

Wound Care

C A N A D A

FALL 2020
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THE OFFICIAL PUBLICATION OF WOUNDS CANADA

Oral Wounds in LTC: **A Hidden Epidemic**

Wounds Canada Celebrates Its 25th Anniversary

Feeding the Foot: Nutrition and DFUs

Digital Health Literacy and Access to Care

Conference
Session Summaries:

Focus on Alberta

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References:

1. KCI. Summative User Interface Evaluation Report. March 20, 2018. 0000046678. 2. ICG DERMATAC Opportunity Assessment: Qualitative & Quantitative Market Research Final Report. October 8, 2015. 3. KCI. The Performance of DERMATAC™ Drape as compared to V.A.C.® Drape in Healthy Human Subjects. April 5, 2016. KCI.2015.DERMATAC.01.

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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.

Wounds Canada was formed in 1995 as the Canadian Association of Wound Care. The association's efforts are focused on four key areas: education, research, advocacy and awareness, and partnerships.

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News in Wound Care

Wounds Canada News

2021 Events: Mark Your Calendar

Wounds Canada is pleased to announce three virtual events in 2021. Mark your calendars now so you don't miss out—stay tuned for early bird registration info.

Limb Preservation Symposium – Virtual Event: Friday, May 28, 2021

A one-day event focused on issues central to amputation prevention in Canada.

National Conference – Virtual Event: Thursday, October 21 through Saturday October 23, 2021/French-language Wound Symposium: Sunday October 24, 2021

Our annual fall conference with experts from across Canada presenting a national perspective on key issues in wound care.

Pressure Injury Symposium – Virtual Event: Thursday, November 18, 2021

A one-day event addressing key issues on pressure injury prevention and management.

Have you downloaded the latest BPR?

Best Practice Recommendations for the Prevention and Management of Moisture-associated Skin Damage is now available for free download! This is the 10th chapter of Wounds Canada's Foundations of Best

Practice for Skin and Wound Management. To download and read the entire collection, [visit our website](#).

Thanks for celebrating our 25th year!

On behalf of the Wounds Canada board of directors and staff, we'd like to thank you for making our 25th year so special. 2020 has been an incredibly difficult year for everyone in the wound-care community, both personally and professionally, but we are proud to have supported and been supported by such a dedicated group of patients, health-care professionals, corporate partners, policy makers and more. The Canadian wound care community is strong and getting stronger!

Here are some of this year's offerings, in case you missed them:

- **Podcast series:** Episodes include interviews with wound experts, info on what's new in wound care, special events and more!

- *Wound Care Canada* issues

March 2020: Read about nutrition for pressure injury healing, virtual care policy, "designer" wound care and other topics of interest to frontline clinicians, policy makers and patients.

June 2020: This issue contains articles on a variety of topics, including the challenges in long-term care facilities, harm reduction in skin and wound care, monofilament testing protocols and mental health concerns for patients with diabetes.



COVID-19 Response

Care at Home Series

Wounds Canada developed and released a series of 10 resources for patients and their care partners to help them better care for their wounds while at home (see the article on page 12 for details). [Download these resources here.](#)

Caring for the Carers Webinar Series

Wounds Canada presented a series of three webinars for health-care professionals to come together and discuss common concerns, difficulties and coping strategies during the COVID-19 pandemic. [Visit our online webinar archive](#) to view these sessions.

Qualitative Research

With COVID-19 spreading, research is necessary to understand and minimize negative impacts on individual care providers and their families. In order to address this, Wounds Canada developed a qualitative online survey to collect data from the perspective of Canadian wound care clinicians. Survey questions explore how the delivery of care has changed during the COVID-19 pandemic and how health-care providers have adapted delivery of wound care services with patients and their families. The first survey was sent out earlier this year, with two follow-up surveys being sent in the coming months. If you'd like your voice to be heard, watch your inbox for instructions about how to participate.

OCTOBER 2020

Virtual Conference Wrap-Up

The 2020 Wounds Canada Virtual Conference, held October 14–18, combined three interactive events: the regional Alberta conference, the national conference and the Limb Preservation Symposium. This year, we welcomed 1,910 delegates from 31 countries, 104 national and international speakers and 375 industry representatives to this five-day mega event.

If you were a registered attendee and missed a session or would like to earn the maximum available continuing education credits, visit the conference platform until December 15, 2020, to view presentations and explore the poster and exhibit halls.

If you didn't attend, you can still access the platform until December 15, 2020. [Register for the conference here.](#) Once you have registered, you will be able to watch the session videos, view the posters and visit the exhibit booths to obtain product literature and watch sponsored videos.





News from Our Industry Partners

B. Braun

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Cardinal

Save the date! Cardinal Health Canada invites you to join a FREE live webinar event, "Changing the Paradigm: Supporting Patients' Transition to Home Care Using a Disposable Canister NPWT Device," on Tuesday December 8 at 7:00 p.m. Eastern Standard Time. During this informative session Canadian



CardinalHealth

clinicians Susan Chandler and Rose Raizman will teach new ways to think outside the box when considering negative pressure wound therapy for patients as they transition to home care. Susan and Rose will review the basics of using a novel dispos-

able canister NPWT, and they will examine some challenging case studies.

Don't miss out – reserve your spot now at: https://cardinalhealth.zoom.us/webinar/register/3716044289995/WN_nQ0uD-69TKuw8RfTCWb1IQ.

Hillrom

Hillrom is a global medical technology leader whose 10,000 employees have a single purpose: enhancing outcomes for patients and their caregivers by advancing connected care. Around the world, our innovations touch over 7 million patients each day. They help enable earlier diagnosis and treatment, optimize surgical efficiency and accelerate patient recovery while simplifying clinical communication and shifting care closer to home. We make these outcomes possible through connected smart beds, patient lifts, patient assessment and monitoring technologies, caregiver collaboration tools, respiratory care devices, advanced operating room equipment and more, delivering actionable, real-time insights at the point of care. Learn more at hillrom.com.



Hydrofera

It was great meeting so many of you at the Wounds Canada conference last month. Thank you for visiting our exhibit booth, meeting our staff and learning about our Hydrofera Blue portfolio of antibacterial wound dressings.

The NEW Hydrofera Blue READY-Border™ dressings provide the perfect option for atraumatic dressing changes. Using a gentle, easy on/easy off silicone adhesive border, the dressing allows intimate contact of its non-cytotoxic antibacterial foam to the wound bed. The gentle contact of foam, with its natural healing and protective properties, provides an added measure of safety to help prevent infection and aid in the healing process.

In celebration of Wounds Canada's 25th Anniversary, Hydrofera awarded digital thermom-

eters to 25 lucky winners. You still have a chance to WIN.

If you missed the Hydrofera session featuring speakers Dr. Perry Mayer and Amanda Loney, you can still see it here. Just click on this link and enjoy Diving Deep into Wound Care: [Hydrofera – Final Video – Virtual Sponsored Session, Wounds Canada Oct. 17 2020](#). Then, click here to WIN a digital thermometer: www.surveymonkey.com/r/M7LVM8G. Three winners will be notified on December 24, 2020.

Happy and safe holidays from Hydrofera. Please visit Hydrofera at www.hydrofera.com.

Medline

The Medline Skin Health Division is a dedicated team of clinicians and sales representatives who work with health-care professionals to improve patient outcomes in skin and wound care. We are a manufacturer of industry-leading, innovative products used across the entire continuum of health care.



This year we have launched a number of new and exciting products.

AccuWrap 2-Layer Compression Bandage System

AccuWrap is a 2-layer system that delivers therapeutic compression to manage venous disease and associated edema for up to seven days. Thin, streamlined layering and breathable materials add comfort to encourage patient compliance. Accuracy indicators confirm ideal compression is applied. See the [Application Video](#) here.

DriGo-HP Antibacterial Wicking Sheet

DriGo-HP uses encapsulated hydrogen peroxide released slowly to help reduce odour and bacteria within the fabric. This product is an ultra-smooth, soft, wicking fabric that helps reduce further damage in vulnerable areas like skin folds. See the [Application Video](#) here.

IoPlex Iodophor Foam Dressing

A proprietary controlled-release system allows for regulated and sustained infection management through slow release of iodine within the wound

dressings while absorbing exudate. It can be cut to fit the wound size. See the [Application Video](#) here.

For more information, contact your local Medline Skin Health representative or email canada@medline.com.

MIP

At MIP, we are committed to making a difference for our caregivers and care recipients by offering a broad range of textiles and related products, services and solutions for the continuum of care.

Did you know that our Swift UltraSlide System helps reduce staff injuries and repositions patients and residents with ease?

And did you know that the Swift UltraSlide System

is made with a breath-

able fabric, which helps reduce the risk of moisture-associated skin damage? To learn more about our repositioning system and how it can help caregivers and care recipients focus on caring and healing, please visit us at www.mip.ca. It would be our pleasure to answer any of your questions.



Perfuse Medtec

Perfuse Medtec Inc. is the exclusive Canadian distributor for the wearable geko™ device, an innovative muscle pump activator. Weighing just 10 g, this wireless, battery-powered device is applied just below the knee using its self-adhesive gel. When activated, the small, painless electrical impulses stimulate the common peroneal nerve, activating foot and lower leg muscles, increasing blood circulation up to 60% of that achieved by walking.

In several Canadian wound healing evaluations, the geko™ device has achieved a highly significant reduction of surface area in patients with chronic non-healing venous leg ulcers (VLUs). In patients with new VLUs, this rate was accelerated to 37% per week. A cost study conducted at an Ontario LHIN demonstrated cost savings of approximately \$2,500 per patient. Further evidence from a large randomized controlled trial conducted at London



Health Sciences Centre demonstrated a significant reduction in edema and weight gain, increased urine output, fewer wound infections at post op day three and five, and a cost savings of \$2,300 per patient due to early discharge for renal and renal pancreas transplant patients. For more information and references visit our website at www.gekowound.ca.

Note: The geko™ device has a broad range of indications. We are proud that the London Health Sciences Foundation and London Health Sciences Centre have recognized the potential role the device may play in preventing catastrophic outcomes caused by thrombus formation for hospitalized COVID-19 patients. This study is currently being designed and we are hopeful that Canada continues to contain the virus to the point that we never conduct the study.

Smith+Nephew

Patients who suffer from a chronic wound, who undergo surgery or who experience an unexpected injury desire a return to normal. At Smith+Nephew, we aim to restore patients to the lives they love. This is why we are continuously improving and expanding our PICO® Single

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To date, PICO® sNPWT has a strong clinical evidence base with 146 clinical publications supporting the use of PICO® to reduce surgical site complications and length of stay and improve healing of chronic wounds, while reducing cost and health resources and improving patient outcomes. Our desire is that patients can return to their normal lives without compromising their recovery—or their sense of self.



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*apart from dark necrosis 1. Minter KC, Meaume S, Augustin M, Senet P, Kérihuel J.C. The reality of routine practice: a pooled data analysis on chronic wounds treated with TLC-NOSF wound dressings. J Wound Care. 2017 Feb; 26 (Sup2): S4-S15. Erratum in: J Wound Care. 2017 Mar 2; 26(3): 153. | 2. Edmonds M, Lázaro-Martínez JL, Alfayate-García JM, Martini J, Petit JM, Rayman G, Lobmann R, Uccioli L, Sauvadet A, Bohbot S, Kérihuel JC, Piaggese A. Sucrose octasulfate dressing versus control dressing in patients with neuroischaemic diabetic foot ulcers (Explorer): an international, multicentre, double-blind, randomised, controlled trial. Lancet Diabetes Endocrinol. 2018 Mar;6(3):186-196. | 3. Lazaro et al. Optimal wound closure of diabetic foot ulcers with early initiation of TLC-NOSF treatment: post-hoc analysis of Explorer.JWC VOL 28, NO 6, June 2019. | 4. Sigal ML, Addala A, Maillard H, Chahim M, Sala F, Blaise S, Dalac S, Meaume S, Bohbot S, Tumba C, Tacca O. Clinical evaluation of a new TLC-NOSF dressing with poly-absorbent fibers for the local management of exuding leg ulcers, at the different stages of the healing process: Results from two multicentric, single-arm, prospective, open-label clinical trials. J Wound Care 2019; 28(3):164-175.

Stryker

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 - Catheter-associated urinary tract infections
 - Surgical site infections
 - Hospital-acquired pneumonia
 - Incontinence-associated dermatitis
- Mobility
- Pressure injuries

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WoundsCANADA^{ca}

Introducing the Care at Home Series

Wounds Canada is pleased to provide the Care at Home series—a set of resources for anyone who wants to learn about and implement health-positive behaviours to help better care for their skin and to prevent or care for wounds while in a home setting. The Care at Home series provides simply written information on healthy habits and lifestyle choices that can contribute to healthy skin. As well, the resources outline what to look for or do if skin breakdown does occur. Each resource focuses on a particular type of skin breakdown or area for prevention or treatment.

The resources are also great tools for health-care providers. They can help to guide conversations around a patient's goals, options for improving their health, and how to maximize their well-being, while in care or while self-managing at home.

The first Care at Home document, "Caring for Your Wound at Home," was introduced in April of this year, when the pandemic prevented many Canadians from accessing the care they needed. To date, Wounds Canada has created 10 Care at Home

documents, which have been downloaded over 15,000 times since mid-April.

These timely documents have been developed by experts in skin and wound care, education and knowledge mobilization, with each resource following a step-by-step process that addresses the following questions:

- What is it? (identifies and describes the potential or actual skin health problem)
- What causes it? (reviews the risks that may lead to this problem)
- What does it look like? (explores the typical characteristics of the problem)
- What can you do to prevent it? (discusses prevention-related actions/options)
- What do you do if you have one? (discusses treatment actions/options)
- When do you call in the professional(s)? (discusses the type of support needed to prevent or resolve the problem)

The documents also contain images, tips, tools and tables that

provide even more information and guidance.

The Care at Home documents in the series are as follows:

- **Caring for Your Wound at Home: Changing a Dressing** walks the reader through a



simple, step-by-step process for changing a dressing and checking on how the wound is doing.

- **Preventing and Managing Skin Injuries: Minor Trauma (Cuts, Scrapes and Bruises)** provides information on how to keep skin healthy by preventing and/or managing minor skin injuries—especially important for individuals who are at high risk for skin damage.
- **Caring for Your Swollen Legs at Home: Preventing and Managing Venous Leg Ulcers (VLU)** outlines the possible causes of leg swelling, and provides information on what the reader can do at home to prevent or manage swelling should it occur.
- **Caring for Easily Injured Skin: Preventing and Managing Moisture-associated Skin Damage (MASD)** reviews the possible causes of MASD, and advises the reader what can be done at home to prevent or manage MASD should it occur.
- **Caring for Pressure Injuries at Home: Preventing and Managing Pressure Injuries (PI)** outlines actions the reader can take to prevent a pressure injury from developing or to care for an existing pressure injury.
- **Caring for Yourself After Surgery: Preventing Surgical Site Infections** provides guidance on actions surgical patients and their care partners

can undertake before and after surgery to help prevent infections and recognize the signs of infections if they do occur.

- **Caring for Your Feet: Safe Foot Care If You Have Diabetes** is a simple guide for persons with diabetes and their care partners on how to care for their feet at home.
- **Diabetic Foot Complications: When is it an emergency?** provides guidance for persons with diabetes and their care partners on recognizing signs of complications and accessing professional assistance when required.
- **Caring for Injured Skin: Preventing and Managing Burns** is a guide to help prevent or manage burns that occur at home.
- **Keeping Your Home Safe: Preventing Skin Injuries for the Whole Family** identifies many easy, inexpensive changes the reader can make to ensure everyone is comfortable and secure in and around the home.


The Care at Home resources benefit everyone, including:

- **The individual**—through increased knowledge and confidence in self management and decreased pain and suffering; improved conversations with their health-care team about goals, options for improving their health and well-being; earlier recognition

of the need for professional intervention

- **The care partner**—through improved knowledge to enable the individualized caregiving that results from increased understanding of the underlying causes of their family member's or patient's current condition and how to address them
- **The health-care professional**—through improved ability to communicate and co-ordinate positive care planning with patients; health-care providers can remind individuals that their health and well-being are based on the small choices they make daily and that healthy choices can add quality to their lives
- **The administrator**—through implementation of strategic policies around preventative care that ensure that making the healthy choice is the easy choice, ultimately resulting in healthier living, healthier individuals and healthier communities

For access to and information on the use of the Care at Home series, visit: www.woundscanada.ca/patient-or-caregiver/care-at-home-series.

For a free online tutorial on how to use the Care at Home resources, check out www.youtube.com/watch?v=_iDzqdyLt3w&feature=emb_logo. 

The Care at Home series of resources will be available in French beginning in 2021.

Coloplast Sponsored Learning: Global Consensus towards Fewer Days with Wounds

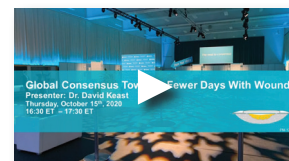
David Keast, MSc BSc(Hon) DipEd MD FCFP(LM) CCFP

David Keast is the Medical Director of the Chronic Wound Management Clinic at the Parkwood Institute in London, ON. He is a clinical adjunct professor of Family Medicine, Schulich School of Medicine and Dentistry, Western University (London, ON). He is an associate scientist at both the Lawson Health and Parkwood Research Institutes. He is Co-director of the Canadian Lymphedema Framework and President of the Wound Alliance for Wound and Lymphedema Care.

Chronic wounds impact more than 50 million people worldwide, and a recent survey showed that many clinicians in wound care are looking for more information about this area of care. In November 2019 Coloplast gathered experts to develop a consensus and guidelines for optimal wound healing. Eighty-five wound care specialists from 19 countries participated in the project over a four-month period. The project included online Delphi studies, online dialogue and face-to-face meetings. 69% of participants had specialized wound care credentials. 86% had more than 10 years of wound care experience. 46% had more than 20 years of experience in this area. The results were published in *Wounds International* in September 2020.

The aim of the consensus project was to look at how to manage the gap between the wound and the wound dressing, as it is imperative to manage this space to improve healing outcomes. Risks associated with this gap being left unmanaged include increased bacterial invasion and impaired healing.

Consensus is developed through a process aimed at creating a common understanding. Consensus building is the process of helping groups reach a common understanding on an issue or solution (Figure 1). It is the process of helping people think together using critical thinking skills to make decisions. It builds on the collective intelligence of the group. The concept of consensus building is based on the belief that when people think together, they can make better decisions.



Consensus Workshop Findings

Consensus was to be found in eight areas: wound assessment, wound bed preparation, managing the gap, effective exudate management, recognizing early signs of infection, managing biofilms, holistic wound management and patient education. Consensus was reached when more than 80% of the participants agreed and no one disagreed.

The workshop participants found that the following should be the focus on the wound gap assessment: wound depth, undermining, tunneling and fistulas, underlying wound bed structure and topography, tissue quality/granulation, necrosis, exudate (quality, colour, odour), age of the wound, infection/bioburden colonization, wound edge and periwound skin and wound etiology.



Figure 1. Consensus process

Figure 2. Members of the consensus team

Managing the gap is important because doing so provides a moist healing environment, decreases the risk of biofilm development, keeps exudate from leaking into the periwound, decreases risk of infection and removes pools of exudate from the wound bed.

Critical success factors for gap management include effective exudate management, wound healing progression, management of wound bioburden, decreased pain, decrease or absence of undermining of the wound and decreased signs or absence of maceration of the periwound skin.

Dressings used to manage the gap should have the following features:

- Antimicrobial properties
- Conformity to the wound bed
- Vertical absorption of exudate to protect surrounding tissue
- Patient comfort and ability to perform self-care
- Cost effectiveness
- Promotion of a moist healing environment

Overall Recommendations

- Wound treatment should be primarily focused on providing an optimal healing environment.
- One of the most important factors in promoting an optimal healing environment is managing the gap between the wound bed and the dressing.
- Gap management is about exudate management and must promote moisture balance in the wound.

Wound assessment is fundamental. A full wound assessment should be completed at each dressing change or at least one per week. This assessment provides an opportunity to diagnose and treat infection in the early stages and to decrease limb-threatening complications.

Next Steps

Evidence-based, experimentally based, accessible guidance on managing the gap between the wound bed and the wound dressing is required to decrease the number of days patients live with wounds. A guidance document will help stop routine or ritualistic care and encourage holistically planned wound care focused on wound healing rather than wound treatment. While this project reached consensus on the importance of managing the gap, further work is needed to develop guidelines that help health-care providers effectively move wound care evidence/best practices into clinical practice.

Coloplast is continuing to collaborate with health-care professionals on three additional articles in this series addressing managing the gap in chronic wounds. Articles on exudate management, preventing and treating infection and biofilm, and holistic wound management will be published in the coming months.

“Treatment Guidelines on Managing the Gap in Chronic Wounds” is currently in development. The guidelines will be based on collaboration among over 2,000 health-care professionals (specialist and generalist) worldwide in a large-scale consensus process.



Presentation Digest is a production of Wounds Canada. (www.woundscanada.ca).

The views expressed in this report are those of the presenter and do not necessarily reflect those of Wounds Canada, which has neither reviewed nor endorsed this report.

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World Diabetes Day

2020 Social Media Campaign

Background

Four out of five lower limb amputations related to diabetic foot complications can be prevented. Wounds Canada used November 14, 2020, World Diabetes Day, as an opportunity to increase awareness about the problem of unnecessary diabetes-related foot amputations and provide resources and solutions. We're trying to "end the four" of five amputations that wouldn't happen if more people knew how to prevent them. To that end, Wounds Canada carried out a national social media campaign to inform Canadians about amputation prevention.

About the Campaign

This fully bilingual campaign consisted of a series of co-ordinated tweets and Facebook, Instagram and LinkedIn posts, beginning in late October. The high point, November 14, World Diabetes Day, featured a blitz on tweets and retweets, personal challenges and live events.

The campaign was aimed at everyone (patients, families, health-care professionals, government

and policy decision makers, media personnel) and was designed to elevate the topic of skin and wound care in general and preventing diabetic foot-related amputations in particular.

A number of stakeholder organizations participated (see box on page 17), along with members of Wounds Canada's National Strategy Committee, Diabetic Foot Task force and individuals at large.

The hashtags used were **#EndAmputations**, **#EndDiabetes** and **#SaveThe4**.

Impact

This highly cost-effective campaign allowed Wounds Canada the opportunity to increase community engagement at the clinical, patient, organizational and policy maker levels. It also resulted in overall increased political awareness and engagement and new followers and fans.

Many thanks to all who participated by posting, liking and retweeting!

Wounds Canada will be initiating other campaigns in the future to raise awareness and advance the cause of excellence in wound prevention and management. 🇨🇦

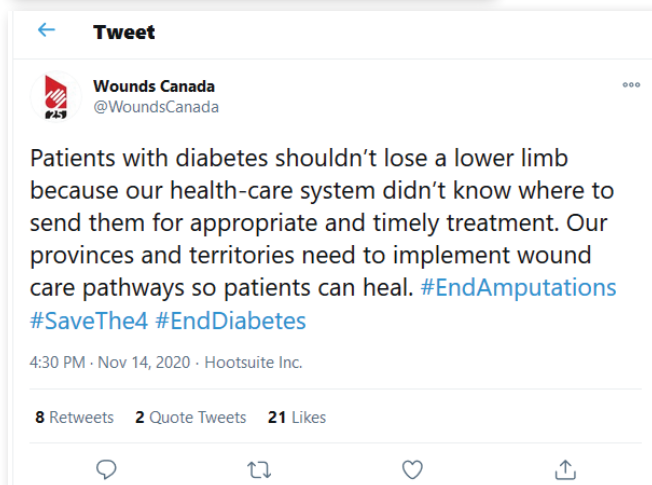


Figure 1: Example of tweets during the campaign

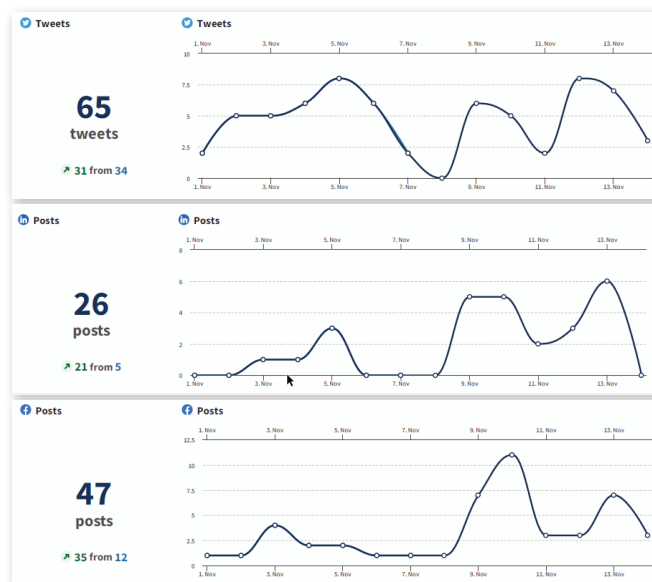


Figure 2: The number of Wounds Canada posts during the campaign

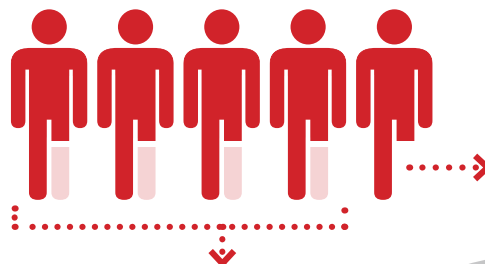


Figure 3: Engagement during the campaign

Participating Organizations

British Columbia Podiatric Medical Association
Canadian Association of Foot Care Nurses
Canadian Cardiovascular Society
Canadian Podiatric Medical Association
Diabetes Action Canada
MIMOSA Diagnostics
Nurses Specialized in Wound, Ostomy and
Continence Canada
Ontario Podiatric Medical Association
Regroupement Québécois en Soins de Plaies
South Riverdale Community Health Centre
WoundPedia

The situation ...



14 amputations per day across Canada resulting from diabetes, equalling **5000+** amputations per year

The problem ...

4 out of 5 amputations resulting from diabetes are **preventable**¹

The solution ...

Awareness and Education: The public, health-care professionals and administrators/decision makers must be aware of the issue and have education appropriate to their situation/position.



Self Care

- Daily foot checks
- Blood glucose control
- Use of professional resources



Systems Support

- Equal access to care
- Policies and funding to support care based on risk
- Specialty clinics



Clinical Care

- Holistic risk assessment
- Plan of care based on risk
- Regular follow-up

#SaveThe4

Source:

1. Mohamad A. Hussain, Mohammed Al-Omran, Konrad Salata, Atul Sivaswamy, Thomas L. Forbes, NaveedSattar, Badr Aljabri, Ahmed Kayssi, Subodh Verma, Charles de Mestral CMAJ Sep 2019; 191 (35) E955-E961; DOI: 10.1503/cmaj.190134
2. Get The Facts – Diabetes 360[®] [Internet]. Diabetes strategy now.ca. 2020 [cited 26 October 2020]. Available from: www.diabetesstrategynow.ca/facts.

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Figure 4: Wounds Canada shares this Diabetes in Canada #EndAmputations infographic widely among policy makers and politicians to raise awareness of the financial and human cost of diabetes to our health-care systems and society.

A Second Campaign in November

November 19 was World Wide Pressure Injury Prevention Day, led by the National Pressure Injury Advisory Panel (NPIAP). Wounds Canada participated by conducting a blitz campaign on social media to raise awareness about pressure injuries in all sectors of care, and particularly long-term care. Using the hashtags **#StopPressureInjury** and **#StopPUDay2020**, Wounds Canada posted in our social media accounts to inform and engage Canadians about this ongoing problem. Federal Health Minister Patty Hajdu's tweet in support of our campaign helped raise the profile of the issue.



Figure 5: Canada's Minister of Health, Patty Hajdu, supported World Wide Pressure Injury Prevention Day.



gekoTM
wound therapy

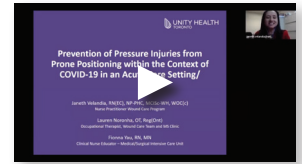
221 Subject Randomized Controlled Trial: Edema and Wound Healing Outcomes in Renal Transplant Patients
Lawson Research, London Health Sciences Centre, London, Ontario^{1,2}
The gekoTM device vs Intermittent Pneumatic Compression and Thromboembolic Deterrent Stocking

Measure	Outcome	Significance
Demographics	No significant difference	None
Leg Edema¹	IPC 3.6 cm vs 2.5 cm geko TM device	P=0.001
Weight Gain¹	IPC 5.18 kg vs 4.06 kg geko TM device	P=0.003
Urine Output Total¹	IPC 12.6 L vs 15.99 L geko TM device	P=0.003
Higher Femoral Vein Velocity¹	IPC 14.41 cm/sec vs 18.9 cm/sec geko TM device	P=0.001
Wound Healing²	POD 3/POD 5	P=0.04/P=0.0003
Wound Infections²	29% of IPC patients vs 12% geko TM patients	P=0.03
Length of Stay¹	9.36 days IPC vs 8.15 geko TM ~ 1 less day than IPC	P=0.038
Mobility² (Pedometer)	1099 steps IPC vs 1231 geko TM device	P=0.009
Hospital Observation	Cost savings of \$2,300.00/patient with geko TM device	

1. Wen Xie *et al.* Daily use of a muscle pump activator device reduces duration of hospitalization and improves early graft outcomes post-kidney transplantation: A randomized controlled trial. E-pub ahead of print 2020 <https://cuaj.ca/index.php/journal/article/view/6487>
2. Shahid A *et al.* Use of a muscle pump activator leads to improved lower limb edema, lower limb blood flow, and urine output compared with standard ted stockings and compression devices following kidney transplant: a randomized controlled trial. Transplantation Proceedings. 2019; 51(6): 1838-44. <https://doi.org/10.1016/j.transproceed.2019.04.032>

Learn more at www.gekowound.ca

Mölnlycke Health Care Sponsored Session: Prevention of Pressure Injuries from Prone Positioning within the Context of COVID-19 in an Acute Care Setting



Presenters: Janeth Velandia RN(EC) NP-PHC MCISc-WC WOC(c);
Lauren Noronha OT Reg(Ont); Fionna Yau RN MN

Janeth Velandia is a nurse practitioner in the Wound Care Program at St. Michael's Hospital in Toronto. She is also an adjunct lecturer at S. Bloomington Faculty of Nursing at the University of Toronto.

Lauren Noronha is an occupational therapist and part of the wound care team and MS clinic at St. Michael's Hospital in Toronto.

Fionna Yau is a clinicial nurse educator in the Medical/Surgical Intensive Care Unit at St. Michael's Hospital in Toronto.

In July 2019, the Medical/Surgical Intensive Care Unit (MISCU) Team and the Wound Care Team (WCT) at St. Michael's Hospital in Toronto began a project with the goal of decreasing the incidence of hospital-acquired pressure injuries (PIs) in the ICU. The plan for the project included pre- and post-data col-

lection; performing chart audits; conducting a survey to explore staff confidence towards PI assessment, staging and management; and recording pressure injury point prevalence and incidence.

After baseline data were collected in October 2019, an e-learning module was created, RNs were provid-

Proning

Proning is the process of turning a patient from their back onto their stomach (Figure 1). This is a collaborative effort by nurses, respiratory therapists and physicians done in a slow, controlled and co-ordinated manner. Proning is done to improve oxygenation for patients with moderate to severe adult respiratory distress syndrome by reducing pleural pressure, improving alveolar recruitment, ventilation and gas exchange, and mobilizing secretions. Proning is not used in patients with new or worsening respiratory symptoms, changes in diagnostic images or changes in P/F ratio (less than or equal to 150 mmHg). Proning must be used for a minimum of 12 hours and must consider bed surfaces (air mattresses vs. gel-based therapeutic pressure redistribution surfaces), positioning devices (pillows) and skin protection requirements (eye patches and eye lubricants, foam facial pillows, dressings to reduce shearing).

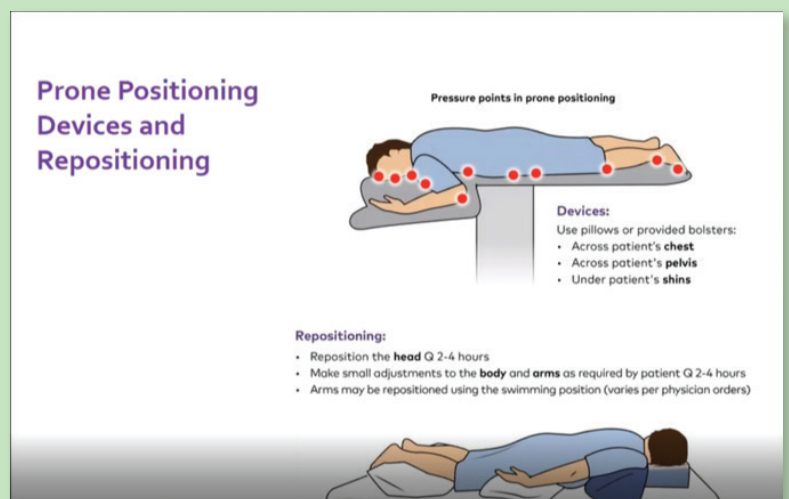


Figure 1. Prone Positioning

ed with education and the patient/family education pamphlet was updated. Product evaluation of soft silicone multi-layered foam dressings was completed through a literature review, a review of the most current practice guidelines and meeting with an expert clinician, Tod Brindle.

Clinical practice guidelines from the NPIAP (2016) recommend the use of foam dressings for the prevention of pressure injuries. Benefits of a five-layered foam include the ability to impact four extrinsic factors that can contribute to developing pressure injuries: minimizing and redistributing shear, redistributing pressure, reducing friction and maintaining optimal microclimate.

When the COVID-19 pandemic began, the priorities of the project changed. There was a sharp increase in the number of patients being prone as part of treatment in the ICU and an increased number of referrals for patients with hospital-acquired PIs. The MISCU and WC teams worked together to review St. Michael's Hospital prone positioning policy and the NPIAP's most recent literature for prevention of PI in patients being put in prone positioning. The project focused on three factors: prophylactic foam, positioning devices and repositioning principles.

Prophylactic multi-layer foam

Prophylactic multi-layer foam is used to protect the patient's forehead, chin, chest, hips, knees, sacrum and bilateral heels. A pillow is used to protect the patient's head. Skin barriers are used at the corners of the mouth to avoid moisture-associated skin damage caused by drooling.

Positioning devices

Positioning devices like heel-lift boots, wedge pillows and positioning rolls are used to offload pressure points. With more patients being put in a prone position, more thought must go into what prevents pressure injuries while lying on the stomach. A literature review found that not much robust data are available, but what data do exist suggest use of pillows under the chest, abdomen and shins (to relieve pressure on ankles and knees). Recommendations state that pillow height should be altered to avoid hyperextension of neck and spine. However, frontline clinicians disagreed that pillows were enough for patients, stating they were too firm/soft, not the right size or not readily

available. The project team trialled various cushions and devices from around the hospital and eventually agreed on a bolster type that seemed to work well. Work in this area is ongoing.

Repositioning principles

Repositioning principles must be adapted to be applied in the context of COVID-19 in the acute-care setting. Typical protocol is to reposition every two hours, but when COVID-19 is present, best practice suggests repositioning every 2–4 hours while regularly making small adjustments to the head and arms.

The project team developed proning kits that are ready to use for each patient preparing to be prone, with the goal of simplifying the process for ICU staff. The kits include an educational pamphlet for clinicians that contains simple instructions and visual cues.

Finally, the team worked with the hospital's IT department to create an order set to standardize the prone positioning protocol in the hospital. The order set includes:

- application of a multi-layered foam for seven days in a specified location
- skin assessment completed during every shift for all areas below the foam dressing
- use of pillows across the chest, pelvis and shins while in prone position
- assessment of pressure points every 2–4 hours
- head turns and eye care every 2–4 hours



Presentation Digest is a production of Wounds Canada (www.woundscanada.ca).

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A Celebration of Wounds Canada's 25th Anniversary

For many reasons, we will not forget the Wounds Canada 25th Anniversary celebration, held during the virtual 2020 fall conference. A long time ago, the Wounds Canada team started planning an exciting event to commemorate this milestone year. We were going to have a gala at the



Westin Harbour Castle in Toronto during our fall conference, with a program highlighting the many milestones of the organization and paying tribute to the leadership of board of directors of the Canadian Association of Wounds Care, now

Wounds Canada. We had arranged a site survey to check the facilities to ensure there would be enough space for guests, the food stations, music and dancing. After all, what is a celebration without dancing?

But the new reality got in the way. Since the Wounds Canada team had to move to an online format for the national conference, the





25th celebration would be virtual as well. Throughout the year we gathered various mementos, photos and video greetings to mark the occasion. Douglas Queen, a long-time supporter of Wounds Canada, worked his creative flair to prepare a combined video of good wishes, memories and trivia questions to commemorate the anniversary during the conference.

We wanted all Wounds Canada supporters/well-wishers to be able to attend the celebratory event, so we organized a meeting that was easy to access and spread the word far and wide. Unfortunately, we did have some party-crashers and had to quickly shut-down our first celebration. This, however, did not dampen our spirits and we regrouped to hold our event the next day with security

in place. Our 25th Anniversary celebration was indeed unforgettable!

The commemorative video included an international welcome by Keith Harding along with greetings from the past and current presidents: Gary Sibbald, Heather Orsted and Karen Campbell, David Keast, Cathy Burrows, Pat Coutts, Greg Archibald, Morty Eisenberg and Barbie Murray.

Added reflections and greetings were also shared by Cathy Harley, Shane Inlow, Connie Harris, Pamela Houghton, Wayne Gulliver, Nancy Parslow, Nicole Kocajda, Michael Quart, Peggy Ahearn, Douglas Queen, Mariam Botros and Sue Rosenthal.



To help jog some memories, the event was sprinkled with trivia questions. See if you can answer these:

1. What city was the location of the first Wounds Canada conference?
 - a. Montreal
 - b. Toronto
 - c. Vancouver
 - d. Halifax





4. Barbara Bates-Jensen presented at the first Wounds Canada conference on what innovative system?
 - a. Wound and skin care intelligence system
 - b. BWAT tool
 - c. PUSH tool
 - d. Braden scale

2. What was the first wounds Canada conference, in November 1995, called?
 - a. Wounds Canada Conference
 - b. Canadian Symposium on Wounds Management
 - c. CAWC National Conference
 - d. Canadian Wound Conference
3. Which physician from Moncton, who specialized in infection control, was a keynote speaker at the first Wounds Canada conference?
 - a. Dr David Keast
 - b. Dr Chester Ho
 - c. Dr Robyn Evans
 - d. Dr Gordon Dow



5. A physician from Cardiff, Wales, spoke on "Clean vs Sterile" at the second Wounds Canada conference. What was his name?
 - a. Dr Marvin Levin
 - b. Dr Keith Harding
 - c. Dr George Rodeheaver
 - d. Dr Kel Cohen



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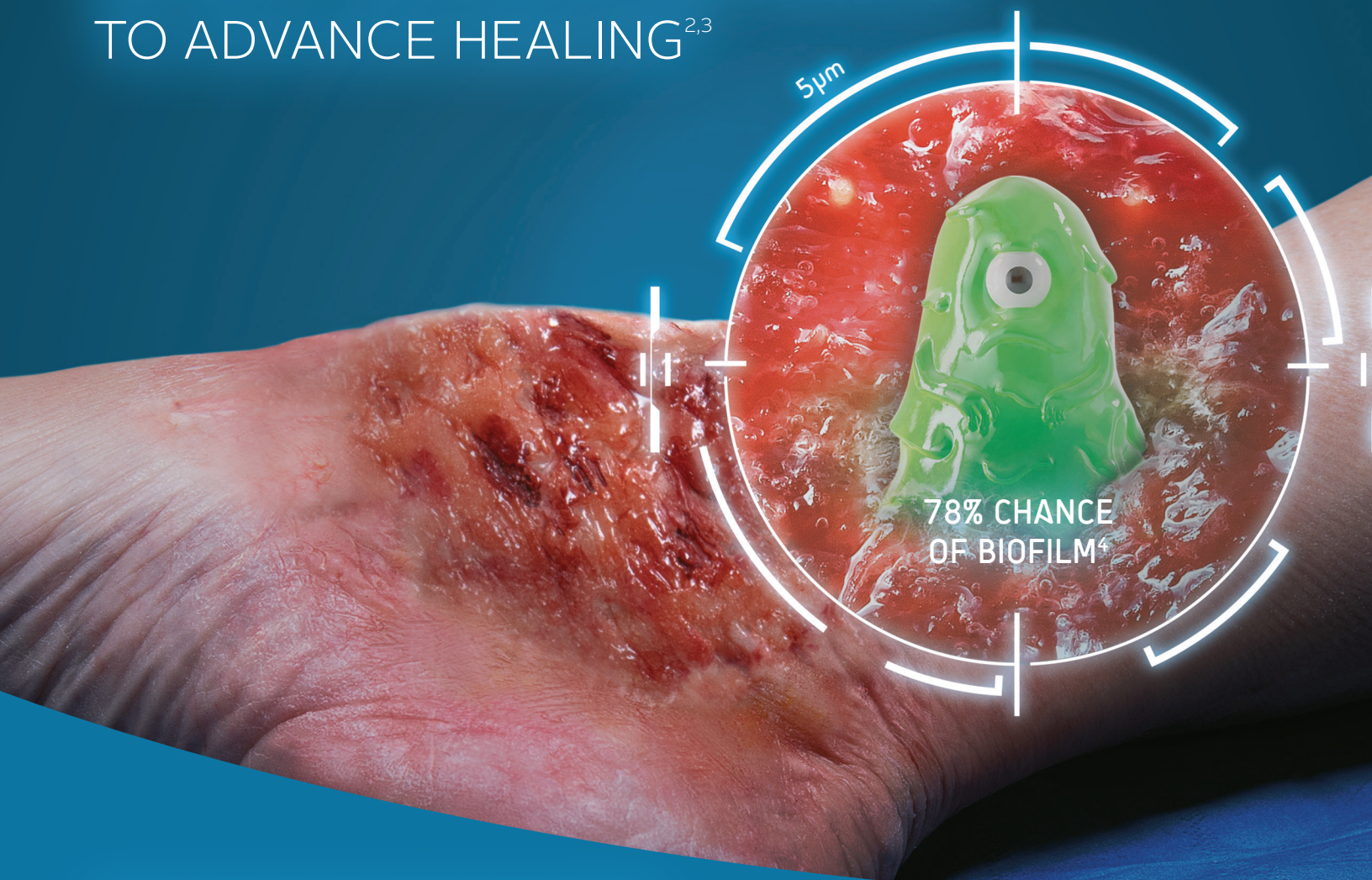
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1. Bowler PG, et al. Parsons, Wound Medicine 14 (2016) 6–11. 2. Metcalf DG et al. J. Wound Care 2016; Vol25, No3. 3. Metcalf DG, et al. Int Wound J 2017; 14: 203–213. 4. Malone M et al. 2017. JWC; 20–25.

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* When compared to AQUACEL™ Ag Extra™ dressing and other silver-only competitor dressings: ACTICOAT™ 7 and SILVERCEL™ Non-Adherent dressings.

6. Who was the first editor of *Wound Care Canada*?
 - a. Deidre O'Sullivan-Drombolis
 - b. Barbie Murray
 - c. Edie Atrell
 - d. Sue Rosenthal
7. In 2017, the keynote speaker had a need for speed. What was his name?
 - a. Douglas Queen
 - b. Keith Harding
 - c. Slo Pace
 - d. James Hinchcliffe
8. What is the name of the registered nurse/enterostomal therapist from Calgary who became the second president of Wounds Canada?
 - a. Heather Orsted
 - b. Nancy Parslow
 - c. Mary Hill
 - d. Rosemary Hill

The walk down memory lane and the multitude of greetings brought up many fond memories and nostalgia for the revelers at the event. At the end, the participants raised a glass to toast to another 25 years of continued hard work in advancing wound care to improve the lives of Canadians.

Happy Anniversary, Wounds Canada! 🍷



Answers:
 1. c
 2. b
 3. d
 4. a
 5. b
 6. d
 7. d
 8. a

Sanuwave Health Sponsored Learning: Innovative Energy Transfer Medical System: PACE® – Focused Shockwave Technology: Facilitates Revascularization and Capillary Perfusion in Chronic Wounds



**Presenters: David Armstrong, DPM MD PhD; Iulian Cioanta, PhD;
Perry Mayer, MD Bch FFP RCPS (Glasg)**

David Armstrong is a professor of surgery at the University of Southern California. He holds a Master of Science in Tissue Repair and Wound Healing from the University of Wales College of Medicine and a PhD from the University of Manchester College of Medicine, where he was appointed Visiting Professor of Medicine.

Iulian Cioanta is an accomplished executive with significant experience in cutting-edge medical devices for urology, cardiology, endovascular, biotechnology, orthopedics and wound care. He received his BS and MS in Engineering and Management of Technological Systems and Business Management from the Polytechnic University of Bucharest, and his PhD in Biomedical Engineering from Duke University.

Perry Mayer is the Medical Director of The Mayer Institute (TMI), a centre of excellence dedicated to the treatment of the diabetic foot. He received his undergraduate degree from Queen's University in Kingston, Ontario, Canada, and medical degree from the Royal College of Surgeons in Ireland.

The Power of Shockwaves

Shockwaves are audible and very strong pressure impulses in any elastic medium (e.g., air, water, solid). They can be created by supersonic aircraft, lightening, explosions, earthquakes or other extreme phenomena that generate sudden and signification changes in pressure. Shockwaves can be precisely controlled and directed inside the human body to produce a specifically tuned “wall of pressure” that has healing power.

Focused shockwaves have several important features:

- Extremely rapid rise time
- Compressive pressure causes mechanical tissue stimulation
- Negative pressure generates cavitation that stimulates cells
- Duration of a pressure pulse is 5–8 nanoseconds

- Each shockwave pulse has a cumulative effect on the energy deposited in the wound region
- Dosage (number of shocks, input energy setting and frequency [number of shockwaves per second]) dictates treatment outcome

Cellular Expression from dermaPACE® Treatment

Pulsed Acoustic Cellular Expression (PACE®) is a proprietary form of extracorporeal shockwave technology (ESWT) that uses high-energy acoustic pressure waves created through an electrohydraulic energy (Figure 1). When shockwaves from dermaPACE® treatment pass through a tissue and associated cells, it immediately produces a response (Table 1).

During shocks, shear and tensile stresses are generated on the tissue. Tissue strain produces improved microcirculation and oxygen supply, angiogenesis, long term anti-inflammation

Table 1. Key Effects of dermaPACE® Treatment

Perfusion	PACE® treatment leads to an increase in perfusion. As the PACE® shockwaves penetrate the micro-circulatory system, there is an immediate change in local blood flow in the treated area.
Biofilm	Shockwave treatment can break physical biofilm barriers and allow antibiotics to access to the entrenched bacteria.
Inflammatory response	Increased leukocyte activation assists in the inflammatory phase of wound healing by triggering the release of pro-angiogenic factors. After shockwave treatment, wounds move quickly through the inflammatory phase to the proliferation phase of healing.
Angiogenesis	Pro-angiogenic factors released in response to PACE® treatment lead to new vessel formation and the creation of new capillary networks in the treated area.
Epithelialization	The dermaPACE® system has an effect in the stabilization, size reduction and complete re-epithelialization of wounds, specifically diabetic foot ulcers.

*PACE® also has an antibacterial effect.

and expression of growth factors. The negative pressure that results from shocks form cavitation bubbles, and when the bubbles collapse near a solid boundary and form microjets, it produces cellular level action. Reactive oxygen species (ROS) are formed in the cells' interstitial fluid, activating signaling proteins and cytokines. The resulting growth factors generate cell proliferation and differentiation.

Indications for use include ischemic injuries, venous ulcers, diabetic ulcers, pressure injuries, arterial and mixed etiology ulcers, full- or partial-thickness burns, post-traumatic acute wounds, post-operative wound healing defects on suture lines, septic/infected wounds and locally infected wounds.

The dermaPACE® device can be used as a standalone treatment or it can be used with standard of care dressings or other advanced therapies such as negative pressure wound therapy. It complements other therapies to optimize the granulation tissue in and around the wound bed, overcoming a long-lasting inflammatory stage and leading to more effective wound healing and less ulcer recurrence. The dermaPACE® machine is easy to use and can be set up in about two minutes. Active treatment time is about 4–7 minutes, depending on the size of the wound area. Analytical reports show no statistically significant adverse effects.

**Figure 1.** dermaPACE® machine

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The Hidden Wound Epidemic in our Midst

By Tonia Peachman-Faust, RRDH MA; Lynda McKeown, RDH HBA MA;
Heather Woodbeck, RN HBSn MHA; Carolyn Weiss, RDH

“Out of sight, out of mind,” the old saying goes. Hidden in the mouths of patients are bleeding wounds that are missed in most health-care settings. Bad breath is thought to be an aspect of normal aging, when it may in fact be a sign of a raging bacterial infection. While a palm-sized wound on the skin triggers immediate assessment and treatment, a mouthful of bleeding and inflamed gums is often overlooked. This article describes gingival bleeding as an oral wound and discusses its causes and treatment. Also discussed are the roles of wound care practitioners and dental hygiene professionals in addressing oral wounds.

The COVID-19 pandemic has uncovered the reality of oral care’s low priority in long-term care (LTC) homes. One case study reported how a lack of oral care during a COVID outbreak caused infection and complete loss of teeth within a few months.¹ The Canadian Armed Forces identified poor mouth-care issues in their report on conditions in Ontario LTC homes.² This article outlines some of the issues surrounding wounds in the mouth, particularly as they affect residents in long-term care.

It is easy to forget that the epithelium that covers the body outside is also the gingival tissue that lines the mouth and esophagus. During fetal development, the gingiva originates from the ectodermal cells of the embryonic disk.³ The

functions of epithelial tissue inside the mouth are similar to those on the outside. Layers of stratified squamous, non-keratinized epithelial cells line



Figure 1. Gingivitis with swollen gums and bleeding at the gum-teeth interface and bits of white calculus

McKeown 2020. Photo used with permission.



the inner oral surfaces of the lips, cheeks, underside of the tongue and floor of the mouth. These non-keratinized tissues are highly vascularized. Gum tissue, which immediately surrounds the teeth and overlays the supporting bone, is highly keratinized; this allows it to withstand the forces of mastication and all other harsh conditions of the mouth.⁴ The gum tissues (attached gingiva) protect the supporting structures of the teeth, known as the *periodontium*. These keratinized tissues deflect food away from the teeth and resist damage caused by hard foods and ever-changing microflora. All oral epithelial tissues provide protection from acids and irritating foods. Fluids from the salivary glands lubricate the teeth and secrete enzymes to begin digestion. Saliva contains minerals that can assist in balancing the pH in the mouth as well as antimicrobial properties, and can aid in remineralization of the teeth. The oral cavity is a complex place.⁵

People tend to equate good oral health with clean teeth. They don't think much about gums or the periodontium that supports the teeth. Teeth arise from the bones, cutting through the gums in teething babies and children. The gums protect the roots and base of the teeth. Below the gum line is the periodontium, which comprises complex connective tissue fibres and capillaries that supply the tooth roots. Healthy gums look pink and stippled (like an orange peel) and are well adhered to the teeth. They DO NOT bleed when brushed. Like the skin, the mouth has its own microbiome. In a healthy mouth, chewing and

saliva help to buffer the bacteria. Saliva helps to naturally wash away sugars.⁵

Oral Health

Oral wounds start at the critical gum/teeth interface, the real "Achilles heel" in humans. Oral tissues exist in a very volatile environment, continually exposed to acids, heat, moisture and bacteria. Gum tissue relies on regular maintenance to thrive. This should include thorough daily brush cleaning of all sides of the gums and teeth. Interdental cleaning is often forgotten. Anatomically, teeth have five sides. If interdental care is ignored, approximately 40% of the tooth structures and critical surrounding gingival tissues are left unattended. Lack of oral care coupled

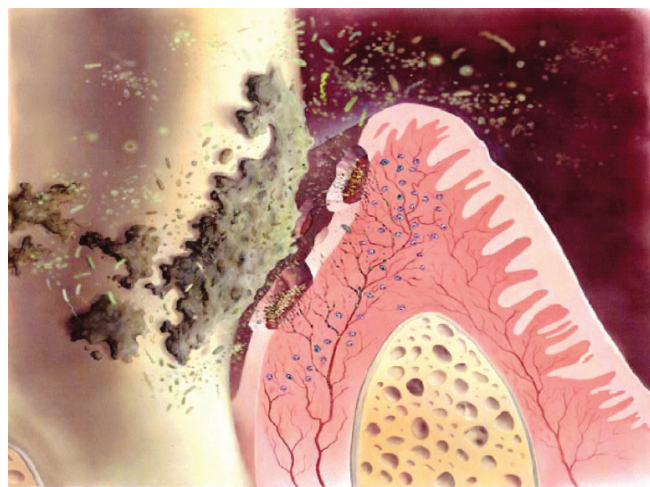


Figure 2. Plaque and debris at the tooth gingival interface

Reprinted with permission from Procter & Gamble.

with other risk factors such as low salivary flow presents opportunity for the rapid onset of oral disease. Professional oral health assessments help identify oral disease at its earliest stages when intervention can preserve teeth and gums. Timely, individualized care planning, oral care and therapy promote optimum oral health in patients.

Poor oral health is rampant, and gingivitis, or inflammation of the gum tissue (gingiva), and untreated dental caries are common human diseases.⁶⁻⁷ In North America, three-quarters of adults have some kind of periodontal disease.⁸⁻⁹ The gums of people with gingivitis are swollen, red and bleed easily when brushed. Bad breath or halitosis is often present. Eating may be painful. These are oral wounds that allow bacteria to directly access a person's bloodstream, spreading infection systemically.

The Role of Biofilm

To understand oral wounds, one must appreciate the role of biofilm in the environment of the mouth. Biofilm is commonly found in moist wounds. According to Wounds Canada's *Best Practice Recommendations for the Prevention and Management of Wounds*, "A biofilm consists of a complex network of bacteria and fungi embedded in a thick, slimy barrier of sugars and proteins that begin to form within minutes to hours of skin breakdown."¹⁰

Mouths are warm, wet and dark, with a constant food supply—the ideal environment for biofilms with their communities of bacteria. The slimy biofilm in one mouth can host more than 800 different types of bacteria. Everyone's mouth has its own particular microbiome, or mix of bacteria.¹¹ Potentially pathogenic bacteria and viruses such as COVID-19 can live in the oral cavity.¹²⁻¹³

The bacteria in biofilm are constantly looking for a place to stick to. Biofilm builds up daily in layers on the teeth (see Figure 3) and every other surface in the mouth. The first few layers feel slippery and smooth. As the bacteria colonies gain hold on the tooth and gums, the biofilm solidifies into dental plaques. These whitish plaques grow

at the gum/teeth interface as their resident bacteria feed on sugars.

The type of foods eaten affect oral health. Sugar and other carbohydrates contribute to oral wounds. Sugar makes the mouth more acidic. Acid attacks the tooth enamel and, along with the biofilm, creates cavities. Biofilm on the gums erodes the soft gingival tissue. Tooth plaque further irritates the gums, resulting in swelling, redness and bleeding. Leftover food debris in the mouth add to the gingival tissue inflammation. Hard, fibrous foods, however, stimulate salivary flow, which in turn helps clear oral debris and food that can pile up between the teeth. Studies show that seniors who have plenty of saliva generally have fewer oral problems.¹⁴

A diet high in starches and sugars increases the layers of biofilm and plaque. Liquid sugars such as juices, sodas and other sweetened beverages are the worst, because the sugar flows into pockets in the gums, papilla of the tongue and other hard-to-reach spots in the mouth. Worse still are hot sweetened coffee, tea and cocoa, all examples of liquid sugars. They flow around the teeth and penetrate areas such as the gingival crevices surrounding each tooth. In these periodontal pockets, sugars are easily broken down into acids by bacteria. This acidic environment results in the demineralization of tooth structures.

Cookies and carbohydrate-rich foods stick to the teeth, and easily convert to food supplies for the bacteria. Soft and sticky foods promote accumulation of food around teeth, which enables growth of biofilm. Of particular concern are the aged or those who have compromised oral health due to the presence of periodontitis, both of which involve loss of gingival attachment and the bone that supports the teeth, which in turn exposes the root structures of the teeth. These root structures do not have the dense, hard enamel protection present in the crown of the tooth; therefore, when roots are exposed to these acids as a result of the person consuming sugars and simple carbohydrates, the demin-





eralization process is rapid, resulting in swift progression of root decay. Often when a senior is eating even soft foods, a tooth will appear to “snap off.”

This can be the result of rapidly progressing root caries, which is exacerbated by xerostomia.⁶

By encouraging the practice of crushing medications and hiding them in sugary food such as applesauce, pudding and yogurt, health-care providers may inadvertently contribute to oral wounds, especially if the patient does not brush or rinse the oral cavity immediately afterward. Left overnight without oral care, residents’ mouths remain in a contaminated, acidic state that contributes to caries and gingivitis. If biofilm and debris are not removed with daily oral care, bacteria proliferate and release toxins, further damaging the gums.¹⁵

Nutrition and Oral Health

Poor nutritional intake exacerbates oral wounds. The tissue repair process is disrupted, the tissue’s ability to resist the negative effects of mature biofilm is decreased¹⁶ and the risk for rapid oral disease progression increases. Vitamin C deficiency can play a part in the decline of oral health, contribute to gingivitis and, if left unaddressed, lead to further breakdown of oral tissues (also known as periodontitis).¹⁷ A deficiency in the vitamin B complex is linked to angular cheilitis (cracking of the tissues at the corners of the mouth), cracked lips, inflammation of the tongue, ulcerative gingivitis, periodontitis (which includes bone loss and detachment of the fibres in the connective tissues supporting the teeth), burning sensations in the mouth, halitosis and painful ulcers in the mouth.¹⁶ Iron deficiencies are linked to salivary gland dysfunction, dysphagia, angular cheilitis and very red, painful tongue with burning sensation.¹⁷

The Importance of Oral Care

Proper daily oral care disrupts the biofilm build-up and prevents dental plaque growth. Without

oral care, that same biofilm continues to develop into colonies where pathogenic bacteria thrive, having very negative effects on the gum tissue and support structures of the teeth. Gingival inflammation-wounded gums (also known as gingivitis), when left unaddressed, can rapidly progress into periodontitis that no longer only affects the gum tissue. Periodontitis is a serious, irreversible condition that attacks the connective tissue and the supporting bones. The loss of tissue is permanent and, as a result of the breakdown of the support structures and loss of bone, teeth may be lost. This same biofilm has the ability to produce acids which, when left sitting on and around the teeth, break down the structures of the teeth, resulting in dental cavity formation (see Figure 3). Cavities left untreated become caverns where bacteria proliferate and affect not only the tooth but the surrounding gum tissues. Root caries, as mentioned earlier, progress rapidly and leave holes in the teeth where bacterial col-

The bridges, crowns
and implants perfected
by modern dentists are
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onies thrive. These holes are typically located next to or below the gum tissues. This causes a tissue response resulting in inflammation and leading to disease progression.

Poor oral care is a major problem. Lack of oral care in all health-care settings can cause periodontitis to worsen. Cleaning the oral cavity is more than just putting a toothbrush onto a resi-

dent's teeth. Thorough cleaning of the teeth and gums requires executive functions of the brain, skill, the right tools and, most importantly, time. The tongue can be covered with bacteria that contribute to oral disease if left unmanaged. A soft or extra-soft toothbrush allows for comfortable cleaning of the gum tissues along with the teeth. Medium bristled toothbrushes cause damage to the gum tissues and are very uncomfortable to those with frail tissues. The instruction to "brush your teeth" implies that the gum tissue is not important, but this is incorrect! Correct technique in brushing is key and must include strokes that clean both the gums and the teeth, keeping the critical gum/teeth interface the focal point. This is where all the action happens. Having the ability to maneuver around the mouth and reach the difficult areas is a skill, particularly when coupled with resistive behaviours. Brushing is not a 30 second job; it takes a minimum of two minutes. Inadequate or skipped oral care is a major contributor to oral wounds. The longer an area of the mouth is left unclean, the more the plaque biofilm will continue to mature and proliferate, increasing the disease-causing bacteria that break down the tissues that support the teeth.

The bridges, crowns and implants perfected by modern dentistry are becoming more common in LTC residents. Bridges and crowns are high-risk spots for oral wounds and infection, as they are difficult to clean, with ridges where biofilm collects. Bacteria and biofilm easily form around implants, contributing to gum pockets forming where food and bacteria collect. In crowns, the area where the crown meets the tooth structure is particularly prone to break down. Gingival inflammation due to a reaction to foreign objects like these, as well as dentures, is becoming much more common in older people. Without proper oral care, the surrounding structures are likely to develop oral disease.¹⁹⁻²⁰

The Impact of Medications on Oral Health

Many medications contribute to dryness of the mouth, termed *xerostomia*, which alters the

physical state and function of the mouth. The natural washing action of the saliva is lost, leaving foods, beverages and oral debris to ferment. The mouth loses its acid-buffering abilities. Bacteria proliferate and contribute to the progression of periodontitis, resulting in oral wounds that continue to develop/progress. These same bacteria feed off the food and oral debris, producing acids that rob the teeth of their minerals, resulting in cavities. This can result in oral discomfort or pain, tooth loss or dysphagia, and can contribute to systemic illness. In addition, it takes a toll on the social well-being of the person, as they may feel the need to avoid social interaction.²¹ While teeth

The practice of crushing medications and hiding them in sugary food such as applesauce, pudding and yogurt shows how health-care providers may inadvertently contribute to oral wounds, especially if the patient does not immediately afterward brush or rinse the oral cavity.

are hard and relatively tough when wet, they are more susceptible to disease and can easily fracture when dry. Older people have less saliva due to medications and chronic conditions. Residents with xerostomia are at high risk for oral problems, and clinicians should identify them.

The Mouth–Body Connection

The mouth has its own ecosystem, which directly connects with all the other parts of the body. Chronic oral inflammation and bleeding take their toll in older people. Aging and chronic health

conditions affect the mouth as well as the rest of the body. Periodontitis is particularly catastrophic in those with diabetes, heart disease and respiratory issues. The link between diabetes and periodontal disease is well established.²² Patients with diabetes are more likely to get periodontitis, which diabetes makes more difficult to control. Some people are genetically predisposed to periodontitis. There is some research that links chronic inflammation in the mouth to Alzheimer's disease and even poor external wound healing.⁷ Just as some patients have challenges with wound healing, some are predisposed to oral health problems.

Moving Forward: Expanding Skin and Wound Care to Encompass the Mouth

Wound care nurses and other members of the interdisciplinary team such as personal support

workers (PSWs), dietitians and speech-language pathologists are in an ideal position in health-care systems to help to identify, treat and prevent oral wounds in their patients. Their knowledge of skin and wound care for the skin on the outside the body is directly applicable to the oral cavity as well.

Oral problems should be identified early. Proper oral assessment requires knowledge and competency. It is easy to miss the early stages of gum disease, because there is no pain. Biofilm can cover sloughed tissue. When poor oral health is common it becomes hard to recognize early gum disease because there are no healthy comparisons. Figures 4a and 4b demonstrate the challenges of identifying oral wounds.

Clinicians working in long-term care should:

- Flag residents with bridges, implants or crowns, as they are at high risk for oral wounds

Figure 3. Continuum of Oral Care¹⁸

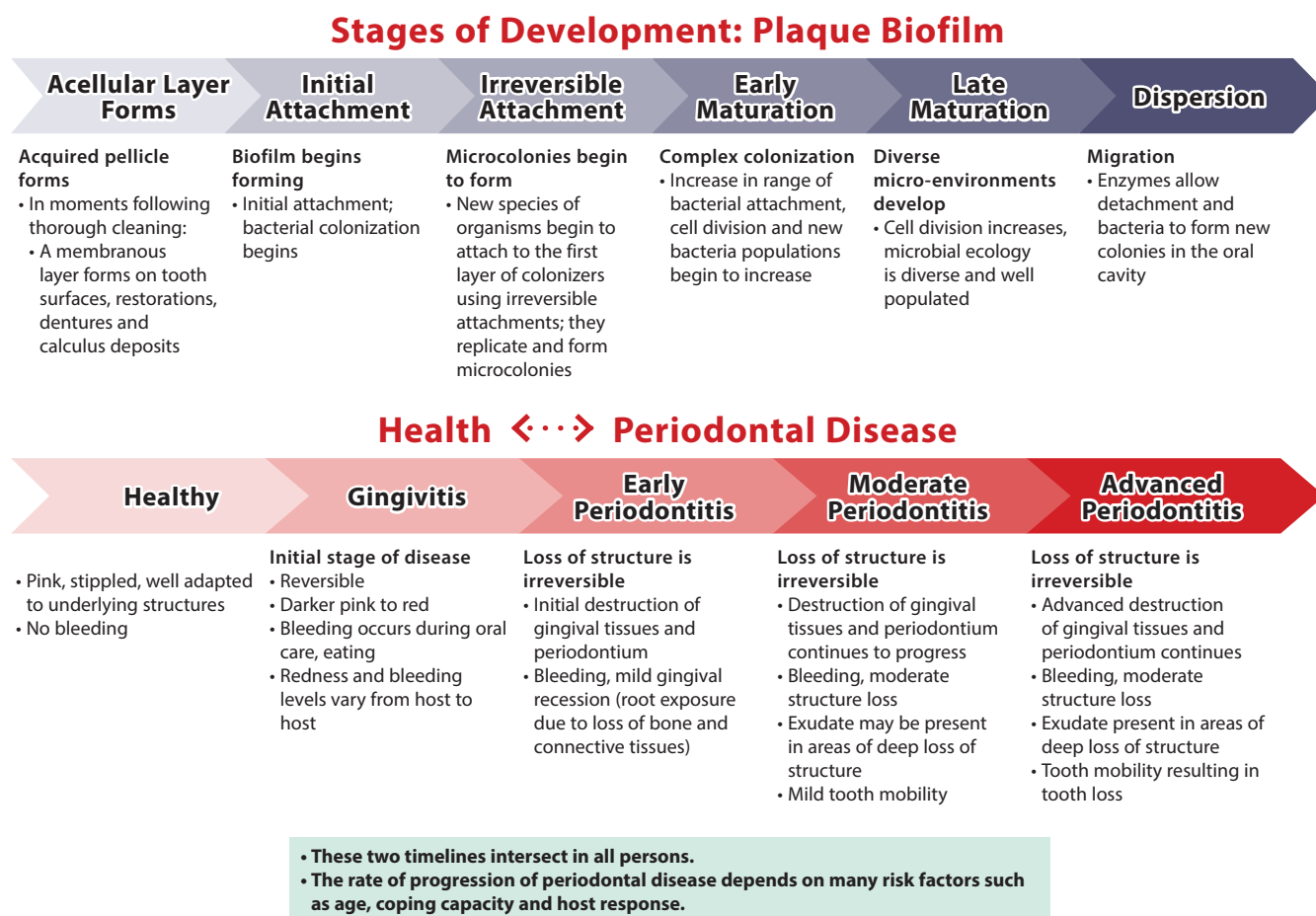




Figure 4a. On first glance, this looks like a healthy mouth, but the photo shows biofilm and sloughed tissue-dead cells in a resident who was tube-fed, so no food debris is present to contribute to the biofilm.



Figure 4b. After removal of sloughed tissue and biofilm by a dental hygienist, bleeding oral wounds at the crucial gum/tooth interface are revealed.

- Flag residents with xerostomia to consider a medication review and additional oral care that may include saliva substitutes
- Ensure that all residents receive proper oral assessments and adequate oral care
- Consider oral health status in residents with chronic systemic disease such as uncontrolled diabetes, heart disease and wounds
- Develop individualized oral care plans for all residents, taking into consideration all risk factors and existing systemic conditions

Prevention is key. Oral wounds are most easily treated at an early stage with twice daily oral care and a focus on controlling oral biofilm. Clinicians should:

- Pay special attention to the tooth–gum interface.
- Clean the entire mouth and tongue.
- Remove debris and other irritants with brushing.
- Change the microflora by using a mouthwash with chlorhexidine to rebalance the bacteria.
- Encourage non-sweetened beverage use and frequent drinking of water, especially after meals and snacks.

Improve policies and practice in your facility by doing the following:

- Include dental hygienists (RDH) in developing and implementing oral care regimens. Refer

any suspected oral wounds or dental issues to dental hygienists, dentists or denturists. Involve registered dietitians when poor nutrition is suspected or identified.

- Expand the mandate of your skin and wound committee to include prevention and treatment of oral wounds. Invite RDHs and dentists to become part of your skin and wound care team. Include RDHs as part of the circle of care, especially for high-risk residents.
- Implement the Registered Nurses' Association of Ontario (RNAO) *Oral Health: Supporting Adults Who Require Assistance Second Edition* best practice guideline. It offers a systematic approach to improve oral care practices in your organization.
- Expand skin and wound assessments to include the oral cavity.
- Provide education and training to build and maintain skills of staff and families with an aim to:
 - Improve oral assessment skills of all staff
 - Improve skills in oral hygiene in registered staff, PSWs and families
- Monitor and evaluate oral care to ensure follow-through. Regularly audit care. Review the point-of-care chart to identify patterns of refusal. Update policies to require an oral assessment after two days of missed oral care.
- Consider a fluoride program for residents to be implemented by an RDH

Summary

Wounds in the mouth are the same as wounds anywhere else. Oral wounds can indicate chronic inflammation and greatly increase risk for a systemic infection. Wounds in the oral cavity are associated with worsened heart disease and Alzheimer's disease. Wound care practitioners are ideally placed to address oral wounds and champion improved oral care in all health-care settings. Dental hygienists, dentists and denturists must be incorporated as essential health-care providers within the team. 🦷

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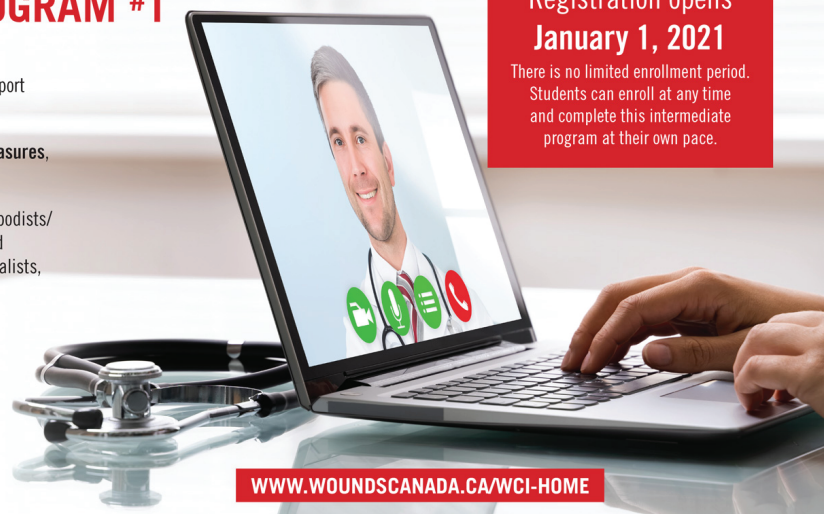
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Feeding the Foot: Nutrition and Diabetic Foot Ulcers

By Ellen Mackay, MSc RD CDE

Diabetic foot ulcers (DFUs) are a serious complication of diabetes that can impair quality of life and lead to further problems such as infection and possibly lower extremity amputations.

Globally, DFUs occur in 15% of those with diabetes and are seen more often in men and those with type 2 diabetes.¹ Other risk factors for DFUs include longer duration of diabetes, age, higher body-mass index (BMI) and tobacco use.

Individuals with diabetes are particularly vulnerable to foot ulceration due to the circulatory and neurological changes associated with the disease. These changes to blood vessels and peripheral nerves can result in loss of protective sensation and poor nutrient delivery to the extremities, leading to an increased risk of injury and poor healing.

Daily inspection of feet, annual foot exams, proper footwear and a healthy lifestyle are at the core of diabetes self-management education to prevent or identify early changes to the feet and efficiently treat ulcers if they occur. See Wounds Canada's comprehensive document [Caring for Your Feet: Safe Foot Care If You Have Diabetes](#), a patient-focused tool clinicians can use with patients.

Nutrition, however, is largely overlooked as part of the prevention and treatment of DFUs, despite the pivotal role it plays in the management of diabetes and prevention of diabetes-related complications.²⁻³ Nutritional intake can impact

immune function, blood glucose levels, blood pressure, cholesterol, body weight and wound healing.⁴ Wound healing alone is dependent upon adequate nutrition intake, and research shows that malnutrition may have a significant impact on limb-preservation outcomes for limb-threatening DFUs.⁵ Nutrition support is a low-risk, cost-effective measure to prevent or treat DFUs and should be considered in all patients with diabetes.

To date, there are no evidence-based nutrition guidelines for the treatment and prevention of DFUs. It is unknown if the recently released evidence-based international guidelines for the prevention and treatment of pressure injuries can be extrapolated to DFUs.⁶ In the absence of nutrition guidelines specifically for DFUs, however, these updated pressure injury guidelines should be considered when determining nutrition requirements for wound healing. (See [Nutrition and Pressure Injury Healing: Updated Recommendations](#) for a review of these guidelines.⁷)

But diabetic foot ulcers are a different wound from a pressure injury and may have different nutrition considerations. The question remains: Are there specific nutrient concerns for individuals with diabetes at risk for, or with, a DFU? There is increasing awareness that a person living with diabetes will face significant nutritional challenges that, if overcome, could ultimately prevent the development of a DFU or improve the chances that the ulcer will heal in a timely manner.⁸⁻⁹ The remainder



of this article will focus on key nutritional areas to consider in the prevention and treatment of a DFU. Table 1 outlines the nutrition checklist for use in supporting a person with a DFU.

Malnutrition Screening

Wound healing is an anabolic process that increases the nutritional needs for energy, protein, fluid and some micronutrients. Malnutrition

Table 1: Nutrition Checklist for DFU

✓	Malnutrition	Use a validated malnutrition screening tool.
✓	Glycemic Control	Target < 7% for most individuals with diabetes. <ul style="list-style-type: none"> • Adjust or titrate diabetes medications. • Encourage low glycemic food choices. • Spread carbohydrates evenly through the day. • Encourage enhanced blood glucose monitoring.
✓	Nutrition Recommendations	Provide adequate nutrition and hydration for wound healing while maintaining euglycemia. <ul style="list-style-type: none"> • Energy: 30–35 kcal/kg/d • Protein: 1.25–1.5 g/kg • Fluid: 30 ml/kg (adjust for extra losses)
✓	Key Micronutrients <ul style="list-style-type: none"> • Vitamin D • B12 (especially with long-term metformin use) • Iron • Vitamin C • Zinc 	<ul style="list-style-type: none"> • Correct deficiencies. • Offer general multivitamin/mineral supplement if intake is poor. • Supplement at physiological doses.
✓	Patient-driven Care	<ul style="list-style-type: none"> • Adapt diet for cultural and personal preferences. • Address chewing/swallowing safety. • Enhance eating environment. • Provide nutrition education to prevent malnutrition and enhance intake.

can have a negative impact on wound healing. Some patients with diabetes may be at higher risk of malnutrition due to long-term restricted diets, poor access to adequate nutrition and drug–nutrient interaction. Some studies have shown a high rate of malnutrition in patients with diabetes.^{1,8,10}

Not only have DFUs been shown to be associated with malnutrition, but nutrition status has been correlated with the severity of the ulcer, risk of infection and poor outcomes, such as amputation.^{1,5} And as nutrition status worsens, the severity of DFUs (as measured by the Wagner ulcer classification system) and risk of infection increases. The wound itself may have a negative impact on nutrition status due to high nutrient demand for healing and loss of nutrients from wound exudate.¹¹

For this reason, all patients with a DFU should be screened for malnutrition using a validated screening tool. The Mini Nutritional Assessment is a valid tool in treating diabetes.⁵ Treating or preventing malnutrition repletes nutrition stores and ultimately improves wound healing. Nutritional assessment also addresses the underlying causes of malnutrition and supports a long-term nutrition care plan to prevent future episodes of malnutrition. For a further review of malnutrition and wound healing, see [Malnutrition in Wound Care](#).¹²

Glycemic Control

Long-term elevated glucose can alter circulation and innervation that increases the risk of a DFU, along with other complications such as blindness, cardiovascular disease and renal impairment. Hyperglycemia contributes to blood vessel rigidity that impacts blood flow—resulting in poor oxygen and nutrient delivery to the wound bed.¹³ In addition, hyper-

glycemia may impair the inflammatory process, interrupting the wound healing cascade and leading to delayed wound healing.^{14–16} Elevated A1c has been associated with slower healing rates of foot ulcers.¹⁷

The primary goal of diabetes management is to maintain glucose levels at target, often measured by glycated hemoglobin (A1c). The A1c reflects the average blood glucose over a two- to three-month window.² While there is no specific A1c target to promote healing, the primary goal of preventing microvascular and neuropathic damage is supported by targeting an A1c below 7%.² For those at risk for hypoglycemia, targets may be set higher.

Healthy Eating: Focus on Carbohydrates

A well-balanced diet that incorporates protein, carbohydrates and fat is the cornerstone of healthy eating for diabetes management. In diabetes, the focus is often on restricting or controlling carbohydrate intake. The challenge for patients is to support the elevated nutrition needs for wound healing and skin integrity while maintaining blood glucose levels at target. Insufficient carbohydrates during wound healing may result in protein being oxidized for energy and contribute to poor healing, muscle wasting and malnutrition. Carbohydrates contribute to energy needs, and the minimum recommended intake is no less than 130 grams per day for those over 18 years of age.¹⁸ Food sources of carbohydrate (grains and starches, fruit, milk products) also provide valuable micronutrients that support wound healing.

Helping patients understand how food affects blood glucose is key to glycemic control. Basic nutrition education should include a review of the food sources of carbohydrates in the diet.





Diabetes
Canada's
*Beyond the
Basics Meal
Planning Guide*

is one tool that
teaches patients
which foods have
carbohydrates and how
to practise portion control.

Patients should be encouraged to distribute carbohydrates throughout the day and include plenty of higher fibre foods and non-carbohydrate vegetables. Incorporating education on glycemic index shows patients how food impacts blood glucose. Oral hypoglycemic agents and/or insulin dose should be considered to assist patients in reaching their glycemic targets.

By reading food labels, patients can find out the available carbohydrate content of a food. (Available carbohydrate is the total carbohydrate content less the fibre content, in grams.) For those with the desire for more detailed nutrition education or those taking insulin or on pump therapy, learning carbohydrate counting and matching insulin (if taking) to food choices will assist in managing glucose levels.

Through blood glucose testing at home with a glucometer, flash or continuous glucose monitor, patients learn the effect of food and activity on glucose levels. Supporting patients in minimizing glucose excursions and recognizing and responding to their glucose patterns will prevent micro- and macrovascular changes.

Protein: The Necessary Ingredient for Healing Wounds

Protein is vital throughout the wound healing cascade, as it is required for the synthesis of enzymes and the creation of collagen, connective tissue, capillaries and epithelial cells. Amino acids provide the building blocks of antibodies, macrophages and a healthy immune system. A lack of protein may prolong the inflammatory stage of wound healing, impair adequate collagen syntheses—leading to reduced tensile strength

of a closed wound—and increase the risk of a wound becoming chronic. Recommended intakes of protein that support wound healing are 1.25 to 1.5 g/kg.⁶ Protein requirements need to be adjusted in patients with certain comorbidities, such as renal or liver disease.

Protein-rich foods include meat, poultry, fish, eggs, milk products and legumes. Ensuring that protein is eaten at all meals fuels the requirements for tissue growth. Protein also slows stomach emptying and may lower the glycemic response when consumed with a carbohydrate-rich food.

Arginine, Glutamine and Beta-hydroxy-beta-methylbutyrate (HMB)

Recent interest in specific amino acids and protein supplementation in diabetes is emerging.

Arginine and glutamine are two conditionally essential amino acids; our body naturally produces arginine and glutamine, but in times of stress, such as with a wound or sepsis, the body's demand for these amino acids outweighs supply, and they become conditionally essential and must be provided through the diet. These amino acids play an important role in repairing wounds, enhancing immune function, stimulating insulin secretion, promoting the transport of amino acids into tissue cells and supporting the synthesis of protein and collagen in the cells. Arginine is also a precursor to nitric oxide, a neurotransmitter that causes blood vessels to relax and dilate, improving blood flow to the wound bed. B-hydroxy B-methylbutyrate (HMB) is a metabolite of leucine and may enhance muscle protein synthesis.

For these reasons, there has been interest in using arginine, glutamine and HMB supplementation for patients with DFUs. Research suggests this type of supplement may



have value in the healing of DFUs, particularly in a subset of study subjects, including those with poor limb perfusion or low serum albumin levels.^{1,8} Further research into this area is warranted. To date, however, these enhanced nutritional formulas are not available in Canada.

Calories

Recommended energy intake for wound healing is estimated at 30 to 35 kcal/kg/day.⁶ In patients with elevated BMI > 30, energy requirements may be tapered to 20 to 25 kcal/kg/day.

Fat

Fat provides a source of calories that ensures sufficient energy intake with minimal effect on glycemia and provides essential fat-soluble vitamins. Monounsaturated fats and omega-3 polyunsaturated fats are often referred to as “healthy fats,” as they have positive effects on a patient’s lipid profile and cardiovascular outcomes.² Omega-3 fats may play an additional role in DFUs due to their anti-inflammatory and antioxidant effects.¹⁹ Some research has shown enhanced ulcer healing with supplementation,²⁰ but further research is needed in this area.

Clinicians should encourage patients to choose olive and canola oil, and avocados, and to include nuts and seeds, in small portions, to ensure sufficient calorie and omega-3 intake. Omega-3 fats can be found in fatty fish (salmon, arctic char, mackerel, trout, herring and light tuna), seeds (flax, hemp) and nuts.

Vitamins and Minerals

Several key micronutrients are involved in preserving skin integrity and wound healing. See Table 2 for a review of key nutrients and their function in wound healing. Note that general malnutrition screening may not be sensitive enough to detect micronutrition deficiencies.³ While diabetes itself may not directly impact nutrition requirements, there is evidence of an association between DFUs and certain deficiencies.^{3,21–22}

Studies show that micronutrient deficiencies, including in vitamin C, zinc, iron and vitamin D, are common in those with DFUs.^{3,22–23}

Clinicians should also consider drug–nutrient interactions. Metformin, often the first-line treatment for type 2 diabetes, will affect the absorption of B12 and has been associated with B12 deficiency. While not directly associated with wound healing, a B12 deficiency will have an impact on anemia, and it may present as peripheral neuropathy.²⁴

Despite the association of micronutrient deficiencies and DFUs, there is limited evidence that supplementation will enhance ulcer healing or indications as to optimal intake levels to target.



This is largely due to the paucity of large RCTs and the variety of ways in which researchers have measured outcomes.^{4,11}

Adding Supplements?

At present there is insufficient evidence to support vitamin and mineral supplementation at levels *above* the daily recommended intake (DRI) for people with a DFU, unless a deficiency is suspected or confirmed. However, individuals with a DFU may not be able to consume an optimal diet and may have additional vitamin and mineral needs. These patients may benefit from a general daily multivitamin and mineral supplement to fill the nutrition gaps.⁴ Supplementation without considering adequate energy, protein and hydration will do little to improve wound healing.

Clinicians should assess oral intake before considering additional micronutrient supplementation. Reviewing nutritional intake from all sources,

including current multivitamin/mineral supplements, oral nutrition supplements and fortified foods, ensures that over-supplementation or excessive intake does not occur. It is not uncommon for some patients to receive multiple sources of micronutrients with possible nutrient interactions (for example, long-term excess zinc intake may impact copper metabolism).¹³

Conclusion

Healthy eating can impact glycemic control, wound healing and ultimately limb preservation. Those at risk for a DFU should receive foot care education on early warning signs and management of complications. In addition, all individuals at risk for a DFU should be screened for malnutrition and assessed by a registered dietitian with expertise in diabetes management. Patients may be at risk for some nutrition deficiencies, and nutrition therapy offers a low-risk, cost-effective

Table 2: Key Micronutrients and Their Functions in Wound Healing^{3,13,21,25}

Micronutrient	Function in Wound Healing	DRI (Adults)
Vitamin C	<ul style="list-style-type: none"> • Neutrophil migration • Fibroblast proliferation • Collagen formation • Immunity • Promotes iron absorption 	<ul style="list-style-type: none"> • 75 mg/d women • 90 mg/d men
Vitamin A	<ul style="list-style-type: none"> • Stimulates immune system • Maintains mucosal and epithelial integrity • Collagen formation 	<ul style="list-style-type: none"> • 700 mcg RAE women • 900 mcg RAE men
Vitamin D	<ul style="list-style-type: none"> • Possible role in glycemic control • Immune function • Reduces inflammation 	<ul style="list-style-type: none"> • 600 IU • 800 IU > 70 years
Copper	<ul style="list-style-type: none"> • Necessary for connective tissue and collagen synthesis • Red blood cell formation 	<ul style="list-style-type: none"> • 900 µg/day
Iron	<ul style="list-style-type: none"> • Necessary for collagen synthesis and strength • T cell and phagocyte function • Needed for hemoglobin formation and oxygen transportation 	<ul style="list-style-type: none"> • 8 mg/d
Zinc	<ul style="list-style-type: none"> • Synthesis of granulation tissue • Re-epithelialization • Anti-inflammatory and antimicrobial effects • Cell division, protein synthesis, collagen deposition 	<ul style="list-style-type: none"> • 8 mg/d women • 11 mg/d men

RAE: Retinol Activity Equivalents

DRI: Dietary Reference Intakes

way to support prevention and treatment of DFUs and to optimize wound healing.

By providing nutrition support, clinicians can also address the underlying cause of the deficiency or malnutrition and play a complementary role in helping patients prevent diabetes-related complications. Informed food choices, especially with regard to foods containing carbohydrates, can impact overall glycemic control while promoting adequate intake to support wound healing. 🍴

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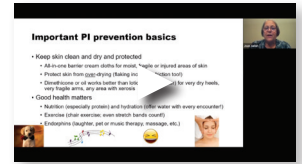
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Stryker Sponsored Learning:

Incontinence-associated Dermatitis and Pressure Injuries

Presenter: Joan Junkin, RN MSN



Joan Junkin's transition into wound specialization came in 1992 in a research analyst role for the AHCPR Pressure Ulcer Treatment Guideline panel. After becoming a clinical nurse specialist and board-certified wound, ostomy and continence nurse (CWOCCN), she spent 10 years building the skin and wound program at a 500-bed acute care facility. For the past 10 years, she has provided wound seminars in all 50 states and four Canadian provinces. She also provides wound consulting for a hospice program and long-term care facilities in Nebraska.

Prevalence of Incontinence-associated Dermatitis (IAD)

Based on the latest combined Canadian and U.S. data, 18% of patients in all levels of care were reported to have incontinence.¹ In long-term care, 8.4% had IAD; in acute care 19% did. Risk factors for skin damage include fecal management systems, higher body weight, diminished mobility, additional linen layers, longer length of stay and lower Braden Scale scores.

How can we do better?

- Keep skin dry, acidic and protected from excess moisture, friction and pressure.
- Follow research-informed guidance from expert organizations.

Moisture

Hazards of moist skin include decreased tensile strength, which can lead to skin tears and fissures, an increased friction coefficient, which can lead to abrasions and deep tissue injuries, and loss of acid mantle protection (alkaline pH), which can lead to fungal and bacterial colonization and infection.

Consistency is Key

While IAD research cites various skin care protocols, findings agree that consistency in care is essential.

Prevention

Avoid indwelling catheters whenever possible to reduce the chance of catheter-associated urinary tract infection. Instead, consider using non-invasive devices. Male condom catheters are available but must be sized correctly; if not used correctly, erosion may

occur. External female urinary collection devices are now available. These devices have very soft cores that contour between labia and are connected to continuous wall suction to collect urine. A silicone, non-adhesive suprapubic pad secures the device. Research suggests clinicians should avoid occlusive containment products (plastic pads/briefs) and that all-in-one incontinence products promote compliance and show a decrease in IAD rates and severity. Non-rinse cleansers are ideal because they reduce the steps involved in care and limit the risk of friction during skin care. They should be pH balanced, unlike alkaline soaps. Clinicians are encouraged to gently cleanse skin, not scrub or rub the skin.

Friction

Friction must be avoided on delicate or moist skin. Reusable cloth washcloths increase friction; disposable cloths are a much better option because they do not have exfoliating nubs. According to the Institute for Healthcare Improvement, all-in-one barrier cloths are the best option as they are very soft, and they leave a consistent, breathable dimethicone barrier to protect high-risk skin.

Best Practice Recommendations for Critical Care

According to Nurses Specialized in Wound, Ostomy and Continence Canada (NSWOCC), goals for all patients in critical care (e.g., for COVID-19) must include:

- preventing moisture-associated skin damage through use of a structured skin-care program
- preventing pressure injury through avoiding use of alkaline soaps and cleansers for incontinence cleansing and using barrier products to protect from excessive moisture

IAD and Pressure Injury Connection

Pressure injury (PI) is about twice as likely as IAD. The rate of IAD and health-care-acquired pressure injuries decrease when all-in-one incontinence barrier cream cloths are used (Figure 1). When skin is kept clean, dry and protected, research shows not only a lower prevalence of IAD but also of PI. In one long-term care facility, patients being treated with all-in-one barrier cream cloths for incontinence care saw a 70% reduction in IAD and a 23.6% reduction in sacral pressure injuries.² In one acute care setting, a baseline prevalence of 39% was reported. Of those with IAD, 67% went on to develop of pressure injury. After 3% dimethicone cloths were implemented for incontinence clean up, IAD levels dropped to zero.³



Figure 1. Sage Comfort Shield all-in-one barrier cream cloths with 3% dimethicone gently cleanse and protect the skin from IAD.

Differential Diagnosis: IAD vs. PI

Location: if on a bony prominence or under a device, it is more likely a pressure injury; if on a fleshy prominence (i.e. buttocks), it is more likely IAD or abrasion

Shape/depth: if it conforms to the shape of the underlying bone or device, or if it is full-thickness, it is more likely a pressure injury

Colour: if deep purple/indurated, it is more likely a deep tissue pressure injury; if faded purple, it may be resolving inflammation

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Pressure Injury Prevention Basics

- Keep skin clean, dry and protected (from over-drying)
- Ensure good nutrition (especially protein and hydration), exercise (e.g., chair exercise, stretch bands) and endorphins (e.g., laughter, music therapy, pet therapy, massage)
- Follow facility protocol, but most stable, high-risk people tolerate repositioning every four hours and do not get more pressure injuries than those turned every two hours⁴
 - Use repositioning devices (e.g., wedges) rather than pillows when repositioning to save time, improve patient compliance, avoid patient and clinician injury and lower pressure injury incidence (see Figure 2)



Figure 2. Sage Prevalon AirTAP air-assisted system with 30-degree wedges, enables staff to turn and position patients safely and easily, while preventing sacral pressure injuries.

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October 14–18, 2020

Wounds Canada 2020 Virtual Conference: Alberta Day

Stories, Partnerships & Strategies for
Wound Prevention and Management



Session Summaries

Wounds Canada held its fall 2020 conference as a virtual event October 14 to 18. The event incorporated the Alberta regional conference that had originally been planned for April but was postponed due to the COVID-19 pandemic, the national conference and the one-day Limb Preservation Symposium into a single mega event. The session summaries that follow include highlights and practice pearls from the Alberta regional conference day. While focused on the Alberta experience, they explore issues and share successes that will be of interest to readers all across Canada. Session summaries from the later four days of the conference event will follow in the next issue of Wound Care Canada and Limb Preservation in Canada.

CELEBRATING THE PATIENT AS A KEY DRIVER OF CARE

Presenters: Jessie Toews, Rod Wojtula

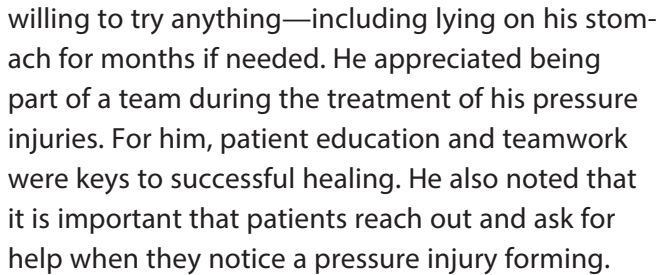
Summary: Heather Ibbetson, BN BA

This session featured two patients, Jessie Toews and Rod Wojtula, who described their experiences living with wounds and navigating health-care systems.

Toews was injured during a high school rodeo accident and has been in a wheelchair since. By

age 24, he had developed several pressure injuries. Despite the growing severity of these injuries, he did not seek immediate medical help. As a result, he became septic and almost lost his life. He had eight pressure injuries that required six surgeries and multiple skin grafts.

Once he became a collaborative participant in his care, he gained a sense of responsibility. He and his health-care team tried different dressings, packing and creams to treat the pressure injuries. He was



When he was first diagnosed with diabetes, he made immediate lifestyle changes, including giving up smoking and getting regular exercise. However, he required two bypass surgeries for peripheral arterial disease in each leg. He also had to travel from his rural area into larger cities for treatment. As a patient, he found that communication with his health-care team helped him adjust his expectations and keep himself responsible. For him, family support, effective planning and asking questions have been key in treating his ulcer.

- Patient education and collaborative goal setting are vital.
- Patients need to find clinicians they can trust.
- It is important for patients to ask meaningful questions.
- Family support is essential for maintaining motivation.

*Presenters: Kathy Dmytruk, RD CDE;
Petra O'Connell, BSc MHSA
Summary: Heather Ibbetson, BN BA*

Petra O'Connell elaborated by discussing the evaluation of the clinical pathway and referring to surveys of foot care practices before and after pathway implementation. Results indicated there was a significant increase in screening across all health-care provider groups. Overall the results were positive. Barriers to full implementation of the pathway included access to treatment, travel costs and wait times. The use of this pathway also improved co-ordination of care and access to limb preservation services.

Next steps include continuing to implement the pathway across Alberta, increasing the number of high-risk foot care teams, integrating virtual health practices and developing standardized vascular referral guidelines across Alberta.



Key Points

- A systematic clinical pathway was developed to improve foot screening in Alberta.
- Surveys found that the pathway improved screening and care practices across Alberta.
- Ideally the clinical pathway will be shared across Alberta to provide tools for a greater number of health-care providers.

KEY CONSIDERATIONS IN WOUND PREVENTION AND MANAGEMENT: CHRONIC DISEASE AND MEDICATIONS/ NUTRITION/PAIN

Presenters: Laurie Parsons, MD FRCPC IMWCC; Ellen Mackay, MSc RD CDE; Eric Bly, DC MD IMWCC

Summary: Eliot To, DCh MCISc (Wound Healing) HBSc

Laurie Parsons opened the session by talking about the effects of chronic diseases and medications on wound healing. She highlighted several factors that can negatively affect wound healing, including local wound factors, organism level factors, age, nutrition, comorbidities, medications and lifestyle. These factors can be further divided into internal versus external factors.

She then discussed the effects of corticosteroids, long-term NSAIDs and chemotherapeutic agents on wound healing. All of the aforementioned medications can have a negative impact on wound healing—inhibiting wound repair, decreasing granulation tissue, reducing wound contraction, impairing cell division and impairing angiogenesis, to name a few. On the flip side, there are instances when such immunosuppressive medications are an integral part of treatment. When treating inflammatory wounds such as pyoderma gangrenosum, moisture-associated skin damage or vasculitic wounds, clinicians should maintain a balance between controlling the inflammation and impairing the normal wound healing trajectory.

Ellen Mackay discussed key nutritional considerations for wound prevention and management. She brought attention to the impact of poor nutrition and hydration on wound healing, discussed current and emerging strategies to address modifiable

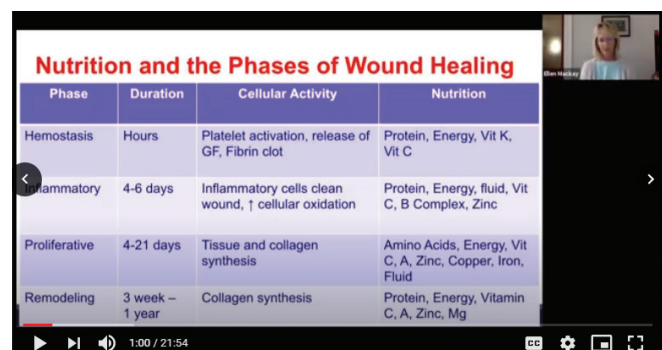
factors and presented strategies to support a person-centred approach to wound prevention and management. She outlined some of the necessary nutrients, amino acids and micronutrients for proper wound healing. These include, but are not limited to, vitamin A, B, C, zinc, copper, iron, magnesium and protein.

She highlighted that, according to a 2016 study, 45% of Canadians admitted to hospital care are malnourished. It is therefore paramount that patients are screened regularly for malnutrition. She mentioned several validated tools for screening for malnutrition and directed attendees to *Wound Care Canada*, where she published an [article](#) on validated screening tools for different patient demographics.

Glycemic control is also important to wound healing; hyperglycemia impairs wound healing and, therefore, must be managed via patient education, diet modification and titration of medications. She mentioned some emerging studies regarding supplementation for wound healing, including the use of arginine, glutamine, B-hydroxymethylbutyrate (HMB), collagen, omega-3 fats and probiotics. She concluded by outlining the importance of optimizing patient diet, which can be accomplished by using nutrient-dense foods, fortified foods, supplementation and/or enteral or parenteral nutrition.

Eric Bly discussed the effects of pain on wound healing and some current and emerging strategies for managing wound-related pain. He reminded attendees that “pain is what the patient says it is.” Pain can affect wound healing directly as well as impact the patient’s experience with the wound, which in turn can affect their adherence to the treatment plan and increase stress and anxiety.

He discussed commonly used topical medications,



Phase	Duration	Cellular Activity	Nutrition
Hemostasis	Hours	Platelet activation, release of GF, Fibrin clot	Protein, Energy, Vit K, Vit C
Inflammatory	4-6 days	Inflammatory cells clean wound, ↑ cellular oxidation	Protein, Energy, fluid, Vit C, B Complex, Zinc
Proliferative	4-21 days	Tissue and collagen synthesis	Amino Acids, Energy, Vit C, A, Zinc, Copper, Iron, Fluid
Remodeling	3 week – 1 year	Collagen synthesis	Protein, Energy, Vitamin C, A, Zinc, Mg

including ketamine (anecdotal evidence only), opioids and tricyclic antidepressants (for neuropathic pain). There is a lack of evidence on safety and efficacy for topical capsaicin, aspirin, clonidine and menthol for the treatment of wound-related pain. Adjunctive modalities, such as electrical stimulation, may decrease pain, but this is not well studied. Virtual reality (VR) is an intriguing emerging treatment for wound-related pain and may provide a distraction, increase patient comfort and decrease practitioner stress. More studies need to be conducted, however, to strengthen its validity. Last, he discussed the use of cannabis for wound-related pain, which may provide benefits; once again, more research needs to be conducted to validate its use.

Key Points

- Care is required when suppressing inflammation, as some inflammation is part of the normal trajectory of wound-healing.
- Corticosteroids exert a more rapid anti-inflammatory response (1 to 3 days) than other immunosuppressive drugs.
- Screen for malnutrition; it is present more often than one might think.
- Adequate hydration can improve skin health and decrease the risk of skin breakdown.
- Pay attention to possible micronutrient deficiencies.
- Pain is what the patient says it is.
- Managing pain is essential to managing chronic wounds.
- Worsening pain may indicate wound infection.

PRESSURE INJURIES AND MASD CASES

Presenters: Chester Ho, MD; Kimberly LeBlanc, PhD MN BScN RN NSWOC WOCC(C); Elizabeth Ernter-King, BN RN IIWCC
Summary: Eliot To, DCh MCISc (Wound Healing) HBSc

Kimberly LeBlanc began the session by introducing moisture-associated skin dermatitis/damage (MASD). MASD is a result of prolonged exposure of skin to hydration. It is, in essence, overhydrated skin that leads to skin damage. Sources of moisture can

Differential Diagnosis	
Incontinence Associated Dermatitis	Pressure Ulcer
<ul style="list-style-type: none"> -Bright red in Caucasians, subtle red in darker skin -Perineal or peri-genital skin, especially near anus, skin folds or beneath containment garments -One or more islands of erosion to extensive denudation of epidermis and dermis -Borders are diffuse -No necrotic tissue -Exudate: None or serous -Symptoms: itching or burning 	<ul style="list-style-type: none"> -Deep red, maroon to bluish/purple in sDTI, non-blanchable erythema in Stage I -Typically over a bony prominence -Varies from partial to full thickness -Demarcated borders -Black eschar or slough -Exudate: volume varies and type depends on wound state -Symptoms: pain, itching exacerbated by dressing change

include perspiration, urine/fecal materials and saliva/mucous. She discussed five types of MASD: incontinence-associated dermatitis (IAD), intertriginous dermatitis (ITD), periwound, peristomal and immersion (trench) foot. She then focused on IAD and ITD.

IAD is skin damage as a result of exposure to urine or stool. She presented a system by Ghent University—the GLOBIAD categorization tool. Patients with persistent redness are Type 1; patients with skin loss are Type 2. Patients presenting with and without clinical signs are categorized as Type A and Type B, respectively. The combinations of skin presentation and signs of infection give rise to four categories of IAD. She explained the importance of differentiating IAD from pressure injuries (PIs). They typically differ in presentation, location, wound margins, wound exudate and symptoms. The most significant complications of IAD are bacterial infections, subsequent pressure injuries and severe pain.

ITD is inflammatory dermatosis of opposing skin surfaces caused by moisture. These are common in inframammary, auxiliary regions and inguinal skin folds. A typical presentation of ITD is erythema (redness) that forms mirror images on opposing skin surfaces, which may become macerated, eroded, oozing and crusted.

She concluded by outlining MASD prevention and management strategies. Some notable recommendations are implementation of a structured skin care program, use of absorptive containment briefs and underpads, adequate nutrition, use of barriers against irritants, protection of denuded skin, cleansing with pH-balanced products, prevention of skin-to-skin friction and reduction of heat and moisture in skin folds. Most important is identifying and treating

the cause of the MASD. She also stressed the importance of implementing a multi-disciplinary approach in preventing and managing MASD.

Chester Ho discussed practice gaps of pressure injury prevent and management. He presented three main categories of gaps: knowledge, practice and systems. Examples include limited knowledge and training for staff, risk assessments not leading to action and lack of standardized reporting systems. He suggested helpful resources for PI prevention and management, including Wounds Canada's Best Practice Recommendations for the Prevention and Management of Pressure Injuries, Insite (Alberta Health Services) and Connect Care (an EMR system for the province of Alberta).

He noted that the population at highest risk for PIs is patients with spinal cord injuries (SCIs). PIs in patients with SCIs lead to lower quality of life, prolonged hospital stays, hospital re-admissions, high use of (recurrent) plastic surgery and high cost of care. Risk factors for patients with SCI include motor and sensory impairment, incontinence, malnutrition, psychosocial factors and support surfaces or durable medical equipment that can cause PIs.

He concluded by reminding attendees that prevention of PIs, especially in high-risk populations, should be "lifelong," and not only when patients are in the hospital. He listed five categories of self-management: structured education programs, telehealth, wheelchair skills training, risk assessment and feedback, and body-positioning skills training. These strategies are mostly based on studies of patients with SCIs; however, he believes these concepts can be extrapolated to other populations who may be at risk of PIs.

Key Points

- Incontinence-associated dermatitis (IAD) is often found in combination with pressure injuries and is a risk factor for pressure injuries.
- Intertriginous dermatitis (ITD) is often misunderstood, yet highly prevalent.
- ITD causes pain and suffering.
- There are many practice gaps in pressure injury (PI) prevention and management.
- The use of province-wide electronic medical records may be helpful for preventing and managing

PIs.

- Persons with spinal cord injuries (SCIs) are at very high risk of developing PIs.
- Self-management strategies for preventing PIs in SCI patients may be helpful for other patient populations.
- The management and prevention of PIs require a multidisciplinary approach.

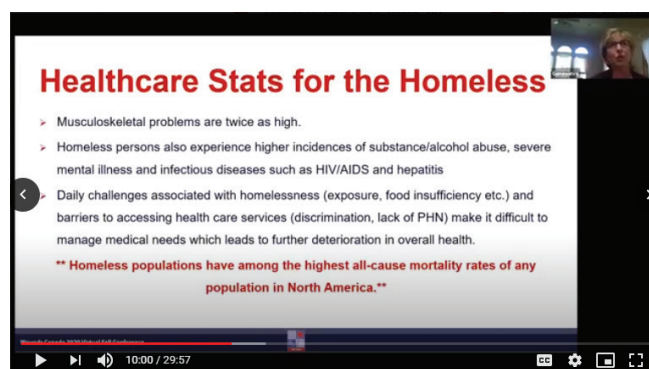
INDIVIDUALIZING APPROACHES TO WOUND PREVENTION AND MANAGEMENT

Presenters: Ashley Bissett, BScOT; Genevieve Wright, RN

Summary: Eliot To, DCh MCLSc (Wound Healing) HBSc

"If our clients are non-compliant, who needs to change?" Ashley Bissett asked rhetorically. She responded, "It's us!" She began the session by outlining the objectives: to discuss the unique needs and barriers of certain patient populations living with wounds, and to describe approaches to individualizing care for these patients. She reminded attendees that there are internal and external factors that can impact wound prevention and healing. These include personal health, environment, resources, social support and lifestyle factors. She said that "we are the experts in wound care, but the patients are experts in their own life." Person-centred care means that the patient, and their family and care partners, should be at the core of our management plans.

Genevieve Wright, a registered nurse who works with the homeless, began by defining *homelessness* and *Indigenous population*. She also took the



time to acknowledge the Land on which she lives and practises. Indigenous peoples, according to her, are overrepresented in the homeless population. Homelessness is closely associated with one's health and well-being; homelessness may complicate treatment and recovery, health problems may cause homelessness, and homelessness may cause health problems. She cited several alarming statistics regarding the homeless and comorbidities and mortality rates. Some commonly seen wound types among the homeless include diabetic foot ulcers, lower leg ulcers, porphyria cutanea tarda, abscesses and frostbite.

There are many barriers to practice change when working with the homeless. Wright outlined several solutions to overcome these barriers. Access to health care in the community is crucial. This includes nursing care within shelters, harm reduction strategies, knowledge of mental health and addiction concerns, trauma-informed care and medical respite/observation beds within shelters. Health-care practitioners must understand the needs of the homeless and the barriers they may face. Last, she encouraged attendees to take a two-eyed seeing approach—to recognize and respect both Indigenous and Western knowledge.

Bissett defined *dementia* and discussed common signs and symptoms. Dementia-related wound risk factors include decreased ability to practise self-care and follow recommendations, hygiene deficits, risk of falls, behavioural concerns (agitation and restlessness), incontinence, impairment in mobility and sensation, and nutrition and hydration deficits. She concluded with a case study of one of her patients. The individualized, patient-centred care plan for this individual included local wound care, pressure redistribution, fall risk management, pain management, agitation management and nutrition support.

Key Points

- Remember the unique needs of each patient.
- Consider internal and external factors impacting wound healing and prevention. Which of these are modifiable?
- Excellent care is about the whole person and their goals.

TIPS FROM THE EXPERTS: USE OF ADVANCED THERAPIES

Presenters: Pamela Houghton, PhD PT;

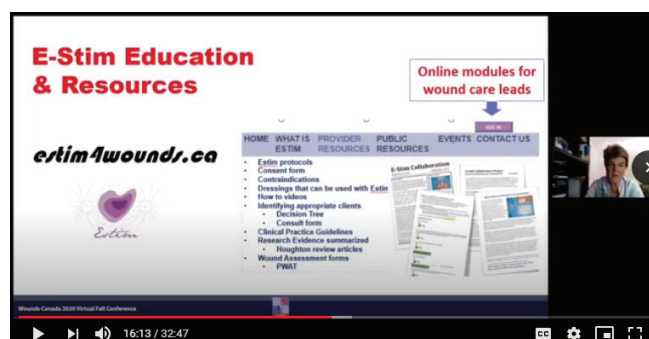
Kelly Sair, MCISC-WH BScPT

Summary: Eliot To, DCh MCISC (Wound Healing) HBSc

Pamela Houghton began by referencing the Knowledge to Action Cycle by Graham et. al. She highlighted the challenges with knowledge mobilization, translation and implementation that involve addressing many barriers to practice change. When implementing an advanced therapy there are additional barriers that may need to be overcome, including systemic factors (e.g., low research evidence), patient-centred factors (e.g., ineffective education) and clinical factors (e.g., availability of products).

She presented electrical stimulation (e-stim) as an example of implementing advanced therapies in wound care. While experimental and clinical evidence suggests e-stim can activate many wound healing processes and stimulate more rapid closure of many types of chronic wounds, this advanced therapy is seldom used by wound care clinicians.

She then presented "The E-stim Collaboration" project she is a part of. This was a best practice implementation project funded by Ontario Neurotrauma Foundation and the Rick Hansen Institute in 2015. More than 30 knowledge brokers across 16 sites and seven provinces of Canada met virtually to discuss strategies to promote the implementation of e-stim therapy so it is available to their patients. As part of the project, her team developed educational resources, which are available at estim4wounds.ca.



Kelly Sair presented an initiative of implementing e-stim as an adjunctive therapy for patients with wounds. At the beginning the barriers to e-stim therapy included time constraints, increased pressure to wounds due to travel time for patients, and parking costs. Her team then transitioned the use of e-stim into the community using a simple self-management approach. Patients and families are now delivering e-stim treatments independently, with education and support from health-care providers. The protocol for the use of e-stim was standardized for consistency:

- One type of machine (high voltage/pulsed current)
- 60 minutes per session, three to five sessions per week
- 100 pulse per second and continuous pulsing
- Switching polarity every Monday

She presented two case studies where this program was implemented. It included an audio anecdote from a patient's father (the patient had a coccyx pressure ulcer, which eventually closed). Both cases demonstrated improvement and success with the use of e-stim as an adjunctive therapy.

Key Points

- Electrical stimulation (e-stim) has been shown to improve wound healing.
- Best practice guidelines and clinical practice guidelines support the use of e-stim as an adjunctive therapy.
- Choosing the appropriate patient for e-stim treatments is crucial.
- Individuals living the community can be trained to apply e-stim safely and effectively.
- Using a self-management approach to deliver advanced therapy empowered patients and their care partners and produced valuable improvements in quality of life.
- Keep e-stim treatment protocols simple and patient-centred.
- Successful implementation of advanced therapies requires management support and dedicated and consistent staff.
- Allot two to four hours per week to implement the program and provide support.

VIRTUAL WOUND CARE: LESSONS COVID-19 HAS TAUGHT

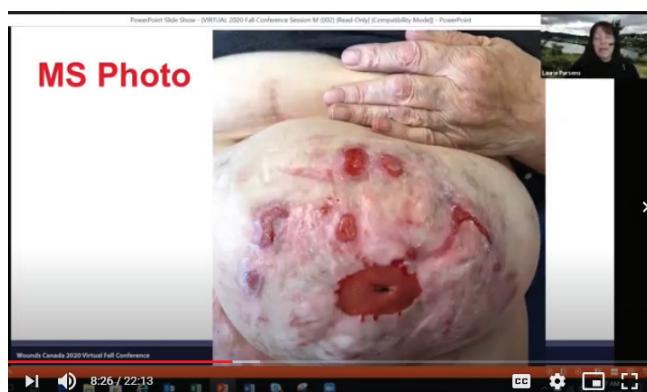
Presenters: Laurie Parsons, MD FRCPC IMWCC;

Kelly Sair, MCISC-WH BScPT

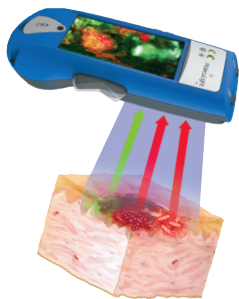
Summary: Eliot To, DCh MCISC (Wound Healing) HBSc

COVID-19 has forced us to live differently. This includes the way we practise medicine, including wound care. The pandemic seemingly struck overnight, and practitioners like Laurie Parsons, Kelly Sair and their respective wound care teams had to adapt quickly to continue to care for their patients. As Parsons said during the presentation, we "cannot put care on hold." Both presenters and their teams had to find solutions to provide care that was patient-centred, safe, effective and comparable to in-clinic settings, despite the pandemic and physical restrictions.

Parsons and Sair presented several cases in which they had made adjustments to continue to provide care virtually. In one case, Parsons coached a patient's family physician to perform a biopsy. In another, she was able to receive wound photos and access blood work online without seeing the patient physically. Sair shared the case of a phone consult (without photos) through which they were able to diagnose a serious diabetic foot infection. Subsequently they instructed the patient to go to the emergency department. Because of the consultation, the patient was able to avoid a potential amputation. Last, Sair presented a case where the patient had a pressure injury. The wound was deemed non-healing, as wound care resources were pulled during the early COVID response. They



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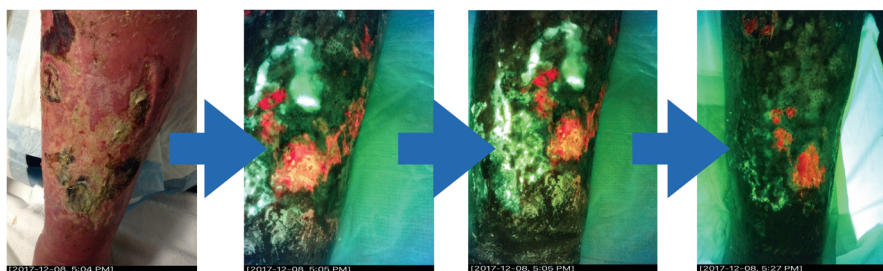
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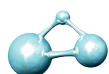
Management:

The use of Anasept[®] Antimicrobial Skin & Wound Cleanser in the reduction of wound bioburden and elimination of certain bacterial species is confirmed by bacterial fluorescence.



Excerpted from
"Shifting Focus: Implications of Periwound Bacterial Load on Wound Hygiene"

By Rosemary Hill BSN CWOCN WCC (C) and Joshua Douglas MD, FRCPC, ABIM
Infectious Disease and Critical Care Internal Medicine, Vancouver Coastal Health



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¹ DaCosta RS et al. Point-of-Care Auto-Fluorescence Imaging for Real-Time Sampling and Treatment Guidance of Bioburden in Chronic Wounds: First-in-Human Results, PLoS ONE, 2015.

² Ottolino-Perry et al. Improved detection of wound bacteria using autofluorescence image-guided wound sampling in diabetic foot ulcers. International Wound Journal, 2017

³ Rennie MY et al. Point-of-care fluorescence imaging positively predicts the presence of pathogenic bacteria in wounds at loads $\geq 10^4$ CFU/g: a clinical study. J Wound Care (submitted).

⁴ Hill-Douglas et al. Shifting focus: implications of periwound bacterial load on wound hygiene. Infectious Disease and Critical Care Internal Medicine, Vancouver Coastal Health.

In these unprecedented times, practitioners have had to embrace and adopt new tools and strategies to continue to deliver wound care. The use of technology to communicate with patients and colleagues and to provide virtual education for patients and colleagues are crucial in the midst of the COVID-19 pandemic. Other solutions Parsons suggested included development of an email account to receive photos, staff orientation for home visits, and the use of web-based patient-information databases for pertinent information like blood work results.

- Health-care professionals cannot put care for the patients on hold.
- These are short-term solutions for an emergent situation.
- These strategies are not sustainable without a proper budgeting model.
- Patients like virtual care—and it is here to stay.
- Patients with significant comorbidities need face-to-face monitoring.
- Virtual care is a new skill for patients and practitioners alike.

*Presenters: Ranjani Somayaji, MPH BScPT MD FRCPC;
John Hwang, MD FRCSC
Summary: Eliot To, DCh MCISc (Wound Healing) HBSc*

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She highlighted important aspects of the IWGDF 2019 guidelines with regard to the diagnosis of diabetic foot infections:

- She continued to reference the IWGDF 2019 guidelines regarding the management of diabetic foot infections. Some highlights include:

- # Infection prevention and control

She then talked about antibiotic selection, reminding attendees to consider factors such as antibiotic susceptibility, clinical severity of infection, efficacy based on research studies, risk of adverse events and cost. Given the current realities of the COVID-19 pandemic, she urged attendees to consider challenges when using virtual care to manage patients with diabetic foot infections. Practitioners must consider the antibiotic strategies used, the best way to follow up with patients, consider risk balance and, ultimately, take a cautious approach.

She concluded by stressing the importance of infection prevention and control protocols and antibiotic stewardship. Infection prevention and control strategies include hand hygiene, sanitation, sterilization and outbreak management. Antibiotic stewardship is, in her words, “using the right drug, at the right time, for the right diagnosis, for the right duration, for the right patient.”

Key Points

- Wound infections are common and can be a challenge to diagnose and manage.
- Alternative strategies will be imperative to implement and evaluate in the current era.
- Infection prevention and antimicrobial stewardship measures are important aspects of health-care programs in wound healing.
- Future research is key to understanding the what, how and why of wound infection.

LOWER LEG ULCER CASES: ARTERIAL, MIXED AND VENOUS LEG/FOOT ULCERS/LYMPHEDEMA AND LIPEDEMA/ POPULATIONS AT RISK

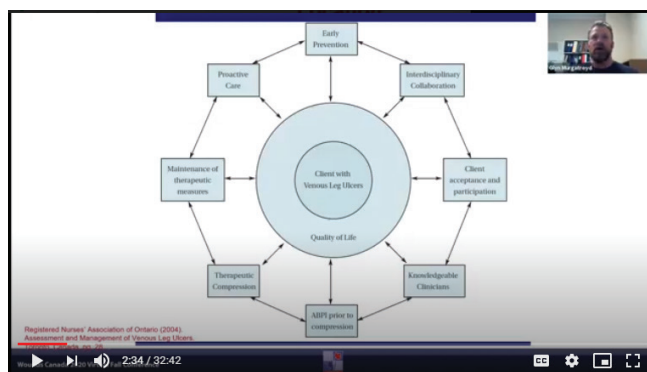
Presenters: Ahmed Kayssi, MD MSc MPH FRCSC;

Glyn Murgatroyd, BScOT BPEI; Ian Soles, RMT LMT(Vodder);

Heather Watt, BScOT CLT

Summary: Eliot To, DCh MCISc (Wound Healing) HBSc

The objective of this session was to describe current and emerging practices for the prevention, assessment and management of venous leg ulcers, arterial



ulcers, mixed arterial/venous ulcers, lymphedema and lipedema, as well as self-management strategies for patients with lymphedema and lipedema.

Glyn Murgatroyd began by outlining the pathogenesis of venous leg ulcers (VLUs). These include venous reflux due to valve dysfunction, obstruction and/or calf-muscle-pump failure. Venous return is dependent upon proper heart function, respiration (pressure changes within thorax), calf-muscle-pump action and movement of the ankle joint (i.e. the foot pump). He then outlined common signs of chronic venous insufficiency. These include “spider veins,” hemosiderin staining, stasis dermatitis and atrophy blanche. It is imperative that practitioners recognize these clinical signs, as chronic venous insufficiency predisposes patients to VLUs. The keys to effective treatment include proper patient education and early intervention, complete vascular assessment, a holistic management plan and compression therapy.

Ahmed Kayssi defined *arterial ulcers* and described their characteristics. He presented a brief review of the blood flow from the aorta to the lower extremities and emphasized the importance of understanding anatomy and blood flow. Proper diagnosis of arterial insufficiency should be made via a history and physical examination and palpation of pulses (femoral, popliteal, dorsalis pedis and/or posterior tibial). Other helpful tests include pallor on elevation/rubor on dependency, ankle-brachial index and Duplex ultrasound. The goals of treatment for patients with arterial ulcers are to preserve viability, preserve life, improve function and prevent deterioration. Angioplasty and bypass surgeries are two procedures that may help to restore perfusion.

Ian Soles presented an overview of the lymphatic system and outlined the staging system for lymphedema. He also discussed factors that may affect lymphatic flow as well as common signs and symptoms. Lipedema can often be misdiagnosed as lymphedema. Patients with lipedema typically present with lower bodies that are disproportionate to their upper bodies. Patients may also present with mixed lipo-lymphedema.

Heather Watt then presented the goals of treatment for patients with lymphedema, including reduction and maintenance of edema, improved skin health, reduced risk for infection, improved quality of life and self-management. She talked about the importance of establishing a three-phase treatment plan for managing lymphedema. In phase 1, the focus should be compression bandages, skin care, manual lymphatic drainage, patient education and exercise. Phase 2 is the transition phase, where patients transition from compression bandages to garments. In phase 3, the goal is to promote self-management strategies as well as maintenance care. She stressed that any condition causing edema can lead to lymphedema.

Finally, Soles focused on the future of lymphedema and lipedema, stating that there is promising research on surgical interventions, diagnostic tests, genetic testing and drug trials.

Key Points

- Proper education, early intervention, complete vascular assessment and a holistic treatment plan (including compression, when appropriate) are all keys to the management of venous leg ulcers.
- Arterial ulcers are a sign of chronic limb-threatening ischemia (CLTI).
- Patients with arterial ulcers should be seen by a vascular specialist as soon as possible.
- Management of gangrene is variable and can be done at time of revascularization or later.
- Management of lymphedema and lipedema requires the involvement of qualified lymphatic therapist who meets the Canadian Lymphedema Framework requirements.

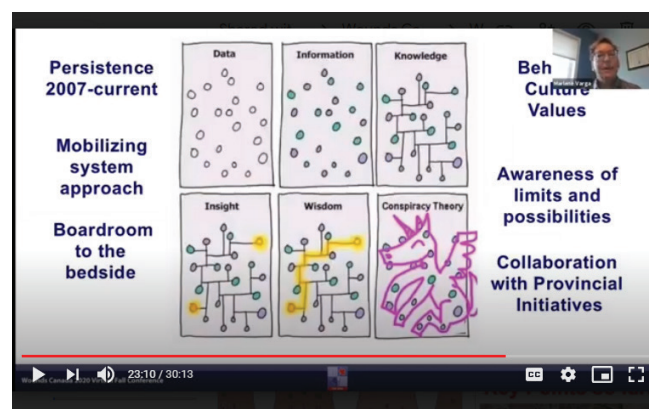
FACILITATING THE IMPLEMENTATION OF BEST PRACTICE IN ALBERTA: PRESSURE INJURY PREVENTION

Presenters: Charlene Brosinsky, BSN RN; Chester Ho, MD; Marlene Varga, MSc BScN RN

Summary: Eliot To, DCh MCISc (Wound Healing) HBSc

This session was designed to help attendees understand the current status of pressure injury prevention (PIP) in Alberta, recognize potential barriers and strategies related to PIP and discuss future opportunities to standardize programming and improve outcomes.

Charlene Brosinsky began by outlining the history of the Alberta Health Services (AHS) Pressure Injury Prevention Committee, established in 2014. She mentioned some of the achievements of the committee since its inception, including standardizing screening tools and processes, developing educational resources and implementing subspecialty collaboration. In 2017, the committee developed a point prevalence audit tool and pilot to evaluate the prevalence of pressure injuries. In 2019–2020, a prevalence study was conducted in collaboration with the Calgary zone's safe clinical practice program (SCPP). Data collected included the following: whether risk assessments were completed, number of pressure injuries, whether pressure injuries were hospital-acquired or present on admission and whether pressure injur-



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ies were related to medical devices. A staggering one in six patients had hospital-acquired pressure injuries. This provided opportunities for improvement in the areas of daily skin assessments, mattress selection, mobility plans, moisture management, nutritional interventions, patient and family education, and risk assessments.

Marlene Varga spoke about the Covenant Health Pressure Injury Prevention Program. She briefly outlined the history and the timeline of the program, including executive sponsorship, hiring of a clinical nurse specialist, and developing, piloting and implementing the program. Key components of the program included establishing policies, standardizing education and prevention tools and protocols, identifying champions and PIP team members, recruiting multidisciplinary teams and leadership, audits and feedback, and developing education platforms, toolkits and learning modules. She emphasized the importance of identifying barriers and facilitators when implementing a best-practice program like this, and of creating a multidisciplinary team.

Chester Ho concluded by outlining future opportunities for pressure injury prevention in Alberta. He talked about standardizing the measurement of prevalence and incidence of pressure injuries provincially through mandatory reporting and provincial electronic medical records. He stressed that collaboration among different professions and organizations is important, as is developing an approach from senior leadership all the way to the bedside (i.e. the patient).

Key Points

- There is a need for a standardized method to measure prevalence and incidence of pressure injury provincially (and nationally).
- To implement change, we must correctly identify barriers and facilitators.
- Implementation of change requires persistence.
- Clinicians must develop a “boardroom to bedside” approach when implementing best practices.

WOUND SLEUTH: DERMATOLOGICAL CONDITIONS

Presenters: Laurie Parsons, MD FRCPC IMWCC;

Danya Traboulsi, MD FRCPC

Summary: Heather Ibbetson, BN BA

Laurie Parsons and Danya Traboulsi discussed the importance of being a wound sleuth to understand and ensure proper treatment.

Traboulsi presented a case study of a 23-year-old female with type 1 diabetes and painful ulcerated plaques, necrobiosis lipoidica, on her left shin. These plaques have an unknown cause and are more commonly seen in women 30 to 40 years old. Venous hypertension may also have played a role. Ulceration is typically secondary to minor trauma or the trans-epidermal elimination of collagen. The plaques were not related to the patient’s glycemic control.

A biopsy was taken, and its findings resulted in the differential diagnoses of diabetic dermopathy, lipodermatosclerosis, panniculitis, morphea and extragenital lichen sclerosis. No clinical data supported a specific type of treatment. The first line of treatment was corticosteroids. Patients with necrobiosis lipoidica have a higher rate of diabetes-related complications, including peripheral neuropathy, retinopathy and limited joint mobility. Some 0.3% of patients with diabetes have necrobiosis lipoidica, and 15 to 65% of those diagnosed with necrobiosis lipoidica have diabetes.

Parsons then discussed pyoderma gangrenosum, a rare etiology of chronic wound. Some 50% of these wounds are idiopathic, and 50% have an underlying disease association. These wounds can have a differ-



ential diagnosis of infection (red, inflamed, warm), vasculitis and chemical dermatitis. There are five clinical presentations: classic, pustular, bullous, peristomal, pyostomatitis vegetans/pyoderma vegetans.

Clinicians should consider disease associations, such as idiopathic, autoimmune, inflammatory bowel disease and malignancy. In its inflammatory phase, debridement can lead to pathergy and worsen the process. Inflammation must be controlled. Immunosuppressive medications are often required; however, infection should first be excluded as an underlying cause, because immunosuppressants can mask and worsen infection. Biopsies can help rule out other causes.

Parsons also spoke about hidradenitis suppurativa. Again, it is important to treat inflammation early to prevent scarring, as well as control pain and odour. Early treatment can also give hope and promote lifestyle changes. Finally, she noted how crucial it is to have an experienced team to treat these conditions.

Key Points

- An experienced team is best when treating these disease processes.
- Rule out infection before initiating treatments like immunosuppressives.
- Biopsy can be used as an effective diagnostic tool in these circumstances.

ACUTE TRAUMATIC AND SURGICAL WOUNDS

Presenters: Lindsay Burnett, MN BScN RN; Maria Celis, MD

CCFP(COE) FCFP CWSP; John Hwang, MD FRCSC

Summary: Heather Ibbetson, BN BA

Lindsay Burnett first discussed burn injury management. Total body surface area (TBSA) is a key in the classification of burn wounds. Burns can be classified by wound depth, noting whether the burn is superficial, partial-thickness or full-thickness. These categories roughly correlate to first-, second- and third-degree burns. Full-thickness burns have no perfusion, no sensation and require surgery. Partial-thickness burns are often initially described as indeterminate, as they can be either superficial or

deep. Superficial burns are not included in TBSA calculations and are pink, painful and perfused.

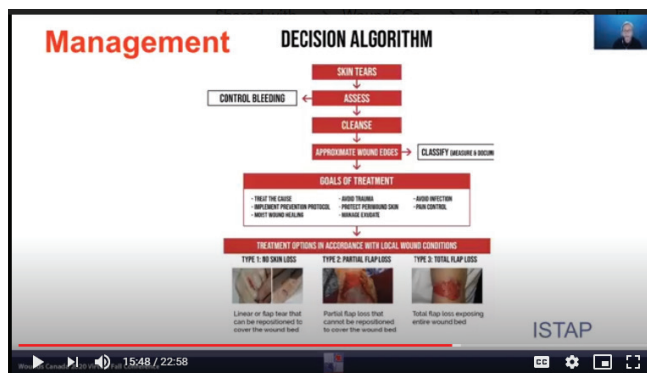
Burns that do not heal within 21 days will do better with surgical intervention to avoid scarring. Surgery can be done for debridement and split-thickness skin grafting, dermal regeneration templates, allografts, amputation, flaps and skin substitutes. Burn management should focus on preventing the wound from becoming more severe, removing necrotic tissue, minimizing infection, encouraging healing and decreasing the incidence of scars.

Maria Celis then focused on skin tears. The skin flap is a portion of skin unintentionally separated due to shear, friction or blunt force. There are three ISTAP classifications for skin tears. Type 1 involves no skin loss. Type 2 has a partial skin flap that cannot be repositioned to cover the wound. Type 3 has a total loss of the skin flap.

She presented a case study of an 86-year-old woman. The patient had several risk factors, including chronic disease, polypharmacy, skin fragility, impaired mobility, ADL dependence and a history of skin tears. The treatment aimed to stop bleeding, cleanse the wound and approximate the edges. The goals were to manage exudate and protect the periwound area.

Dressing selection should be based on the type of skin tear and amount of exudate. The ISTAP product selector is a good resource when deciding on a dressing. Finally, she highlighted that prevention and risk reduction are essential. It is important to determine the risk, use emollients, educate health-care professionals and patients and conduct regular skin assessments.

John Hwang spoke about "when surgical wounds



go wrong." He said clinicians need to complete a thorough patient history and wound assessment. Further, they should be aware of systemic factors, such as comorbidities, age and lifestyle. Patient priorities should also be taken into account. He then presented the case studies of five surgical wounds. Each patient was carefully assessed before the decision was made for surgical intervention.

Key Points

- It is important to use TBSA when classifying burns.
- Prevention and risk reduction are important for reducing skin tears.
- Careful patient history and thorough assessment are essential.
- Patient priorities must be discussed.

DIABETIC FOOT ULCER (DFU) CASES: ARTERIAL, MIXED AND VENOUS LEG/ FOOT ULCERS/LYPHDEMA AND LIPEDEMA/POPULATIONS AT RISK

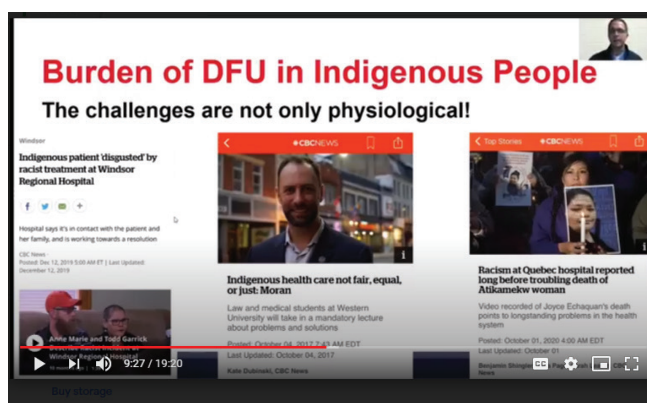
Presenters: Karim Manji, DPM, FACFAS;

John Rahman, Certified Orthotist; Ahmed Kayssi, MD MSc MPH

FRCS

Summary: Heather Ibbetson, BN BA

Karim Manji discussed low-, moderate-, high- and urgent-risk diabetic foot ulcer cases. Low-risk cases have no signs of deformity, peripheral vascular disease (PVD), neuropathy or skin and nail changes. The patients may also have access to good footwear. These cases can be managed through mediating risk factors, patient education and surveillance. Moderate-risk cases involve structural changes, pre-ulcerative lesions such as a callus, and a burning or tingling sensation. Risk factors should be managed, education and surveillance provided, and follow-up provided every three to six months. High-risk cases involve the formation of an ulcer, previous amputations, non-palpable pulses, loss of protective sensation and claudication. The wound should be healed as soon as possible, and steps taken to manage moisture, infection, pressure, edema and perfusion. Urgent-risk cases involve an infected ulcer or wet gangrene. These cases may also have acute



swelling and absent pulses. They should be referred to the emergency department, and to the "toe and flow" team (if available) to assess and manage infection and ischemia. To overcome the barriers to effective management, he highlighted the importance of practitioner education, a multidisciplinary approach and strong lines of communication across the spectrum.

John Rahman highlighted the significance of physiological factors such as PVD in the formation of ulcers. Properly fitting footwear is key in ensuring that diseases such as PVD and neuropathy do not cause or worsen foot ulcers. Offloading devices such as removable cast walkers have been shown to effectively improve healing times. Costs and coverage can vary for offloading devices, with removable cast walkers being a cost-effective option. Appropriate footwear and offloading are essential for prevention and can diminish pressure areas on the high-risk foot.

Ahmed Kayssi examined the increased risk for diabetic foot ulcers experienced by Indigenous populations in Canada. Indigenous populations are more likely to be marginalized and unsupported and to have a greater burden of chronic diseases. They are also less likely to have access to comprehensive health care. Indigenous populations face historical, social and political discrimination that has led to geographic isolation, substandard infrastructure and inadequate educational opportunities. The physiological risk factors and systemic discrimination result in a seven-fold increased risk of developing diabetes. Diabetic foot ulcers occur at a younger age and more often result in leg amputations in Indigenous popu-

lations. To address these inequalities, health-care teams and policy makers need to address geographical isolation, historical discrimination and mistrust, and lack of medical access in Indigenous communities. To create a diabetic foot ulcer prevention program in Indigenous communities, people at risk must be identified, screened and evaluated using validated risk scoring systems. Health-care teams must work with Indigenous communities to build capacity and address the challenges to preventative care.

Key Points

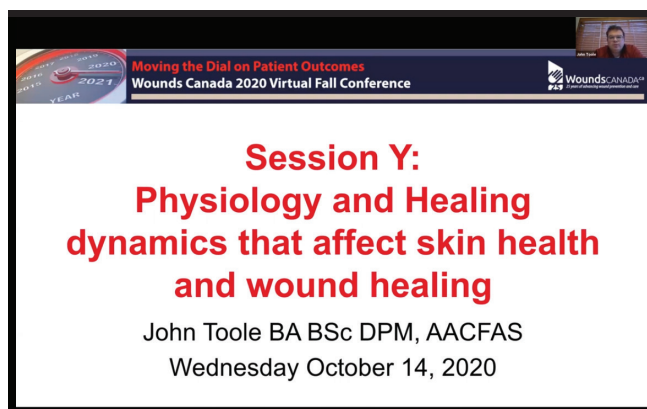
- It is important to develop and use a diabetic foot ulcer assessment and management process across the continuum of care.
- Footwear is essential to the prevention and management of diabetic foot ulcers.
- Physiological and social factors complicate the treatment of diabetic foot ulcers in Indigenous populations.
- Prevention of DFUs in Indigenous populations involves preventative care and capacity building.

PHYSIOLOGY AND HEALING DYNAMICS THAT AFFECT SKIN HEALTH AND WOUND HEALING

Presenter: John Toole, BA BSc DPM AACFAS

Summary: Heather Ibbetson, BN BA

In this presentation on the physiological dynamics that affect wound healing, John Toole noted the significance of phases of wound healing. Hemostasis occurs within the first 24 to 48 hours and involves vasoconstriction, the clotting cascade, platelets and degranulation. The second phase revolves around inflammation and can last one to seven days. During this phase, vasodilation, leukocyte migration, and neutrophils and macrophages act to remove debris. There is also lymphocytic activity at the site. The third phase involves proliferation and can last from four to 24 days. In this constructive phase, tissue continuity is re-established. Fibroplasia, collagen synthesis, angiogenesis and epithelialization occur. In the fourth and final phase, maturation of the wound site occurs and can last for one to two years.



Collagen is matured, remodeled and strengthened.

He highlighted several key factors that affect the healing process. First, comorbidities such as diabetes, renal disease, peripheral vascular disease, obesity and smoking can have a significant impact on the healing process. Hypoxia and vascularity are also factors that play a substantial role. Nutrition must be considered, especially the patient's consumption of protein, and vitamins A, C and D. He concluded by stressing the importance of offloading and considering the patient's social history in treatment.

Key Points

- Health-care workers should recall the stages of wound healing when treating patients.
- Consider comorbidities such as diabetes, renal disease and PVD, and their impact on wound healing.
- Lifestyle is an important aspect of the wound healing process. Factors such as smoking, obesity and nutrition impact the ability of the body to heal.

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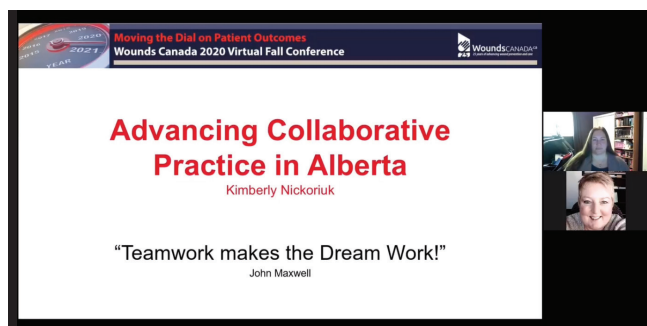
ADVANCING COLLABORATIVE PRACTICE IN ALBERTA

Presenter: Kimberly Nickoriuk, BN RN

Summary: Heather Ibbetson, BN BA

Kimberly Nickoriuk discussed wound care plans and their many components. Some of these include pathophysiology, governance and policies, skin and wound products, clinical practice resources and the interdisciplinary team. *Evidence-based* care is often strict, informal and inflexible in its use of guidelines. *Evidence-informed* care plans are adaptable to changes in key factors. *Person-centred* care involves the patient as a participant in the care-planning process.

She focused on a survey completed in Alberta that found five different zones with five different systems. These systems were disconnected from one another and had no core education or minimum standards, no clearly defined interdisciplinary roles, and multiple streams and core documents. To address these disconnects, the provincial wound and skin care product formulary was streamlined, a provincial Skin and Wound Committee was established and connections were made with strategic clinical networks. Clinical care topics were also added to the wound care and prevention CCT.



She highlighted how collecting data from paper-based forums is time-consuming and inaccurate. Instead, a website, MyAHS Connect, allows patients to connect with care teams. Through this site, care can be provided in collaboration "with" patients instead of "for" patients.

Key Points

- Evidence-informed care plans are adaptable to factors that can change.
- Person-centred care is essential, and the patient should be involved in establishing goals, defining roles, and in building meaningful relationships with the team members.
- In Alberta, a survey found five different zones with five different systems—a situation that was remedied through province-wide initiatives. 🇨🇦

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Subject A:



Week 1



Week 8



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1. Cutting KF. Honey and contemporary wound care: An overview. *Ostomy Wound Manage.* 2007;53(11):49-54. 2. Lusby PE, Coombes A, Wilkinson JM. Honey. A potent agent for wound healing? *J Wound Ostomy Continence Nurs.* 2002;29(6):295-300. 3. In-house data.

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Smith + Nephew Sponsored Learning: A Route to More Effective Chronic Wound Management

**Presenters: Caroline Dowsett, PhD MSc BSc (Hons) Dip N DN RGN;
Kevin Woo, PhD RN NSWOC WOCC(C) FAPWCA**

Caroline Dowsett works as a clinical nurse specialist in tissue viability for East London Foundation Trust where she is also the clinical lead for the leg ulcer service. Caroline also works globally as an independent nurse consultant in wound care. She has worked in the field of wound care for over 25 years.

Kevin Woo is an associate professor at Queen's University, School of Nursing, School of Rehabilitation therapy in Kingston, Ontario. He is the Regional Director – North American and Chair of the Research Committee for the International Skin Tear Advisory Panel (ISTAP). He is the web editor for the Advances in Skin and Wound Care website.



Hard-to-heal Wounds^{1,2}

Hard-to-heal wounds are extremely common in our health-care systems. Often, these wounds are not recognized early enough, leading to reduced patient quality of life, increased clinical workloads and higher costs. Some of the most challenging components of chronic wound management are prevention and management of infection, biofilms and progression of the wound to a healing trajectory. Despite best practice principles, including addressing the cause, performing tissue debridement, managing infection and moisture balance, the edge of wound may not advance. A more proactive approach to early assessment and intervention can improve patient outcomes and is much more cost effective.

Infection³

Chronic wounds are susceptible to infections for several reasons:

- Chronic wounds provide an ideal environment for bacteria and fungi to grow.
- Delayed wound closure increases the risk of continued exposure to infection-causing pathogens, leading to complications such as increased risk of fecal contamination in pressure injuries.

Chronic Wound Pathways

It has been shown that implementation of an evidence-informed treatment pathway leads to improved health outcomes. In 2020, Dowsett et al. developed The Infection Management (IM) Pathway, a route to more effective infection management, which is one of the first

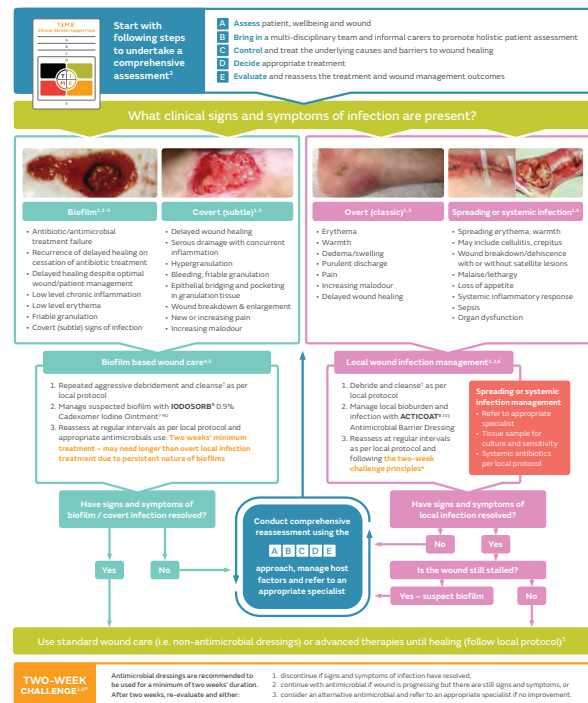
tools that combines the diagnosis and treatment of local infection and biofilm and offers a consistent approach to care (Figure 1).^{1,2}

Figure 1: The Infection Management Pathway

Smith+Nephew

A route to more effective infection management

Improve patient outcomes* with accurate decision making, a fast response and effective treatment choices

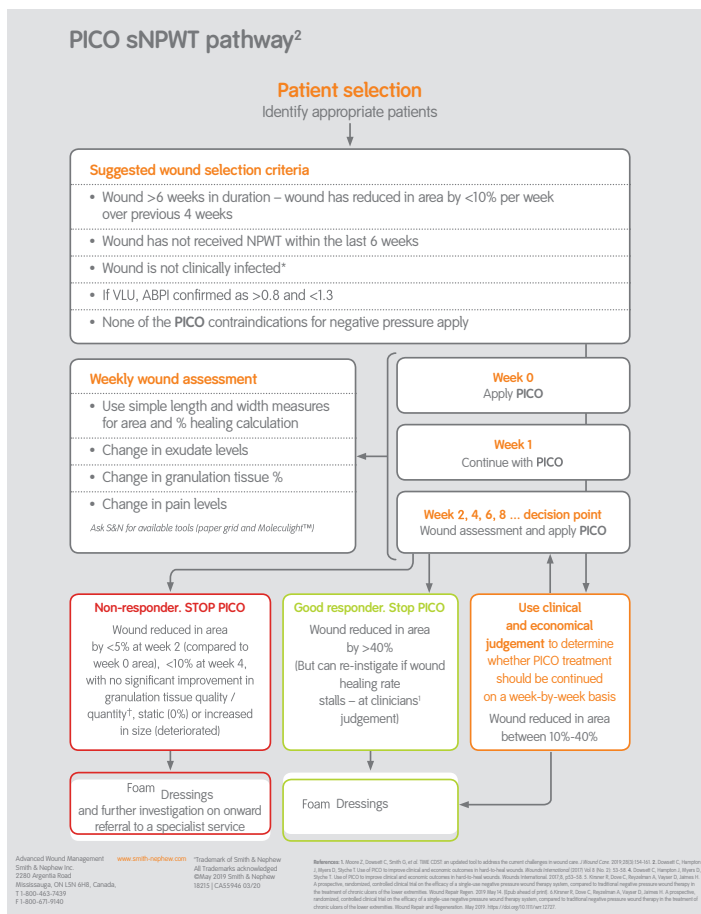


The IM Pathway is designed to:

- Promote comprehensive patient and wound assessment, including for signs or symptoms of local infection or suspected biofilm
- Guide management of patients with infected wounds or wounds with biofilm
- Simplify clinical decision making and facilitate best practice among all health-care providers, including non-wound care specialists
- Increase continuity and consistency in care
- Encourage and support antimicrobial stewardship practices

In 2017, Dowsett et al.² developed and implemented a pathway for use of single use disposable negative pressure wound therapy (sNPWT) to “kick start” hard-to-heal wounds (Figure 2). PICO sNPWT significantly improved the healing trajectory of hard-to-heal wounds compared with standard care, resulting in cost savings and reduced nursing time. McClusky et al., replicated this study with similar outcomes.⁴ Further, both studies confirmed that the earlier PICO sNPWT is initiated (< 3 months) the greater the probability of wound healing.

Figure 2: The PICO sNPWT pathway²



Traditional NPWT Compared to sNPWT⁵

In a multi-centre randomized, controlled study, use of PICO sNPWT helped to significantly reduce wound area, depth and volume compared with tNPWT in patients with lower-extremity wounds and twice as many wounds treated with PICO healed compared to tNPWT.

The PICO pathway is designed to:

- Support clinical decision-making in the management of hard-to-heal wounds
- Improve healing outcomes
- Encourage clinicians to think about taking a different approach to hard-to-heal wounds
- Focus on progressing a stalled wound to healing as opposed to simply managing wounds of longer duration
- Pinpoint at what stage clinicians need to make a decision about whether or not to continue therapy
- Emphasize the importance of early intervention

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Bridging the Digital Divide in Wound Care: Health Literacy and Access to Care

By Karen Laforet, RN MCISc-WH CCHN(C) VA-BC CVAA(c)

Recent global events have increased virtual health-care use from 19% in 2019 to more than 56% in the first half of 2020.¹ This fundamental, pandemic-driven shift is changing health care and wound management. Kickbusch called using digital health technologies, including virtual care, “health 4.0.”² With digital health literacy (DHL), we can anticipate improved health-care quality, wider accessibility and reduced costs.³

Virtual care, while beneficial, also limits equitable, fair and timely access to health care. The risk is that digital technology will drive practice rather than practice informing technology. Virtual care enthusiasts usually have the literacy levels to use it effectively. Although health literacy (HL)

is critical for successfully adopting digital health care, literacy has garnered only limited mentions. Digital health literacy is fundamental to equitable health care. This article looks at the current state of Canadian HL, identifies DHL components that impede or support adoption of digital health care and explores future policy opportunities for patients and health-care professionals (HCPs).

Canada’s Health Literacy

Literacy impacts our daily lives. It is “the ability to identify, understand, interpret, create, communicate and compute printed and written materials associated with varying contexts.”⁴ Measuring on a 5-level scale, the Government of Canada sets Level 3 as the minimum for employability and coping with society’s increasing information demands.⁵ A 2012 literacy survey showed 48.5% of Canadians (all ages) at \leq Level 2 for overall literacy and 54.7% at \leq Level 2 for numeracy (see Table 1). Canadian adults’ average score in prose and document literacy is \leq Level 3.⁶ This means two in five adults (approximately 9 million people) cannot read well enough for daily activities.

Digital health literacy

is the ability to seek, find, understand and appraise health information using information and communication technologies (ICTs) to address or solve a health-care problem.^{25,26}

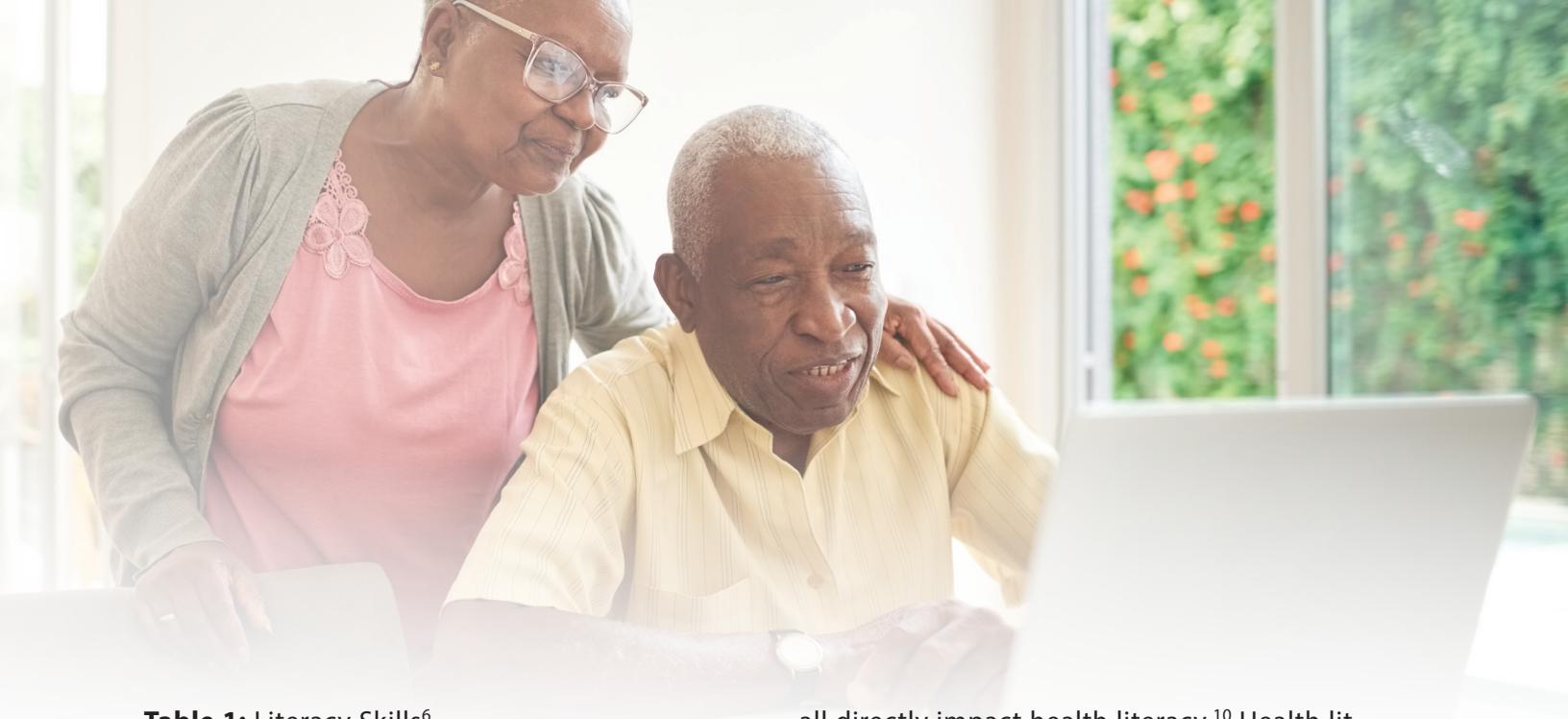


Table 1: Literacy Skills⁶

Prose	Knowledge and skills needed to understand and use information from written texts
Document	Knowledge and skills needed to find and use information in various formats, e.g., schedules, maps, tables and charts
Numeracy	Knowledge and skills needed to do arithmetic and understand numbers in printed materials
Problem-solving	Process of solving problems by using goal-directed thinking and action, without having a routine to follow

The International Adult Literacy and Skills Survey (IALSS), a Canadian component of the Adult Literacy and Life Skills Survey (ALL), assesses Canadians' literacy performance in using health information (health literacy [HL]).⁷ Recently the IALSS predicted that approximately 55% of all Canadians, age 16 to 65, will score below Level 3 on the HL scale. Also, only 12% of adults age 65 and over exhibit \geq Level 3 health literacy.⁸

In addition to the literacy skills identified in Table 1, health literacy includes "the ability to access, comprehend, evaluate and communicate information to promote, maintain and improve health in a variety of settings across the life-course."⁹ Social determinants of health—specifically language barriers, cultural, physical and environmental factors, education, and income—

all directly impact health literacy.¹⁰ Health literacy has three main pillars: capacity to obtain health information (where to find help), ability to understand the information gathered and ability to apply health information.⁹ All three pillars are essential to achieve health literacy goals.¹¹

Digital Health Literacy

Digital health literacy is the ability to seek, find, understand and appraise health information using information and communication technologies (ICTs) to address or solve a health-care problem.^{12,8} The ICTs include telemedicine, mobile health, Internet-based services, patient forums, electronic records, patient wearable applications (e.g., health and fitness monitors) and other online-based consumer applications.¹³ In today's world, health literacy is foundational for a person's digital health literacy.

Canada's exponential increase in virtual care—health-care visits conducted by phone, telehealth, video, text or email^{1,2}—highlights the importance of adjusting existing practice and governance structures to meet digital health-care challenges. The inability of some Canadians to use e-health services, including virtual care, contributes to health inequality.¹⁴

The e-health sector is growing exponentially, and health-care providers and patients need DHL skills to access or use health technology, especially patient self-management apps. Such



services enable individuals' resource development, especially patient-specific ones, so measuring health literacy from the user's perspective remains a high priority.¹⁵ Assessing health literacy over time is challenging, because it improves or deteriorates depending on a person's circumstances.¹⁶

At greatest risk of exclusion from digital health solutions are low-income adults and lower-income older adults. Having in many cases experienced lifelong economic insecurity and limited education, these populations are more likely to have low DHL.¹³ Their lack of health-care skills, resources and experiences may limit their participation in virtual care or e-health initiatives. Illness also affects literacy level, especially when it comes to patient decision-making abilities.¹¹ Effective digital health strategies, education and access alternatives must all be accessible and engaging at a wide range of health literacy levels.¹⁷

Health literacy goes beyond the individual patient or care partner's correct use of digital health solutions.^{10,14} Health-care professionals are responsible for their patients' health literacy—to assess current level and support further skill development. The clinicians' ability to use digital environments effectively directly correlates with a patient building confidence and skill in finding and applying health-care solutions.¹⁷ To assess DHL, a clinician requires competency in

evaluating quality and validity of information, sourcing credible and valid content, revising or creating materials for specific health literacy levels, and knowing each patient's health literacy level so their information documents are adapted appropriately.¹⁸

Patients benefit from improved access to information: specifically, for informed decision-making,¹⁹ effective mobile device application use, and access to recommendations regarding health applications, test results and follow-up forms. The literacy bar rises when learning is applied, but assuming patients "know" risks results in poor patient outcomes. For health literacy, information must be understood and used to make good health decisions. How many clinicians have had a patient with non-healing wounds present their "findings" from a "Dr. Google" or social media search? Being able to discriminate accurate from inaccurate information requires the ability to retrieve information from digital sources and apply critical thinking skills to evaluate the information. The wound care clinician can increase the patient's DHL in several ways (see facing page).

Recent research suggests a number of health-care providers may lack the digital literacy needed to effectively guide patients in using technology-based supports.^{3,14,19} At the same time, a number of providers have confirmed a reluctance to use digital technologies, resulting in barriers to broad-scale implementation.¹⁴ Despite growth in virtual care options, most clinicians, especially doctors, are reluctant to see patients in formats other than face-to-face visits, furthering health access inequities. To maximize virtual care's benefits, the following policies may help bridge the digital divide.

Policy Strategies for Health-care Providers

1. Develop and provide digital literacy programs for health-care professionals within school curricula and ongoing professional development in current practice.²⁰
2. Assess a patient's health literacy before providing digital solutions, using a validated, efficient literacy scale (e.g., eHEALS)²¹ to recommend and leverage appropriate interventions.

3. Train HCPs in cultural competency to determine patient and care partner needs. Cultural norms and values affect one's ability to leverage digital health solutions, especially completion of required forms, numeracy skills and decision-making.²²
4. Build a repository using currently developed content to share with patients that includes credible websites, online community directories and tools to assess the reliability and accuracy of online information: e.g., McMaster Optimal Aging Portal²² and IMAGINE – Citizens Collaborating for Health.²³
5. Build and support digital health interdisciplinary teams. Digital health technologies connect professions for patient care, policy and research, specifically to build knowledge and skill for self-care strategies. Improved self-care mitigates the impact of low health literacy.¹³
6. Develop patient-specific tools to leverage virtual care, e.g., how to prepare for a virtual visit; what questions to ask your HCP; how to communicate signs and symptoms.
7. Work with e-health developers to identify and fill gaps for digital health wound care management solutions.¹⁰

Patient-focused Strategies

1. Provide access to technology and technology-based supports, such as reliable Internet, computers and mobile devices. These technologies improve patients' information access (including exclusive online offerings [e.g., iKNOWHEALTH, Medical ID, COVID self-screening apps]) and increase independence (self-management) and socialization.
2. Offer local community support programs and services (e.g., digital literacy training in local community environments) geared to specific needs (e.g., new immigrants' language needs, numeracy training). Education and training remove socioeconomic barriers that interfere with skill development.¹⁶
3. Reduce financial barriers for basic technology-based supports for all populations who need it.
4. Provide supplemental funding for affordable

Internet, free computers and maintenance costs (replacement, repairs). The high costs of Internet access and replacement or repair of equipment create barriers to access.¹⁶

5. Reduce regional and jurisdictional inequities for access to assistive devices for the visually impaired, hearing impaired, those with compromised dexterity and others who require such devices to operate a computer. Monies must be allocated for persons requiring computer access for health care. It is unconscionable for the government to introduce cost-saving technologies that disadvantage those who need it the most.

Conclusion

Relevant, accurate and useful health information can close health literacy gaps—and not just in wound care. Despite evidence that proficient health literacy improves health outcomes, it is often an afterthought or addressed in isolation.²⁴ Health literacy must inform all health communication and public health research. The response to the current COVID-19 pandemic clearly illustrates how inequities sharpen and deepen when some population segments cannot “shelter in place,” simply because they lack access to resources that can help them make positive health-care choices. Wound care continues to be fragmented, under-serviced and under-supported. Virtual care and other digital health technologies (e.g., mobile health, patient forums, electronic records, patient wearable applications) that are becoming ubiqui-



tous in health-care provision have the potential to address the current gaps. To ensure that access to these technologies does not increase health inequity but rather closes the digital divide, policy makers must not place the burden of ensuring success on the backs of those who are economically, culturally, physically or mentally disadvantaged. The responsibility for ensuring that health literacy improves and the digital health literacy gaps close rests with health-care providers and policy makers. We, as a society, should support only health-care advancement cost efficiencies that promote equitable health care—something that is achievable through digital health literacy. 🏠

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**Presenters: Cathy Burrows, RN BScN MScCH (Wound Prevention and Care);
Rochelle Duong, RN BScN IIWCC MHA(CC); Robyn Evans, BSc MD CCFP FCFP;
Carol Ann Rabley-Koch, BSc RN NSWOC(C)**
Moderated by Gary Sibbald, BSc MD FRCPC(Med, Derm) MACP FAAD MEd FAPWCA DSc(Hons)

Cathy Burrows has a broad range of clinical backgrounds, with the past 20 years focused on wound care. She has been an active member of Wounds Canada since 1999, has chaired numerous committees and was president from 2007 to 2009. In 2008, Cathy completed the Masters of Science in Community Health (Wound Prevention and Care) at the University of Toronto.

Rochelle Duong specializes in wound care and currently works as the Manager, Clinical Programs. She is responsible for the Wound Care Program, wound care clinics and Home and Community Care Medical Supplies and Equipment formulary for the Mississauga Halton LHIN.

Robyn Evans is the Medical Director of the Wound Healing Clinic at Women's College Hospital, involved in research and teaching, and a family physician in the community. She is part of the faculty of the International Interprofessional Wound Care Course (IIWCC) through the University of Toronto. She is senior faculty for Wounds Canada, supporting the development of interprofessional education programs for clinicians as well as delivery and evaluation of these programs.

Carol-Ann Rabley-Koch graduated with an Honours Bachelor of Science degree in Kinesiology from the University of Waterloo in 1981. Following graduation, she completed the nursing program at St. Clair College in Chatham. She holds a diploma in alternative health care and is a certified member of Nurses Specialized Wound, Ostomy and Continence Canada.

Understanding Edema

Edema, or swelling produced by expansion of the interstitial fluid volume, is caused by fluid volume overflow, low protein states (leading to reduced oncotic pressure) and/or damage to the capillaries and/or lymphatics. Edema can lead to skin changes (stasis dermatitis), hyperpigmentation, cellulitis, pain, quality-of-life issues, lipodermatosclerosis, mobility issues and ulceration. It can also lead to infection: stasis changes lead to breakage into the skin barrier; edema fluid neutralizes the fatty acids of sebum, reducing bactericidal properties of the skin; poor local perfusion is caused by the swelling; tinea pedis develops between toes due to swelling and moisture. Arterial edema is caused by blockages in large vessels. Usually the capillaries constrict when the leg is dependent, but when

arterial edema is present, the capillaries dilate.

To manage edema, clinicians must identify its cause(s), use compression therapy and improve calf-muscle-pump function. Compression therapy is the gold standard, but it can lead to issues such as skin irritation, discomfort/pain, mechanical issues, nerve damage, forefoot edema, swelling above the knee and maceration. While many dressings are available, they do not address the underlying cause of the edema.

The geko™ device (Figure 1) stimulates the common peroneal nerve, which activates lower leg muscle pumps to increase blood circulation, reduce edema and support healing. The device reduces edema in three ways:

1. By eliciting muscle contraction of the calf and foot

2. By changing the volume and velocity of blood flow by increasing flux to the wound bed and periwound skin
3. By decreasing venous pooling

Figure 1. geko™ device



Early intervention with the geko™ device has proven to be effective in the treatment and management of edema and wound healing.

Early Intervention with geko™ Device for Venous Leg Ulcers (VLUs) Predicted to Not Heal within 24 Weeks

The geko™ device was evaluated and added to the Mississauga Halton (MH) LHIN compendium in 2017. Audits conducted six to nine months following its addition found very few referrals to the device, and long wait times before device use caused by delays in getting vascular studies

(90–100 days). During these delays, many wounds deteriorated. A quality improvement initiative looked at using the Venous Leg Ulcer Risk Assessment (VLURA) tool to classify risk and identify wounds that were unlikely to heal within a 24-week period and trigger earlier use of geko™ as a first-line adjunctive therapy (within two weeks). Results showed a mean daily healing rate of just under 1.5%, compared with –2.25% per day before use of the device. Without the use of geko™, the average time for closure is about 15 weeks for all VLU patients in MH LHIN. Healing time while using the geko™ device averaged 12 weeks for patients at risk of not healing in 24 weeks. This initiative demonstrates that early intervention using the geko™ device improves healing outcomes and decreases costs related to VLUs.

Kuhnke and Maxwell conducted a qualitative study looking at the experience of patients living with VLUs. Pain was a leading issue reported, leading to psychosocial issues such as relationship distress and emotional crisis. Participants reported VLUs had a negative effect on them and on their family, associated with decreased functional status and ability to dress and walk, and intensified dependency. In contrast, participants identified hope and optimism that the geko device would bring healing, including shrinking or closing of the wound, fewer or no trips to the clinic, less or no pain medication and the ability to wear pants, socks and shoes.

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Wounds Canada is pleased to announce three virtual events in 2021. Mark your calendars now so you don't miss out—stay tuned for early bird registration info.

**Limb Preservation Symposium – Virtual Event:
Friday, May 28, 2021**

A one-day event focused on issues central to amputation prevention in Canada.

**National Conference – Virtual Event:
Thursday, October 21 through Saturday October 23, 2021/
French-language Wound Symposium:
Sunday October 24, 2021**

Our annual fall conference with experts from across Canada presenting a national perspective on key issues in wound care.

**Pressure Injury Symposium – Virtual Event:
Thursday, November 18, 2021**

A one-day event addressing key issues on pressure injury prevention and management.



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