an appropriate support surface for her bed. The wound and periwound were cleansed with a wound cleanser spray and the periwound was protected with a skin barrier agent. The wound was debrided at the bedside using sharp debridement, in addition to using 0.125% sodium hypochlorite solution moistened gauze three times weekly short-term until it was cleaner with less necrotic tissue. Once it was cleaner, the treatment was changed to include calcium-alginate and a silicone foam dressing to manage the exudate two times weekly and as needed (PRN) if the dressing became soiled. The treatment was ultimately changed to hydrogel moistened gauze two times weekly and PRN as the exudate amount decreased. The wound treatment was changed as the wound characteristics changed to achieve a clean wound bed with moisture balance.



Case 1: Sacral stage 4 PI initially, 1.5 weeks later and 11 months later

The frail patient was also prone to skin tears due to factors such as advanced age, poor nutrition/hydration, comorbidities and medications, such as steroids, antiplatelets and anticoagulants.

Case 2

Case 2 involves an 85-year-old female with lung cancer, coronary artery disease and recurrent skin tears. The treatment plan included discontinuing the aspirin after a discussion with the patient and caregiver regarding the burden versus

benefit at this juncture of her life. Topically, a wound cleanser spray was used to gently cleanse the wound and periwound, a non-stick petrolatum/bismuth gauze was applied, covered by gauze and secured with a gauze wrap twice weekly.



Case 2: Right arm, initially and two weeks later

The next two case studies take a palliative approach when wound healing was not possible.

Case 3

Case 3 involves a 100-year-old female with extensive peripheral vascular disease and gangrene to her right leg. The treatment focused on comfort measures. The topical treatment included metronidazole 5% powder to the open clean area below her knee and painting the necrotic tissue with povidone-iodine for palliation, as well as applying covering with abdominal pads and gauze wrap twice weekly. Caregivers were educated to avoid any moist dressing or creams to prevent converting this dry gangrene to wet gangrene. This regimen helped her remain in the comfort of her home until she passed away peacefully a few months later.



Case 3: Right leg, initially and two months later as the gangrene progressed

Case 4

Case 4 involves a 95-year-old male with multiple comorbidities, including a malignant wound on his scalp. No pain was reported, but caregivers were concerned about episodes of bleeding and odour, as well as the amount of exudate. The treatment regimen to address their concerns included wound cleanser or sodium hypochlorite solution to gently cleanse as needed for odour management, a silver gelling fibre, which contains chitosan, to manage the odour and for its hemostatic and absorptive capabilities.

The periwound was protected with a moisture barrier agent and the secondary dressing was an abdominal pad secured with a tubular elastic net dressing retainer twice weekly and PRN.



Case 4: Scalp malignant

Over time, the bleeding episodes increased and oxymetazoline 0.05% spray was added, off-label, to use on the site as needed for bleeding episodes, with dressing changes. As the exudate amount decreased, the primary dressing was changed to a petrolatum gauze twice weekly. Also, the team reviewed environmental options to manage the odour such as a tray of kitty litter under the bed to absorb the odour. This regimen managed the symptoms that were concerning for the patient and his caregivers to allow quality time with loved ones.

The following four tables present options to consider for managing wound pain, bleeding, odour and/or excessive exudate.

Wound Pain^{5,6}

- Pain assessment with validated tool (may be multidimensional pain)
- Pre-medicate with an appropriate pain med prior to painful wound care (30-60 minutes for oral, IV/SQ about 15 minutes prior)
- May include opioids (assess for any risk for substance use disorder— includes patient and others in the home), non-opioids, non-pharm approaches. Opioid regimen may include short-acting, long-acting agents (e.g., morphine, oxycodone, hydromorphone, methadone, fentanyl)
- Topical agents may also be helpful, e.g., lidocaine, lidocaine-prilocaine about 20 min before debridement or dressing changes
- Less frequent dressing changes
- Non-adherent dressing such as a petrolatum gauze if minimal exudate or consider a multifunctional polymeric membrane dressing
- May need an antimicrobial dressing short-term such as twice weekly & PRN x 2 weeks to manage pain/bleeding from bacteria causing inflammation/irritation, e.g., silver, cadexomer iodine, methylene blue/gentian violet or honey-based dressings
- Systemic or topical antibiotic may be indicated (case by case basis, considering goals of care, disease progression)

Wound Bleeding^{7,8}

- Less frequent dressing changes
- Non-adherent dressing
- Consider a multifunctional polymeric membrane dressing
- Check meds that may contribute to bleeding (antiplatelets, anticoagulants)
- May need an anti-microbial dressing short-term to manage pain/bleeding from bacteria causing inflammation/irritation (and/or systemic agent where appropriate), e.g., silver, cadexomer iodine, methylene blue/gentian violet or honey-based dressings
- Hemostatic dressings such as calcium-alginate, chitosan-based gelling fibre dressings for moderate exudate/bleeding
- Off-label use of oxymetazoline nasal spray to the wound; topical aluminum chloride solution, ferric subsulfate hemostatic solution, silver nitrate sticks, aminocaproic acid, epinephrine or topical 5% tranexamic solution or systemic tranexamic acid, e.g., 650mg bid po prn
- Many over the counter hemostatic agents available
- Herbal agents such as the Chinese herb Yunnan Baiyao for wound bleeding, pain, inflammation
- Palliative radiation therapy, e.g., single fraction of 8-10 Gy or 20 Gy in 4-5 fractions for bleeding, pain, odour depending on patient performance status and goals of care

Wound Odour^{9,10}

- Thorough wound and periwound cleansing (evaluate for odour after cleansing and removing soiled dressing from the immediate environment). May consider cleansing with sodium hypochlorite or sodium hypochlorous solution PRN odour
- Debridement as appropriate to manage the odour caused by necrotic tissue (exceptions may be malignant wounds due to bleeding risk). Intact eschar at the heel without signs and symptoms of infection should not be debrided without a vascular consult, where appropriate, to confirm adequate perfusion to the area.
- Evaluate for signs and symptoms of infection
- May need an anti-microbial dressing short-term to manage odour (and/or systemic agent where appropriate), e.g., silver, cadexomer iodine, methylene blue/gentian violet or honey-based dressings BIW and PRN
- Metronidazole as a spray, powder, gel or crushed tablets to the site with dressing changes
- Odour specific dressing such as charcoal dressing where appropriate (may use as the outer dressing to increase the wear-time as it is inactivated once wet and can be costly)
- Environmental options to consider include kitty litter, charcoal, coffee grounds in the room to absorb the odour, essential oils, commercially prepared odor eliminators

Excessive Wound Exudate^{11,12}

- Thorough wound and periwound cleansing
- Debridement where appropriate as necrotic tissue may lead to increased exudate as the body attempts to autolytically debride the moist necrotic tissue
- Absorptive dressings such as calcium-alginates, hydrofibres, gelling fibres, foam dressings and super absorbent polymer core dressings. May need anti-microbial versions of these absorbent dressings short-term to decrease the microbial count such as BIW and PRN x 2 weeks and re-evaluate ongoing need as they can be costly
- May need an ostomy pouching system to manage large amount of exudate e.g., with the presence of a fistula
- Negative pressure wound therapy where appropriate

Conclusion

In conclusion, patients receiving hospice or palliative care services may present with wounds of varying etiologies and complexities, and while wound healing may not always be possible, there is much we can do to improve the quality of life for our patients and their caregivers. It takes the whole team to support our patients and caregivers during a difficult time in their lives. Wounds can make the caregiving more complicated and lead to complicated grieving if loved ones feel guilty about the wounds occurring or not healing, and need to be educated about the underlying disease process at play despite optimal care.

Editor's note: Specific products/medications mentioned in this article are described as used in the US. Individual products/medications may have different names, indications or alternatives in Canada.

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- Josee Senechal
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- Bev Smith
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- Allison Luther
- Maryse Beaumier
- Helen Arputhanathan
- Shannon Handfield

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The Intersection Of Patient Safety And Wound Care: A Strategic Approach For Optimal Outcomes

By Maryanne D'Arpino RN BScN MScN CHE

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Patient safety is a cornerstone of high-quality health care, yet the intersection between patient safety and wound care often remains underemphasized. Pressure injuries, surgical site infections, and other wound-related complications are preventable harm that can lead

to prolonged hospital stays, increased health-care costs and diminished patient quality of life. An integrated collaborative approach that prioritizes wound prevention, promotion, and management is essential to improving patient safety and outcomes.

The prevention, promotion and management of wounds requires a comprehensive systems thinking approach that integrates evidence-based practices, interdisciplinary collaboration with expert wound-care practitioners, early access to treatment and a patient-centred care approach. This article explores the intrinsic link between patient safety and wound care, emphasizing strategies to minimize risk, enhance prevention efforts, and optimize positive outcomes.

The Link Between Patient Safety And Wound Care

Wounds, whether acute or chronic, pose significant risks to patient safety. Poor wound care practices can result in infections, sepsis, pain and impaired mobility, leading to adverse events, such as hospital acquired pressure ulcers (HAPUs) and surgical site infections (SSI). These conditions are largely preventable through proactive safety measures, yet they remain prevalent in health-care settings, in the community, and worldwide.

According to Wounds Canada, “the overall prevalence of pressure ulcers (PU) across all health-care settings was 26%, with approximately 70% of these wounds considered preventable”¹ Recent scholarly literature also underscores the critical importance of proper wound care management to prevent these outcomes.² The Canadian Institute of Healthcare Information (CIHI) reports, “Patient harm in Canadian hospitals occurs in 1 in 17 hospital stays...47% were related to bedsores and medication errors, 31% were related to infections like surgical site infections”³

This, and other data,⁴ reinforces the magnitude of patient harm relating to the incidents of pressure ulcers and preventable harm. A comprehensive patient safety strategy that aligns with a learning health system and patient engagement framework for wound prevention

and management can drastically reduce these risks and improve patient safety outcomes.

A comprehensive patient safety strategy that includes wound prevention and management can drastically reduce these risks.

Wound Prevention: A Proactive Patient Safety Approach

Prevention is the most effective strategy for enhancing patient safety in wound care. Key components include:

- **Risk Assessment:** Regular skin assessments using validated tools help identify at-risk patients early.
- **Pressure Injury Prevention:** Frequent repositioning, appropriate support surfaces and skin protection strategies reduce the incidence of pressure injuries.
- **Moisture Management:** Controlling incontinence and excessive moisture helps prevent skin breakdown and irritation.
- **Nutrition Optimization:** Adequate protein and micronutrient intake is essential for maintaining skin integrity and promoting healing.

Wound Promotion: Educating And Empowering Stakeholders

Enhancing wound prevention and management requires a culture of safety where health-care professionals, patients, and caregivers are well-informed and engaged.

Key strategies include:

- **Health Care Provider Education:** Ongoing training in best practices for wound assessment, dressing selection and infection control reduces complication.
- **Patient and Caregiver Engagement:** Teaching and engaging patients and caregivers about wound prevention,

early warning signs, and self-care fosters shared responsibility for wound-care management.

- **Interdisciplinary Collaboration:** Encouraging collaboration, team-work and communications among nurses, physicians, physiotherapists and wound-care specialists ensures comprehensive care.
- **New Models of Care:** Innovations in recent hospital—to-home programs, where discharge from hospital to home includes wrap-around health-care services and timely care, will optimize wound healing and the potential for readmission to hospital.

Wound Management: Evidence-Based Strategies For Safety And Healing

Effective wound management is critical for ensuring patient safety and achieving optimal outcomes. Best practices include:

- **Timely and Accurate Diagnosis:** Early identification and classification of wounds facilitate appropriate treatment plans.
- **Appropriate Dressing Selection:** Choosing the right dressing based on wound type (foam, hydrocolloid, antimicrobial) promotes healing and reduces infection risk.
- **Infection Control Measures:** Adhering to aseptic techniques, monitoring for signs of infection, and using antimicrobial therapies, as needed, prevent complications.
- **Monitoring and Documentation:** Consistent tracking of wound progress ensures timely interventions and prevents deterioration.

The Role Of Health Care Leadership In Wound Care Safety

Health-care executives and policy makers play a vital role in integrating wound care into patient safety initiatives. A great example of system

collaboration and leadership worthy of replicating is the Pressure Ulcer Awareness Program (PUAP).⁵ The PUAP is a provincial multi-stakeholder quality improvement initiative led by the Ministry of Health and Long-Term Care of Ontario, Registered Nurses Association of Ontario (RNAO), Wounds Canada (formerly the Canadian Association of Wound Care), Health Quality Ontario (Now Ontario Health) and 30 participating Long-Term Homes (2006). The initiative was designed to shift the focus from treating existing pressure ulcers to preventing them, a goal that has influenced practice.

Conclusion

The intersection of patient safety and wound care is a critical focus area for improving health-care quality, and to reduce the significant health concerns in Canadian health-care settings. By emphasizing prevention, education, early access to treatment and evidence-based management, health-care systems can significantly reduce wound-related harm and enhance patient outcomes.

A call to action is urgently needed and can be positioned to mobilize quality improvement collaboratives across sectors to galvanize an integrated process and pathway for wound care safety. Optimizing lessons learned from the PUAP and other wound-care safety initiatives that shift the focus and place the emphasis on the collaborative relationship between acute, primary, and home and community care, while simultaneously, increasing the quality improvement capacity in the health-care workforce, will reinforce a prevention and promotion approach to wound care. This combined with strong leadership and patient engagement are key to fostering a culture of safety in wound care. As health care continues

to evolve, integrating wound prevention and management into patient safety frameworks that highlight practical steps will be essential for delivering high-quality, safe, and effective care.

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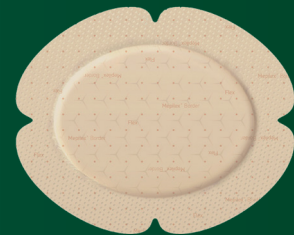
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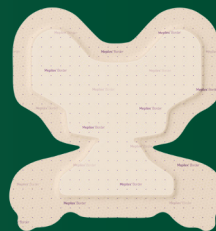
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Decreasing Pressure Injuries in Long-term Care: A Quality Improvement Project

By Candy Gubbels MN DNP NP(F) NSWOC WOCC(C), Margaret M Pearce RN CRNP PhD and Janet Kuhnke RN BA BScN MS NSWOC FCN PhD

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Health care-acquired pressure injuries (HAPIs) cause significant pain and suffering to those who experience and live with these often-preventable wounds.^{1,2} Ageing skin is at an increased risk of developing pressure injuries due to thinning, dryness and the person's co-morbidities.^{1,3} In addition, if the elderly sustain a pressure injury, their disease burden increases, similarly affecting

their risk of developing another pressure injury.⁴⁻⁶ Further, treating a HAPI is significant, costing up to \$90,000 CAD for one wound.¹ Thus, preventing HAPIs across health-care communities of care needs to be a priority, including long-term care (LTC).

Current practice to prevent HAPIs in British Columbia (BC) includes identifying risk using

a risk assessment scale, such as the Braden Scale.⁷ However, the Braden Scale is subjective and does not account for multi-morbidities, as seen in the current population of those living in LTC.^{8,9} Further, in LTC, nurses no longer regularly assess each person's skin. Observing the person's skin is done by the unregulated health-care aides who report any skin breakdown, skin changes or concerns to the nurses.¹⁰ When pressure injuries are visible on the skin, the damage is already done,¹¹ and often, it is too late for prevention interventions; the focus then becomes treatment and mitigation of worsening pressure damage.

Despite increased access to national and international pressure injury prevention guidelines, pressure injury rates have not changed over the past 20 years.¹²⁻¹⁴ However, people entering LTC have changed, with increased complex health-care needs; leading to an increased frailty score.¹⁵ The number of people requiring LTC is also increasing.¹⁶ If the current approach to preventing pressure injuries continues, the number of people suffering from pressure injuries will only continue to rise. Therefore, an alternate approach was sought to support the LTC staff in identifying bony prominences at risk.

As national and international guidelines recommend, a sub-epidermal moisture scanner (SEMS) is considered part of the tissue and skin assessment.^{1,3,17} The SEMS is a handheld device used to detect cellular level damage up to five days before damage to the skin is visible.

The SEMS measures the difference in the biocapitance or electrical charge from the fluid released from damaged cells that enter the subepidermis.^{11,19} Cellular damage occurs when there is unrelieved pressure. Thus, fluid from the damaged cells escapes into the extravascular space to the subepidermis. Increasing fluid in

the subepidermis changes the electrical charge in that area.¹⁹ The measured difference in the change of the electrical charge indicates pressure injury risk.¹⁹ The SEMS device manufacturer recommends taking six measurements at the sacrum and four on each heel.¹⁸ Each location's measurements are averaged and expressed as a delta.¹⁸ A delta reading of 0.6 or more indicates that location is at an increased risk of developing a pressure injury.^{11,18}

Using a SEMS has been shown to reduce HAPIs across communities of care, including LTC.^{20,21} Pressure injury risk assessments have remained unchanged in LTC homes across BC, with little or no change to the development of HAPIs. Because pressure injuries remain a concern, a QI project was implemented to decrease HAPIs in LTC using the SEMS in conjunction with head-to-toe routine clinical skin assessments (RCSAs).

Method

Alongside the staff, the QI project occurred on one floor at an urban LTC home in southern BC. The floor consisted of two units, with 14 people in each unit. Implementing SEMS and RCSAs was a new workflow for this LTC home staff. Thus, the SEMS and RCSA were done on each person's bath day to enhance consistency and staff compliance.²² Two baths occurred on the day shift and two on the evening shift, for four baths with SEMS and RCSAs daily. The QI project occurred over eight weeks.

Before implementing the SEMS with RCSA, the plan was reviewed with senior leadership and the home's manager to obtain approval and buy-in. Once the project was approved and before the project started skin assessments were completed by Nurses Specialized in Wounds, Ostomy, and Continence (NSWOCs) to ensure standardized assessments of any pre-existing pressure

injuries.²³ Of note, there were 15 pressure injuries found, with nine attributed to the LTC home and the other six developed before admission.

Once the skin assessments were done, all staff involved in caring for those living on the project floor, including nurses, health-care aides, occupational therapists and the home's dietician, received education about the purpose and background of the QI project provided by the project manager.

The SEMS device utilized was the Provizio™ by Bruin Biometrics (See Figure 1.) It is licensed to objectively detect pressure injury risk at the sacrum and heels.¹⁸ (See Figure 2).



Figure 1: Hand-held SEM device (Used with permission from Bruin BioMetrics)



Figure 2: Where to scan (Used with permission from Bruin BioMetrics)

Table 1: Example of SEMS and RCSA Chart

Instructions for use: To be completed weekly on the person's bath day by the responsible nurse. One per person on the unit.

Week	Date	De-identified Number	Right Heel SEMS Measurement	Left Heel SEMS Measurement	Sacral SEMS Measurement	Skin assessment done? (Y/N)	Skin damage present? Location	PIP Interventions Implemented?
1.								
2.								
3.								

Abbreviations: SEMS=sub-epidermal moisture scanner; RCSA=routine clinical skin assessment; PIP=pressure injury prevention

The education sessions also provided information on the SEMS and each person's role in the QI project, and nurses received a hands-on demonstration of the SEMS. The 30 minute education sessions occurred twice daily for one week. The implementation of the SEMS with RCSAs began following completion of the education sessions. (See Figure 3).

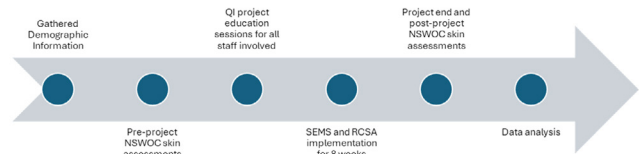


Figure 3: Project Timeline

The nurses were to conduct the SEMS and RCSAs on the person-in-care's bath day regardless of their Braden Scale risk score. The health-care aides were responsible for informing the nurses when the person finished their bath, shower or bed-bath and were ready for their assessments. The nurses would then conduct the SEMS and RCSAs and document their findings on a chart provided by the QI project manager. (See Table 1.) Data collected included: the SEMS measurements for the heels and sacrum, whether an RCSA was done, note of any new skin damage, and the implemented pressure injury prevention interventions if the SEMS assessment indicated risk. The project concluded with skin assessments repeated by NSWOCs. (See Figure 4).

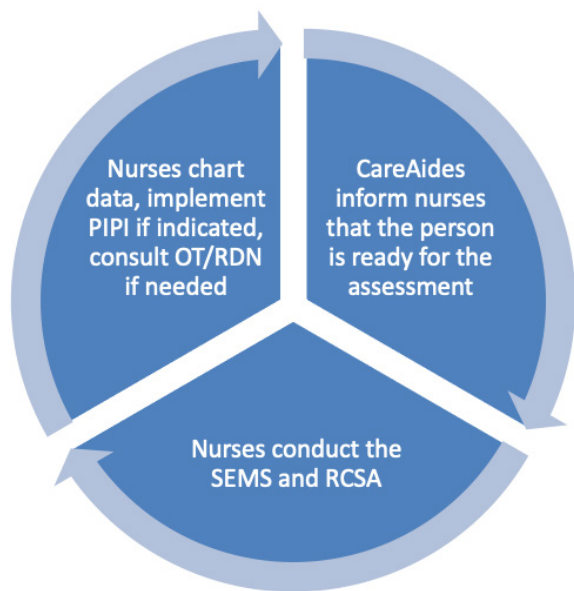


Figure 4: Project Process

Results

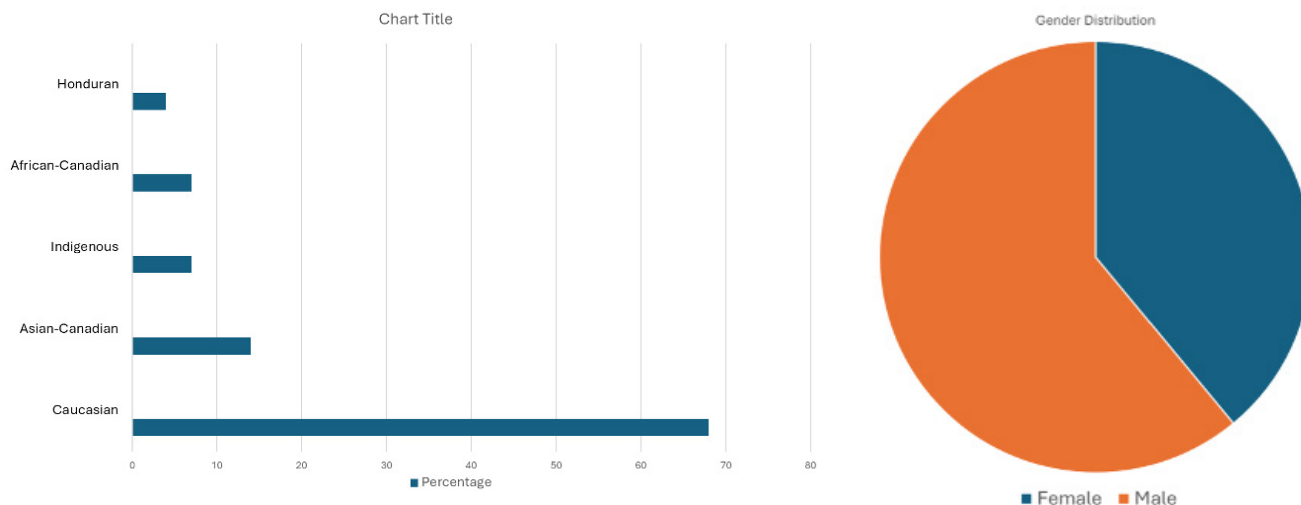
The primary outcome of this LTC QI project was to determine if implementing SEMS with RCSAs would decrease the frequency of HAPIs during the eight weeks. Thus, after eight weeks of implementing the SEMS with the RCSA, the project manager collected and analyzed the data, hoping to achieve a p-value of ≤ 0.5 when comparing the pre- and post-project skin assessments.²⁴ The pre-project HAPI rate

was 32% (n=9), and after eight weeks, the post-project HAPI rate was 4% (n=1) — a clinical and statistically significant result.

The total number of SEMS with RCSAs over the eight weeks was 94, averaging four scans per person. The number of SEMS pressure injuries (when the person’s SEMS assessments deem them at risk of developing a pressure injury, with no visible pressure injury present) was 23 times—the number of pressure injury prevention interventions implemented equaled 19. The most implemented pressure injury prevention intervention was minimizing layers.

Descriptive statistics, including age, gender, and ethnicity, were collected before the implementation of the SEMS with RCSA to understand for whom this intervention was being implemented. Most people living in the unit were male, 61%, compared to 39% females. The average age was 60.4, with the youngest being 33 and the oldest 89. Regarding ethnicity, the majority were Caucasian, 68%, followed by Asian Canadians, 14%; 7% Indigenous; 7% African Canadians; and 4% Honduran (See Table 2).

Table 2: Descriptive Statistics



Implications for Nursing Practice

Current pressure injury prevention practice in BC's LTC homes relies on subjective risk assessments, such as the Braden Scale, and reported observations by unregulated health-care aides.⁷ When tissue damage is visible, the damage has already occurred. Therefore, with the development of a new pressure injury, nurses now not only need to treat the pressure injury, but the person who has sustained this injury is at risk of pain, suffering, potential alteration in their activities of daily living, as well as further increasing their risk of developing another pressure injury.¹

The population of Canadians requiring admission to LTC homes is increasing, putting more and more people at risk of developing a pressure injury.^{4,25-27} Thus, implementing an objective measure of risk, such as the SEMS with RCSAs, can potentially transform pressure injury risk assessments, leading to decreased pressure injury incidences.²⁸ Decreasing the number of HAPIs in LTC can potentially decrease nursing workloads and health-care spending.²⁹ However, the most important nursing implication that SEMS with RCSAs may provide is improving the quality of life for people living in LTC by preventing HAPIs. (See Figure 5).



Figure 5: Trajectory of Pressure Injury Risk in LTC

Discussion

This QI project in a LTC home demonstrated a statistically and clinically significant decrease in HAPIs for those on the project floor. The current pressure injury prevention practice has not improved rates of HAPIs in LTC in Canada. The ratio of nurse to persons-in-care for this home's two units was 1:14 making it challenging for the nurse to provide daily skin assessments for the 14 persons-in-care. In addition to this challenging ratio, the complexity of those living in LTC has increased,¹⁵ further increasing one's risk of developing a pressure injury.

Although the SEMS with RCSA QI project did demonstrate a decrease in the frequency of HAPIs at the project's LTC home, compliance was an issue, with both the SEMS and RCSAs and implementing the equivalent pressure injury prevention interventions when a SEMS pressure injury was documented. The compliance rate for the weekly SEMS and RCSA was less than anticipated. The decreased compliance was partly related to the person-in-care refusing assessments and the fact that nurses often worked short-staffed during the project timeline. The nurses deemed the assessments not essential when short-staffed, thus missing the significance of pressure injury risk assessments.

In addition, the number of documented SEMS pressure injuries was greater than the number of documented pressure injury prevention interventions. The expectation was that the number of pressure injury interventions would equal the number of SEMS pressure injuries. It was unclear if interventions were implemented and not documented or if no interventions were put in place.

Despite the positive outcomes, the findings cannot be generalized to the LTC population as the average age of people who participated in

the quality improvement project was 20 years younger than the average person living in LTC. The average age of people living in LTC in BC is 83 years.¹⁵ Further, the number of people living in LTC homes within the health authority where this quality improvement project occurred is just over 6,000.³⁰ Given the relatively small number of people who participated (n=28) and the significant age difference in this quality improvement project, the population of the QI project does not reflect those living in LTC in BC.

Recommendations For Future Practice

Recommendations for future practice include broadening the scope of the QI project to homes that are more reflective of the LTC home population to fully understand if SEMS with RCSA positively impacts HAPI rates in LTC. There are 51 LTC homes within the same health authority as the project home.³⁰ This project home was chosen because of concerns about the number of HAPIs and the manager's enthusiasm for improving outcomes. To better understand how the SEMS and RCSA can impact the frequency or incidence of HAPIs in the LTC population, it would be prudent to replicate this QI project at other homes that are more reflective of the LTC home population. Thus, to generalize the findings of this QI project to the entire region cannot be done; and therefore, expanding the scope to a larger, more reflective population is recommended.

Another recommendation for future practice includes using the SEMS with RCSAs with the current risk assessment, the Braden Scale, and standardized, home-specific pressure injury prevention bundles. Pressure injury prevention bundles are standardized pressure injury interventions that have been reported to decrease the incidence of pressure injuries.³¹⁻³²

The pressure injury prevention bundles would correlate with the Braden subscales of sensory, moisture, mobility, nutrition, activity, friction and shear, providing nurses with home-specific options. Using the SEMS with RCSA and the Braden Scale risk score allows for a person-centred approach to pressure injury prevention. When the SEMS indicates an at-risk delta measurement, nurses are provided with a timely objective risk assessment, which triggers them to implement pressure injury prevention interventions at that moment or to re-evaluate the interventions currently in place. In addition, reviewing the Braden Scale when the SEMS indicates risk can also ensure all interventions prescribed in the bundle for the Braden subscale scores are implemented, providing person-centred interventions (See Figure 6).

Recommendations for Future Practice:

- Increase scope reflective of LTC
- SEMS+RCSE+Braden+PIPI Bundles

Figure 6: Recommendations for Future Practices

Conclusion

Pressure injuries have been a concern for years with minimal outcome improvement, even though in LTC worsening pressure injuries is a Canadian Institute for Health Information quality of care indicator.³³ Current practice for pressure injury prevention has not altered the HAPI rates. The sense of urgency to prevent HAPIs has been lacking, resulting in the unaltered rates of HAPIs. This QI project showed a lack of understanding of the significance of HAPIs, with decreased compliance rates when short-staffed. If the significance of HAPIs were fully understood, preventing HAPIs would have been a priority,

especially when staffing shortages are a concern.

The regular use of SEMS with RCSAs provides in-the-moment risk assessments for overburdened nurses, highlighting the need to act immediately. This has the potential to transform pressure injury risk assessments in LTC. Nurses now have a tool to objectively determine risk at the bedside, prompting them to intervene immediately to prevent pressure injuries and provide targeted person-centred pressure injury prevention interventions. While this QI project has shown limited positive outcomes, it has shown that SEMS is a potential option as an adjunct to the current practice that has not been available to the British Columbia health-care system until now. The potential decrease in HAPIs can not only save nursing time and health-care dollars but also equitably improve the quality of life and outcomes for those living in LTC.

Disclaimer

The Provizio™ SEMS devices and sensor heads used in this study were provided free of charge by Bruin Biometrics LLC, USA.

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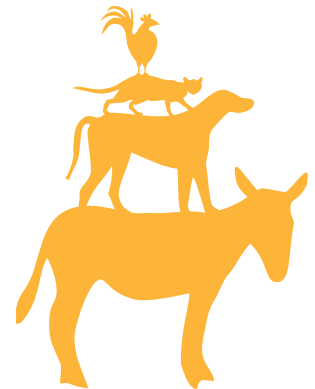
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The Use Of AI Informed Technology For Wound Care Progress Tracking And Data Analysis: Rural And Northern Perspectives

By Shannon Freeman PhD, Matthew J Sargent MSc, Laura Rodriguez Galarza MA and Emma Rossnagel

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Wound care presents considerable burdens to staff time and financial resources in Canada. Accordingly, challenges facing equitable, sustainable, and cost-effective wound care in Canada remain. Wound care expenditures account for around \$12 billion CAD annually in Canada, comprising 3.1% of total health-care expenditures in 2024.^{1,2} Approximately 50% of community-delivered nursing visits involve wound care.³ Most wound management costs directly relate to chronic wounds, which are commonly associated with aging and prominently affect individuals residing in long-term care settings.⁴

There is a growing need for comprehensive, specialized wound care education for all frontline nurses and care aides, but there is lack of resources available to develop and implement this training. There is a need for standardized infrastructure and protocols to support the increase in caseloads of frontline workers and health-care providers treating wounds. Addressing issues for timely and high-quality wound management could significantly decrease associated costs and improve the quality of life for Canadians.

In response, many researchers, health system leaders and wound care organizations are constantly creating and sharing literature, recommendations and manuals that ultimately aim to create an equitable, efficient and cost-effective wound care system in Canada. Often, recommendations propose prioritizing wound care to reduce hospitalizations and health-care costs.^{3,5}

In 2020, Wounds Canada released a 2021 Pre-Budget Consultation Submission to the Standing Committee on Finance of the Government of Canada.⁵ In this document, a series of recommendations to implement for

wound care across Canada was shared. These recommendations were:⁵

1. Wounds Canada urges the Government of Canada to work with the provinces and territories to develop national wound care standards.
2. Wounds Canada urges provincial and territorial leaders to prioritize wound prevention and care, ensuring that patient care is equitable, timely, non-fragmented, and accessible across jurisdictions.
3. Providing access to wound care products and technology that are evidence-based and improve patient outcomes.

Technologies to support wound care have the potential to streamline workflow for clinicians, guide clinical best practices and, ultimately, improve care and cost outcomes.³ The benefits of technology-informed wound care management include improved evidence-based care and enhanced data collection, measurement and analytic approaches. Such features support education in wound management and prevention, which has the potential to promote interdisciplinary collaboration and foster relationships between organizations involved in wound care management. Promoting the adoption of technologies for wound care management may be an effective solution for supporting the recommendations made by Wounds Canada and could ultimately improve equitable access to wound care management in Canada.

The Centre for Technology Adoption for Aging in the North (CTAAN) is a National Innovation Hub that supports aging in northern British Columbia (BC) by improving the availability of technologies to support older adults and their members of their circles of care. (For more information on CTAAN visit www.ctaan.ca). In the spring of

2024, CTAAN facilitated a series of workshops featuring Swift Skin and Wound™, a wound care assessment software created by Swift Medical (Chicago, Toronto).

Swift Skin and Wound uses AI technology to provide specialized wound care management. Using images of a patient's wound, the software can measure length, width, depth and surface area of a wound. Further, the platform tracks the progress of a wound by employing automatically calculated progression metrics, which can be used by clinicians to tailor care plans according to the progression of a wound. For more information on this technology visit <https://swiftmedical.com/solution/>.

Background

Wounds are often thought of as minor cuts or scrapes, but chronic and complex wounds, such as diabetic ulcers, pressure injuries or post-surgical wounds, pose serious health risks if they fail to heal properly.⁶ These wounds can be life-threatening, costly, and place a significant burden on the health-care system. In 2003, research was conducted in a variety of settings across Canada that found the point prevalence of pressure ulcers to be 29.9% in long-term care.⁷ This study also found that in BC, 24.1% of the community care population had pressure ulcers.⁷ More recently, a study from 2024 reported the prevalence of pressure ulcers as 18.9% across long-term care homes in Ontario during a one-year research period, beginning in January 2019.⁸ The Canadian Institute for Health Information (CIHI) reported chronic wounds were found in 9.6% of the Canadian long-term care population in 2011-2012.⁹ Despite the high prevalence of wounds and the availability of appropriate treatments, systemic issues prevent the consistent implementation of evidence-based treatments

that could improve wound healing.

Key challenges in wound care include a lack of standardized treatment protocols across health-care settings and gaps in data collection, making it difficult to track and measure patient outcomes effectively.⁶ The absence of accurate prevalence and incidence data limits the ability to justify funding and develop programs for better wound care. Additionally, many health-care facilities across Canada rely on out-of-date, analogue methods, such as paper forms or manually uploading wound images, which create inefficient charting protocols and fragmented information for health-care providers. Addressing these inconsistencies is essential for improving patient care and optimizing health-care resources.

In 2012, The Canadian Home Care Association (CHCA) provided recommendations on best practices for wound care,³ which addressed the benefits of leveraging technology-informed wound care management. There are many similarities between CHCA's recommendations, and the in-depth recommendations provided more recently by Wounds Canada in 2020.^{3,5} This informs us of how much work remains for implementing effective wound care across health-care facilities in Canada (See Table 1).

Where technology is been adopted by wound care professionals in Canada, it is often used for integrating wound management software into the Electronic Medical Records (EMR) used by the health authorities. These software deliver automatized remote monitoring protocols that enhance data access for experts, increase electronic exchange of clinical information, and provide computerized tracking systems.

Technologies being considered for use by wound care professionals must adhere to policies implemented by regional health care governing bodies. In BC, in partnership with wound

Table 1: Recommendations For Wound Care Management Provided (CHCA and Wounds Canada)^{3,5}

CHCA (2012)	Wounds Canada (2020)
Accelerate the adoption of technology to improve access to best practice guidelines, to support point of care access to expertise (e.g. through remote monitoring or digital imaging) and to support data collection.	Provide access to wound care products and technology that are evidence-based and improve patient outcomes.
Improve access to products, devices and adjunctive therapies across health-care sectors and client geographies, such that issues related to setting of care (e.g. cost, provider knowledge, geographical constraints) are not barriers to recommended treatment.	Develop policies that prevent wounds such as pressure injuries and infected wounds from developing in acute and home care settings.
Mandate continuing education in wound management and prevention for all clinicians involved in caring for patients living in the community with wounds and improve the resources available to the public on effective management and prevention of wounds.	Increase wound-related education and information for health-care providers, patients, and families.
Support interprofessional collaboration to optimize professional capacity and ensure that the right care is delivered at the right time by the right provider.	Ensure that interprofessional teams include wound experts.
Provide measurement and analytic support to care teams so performance outcomes can be readily available and can be used to continuously improve practice by building upon lessons learned.	Implement wound prevention and management pathways in all settings, from hospitals to home and community care, with set measurables, monitoring, and evaluation.

clinicians from First Nations Health Authority, Fraser Health Authority, Interior Health Authority, Island Health Authority, Northern Health Authority, Provincial Health Services Authority, Vancouver Coastal Health Authority and Providence Health Care, the BC Provincial Nursing Skin and Wound Committee created a series of guidelines for the assessment, prevention, and treatment of different types of wounds for different types of patients.¹⁰ These guidelines were developed in accordance with the policies from each of the health authorities (HAs) involved and are available for public online access through the Connecting Learners With Knowledge (CLWK) webpage (clwk.ca).

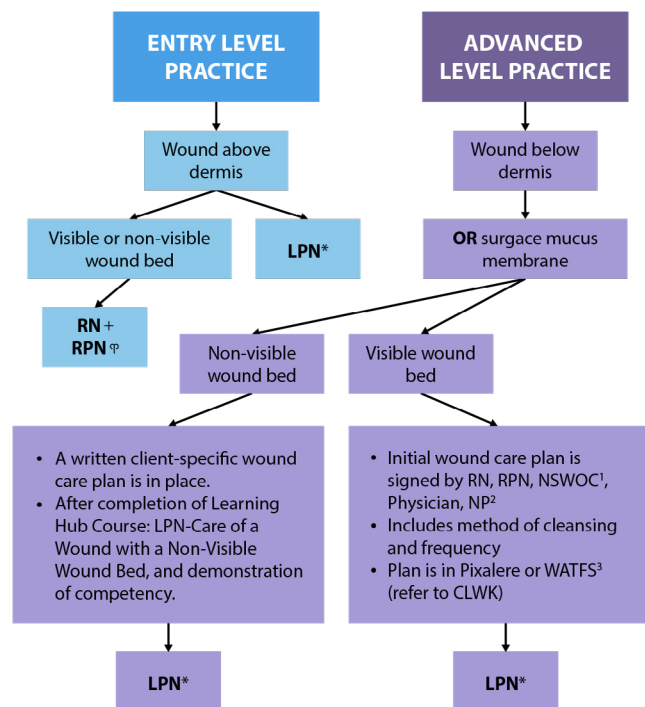
The CLWK website, created in 2022, is associated with the British Columbia Professional Practice Stream of Wound Ostomy and Continence.

The CLWK guides include Treatment of Moisture Associated Skin Damage (MASD) in Adults and Children,¹¹ Wound Management Guideline Summary Flowsheet,¹² and Procedure: Wound Packing¹³ among many others.

Aside from the provincial protocols established by the BC Provincial Nursing Skin and Wound Committee and available through CLWK (clwk.ca), each health authority has its own policies and clinical practice standards. In the case of Northern Health Authority, Nurses Specialized in Wounds, Ostomy and Continence (NSWOCs) and physicians assess severe wounds or authorize care plans for Registered Nurses (RNs) and Registered Psychiatric Nurses (RPNs) to execute, in cases of non-severe wounds. Licensed Practical

Nurses (LPNs) assess, clean, and dress wounds. Wound care plans in Northern Health Authority will be found in the digital documentation tool (Pixalere™) or on the Wound Assessment and Treatment Flowsheet (WATFS), found on the CLWK website.¹⁴ Other health authorities in BC report similar protocols and best practice recommendations based on similar information systems and adherence to the publicly available CLWK guidelines.¹⁰

Pixalere™ is a wound management software solution for the aged, community and disability care sector, which features intelligent algorithms that determine best practice management and treatment plans at the bedside.



* Licensed Nurse Practitioner 1 Nurse Specialized in Wound Ostomy and Continence
 † Registered Nurse 2 Nurse Practitioner
 ‡ Registered Psychiatric 3 Wound Assessment and Treatment Flowsheet

Figure 1: Wound Assessment Protocol Across BC Health Authorities: An Adaptation From Northern Health’s Wound Care Assessment Protocols.¹⁴

Despite the availability of advanced wound care technologies and standardized guidelines, significant barriers remain in ensuring equitable and effective treatment across health-care settings. Addressing inconsistencies in data collection, improving access to evidence-based interventions and integrating digital tools into clinical practice is crucial for optimizing patient outcomes across the Canadian health-care system.

CTAAN's Approach to End User Consultations

Built on a partnership between the University of Northern British Columbia, Northern Health Authority and AGE-WELL, CTAAN's programs focus on testing, piloting, implementing and promoting new and existing technology solutions tailored to support older adults and their caregivers (known as *AgeTech* technologies) in northern and rural communities. CTAAN's AgeTech Discussions: Exploring Perspectives on Technology (ADEPT) workshops, which focus on creating spaces for discussing the possible implementation of AgeTech in settings in northern and rural BC, are important first steps for AgeTech implementation. These workshops gather feedback from end users' perspectives on the applicability and feasibility of various featured AgeTech solutions.

AgeTech is a term for the type of technology that helps older adults and their caregivers. It can also refer to services and practices that improve the lives of older adults. AgeTech technologies can involve everything from housing and health care to autonomy, mobility, mental health, well-being, financial health, communication, and maintaining social connection.¹⁵

CTAAN conducted workshops featuring Swift Skin and Wound in spring-summer 2024, which included participants with experience in long-term, community, and hospice care settings, as well as digital health settings. Workshops were digitally recorded, and audio was transcribed verbatim and checked for accuracy, followed by being analyzed to devise themes in the data, informed by Braun and Clarke's¹⁶ guide to thematic analysis. A report that shared the results and recommendations of participants in the workshop is available on the CTAAN website (www.ctaan.ca). Ethical approval for the ADEPT workshops was provided by the University of Northern British Columbia's Research Ethics Board (H22-00499), the Northern Health Operations Board (RRC-2022-004) and the National Research Council (2022-56).

Beneficial Features To Be Integrated Into Wound Technologies

While most participants did not have any direct experience with advanced AI informed wound care technologies like Swift Skin and Wound, there was clear consensus that the features that should be prioritized within a wound care management system: wound identification, tracking, care planning, and treatment recommendations. Overall, the participants indicated that the technology should be easy to use and smoothly integrate with other existing systems, while also maintaining compliance with privacy regulations. The findings are presented in a thematic narrative format identifying salient quotes from participants (See Table 2). Four key themes were developed through the analysis:

Theme 1: Confidence and Hope for Improved Wound Care and Management

Swift Skin and Wound (referred to as wound care, or WC, assessment technology) was identified as a promising tool, highlighting its advanced AI capabilities for wound measurement, tracking, and analysis. Participants shared experiences of frustration with chronic wound care but anticipated improved outcomes using this technology. The participants also saw potential for expanding the roles of health-care aides and personal support workers in wound management, fostering collaboration, and enhancing their professional engagement. Additionally, the tool was recognized as valuable for educating care providers with limited wound care knowledge and empowering patients in northern and rural communities. Overall, participants expected the WC assessment technology to boost confidence, communication, and teamwork in wound care.

Theme 2: A Superior Tool to Enhance Treatment and Care Compared to Current Practices.

Pixalere is a commonly used wound management software. Participants shared that the first generation of Pixalere is available in health-care facilities. When comparing both technologies, participants noted that the WC assessment technology was more dynamic and supports more upstream solutions. As the WC assessment technology is AI-powered, its measuring and prediction capabilities have the potential to ameliorate current inconsistencies in data entry. It was also noted that the WC assessment technology supports more in-depth understanding of specific wound progression or regression, by collecting and analyzing real-time data. Thus, participants anticipated more timely treatment decisions.

Theme 3: Adaptive Change Processes for Successful Adoption

The implementation of new technologies can be difficult as it requires time and effort for users to develop familiarity, trust, and confidence. The WC assessment technology could potentially face resistance, especially from frontline workers and management staff, due to the widespread use of existing software, as well as concerns about inconsistencies in charting methods. While some participants saw potential for adoption, especially in smaller communities where analogue and virtual systems are in use, others viewed these inconsistencies as a barrier for implementation. Despite possible apprehension from facility managers, implementing education on the tool's advanced functionality and usability could improve acceptance. To facilitate adoption, participants recommended a gradual transition process.

Table 2: Key Themes, Supported By Quotes From ADEPT Workshops Featuring Swift Skin and Wound™.

Theme #	Gender	Age	Role	Quotes and Testimonies
Theme 1: Confidence and Hope for improved Wound Care and Management	Female	51	Community Services Manager	"[It] is a game changer on the quality front, for patients and for preventing [hospital/emergency room] admissions."
	Female	52	LTC Operations Executive	"Realistically, [HCAs] are the ones that are going to catch something before it becomes ... So, I think for like that would be amazing if somehow their scope of practice could be integrated in this - that would be huge."
Theme 2: A Superior Tool to Enhance Treatment and Care Compared to Current Practices.	Female	51	Community Services Manager	"The standardization component as, with the AI technology, taking out the inconsistencies that you have from one practitioner to another is really helpful and useful in terms of monitoring and assessing whether a wound is getting better or not."
	Male	46	LTC Manager	"Where you can look at what's happening across multiple sites. To see what is working for us at site X versus site Y."
Theme 3: Adaptive Change Processes for a Successful Adoption	Male	48	Digital Health Manager	"We're at a low in EMR adoption level and so trying to put a powerful tool like on top of that state can be problematic."
	Female	40	Care aide	"I think it would be hard to start, but once everybody tries and sees what it can do, I think people would really like it, especially because we do have the, not everywhere,[we could see the changes."
Theme 4: Practical Implementation Logistics and System Compatibility	Female	52	LTC Operations Executive	"It would be usability, in terms of trying to avoid as much as possible the nurses hav[ing] to double chart. I don't want them to have to chart everything here, but then they still have to go into progress notes and chart stuff there."
	Male	46	LTC Manager	"I really like that [it works on most tech] because we're running with some older technology from time to time, particularly around some of the nurses, like they just have older phones."

Theme 4: Practical Implementation Logistics and System Compatibility

Participants reflected on the low Electronic Medical Records (EMR) implementation rates as a challenge to implementing new clinical systems. Full integration of the WC assessment technology with existing EMRs will be essential to the usability and sustainability of this software. As EMRs vary widely across and even across health jurisdictions, inconsistency in interoperability with existing systems can be challenging. Some facilities, particularly long term care facilities (LTCFs), still rely on paper-based tracking, necessitating a slower transition to new technology.

Despite these challenges, participants found the WC assessment technology, compatible with major operating systems, older devices, and offline functionality, making it suitable for northern and rural communities with limited connectivity. The adoption of the WC assessment technology depends on the 'enthusiasm' of care providers to implement the technology as well as on executive and managerial commitment to secure funding for implementation.

Participants viewed the WC assessment technology as an exciting opportunity to implement an interdisciplinary tool that would be easy to use and had great potential to optimize productivity and reduce workload for at-capacity frontline staff. Additionally, participants mentioned the benefits of implementing this technology to support chronic wound patients living in the community as well as at LTCFs, especially in areas that lack human and health-care resources. They also discussed the potential benefits of the technology to wound specialists, such as NSWOCs. Altogether, three notable features that should be prioritized before implementing WC assessment

technology-informed health-care systems include:

1. Data tracking and management
2. Ease of use/ease of data interpretation
3. Ease of upload for photos or additional documents.

The participants also highlighted that the main barriers for implementing the technology are cost and the potential incompatibility between the WC assessment technology and existing clinical systems.

Discussion

While specialized technological tools for wound care are in a constant process of adoption across BC, there is a recognized need in both the home and community care, as well as the long-term care sectors, to implement technology-based and evidence-based practice to ensure high quality cost-effective wound care management.

Findings highlight both the enthusiasm and challenges surrounding the implementation of AI-powered wound care technology at the health-care systems level. While there is a clear recognition of the need for advanced wound care solutions, the successful adoption of such technology requires addressing infrastructure, training, and system integration barriers. One significant advantage, as highlighted by participants, is its potential to standardize wound assessment through AI-driven measurements and predictive capabilities. This standardization could reduce inconsistencies in documentation and decision-making, which are common issues with existing wound care practices.

However, implementing new technologies into the health-care system presents notable challenges, including concerns about compatibility with existing EMR systems, particularly in facilities where digital adoption is low.

Table 3: Challenges And Opportunities Of Integrating Technology Into Wound Care

Challenge	Opportunity/Recommendation
At-capacity health-care professionals and excessive workload for frontline workers.	Wound care management technologies, like Swift Skin and Wound, foster collaboration and enhance staff efficiency by streamlining record keeping processes.
Minimum capacity to attend and conduct educational modules on wound care.	Within the platform, trained staff can use patient processes as case studies and upskill other care providers in wound management.
Lack of literacy on data needs in care facilities.	Work with specific facilities to understand data needs and develop seamless data pathways for staff to use.
Inconsistencies in EMR adoption and data processes across facilities.	Work with facilities to understand barriers to EMR adoption and address the inconsistencies in data records through streamlined, digitized record keeping processes.
Budget and capital demands for implementing costly technologies.	Technology developers should consider free trial periods for facilities to raise awareness of the benefits of technology implementation. Facilities should apply for grants to subsidize the implementation of innovative technologies.
Suboptimal record keeping practices.	Collaborate with facilities to understand data needs and promote technologies which streamline recording keeping processes.
Insufficient adoption of technology.	Customize/personalize technology packages according to each facility's needs while following appropriate facility, regional, and provincial policy.

The lack of uniformity in EMR systems across health authorities creates an additional obstacle, as not all facilities have the necessary infrastructure to seamlessly integrate new digital tools. Additionally, the financial implications of adopting new technologies, including costs associated with subscriptions, maintenance, and staff training, can be seen as significant barriers. Features such as offline functionality, compatibility with older devices, and intuitive interfaces were identified as crucial factors that would facilitate adoption and usability especially in rural and northern communities.

Wound care assessment technology was widely regarded as an innovative tool with the potential to enhance wound care management. By adopting a wound care management software, challenges have the potential to become opportunities, which are highlighted in the study as recommendations for the effective implementation of the technology in the region (See Table 3).

Moving Forward

A concerted effort is needed to bridge gaps in wound care technology adoption by enhancing interprofessional collaboration, investing in innovative technologies, and ensuring that standardized protocols are consistently implemented across all health authorities. By doing so, health-care leaders can strengthen the wound care management system thereby improving patient care and reducing the burden on health-care resources. The workshops revealed both the enthusiasm for innovative wound care technologies and the challenges that must be addressed for their successful implementation.

A multifaceted approach is necessary to facilitate the adoption of wound care assessment technology, such as Swift Skin and Wound, and

similar technologies. This includes securing funding to support implementation, providing comprehensive training to health-care professionals and ensuring seamless integration with existing clinical systems.

By investing in innovative digital solutions and prioritizing equitable access to wound care technology, BC can enhance its capacity to manage chronic wounds more effectively, ultimately improving patient outcomes and reducing the burden on health-care resources.

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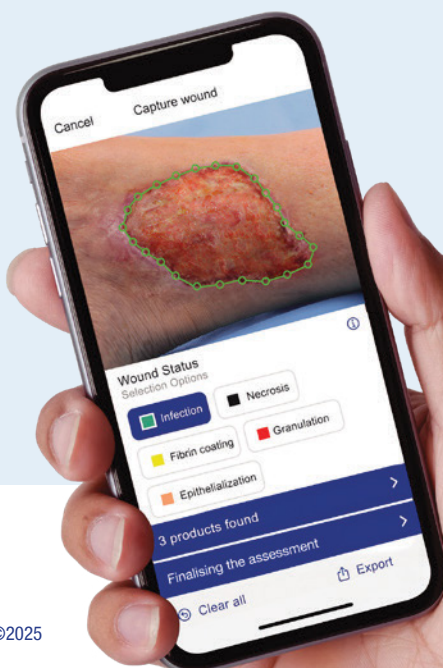
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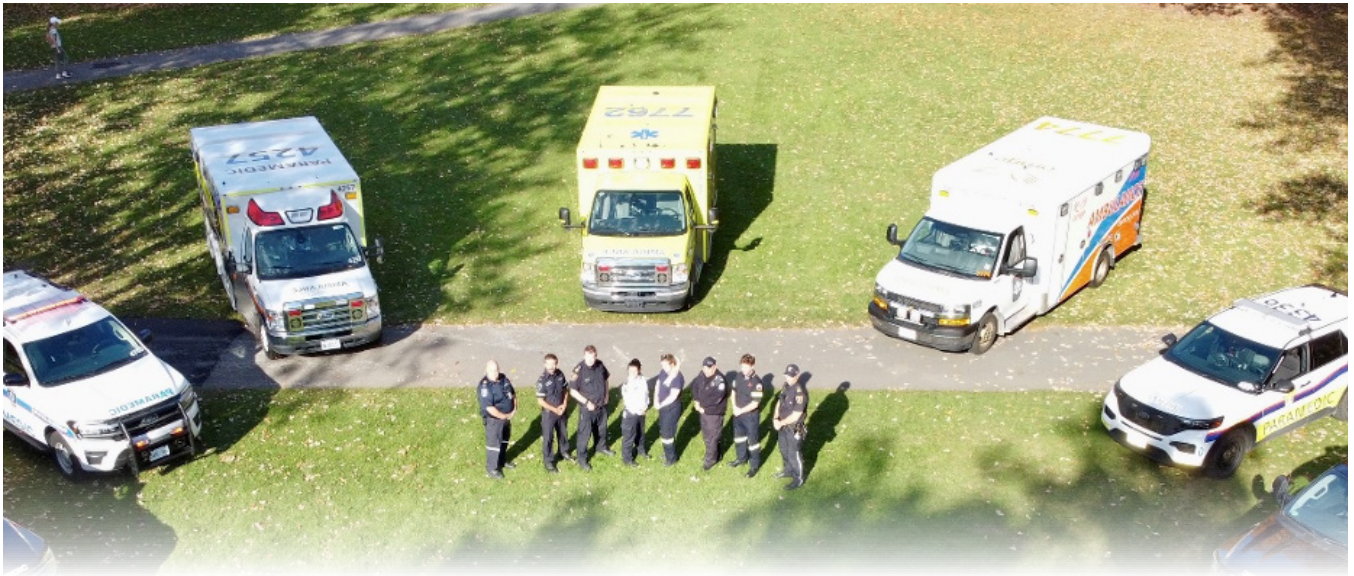


Photo: Canadian Paramedic Memorial Foundation

First Nations Paramedics / Paramédics des Premières Nations / Onkwehón:we Ronwatiia'takéhnhas: Reshaping The Narrative

By Robert Bonspiel LSSBB CREM FNP-PPN

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While paramedicine programs flourish in communities across Canada, many Indigenous communities remain overlooked. The question remains: why are these resources plentiful for some yet scarce for others?

The siren's wail slices through the quiet of a First Nations community. The sound is more than just an emergency signal; it echoes longstanding

disparities. Picture the landscape momentarily if you can: isolated roads winding through vast forests or across icy tundra, communities

scattered over distances most city-dwellers can't quite fathom. Emergency medical services (EMS) in these settings aren't simply essential; they're lifelines frayed thin by underfunding, geographic isolation, and a historical legacy of neglect. Shockingly, in certain areas, expert emergency wound care, even basic prehospital care—taken for granted in most Canadian towns—is hardly more than a distant promise.

Yet amidst these daunting challenges, First Nations paramedics quietly reshape the narrative. They're not merely health-care workers dispatched into crises, but trusted neighbours, fluent in more than just medical procedures. They speak the language of their respective communities—culturally, historically, and emotionally. They comprehend that healing isn't always about medicine. Healing is about addressing generations of trauma, mistrust, and the invisible threads that link social determinants of health.

Cultivating Trust

Take, for instance, a paramedic responding to an elder experiencing chest pain or suffering a serious wound in a remote community. Sure, there's the clinical urgency—vitals, medications, transport—but equally important is the trust cultivated through shared experiences and cultural understanding. These paramedics know that their uniform isn't always welcome, that health care's past sins have fostered a persistent wariness. So, they approach things differently, carefully stitching medical intervention with cultural sensitivity and gradually mending decades-old rifts.

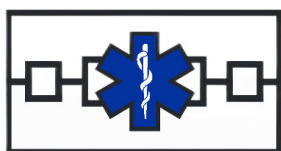
But this delicate balance is constantly threatened. The stark reality is that funding for Indigenous EMS services remains disturbingly inconsistent, at times virtually non-existent. This underfunding directly impacts the quality and availability of health care in these communities. While community paramedicine programs flourish elsewhere, bringing preventive care and proactive health management rights to patients' homes in many Indigenous communities remain glaringly overlooked. It begs the question: why are resources plentiful for some yet painfully scarce for others?

Advocacy becomes crucial here. First Nations paramedics and dedicated allies are actively pressuring provincial, territorial and federal authorities, demanding equitable resource allocation that recognizes unique needs—parity and meaningful justice. They're championing policies that don't simply patch existing holes but fundamentally rebuild the framework for health-care delivery in their communities. The urgency of this issue cannot be overstated. The goal isn't charity; it's genuine self-determination in health services.

Reflecting on these paramedics' stories reveals incredible resilience. Imagine navigating treacherous roads with minimal equipment, holding together lives with ingenuity and sheer determination. These aren't abstract statistics, but deeply personal stories of commitment, sacrifice, and a profound belief in community.

They're individuals facing impossible odds, yet persistently answering calls, knowing every intervention inches their communities closer to equity.

In essence, First Nations paramedics aren't just changing health care—they're redefining it entirely. They embody hope and strength.



FNP / PPN

Onkwehón:we Ronwatia 'takéhnhas
First Nations Paramedics
Paramédics des Premières Nations

They possess the quiet courage necessary to confront systemic neglect head-on.

Bridging this gap is not simply about emergency response; it's about reclaiming dignity, rebuilding trust, and ultimately transforming the health of Indigenous communities for generations to come.



**Robert Bonspiel,
Kanien'kehá:ka
(Mohawk) LSSBB
CREM FNP-PPN** is
from the community
of Kanehsatà:ke near
Oka, Quebec He is
the Paramedic Chief

and General Director of First Nations Paramedics (FNP/PPN). FNP/PPN is Quebec's only Indigenous-owned and operated provincially-contracted pre-hospital emergency medical service dedicated exclusively to serving Indigenous communities. With more than 36 years of experience in emergency medical services and health-care advocacy, Robert passionately promotes inclusive and culturally representative EMS systems. Robert has been instrumental in pioneering innovative health-care delivery models, championing policies that amplify Indigenous voices and striving to achieve equitable, accessible health care for Indigenous peoples across Canada. Additionally, he serves as the Quebec provincial representative and the sole Indigenous national representative on the Canadian Paramedic Memorial Foundation.

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By Wound Care Canada Staff

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In 2018, Wounds Canada launched the Wounds Canada Institute (WCI), which builds on decades of excellence in educational programs for health-care professionals in the areas of skin health and wound management. Through the WCI, health-care professionals at all levels and in all disciplines can access flexible, interprofessional education that supports their learning needs and professional career growth. The Institute offers many course and skill labs that are custom created to meet the needs of all wound care professionals. Wound Care Canada (WCC) interviewed two recent graduates about their experiences with the Institute courses.



Joanna Xavier RN BScN, Manager of Clinical Strategy and Planning | IST | EPI- Peel at SHIP
Best Practice Approach to Skin Health and Wound Management: Knowledge (A100MNN) graduate and organizer of a skills lab for her team

WCC: Tell us a bit about SHIP and how the organization focuses on wound care.

Joanna: Services and Housing In the Province (SHIP) is a nonprofit charitable, accredited (Exemplary Standing) housing and health service provider. We are one of the largest supportive housing providers in the provinces. For over 30 years, we have been delivering services to Peel Region, the County of Dufferin, West Toronto and, most recently, the Region of Waterloo. We promote the well-being of vulnerable and at-risk populations, and we work closely with individuals in our community, enabling them to embrace their full potential. Our approach encourages participation in planning and directing personalized support to ensure clients receive the best possible care.

SHIP aims to support individuals to improve their quality of life and to reach their full potential by providing safe health-care services in a

compassionate, respectful and empowering way.

SHIP operates several residential and group homes throughout Peel and the County of Dufferin. These residences successfully house SHIP clients, with satellite office spaces and community space for activity groups and training meetings.

Ongoing professional development is a vital part of ensuring quality in care. We care for individuals presenting more complex issues affecting their mental and physical health. I want to ensure there's ongoing education for nurses to refine and refresh their skillsets, so that they are confident and prepared to address client needs in the community.

WCC: You have done the Best Practice Approach to Skin Health and Wound Management: Knowledge (A100MNN) course from the Wounds Canada Institute. How did that aid you in your work?

Joanna: This course helped me with obtaining knowledge and updating my awareness of best practice guidelines using evidence-based research and practice. These are things I can use in my nursing practice.

WCC: What aspects of the course did you find most helpful in your line of work?

Joanna: At present, I am not actively working in wound care, however I have obtained knowledge in assessments and am able to decipher between major wounds and types.

WCC: How did you improve after finishing the course? Did you have a new awareness, new skills?

Joanna: Absolutely. For example, the ability to measure wounds the right way and use the right dressing kits for the particular wound.

WCC: You also organized a skills lab for your team. What did you hope to teach your employees?

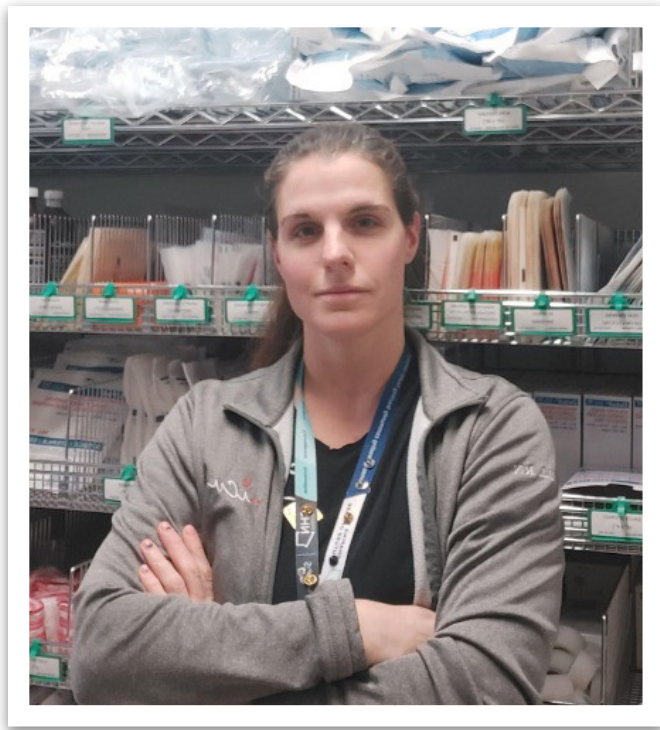
Joanna: That nursing care is invaluable. I hope my team members remember to stay curious, as it's a necessity to learn and be innovative in their trade. Where wound care is concerned, I want to ensure that SHIP nurses are equipped to treat urgent situations when wound care is needed. I want to promote critical thinking skills and equip nurses with the latest medical supplies to provide optimal care. Bringing the nurses together from across the organization for knowledge exchange provides the opportunity to recognize those who demonstrate strong skill sets, or identify where wound care is prominent, so that they feel comfortable tapping into each other's strengths. Many nurses work independently in their program, but they should not feel alone.

WCC: In what aspects of your teams' performance did you notice the biggest improvement after the train?

Joanna: I have learned the acquired skills and training necessary to help out and perform wound care when required and to include it in a holistic care approach with clients.

WCC: How do you feel that the Wounds Canada Institute contributed to your mission?

Joanna: I updated my skill set and gained physiological knowledge, as well as a better understanding of best practice guidelines.



**Vanessa Hill RN, Clinical Scholar-General ICU,
Scarborough Health Network**

*2024 graduate from the Wound Care Champion
program*

WCC: Tell us a bit about yourself and why you felt you needed to improve your wound care skills.

Vanessa: I have been a registered nurse for 18 years. I have clinical experience in orthopedics, medicine, forensics, cardiology, same day surgery /post-anesthesia care unit and critical care.

My clinical roles over the years started with bedside nursing and in the last two years I expanded my scope to Clinical Practice Leader with the critical care population. During this role, I was actively involved in the development and implementation of a wound care program in the Intensive Care Unit. This program involved the implementation of Wound Care Champions on the unit to perform bedside audits for pressure injury prevention bundle compliance; assisting with complex dressings and providing real-time education when gaps were identified. The data

collected was incorporated into a prospective longitudinal Quality Improvement study that identified the risk factors for hospital acquired pressure injuries and interventions to reduce them in the clinical setting. This study was presented at the CACCN (Canadian Association of Critical Care Nurses) conference in September 2024. As part of the education, various stages of pressure injuries were reviewed for prevention, identification and treatment.

In order to provide education and implement best practice guidelines, I advocated for enrollment in the Wound Care Champion program (WCCP). Our focus in the unit wound care program is primarily pressure injuries; however our patients have multiple co-morbidities leading to risk of peripheral artery disease, peripheral vascular disease, and diabetic ulcers. Obtaining further education on these wound types makes me a more valuable asset to the patient population. Through the WCCP, I also learned about additional assessment tools that could be implemented in the patient population and possibly incorporated into our documentation.

WCC: What first attracted you to the WCCP?

Vanessa: The WCCP first attracted me because of its collaboration between RNAO and the Wounds Canada Institute, as they are key in the development of the best practice guidelines for pressure injury prevention. My workplace is part of a Best Practice Spotlight Organization, and I felt that acquiring further knowledge through the WCCP would be beneficial for the critical care population.

WCC: How was your learning experience with the Institute?

Vanessa: My experience with the Institute was very positive. The resources provided with each module have been incorporated into my education for the unit wound care program and I have made invaluable contacts with previous students for future collaborations. The case scenarios and application of assessment tools helped me build my confidence in implementing my education at the bedside. The practical exam helped me bring everything together and the feedback from the facilitators have peaked my interest in community nursing.

WCC: What would you say were the most important skills you acquired from the program?

Vanessa: I'd say the most important skills acquired were the clinical application of the knowledge in the case scenarios, skills lab and practical exam. I have been able to identify pressure injury stages and implement interventions as part of our bedside rounds and education development. In 2025, I wish to review the current wound care products available and look at potential modification of the bedside rounds to identify the specific risks for the critical care population.

WCC: How do you feel your new skills have improved your performance at work?

Vanessa: I am able to implement the pressure injury prevention best practice guidelines within the critical care population, as part of my involvement and development of the unit wound care program. Hospital acquired pressure injuries are a significant risk factor for the critical care population, in light of our interventions that reduce mobility, medications that decrease perfusion and multiple co-morbidities that

impede healing. Implementing the best practice guidelines reduces the complications and prolonged stays for our critical care population. As part of the 'circle of care', I feel more confident collaborating with the inter-disciplinary team to advocate for wound care interventions and consulting with our wound care specialists. I am using the resources provided through the WCCP to develop onboarding education for new staff and reviewing the current role of the wound care champion on the unit.

WCC: Would you recommend this program to other students and what tips would you give them?

Vanessa: I would highly recommend the WCCP to other students. My tips for future students would include: reading the resources provided for each module prior to the live sessions in order to fully benefit from the case studies and clinical examples; and participating as fully as possible during the skills day. The WCCP will open doors for further wound care education opportunities and expansion of your professional scope.

Interviews were conducted by Loukia Papadopoulou MSc, Assistant Editor, *Wound Care Canada*.



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Use Of A Muscle Pump Activator To Treat A Left Ankle Wound

By Corina Tezcan RN BScN BScMBB NSOWC WOCC(C)

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This case study reports on a 68-year-old woman with a long-standing recurring wound which was the result of a traumatic ankle injury requiring an open reduction and fixation. It describes the use of a muscle pump activator (MPA) as part of the wound management strategy and its impact on wound healing.

At the age of 63 the patient was referred to the Community Outpatient Clinic (COC) and followed over the course of five years, from 2019 to 2023. On initial assessment the client presented with a long-standing chronic wound. Her lower leg skin was warm to touch, fragile, hairless, scarred, and mottled. There was significant hemosiderin staining, stasis dermatitis, atrophie blanche, puritis, varicosities, moderate left leg edema at 2+ 4mm up to mid calf and intermittent generalized pain which is indicative of venous disease.¹

The left and right dorsalis pedis and posterior tibial pulses were both palpable and biphasic and cap refills were less than three seconds, suggesting normal arterial blood flow.² She had full sensation of the foot and toes and her ABPI's were within normal range (Left=1.03 and right=1.08).¹ The client reported pain when lying down which was relieved when the limb was dependent. This would indicate an arterial component.¹ Based on these clinical findings, this

wound was managed as mixed arterial venous disease with a heavy focus on venous congestion.

Approximately 15 to 25% of patients with venous disease will also have some arterial insufficiency.^{1,2} In a recently published paper by Professor Keith Harding et al. (2025) it was reported that, "the MPA [muscle pump activator] device is effective in significantly increasing microvascular flow in leg ulcers with combined venous and arterial etiology."³ The range of motion of her knee was normal, however, due to prior surgery, the ankle fusion resulted in complete ankle rigidity. The client had developed wound infections over the course of treatment and was treated with parenteral and oral antibiotics and antimicrobial dressings. A Tagged White Blood Cell Scan ruled out hardware infection.

The client maintains a healthy, active lifestyle, and follows a nutritious, protein-rich diet to support optimal wound healing.

She is a non-smoker and non-drinker. These factors support wound healing, however she has some isolation based social determinants of health, which are known predictors for delayed lower leg ulcer healability.¹ She maintains strong community involvement, which provides a social and functional support that may help mitigate these risks.

Evidence-based best practices were used with the following treatment modalities: compression socks 20-30mmHg, 2-layer compression wraps, antimicrobial soaks, Iodine based topical antimicrobials, Silver based products, Methylene Blue/Gentian Violet foam dressings, Biochemical Modifiers, Polyhexamethylene Biquanide, Silver Nitrate to wound edges. Unfortunately, the wound did not respond to these therapies.

Discussion

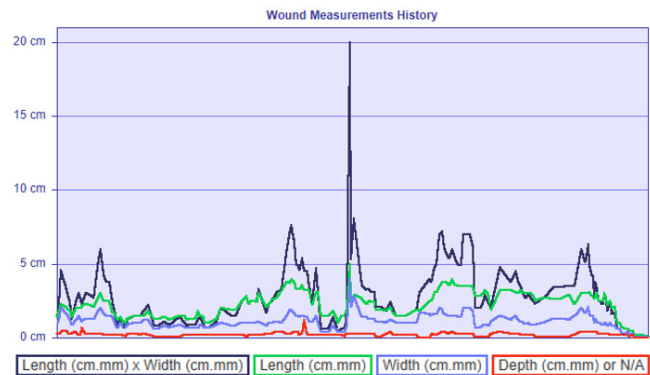
The failure of the client's calf muscle pump due to ankle immobility was a primary etiological factor in this wound not healing. According to Meulendijks et al. (2018), cited in Evans et al 2025, calf-muscle dysfunction is a strong predictor of VLU severity and healing.¹ The calf muscle pump, often called the second heart, returns the largest volume of blood to the heart, more than all other veins in the circulatory system. Based on the current literature it was decided to implement the MPA device using the Wounds Canada Best Practice Recommendations and the Canadian Consensus document.¹⁻³

The MPA increases venous, arterial and microcirculatory blood flow to the lower extremity, optimizing wound healing two-fold.³⁻⁷ In a recent article published by Professor Keith Harding et al. (2025), flux, the exchange of blood, oxygen and nutrients within the wound bed, increased by 38% to the wound bed and 95% to the periwound. The pulsatility, the rhythmic

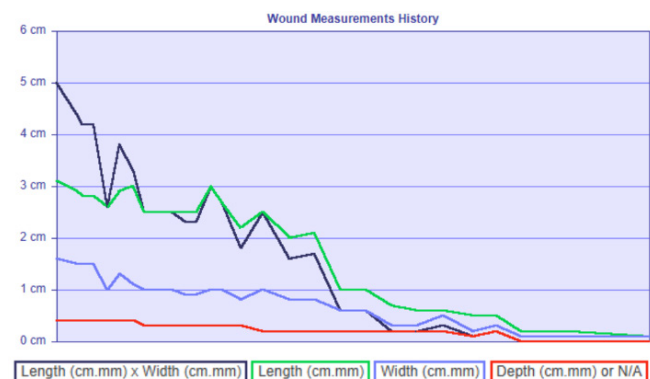
variation of blood flow, increased by 95% to both the wound bed and the periwound.⁶ For this client, the numbers show a greater improvement. The MPA was initiated May 16, 2023, and by September 5, 2023 wound closure was achieved and the MPA was stopped shortly after, on September 11, 2023. After not healing for 1467 days, it healed with the MPA within 112 days. See Calculating Time to Closure on following page for a detailed calculation.

Figure 1: This graph represents the measurements of the wound for the full duration of treatment from May 11, 2019-Oct 23, 2023.

Graph auto populated from Pixalere™



Note dated range listed is May 16, 2023-Sept 11, 2023, MPA initiated May 16th.



Demonstration of healing with the MPA in 16 weeks 210 weeks of non healing with standard wound care.

Initiating The MPA Device

On May 16, 2023, the MPA device (Firstkind Ltd., UK) was initiated. The fibular head was identified and marked with an indelible marker. The device was worn 12 hours/day, seven days/week as per the manufacturer's recommendation.⁸ The client was able to self-manage both compression and the MPA application. Self management supported the client's independence, while reducing the number of nursing visits. The client developed a contact dermatitis over the application (See Figure 2) and alternate placements sites were used as recommended by the manufacturer.⁸ A glucocorticoid steroid spray effectively managed this inflammation, and the client was able to continue with therapy.

Calculating Time to Closure

- Initial non-healing period: From May 11, 2019, to May 16, 2023 → 1467 days
- Healing period with MPA: From May 16, 2023, to September 5, 2023 → 112 days

Wound Healing Rate Calculation: Initial Wound Area-Current Wound Area/Time Lapsed.

- Without MPA: (14mm x10mm)-(31mmx16mm)/1467days= -0.24mm²/day. (Initial wound area - wound area on the day of starting MPA/total days before MPA).
- With MPA: (31mm x 16 mm)-(5mm x 2mm)/112days= 4.34mm²/day. (Wound area day of MPA initiation - final wound area / total days with MPA).

With the MPA, this client achieved wound closure in 16 weeks compared to a chronic non-healing period of over four years.

Figure 2: Baseline to Closure



May 16, 2023-Baseline.



June 29, 2023 after 6 weeks and 2 days of MPA treatment.



August 7, 2023 after 11 weeks and 6 days of MPA treatment.



September 5, 2023, after 16 weeks of MPA treatment.



Contact dermatitis which was managed with a glucocorticoid steroid inhaler applied to the application site of the MPA device.

Conclusion

The use of the MPA device for this patient resulted in a significant and positive outcome. This wound went from four years of non healing to closure within 16 weeks, with an increase in healing rate from $-0.24\text{mm}^2/\text{day}$ to $4.34\text{mm}^2/\text{day}$. The patient reported high satisfaction with the therapy and the nursing staff found the device easy to integrate into standard wound care. The client was able to transition to compression hosiery to maintain closure and prevent recurrence. The clinical implication is that clinicians have a viable option to improve wound healing outcomes using the muscle pump activator device.

Disclaimer

No financial or similar considerations were provided by Firstkind Ltd.

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