

# Wound Care

WINTER 2017  
VOL. 15 NO. 3



C A N A D A

THE OFFICIAL PUBLICATION OF WOUNDS CANADA

## Reflections on Conference

### Special Focus on the **Diabetic Foot**

- Advocating for Patients
- Supporting Better Wound Care through Policy Change
- Spend a Minute, Save a Life with Foot Screening
- Living with a Diabetic Foot Ulcer

### Wound **Sleuth:** Blackened Nails

### Tips for Improving Your Writing

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Wounds Canada is the leading wound-related knowledge mobilization organization in Canada.



**Wounds**CANADA<sup>ca</sup>

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Wounds Canada ([www.woundscanada.ca](http://www.woundscanada.ca)) is a non-profit organization of health-care professionals, industry participants, patients and caregivers 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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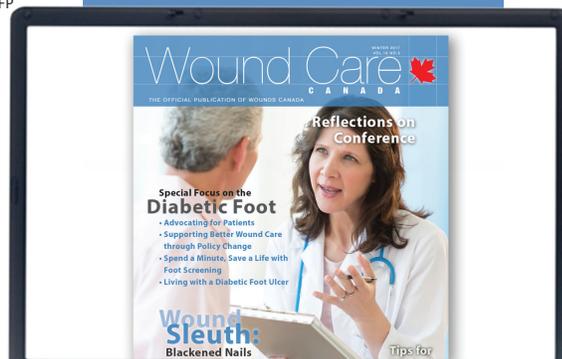
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## Don't Miss Out

Each time a new issue becomes available, subscribers will be notified by an email that contains a live link to the online magazine. If you are not already a subscriber, get on the list by sending an email to [info@woundscanada.ca](mailto:info@woundscanada.ca). It's free!





# News in Wound Care

## The Year in Review

Wounds Canada has enjoyed its most active year to date, with a new name, new look and new website, alongside our popular programs and events. Here are some highlights of 2017.

We started the year by rebranding the Canadian Association of Wound Care (CAWC) as Wounds Canada to reflect a new era for the organization. The website was rebranded and refreshed as well.

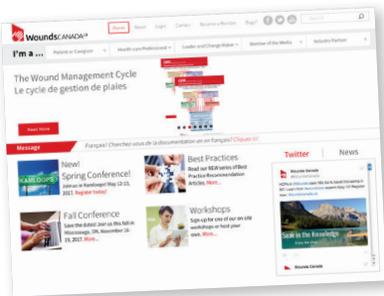
To serve our stakeholders better, we expanded our team by hiring a Senior Marketing Manager and Education Manager.

In the area of policy development, Wounds Canada was particularly active in advocating for funding for offloading devices for patients with diabetic foot ulcers. The first push has been in Ontario, but we spent time during the year working as well in BC, Alberta and Manitoba to implement the offloading advocacy initiative. The articles on pages 12 and 18 provide more details on the work we have been doing and the background to the issue of implementing policy change at a provincial/territorial level.

We partnered with 16 organizations to raise awareness of diabetic foot complications on Diabetes Day and have been involved in various wound-related activities, conferences and other initiatives in BC, Alberta, Manitoba, Ontario, Quebec and nationally.

Education for health-care providers is always on the agenda at Wounds Canada, and 2017 saw the delivery of two conferences (Kamloops in May and Mississauga in November), along with a number of half-, full- and two-day workshops—including Diabetes, Healthy Feet and You, Practice Change through Applied Knowledge and various hands-on skills workshops—at various locations around the country.

On the publishing side, we have continued to update and increase the content on our website, including the new Diabetes, Healthy Feet and You portal at [www.DHFY.ca](http://www.DHFY.ca), published three issues of *Wound Care Canada* and one *Diabetic Foot Canada e-Journal*, along with six Best



### Message from the President of the Board of Directors of Wounds Canada

It is with tremendous gratitude that we say goodbye to three of our Wounds Canada Board members: Nicola Waters, RN, from BC; Anna Slivinski, Reg Dietitian, from BC; and Janice de Boer, RN, from BC. Each has made a substantial contribution to the well-being of our organization, and they will truly be missed. We wish them the best in their future endeavours.

At the same time, we are very pleased to announce the appointment of five new Board members, to take effect January 1, 2018. We are particularly excited that this group brings to our Board great expertise and diversity, in terms of both skill set and regional representation. We welcome John Hwang, surgeon from BC; Sébastien Hains, podiatrist from Quebec; Petra O'Connell, health administrator from Alberta; Janet Kuhnke, RN, from Nova Scotia; and Ellen Mackay, dietitian from BC.

I am looking forward to working with our new Board to enhance and expand the Wounds Canada footprint across Canada and globally.

Morty Eisenberg

Practice Recommendations articles, which form the first six chapters of the online document *Foundations of Best Practice for Skin and Wound Management*, available free at [www.woundscanada.ca/BPRs](http://www.woundscanada.ca/BPRs). We have begun the French translation of these documents.

Our research activities included the launch of the Research Directory on the website and the initiation of a study of the prevalence of wounds in Canada. We improved the abstract submission process for conference posters and changed the format of oral poster delivery, which has resulted in lively discussions among presenters and audiences.

## Moving into 2018

The slate for next year is also full. In addition to two conferences (Winnipeg, MB, and London, ON), additional BPRs and our usual publications, we will move more deeply into the Canadian public realm, by providing educational materials for everyone, including patients, their families and caregivers and government decision makers, as well as by creating awareness campaigns on the most pressing issues.

On the health-care professional education side, we have big news: the launch of the Wounds Canada Institute (see announcement on this page).

The website will keep expanding in content and functionality, and through eblasts and our social media channels, we will continue to keep you abreast of the latest research, activities and developments that impact you and your practice. [Click here to sign up.](#)

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## News from the Canadian Association for Enterostomal Therapy



### Helping Ostomy Patients Navigate the Disability Tax Credit

Many Canadians who live with an ostomy are unaware of their eligibility for the Federal Disability Tax Credit (DTC), and even those

*continued on next page...*

## Launching Wounds Canada Institute

In response to a growing demand for high-quality, interprofessional wound education across Canada (and internationally), Wounds Canada will launch the Wounds Canada Institute in January 2018. This will be home to an expanding suite of online and onsite educational courses, programs and resources to support the learning needs and professional career growth



## WoundsCANADA Institute

of health-care professionals of all disciplines relating to the prevention and management of wounds.

Whether in the form of online modules and events, face-to-face learning or hands-on workshops, offerings will provide learning experiences to best suit the content and the specific interests, time availability, resources and expertise of each user. Our website ([www.woundscanada.ca](http://www.woundscanada.ca)) contains the Wounds Canada Institute portal, offering easy, on-demand access and tracking features so users can monitor their progress. The portal will also offer automated registration and payment features.

In addition to our modules and workshops, the Institute will house our national publication, *Wound Care Canada*, public education development and any education-related research activities of Wounds Canada.





# News from Our Industry Partners

## Mölnlycke: Reducing Pressure Injury Risk

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*News in Wound Care continued from previous page ...*

who work toward completing the application process often encounter difficulties. In response, in 2016, the Canadian Association for Enterostomal Therapy (CAET) and Ostomy Canada Society formed a joint committee to find ways to improve things for Canadians living with an ostomy. The committee decided that creating a brochure would be the best way to help communicate the information necessary for completing a DTC application. The resulting brochure's purpose is to provide information in a clear and simple format. The goal is to outline who is eligible, how to apply,

and where to access the form to submit to the Canada Revenue Agency (approval from the CRA is required before those living with an ostomy become entitled to the DTC benefit). Both English and French brochures are now available: Disability Tax Credit for People Living with an Ostomy and Crédit d'impôt pour personne handicapée (CIPH) pour les personnes stomisées.

You can download this brochure at [www.caet.ca](http://www.caet.ca), or order free hardcopies via [www.ostomycanada.ca](http://www.ostomycanada.ca) or by calling 1-888-969-9698.

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# Reflections on the Wounds Canada Fall Conference

By John Gregory, IIWCC

*The 2017 fall Wounds Canada conference, Evolving over Time: Targeting Best Practice in Canada, was held in Mississauga, Ontario, November 16–19. Over 800 health-care practitioners, administrators, government decision-makers, industry representatives and patients attended. What follows are highlights from the conference.*

**“K**now what you don’t know,” advised Canadian IndyCar driver James Hinchcliffe, who bounced onto the stage telling wound-care clinicians that they are doing remarkable work.

He knows from personal experience. You

could hear a pin drop in this keynote address, as Hinchcliffe told a packed conference the story of his accident and improbable rehabilitation.

“I was a shish kebab, a Hinch kebab,” he said.

His story provided a fascinating insight into the patient experience in a major trauma case.

“Stories like yours fuel us,” noted one member of the audience.

The conference feedback indicated that the majority of attendees found his keynote very relevant to their practice.

## Challenging the Audience

While Hinchcliffe reminded us of the importance of teamwork in effecting positive outcomes, Kerstin Lewis noted that “We can’t assume everyone knows how to work as part of an integrated team.” And challenging the accessibility of the interprofessional health-care team, one delegate noted, “What happens in Toronto is entirely differ-





Physiatrist Chester Ho provided a glimpse into the controversial discussions within Alberta Health Services on the balance of cultural change versus policy/procedure-driven governance in pressure injury prevention.

The attendance across all four days of the conference was a testament to the level of engagement. And based on the high energy in the room and the feedback later, Sunday morning's Wound Jeopardy was a particularly memorable session that deeply involved the audience.

ent than what happens in Northwestern Ontario. Don't make the assumption that your pathway for health care will work there."

"Who feels completely happy with everything they do in the organization for managing patients?" asked speaker Nicola Waters, introducing the term *institutional ethnography* (IE). This distinctive mode of inquiry seeks to understand how what people do and experience is organized in relation to others.

## Living in the World of Wounds

"I don't want to be part of that 80% that gets an amputation," said an impassioned Robert Meyer, a patient with diabetes. A participant at two previous Wounds Canada conferences, he returned to this conference and, with his no-nonsense comments and singing, brought the house to its feet.

Conference co-chair Deirdre O'Sullivan-Drombolis added, "Attending this conference and being around so many like-minded health-care individuals is truly inspiring and uplifting. We can come together to share not only knowledge and the latest evidence but also personal stories about our own trials as well as successes navigating the health-care system. It enables us to return to our everyday lives with fresh new ideas and a renewed sense of purpose."



## Exceptional Speakers

Throughout the conference, attendees were treated to many distinguished speakers and panel members. These included special guests Evan Call and David Keast from the International Wound Infection Institute. Call's ses-



sion on Saturday highlighted why microbes are so difficult to control. He noted we have identified only 7% of bacteria, with 93% yet to be discovered. This built on an earlier session with Kevin Woo, who presented the **UPPER and LOWER infection checklists**.<sup>1</sup>

Shahriar Shahrokhi, Attending Surgeon at Ross Tilley Burn Centre at Sunnybrook Health Sciences Centre, kept us mesmerized for 45 minutes in an after-lunch industry-sponsored session.

Kathleen Reid, speaking at the conference for the first time, articulately described setting up a wound-prevention program in the Saturday Long-Term Care session. (“Note to self,” tweeted Wounds Canada, “invite her back again.”)

## Digital Posters and Oral Poster Presentations

Pamela Houghton emphasized the importance of the oral poster presentations, where many innovations are presented. During the conference, these presentations were organized into topic

groups, including Infections and Skin Tears, Dressings, Programs, and Pressure Injuries.

Maryse Beaumier won the People’s Choice Award for her poster “Let’s See the Best Dry Dressing When Blood Supply Is Poor in a Leg

Ulcer: A Literature Review,” and Simona Gabriele received the Judges’ Choice Award for her poster “Transdermal Doxycycline: A Novel Treatment of Diabetic Foot Ulcers.”

The top three oral poster presentations were:

- “Skin Tear Prevalence, Incidence and Associated Risk Factors in the Long-term Care Population,” by Kimberly LeBlanc
- “A Prospective, Multi-Site, Non-Blinded Study Comparing the Cost-Effectiveness of Gentian Violet/Methylene Blue Dressing in

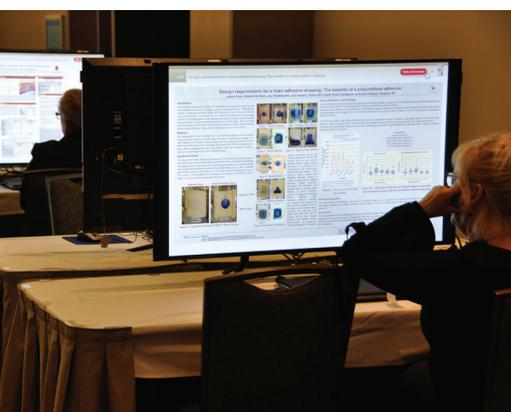
the Management of Open Surgical Wounds vs. the Current Standard of Care in a Canadian Community Care Setting,” by Karen Laforet

- “The Benefits of a Regional Interprofessional Complex Wound Center,” by John Hwang

## Industry Symbiosis

The high attendance at the industry-sponsored sessions and attendee engagement with industry reps on the exhibition floor are a tribute to the successful symbiosis among health-care professionals, wound-care companies and related professional organizations in Canada.

“Wounds Canada attendees are among the world’s most motivated and innovative wound-care providers as shown by their dedication to attending educational sessions and interactions



with the many exhibitors demonstrating their products,” said Canadian industry consultant Alan Neil.

Nicola Waters commented, “For me, the highlight of the Mississauga event was the opportunity to continue the debate we began at the spring conference in Kamloops about ‘What is evidence in wound care?’ These two groundbreaking forums have offered patients, clinicians, educators, researchers and industry representatives a unique platform on which to showcase how, although our views and priorities may be very different, we can come together with the aim of improving life for people with or at risk of wounds.”

“This year’s fall conference showcased the role Canada has played in the development and evolution of best practices and patient-centred wound-care advocacy,” added Neil.

## We Have an App for That!

The new smartphone app for the conference gave a taste of what to expect in the future. It allowed attendees real-time access to the session schedule and summaries, speaker biographies and digital posters. The posters could be downloaded from the app for future reading.

In the 15 years that I have attended Wounds Canada conferences, I have seen them become *the* centre of learning for attendees from many backgrounds with a stake in improved wound management. For example, more physicians, facility/agency administrators and government decision-makers

have become involved in how wound care has evolved in Canada, and they now make up a greater proportion of conference participants. To accommodate the learning needs of this wider range of attendees, the



conference provides a successful balance of clinical science, everyday real-world clinical practice, lived experience and the seeds of institutional ethnography. One result of the education these conferences provide is that Canada has created an exceptional sphere of international influence.

Said Morty Eisenberg, president of the board of directors for Wounds Canada, “We are indebted to Mariam Botros, Wounds Canada CEO; Robin Evans and Dee O’Sullivan-Drombolis, conference co-chairs; and the entire team at Wounds Canada for putting together a very successful and well-attended conference in Mississauga. The feedback has been excellent, both from participants and our industry partners.”

## Looking Forward

Next year’s spring conference will take place in Winnipeg, Manitoba, May 11–12, with the fall conference in London, Ontario, November 8–11, 2018. 📱

*John Gregory* edits the syllabus for Wounds Canada conferences. Expect further articles from him on crafting session summaries and the rise of social media in Canadian wound care. You can find him on Twitter @gregiej and @opencityinc.

## Reference

1. Woo KY, Heil J. A prospective evaluation of methylene blue and gentian violet dressing for management of chronic wounds with local infection. *Int Wound J*. 2017;14(6):1029–1035. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/iwj.12753/full>.



# A Journey of a Thousand Steps to #ActAgainstAmputation

By Mariam Botros, DCh, IIWCC, CEO, Wounds Canada; Doris Grinspun, RN, MSN, PhD, LLD(Hon), O.ONT. CEO, Registered Nurses' Association of Ontario (RNAO); Amanda Thambirajah, Director of Government Relations – Ontario, Diabetes Canada; Cathy Harley, Executive Director of CAET and Sue Rosenthal, BA, MA, Director, Knowledge Mobilization, Wounds Canada

**D**iabetes is the sixth leading cause of death in North America. By 2020, an estimated 4.2 million Canadians will be living with the disease and its devastating complications. People with diabetes have an increased risk of developing diabetic foot ulcers (DFUs) as a result of the loss of protective sensation in their extremities. Twenty-five percent of individuals with diabetes will have a DFU in their lifetime, increasing their risk of amputation and pushing their five-year mortality rate to surpass that of patients with Hodgkin's disease, breast cancer or prostate cancer.<sup>1,2,3</sup>

The direct cost of diabetes in Canada now accounts for about 3.5% of public health-care spending, and this figure continues to rise.<sup>4</sup> The cost of DFUs is an enormous strain on health-care systems: about \$12.2 billion in 2010.

Care for people living with diabetic foot ulcers needs to be holistic and requires addressing all factors that contribute to ulceration, including repeated trauma and pressure. For years, the Canadian wound-care community recognized and understood the importance and value of pressure

redistribution for diabetic foot ulcers and the financial barriers to delivering evidence-based care for patients living with diabetic foot ulcers. We knew that it did not matter what you put on the wound if you did not first remove the pressure and therefore the circumstances that allowed repeated trauma to the wound.

It was challenging to advance this concept to health systems that, until recently, dealt with diabetic foot ulcers as an acute incident, and therefore spent little to nothing in primary and secondary prevention. For example, while dressings and amputations have received universal funding, devices to redistribute (offload) pressure and eliminate the repeated trauma have not.

If diabetic foot complications were ever going to be treated as the chronic condition they are, awareness of the issue and the consequences of the status quo needed to be tackled head-on.

## **A History of Advocacy**

For more than two decades, Wounds Canada (formerly the Canadian Association of Wound Care) has been leading the charge in wound prevention



and treatment across Canada. In 2000, Wounds Canada published the first iteration of “Best practices for the prevention, diagnosis, and treatment of diabetic foot ulcers,” in *Ostomy/Wound Management*, and since that time several updates have been published in the freely available *Wound Care Canada* and downloaded by thousands of health-care professionals and put into practice across the country.

Wounds Canada worked with both Public Health Agency of Canada and Diabetes Canada (formerly the Canadian Diabetes Association) from 2009 to 2012 to raise awareness of diabetes-related foot complications and of prevention and management strategies.

In 2012, Wounds Canada established a new division—Diabetic Foot Canada—to focus solely on foot disease in those living with diabetes, with a strong tie-in to the important etiological issues surrounding diabetes. Diabetic Foot Canada was established as the national go-to organization for online information and education for clinicians and patients in support of effective self-monitoring, early detection, prevention and treatment.

In 2012, Wounds Canada and Diabetes Canada partnered in the adoption and dissemination of “Diabetes, Healthy Feet and You” patient and clinician educational materials.

In 2012, Canada’s Council of the Federation, which represents all jurisdictional premiers, endorsed<sup>5</sup> the Registered Nurses’ Association of Ontario’s (RNAO) *Clinical Best Practice Guidelines*:

*Assessment and Management of Foot Ulcers for People with Diabetes*<sup>6,7</sup> for national implementation. Provincial governments across Canada have publicly declared that foot care for people with diabetes is a significant health challenge and one of their top care priorities. The RNAO committed to supporting the dissemination, adoption and uptake of their guidelines at a national level.

In 2013, Wounds Canada and the RNAO identified this area as a priority that affects both quality of life and health-care costs. They joined forces to produce the *Diabetic Foot Canada e-Journal*, an online publication targeted at health-care professionals in multiple disciplines, to provide education, disseminate best evidence and educational tools, and raise awareness of the importance of preventing diabetes-related foot complications and amputations. This open-source journal is available free of charge at: [www.diabeticfootcanadajournal.ca](http://www.diabeticfootcanadajournal.ca).

### **Joining Forces to Advance Healthy Public Policy**

Wounds Canada, the RNAO and Diabetes Canada also recognized that, historically, the Canadian diabetic-foot-care community had struggled to fully leverage the power of our collective voices. The three organizations invited the Canadian Association for Enterostomal Therapy (CAET) to form a coalition to jointly engage governments, starting with Ontario. One of the key goals of this

coalition has been to prevent diabetes-related foot complications, including preventable lower-limb amputations, through the development and implementation of evidence-based clinical practice guidelines (CPGs), best practice recommendations and timely management of abnormalities.

On December 9, 2014, Wounds Canada, the RNAO, Diabetes Canada, the CAET and nearly 50 other supporters delivered a letter on care for diabetes-related foot ulcers to the top levels of the government of Ontario stressing the lack of universal funding for offloading devices. This letter can be viewed at <http://rnao.ca/policy/submissions/rnao-and-cawc-joint-letter-diabetic-foot-care-ontario>.

A series of meetings, a visit to the legislature accompanied by patients who had suffered amputation, and successful media engagement served to increase awareness and build the necessary pressure to advance this important policy imperative. The organizations and individuals of the coalition continued to work together and separately to further the issue and to advocate specifically for universal public funding of offloading devices.

In 2015, Diabetes Canada developed the report *Impact of Offloading Devices on the Cost of Diabetic Foot Ulcers*. The report demonstrated that every four hours in Ontario, a patient had a lower limb amputated because of a diabetic foot ulcer that did not heal properly. The report also included an economic analysis showing that the Government of Ontario could save as much as \$75 million (net) a year if public funding for offloading devices were to be provided.

In 2016, the coalition was invited to submit a formal Ontario Health Technology Advisory Committee (OHTAC) request outlining the evidence supporting removable cast walkers (RCW) and RCWs rendered irremovable (ITCC). OHTAC comprises a group of experts from across the province that reviews health technology assessments and makes recommendations on which health-care services and devices should be publicly funded (see page 18 for more information on OHTAC). The experts' assessment concluded



that increased access to offloading devices could result in decreased amputation rates and cost savings for the health system.

## Victory at Last

In 2017, Dr. Eric Hoskins, Ontario Minister of Health and Long-Term Care, announced at RNAO's Annual General Meeting that the province would provide funding for removable, irremovable and total contact foot casts.<sup>5</sup> These offloading devices will be available free of charge at foot and wound clinics, specialized programs for diabetes and community health, continuing care centres and rehabilitation centres.

In his announcement, Hoskins said, "Diabetic foot ulcers can be extremely debilitating and, if not properly treated, can negatively impact a person's health and quality of life. We are making these wound-care devices available free of charge to patients who need them in order to improve their healing and subsequently, their overall health."

Health-care providers are pleased by the funding decision. Doris Grinspun, CEO of the RNAO, Mariam Botros, CEO of Wounds Canada, and Cathy Harley ED of the CAET issued the following **statement**:

"The government's announcement today is excellent news for persons with diabetes who suffer from diabetic foot ulcers. The funding of offloading devices will prevent amputations and the devastating suffering and cost that result from them. We are proud that Ontario is the first province to provide universal funding for offloading devices for the treatment of foot ulcers, and we encourage all other provincial and territorial governments across Canada to implement this evidence-based, cost-saving therapy. The **announcement** is the culmination of a meaningful partnership between organizations representing nurses, physicians, other health professions and the public."



# NPIG

## join NPIG an interest group of RNAO

**NO FEES FOR 2017-2018**

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Reference:

Serena T, Cullen B, Bayliff S et al. Protease activity levels associated with healing status of chronic wounds [abstract] Serena T, Cullen B, Bayliff S et al. *Wounds UK* 2011.

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Acelity<sup>™</sup>

Diabetes Canada, through Amanda Thambirajah, Director of Government Relations – Ontario, issued this statement: “Amputations are one of the most feared consequences of diabetes. Diabetes Canada recognizes the Government of Ontario’s leadership in providing public funding for offloading devices, which treat diabetic foot ulcers and prevent amputations. Diabetes Canada encourages the Government of Ontario to continue working on this issue, and encourages other provinces to follow Ontario’s leadership in helping Canadians living with diabetes with their foot care.”

## The Way Forward

We continue to urge all provincial and territorial governments across Canada to act to prevent amputations by developing local and regional strategies to improve the care of patients presenting with a diabetic foot. These strategies include the following:

- universally funding offloading devices in all jurisdictions across Canada
- providing universal access to preventative foot-care services, including supplying preventative shoes, socks and offloading devices to those in need, free at the point of care, for all patients living with diabetes
- developing policies that enable every person with diabetes to undergo appropriate foot assessments (an annual exam for all persons with diabetes and more frequent assessments for higher-risk individuals) as outlined by the International Diabetes Federation 2017 guideline document
- adopting an interprofessional approach to diabetes-related foot care, with at least one interprofessional diabetes foot-care team, with a well-defined referral pattern, in each health region
- publishing, on an annual basis, reliable data on diabetes-related foot care, using internationally recognized metrics, to assist ongoing quality improvement efforts

## A Thousand Steps

While the journey has been long and has required the sustained commitment of many individuals

and organizations, it has been worth the effort because of the impact it will have on the lives of persons with diabetes and foot ulcers in Ontario. We will continue to work to achieve national universal coverage of offloading devices across Canada. Our thousand steps will mean more people with foot ulcers will receive the care they need to prevent amputation. The real winners are the patients and their families, whose suffering will lessen and whose lives will be improved.

Said David Armstrong, founder and co-chair of DFCon, the largest annual symposium on the diabetic foot in the world: “I can’t begin to express my gratitude and admiration for our Canadian colleagues, their leadership, passion, and enthusiastic advocacy for care of our highest risk patients. [It] serves as an inspiration to us all. Here’s to making a difference and joining the worldwide movement to #ActAgainstAmputation!” 

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# Health Quality Ontario: Supporting Better Wound Care

By Nancy Sikich, Director, Health Technology Assessment, Health Quality Ontario  
and Terri Irwin, Director, Quality Standards Health Quality Ontario

**O**n November 22, 2017, the Ontario Ministry of Health and Long-Term Care announced it would begin covering the costs of specialized casts for patients with diabetic foot ulcers.

In its announcement, the ministry acknowledged that wound care devices, which include removable, irremovable and total contact foot casts, can significantly improve quality of life for patients with diabetic foot ulcers by relieving or offloading pressure around the heel, ankle and toes, allowing the foot to heal properly. The ministry stated that the decision to fund the specialized casts was based on its acceptance of the [Health Quality Ontario recommendation](#), made in September, to fund three types of offloading devices. The decision demonstrates the important role Health Quality Ontario, the provincial adviser on quality in health care, plays in enhancing wound care for patients in the province, both by developing quality standards to help guide care in clinical areas where wide variations in treatment and outcomes exist and by making

recommendations on the funding of health-care services and medical devices.

In early December 2017, Health Quality Ontario released quality standards outlining what quality care looks like for people with [diabetic foot ulcers](#), venous leg ulcers and pressure injuries.

## Developing Quality Standards

Every quality standard is based on the best available evidence and developed in collaboration with clinical experts from across the province as well as patients and caregivers with lived experience of the condition being discussed. Each quality standard consists of a patient guide, a clinical guide, data detailing why a particular standard was developed and recommendations for its adoption at the system, regional and practice level to help health-care professionals and organizations.

The quality standard dealing with diabetic foot care begins by setting out the rationale for the standard by noting the negative impact of dia-



betic foot ulcers on quality of life for patients and the fact that such ulcers cause about a third of all non-traumatic below-the-knee amputations in Canada.

“Wound care represents a significant area of opportunity for quality improvement in Ontario,” the document goes on to state. “There are important gaps and variations in access to services and in the quality of care received by people who have developed or are at risk of developing a diabetic foot ulcer. In 2014, the amputation rate in the local health integration network (LHIN) with the highest rate was almost eight times that of the LHIN with the lowest rate.”

The clinical document for the standard outlines 12 quality statements detailing how foot care can be improved for people with diabetes. One of these deals specifically with offloading: “People with diabetic foot ulcer or foot complications are offered pressure redistribution devices as part of their individualized care plan.”

The accompanying patient guide for the same condition tells patients and their families what

they should do and what to expect if they have a diabetic foot ulcer or other foot problem: “As part of your care plan, you should be offered ways to take pressure off your foot so it can heal, and to prevent future ulcers, too.” These methods could include total contact casts, removable cast walkers and irremovable cast walkers.

Data had indicated that such offloading devices were often recommended by clinicians but not widely available, and organizations such as Wounds Canada and the Registered Nurses’ Association of Ontario had advocated for full funding of the devices.

As a result of these efforts, offloading devices for diabetic foot ulcers were prioritized as a topic warranting a health technology assessment by Health Quality Ontario. Health technology assessments use scientific methods to analyze the evidence for a wide range of health interventions, including diagnostic tests, medical devices and interventional and surgical procedures.



## Which Technologies Are Evaluated?

As with quality standards, the decision regarding which technologies to evaluate is the result of an open process through which any person or organization in Ontario can submit a topic request. Selection of assessment topics is made through a prioritization process using explicit criteria that include in part the potential clinical benefits and harms of the technology and the potential need for the technology in Ontario.

Evidence is analyzed to determine clinical benefit, safety, value for the money, and patient preferences and values. The reports are prepared by a team of medical librarians, clinical epidemiologists, health economists, patient engagement program analysts and medical editors in consultation with health-service researchers, patients, families, caregivers, clinical experts and industry.

The [Ontario Health Technology Advisory Committee \(OHTAC\)](#), a group of health-care experts and individuals from across the province who can contribute the patient perspective, reviews the evidence and makes recommendations as to which health-care services and medical devices should be publicly funded. These recommendations are then posted on the Health Quality Ontario website and promoted through social media for public input prior to recommendations being approved by the Health Quality Ontario Board of Directors. The final recommendations are then shared with the Ministry of Health and Long-Term Care.

## Comparing Offloading Devices

In the case of offloading devices to help patients with foot ulcers as a result of diabetes, the

assessment noted that about one in 10 people in Ontario have diabetes, and 2% to 3% of them will develop a foot ulcer annually and are at risk for lower-limb amputation.

The assessment team identified 13 randomized controlled trials of offloading devices. The evidence suggests that fibreglass total contact casts and cast walkers (removable or irremovable) may be beneficial for treating neuropathic non-infected diabetic foot ulcers.

An economic analysis conducted as part of the assessment found total contact casts and irremovable cast walkers were less expensive and led to more health outcome gains than removable cast walkers and that irremovable cast walkers were as effective as total contact casts and associated with lower costs.

Patients who were interviewed as part of the assessment process said they felt that wound healing was improved with total contact casts more than with removable cast walkers, but that removable cast walkers were more convenient and cost less.

The assessment concluded that increased access to offloading devices could result in fewer amputations and therefore cost savings for the health system.

Offloading devices represent just one tool for improving care for patients with diabetic foot ulcers and play a role in improving wound care in general. By adopting health technology assessments and quality standards, Health Quality Ontario supports the use of evidence to enhance quality health care in the province—in this case specifically wound care. 🇨🇦

# An Advanced Breakthrough Therapy to Treat Foot Ulcer: EpiFix® – a skin substitute clinically proven for effective healing of DFUs and VLU.

Don Fetterolf MD, MBA, FACP, Chief Medical Officer MiMedx Group, Inc.

## **Q1** Why is choosing an advanced therapy, like EpiFix, important to Ontarians?

Millions of people are living with diabetes in Canada. *Diabetes Canada* and *Wounds Canada* are leaders in highlighting key issues that affect Canadians living with diabetes and, more importantly, in guiding Canadians to important treatment remedies for insidious complications of diabetes like Diabetic Foot Ulcers (DFU).

In Ontario, for example, as a direct result of DFUs, there is one amputation every four hours, according to *Diabetes Canada*, and the majority of these amputations are the direct result of foot ulcers that do not heal. More importantly, diabetics are more likely to be hospitalized for limb amputation - almost 25 times more likely than non-diabetics. Furthermore, the complications from DFUs costs the system almost half a billion dollars annually.

## **Q2** Why EpiFix, a human allograft consisting of dehydrated Human Amnion/Chorion Membrane (dHACM), and how does it help as an advanced wound care therapy?

Human amniotic membrane has been noted in clinical literature for over a century. *In vivo* studies show that the barrier properties of amniotic membrane help reduce scar tissue formation and enhance wound healing, and physicians have been using amniotic membrane for wound repair for years.

Since 2006, MiMedx has optimized its PURION® Process, a proprietary processing methodology that employs aseptic processing techniques in addition to terminal sterilization to produce EpiFix, a skin substitute consisting of dehydrated Human Amnion/Chorion Membrane (dHACM) allograft.

## **Q3** Can EpiFix be used in Canada?

Since its introduction in the United States, MiMedx has processed and distributed in excess of 1 million tissue allografts for the treatment of wound care. MiMedx has had a license registration in Canada since 2011.

In several peer-reviewed publications MiMedx PURION® Processed dHACM allografts demonstrated recruitment of stem cells, promotion of cell migration, and modulation of stem cell activity *in vitro* and *in vivo* compared to appropriate controls. Numerous published randomized, controlled, clinical trials have demonstrated that the PURION Processed dHACM is an effective therapy for treatment of chronic wounds and to promote healing.

## **Q4** How does EpiFix compare from an economic standpoint?

According to *Diabetes Canada*, it has been demonstrated that the cost for chronic wound management to the health care system in Canada is high in terms of resource utilization and the negative impact to the quality of life of the patient.

In a complex Markov Model approach used in a recent Ontario study comparing the costs and outcomes of EpiFix with the costs and outcomes associated with standard of Care (SOC) and off-loading, the model found that EpiFix used in DFU treatments resulted in superior wound healing and reduced costs. Moreover, the model showed that costs associated with EpiFix over SOC were more cost effective and most importantly dominated SOC in quality of life years.



**MiMedx**

# How are you managing DFUs? Innovative Therapy in Accelerating Wound Healing

*This is a brief summary of a presentation given at the annual fall conference of Wounds Canada, in Mississauga, Ontario, on November 16, 2017. It has been produced with the financial support of Acelyty. The presenters were Christine A. Murphy, RN CETN(C) BSc(hons) MClScWH PHD, who leads a vascular limb salvage project in an acute care setting, with focus on innovative wound solutions for a challenging population; and Ken Unger, DPM FACFAS DABFS, whose areas of interest and expertise are reconstructive surgery of the foot and ankle, wound care and limb preservation in patients with diabetes.*



## Diabetic Foot Ulcers: An Overview

According to the Canadian Diabetes Association (2015), 3.4 million (9.3%) Canadians are living with diabetes. This number is expected to rise to 21.2% by 2025.

One particular consequence of diabetes is diabetic foot ulcers (DFUs), which have a major medical, social and economic cost in Canada and around the world. Up to 25% of individuals with diabetes will have a DFU over the course of their lifetime. Following a below-the-knee amputation, the five-year mortality rate exceeds that of colon, breast and prostate cancer.

Diabetic foot ulcers have a complicated and multifactorial etiology, including five main components:

- Peripheral neuropathy (loss of protective sensation)
- Structural changes of the feet
- Ankle equinus (tight posterior muscles)
- Soft tissue trauma: repetitive stress to tissue (callus), single event trauma, toenail disorders
- Peripheral vascular disease

## DFU Treatment

When managing DFUs, health-care providers should focus on optimizing vascular supply, removing necrotic tissue, treating infection and choosing appropriate offloading and/or protection devices. Furthermore, in order to rebalance the wound-healing environment, special care should be taken to reduce microbial burden and biofilms, lower

protease activity and maintain an appropriately moist wound environment.

## Proteases and DFU Healing

One sometimes-neglected piece of the DFU-healing puzzle is the effect of proteases on wound healing. Proteases are enzymes that perform proteolysis, through which proteins are broken down into smaller polypeptides or amino acids. Are they perplexing, confusing, relevant, interesting? Do they affect healing outcomes? Do you think about them while you do your assessments?

Currently, the health-care sector is spending vast amounts of money on managing and treating chronic wounds. DFUs alone are more expensive than the five most expensive types of cancer. Consider how much is spent annually on wounds that are stalled. If this is such a problem, we must ask why it is still happening. One reason has to do with proteases: 90% of chronic wounds with elevated protease levels won't heal.

**DFUs alone are more expensive than the five most expensive types of cancer.**

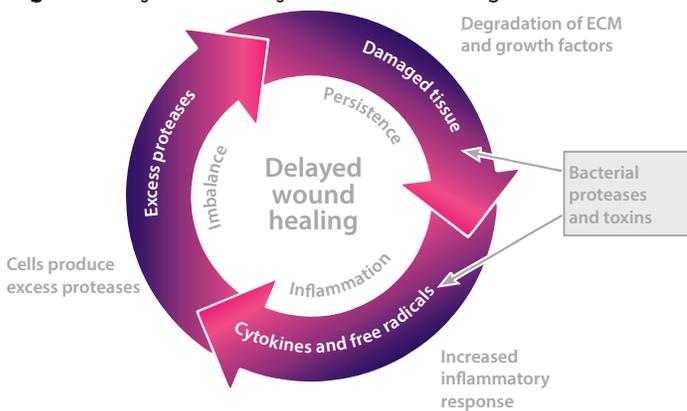
## Steps of Wound Healing

Health-care professionals must support the body's tissue to let the body heal itself. In normal wound healing, four steps occur sequentially: hemostasis, inflammation, proliferation, and, finally, remodeling. A goal of wound healing is to regenerate a functioning group of cells, adhered to a stable extracellular matrix base, while closing the defect to prevent pathogen entry.

**90%** of chronic wounds with elevated protease levels won't heal.

But what about when things go wrong? Often, chronic wounds get stuck in the inflammatory stage (see Figure 1).

**Figure 1.** Cycle of Delayed Wound Healing<sup>1</sup>



Reproduced with permission.<sup>1</sup>

## Effect of Proteases on Chronic Wounds

Bacteria use proteases to invade the host. When a large number of proteases are present in a wound, the inflammatory response increases. This increased inflammatory response, in turn, promotes the production of even more proteases and the degradation of the extracellular matrix, which then causes additional inflammation. This cycle continues, resulting in a wound that has stalled in the healing cycle. Protease imbalance is implicated in many forms of diseases, including aneurysms and various types of cancer. Several different types of proteases affect chronic wounds. The two main families are matrix metalloproteinases (MMPs) and human neutrophil elastase (HNE). When the MMP and HNE families of proteases are combined, all soft tissues in the wound are degraded—and healing stalls.

## Management Strategies

How do you know if there is an elevated protease problem? If the DFU healing has stalled, it is time to take a closer look. Some signs of protease imbalance include poor quality granulation tissue, increased drainage, a cliff edge not moving forward (rolled edge appearance) and poor new blood vessel growth.

Certain types of dressings can help when protease imbalances are present. Dressings, when chosen correctly for the patient, can help with moisture balance, pH balance (bacteria like high pH), reduction of inflammatory proteases and the stimulation of a positive wound response by providing the components for building an extracellular matrix scaffold.

## ORC/Collagen Dressings

ORC/collagen dressings have three main components: native collagen, denatured (broken) collagen and oxidized regenerated cellulose (ORC). Native collagen sequesters excess MMPs by acting as a decoy, and provides structure for neocapillaries, GF protection and cell attachment. Denatured collagen attracts cytokines, GFs and fibroblasts.

ORC binds elastase (necessary for pro-MMPs to convert to active MMPs), binds metal ions such as zinc and calcium, binds free radicals and reduces pH.

Cellulose is extremely abundant in the world: it comes from wood pulp and cotton. The oxidation process makes it biodegradable. Cellulose is a hemostat (i.e. it stops bleeding), and it lowers pH, which makes the environment less bacteria-friendly. Cellulose also breaks down sugars to provide a source of energy and nutrients. *In-vitro* studies show that it increases cell growth, protects growth factors from degradation and inactivates protease activity.

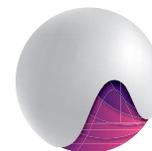
When ORC and collagen are used together in a dressing with the correct ratio, a 100% reduction in elastase, a type of protease, is possible. This combination is also effective against bacterial proteases.

## In Summary

Diabetic foot ulcers are an ever-growing concern in Canada and abroad. One sometimes-overlooked factor in DFU healing is the role of proteases. When assessing and treating DFUs, consider whether proteases are a factor in stalled healing, and consider using a dressing that can help neutralize this contributing factor.

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**Protease imbalance is implicated in many forms of diseases, including aneurysms and various types of cancer.**

# Spend a Minute, Save a Life: Inlow's 60-Second Diabetic Foot Screen

By Mariam Botros, DCh, IIWCC; Janet L. Kuhnke, RN, BA, BScN, MS, ET, Doctorate in Psychology(c) and Sue Rosenthal, BA, MA

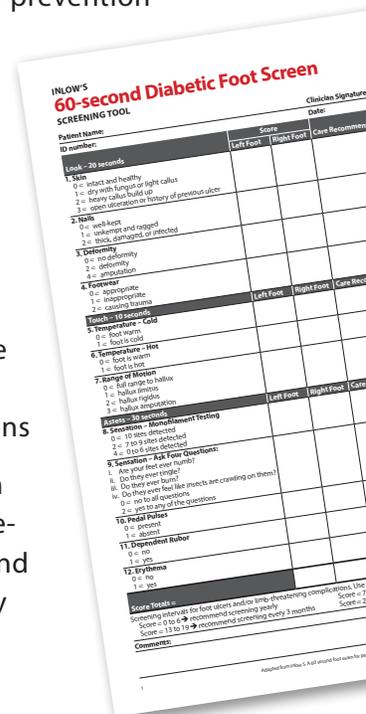
**B**oulton states that “throughout our medical training, we are taught how to manage patients who present with symptoms, which usually leads to a clinical examination, a diagnosis, and a treatment and management plan. However, virtually no time is spent on teaching how to manage patients who have no symptoms because they have lost the ability to feel pain; that is, they have peripheral neuropathy.”<sup>1</sup>

Clinical experience and the literature<sup>1</sup> have shown us that the lack of symptoms Boulton referred to in those with or at risk for diabetic foot complications can have devastating effects on the person, their family and health systems. As clinicians, we have the opportunity, and the obligation, to step in and fill the gap left when peripheral neuropathy is present, or potentially present, in any of our patients. The key is a simple, quick procedure: foot screening.

Foot screening in patients with diabetes is one of the cornerstones of amputation prevention.<sup>2</sup> These five key elements underpin prevention of foot problems:<sup>2</sup>

- identification of the at-risk foot
- regular inspection and examination of the at-risk foot
- education of the patient, family and health-care providers
- routine wearing of appropriate footwear
- treatment of pre-ulcerative signs

By identifying key risk factors in those with diabetes, we can implement the appropriate care plan and prevent complications *before* they occur.



## Appropriate Screening: Three Questions

### 1. Who should receive screening for diabetic foot complications?

The answer is simple and without exception: anyone who has been diagnosed with diabetes. To prevent complications, it is essential that clinicians not wait until there *is* a problem. Early and regular screening also serves as a communications tool between patients and their health team, because it provides a foundation for self-management strategies that will help the patient navigate their condition.

### 2. What should clinicians be screening for?

In our travels across the country as educators and consultants, we have heard from many clinicians who claim they have performed the diabetic foot screen as a monofilament examination only. Unfortunately, when we look at the stairway to amputation (Figure 1), we recognize that multiple risk factors lead to ulcers and subsequent amputations. All these risk factors must be identified and addressed to prevent adverse outcomes for the patient.

### 3. What tool should be used?

Multiple tools are available, and many of them are easy to use. It is recommended that clinicians use only a validated tool to ensure that it has inter-rater reliability and predictive validity.

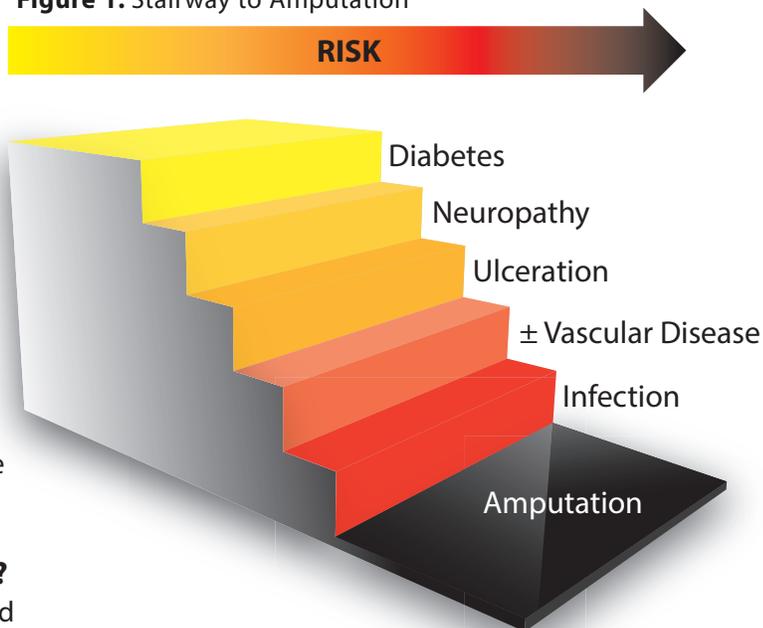
### The Inlow Tool

We recommend Inlow's 60-Second Diabetic Foot Screen<sup>3</sup> as an excellent tool to aid clinicians in identifying patients at risk for ulceration. This validated tool<sup>4</sup> is quick and easy to use and addresses much more than just basic sensation testing.

The 12 elements of the tool require only a 10 g monofilament and good clinical knowledge and assessment skills.

The foot screen allows the clinician to assign a value to each of the elements.

Figure 1: Stairway to Amputation



### Elements for Assessment

Using hands, eyes, ears and a monofilament, clinicians can quickly move through the categories below. Once each element is assessed, a score is placed in the appropriate space on the patient's Inlow worksheet. Based on the value entered for each category, the clinician can provide care recommendations specific to each patient's needs. The sum of the scores for each foot will dictate the recommended follow-up.

#### Skin

Assess the skin on the foot: top, bottom and sides, including between the toes, to determine if portals of entry, existing skin infections, signs of trauma, heavy callus build-up or open-skin ulcerations are present.

#### Nails

Assess if the nails are well trimmed, have any ragged edges, or are thick, damaged or infected. It is important to note if they are creating secondary ulcerations or infections.

#### Deformity

Look at and palpate the foot for any deformity that puts the foot at increased risk of pressure or





## Learn More

For more information and resources on diabetic foot complications, go to [www.DHFY.ca](http://www.DHFY.ca). This website provides patients and clinicians with information about effective self-monitoring, prevention, early detection and treatment of diabetic foot ulcers.

subsequent ulcerations or prevents the wearing of off-the-shelf footwear.

### Footwear

Assess shoes for fit, degree of support and ability to cause or prevent injury. When possible, have the patient bring all their shoes for assessment.

### Temperature: Two Elements—Hot and Cold

Palpate the foot to see if it feels hotter or colder than the other foot, or is hotter or colder than it should be considering the environment, both of which can indicate arterial disease or inflammation.

### Range of Motion

Check the hallux for range of motion. Move the first toe back and forth to determine where it sits on a range from easy movement to virtually no movement.

### Sensation: Two Elements—Testing and Questions

Use a monofilament to test 10 sites on foot for neuropathy. (See Figure 2.)

Ask the following four questions to detect potential neuropathy:

- i. Are your feet ever numb?
- ii. Do they ever tingle?
- iii. Do they ever burn?
- iv. Do they ever feel like insects are crawling on them?

### Pedal Pulses

Palpate the dorsalis pedis pulse located on the top of the foot. If you are unable to feel the pedal pulse, feel for the posterior tibial pulse beneath

the medial malleolus. Lack of or weak pulse can indicate arterial disease.

### Pallor on Elevation and Dependent Rubor

Look for pronounced redness of the feet when they are down (dependent) and pallor when they are elevated. This can indicate arterial disease.

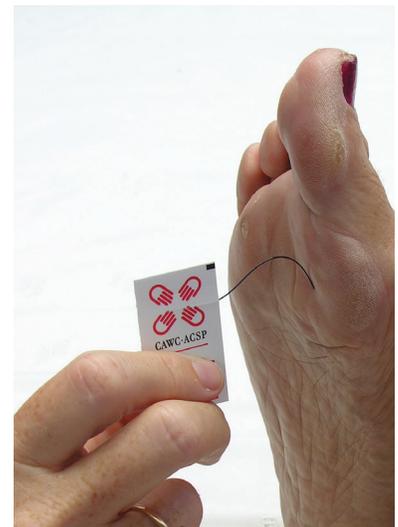
### Erythema

Look for redness of the skin that does not change when the foot is elevated.

### Interpreting the Scores

The Inlow tool has been designed so the results from different parameters can be combined to identify for clinicians any pathologies or care deficits that threaten the integrity of the patient's feet—in other words, the patient's risk for developing complications that may lead to ulceration or amputation. For example:

- High scores in the areas of temperature (cold), lack of pedal pulse and dependent rubor can indicate peripheral arterial disease.
- High scores in the monofilament testing and sensory questions can indicate loss of protective sensation.
- High scores in the skin, nail and footwear categories may be a sign that there is a deficit in the area of self-care.
- High scores in the areas of skin, temperature and erythema may identify that an infected ulcer is present.
- High scores in the nail category, along with temperature and erythema, can be indicative of infected nails.



**Figure 2:** Monofilament Testing

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- High scores in erythema and temperature (warm) without any portal of entry can indicate the presence of a Charcot deformity.

### Risk to Action

Care planning requires the clinician to address and manage any factors that were identified by the Inlow tool and create a personalized and cost-effective care plan, in collaboration with the patient, according to their level of risk in each of the categories. But this is just the first step. It is also important to consider co-morbidities, existing health factors and patient needs as well as challenges related to the environment and the health-care system.

Once a patient's risk status is determined (Figure 3), it is essential that the clinician inform them, encouraging them to become active members of their care team. Discuss with them ways they can ensure their feet are well protected and cared for. Refer them to appropriate services for further investigations and care. Support their

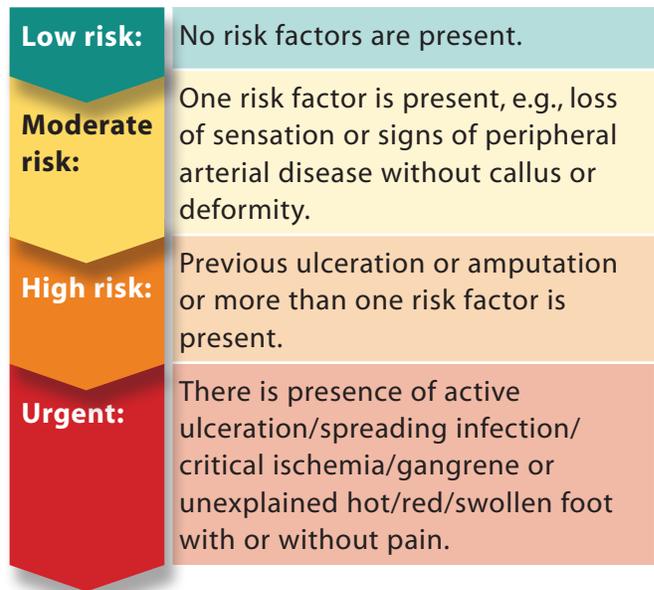


Figure 3: Levels of Risk

self-management efforts and schedule appropriate rescreening and other types of follow-up. Figure 4 shows how often follow-up rescreening

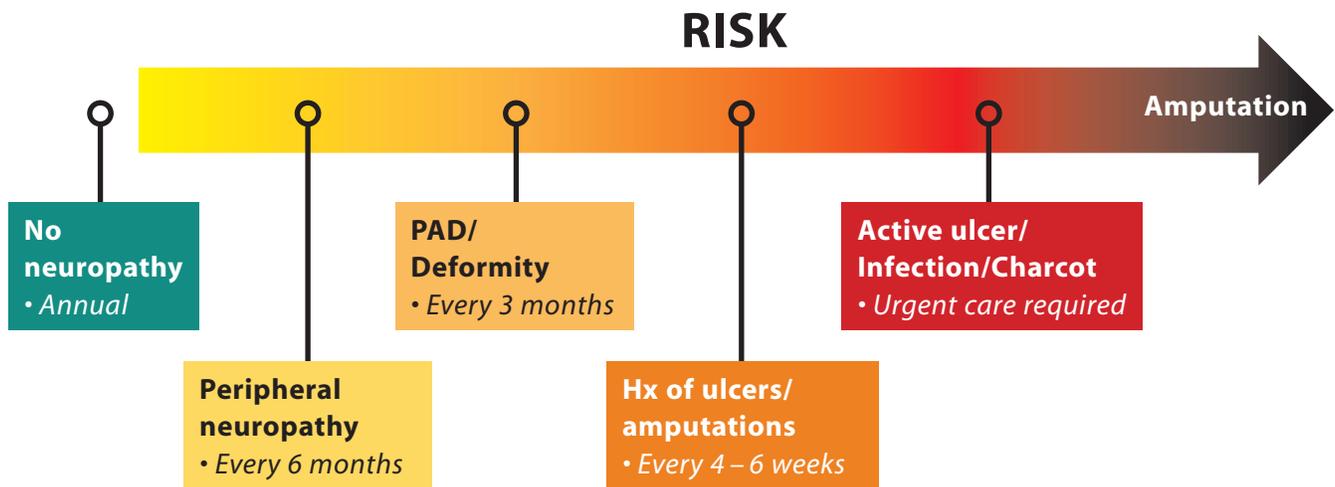
# Diabetic Foot Canada e-Journal

is an innovative publication from Wounds Canada and the Registered Nurses' Association of Ontario addressing an interdisciplinary audience of health-care professionals who care for people with diabetes, to support their practice and to improve patient outcomes.

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**Figure 4:** Recommended Rescreening Frequency Based on Assessment Findings

is recommended. Remember: All interventions should be based on the patient's risk level.

minute and prevent foot complications from occurring or getting worse. Spend a minute, save a life.

### Screen Early, Screen Often

Diabetes is complex and multifaceted, and it can lead to complications such as foot ulcers, infections and amputations. It requires a co-ordinated, integrated approach to care, with the patient at the core. Everyone on the team should be primed to use prevention tools and techniques, acknowledge and act on recognition of risk, and assure timely access to care. Inlow's 60-Second Diabetic Foot Screen is an example of one important step in this process.

Can the Inlow tool really be used in 60 seconds to do a complete foot assessment? At first it may take a little longer, but with regular use clinicians will indeed be able to do a comprehensive exam in one

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# Evidence-Based Pressure Injury Prevention: Setting the Standard



*This is a brief summary of a presentation given at the fall conference of Wounds Canada, in Mississauga, Ontario, on November 17th, 2017. It has been produced with the financial support of Mölnlycke Health Care. The presenters were Chester Ho, MD, professor and Director of the Division of Physical Medicine and Rehabilitation in the Department of Medicine, and Chair of Spinal Cord Injury Research at the University of Alberta; and Marlene Varga, MSc RN BScN IIWCC, wound care nurse at the Grey Nuns Community Hospital, also in Edmonton.*



## Pressure Injury Etiology

Pressure injuries are an internal response to an external load that is either perpendicular, as in pressure, or parallel, as in shear. To avoid severe injuries, it is important to minimize magnitudes and exposure durations to shear loads, to reduce pressure over bony prominences and to implement timely pressure and shear redistribution interventions. These considerations are especially important for individuals deemed to be at high risk of developing pressure injuries.

## Use of Prophylactic Foam Dressings

The NPUAP suggests considering the use of dressings as part of a pressure injury prevention program. In a large randomized controlled trial,<sup>1</sup> an intervention group in an emergency department received a dressing and standard care while the control group received a different, randomized form of standard care. The research team concluded that multi-layered soft silicone foam dressings were effective in preventing pressure injuries in critically ill patients. In the study, the total treatment cost for the control group was 3.6 times higher than the intervention group, with time spent by health-care providers being the major driver of overall treatment cost.

Another study<sup>2</sup> demonstrated a 64% reduction in spending on pressure injury treatments per patient over the study period when sacral dressings were used as a preventative measure. In this study, total spending on pressure injuries decreased from \$120 to \$43 per patient.

## Pressure Injuries on the Heel

The heel is particularly at risk for developing a pressure injury because of the curvature of the bony prominence and the relatively thin overlying soft tissue, both of which contribute to higher levels of compression and greater mechanical loading intensity. It is important to note that in persons with diabetes the risk is elevated significantly, not only due to lack of sensation and poor perfusion but because diabetes affects

connective tissue, making it stiffer, which results in reduced ability of the tissues to distribute mechanical loads.

Supine position and head of bed elevation also contribute to compressive and shear loading.

Because health-care professionals generally cannot change the duration of pressure, it is important to change the intensity of the pressure. Complete offloading is the most effective treatment. Unfortunately, decreasing the pressure in one area may increase it in another. For example, one study demonstrated that offloading the heels with two pillows significantly



increased sacral pressure.<sup>3</sup> The use of prophylactic foam dressings on both heel and sacrum is one strategy clinicians can use to reduce the intensity of pressure.<sup>4,5</sup>

## In Summary

Minimizing magnitudes and exposure durations of mechanical compression and shear stress is key in preventing pressure injuries. Prophylactic multi-layer foam dressings can be an effective and cost-effective adjunct to enhance existing pressure injury prevention practices.

A study of the mechanical loading at the soft tissues<sup>6</sup> demonstrated that multi-layer heel foam dressings:

- Reduced the effective, compressive and maximal shear stressed by 49%, 36% and 48%, respectively
- Reduced the volumetric exposure to elevated strain levels
- Dissipated internal shear to a greater extent than a single-layer foam dressing

## The AHS Provincial Committee for Pressure Injury/Ulcer Prevention (PI.UP)

The Alberta Health Services committee was formed in March 2014, with the goal of devising a provincial standard for the prevention of pressure injuries. The 25 members of the committee included operational representatives, clinical experts, provincial representatives, partners (Covenant Care and Covenant Health), ad-hoc policy members and the accreditation department.

The initial activity of the committee was an environmental scan survey focused on:

- Risk assessment
- Best practice
- Standardized protocols
- Wound care team concept
- Documentation
- Education
- Tracking/monitoring

This survey found that, while most staff were using a pressure injury risk assessment tool, knowledge of the evidence was lacking and there was a systematic lack of documentation, tracking, and data review.

### An Evidence-Based Approach

The results of the survey demonstrated the need for a systematic approach for addressing pressure injury prevention at a provincial level. The next steps were to use existing evidence-based guidelines and resources for pressure injury prevention and identify—through auditing (looking at processes) and prevalence data (looking at outcomes)—how well health-care professionals were doing with pressure injury prevention.

### Achievements

To date, the PI.UP has made several noteworthy achievements in the area of pressure injury prevention and treatment, including:

- Implementation of standardized tools and guidelines to facilitate an accreditation survey
- Implementation of standardized screening tools (the Braden for adults and the Braden Q for pediatrics)
- Development of educational resources such as the pediatric pamphlet, the patient pamphlet and staff education
- Collaborations with sub-specialty health-care providers such as pediatrics, continuing care and surgery
- Alignment with other complementary programs such as Clinical Knowledge and Content Management Services (CKCM) and Clinical Information System (CIS)
- Implementation of improvements to monitoring and quality of care, including 10 audits per unit per quarter
- Implementing governance to the resources available on inSite<sup>7</sup>



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### Looking Ahead

In the coming years, the PI.UP is aiming to finalize prevalence tools and processes, to increase the number of educational materials and to further review collaboration opportunities in specialty areas such as pediatrics, continuing care and surgery. The PI.UP is also looking for new ways to deal with issues of compliance and to have staff understand the benefit of prevention measures.

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# Words Matter

## How to Get Your Message Across: Six Tips to Improve Your Writing

By Allyson Latta, BA, HBJ, and Sue Rosenthal, BA, MA

**T**he bedrock of effective team care is good communication among team members. In wound prevention and management, care and education can often be complex and involve team members with different levels and areas of expertise, backgrounds and perspectives. The patient, family members, frontline clinicians and administrators are all part of the team, and everyone's goal is the best outcome for the patient.

For that to happen, communication must be clear. Miscommunication, as we all know, can have serious negative consequences.

While much team communication is verbal, written communication is vital as well, especially in the short and long term and even with the larger community. Written communication may take the form of clinical documentation, educational materials, papers and articles written for publications, policy documents and more.

Here are six tips to help you communicate in writing more effectively in the workplace and beyond.

### **1. Create objectives for your communication**

Before you write a word, determine your purpose. To keep your message focused, make sure all content in your document supports your objectives. Eliminate anything that does not.

If you have only one objective, your document will likely be short. More than three objectives is generally too many, regardless of the document's length.

### **2. Make a plan**

Remember back in school when your teacher insisted you create an outline for your essay? There was a reason for that. Create an outline, making sure it aligns with your objectives.



Drafting an outline is the most effective method for organizing your thinking, writing the first draft and rewriting subsequent drafts. Without an outline, you risk wandering off the topic, including irrelevant or confusing information and rendering your message unclear.

### 3. Write for your audience

Know who will be reading your document, and write for them. The words you choose, and the amount of background and depth of information you provide all depend on your anticipated readers. Consider the following questions:

- Does your readership speak English as a first language? The answer to this will guide your word choice, the complexity of your arguments and the degree to which you define terms.
- How technical can you get without losing readers? Precise language is a powerful shortcut to getting a message across. If your audience consists of health-care colleagues who all have university degrees in science, feel free to use technical words, but even then, consider adding short definitions to ensure no one is left behind. When writing for a more general audience, steer clear of occupational jargon; use the essential technical words (in part as an educational tool), but definitely provide definitions.
- Do you need to observe particular conventions?

For example, clinical documentation usually requires specific terminology; some publications insist on standardized formats; spellings might have to be Canadian, British or U.S., depending on the publication and audience.

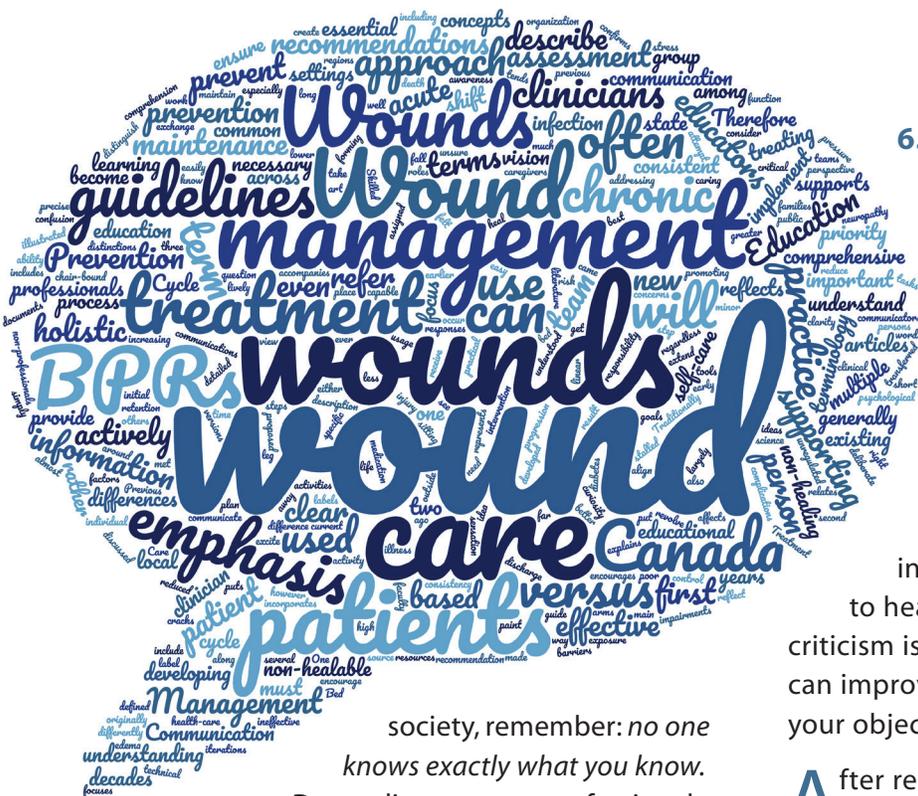
### 4. Don't make assumptions

While there is often significant overlap of common knowledge, within a group or generally within

#### The Goldilocks

**Question:**  
How much information is too much, too little, or just right?

Many writers struggle to find the right amount of information and level of detail to convey their message. Too many facts and references to support an argument can be confusing. Too little information can leave gaps and lead to misunderstanding. Get it "just right," and your reader will learn and benefit from your written communication.



society, remember: *no one knows exactly what you know.*

Depending on your professional perspective and the particular topic, you may need to provide background information to ensure that by the time your audience has finished reading, they all have the same baseline knowledge.

During Wounds Canada’s advocacy efforts with legislators in the Ontario government, for example, we discovered that many MPPs didn’t know what the term *offloading* meant in a health context, despite having had many health-care advocates speak to them about it. Once we were aware of this, and because offloading was the key issue we were addressing, we needed to account for this knowledge gap, which meant creating documentation and changing how we verbally represented the issue.

### 5. Be prepared to write and rewrite

Reread and rewrite with an eye to ensuring you’ve followed all the steps above. If you have time, put the document aside for a day or more, and come back to it with a more discerning eye. Reading your work aloud can often turn up problems you’ll miss when rereading it silently. And consider printing out your document to assess it; most writers find they read more carefully and catch more issues on a paper copy than on-screen.

### 6. Get a second (third, fourth) opinion

At any stage in the writing process, you might want to seek out other perspectives on your document.

To respect your reviewers’ time, it’s important to tell them where you are in the writing/rewriting process and to be clear what you want from them (substantial content feedback, answers to specific questions, proofreading) and in what form. It can sometimes be difficult to hear and accept feedback, but constructive criticism is an important part of the process and can improve your written work and help ensure your objectives will be met.

After receiving and considering feedback, repeat tips 5 and 6 as many times as required to polish your writing. Lack of clarity, incorrect information, or even spelling, grammar or punctuation errors can affect a reader’s perception of your authority and credibility.

Ultimately, effectively written communication can save you time, conveying vital information broadly and efficiently. But as a busy professional, only you know how much time you can reasonably spend polishing a particular document. Give yourself plenty of lead time, especially to solicit reviewer opinions (tip 5) and do any necessary rewriting (tip 6)—but use your judgement. The tips above can be expanded or compressed, depending on the time available.

Just don’t skip any. Your writing will be the stronger for it. 📖

**Allyson Latta**, a writing instructor with University of Toronto’s School of Continuing Studies, has also been a book editor for more than 20 years and leads writing workshops and residential retreats in Canada and abroad.

**Sue Rosenthal** is Director of Knowledge Mobilization for Wounds Canada, Editor of Wound Care Canada and has been a freelance writer and editor for almost four decades.

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# Using Low Frequency Nerve Stimulation to “Treat the Cause” in Chronic Venous Insufficiency

*This is a brief summary of a presentation given at the annual conference of Wounds Canada, in Mississauga, Ontario, on November 17, 2017. It has been produced with the financial support of Perfuse Medtec Inc. The presenters were Connie Harris, RN ET MSc IIWCC, a consultant in clinical, education and research and a wound care/enterostomal therapy specialist; and Deirdre O’Sullivan-Drombolis BSc PT MCLSc (WH), a physical therapist who practises in Northwestern Ontario and advocates for equal and timely access to effective and efficient care for all.*

## Chronic Venous Insufficiency: An Overview

Chronic venous insufficiency (CVI) is caused by a complex interplay of several factors, including an abnormal calf-muscle pump, decreased range of motion, decreased muscle strength/activation, incompetent venous valves, neuropathy and decreased mobility. CVI affects the venous system of the lower extremities with venous hypertension, and can cause pain, swelling, edema, skin changes and ulceration.

## Treating the Cause

Identifying and treating the cause of a wound is essential to effective wound healing. Because the calf-muscle pump is the force responsible for returning venous blood from the lower extremities back to the heart, abnormal calf-muscle-pump action is a key factor in the development of CVI—so it is something the clinician should always be aware of.

In a normally functioning muscle pump, contraction of the calf muscles expels blood into the proximal col-

lecting vein. During relaxation, the blood is drained from the superficial veins into the deep veins. With a healthy pump, the vein valves are closed during calf-muscle relaxation, preventing backflow of blood due to the force of gravity.

In a leg with an impaired or poorly functioning pump, there is backflow across the valves at rest, and with calf-muscle contraction, blood flows in both directions. This results in ineffective emptying of blood from the calf. A high percentage of patients with CVI have a combination of valve dysfunction and calf-muscle pump insufficiency.

## CVI and Wound Healing

**Chronic Venous Insufficiency (CVI) is complex and contributes to venous leg ulcers. People with CVI can develop other types of wounds on the legs and feet as well. While CVI may not be the CAUSE of these wounds, it can complicate and prolong their healing.**



## Helping Patients with CVI

The geko™ device is a type of muscle-pump activator technology that increases blood circulation in a variety of conditions, including CVI. Small electrical impulses stimulate the common peroneal nerve which, in turn, activates the calf- and foot-muscle pumps to return blood to the heart.

Early evidence suggests that the geko™ device, through this stimulation of the common peroneal nerve, can contribute to “treating the cause” by impacting several of the underlying conditions of CVI.

This device can have positive effects on six main facets of treatment. Studies of the geko™ device have demonstrated:

1. **Improved arterial and venous flow volume and velocity.** In patients with intermittent claudication, a recent study<sup>1</sup> demonstrated a 29% increase in arterial flow and a 23% increase in venous flow. In patients with lower limb vascular disease, a 31.5% increase in arterial flow has been reported.<sup>2</sup>



2. **Improved range of motion.** Patients with chronic veno-lymphedema had increased range of motion in ankle and toes within two weeks of starting treatment.

3. **Improved microcirculation to the wound bed and peri-wound skin.**

4. **Assistance in the reduction of edema.** Figures 1 and 2 show the rapid reduction of edema on a patient with severe chronic veno-lymphedema.
5. It may **reduce symptoms of wound-related pain** associated with CVI, improving tolerance and adherence to compression therapy. Twenty-six percent of patients not in therapeutic compression therapy were able to start or increase compression therapy after using the device to decrease pain.<sup>3,4</sup>
6. In conjunction with adherence to best practices, it **may increase healing rates** and is suggested for wounds that have failed to reduce in surface area by 30% at 4 weeks.

## Part of Care Planning

Clinicians looking to help their patients with venous leg ulcers may consider adding the geko™ device to their toolkit in order to activate the lower-leg- and foot-muscle pumps to increase blood circulation and enhance healing.

For more information, please visit [www.gekowound.ca](http://www.gekowound.ca).

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Leg Measurements (in cm) – geko™ started October 10, 2017						
	October 10, 2017		October 15, 2017		October 23, 2017	
	Right	Left	Right	Left	Right	Left
<b>Above knee</b>	65.0	80.0	64.0	74.5	64.5	70.0
<b>Mid-calf</b>	50.5	60.5	44.0	58.0	48.5	60.5
<b>Ankle</b>	36.0	45.0	30.5	40.0	30.5	40.5
<b>Foot</b>	30.5	36.5	28.0	33.5	28.5	33.5

**Figures 1 and 2.** Within 10 days of geko™ treatments, with no change to his current compression bandaging system, this patient showed a 10 cm reduction in the measurements above his knee, 5 cm at the malleolus and 3 cm mid-foot.

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# Patient Perspective: Empowerment, and Living with a Diabetic Foot Ulcer

An Interview with Robert S. Meyer by Janet L. Kuhnke

*Robert Meyer lives with diabetes and a foot ulcer. He has attended multiple Wounds Canada events as both a speaker and to learn more about how he can manage his condition, heal his wound and prevent further foot complications. He is interviewed here by wound care clinician and educator Janet Kuhnke.*

**Janet L. Kuhnke:** Robert, you attended the fall 2017 Wounds Canada conference in Mississauga, Ontario. Can you tell me what this was like for you as a patient?

**Robert S. Meyer:** I was there as a patient and a speaker, but it was not until I got back home that the depth of my message sank in. First, I wanted to do my talk as a tribute to my mother, who had a nasty death due to the complications of diabetes. Second, if my message could help someone, it would be worth it all. Not just for other patients but for other service

providers who need to find their own inner voice and become advocates for themselves or others, no matter the issue. Third, telling my story has a profound impact on my own healing journey. Now I know why victims of trauma need to tell their story as part of their healing. The important part is knowing that someone has listened and heard.

**JLK:** What does *empowerment* mean to you, and, in that context, how would you describe yourself, and why?

**RSM:** To me empowerment means to soar above the status

quo. If the statistics say that 80% of foot ulcers end up in amputation, I want to be in the 20% who keep their limbs. If diabetes is a progressive, slippery slope, I want to be where I can get off and climb back up the hill.

I describe myself as someone who asks why and expects to get the answer. It is not enough to get a superficial answer; I want to understand the breadth of the issue.

It seems all too common, especially in health care, to give poor information and have patients believe it. For example, my father was in acute care in

Edmonton. He needed to have an indwelling catheter. After insertion, the urine drainage bag was so bloody. Staff just told me this was normal. This happened for three days. I started to document and take pictures of it. Then I asked other people if this was normal. It was not normal. Health Link told me to be assertive and talk to the charge nurse and insist on some action.

This is just one of many problems that happened to my dad. I had to be an advocate for him, so he could survive and come home.

This is the same zeal and passion I had to channel for myself with my foot ulcer. Because you can only make decisions based on what you know, I decided to attend the Wounds Canada fall conference in Niagara Falls, Ontario, in 2016. I learned so much. Then I implemented my new knowledge and saw the results. So I am a Wounds Canada believer.

**JLK:** What would you recommend clinicians do to understand empowered patients more fully?

**RSM:** I would like clinicians to understand that we are a team solving problems together. No



one needs to be an authoritative glory hound. For example, if a patient asks about a total contact cast, there should be a pathway to get one. If someone asks for a fasting insulin test, there should be appreciation that the patient is now starting to investigate his own health.

**JLK:** Are there resources on empowerment that you used as a patient? If so, what would you recommend patients living with diabetes read?

**RSM:** My favourite books are not

diabetes related. They are leadership books written by John. C. Maxwell.

In *Today Matters*, Maxwell writes, "Today Matters People create success in their lives by focusing on today. It may sound trite, but today is the only time you have. It is too late for yesterday. And you can't depend on tomorrow. That is why today matters."

For example, in wound care, the issue of biofilm is important. Yesterday is too late to affect the outcome of that wound. For me it is least preferred to wash the wound with simple saline. Therefore I look for products or dressings that can target this biofilm or prevent it. The products I choose must be supported by published research.

Currently my favourites usually contain polyhexamethylene biguanide. Remember, it only takes a few hours to start to develop biofilm. This brings me to my second point: Learn everything about biofilm in books, magazines, podcasts and research articles. Just become an expert on biofilm as well as diabetes.

In one of his other books, *Make Today Count*, Maxwell writes, "You will never change your life until you change something you do daily. Ultimately



our daily routine will have the biggest impact on whether we succeed or not. We are all creatures of habit.” This is so key in food intake, exercise and prevention. For example, moisturize your feet twice per day. That will help keep your healing progressing.

**JLK:** Empowerment in diabetes is defined as “helping patients enhance and use their own innate ability to gain mastery over their diabetes.” To date, how has the team assisted in your journey of empowerment?

**RSM:** Since I moved to Saanichton, BC, my experience has been incredible. Although I do not have a family physician there, I get a lot of data from Wounds Canada, followed by Doctor Google and Nurse YouTube.

What was critical for me is that I had a community nurse who listened to me. My podiatrist got me referred to the lower leg and ulcer clinic, because he listened. The wound-care nurse at the Royal Jubilee Hospital listened to me. She is a presenter sometimes with Wounds Canada. When I asked about a total contact cast (TCC), the doctor listened. They happened to be having a pilot program there. Quickly I was accepted into the program. The nurse gave me the same care as if I were her brother. The ulcer closed in 16 days or less. If I had never asked about TCCs or mentioned Wounds Canada, I might still have an open wound, fighting for closure.

**JLK:** When empowered, what self-care behaviours have you focused on changing?

**RSM:** My nutrient timing and absorption, because I suffer from the dawn effect. My blood

then wake up to drink a whey protein shake. This spikes my insulin and drives it back into normal levels. I take carbs only between noon and 4 p.m. This helps me sleep better, because then my body has less sugar to expel while sleeping.

Whatever I put into my body, I better know its effects on my insulin response, blood sugar and my wound. I get excited when something helps with blood sugar and helps the wound heal, such as L-glutamine, L-carnitine, proline and glycine. Take L-carnitine, for example. I have Googled L-carnitine to see what effect it has on blood sugar and on wound healing.

Currently I am researching topical insulin cream, which has evidence for increasing closure rates in diabetic wounds.

I always read several articles, both for and against. Then I seek out advice from doctors, phar-

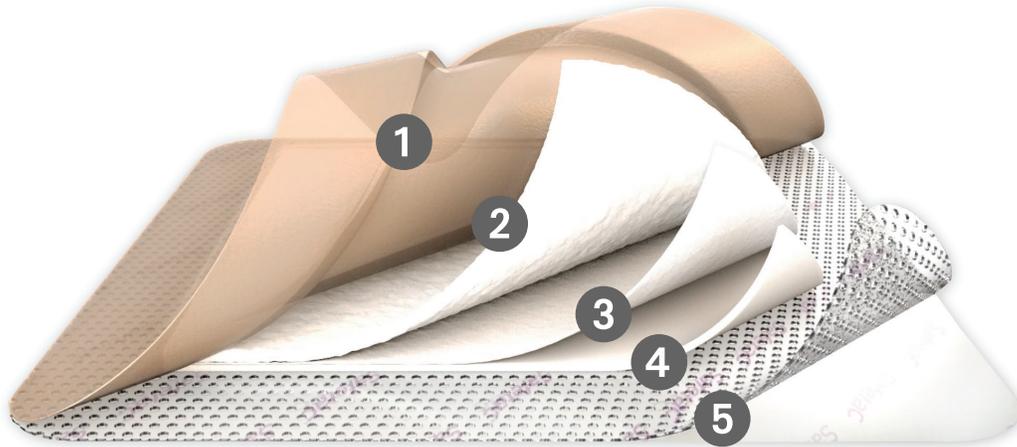
*Whatever I put into my body, I better know its effects on my insulin response, blood sugar and my wound.*

sugar is lower before bed and higher upon waking. This happens between 3 a.m. and 8 a.m. Cortisol is released to wake you up, and that triggers your liver to dump, causing an increase in blood sugar. I take my metformin before bed, so it can help with the liver dump at 5 a.m. I

macists and dietitians. After that, I will make a decision whether to include this in my healing plan.

**JLK:** Robert, thank you for your time today. We look forward to hearing about your ongoing healing journey. 📌

# 5 LAYERS 1 TRUTH.



## Mepilex® Border

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Plus, a new study of 1.03 million patients shows prophylactic use of Mepilex® Border dressings<sup>5</sup>:

- Reduced reportable pressure injuries (PSI-03) by, on average, one per quarter
- Delivered a return on investment of 100% in less than one year
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# Managing Infected Wounds and Biofilms: What have we learned in the past year?

This is a brief summary of a presentation given at the fall conference of Wounds Canada, in Mississauga, Ontario, on November 18, 2017. It has been produced with the financial support of Hollister. The presenter was Kevin Woo, RN PhD FAPWCA, an Associate Professor at Queen's University, School of Nursing and School of Rehabilitation in Kingston, Ontario. He has served on expert panels to develop Best Practice Guidelines and Recommendations in collaboration with the Registered Nurses' Association of Ontario and Wounds Canada, and is Web Editor for the Advances in Skin and Wound Care website.



## Updated Terminology Related to the Infection Continuum

The International Wound Infection Institute's 2016 consensus document<sup>1</sup> has suggested a new definition for chronic wounds: "While acute wounds heal in a timely manner, chronic wounds have a slow progression through the healing phases or show delayed, interrupted or stalled healing due to intrinsic and extrinsic factors that impact the individual and their wound. A chronic, non-healing wound can be an indicator of the presence of a biofilm when holistic assessment and treatment have corrected the underlying cause(s) of the wound."

The wound infection continuum (see Figure 1) illustrates the potential numbers and virulence of microorganisms in a wound. All wounds have bacteria in them, but they become problematic when the host's defence systems become overwhelmed by the quantity and/or virulence of the bacteria.

## An Update on Wound Biofilms

Biofilm formation is the dispersion of planktonic bacteria and biofilm fragments from mature biofilm. According to IWII<sup>1</sup> and Schultz et al.,<sup>2</sup> wound biofilms:

- Cannot be visualized on the wound
- May reappear within 72 hours after debridement (based on *in vivo* studies)
- Are found both on the wound surface and in deeper layers of tissue
- Are found in slough (devitalized tissue)

## Duration and Use of Topical Antimicrobials and Antibacterials

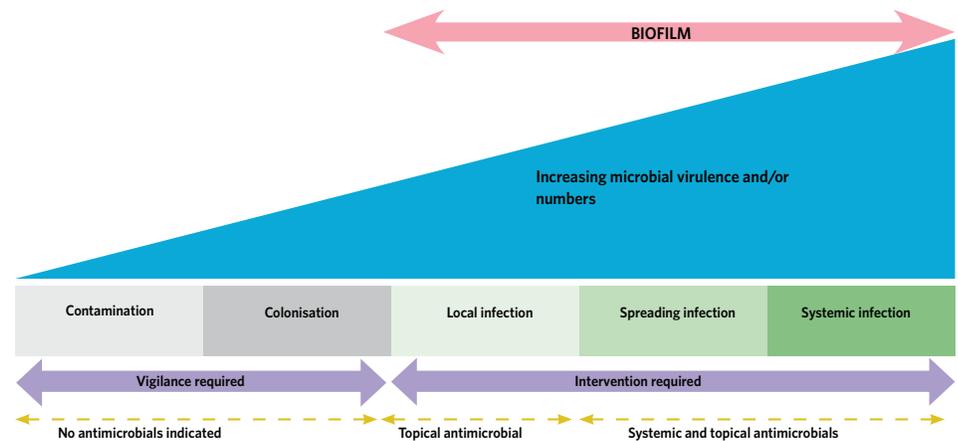
Current research recommends the use of topical antimicrobials and antibacterials for 2–4 weeks, after which time the patient should be reassessed. Topical antimicrobials may be used following debridement to prevent biofilms reformation.<sup>1,2</sup> Health-care professionals should consider using a topical

antimicrobial or antibacterial dressing that is minimally or non-cytotoxic and that addresses form and function.

## Clinical Diagnosis of Infection

One clinical challenge in wound care is determining whether or not an infection is affecting the wound's healing progress. Many wounds do not produce the signs that are traditionally considered diagnostic of an infection (pain, exudate, odour, temperature). In these cases, checklists may be used to gather more information about the wound and to determine whether or not an infection is present.

Figure 1. The Wound Infection Continuum<sup>1</sup>



To give health-care professionals additional direction and memory aids for assessing a complex wound for signs of infection, the following UPPER and LOWER checklists have been created (Figures 2 and 3).

## Methylene Blue and Gentian Violet Dressings: A Prospective Evaluation

A recent prospective study<sup>3</sup> examined the use of the methylene blue and gentian violet dressing (Hydrofera Blue Classic Antibacterial Foam Dressing) for the management of chronic

**Figure 2.**  
**Wound Infection Checklist (UPPER)**

Local/Superficial Infection – Treat with Topical Antimicrobials

<b>Unhealthy tissue</b>	Surface area on wound bed covered by devitalized tissue and unhealthy granulation tissue (thin and friable, bleeds easily, dark red, dull or dusky discoloration, overgranulation, pocketing, and bridging)
<b>Poor healing</b>	Stalled wound healing with no significant change in wound size or volume (approximately 10% in last 7 days)
<b>Pain</b>	New or increased pain
<b>Exudate</b>	Increased volume of exudate Change of consistency: viscous and thick exudate
<b>Reek</b>	Presence of foul odour

*Local infection/increased bacterial burden should be suspected in the presence of 3 or more signs and symptoms.*

wounds with local infection in 29 patients. All patients completed the four-week study, and the following wound improvements occurred:

- Baseline mean wound surface area was significantly reduced by 42.5%, from 21.4 to 12.3 cm<sup>2</sup> at week 4 (P=0.005).
- Baseline mean wound coverage by devitalized tissue (%) was significantly reduced from 52.6% to 11.4% at week 4 (P<0.001).
- Mean UPPER and LOWER wound infection scores were reduced from 3.6 at baseline to 0.9 at week 4 (75%; P<0.001).

These results indicate that the Hydrofera Blue Classic dressing was effective at managing these chronic wounds and helped them progress onto a healing trajectory.

These findings are supported by four recent studies<sup>3,4,5,6</sup> that demonstrated that foam dressings containing methylene blue and gentian violet manage exudating wounds and may aid in the removal of devitalized tissue from the wound bed. As this action occurs, the dressing helps disrupt biofilm that is associated with slough and devitalized tissue.

## In Summary

Three takaways from recent advances in wound infection and biofilms:

- Assess the wound using an infection checklist to differentiate between local and deep infection.
- Biofilm management: select antibacterial/antimicrobial dressings.
- Clear away devitalized tissue and slough through debridement.

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**Figure 3.**  
**Wound Infection Checklist (LOWER)**

Deep Infection – Treat Systemically ± Topical Antimicrobials

<b>Larger in size</b>	Sudden or unexplained increase in wound size or new areas of satellite breakdown
<b>Osseous tissue and/or deep structure</b>	Wound that probes to bone or deep structures; crepitus may be present
<b>Warmth</b>	Increased periwound temperature of more than 3° F compared to areas distant from the wound
<b>Edema</b>	Increased edema or induration around the wound
<b>Redness</b>	Redness of > 2 cm beyond wound margin

*Deep infection/increased bacterial burden should be suspected in the presence of 3 or more signs and symptoms.*

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# Wound Sleuth

By R. Gary Sibbald, BSc, MD, MEd, FRCPC (Med) (Derm), FAAD, MAPWCA, JM; Patricia M. Coutts, RN, IIWCC, and Laura Lee Kozody, BSc, DCh, IIWCC; Photos by Reneeka Persaud, MD

## Thickened and Black Toenails: What's the Cause?

A 59-year-old semi-retired accountant noticed black toenails (Figure 1) over the past three months. His toenails were abnormal despite six months of oral terbinafine 250 mg and subsequent topical efinaconazole 10%. He was concerned about a melanoma.

### Questions for the Reader

**Q** What is the cause/diagnosis, and how would you investigate this patient?

**A** Only half of toenail abnormalities are fungus. Oral agents should be used ONLY after a positive potassium hydroxide microscopic mount for fungus examination is documented. Samples of nails should include subungual debris that will contain the greatest fungal load. Alternatively, the culture should grow a true dermatophyte fungus (e.g., *Trichophyton rubrum*). A positive result of

either test, along with the presence of clinical features, is enough evidence to treat for fungus. Up to three samples may need to be obtained if the clinical picture of distal streaking or whole nail plate involvement is noted. If three samples are negative, alternative causes should be considered.

In the history, he received six months of oral treatment. Four months is adequate. He had been treated with *no clinical improvement or confirmatory fungal microscopic or culture laboratory evaluations*.

It takes a toenail two years to grow from the matrix at the proximal nail fold to the distal nail plate position (approximately 1 mm a month). Repeat cultures on oral therapy can determine if

the fungus has been adequately treated, and the proximal nail is beginning to appear normal.

**Q** How do you rule out a melanoma?

**A** Melanomas under the nail plate show irregular or black pigment. The significant indicator is that the melanoma cells extend onto the skin of the nail fold (Hutchinson's sign), as outlined in Figure 2.

**Q** What other diagnoses/causes would you consider?



**Figure 1:** Abnormal 2nd, 3rd and 4th toes



**Figure 2:** Melanoma cells extending beyond nail fold

ing, use a felt pen to draw the outline of the foot on the paper. Figures 4 and 5 demonstrate how, upon examination of the tracing of this patient's foot, it becomes obvious that the golf shoe is not

adequate to accommodate the foot without pressure. The toe box is too narrow. This method illustrates to both clinician and patient when the shoe is too small for the foot. A tracing is a simple and effective way to determine a proper fit of shoes. Shoes should have enough width to accommodate the foot on a tracing without a visible line outside the shoe. This is especially important in the toe box, where there should be a finger's breadth between the most distal toe and the end of the shoe. The heel should be snug enough to hold the foot in place. If calluses are noted, they indicate increased pressure, and inserts or orthotics should be prescribed by an orthotist, chiropodist or podiatrist.

**A** We have ruled out fungal infection and melanoma. We need to consider trauma. He is a jogger and a golfer. He was wearing excellent deep-toed running shoes (Figure 3). However, his golf shoes had a narrow and shallow toe box (Figure 4).

adequate to accommodate the foot without pressure. The toe box is too narrow. This method illustrates to both clinician and patient when the shoe is too small for the foot.

### Conclusion

This is a traumatic injury, not fungal infection or melanoma, with both feet showing hemorrhage between the nail and the nail bed. The deep-toed runner is adequate to prevent trauma while jogging. However, the

A tracing is a simple and effective way to determine a proper fit of shoes. Shoes should have enough width to accommodate the foot on a tracing without a visible line outside the shoe. This is especially important in the toe box, where there should be a finger's breadth between the most distal toe and the end of the shoe. The heel should be snug enough to hold the foot in place. If calluses are noted, they indicate increased pressure, and inserts or orthotics should be prescribed by an orthotist, chiropodist or podiatrist.

**Q** How do you determine that a shoe fits properly?

**A** Place a large piece of paper on the floor and have the patient stand on it. While the patient is weight-bearing,



**Figure 3:** The running shoe



**Figure 4:** The golf shoe



**Figure 5:** The foot tracing compared with the golf shoe

# Treating Hard-to-Heal Wounds: An Evidence-Based Approach for DFU and Chronic Wounds

*This is a brief summary of a presentation given at the annual conference of Wounds Canada, in Mississauga, Ontario, on November 16th, 2017. It has been produced with the financial support of Integra Life Sciences. The presenter was Robert Fridman, DPM FACFAS CWSP, a fellowship-trained podiatric surgeon at the Department of Orthopaedic Surgery at New York-Presbyterian Columbia University Medical Center and the Department of Surgery at New York-Presbyterian Weill-Cornell Medical Center.*



## Normal Wound Healing

For health-care professionals, standard wound management consists of preparing the wound bed to support the healing process. When treating diabetic foot ulcers (DFUs), health-care professionals must work toward controlling infection, correcting ischemia, optimizing nutrition, correcting hyperglycemia and offloading of the wound.

## Offloading

Offloading is one of the cornerstones of effective management of a diabetic foot ulcer, as it helps to minimize repetitive trauma to the area.

Total contact casting (TCC) has been established as the gold standard to achieve offloading while enabling patients to ambulate. TCC enables pressure to be transmitted to the cast wall or rearfoot, resulting in decreased forefoot pressure.

The device also reduces gait speed and shortens stride length, resulting in reduction of pressure. Ankle movement and the propulsive phase of gait are reduced, resulting in a reduction in vertical loading forces (see Figure 1). Ninety percent of DFUs have been shown to heal within six weeks when treated with a TCC.<sup>4</sup>

## When Problems Arise

Forty-nine percent of diabetic foot ulcers may fail to heal despite traditional wound care.<sup>1</sup> According to a study by Sheehan et al.,<sup>2</sup> patients in whom the size of the ulcer does not reduce by half over four weeks of

treatment are unlikely to achieve wound healing over a reasonable period. Early adoption of advanced care may be more cost-effective than traditional standard practices for decreasing the incidence of lower-extremity amputation and might speed the healing process.<sup>3</sup>

## Non-Healing Wounds

Wounds fail to heal for a variety of reasons. While each of the factors shown in Figure 2 can contribute to compromised healing, there are treatment options to address each impediment. Trauma pressure can be combatted with appropriate offloading. Hypoxia vascular insult can be aided by revascularization efforts.

Debridement techniques can be used to address infection, topical therapies for non-viable tissues and antibiotics for biofilm. Further, hostile wound conditions can be treated with advanced wound dressings and cellular tissue-based

products (CTPs). Finally, nutritional support can help correct existing nutritional deficiencies.

## When to Use Advanced Therapies

If all risk factors are addressed and corrected, but the wound is still not healing at a reasonable rate, then health-care professionals should consider using advanced wound therapies.

For DFUs, there are several advanced therapy options to consider, including offloading devices, negative pressure wound therapy, hyperbaric oxygen therapy, growth factors and supports for the extracellular matrix.

**Figure 1.** Mechanisms at work with TCCs

Reduces shearing forces and stride

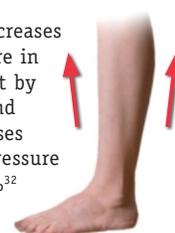


Removes propulsive phase of gait and locks ankle



Reduces pressure – catches weight on the calf

TCC decreases pressure in 1st met by 69% and decreases heel pressure by 45%.<sup>32</sup>



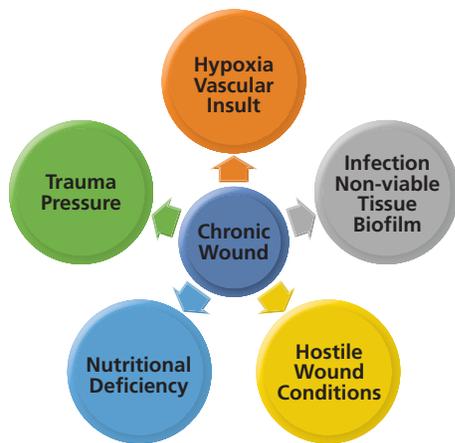
## Supporting the Extracellular Matrix

Following comprehensive assessment, appropriate patient selection, sharp debridement and off-loading, consider using Integra Dermal Regeneration Template IDRT, a skin replacement matrix designed to provide immediate wound closure and permanent regeneration of the dermis. This therapy provides the wound with a scaffold for cellular ingrowth and capillary growth and results in regenerated tissue comparable to embryonic dermis.

The product comes in three forms:

- Matrix alone for bulk filling spaces
- An injectable form for small spaces or tunneling
- Thin bilaminar sheet with silicone to act as an artificial skin with barrier functions.

**Figure 2.** Contributors to Non-Healing Wounds



A pivotal randomized controlled parallel group clinical trial, the FOot Ulcer New Dermal Replacement (FOUNDER) Study,<sup>5</sup> enrolled 307 patients at 32 sites. Patients were monitored for up to 29 weeks. The primary endpoint of the study was the incidence of complete wound closure at 16 weeks, as assessed by the investigator. The secondary outcome measures included time to complete wound closure, rate of wound closure, incidence of recurrence and change in quality of life metrics (see Figure 3).

## In Summary

Based on several studies, it has been suggested that the use of advanced wound healing therapies can drastically improve the healing process for complex wounds such as DFUs. Application of a TCC or use of supports to the extracellular matrix can dramatically reduce the time it takes for these wounds to heal. When treating complex wounds, health-care providers should consider the appropriateness of advanced therapies if all risk factors have been addressed but the wound is still not healing at a reasonable rate.

**Figure 3.** Results of the FOUNDER Study

	ACTIVE	CONTROL	
# Patients	154	153	
Complete closure of ulcer during treatment phase (16 weeks)	51% (79/154)	32% (49/153)	> 59% improvement over control
Median time to complete closure	43 days	78 days	5 weeks reduction in time to closure
Rate of reduction in wound size	7.2% per week	4.8% per week	50% improvement in rate of reduction of wound size
Median # Integra applications	1	N/A	

**Faster healing + Fewer applications = Cost effective solution for DFU**

For more information, visit [www.integralife.com](http://www.integralife.com) and <http://outside-us.dermasciences.com/>.

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