



Shared Decision-Making in Wound Prevention and Management

A Caregiver's Perspective Being Part of the Process



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

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

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News in Wound Care

Awareness and Advocacy

Wounds Canada's 2023 Awareness Campaigns: Spreading Knowledge about Wound Care Principles

In the months of April, May and June, Wounds Canada ran three separate campaigns around wound care that coincided with specific monthly events.

April was **Limb Loss and Limb Difference Awareness Month** and Wounds Canada took the opportunity to raise awareness about the challenges faced by those who have experienced limb loss, particularly due to diabetes-related conditions.

Throughout the month, we shared useful tips and resources

as well as the stories of those affected by limb loss. We also took the opportunity to highlight the connection between the risk of limb loss and wounds related to diabetes and peripheral arterial disease.

Popular hashtags promoted during the month were *#ActAgainstAmputation*, *#LimbLossAwareness* and *#PAD*.

May was **Foot Health Month** and Wounds Canada focused on emphasizing the importance of healthy feet, particularly for those who are already dealing with pre-diabetes and diabetes.

We sought to promote Wounds Canada guidelines and tools in order to help patients with diabetes avoid problematic ulcers and infections. We recommended that anyone afflicted with diabetes undergo a diabetic

foot screening, and a complete assessment followed by personalized diabetic foot care advice, including professional foot care and footwear guidance.

Hashtags for the month were *#FootHealthMonth*, *#HealthyFeet* and *#ActAgainstAmputation*.

Finally, June was **Wound Healing Month** and we chose to focus on the prevention and treatment of wounds, highlighting the fact that prevention was preferable to treatment.

Through our campaign, we focused on these four guiding principles:

1. Evading all avoidable wounds
2. Prohibiting existing wounds from escalating to complex or chronic stages
3. Redirecting all chronic wounds onto a healing path



4. Enhancing and sustaining an excellent quality of life for patients with non-healing wounds.

Our hashtags for the month were #WoundHealingMonth, #WoundPrevention, and #ProtectSkin.

All our campaigns used evocative visuals and clear messaging to drive the message of each month's theme. As such, we hope to reach a large audience and convey the principles required to protect against wounds of all kinds and promote healthy skin.

CN Tower Salute

On June 13th, the CN Tower lit up with Wounds Canada colours in homage to #WoundHealing Awareness



Month. This is but one of the many ways we raise awareness, staying at the forefront of teaching the significance of proactive measures to circumvent wounds entirely.

Events

Don't Miss our Hybrid National Fall Conference

We are excited to invite all interested parties to the in-person Wounds Canada National Fall

Conference taking place from September 28 to 30.

This continuing education conference is designed to support health-care professionals who work with patients with wounds or who are at risk for developing wounds. It is a hybrid session with both virtual and in-person sessions taking place at the Fallsview Casino Resort in Niagara Falls, ON.

Our co-chairs for this event are Dr. Virginie Blanchette, Dr. Robyn Evans and Marlene Varga.

For a full agenda and more information on the Wounds Canada National Fall Conference, visit woundscanada2023.ca.



Research

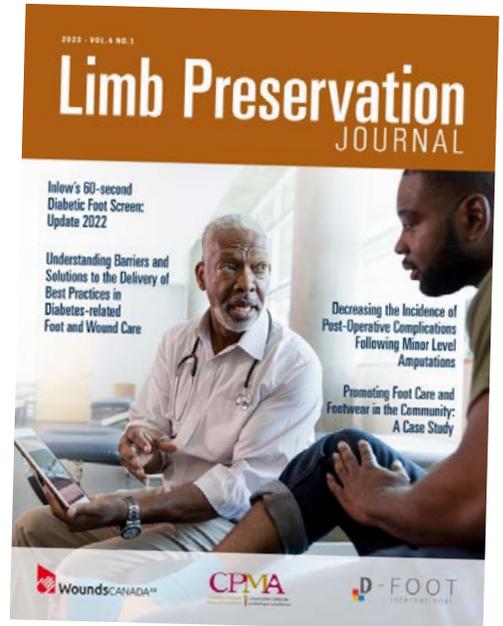
Limb Preservation in Canada now Limb Preservation Journal with DOIs

Our peer-reviewed journal dedicated to improving understanding among stakeholders working in the area of limb preservation has been rebranded from *Limb Preservation in Canada* to *Limb Preservation Journal*.

The change is meant to reflect the global nature of the journal that seeks to provide insights into how to apply new knowledge in the field. Another excit-

ing and important development is the addition of digital object identifiers (DOIs) in the latest edition.

DOIs identify objects persistently, allowing for all articles to be uniquely identified and accessed reliably at all times. DOIs will from now on be featured in all our journals.



New Indigenous Resources Available for Free Download

We are excited to announce that Wounds Canada, in collaboration with Indigenous Services Canada and KTC Health, has developed a set of resources focused on skin health and wound management in Indigenous-oriented home care in Alberta. These new best-practice-based resources, ranging from Product Pickers to Professional Guides for Care to posters, have been developed and reviewed by clinical,

PROFESSIONAL GUIDE... at a Glance

Enterocutaneous and Enteroatmospheric Fistula Assessment and Management

A guide for home care in Alberta with a focus on Indigenous health.

Wound Healing Phases

Many wounds heal in an orderly sequence of repair as described below. This usually occurs because the cause of the wound has been removed and an optimum environment for healing has been created. Note: Time to heal depends on several factors: the dimensions of the wound, removal of the cause and co-existing health factors and appropriate wound management.

However, some wounds fail to progress through a normal and timely sequence of repair and health-care providers need to determine why. Most often this occurs when the cause(s) or co-factor affecting the wound have not been corrected so the wound lacks an optimum environment for healing.

Note: It is important to remember that even when a wound is "closed" it may take up to 2 years for it to be considered "healed."

Hemostasis
Hemostasis occurs immediately upon injury releasing platelets that lead to clotting. There is also a release of growth factors.

Inflammation
Inflammation occurs days 1-4 with the release of neutrophils, macrophages and monocytes. Phagocytosis supports wound clean-up.

Proliferation (granulation and contraction)
Proliferation occurs days 4-21 with the release of macrophages, pericytes, lymphocytes, angiocytes, neovascytes, fibroblasts, keratinocytes and epithelial. The defect is filled with closure of the wound and a re-establishment of skin function.

Maturation (remodeling)
Maturation (remodeling) occurs from 21 days to 2 years with the release of fibrocytes and fibroblasts that lead to the development of tensile strength.

Identify and address all causes of slow or non healing in wounds.

For more information on wound healing phases, please read the chapter titled "Best Practice Recommendations for the Prevention and Management of Wounds" in Foundations of Best Practice for Skin and Wound Management, available on the Wounds Canada website (woundscanada.ca).

Figure 1: The Wound Prevention and Management Cycle

This cycle is based on a commitment to support patients through their entire journey to help them adapt to and self-manage their condition in the face of social and emotional challenges. It is a model that is based on the premise that cultural sensitivity, equity and self-management is an inherent part of high-quality health care, as well as values, traditions and biases on the part of systems, care providers, patients, families and communities can all influence care.

This cycle is based on the Wounds Canada Wound Prevention and Management Cycle (WP/MC) (Figure 1) for clinical decision making. For clinicians, this document is meant as a cue for treatment; it is not inclusive examples listed below each recommendation. For policy makers, it highlights (in blue) actions and policies that support best practice.

For more information on content or tools related to a particular recommendation, click on the links provided.

Definition
Fistula (Latin word meaning pipe or flute): A fistula is an abnormal connection between two body parts, an organ or blood vessel or another structure. Fistulas can develop for many reasons, including long-term bowel disease such as Crohn's or ulcerative colitis, diverticulitis, appendicitis, malignancy, trauma such as injury or surgery, ulcers and infections.¹¹

Diagnosis of a fistula can be challenging for the affected patient and their family. A patient-centred, multidisciplinary team is needed to partner with the person to ensure completion of a comprehensive assessment and development and implementation of a treatment plan. As a fistula is a potentially life-threatening condition, the patient's mental health and wellness should be a priority throughout care delivery, for the patient developing infection, sepsis, malnutrition and significant fluid and electrolyte imbalances.

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overall external and internal communications strategies and promotion of Wounds Canada.

As a Métis woman, she is very passionate about projects involving reconciliation and inclusion. During her career, Gaylene has worked for such organizations as the Canadian Red Cross, Parks Canada, CBC, Government of Saskatchewan and Métis Nation - Saskatchewan. She was lead of the communications team that launched the *Beyond 94 – Truth and Reconciliation in Canada* project, an interactive website and tool that houses resources and measures the



New Faces at Wounds Canada

Gaylene Poulin is a communications professional with over 20 years' experience in strategic communications and media relations, in both the private and not-for-profit sectors. As Director of Communications for Wounds Canada, she contributes and oversees the

94 Calls to Action by the TRC.

During her time with Parks Canada, she was the event lead of the closing ceremony of the inter-

national memorial installment of "Walking with Our Sisters", a week long memorial exhibit honoring Missing and Murdered Indigenous Women and Girls for which she was recognized with the Parks Canada CEO Award of Excellence. She spends her spare time traveling, camping with her children and her little dog, Charlie.

Loukia Papadopoulou is the new Communications Specialist for Wounds Canada, where she will be intimately involved in all aspects of our journals and numerous other projects and initiatives. She



is the former program manager for the Clean Energy Business Council. She has had a long career in journalism and the not-for-profit sector which included roles with the United Nations Momentum for Change, Leo Burnett and Al Arabiya English. She holds a DEC in Pure and Applied Sciences from Marianopolis College, a BA in Communications and a MSc in Geography, Urban and Environmental Studies from Concordia University. 🇨🇦

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Vacation Fun! A Cutaneous Toe Infestation From Walking On The Beaches In Brazil

By Krisha Borromeo MD FPCP DPCGM; Samira Abukar BSc DCh
and Carol Ott MD FRCPC

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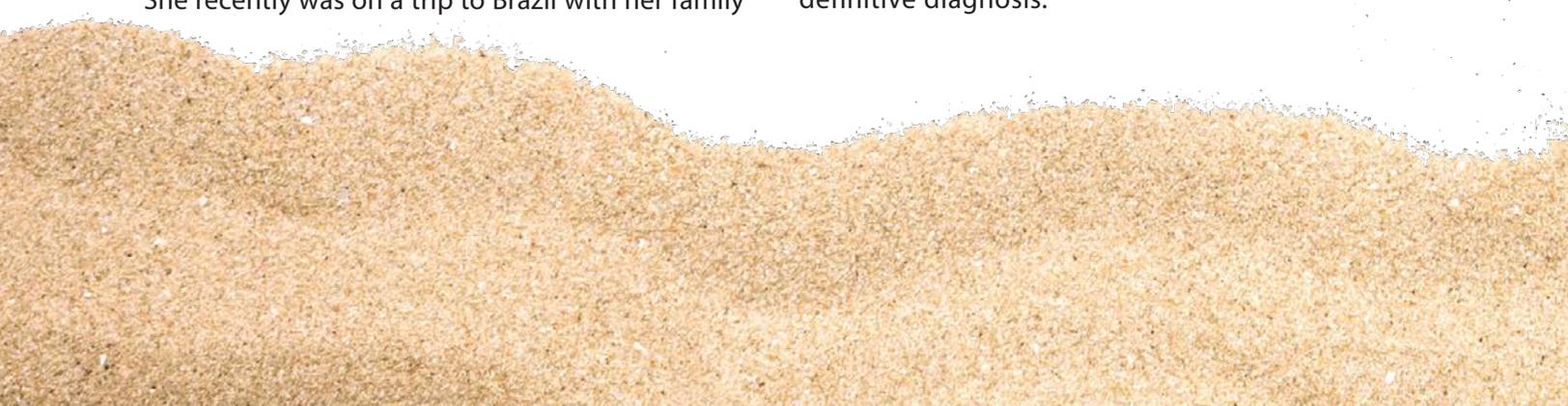
A 52-year-old female came to the wound care clinic concerned about a growth on the fourth toe of her right foot. It appeared two weeks prior and had increased in size. It was firm and did not cause any pain.

She considers herself to be a healthy person who runs daily. She has no significant past medical history other than a recently treated wart on her hand. There had been no recent change in footwear. She recently was on a trip to Brazil with her family

where she spent time walking on the beach.

On examination, there was a small 4x4mm lesion with the height of 3mm on the fourth toe of the right foot (see Figure 1). It consisted of a callus cap with verrucous tissue underneath. Pedal pulses were present bilaterally. 10g monofilament testing was conducted and showed intact sensation at all 10 sites of the foot.

The lesion was excised with a scalpel and sent to pathology for evaluation, which led to the definitive diagnosis.



Question For The Reader

What would be the differential diagnoses for the etiology of this toe lesion?

Differential diagnoses for this foot issue are considerable, but keeping in mind her recent travel and history of a wart on her hand, would include: ¹⁻⁵

1. Verrucae (wart)
2. Myiasis (the infection of a fly larva (maggot) in human tissue)
3. Pyogenic infection/abscess
4. Foreign body
5. Acute paronychia
6. Cutaneous larva migrans
7. Dermoid cysts
8. Dracontiasis
9. Melanoma
10. Deep mycosis
11. Bites or stings of other injurious arthropods.¹⁻⁵

Diagnosis

A histology report showed there were arthropod body parts including an exoskeleton, tracheal rings, a striated muscle and eggs in varying stages of development. The morphology of the arthropod parts was consistent with tungiasis – an infestation by the flea *Tunga penetrans*.

Introduction:

Tungiasis is a neglected ectoparasitic disease from the burrowing of the female *Tunga penetrans* (also called sand flea, jigger, nigua, chica, pico, pique, or suthi) into exposed skin (see Figure 2), typically the periungual region of the feet and heels.⁶ It is endemic in Latin America, the Caribbean, and sub-Saharan Africa, and can be observed in travelers returning from these regions.⁷

Depending on the burden of the disease, secondary bacterial infections, tetanus, and gangrene may result. It is also a zoonotic disease, with a variety of animal reservoirs such as cats,



Figure 1: Growth on the 4th digit of the right foot.

dogs, horses, rats, and pigs living in contaminated soil or sand.⁷ The life cycle of this parasite is shown below (see Figure 2). After penetration, the flea undergoes hypertrophy and the abdominal sections can be enlarged up to 1 cm.⁶

Presentation:

Once the adult gravid flea burrows painlessly into the skin, it matures and evolves from a 1 mm red-brown macule into a 10 mm pearly white nodule with a central dark punctum.⁸ Engorgement is due to egg production and causes swelling, erythema, pruritus and pain. Egg release and its death trigger inflammation, resulting in a black-crust papule which heals as a punched-out scar.⁸

Diagnosis:

Aside from eliciting a travel or exposure history, a dermoscopy is a convenient tool to identify typical features, such as dark central pores (a hallmark of tungiasis corresponding to the anogenital and respiratory opening), whitish oval structures

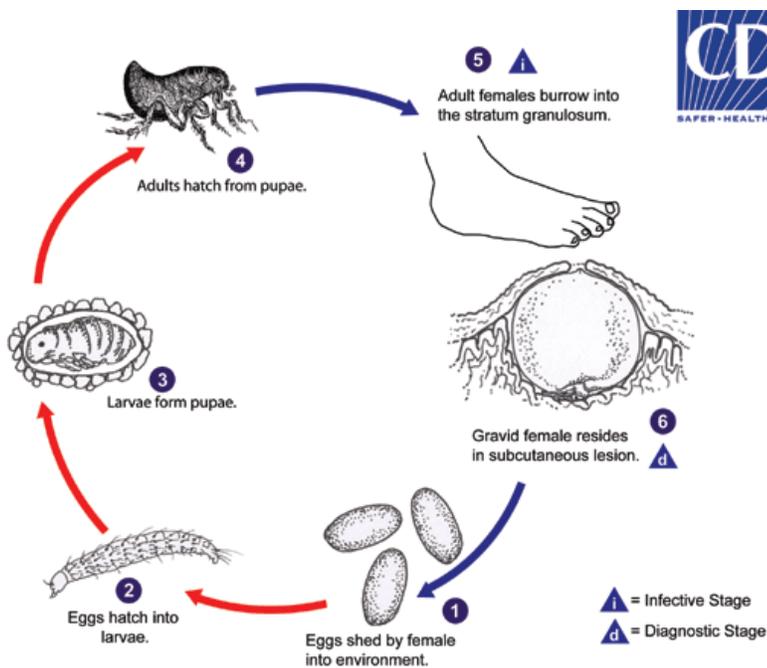


Figure 2: Life Cycle of the Female *Tunga penetrans*.
Source: <https://www.cdc.gov/dpdx/tungiasis/index.html>

(eggs), silver dendritic fibres (trachea), wriggling reddish tubules (midgut filled with host blood), and blue-black or grey-blue blotches (hematin in the gastrointestinal tract).⁹ Extraction of the flea is both diagnostic and therapeutic and no laboratory or imaging studies are typically indicated other than a histological examination of the excised tissue if a skin biopsy is done.⁸⁻¹⁰

Treatment:

If left untreated, tungiasis is a self-limiting disease, generally concluding with the end of the flea's life cycle in approximately six weeks, leading to involution and expulsion from the skin through exfoliation.⁸ Preferred treatment is the sterile removal of the entire flea as soon as possible with topical wound care to prevent complications such as secondary bacterial infection, cellulitis, and blood-borne diseases.⁸ Tetanus vaccination should be up to date.⁸ Clinical trials that evaluated the efficacy of targeted application of topical products, such as dimethicone-based compounds have shown benefit in disseminated cases as these agents act to occlude the parasite's



trachea. While oral ivermectin is not effective, topical ivermectin shows promise.⁸

Prevention:

Travelers walking on tropical beaches are advised to wear closed-toe shoes and to do frequent inspections of their feet. Twice daily application of a plant-based lotion (such as Zanzarin, containing coconut oil, jojoba oil, and aloe vera) was also shown in randomized controlled trials to lower infestation intensity in resource-poor settings.¹⁰

Outcome

Once the area was debrided it proceeded to heal with no issues (see Figure 3). The patient had received a recent tetanus shot.

Prevention for future concerns was discussed with the patient as she will likely return to Brazil for future vacations.

Our clinic staff had a debriefing session on this diagnosis, which is very unusual for our area. We discussed the need for asking patients about recent travel history. 🚩



Figure 3: Once the infection was removed, the patient went on to heal.

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Carol LB Ott, MD FRCPC is a geriatrician practising wound care and geriatrics in Toronto Baycrest and Women's College Hospital and Assistant Professor at the University of Toronto.

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Nutrition And Negative Pressure Wound Therapy: Improving Outcomes

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Negative pressure wound therapy (NPWT), also known as vacuum-assisted closure (VAC) therapy, has been used since the early 1990s for the treatment of both acute and chronic wounds. It is now used both in the home and acute care settings for a variety of wounds including diabetic foot ulcers, dehisced wounds, skin grafts, skin flaps, partial-thickness burns, and open abdomens, to name a few.^{1,2}

NPWT works by applying negative pressure to the wound leading to the removal of fluids and debris.¹ The negative pressure can be either intermittent or continuous and can range from 40-200 mm Hg. The system consists of dressing material to pack and seal the wound, tubing for fluid removal from the wound area, a canister to collect waste material and a pump that generates a vacuum.¹ Dressings are usually changed two to three times a week.



There are multiple benefits to wound healing seen with the use of these devices, including increased oxygenation of and blood flow to the wound bed; enhanced tissue epithelialization and granulation and reduced edema and bacterial colonization at the wound site.³ The vacuum effect can also enhance wound contraction.⁴

Client Selection And Assessment

Successful use of this form of wound therapy requires appropriate client selection and a thorough assessment of a client's type of wound, medical history, comorbidities and willingness and ability to adhere with the NPWT regimen.^{1,4}

The nutritional status of the client must also be considered both prior to initiation and during treatment with NPWT. Nutrition risk is often overlooked despite evidence that poor nutrition, or malnutrition, can lead to delayed wound healing, increased risk of infection and wound dehiscence.⁵ NPWT can also increase the risk of malnutrition through loss of fluid and protein, negatively impacting successful wound healing. This article looks at the impact that NPWT may have on the nutritional status of a client and how optimizing nutrition intake - particularly energy, fluid and protein - will enhance successful outcomes.

Wounds Increase Nutrition Requirements

When a wound is present, nutritional requirements are increased, particularly for energy (calories), protein and fluid. Wound healing is an anabolic process requiring a steady stream of nutrients and fluid to the wound bed throughout

all stages of the wound healing cascade. Nutrient needs are influenced by prior nutritional status, the number and severity of wounds and other comorbid conditions. Current nutrition recommendations for wound healing are listed in Table 1.⁶⁻⁸

Malnutrition may impact the duration of NPWT required for wound closure/healing. Poor nutrition status has been shown to be a risk factor leading to longer courses of treatment.³ Depending on the wound type and size, NPWT can incur significant fluid and protein losses which, if not replaced, can lead to depletion, further contributing to malnutrition and decreasing the ability to heal.⁸ Poor nutrition status may contribute to impaired immunity leading to higher risk of infections at the wound site. Improved nutrition status may result in shorter duration for NPWT, reduced costs associated with this therapy, and improved client outcomes.

Nutrition status impacts wound healing and poor nutrition may require a longer course of NPWT.

Exudate: More Than Just Fluid

In addition to the recommended baseline nutrition requirements for wound healing, losses from the exudate must be replaced in the diet or from enteral/parenteral nutrition (see Table 1). It is relatively straightforward to quantify exudate volumes collected and estimate additional fluid replacement requirements. However, wound exudate is more than just fluid. Protein, electrolytes, and even vitamins and minerals are also drawn out of the wound, regardless of the wound type.⁹

Table 1: Nutrition Recommendations for Wound Healing with NPWT⁶⁻⁸

Nutrient	Recommendation for Wound Healing	Additional Requirements for NPWT
Energy	30-35 kcal/kg/d	
Protein	1.25-1.5 g/kg/d (up to 2.0 g/kg in critical care)	Add 1.5-3.0 g/100 ml exudate
Fluid	1 ml/kcal or 30-35 ml/kg	Add exudate losses. The higher range is recommended with larger wounds or open abdomen treatments where the volume of exudate may be significant.
Micronutrients	Multivitamin with minerals (MVM)	If evidence of deficiency, supplement individual micronutrients in addition to a standard MVM

Not considering NPWT nutrition losses leads to an underestimation of nutrition needs, negatively impacting wound healing and increasing the risk of malnutrition.

As exudate losses increase, so do protein requirements. Estimates of the protein content of the exudate are between 1.5-3.0 grams per 100 ml.^{6,8} For some wounds, this can be significant; particularly long-duration NPWT treatments, large wounds, open abdomens, high output wounds or when there are multiple wounds requiring NPWT. Among hospitalized patients, where available, a nitrogen balance study can be conducted with a correction factor to account for protein in wound exudate and other losses from drains, fistulas or the gastrointestinal tract to ensure the adequacy of the nutrition prescription.¹⁰

Other Losses: Micronutrients and Electrolyte

Various micronutrients play a role in wound healing and immune function, including vitamins A, C and D, as well as iron, copper, selenium and zinc. Decreased levels of these micronutrients have been associated with delayed wound healing and compromised immune function.¹¹

Both micronutrient and electrolyte loss during NPWT can be significant. Only one study that we are aware of has been conducted on micronutrient losses during NPWT and the sample size was quite small, pointing to a lack of research in this area.⁹ Extrapolating from the burns literature, where evidence is more robust (though further research is still needed), micronutrient losses are known to be high in wound exudate

and supplementation may reduce infection rates and improve wound healing.¹²⁻¹⁵ Use of high calorie, high protein, arginine, zinc and antioxidant enriched oral nutrition supplements may help offset micronutrient losses in NPWT and improve outcomes, as has been shown for those with a Category/Stage II or greater pressure injury.⁷ Additionally, provision of a standard multivitamin with minerals and periodic monitoring of micronutrient status is warranted, with supplementation to treat deficiency when evident. A nutrition focused physical exam can be a valuable tool for the hospitalized patient undergoing NPWT, where many micronutrient levels will be falsely increased or decreased due to the presence of inflammation. See Table 2 for nutrition support recommendations during NPWT.

Similarly, electrolyte losses in wound exudate can be high.⁸ Periodic monitoring of serum levels and supplementation as indicated should be implemented to prevent complications of deficiency. As with gastrointestinal and urinary losses, wound exudate losses during NPWT should be considered in estimating electrolyte replacement needs. Higher losses during NPWT warrant more frequent monitoring.

Monitor Nutrition Status

All clients with a wound should be screened for malnutrition and referred to a Registered Dietitian (RD) for individual nutritional assessment. Please see [Malnutrition and Wound Healing](#) for further information on nutrition screening tools.

In addition, due to the risk of nutritional depletion, proactive nutrition therapy and optimiza-

Table 2: Nutrition support in NPWT ^{6, 16}

Route	Recommendation	Note
Oral nutrition supplements (ONS)	Provide high calorie, high protein, arginine, zinc and antioxidant ONS	Not yet available in Canada as an oral supplement.
Enteral formula	Provide high calorie, high protein, arginine, zinc and antioxidant enteral formula	At present, the only available product in Canada is Pivot 1.5 [®] (Abbott Canada)
Parenteral nutrition	Higher protein dose to account for losses in wound exudate, with standard vitamins/trace elements.	Parenteral glutamine may be considered in surgical patients undergoing NPWT

tion will help prevent malnutrition for those who are well-nourished when starting NPWT. This is particularly important if exudate losses are high. While there currently are no established thresholds, it is the opinion of the authors that exudate volumes exceeding 250 ml/day warrant attention from a registered dietitian.

Preoperative Assessment By Dietitian Important

For elective surgeries where NPWT is expected to be used postoperatively, preoperative assessment by a Registered Dietitian may help improve outcomes. Similarly, for malnourished patients, preoperative nutritional support for 7-14 days may improve postoperative outcomes.¹⁶

During treatment with NPWT, client weight, ability to conduct activities of daily living (ADLs) and instrumental activities of daily living (iADLs), fluid status, blood glucose when diabetes is present and overall wound healing should be monitored. Poorly healing wounds, unexplained weight loss, declines in functional status or erratic blood glucose measures should prompt more aggressive nutritional intervention, if aligned with the client's goals, and referral to other members of the health-care team where indicated (e.g., MD/NP, pharmacist, OT/PT, diabetes educator).

Conclusion

Paying attention to the volume of exudate and replacing losses of fluid, protein, micronutrients and electrolytes incurred by NPWT has the potential to improve the overall nutrition status of the client, improve wound healing, reduce risk of infection, reduce health-care costs and, most importantly, improve outcomes for our clients. Proactive nutrition intervention should be considered with all clients to help prevent nutrition concerns from developing. RDs have a key role to play in wound care and can help clients meet their individual nutrition needs to optimize healing and beyond.

Further research into the impact of NPWT on exudate losses and nutrition status is warranted to help in the creation of nutrition guidelines to improve patient outcomes. 

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Foot Skin And Nail Care For People With Diabetes: Are We Prioritizing Or Neglecting It?

By Idevania G. Costa RN, NSWOC, PhD

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Introduction

Health professionals involved in the care of people with diabetes, including nurses, chiropractors, dietitians, physiotherapists, occupational therapists, general practitioners and diabetes educators, play a key role in educating and preparing these individuals and their caregivers/family members to embark on a self-care journey to prevent foot skin and nail complications.

While early signs of metabolic imbalance (e.g., blurred vision, fatigue, obesity) are usually noticed by individuals with diabetes mellitus, not all of them understand nail and skin changes/issues as early complications of diabetes. As a result, they may ignore or underestimate these changes, or decide to apply over-the-counter medications that are not appropriate and can

lead to further issues (e.g., foot ulceration, skin infection).¹ These are signs of a lack of preparedness to monitor their disease, identify its early signs of complications and then take appropriate actions to prevent further issues. Thus, the lack of support and education to prepare these patients to embark on their self-care journey ends up contributing to late diagnosis, and the development of complications.^{2,3} This paper aims to discuss the main changes in the skin, nails and feet of people with diabetes and highlights the importance of involving, educating and supporting individuals with diabetes in skin and foot self-care.

Diabetes-Related Skin And Nail Complications

There are numerous skin and nail changes related



to poor glycemic management or metabolic disorder. Among the most common skin changes are xerosis (dry skin) and pruritus, which may lead to lesions or ulcerations. The development of keratoses (thick skin) in people with diabetes, usually caused by ill-fitting shoes, places them at greater risk of easily developing calluses and 'invisible' lesions underneath. The nails and adjacent skin of people with diabetes are also at increased risk of developing bacterial and fungal infections which are often manifested by colour changes (e.g., whitish, yellowish or greenish).^{2,4,5}

Skin and nail disorders are often underdiagnosed.^{2,6} Thus, it is important to schedule regular skin and nail assessments and, if necessary, immediate treatment of such changes to avoid more serious complications.⁷ In this case, the nurse plays an important role in the early detec-

tion of these alterations, through regular physical assessments and referral to specialists when detecting disorders that are beyond their professional scope.

There are several clinical changes and complications that people with diabetes experience in relation to their skin, nails and feet. These alterations are mainly categorized as infectious, vascular, and neuropathic alterations, the latter being a possible precursor of the diabetic foot – a condition in which foot ulcers form on individuals with diabetes.^{7,9} Many of these problems can be detected early, with the involvement of patients in the daily practice of self-care, including optimal glycemic management, choosing appropriate shoes, skin hydration and healthy diet, among others.³

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Foot Skin And Nail Infections

Foot skin infections are among the most frequently (20.6%) reported disorders in people with diabetes. In general, skin infection and dry skin (xerosis) have been shown to be highly prevalent and significant skin diseases across multiple studies.⁹⁻¹³ Among foot skin and nail infections in people with diabetes, fungus is more common than bacterial or viral infections.⁹⁻¹³

The main types of skin infection can occur in both fingernails and toenails including paronychia and onychomycosis. Paronychia is classified as acute or chronic. The acute form lasts less than six weeks and is caused by bacterial infection or trauma to the nail fold of the finger or toes. Repetitive trauma, usually from excessive and aggressive manicure and excessive immersion of the hands in soap and water, together with the presence of damage to the cuticle of periungual fold, may result in distortion of the underlying tissues of the nail, causing spaces that can be easily infected.⁷⁻¹⁴

Chronic paronychia manifests similarly to the acute form but lasts longer than six weeks and is caused by multiple factors.¹⁵ Examples include: diabetes, prolonged exposure to water, irritants, manicures, nail trauma and finger sucking.¹⁶ The diagnosis of acute paronychia is made by clinical examination, where the presence of edema and/or sensitivity in the lateral or posterior periungual folds with the presence of purulent collections is observed.

Onychomycosis, or fungal nail infections, usually affect the toenails of people with diabetes.¹⁷ This presents as a white/yellow/greenish discoloration and thickening at the end of the nail that gradually spreads to wrap around the nail, which can be thick and brittle. Onychomycosis is a significant predictor of diabetic foot ulcer; thus representing an alert to the patient.¹⁸ Considering that treatment is time-consuming and challenging, it is recommended to look for early signs to allow for early treatment.⁷

Vascular Conditions

Vascular problems often seen in diabetes can

decrease circulation, both in the lower limbs and in the nail bed, resulting in brittle nails and infections. People with diabetes may have some erythema around the nails and may also have periungual telangiectasia (small, dilated blood vessels in the skin at the margin of the fingernails). Initially, this clinical manifestation may be difficult to distinguish between erythema of circulatory origin or nail infection married with paronychia (discussed earlier).

The periungual region (where the cuticle originates) is a gateway for microcirculation via capillaroscopy. Thus, people with more advanced diabetes have dilated capillaries, although these changes may not be seen in early diabetes.⁷

Like other tissues, nails also need healthy circulation. Decreased circulation in the nail matrix can cause thin, brittle nails in people with diabetes. This nail fragility is known as onycholysis, where the nails break, split and then separate from the nail bed.⁷ This change can have an aesthetic implication and works as a gateway for dirt, moisture and microorganisms leading to various infections. Impaired circulation can also cause localized nail hypertrophy, decreased circulation in the lower extremities, blisters, bleeding and ulceration in the fingers and toes.^{7,19}

Finally, the absence of circulation in the extremities can cause tissue death, manifested by wet or dry gangrene. Thus, it is extremely important that people with diabetes receive education about the potential skin and nail changes, the self-care required with their skin and nail and the need to avoid inappropriate care (removal of cuticles or inadequate or improper cutting of nails), which can lead to emergency and life-threatening situations.

Diabetic Peripheral Neuropathy

Diabetic peripheral neuropathy (DPN) is a debilitating microvascular complication present among individuals with type 2 diabetes. DPN affects the proximal and distal peripheral sensory and motor nerves. Sensory neuropathy causes damage or dysfunction of one or more nerves. It typically results in numbness, tingling, muscle weakness and pain in the affected area. Diabetic neuropathy

Figure 1: Education of the patient with diabetes regarding self-care of the skin, nails and feet along with the reason/justification for each recommendation

Teach your patients the following self-care practices	Reason/justification
Monitor and control blood sugar regularly to maintain optimal glycemic management.	High blood glucose levels (i.e., glucose levels consistently above target) can cause dry skin and reduce the body's ability to fight bacteria. Both conditions increase the risk of infection.
Maintain skin clean and hydrated.	To avoid dryness and cracks in the skin that serve as an entrance for bacteria.
Dry the skin well and apply a powder drying agent (e.g., talcum powder) between areas where friction and high moisture occur such as the groin, between skin folds in the abdomen, under the breasts, and armpits or between the toes. In these areas, the use of moisturizers should also be avoided.	It avoids intertrigo or skin rashes that are caused by itching, humidity, and friction between one skin and another. Using a powder drying agent will keep these places dry as moisture can lead to fungal infection.
Avoid very hot baths and showers.	Hot baths can dry out the skin causing itching and excoriation. Those with loss of protective sensation may get scalded.
Use mild shampoos, soap with neutral PH and avoid bubble baths.	Mild shampoos and PH-neutral moisturizing soap help maintain moisture and hydration balance.
Avoid scratching dry or itchy skin.	Nail friction during itching can break the skin and provide a gateway for microorganisms.
Avoid antiseptics, alcohol-based products or products with iodine.	These agents are very aggressive to the health of skin and new skin formation, which can delay healing. In case of signs of infection seek medical attention.
Instruct patients to inspect their feet well, checking them every day for minor injuries, blisters, or calluses. Show them how to use a mirror to help them see the soles of their feet.	Neuropathy causes decreased sensation and many people with diabetes may not feel an initial lesion, and if not inspected daily, it can progress to a more serious and infected lesion.
See a primary practitioner or diabetes educator and require them to use a standardized tool such as <i>Inlow's 60 Second Diabetic Foot Screen</i> to identify the risk of developing skin and nail issues. ³⁴	A standardized assessment tool helps to identify foot skin and nail changes in both the right and left foot and serves as a guide to the development of a care plan.
Wear wide, flat shoes that fit the feet well; and inspect inside the shoes for foreign objects before putting them on.	Also due to the loss of feet sensation caused by diabetic neuropathy, the person does not feel if the shoe is tight or if there is a foreign object inside it, leading to the development of blisters and lesions (onset of a diabetic foot ulcer).
Advise the person with diabetic sensory neuropathy not to walk barefoot or with socks only and not to cut the corners of the nails.	Due to loss of sensation in the soles of the feet when stepping on foreign or sharp objects, the person may not feel it. By the time they realize it, it may be too late. So prevention is the best solution.
Refer to a professional who specializes in foot care (e.g., nurses, chiropodists) to take care of nails and calluses.	Due to the loss of sensitivity, the simple cutting of nails or the removal of calluses by unskilled people can lead to injuries and consequently to infections, gangrene and amputation.

Teach your patients the following self-care practices	Reason/justification
Treat cuts immediately.	Small cuts should be washed with soap and water and covered with sterile gauze. Remind the patient that in the event of a major cut, burn or infection they need to seek professional assistance in wound care.
Refer your patient with diabetes and signs of infected lesions to a wound care service immediately if you are unable to resolve any skin, nail or injury issues.	Progress in healing is seen in the first week of treatment. If there is no improvement or the condition worsens, the best solution is to look for a specialized professional.

is associated with loss of sensation that places individuals at high risk for injury or re-injury to the extremities.²⁰

These usually start by affecting the hands and feet, but other parts of the body can also be affected. For example, neuropathy can lead to foot deformity and unsteadiness in walking, as well as affecting nail growth, which can cause damage to the nail bed on the hands and feet.⁷ People with sensory neuropathy do not always feel the damaged areas and thus should be equipped with knowledge about skin and nail self-care, for example, cutting toenails incorrectly can result in injuries that are slow to heal and lead to complications (e.g., infections and gangrene).^{7,21}

Neuropathy can also lead to an abnormal foot posture and gait in the person with diabetes. Consequently, this may cause difficulties fitting feet into shoes, causing the toes to overlap each other and causing damage or distortion. In people with sensory neuropathy, the toes can be injured during nail trimming, or afterwards if the corners are not cut properly. Additionally, ingrown toenails can also cause injury and infection.⁷

Although the formation of a diabetic foot ulcer (DFU) is compounded by multifactorial causes, neuropathy is considered paramount and precedes the DFU in almost all cases.²² Due to its association with loss of protected sensation, neuropathy leads DFU to have a silent onset and devastating results if not detected early and/or adequate preventive measures are implemented. Loss of sensation in the soles of the feet puts individuals with diabetic neuropathy at high risk for trauma to the foot, which in most cases is not

noticed immediately and therefore leads to complications such as ulceration, infection, amputation and possibly death.²³

Neuropathy also leads to a cascade of events resulting in foot changes (e.g., deformity and Charcot foot).²⁴ These changes, along with the aforementioned factors, place individuals with diabetes at high risk for developing foot ulcers. Thus, patient involvement in self-care is critical in the prevention and treatment of DFU. The practice of self-care can prevent, detect early or reverse complications, saving limbs and lives.²⁴⁻²⁸

Self-care For Skin, Nails And Feet Of People With Diabetes

Self-care in diabetes management is defined as a series of actions that maintain health through health promotion practices.^{29,30} Scholars report that these practices result in better glycemic control and achievement of the expected results for people with diabetes.^{26,31} Clinicians view self-care behaviours as important strategies for preventing diabetic complications and maintaining health.^{30,32} Self-care educational strategies include exercise or physical activities, following a healthy diet, glucose monitoring and control, skin care, proper nail trimming by a specialized professional (e.g., podiatrist or foot care nurse), foot care, and monitoring for complications.^{30,32} These should be supported by regular follow-ups with the appropriate medical professionals. A list with additional recommendations for education regarding the self-care of the skin, nails, and feet of people with diabetes is described in Figure 1.

While some changes in the skin and nails of people with diabetes are nothing more than

inconvenient cosmetic changes that do not always have solutions, others can cause physical disability and even death.¹⁰ For example, bacterial infections that are not properly treated can lead to ulceration and consequently to limb amputation or to septicemia and death. Some skin and nail disorders seen in people with diabetes may not have definitive treatment modalities³³, however, most of the time, there are preventive strategies recommended to prevent complications. Thus, the integral role of the person with diabetes in self-care is a key part of prevention and treatment components^{1,32}, which most often are done at home and away from the eyes of health professionals.

Conclusion

This paper provides an overview of skin, nail, and foot changes in people with diabetes. It is extremely important for health-care providers to be aware of these alterations, but also to prepare the person with diabetes with the necessary knowledge for early detection and prevention. This education should be provided early in the diagnosis and regularly discussed at follow-up appointments. Patients' engagement in self-care is essential for the prevention and implementation of best practices for skin and nail care, especially because when patients leave the outpatient clinic or hospital, they play the role of their own caregiver. Away from our professional eyes, they will make daily decisions about what to eat, whether to exercise, buy and wear the right shoe or inspect their feet. Thus, the care for the skin, nails, and feet of people with diabetes should be planned and implemented together with the patient and health professionals with expertise in diabetes and skin and wound care. 

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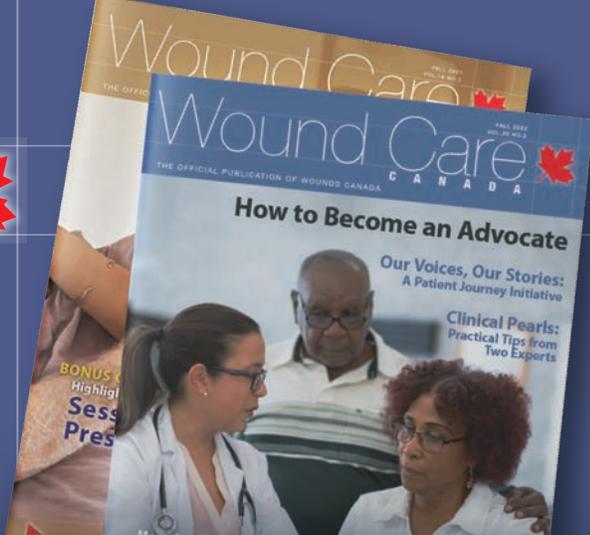
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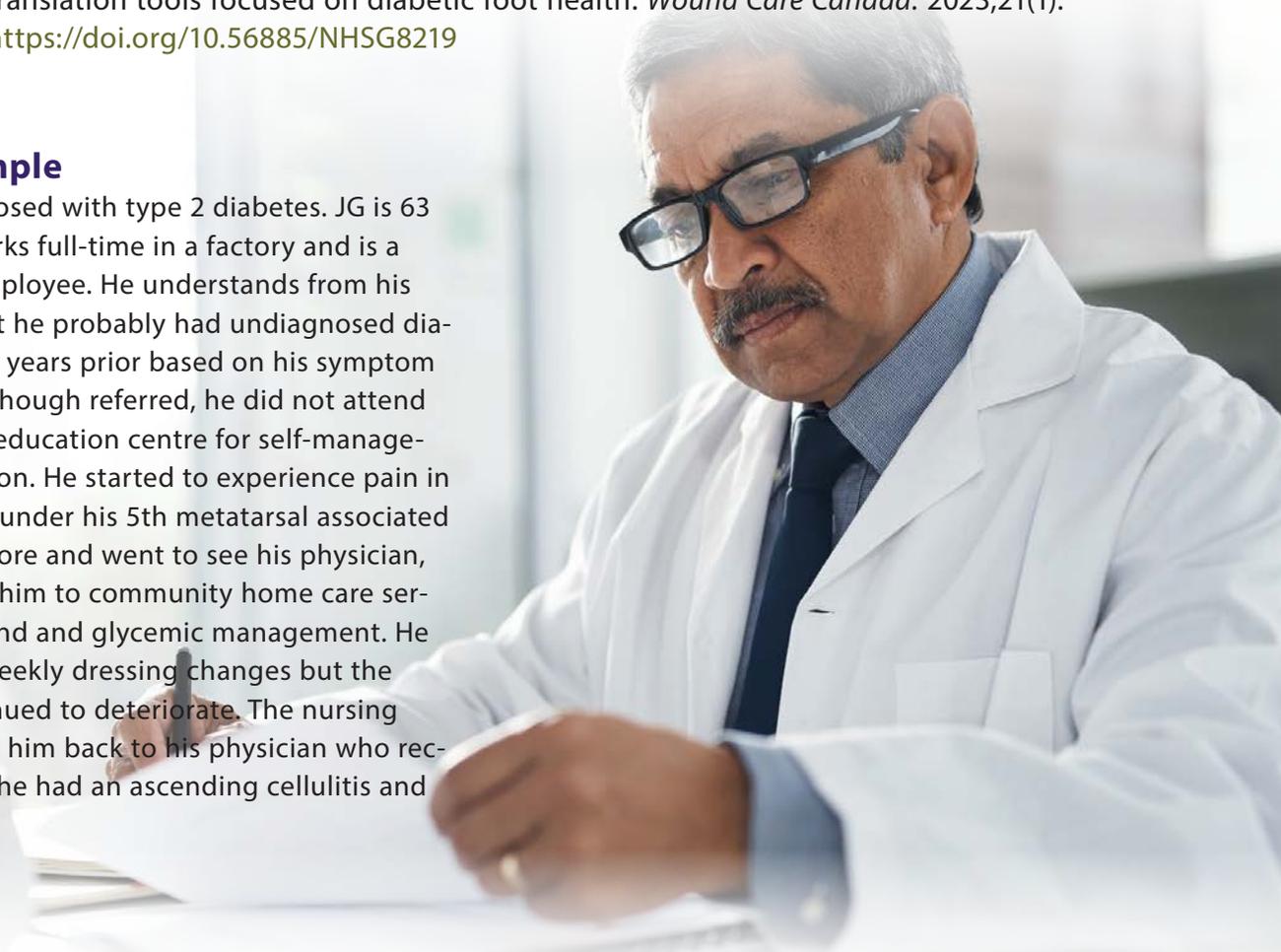
Implementing Knowledge Translation Tools Focused On Diabetic Foot Health

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Case Example

JG was diagnosed with type 2 diabetes. JG is 63 years old, works full-time in a factory and is a dedicated employee. He understands from his physician that he probably had undiagnosed diabetes for four years prior based on his symptom description. Though referred, he did not attend the diabetes education centre for self-management education. He started to experience pain in his right foot under his 5th metatarsal associated with a deep sore and went to see his physician, who referred him to community home care services for wound and glycemic management. He received bi-weekly dressing changes but the wound continued to deteriorate. The nursing team referred him back to his physician who recognized that he had an ascending cellulitis and



referred him to the local emergency service.

He was hospitalized, but due to the late stage of his foot ulcer and uncontrolled diabetes, infection and ischemia, he underwent a below the knee amputation. He proceeded to a rehabilitation unit for a month and eventually moved toward early retirement, though this was not his first choice. The loss of income led his wife to return to her retail position. She stated, "JG is depressed and very hard to live with". Later she shared that JG passed away in the hospital 4.5 years after the amputation.

Why Did This Happen?

This case example is all too common an occurrence in our Canadian health-care system despite the plethora of well-established global¹ and Canadian guidelines² and best practice recommendations.³ This case scenario is a result of the patient's lack of awareness, barriers to early screening in primary care and access to preventative foot care, as well as lack of timely diagnosis of foot complications and access to specialized wound care, diabetes and vascular assessments and interventions.

In Canada, Patel and colleagues (2022) recently reported that only 53% of persons with diabetes received a foot examination by a health-care professional, at least once in the last 12 months.⁴ Hussain et al. (2019) stated that in the last 10 years, lower-extremity amputations related to diabetes mellitus, peripheral artery disease and/or both have increased.⁵ This has been due to the lack of timely access to teams that support initial diagnosis of ulcer severity or foot complications, and referral to appropriate team care that supports these complex patients with poorly managed glycaemic and hard-to-heal wounds resulting from ischemia, infection and deformity.

Why Is This Important?

According to research by Edmonds, et al. (2021), about one-third of individuals diagnosed with diabetes will develop a foot ulcer at some point in their life.⁶ Diabetic foot ulcers generally come in two major forms: **neuropathic** ulcers, which affect feet with altered or lack of sensation, and

ischemic ulcers, where blood flow is inadequate. Both ulcer types are alarmingly prone to rapid infection, leading to serious trauma and tissue destruction. Notably, the journey from a minor injury such as a scratch to a severe condition like ulcerations and gangrene can occur within 48 hours.⁶ The rapid rate at which an infection can manifest and escalate in both neuropathic and ischemic feet necessitate immediate recognition. Prompt acknowledgement is vital to facilitate urgent referrals aimed at preserving limbs and preventing amputations.

Addressing The Problems

In the world of diabetic foot ulcer (DFU) care, implementing evidence-based knowledge and embracing a quality improvement mindset are essential for delivering patient-centred outcomes. With the aid of best practice tools and educational resources, such as those provided by the Wounds Canada Institute, and the *Limb Preservation Journal*, health-care professionals can revolutionize the landscape of DFU management.

Effective implementation serves as the bridge between research and real-world practice within health-care systems. It offers health system designers, primary care teams, specialized teams, educators and researchers a clear path for implementing evidence-based changes and measuring their patient reported outcome measures.⁷ By prioritizing early identification through risk screening, comprehensive assessment and timely referrals to specialized teams, health-care professionals can provide proactive and personalized care that meets the unique needs of each patient.

Knowledge Translation

"Knowledge Translation is defined as a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the health-care system."

This process takes place within a complex system of interactions between researchers and knowledge users which may vary in intensity, complexity and level of engagement depending on the nature of the research and the findings, as well as the needs of the particular knowledge user” – Canadian Institutes of Health Research.⁸

The knowledge translation tools developed by Wounds Canada and D-Foot International play a vital role in supporting best practices and improving health outcomes for individuals with DFUs. By streamlining care processes and optimizing resource utilization, these tools contribute to equitable access to high-quality care. Their integration holds the potential to optimize DFU management, enhance patient outcomes and enrich the entire health-care ecosystem.

Wounds Canada Institute and D-Foot International recognize the urgent need for early detection, foot screening and effective DFU

management. They have led the development of ground-breaking tools such as the *Foot Health Pathway*⁹, *Inlow's 60-second Diabetic Foot Screen*¹⁰ and the *Fast Track Pathway for Diabetic Foot Ulceration*.¹¹ These innovative resources support health-care professionals (teams) in identifying risk and managing DFUs at an early stage, potentially preventing ulcer development and severe complications and significantly improving patient outcomes.

In the following sections, we will delve deeper into the integration of these knowledge translation tools, exploring their transformative potential in optimizing DFU care (see Table 1). By embracing implementation strategies, prioritizing quality improvement and harnessing the power of these best practices, policy makers, administrators and frontline clinicians have a unique opportunity to revolutionize the care provided to individuals with DFUs. Together, we can pave the way for healthier and brighter futures for those affected by this condition, ensuring that every patient receives the exceptional care they deserve.

The introduction of assessment tools such

Table 1: Implementation Tools to Support System Design, Early Risk Screening and Intervention, Patient and Clinician Education and Referral

Tool	Description	Available at:
<i>A Foot Health Pathway for People Living with Diabetes</i> (Evans et al. 2022)	A systematic approach to managing DFU. It consists of assessment, management and follow-up stages, offering a patient-centred and tailored approach to care.	https://www.woundscanada.ca/docman/public/limb-preservation-in-canada/2022-vol-3-no-1/2501-lpc-spring-2022-v3n1-final-p-12-25-foot-health-pathway/file
<i>Inlow's 60-second Foot Screen: Update 2022</i> , now in a PDF fillable version	For a person with diabetes, the screening results provide a risk level and identify direct associated educational activities and ongoing screening schedules. For clinicians and health-care organizations, the use of the diabetic foot screening tool in all care settings creates a common communication avenue between individuals and interdisciplinary teams supporting the individuals' foot care.	Link to fillable PDF: https://www.woundscanada.ca/docman/public/2642-2022-wc-inlow-foot-ulcer-screen-tool-1101r6e-copy-nov4/file
<i>Fast Track Pathway for Diabetic Foot Ulceration</i> (D-Foot International)	A document focused on promoting timely access to referral.	https://d-foot.org/projects/fast-track-pathway-for-diabetic-foot-ulceration

Tool	Description	Available at:
<i>Best Practice Recommendations for the Prevention and Management of Diabetic Foot Ulcers</i> ; chapter in <i>Foundations of Best Practice for Skin and Wound Management</i>	<p>BPRs focused on diabetic foot developed by experts on this topic and based on the latest research evidence.</p> <p>They use the Wound Prevention and Management Cycle to help guide front-line clinicians and health decision makers through a step-by-step process that addresses the assessments and interventions of factors that may interfere with skin integrity or affect wound healing.</p>	https://www.woundscanada.ca/health-care-professional/publications/dfc-2

Patient tools - Wounds Canada

<p><i>Do It Yourself (DIY) Skin Health Series</i></p> <ul style="list-style-type: none"> • Arterial Foot and Leg Ulcers • Neuropathic/ Diabetic Foot Ulcers 	The <i>DIY Skin Health Series</i> focuses on wound prevention and management information and techniques to enable patients to become architects of their own health.	Home Page: https://www.woundscanada.ca/patient-or-caregiver/resources/diy-series
<i>Care at Home Series</i>	The <i>Care at Home Series</i> focuses on skin health and basic wound care for patients and family members.	Home Page: https://www.woundscanada.ca/patient-or-caregiver/resources/care-at-home-series
<i>Diabetes, Healthy Feet and You</i>	This website provides people living with diabetes, their caregivers and health-care professionals with information about effective self-monitoring, prevention, early detection and treatment of diabetic foot problems, including ulcers.	Home Page: https://www.woundscanada.ca/about-dhfy Literature resources: https://www.woundscanada.ca/doc-man/public/diabetes-healthy-feet-and-you

Clinician / Teams

The Wounds Canada Institute (WCI)	The Wounds Canada Institute (WCI) is a leading organization dedicated to enhancing wound care competencies among health-care professionals through educational programs focused on skin health and wound management.	Home Page: https://www.woundscanada.ca/about-us-2021/about-the-wounds-canada-institute
Wounds Canada- Nutrition Web Resources	A web page offering guidance on the crucial role of nutrition in wound healing and skin health.	Nutrition: https://www.woundscanada.ca/health-care-professional/resources-health-care-pros/nutrition

Clinician / Teams

<p><i>Wound Care Canada</i></p>	<p><i>Wound Care Canada</i> is the flagship magazine of Wounds Canada. It is Canada's only publication devoted entirely to wound care and remains the best source for health professionals seeking credible information regarding wound management and prevention in clinical practice.</p>	<p>Home page: https://www.woundscanada.ca/health-care-professional/publications/wcc-magazine</p>
<p><i>Limb Preservation Journal</i></p>	<p><i>Limb Preservation Journal</i> is a peer-reviewed journal dedicated to improving understanding among stakeholders working in the area of limb preservation, providing insights into how to apply new knowledge, and strengthening the community's bonds.</p>	<p>https://www.woundscanada.ca/health-care-professional/publications/limb-preservation-in-canada</p>

as the *Canadian Foot Health Pathway*⁹, *Inlow's 60-second Diabetic Foot Screen*¹⁰, and the *Fast Track Pathway*¹¹ have the potential to revolutionize the early detection and management of DFUs if they become widely used. Additionally, educational programs like *Diabetes, Healthy Feet and You*¹², coupled with adherence to the recommendations outlined in the chapter "Best Practice Recommendations for the Prevention and Management of Diabetic Foot Ulcers" in *Foundations of Best Practice for Skin and Wound Management*³ have provided further support for DFU prevention and management.

The remainder of this article aims to explore the integration of these tools and resources to optimize DFU care.

DFUs are wounds that occur on the feet of individuals with diabetes.¹³⁻¹⁶ These ulcers develop due to a combination of factors, including neuropathy, peripheral vascular disease, foot deformities and trauma. If risk factors for the development of foot ulcers in a person living with diabetes are identified and addressed many ulcers can be prevented. However, once ulcers do develop, due to their complex nature, early detection and appropriate management are vital to prevent worsening of these ulcers and associated complications. This calls for a multidimensional approach that encompasses the identification of risk factors, provision of holistic care, timely inter-

vention, patient education and adherence to evidence-based best practices. By utilizing the tools outlined below, clinicians can:

- Improve their decision making
- Communicate more effectively with their patients
- Implement best-practice-based care
- Provide better patient outcomes.

The Foot Health Pathway⁹

The *Foot Health Pathway for People Living With Diabetes* (see Figure 1) is a risk-based health-care strategy. It organizes care around patients' risk levels and prioritizes patient outcomes, experiences and value-based care consistent with the population health principles advocated by the Institute for Healthcare Improvement.¹⁷ The primary aim of this strategy is to pre-empt foot ulcerations, avoid the devastating consequences of amputations and prevent deaths linked to amputations.

Evans and colleagues (2022) developed the *Foot Health Pathway for People Living with Diabetes* as a collaborative effort involving a group of Canadian stakeholders, including experts and organizations associated with Wounds Canada.⁹ They collectively created this system-oriented guide built on the principles of the IHI's Quadruple Aim framework. This framework is centred on four major goals:

1. Enhancing the patient experience

2. Improving health outcomes
3. Delivering better value to the health-care system
4. Enhancing the experience of health-care providers.

New in the IHI health care improvement is a fifth aim: advancing health equity¹⁸, with which the pathway also aligns.

The *Foot Health Pathway* offers a comprehensive approach, prioritizing prevention for people living with diabetes, irrespective of whether they have previously experienced diabetes-related foot complications. The *Pathway* consists of four domains, each strategically structured around interventions aimed at yielding the most favourable patient outcomes at various risk levels.

In this pathway, the emphasis is placed on prevention or "upstream" interventions (represented by the green and yellow), with the ultimate objective being to prevent "downstream" complications (outlined in the red and orange). In addition to emphasizing the prevention of foot complications, the *Pathway* underscores

the importance of having a health-care system structured to provide timely care for individuals who may develop a foot ulcer, Charcot deformity, acute critical ischemia or infection (as addressed in the red and orange domains).

Inlow's 60-second Diabetic Foot Screen¹⁰: The First Step in DFU Detection

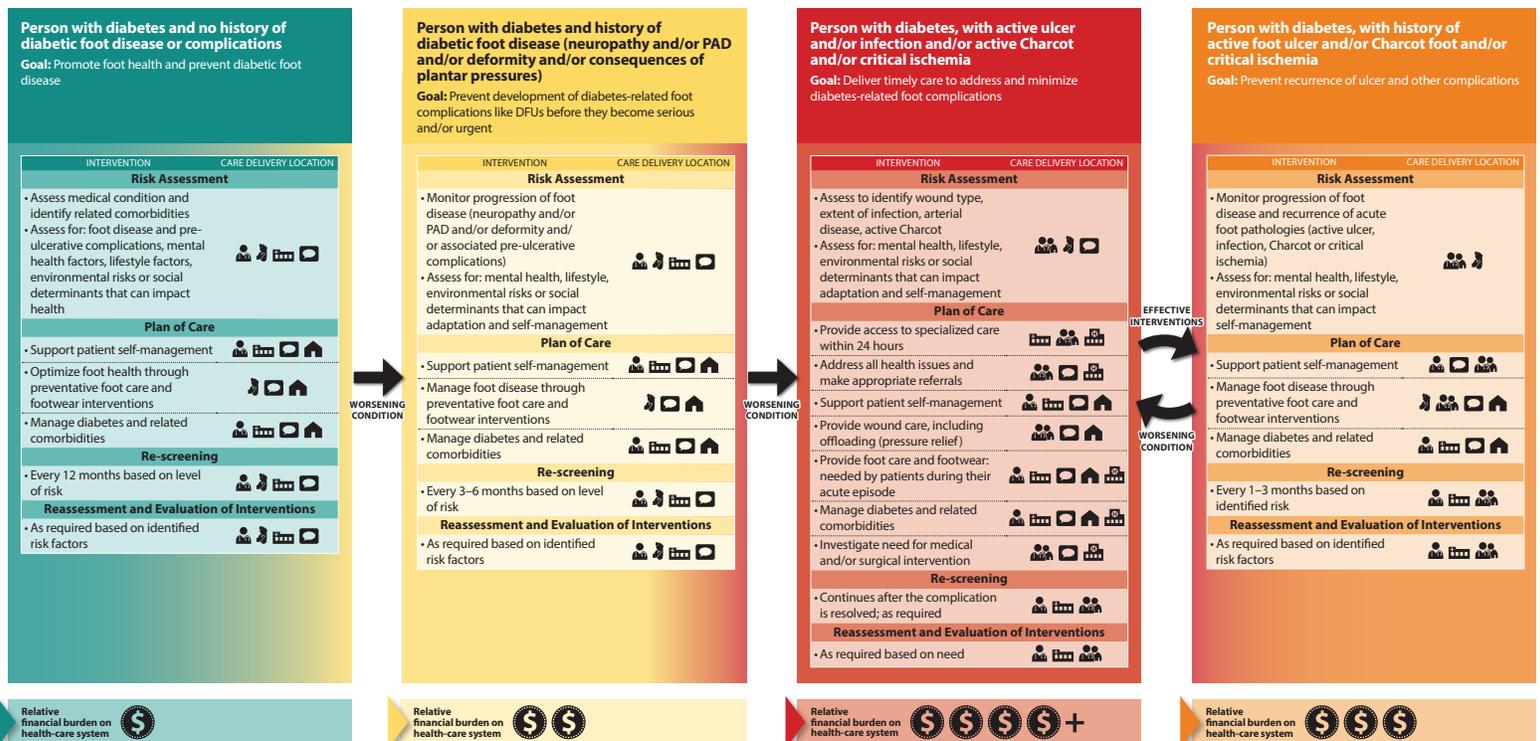
Inlow's 60-second Diabetic Foot Screen, updated for 2022, is a rapid risk assessment tool (see Figure 2) that helps to identify patients susceptible to developing diabetic foot ulcers (DFUs). It is a comprehensive diagnostic instrument that evaluates:

- Sensation
- Skin integrity
- Deformities
- Vascular health.

By swiftly pinpointing individuals at risk, it prompts the clinician to implement early interventions, reducing the chances of ulcer formation

Figure 1: Screening the foot is the first step in identifying risk

Foot Health Pathway for People Living with Diabetes



ces wound healing and improves patient outcomes.¹⁰

This tool, designed specifically for non-specialist health-care professionals (HCPs) who provide primary care, equips these primary responders, who may lack specialized knowledge, to handle diabetic foot ulcers (DFUs) effectively. It emphasizes the importance of a clinical assessment in determining the severity and characteristics of DFUs, which should subsequently inform treatment decisions.

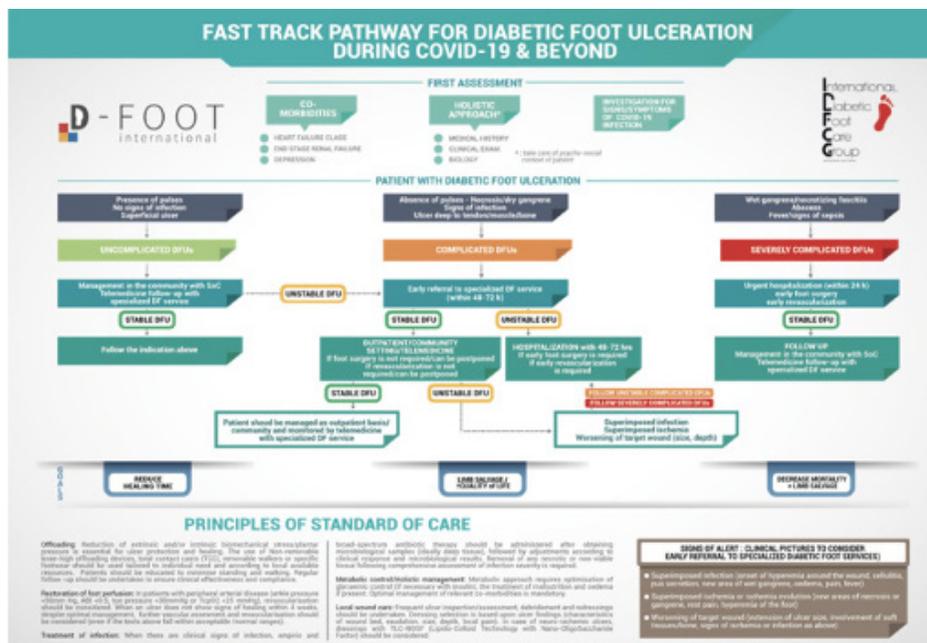
For instance, the absence of foot pulses and/or the presence of necrosis could suggest ischemic or potential ischemic ulcers. Infections should be identified according to clinical signs, in adherence with international guidelines, and the Standard of Care (SoC) should align with these recommendations.

By evaluating a patient's medical history, comorbidities and wound characteristics, and through clinical examination, the tool aids HCPs in differentiating between non-life-threatening conditions, which can be managed within the community, and severe conditions that present potentially immediate risks to the patient's life or limb.

Upon application of this tool, patients can be swiftly categorized into three levels of severity and care:

1. Uncomplicated DFUs: These are superficial, non-infected and non-ischemic ulcers. HCPs can supervise these cases but should refer them to specialized Diabetic Foot Services (DFS) if there's no observed clinical improvement (like ulcer area reduction exceeding 30%, absence of granulation tissue or signs of re-epithelialization) after two weeks of standard care.
2. Complicated DFUs: These are suspected ischemic ulcers or infected, deep ulcers (expos-

Figure 3: Expediting care for individuals with DFUs



ing bone, muscle or tendons) or any kind of ulcers in patients with active heart failure or end-stage renal disease. These cases should be referred to specialized DFS within four days of the initial evaluation. After the acute phase is resolved, they can be collaboratively managed within the community.

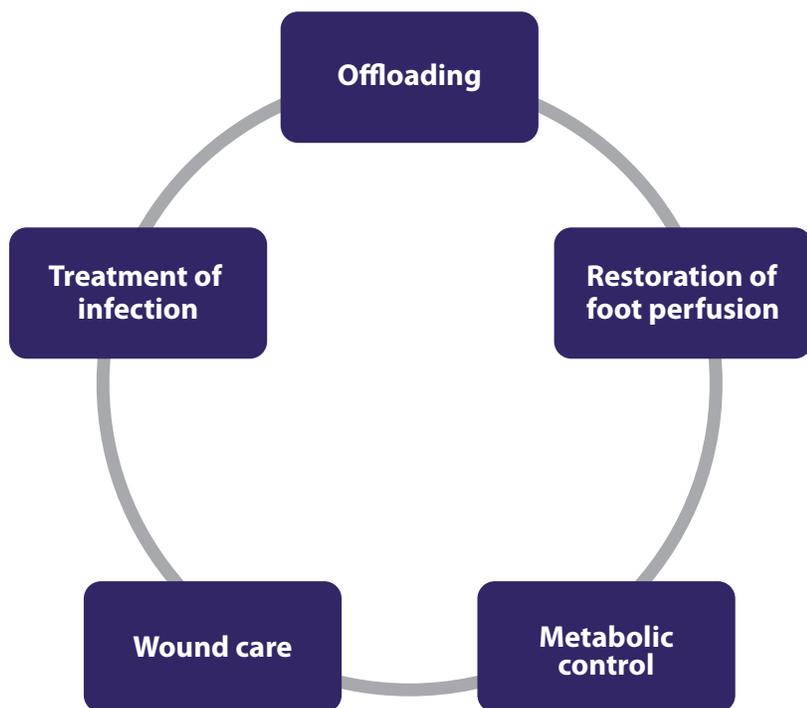
3. Severely complicated DFUs: This category comprises conditions such as wet gangrene, abscess, phlegmons or foot ulceration in patients showing fever or signs of sepsis. Such cases necessitate urgent hospitalization in specialized DFS within 24 hours of diagnosis.

Additionally, key clinical states have been incorporated into the tool to better define crucial stages in DFU management. These states assist in determining whether DFUs should be referred from primary care to specialized DFS. They are referred to as *stable* and *unstable* DFUs.

- A stable DFU is an ulcer that is either healing or not healing but not worsening.
- An unstable DFU is a foot ulcer that is worsening due to underlying infection or ischemia, or experiencing an increase in size and depth.

Standard of Care for the Management of Diabetic Foot Ulcers¹¹

Figure 4: Best Practice Recommendations for the Prevention and Management of Diabetic Foot Ulcers



Best Practice Recommendations for the Prevention and Management of Diabetic Foot Ulcers³

Best Practice Recommendations for the Prevention and Management of Diabetic Foot Ulcers in *Foundations of Best Practice for Skin and Wound Management*³ offers evidence-based recommendations to prevent and manage diabetic foot ulcers, with the goal of improving patient outcomes and reducing the burden of this condition (see Figure 4). These recommendations are grounded in the latest scientific guidelines, research and expert consensus, ensuring that the advocated practices are supported by reliable data and have proven effectiveness.

The DFU recommendations chapter provides

a detailed framework covering various aspects of diabetic foot ulcer management, including risk assessment, patient education, foot care, offloading techniques, wound assessment, infection control and appropriate use of dressings and therapies. This comprehensive approach equips health-care providers with a structured and standardized method to prevent and manage diabetic foot ulcers, reducing variability in care and optimizing patient outcomes.

Moreover, the recommendations highlight the importance of multidisciplinary collaboration. By emphasizing the involvement of health-care professionals from different disciplines, such as podiatrists, wound care specialists, diabetologists, nurses, and others, these best practice recommendations ensure that patients receive holistic care that maximizes the effectiveness of treatment, enhances patient well-being and reduces the impact of diabetic foot ulcers on individuals and health-care systems.

Patient Education Modules

Wounds Canada offers a range of resources, modules and tools to support patients and their families through a patient-driven approach that helps individuals to take charge of their skin health.

One set of resources is the *Do It Yourself (DIY) Skin Health Series*, which supports the prevention and management of diabetic foot complications.

- The **Arterial Foot or Leg Ulcer module** addresses the specific challenges associated with arterial ulcers. This module aligns with Wounds Canada's commitment to evidence-based practices and equips patients with comprehensive information and guidance to effectively under-

stand and manage arterial ulcers in the lower extremities.

- The **Neuropathic/Diabetic Foot Ulcer module** is specifically for individuals living with diabetes, a population at risk of foot ulcers. This module aligns with Wounds Canada's expertise in diabetic foot care and provides essential insights and strategies for preventing, detecting and managing neuropathic/diabetic foot ulcers. The module promotes self-monitoring, early detection and effective treatment, so patients can confidently play an active role in minimizing the risks and impact of diabetes-related foot complications.

The **Care at Home Series**, another resource offered by Wounds Canada, complements the *DIY Skin Health Series* by focusing on skin health and basic wound care. This series provides patients and their family members with practical information and guidance for managing wounds at home, aligning with Wounds Canada's commitment to holistic and patient-centred care. By equipping patients and their support networks with the necessary knowledge, the *Care at Home Series* enables effective care provision and promotes healing within the comfort of one's own home.

Wounds Canada's *Diabetes, Healthy Feet, and You* website serves as a comprehensive resource for any individuals interested in diabetic foot ulcer care. This resource is designed to support people living with diabetes, caregivers and health-care providers. It offers valuable information on self-monitoring, prevention strategies, early detection and treatment approaches.

Diabetes Healthy Feet And You Program¹²: Supporting Patient Self-Care

Diabetes, Healthy Feet and You is a peer-led self-management program designed to tackle the challenges posed by diabetes-related foot complications, while optimizing the allocation of limited health-care resources. This program stands out for its comprehensive approach to increasing awareness of and providing education to patients and their caregivers regarding the significance of foot care in persons living with diabetes. By

emphasizing the role of patients in the prevention and management of DFUs through regular foot inspections, appropriate footwear and prompt reporting of any abnormalities, the initiative encourages active involvement in personal care. The program incorporates clinical tools such as *Inlow's Foot Screen*, the *Foot Health Pathway* and the *Fast Track Pathway*, providing patients with practical resources to engage in self-care and raise awareness about foot health.

One of the program's key strengths lies in its peer-led approach, which fosters a sense of community and support among individuals living with diabetes. Peer leaders, who have personal experience with diabetes and its associated foot complications, play a vital role in delivering educational sessions and serving as relatable role models. This peer-led approach enhances the program's effectiveness by promoting empathy, trust, and shared understanding, ultimately motivating participants to actively manage their foot health. By combining peer support and clinical expertise, *Diabetes, Healthy Feet and You* effectively provides individuals with diabetes with the knowledge and confidence to take control of their foot care and overall well-being.

Wounds Canada Institute

The **Wounds Canada Institute (WCI)** has a strong track record in providing educational programs for health-care professionals specializing in skin health and wound management and building wound care competencies. The Institute offers a range of learning experiences for professionals from all disciplines and experience levels. Programs are delivered through online courses, webinars, hands-on skills labs and interactive online forums, ensuring that learners can engage with the content in a manner that suits their preferences.

WCI's expert faculty takes an interprofessional and holistic approach, equipping learners with the knowledge and strategies needed to optimize patient outcomes and enhance the overall experience.

WCI offers a suite of diabetic foot programs specifically designed for interprofessional teams. These programs target both knowledge and skills, equipping professionals with the necessary tools

to address the complexities of diabetic foot care collaboratively.

Limb Preservation Journal

Limb Preservation Journal (LPJ) is a vital peer-reviewed publication committed to advancing knowledge and fostering collaboration within the limb preservation community. As an open access journal, it serves as a platform for sharing cutting-edge research, clinical experiences and innovative approaches in the field.

The journal plays a crucial role in knowledge translation by bridging the gap between research findings and practical application. Through its rigorous peer-review process, *LPJ* ensures the dissemination of high-quality, evidence-based information to clinicians, researchers, educators and other stakeholders. By featuring original research articles, reviews, case studies and expert commentaries, the journal facilitates the exchange of ideas, experiences, and best practices among professionals.

Moreover, *LPJ* strengthens the bonds within the limb preservation community. By providing a central hub for researchers and practitioners to share their work, it fosters collaboration and encourages multidisciplinary approaches to limb preservation. This collaborative aspect of the journal enhances the collective knowledge and expertise in the field, ultimately benefiting patients and improving clinical outcomes.

Conclusion

The integration of knowledge translation tools in DFU care not only aligns with the IHI's Quadruple Aim framework but also plays a crucial role in quality improvement. By combining the use of evidence-based recommendations, patient and clinician tools, professional education delivered by organizations such as the Wounds Canada Institute and research summaries from open-access publications like *LPJ*, health-care professionals can drive continuous improvement in the delivery of care.

Enhancing the patient experience is a worthy goal for all health-care professionals and focusing on ensuring that individuals with diabetes receive

proactive and personalized care can lead to improved outcomes and a higher quality of life.

The integration of knowledge translation tools also contributes to cost reduction by optimizing resource utilization and promoting equitable access to high-quality care. By implementing early detection strategies and appropriate interventions, health-care professionals can prevent costly complications and hospitalizations, resulting in health-care cost savings and more efficient resource allocation.

Streamlining care processes and enabling comprehensive and proactive care not only improves patient outcomes, but also leads to greater job satisfaction and professional fulfillment for health-care professionals.

Through the integration of knowledge translation tools in DFU such as those outlined above, we can create a future where DFU care is optimized, resulting in healthier lives for individuals living with diabetes, more satisfied health-care providers and a more efficient and effective health-care system overall. 📌

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Pressure Injuries: Changing Mindset Changes Outcomes

By Elizabeth Ermter, RN BN IIWCC

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Why Is It Important To Focus On The Continuing Care Population?

Covid-19 brought to light the vulnerability of populations living in continuing care settings, as these individuals were dying at an alarming rate during the pandemic. The spotlight has rarely been focused on this population, their vulnerability and the sheer volume of patients

living in these homes. For example, Alberta has 106 acute care facilities with 8,523 acute care beds in comparison with 28,360 continuing care beds¹, many of which are within the 186 Long Term Care homes.² Alberta is the only province in Canada that funds a Designated Supportive Living (DSL) model, with residents of DSL receiving 24-hour on-site scheduled and unscheduled

personal care and support services from health-care aides and/or licensed practical nurses.³ As a skin and wound RN this makes it possible to provide care at these homes supporting both staff and patients with chronic complex skin and wound needs.

Continuing care patients are described as highly complex individuals with unpredictable care needs who cannot be cared for at home or another level of facility living.⁴ Assessing pressure injury risk in patients living in Long Term Care (LTC) and Supportive Living (SL) is standard practice in Alberta, and yet, pressure injuries are amongst the most common preventable wounds found in this population. A 2003 study funded by Wounds Canada found the overall prevalence of pressure injuries across all health-care settings was 26%, with preventable wounds making up about 70% of the total.⁵ There is consensus among skin and wound experts and researchers that using a validated risk assessment tool to identify and address risk factors can prevent pressure injuries.⁵ The Alberta Facility-Based Continuing Care Review confirmed that sites are using well established and valid clinical assessment tools.³ The benefits of using a standardized risk assessment tool are well documented, along with positive outcomes related to interventions that address the identified risks.⁵ The goal is to prevent pressure injuries from occurring, however, this too often becomes a task with little connection between the risk assessment findings and the patient themselves. We have the tools, and the assessments are being completed, so why do we still have so many pressure injuries in this population?

Just Another Task

When supporting staff and residents in LTC and SL, I see that sites are diligently completing their risk assessments and commonly using the Braden Scale⁶ or Resident Assessment Instrument Pressure Ulcer Risk Scale (interRAI PURS)⁷ assessment tools to do so. The risk assessment scores are documented in the charts and updated routinely, and yet I hear time and again the distress

in the health-care provider's voice when they discover a pressure injury despite their diligence in completing risk assessments. A gap exists between identifying the risks and preventing the wounds. Completion of the risk assessment tool alone does not prevent wounds, which makes perfect sense, but the disconnect is real. There is a common perception that the task is complete once the assessments have been documented and many health-care providers are not aware of, or have never been taught, the connection between identifying risk, implementing interventions, and evaluating the response. There are many barriers contributing to the risk assessments becoming "just another task" for health-care providers. To address this, health-care providers may need to change their mindset around how we use the pressure injury risk assessment tools.

Changing Mindset Changes Outcomes

Whether using the Braden or the interRAI PURS, once trained and familiar with the risk assessment tools, most health-care providers can complete the assessment within a few minutes. Using the information from the completed assessment, what are the practical, effective strategies that can be implemented to see changes in our patient's outcomes?

Here is where mindset comes into play. Instead of just filing the assessment in the chart, or hitting "save" on the computer, we could use our identified risks as our care planning "cheat sheet", where every identified risk has a corresponding personalized intervention.

Strategies To Change Our Mindset⁸

1 Connection:

The first strategy to change our mindset is to remember we are caring for people with families and friends. A person-centered approach can humanize our work, so we connect with the patient and family. Ask what the patient and key family members want

– it doesn't have to be connected to pressure injury prevention, but it sure can foster a connection. Personal connections help us care about our patient's outcomes.

2 Curiosity:

Secondly, engage your curiosity. Ask yourself throughout the risk assessment "what else is going on here?" and watch for connections to their skin health. Think about why you are asking questions about pain, previous pressure injuries, and nutrition. Our patients are holistic beings and prevention includes promoting optimal overall health.

3 Care planning cheat sheet:

Identify the valuable information gathered from the risk assessment. Every item coded on the assessment as less than optimal is an opportunity for intervention. Our risk assessments are often completed as part of a holistic assessment, followed by creation of or updating the care plan. This is your 'golden ticket' to creating a prevention-focused care plan. Every identified risk requires an intervention.

4 Continuity:

Once the personalized care plan is created, and interventions implemented, we can follow up and see how our updated interventions have worked. This requires continuity as some interventions can make an impact over time, such as nutrition changes. Continuity is also important in sustaining any changes that are working well, and tweaking any that are not. Here is where the connections built in Step 1 come in handy, as we have an incentive to work together with the patient and family to find ongoing solutions for managing risks.

5 Creativity:

Making changes can be hard, from a personal, unit, facility, organization or systems stand-

point. Education provides us opportunities for change and when change feels overwhelming, creativity can help with motivation and sustainability. Challenge your colleagues to change mindsets together and be resources and motivation for one another. Work with your educator or manager to create a unit-wide change, adopting one strategy at a time. Engage your organization to reduce pressure injuries from the top down or embrace the new system-wide documentation program that allows for easier and more consistent communication. Creatively working together promotes solutions for change.

Step-by-step, change is possible in all care streams. The tools and resources are available and accessible, and the strategies discussed apply to all care settings. Pressure injury prevention helps everyone – it improves patient quality of life, reduces nursing time and health-care costs, improves communication and a sense of community, engages organizations and promotes a feeling of pride and accomplishment. Challenge yourself to change your mindset about your risk assessments from a task to a continuum of care and see your patient's outcomes improve. Prevention is possible! 🏠

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FIRST-TIME
AUTHOR

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Shared Decision-Making: The Norm, Not The Exception, In Prevention And Management Of Wounds

By Virginie Blanchette PhD DPM; Maya Fakhfakh MD MSc; Janet L Kuhnke RN BA BScN MS NSWOC DrPsych and France Légaré MD MSc PhD CCFP FCFP

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A Key For Patient-centered Care And Engagement

In the current Canadian health-care landscape, patients increasingly seek to take an active role in decisions related to their health.¹ Patient-centered care (PCC) emphasizes the importance of engaging patients and their caregivers in the decision making processes and taking time to understand their needs, priorities and preferences.^{2,3}

Moreover, informed patient preferences are

seen as the optimal objective, as this tends to lead to more realistic expectations and a better understanding of the positive and negative consequences of the plan.⁴ A call to action for PCC and shared decision making for wound care (prevention, assessment, treatment and management) highlights the importance of providing sufficient information to enable patients and caregivers to play an active part in their care planning. This engagement supports transparency in infor-

mation-sharing with the patient and facilitates a time to discuss the plan, ask questions and participate.⁵ Shared decision-making (SDM) is a great way to do this. Palmer (2022) states in reference to shared decision making and wound care: shared decision-making involves providing all the information that is necessary to help the patient⁶ critique and review what is best for them, and to give the patient the choice to make a decision about not only the treatment, but regarding who provides it.⁷

The process of engaging in shared decision making in wound care is important and it complements other goals such as focusing on patient-related outcomes and experiences (PROMs and PREMs). The engagement of patients in the decision-making process beyond informed consent are deemed important for effective management in recent years.⁸ With increasing emphasis on patient-centered care, SDM between interprofessional wounds care team members, the patient and their caregivers is becoming essential in wound care.

What is Shared Decision-making?

When both health-care professionals and patients acknowledge the necessity for a decision, the process in which a health-care choice is informed by evidence and what matters most to the patient and is jointly made by both parties is known as shared decision-making (SDM).^{1,4} For example, in wound care, this could be the decision on offloading modalities for diabetic foot ulcers, or the choice of compression modalities for venous ulcers, or pressure redistribution devices for persons with a spinal cord injury and at risk

of pressure injuries.

Engaging in SDM empowers patients to comprehend the evidence-based risks and benefits of each option, enabling them to make decisions based not only on their health-care professional's (or team) recommendations but also on what matters to them.¹

What Steps Need To Be Taken To Engage In A Shared-decision Process?

SDM is a process grounded in a model of deliberation and exploration of patients' priorities and what is most important to them. Although SDM is influenced by a plethora of psychological, social, and emotional factors, Elwyn, et al. (2012) have proposed a three-step parsimonious model to simplify SDM and promote its integration into clinical practice. It is essential to note that this model is not a prescriptive guideline but rather

The Wound Prevention and Management Cycle

Assess/Reassess ▶ Set Goals ▶ Assemble Team ▶ Establish and Implement ▶ Evaluate

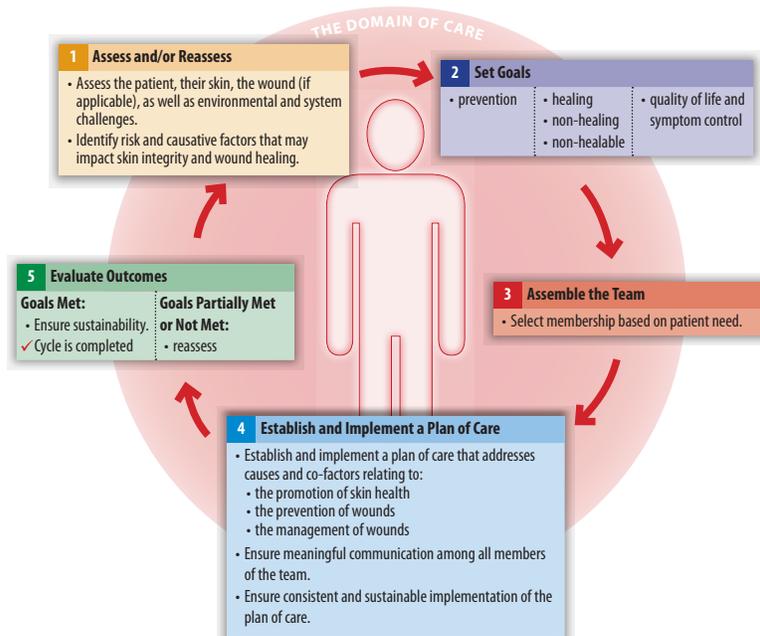


Figure 1: The Wound Prevention and Management Cycle (Wounds Canada).



outlines a stepwise process.⁴ The model consists of the following steps:

1. Choice talk
2. Option talk (utilizing patient decision support) and
3. Decision talk.

Integrating these steps into interprofessional wound care teams at step 3 of the wound prevention and management cycle (see Figure 1) would facilitate the use of SDM throughout by defining a decision coach within the team that will support the SDM process. The SDM's interprofessional model (IP-SDM) was developed to support the decision process with a team with all stakeholders involved in the decision making process (patient, family, first responders, health-care professionals).¹⁰

Step 1: Choice Talk: Introducing Options

The first step involves ensuring that patients are aware that there is a decision point and, therefore, that there are options available to them for risk screening, prevention, diagnosis, treat-

ment and/or follow-up regarding their skin and wounds. This step does not necessarily have to occur during the clinical encounter. For instance, patient decision aids (DAs), evidence-based tools designed to assist patients in making informed choices among health-care options, can be highly beneficial in this regard and distributed outside the consultation time.¹¹ For example, *The Ottawa Hospital Research Institute: Patient Decision Aid* features an A to Z inventory. Here is an example related to skin: *Basal Cell Skin Cancer: Should I have Surgery or Use Medicated Cream?* This tool also features an introduction to the topic, patient options, key points to consider (including surgical and other treatment options) and risks of treatment. *The Ottawa Hospital Research Institute Patient Decision Aid* is available at: <https://www.healthwise.net/ohridecisionaid/Content/StdDocument.aspx?DOCHWID=abp6164>

Referring patients to educational online platforms or electronic DAs can also be an interesting alternative where educational material is available and easily accessible online. During this step, it is recommended to step back, summarize, and

guide the patient (and caregiver) through their decision-making process after presenting options. It is also important to justify the options while emphasizing the significance of respecting individual choices and acknowledging the role of uncertainty in health care, especially regarding the level of evidence-based facts, unpredictable treatment outcomes and potential side effects. It is also suggested to defer closure if patients directly ask health-care professionals, "what to do", and instead encourage patients to reflect on their options. Only after explaining all options in depth and ensuring patients understand what is at stake should health-care professionals offer to help them think their options through.

For example, in a recent study, researchers in Calgary took an existing Decision Aid regarding rheumatoid arthritis to Indigenous patients for their review and adaptation. In focus groups on medical and cost coverage information (formulary), Umaefalam and colleagues (2022) included Indigenous traditional health practice options, language and text and integrated Indigenous images and colours representative of the community.¹² From this study, researchers recommend co-creating DA with Indigenous partners to increase use and relevancy. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8866334/>

Step 2: Option Talk: Describing Options

The second step involves providing more detailed information about the available options. Before listing out the options, it is important to assess the patient's knowledge and inquire if they have already heard about a specific screening option or treatment. This approach helps ease into the conversation gradually and facilitates the process of explaining different options while involving and empowering the patient. When discussing the options, it is crucial to be attentive to the patient's reaction, assess their understanding, and ensure that each option and its respective benefits and risks are thoroughly explained and fully understood. Summarizing, reformulating, and listing the options again, known as "teach-back",

is a valuable method for detecting and addressing any misconceptions. Risk and benefits and explaining in lay terms the probabilistic nature of evidence is crucial. For example, the Agency for Healthcare Research and Quality provide A *Patient's Guide to Teach-Back* that includes:

Teach Back IS:

- A way to make sure you and your provider understand each other.
- A chance for you or your family to ask questions during your visit.
- A safety check that your provider wants to do with you.

Teach Back IS NOT:

- A test of what you know.
- Something to be nervous about.

Available at: <https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/quality-patient-safety/patient-family-engagement/pfeprietarycare/PatientsGuideToTeachBack.pdf>

Step 3: Decision Talk: Helping Patients Explore Preferences And Make Decisions

The third step is a deliberative process in which health-care professionals' recommendations and patients' preferences are considered. It entails determining which option aligns with their personal values and is, therefore, the best choice for them. During this step, it is important to focus on the patient's preferences and encourage them to think about what matters most to them. Health-care professionals should be willing to guide the patient throughout the decision-making process, gradually moving towards a decision. Finally, it is important to offer a review to patients and remind them that decisions can be revisited until they are sure about their choice. They can adjourn the decision.

With the examples of offloading modalities for diabetic foot ulcers, or the choice of compression modalities for venous ulcers, this represents presenting all the options available to patients (and caregivers) and not imposing a particular choice of offloading or compression. Give patients all the evidence-based medicine information available

The Quintuple Aim For health-care improvement



Figure 2: Building a health-care system that's Fit for Purpose. Ma. A. (2022). Available from: <https://www.pwc.com/ca/en/industries/healthcare/system-fit-for-purpose.html>

on these options, discuss with them, observe their reflective process by supporting them to make a choice with facts and figures they can understand, so that they can construct their own ideas to make their own choice. The final choice is shared between all stakeholders involved directly in this specific process. So, the final choice may not be the one that will heal the ulcer fastest in a certain context, but it's a choice that respects both parties.

What Are The Impacts Of SDM?

SDM has demonstrated positive impacts on the health system as a whole, aligning with the quintuple aim (see Figure 2).¹³ SDM enhances patient experience, improves outcomes, optimizes value-based care, and improves providers experience. A fifth aim was recently added in terms of health equity, and it was shown that SDM seems to benefit more vulnerable people.^{14,15,16} However, there is very little data related to SDM and its impact in wound care, but it is promising, espe-

Resources To Support SDM In Practice

Note: This list is not inclusive.

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cially in self-care.^{17,18} In the context of patients with non-life-threatening conditions, SDM presents a truncated risk-benefit ratio for its application as a communication tool that engages patients and their caregivers with the wound care team. SDM's positive impact on communication can support the Quintuple Aim.¹⁹

In terms of patient experience, SDM is inherent to informed consent and is rooted in a health promotion perspective. It aims to involve patients in decisions related to their health. It has been shown that SDM contributes to improved health outcomes by empowering patients, minimizing conflict and regret in the decision-making process and increasing satisfaction with the received care.^{11,20} SDM also facilitates high-quality communication to support the decision-making process and helps patients choose the most suitable option for them.²¹ By providing a more accurate perception of the risks and benefits associated with different health conditions and the probabilistic nature of evidence, an SDM-based approach helps reduce unrealistic expectations and reduce regret after a decision is made. It has also been demonstrated that patients (and caregivers) who use DAs feel better informed and have a clearer understanding of their preferences within the decision making process.¹¹ Unfortunately, there are very few DAs to help SDM in wound care. However, some do focus on the patient as a whole and not only the wounds, and thus are relevant in wound care. (see Resources To Support SDM In Practice). DM is developing in the wound care sector, and specific DAs will soon be available. Regarding health outcomes improvement and health system optimization, emerging evidence suggests that SDM promotes treatment "adherence" among patients to their chosen option. A positive correlation exists between patient involvement in treatment decisions and higher treatment compliance.²² Improved adherence to treatment leads to cost minimization in health care, reducing hospitalization rates and complications.¹¹ Therefore, SDM contributes to cost optimization and enhances the efficiency of the health-care system.²² Patients receiving enhanced support for SDM had lower overall medical costs

(5.3%) and fewer hospital admissions (12.5%) compared to a usual support group, indicating potential cost savings. Additionally, for preference-sensitive conditions, the use of DAs has been found to influence patients to opt for conservative treatment options rather than invasive surgery.²¹⁻²²

SDM establishes positive clinical encounters, promoting meaningful and fulfilling work for physicians, and it can be suggested that SDM potentially reduces burnout in the health-care force. SDM is embedded in the Interprofessional Shared Decision Making (IP-SDM) model, which involves at least two health-care professionals with different backgrounds working together towards an SDM-based approach. This model expands the perspective of SDM beyond the patient-physician dyad. Aligning with Bodenheimer's vision (2014) of expanding roles within the health-care team to improve the work life of health-care professionals, IP-SDM is seen as a suitable approach to address the fourth aim.²⁴ Finally, regarding the equity aim, results from a systematic review indicate that SDM interventions significantly improve outcomes for disadvantaged patients.²⁵

SDM Myths, Realities And Limitations

There are many myths surrounding the practice and implementation of SDM in the health-care landscape. Some argue that SDM is an unsustainable trend in the modern world and will eventually fade away, as not every patient is ready to engage in it.²⁶

However, considering that SDM is at the core of patient-centered care, which is a priority in the health-care system in Canada, that it is deeply rooted in the way we perceive our health, SDM should not be dismissed as a passing fad. Moreover, an increasing body of literature suggests that patients desire more information about their health condition and wish to play an active role in decisions concerning their health.^{27,28}

It is often misunderstood by health-care professionals who mistakenly equate SDM with patient informed consent or with what is commonly

and broadly perceived as a patient-centered approach. Some health-care professionals who hold this misconception fail to adequately engage with patients during clinical encounters. SDM, in reality, follows a rigorous approach with well-defined steps that encompass specific behaviours from both patients and health-care providers. In contrast with the common belief that SDM is limited to the patient-physician relationship, SDM-based approaches can also be applied to interprofessional health-care teams with the aim of improving continuity and quality of care, reducing professional silos and fostering a more harmonious work environment.^{18,29}

Although there are numerous myths surrounding SDM practice and implementation, certain situations can impose limits on its application in specific contexts. These limits arise when broader interests override individual preferences. For instance, some medications cannot always align with patient preferences due to the need for cautious use and reliance on the clinical judgment of the health-care professional. This is particularly relevant for antibiotics and opioids to address concerns of antibiotic resistance and opioid addiction, respectively. Moreover, SDM may face limitations when population health prevails over individual preferences, as seen in the emphasis placed on the broader societal benefits of immunization methods, especially in the context of vaccine hesitancy. Additionally, SDM faces resistance from health-care professionals, primarily when patient preferences do not align with the existing evidence in favour of a specific clinical option compared to others, or when the treatment is considered a standard of care and a widely accepted clinical practice recommendation. Furthermore, there are specific contexts where SDM-based approaches cannot be fostered, such as medical decision points mandated by the law or explicitly guided by societal norms or system-level legislation, like newborn screening or medical screening for work activities. In life-threatening conditions, highly stressful situations, where an unfavourable prognosis of a severe disease is announced, patients' judgment may be impaired and limit their cognitive abilities

to process medical information, statistics, evidence and to consider different treatment options with their respective benefits and side effects.²⁷ In such cases, SDM cannot be achieved.

Conclusion

Patient-centered care of high quality integrates SDM in wound care prevention and management. This is the standard of care. SDM has demonstrated its benefits in many areas of medicine and should be the norm, not the exception, for patients with chronic wounds or at-risk. The benefits would include an informed patient and family. Patients may change health behaviours and engage in self management. However, SDM success lies in its implementation, which requires considerable effort on the part of health-care professionals and patients, as well as at the organizational level. There is a great deal of research to be done in this sector to measure its potential at the patients' bedside. 🏠

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Advancing Wound Care In Canada: Using Infographics To Disseminate Key Insights Of The First Patients' Journey Conference

By Idevania G. Costa, PhD; Darren Levine, EdD and Sue Rosenthal, BA MA

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Introduction

With an aim toward advancing partnerships between patients, patient-advocates and health-care providers, infographics were designed to disseminate key insights and themes that emerged during the 2022 *Our Voices, Our Stories* patient journey conference.

highlighted the needs, challenges and barriers to health and social care faced by individuals living with complex wounds. The aim of the event was to identify pathways toward improving wound

Our Voices, Our Stories

The *Our Voices, Our Stories* conference held June 9 and 10, 2022, was part of a knowledge mobilization project funded by the Social Science and Humanities Research Council of Canada, Wounds Canada and Lakehead University.¹ The conference shared patients' and patient-advocates' stories of navigating wound care within Canada's health-care system. It



care for all Canadians. A summary of the conference, entitled *Our Voices, Our Stories: A patient journey initiative*, was published as a supplement to *Wound Care Canada*.²

One of the outcomes of the knowledge mobilization project was the development of two infographics—one for patients and one for health-care providers. These infographics summarize what patients and patient-advocates, who shared their stories during the conference, expressed most strongly about their needs and wants when navigating their wound care journey and entering into a relationship with health-care providers and a health-care system.

Infographics (informational graphics) have become an important tool in today's digital era because they can be easily shared.³ They are also useful to disseminate complex evidence-based information in an attractive, succinct, and understandable way.^{4,5} Infographics were identified as valid and important tools for disseminating knowledge learned from the *Our Voices, Our Stories* project. Additionally, they help to advance partnerships among patients, patient-advocates, and health-care providers—an important foundation toward strengthening wound care in Canada and facilitating a shift away from a biomedical model and toward a person-centred approach to care.

Creating The Infographics

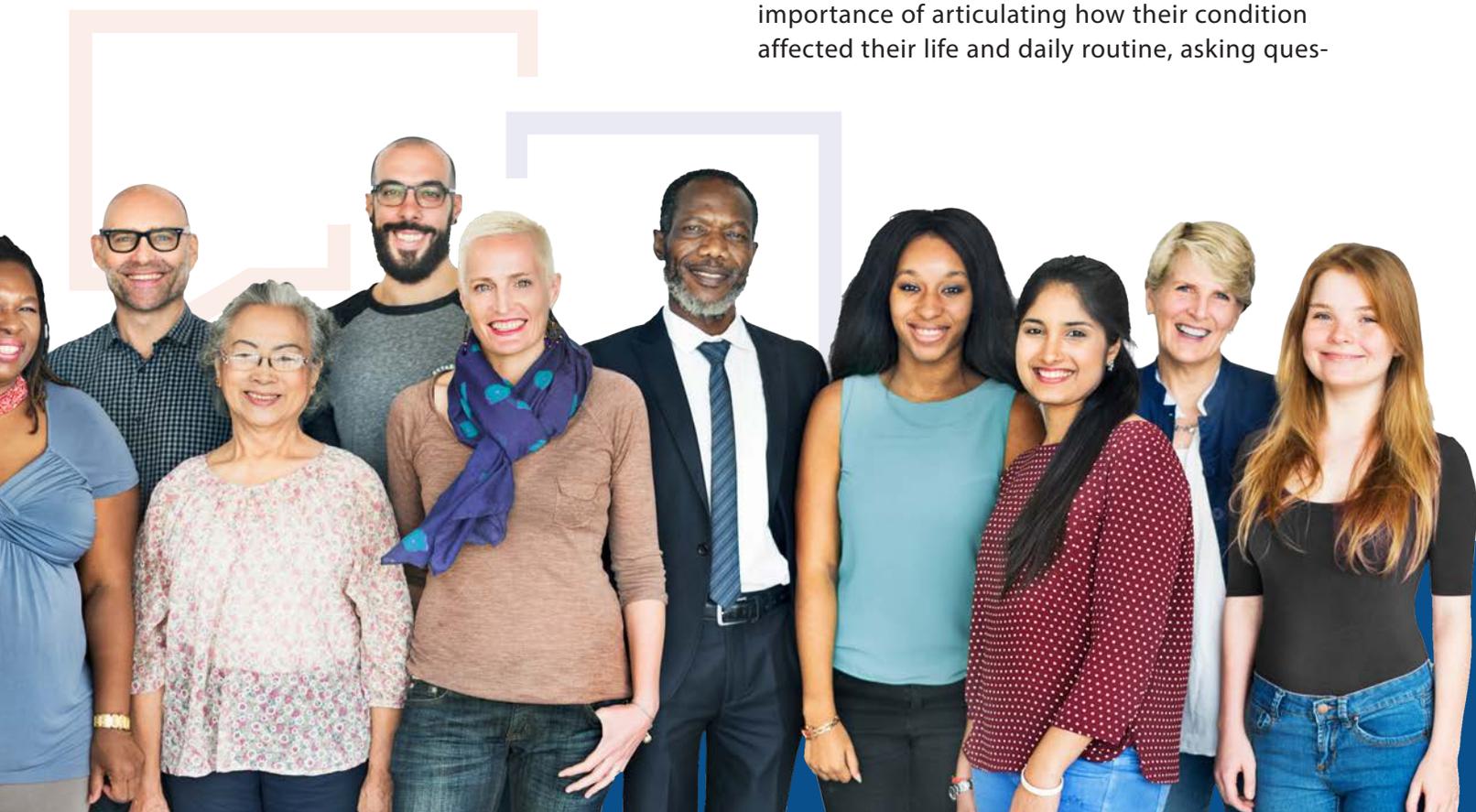
The *Our Voices, Our Stories* conference produced a wealth of knowledge and the co-creation of the key messages displayed in the infographics required the engagement of a project team from different areas of expertise, including:

- 1. The research team** involved in the knowledge dissemination project, which drew on the knowledge of the academic partners and analyzed data from the conference to extract themes/concepts
- 2. The communication and education specialists**, who wove together key themes to create a narrative that would resonate with patients, patient-advocates and health-care providers
- 3. The graphic designer**, who brought the combination of themes/concepts to life visually.

The project team worked together in a co-operative and iterative manner, drawing key messages from the conference and choosing appropriate words, phrases and images that would best convey the messages and facilitate the retention of information.

The two infographics were designed to disseminate messages for patients and health-care providers.

For patients: Emphasis was placed on the importance of articulating how their condition affected their life and daily routine, asking ques-



tions and expressing their health-care needs and goals (see Figure 1).

For health-care providers: Emphasis was placed on involving patients in care planning, recognizing the patient as an essential member of the health-care team and on consideration of the whole person, including personal needs, cultural beliefs and how their condition affects all aspects of their life (see Figure 2).

Distributing And Promoting The Infographic

Both infographics are available for download on Wounds Canada's website (www.woundscanada.ca). They can be accessed at <https://www.woundscanada.ca/leader-change-maker/advocacy/infographics>. They will also be shared through social media, with an aim toward raising awareness about improving wound care in Canada through a person-focused approach. The overall goal is to emphasize the importance of collaboration and communication among care providers, patients and patient-advocates (e.g., family members) as a foundation for holistic, person-centred and culturally safe wound care.

Conclusion

As visually appealing, quick reference and action-oriented knowledge dissemination resources, infographics can play an important role in bridging research and practice and translating knowledge into action. These infographics share key insights and themes that emerged during the *Our Voices, Our Stories* conference through the patients' and patient-advocates' shared stories of navigating Canada's health-care system, social life and challenges accessing wound care services. 🏠

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Figure 1

OUR VOICES OUR STORIES

DID YOU KNOW?

- In June 2022, the first Patient Journey Conference was held.
- This unique event shared patients' and patient-advocates' stories of navigating navigating life with a wound within Canada's health-care systems.
- Together, patients, care partners, health and social service providers, clinicians, educators and community leaders, students and researchers explored ways to improve wound care for all Canadians.

WHAT DID WE LEARN FROM LISTENING?

While each person's story about their health-care journey was different, each person wanted to be...



HEARD



SEEN



SUPPORTED



CONNECTED



AS A PATIENT OR CARE PARTNER, WHAT CAN YOU DO?



PREPARE FOR APPOINTMENTS

by writing down questions or any concerns you have.



TELL YOUR STORY

by describing how your condition has affected your life and daily routine.



RECOGNIZE YOUR ROLE

as an essential member of your health-care team.



EXPRESS YOUR NEEDS & HEALTH-CARE GOALS

and talk about the supports you'd need to have in place to help you.



KEEP ASKING QUESTIONS

if there's something you don't understand or want to happen differently.

WANT TO KNOW MORE?

Visit www.woundscanada.ca/patient-or-caregiver/patient-stories for more information.



Source: Costa I, Levine D. Our Voices, Our Stories: A Patient Journey Initiative. Wound Care Canada. 2022;20(3):31-2

Figure 2

OUR VOICES OUR STORIES

DID YOU KNOW?

- In June 2022, the first Patient Journey Conference was held.
- This unique event shared patients' and patient-advocates' stories of navigating navigating life with a wound within Canada's health-care systems.
- Together, patients, care partners, health and social service providers, clinicians, educators and community leaders, students and researchers explored ways to improve wound care for all Canadians.

WHAT DID WE LEARN FROM LISTENING?

While each person's story about their health-care journey was different, each person wanted to be...



HEARD



SEEN



SUPPORTED



CONNECTED



AS A CARE PROVIDER, WHAT CAN YOU DO TO SUPPORT YOUR PATIENTS?



CREATE A SAFE ENVIRONMENT

and allow care partners to be involved if the patient wants them to be part of the appointment.



RECOGNIZE THE PATIENT

as an essential member of the health-care team by allocating sufficient time for discussion, planning, resource provisions and follow up questions.



CONSIDER THE WHOLE PERSON...

not just their health problem. Encourage them to describe how their condition affects their life.



INVOLVE PATIENTS IN CARE PLANNING

to make sure the plan is realistic, achievable and respects their needs.



LISTEN, BE CURIOUS AND ASK QUESTIONS

about their challenges and supports. Don't jump ahead of problem solving.

WANT TO KNOW MORE?

Visit www.woundscanada.ca/patient-or-caregiver/patient-stories for more information.



Source: Costa I, Levine D. Our Voices, Our Stories: A Patient Journey Initiative. Wound Care Canada. 2022;20(3):31-2

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Mölnlycke Sponsored Learning:

The University of Texas Diabetic Foot Classification System

Presenter: Lee C Rogers, DPM FFPM RCPS (Glas)*

		Grade			
		0	1	2	3
Stage	A	Pre-ulcerative	Superficial wound	Wound penetrates to tendon/capsule	Wound penetrates to bone/joint
	B	+Infection	+Infection	+Infection	+Infection
	C	+Ischemia	+Ischemia	+Ischemia	+Ischemia
	D	+Infection and ischemia	+Infection and ischemia	+Infection and ischemia	+Infection and ischemia

Patients with diabetes often develop foot complications. These complications, such as ulceration, infection, and ischemia, can be limb-threatening and life-threatening. Timely and adequate management of these complications is critical. *The University of Texas Diabetic Foot Classification System* was developed in 1996. This is a validated assessment tool that has been widely used to stage and grade diabetic foot ulcers (DFUs). It considers the depth of the wound (i.e., grade) and associated complications, including infection and ischemia (i.e., stage). The original research study found that the risk of any level of lower extremity amputation (LEA) increases with increasing ulcer depth and number of associated complications. Therefore, limb salvage strategies should always aim to address perfusion and infection.

The VIPs of Limb Salvage

The VIPs of Limb Salvage

V: Vascular (ensure adequate perfusion)

I: Infection management

P: Pressure offloading (internal and external)

+ Social determinants of health

The VIPs of limb salvage include vascular (i.e., ensuring adequate perfusion), infection management (or source control) and pressure offloading. Of the three, infection management should always come first, as infections can spread rapidly and are limb- and life-threatening. Last, but certainly not least, the patient's social determinants of health (e.g., socio-economic status, support system, occupation, housing, etc.) must be considered as part of limb salvage. These determinants can hinder healing and increase the patient's likelihood of a LEA and mortality.

V for Vascular

When it comes to limb salvage, "time is tissue"! Prompt referral for vascular diagnostic studies and intervention is paramount to limb salvage efforts. One of the biggest contributors to limb loss is a delay in vascular interventions. The delay is often due to a lack of symptoms, such as pain. Patients with diabetes may have concurrent peripheral artery disease and sensory neuropathy. They may not feel the pain due to the ischemia – this leads to a delay in diagnosis and intervention. CLTI is defined by the Society of Vascular Surgery as peripheral artery disease with rest pain,

lower limb ulceration or gangrene for greater than two weeks.¹ Any patient living with chronic limb threatening ischemia (CLTI) should be referred to a vascular specialist urgently.

I for Infection

In the presence of concurrent infection and ischemia, infection should always be addressed first. Infections can spread rapidly and can truly be limb- and life-threatening. Diabetic foot infection (DFI) is a clinical diagnosis – it is made based on clinical signs and symptoms. Lab diagnostic tests are often not definitive. Practitioners should refrain from taking a wound culture of a clinically uninfected wound. Wound culture is helpful for the identification of the microbes involved and for targeted antimicrobial therapy. It should never be utilized for the sole purpose of diagnosing a wound infection.

The Infectious Disease Society of America (IDSA) and the International Working Group for the Diabetic Foot (IWGDF) have helpful guidelines for the diagnosis, staging and management of DFIs. A mild infection based on the IDSA guidelines¹ can be treated predominantly in an outpatient setting with debridement and antimicrobial treatments. Severe infections (i.e., patients presenting with systemic signs and symptoms) usually requires hospitalization. Patients with moderate infections may be treated in an outpatient or inpatient setting, depending on factors such as extent of tissue loss and comorbidities. Infection management include both a medical and surgical approach. Surgical debridement and resection are helpful to remove non-viable tissue and decrease bioburden. Frequent debridement has been shown to expedite wound healing.²

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P for Pressure

Foot deformities, such as ankle equinus, structural hallux limitus, hammer toes and Charcot arthropathy, can predispose patients to DFUs and delay healing. Pressure offloading can be accomplished internally (e.g., surgery) and externally (e.g., total contact casting, offloading devices). Examples of surgical offloading include Tendo-Achilles lengthening, Keller arthroplasty and Charcot foot reconstruction. The goal of offloading is to decrease direct pressure and/or shearing to expedite healing and prevent ulcerations.

Indication for Surgery and Amputation

The indication for surgery is dependent on where the patient lies in the spectrum of the course of disease. This includes the extent of infection and ischemia. Patients presenting with IDSA severe infections (i.e., systemic signs and symptoms of infection) usually require emergent surgeries. Patients presenting with IDSA moderate infections and CLTI should be referred for urgent surgeries, which may be performed the same day of referral or the next day. Patients with mild or no infection may be treated with non-urgent surgeries (e.g., surgical debridement, skin flaps and grafts, muscle tendon re-balancing etc.). Evidence suggests that patients going through surgical procedures do not usually require diabetes management optimization as it does not predict post-operative complications. Patients requiring urgent and non-urgent surgeries should have their anticoagulation therapies stopped or bridged in the meantime.

In certain cases, a LEA is the only remaining option in order to preserve a patient's limb and/or life. A

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primary amputation (i.e., without an attempt at limb salvage) may be considered when there is:

- No option for revascularization
- The major weightbearing surface of the foot is destroyed (i.e., incompatible with ambulation)
- There is severe comorbid conditions that limit life expectancy
- Numerous surgical procedures are required to restore a viable lower limb.

A secondary amputation may be considered when one or more revascularization attempts have failed or if the likelihood of further procedures have limited success.

Lee C Rogers, DPM FFPM RCPS (Glas) is the Chief of Podiatry and Associate Professor of Podiatric Medicine and Surgery at the University of Texas Health Science Centre in San Antonio, Texas. He is the President of the American Board of Podiatric Medicine and an associate editor for the *Journal of the American Podiatric Medical Association*. He is also a Fellow Faculty in Podiatric Medicine of the Royal College of Physicians and Surgeons of Glasgow.

* To access the full presentation, click here: https://drive.google.com/file/d/18e2Z6lYxqYy0GuSIsHxQQbd-c74LYZkaG/view?usp=drive_link

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Being Part Of The Process: A Caregiver's Perspective

By Laura Dann and Janet L Kuhnke, RN BA BScN MSc NSWOC Dr Psychology

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Introduction

One of the commitments at Wounds Canada is to prioritize and engage the voice and stories of patients and their families. In recent months, and as part of the pending updates to the *Best Practice Recommendations* (BPR), several caregivers were approached to be part of the process.

In January 2023, Laura Dann, a primary caregiver and care manager for her son AC, was approached to be part of the process of updating the *Prevention and Management of Moisture-associated Skin Damage* chapter. As part of the team process, we met several times to discuss the process, access the documents, and to explain expectations. Laura had previously published a *Wound Care Sleuth* focused on health care and families coming together to create patient-centered plans of care. Her involvement in the *BPR Update* was important to her as she daily coordinates a team of support workers to promote skin

health and provide total care for her son, an adult living at home and requiring full time support.

Laura Shares Her Perspective

My initial response when asked if I would be interested in being part of updating a best practice recommendation on skin health was one of curiosity. I was interested as I did not know that such a resource existed for patients and their families. Yet, after publishing in *Wound Care Canada* in the fall of 2022, I learned that there was skin, wound and continence expertise available in the community of which I did not know about.

I am a care manager for my 35-year-old son, AC. He has worn briefs



Laura Dann

full-time for both urine and bowel incontinence his whole life. Throughout this journey, I had often come across the need for skin care routines, yet nothing was readily available or known to me. When I needed information, I researched online, spoke to valued support workers and people on his interdisciplinary team and, most often, used a 'trial and error' approach. As well, I have two sisters that are registered nurses, and we often brainstormed ideas to consider, knowing, in the end, it was my responsibility to ensure his skin was healthy.

Joining the team for the *Moisture-associated Skin Damage (MASD)* chapter of the *BPR Update* was of great interest. I was motivated to read and learn about the complexity of protecting skin, promoting hydration and choosing briefs. We met regularly on Zoom and benefitted from some expert guidance and input. The process was very much a team effort, and the authors wish to acknowledge the leadership of Louise Forest-Lalande, the chapter lead.

The Dance Of Skin Hydration

This MASD project was important to me as AC, who is challenged by an intractable seizure disorder and an acquired brain injury that affects every aspect of his life, was struggling with his skin related to urine and bowel incontinence and his hydration. AC is cared for at home with 24-hour care.

Knowledge Of Nutrition And Hydration Improved

From 2018 to 2020, we as a team supporting AC, were challenged to find a nutrition plan that might help reduce his seizure activity. One of the suggestions (January 2020) from his long-term neurologist, was to start AC on the Keto food plan. At the same time, she also referred me to a second neurologist specializing in Keto diets and epilepsy management. This plan was in place until 2022, when we waited for the first neurologist to make a referral to a Registered Dietician (RD). I was hoping this would be a good resource for me and the team.

The RD offered general guidance. The challenge

we experienced was that the RD was at a disadvantage trying to balance the variables of AC's complex neurological condition, an intractable seizure disorder, incontinence (urine and feces) and managing a food plan that all had to work seamlessly. While his diet was discussed specific to fat, carbohydrates and protein grams, his hydration was not reviewed or discussed. In February 2023, I met again with the neurologist specializing in Keto. Again, hydration was not a priority. Later, and in discussion with my sister, we wondered if his recovery from a seizure was longer if he was dehydrated as he often would not drink fluids for some hours after the event.

As a result, we implemented a hydration plan including offering him a drink every thirty minutes during his seizure recovery hours and days. Ongoing, our goal is to ensure he drinks 36 to 48 ounces of fluid a day. One of the things I learned being part of the MASD team is the importance of oral hydration to improve his urine output and bowel health and the overall health of his skin. We observed the changes within a week of increasing his oral hydration. His communication abilities appear to be more interactive and more responsive. His pale and often colourless skin has changed to clearer with a rosy colour. His urine output changed from an odourous dark yellow to pale in colour with less odour. While his bowel movements did not change, we know the added hydration is helpful as AC takes additional fibre tablets two times daily.

Learning Moments:

- Hydration is essential for skin health
- Prevention of moisture-associated skin damage is a team effort
- Poor fitting briefs can create skin damage
- Observe, listen, and continue to learn when your loved one cannot speak for themselves.
- Ask for referral to a wound care clinician or nurse specialist in wound, ostomy and continence.

Knowledge Of Briefs Improved

Over the past years, choosing briefs and fitting them was just a 'guess'. While I have used many name brand products and some store-brands for AC, it was about availability and fit next to his skin. When choosing bed pads, I usually opted for washable pads for breathability and their ability to stay in place on AC's bed when he moves throughout the night, and to reduce waste and cost. Later in his early adult years (age 19-20) I was introduced to a moisture barrier skin cream. I still use the same cream today, 17 years later.

During the process of updating the MASD best practice recommendation, I learned about the role of a Nurse Specialized in Wound, Ostomy, and Continence care (NSWOC). This filled a void on his care team and will be a well-respected resource. Two years ago, he had experienced a serious skin breakdown from excessive urine and feces contact on his skin. It took 4-5 months to resolve the skin issue using trial and error. As a care manager, I had no one to discuss skin cleansing, continence products used/how to fit them, creams available/used, healthy skin condition and what families should look for to be proactive to avoid skin breakdown. It would have been so helpful to have known about what an NSWOC could offer in guidance and recommendations to resolve this skin breakdown in less time.

Final Notes

I believe each patient who wears briefs constantly and is at risk for moisture-associated skin damage should have an automatic referral made to an advanced wound clinician or a NSWOC nurse for an annual, or as needed, consultation. Families and care managers like myself should be aware of the resource of the *Prevention and Management of Moisture-associated Skin Damage* chapter. Having this knowledge would encourage families to act before a skin inflammation or breakdown occurs.

As an avid reader, I believe that a pamphlet in each doctor's office would benefit caregivers and families describing support available and offering families a website link and a phone number to call for information. On retail websites and

manufacturers of continence products, I believe it is incumbent on the large manufacturers to offer skin care information, on their websites and/or with an insert in the packaging. For local shopping, I would like to see a pamphlet given with each purchase explaining what healthy skin is, what moisture-associated skin damage is and what to look for.

Thank you for this opportunity. It is important that Wounds Canada continue to involve families and their loved ones in education. 🙏

Laura Dann is the primary caregiver and care manager for AC, her 35-year-old son.

Janet L. Kuhnke, RN BA BScN MSc NSWOC Dr Psychology is Associate Professor in the School of Nursing, Cape Breton University, Sydney, NS.



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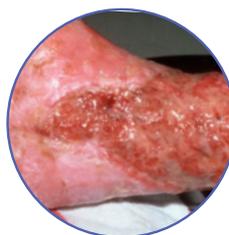
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Wound Sleuth

By Robyn Evans, BSc MD CCFP FCFP and Ahmed Kayssi, MD MSc MPH CWSP FRCSC FACS

Diagnosing A Newly Developed Ulcer On The Dorsum Of The Toe

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Diabetic foot ulcers are quite common, occurring in 25% of diabetic patients. Managing these patients and their ulcers can be challenging. Presented here is a case of a soft tissue anomaly that occurred in a diabetic foot ulcer.

History

RW is a 58-year-old male with diabetes type 2 for the past 12 years. He has had previous diabetic foot ulcers complicated by osteomyelitis. He presents to a walk-in clinic with a new ulcer on the dorsum of the third toe. He is treated with a course of antibiotics for two weeks. He is referred to our wound clinic due to the development of a pedunculated mass at the base of this ulcer. He reports the mass developed quite quickly over two weeks, bled easily, was very wet and was painful due to rubbing on the top of his shoe.

Physical Examination

Physical examination and history revealed the following:

- Bandages soaked with serosanguinous fluid, staining his running shoe
- Afebrile, no systemic symptoms
- Dorsalis pedis and posterior tibial pulses are palpable
- Previous vascular studies had been normal in 2020
- Fleshy friable soft tissue mass protruding from the dorsum of the third toe (see Figure 1).

Management

The soft tissue mass was excised and sent to pathology; bleeding was controlled with electrocautery; and moxifloxacin was prescribed. The chiropodist dispensed a soft surgical shoe to prevent friction and pressure over the ulcer. X-rays were done and RW was asked to return in one week. Figure 2 clearly shows the 'sausage'-shaped toe X-ray confirmed the clinical diagnosis of osteomyelitis. Pathology

also confirmed the diagnosis of a pyogenic granuloma. Using a hand-held thermometer there was a 6°F temperature difference compared to the same site on the right foot. The ulcer was not probing to the bone. He remained on moxifloxacin for six weeks. Figure 3 shows clinical evidence of improvement in the swelling and erythema of the toe with no evidence of recurrence of the pyogenic granuloma at the three-week follow-up visit.

What Is Pyogenic Granuloma (PG)?

Pyogenic granuloma (PG) is also known as lobular capillary hemangioma. These are benign lesions that tend to develop quickly over the course of a few weeks.¹ They rarely exceed one centimetre. The skin most commonly involved in the development of PG is the mucosa. The surface frequently erodes and bleeds easily. The cause of PG is not known, however it is associat-



Figure 1: Initial presentation



Figure 2: One week later



Figure 3: Three weeks later

ed with trauma, certain medications, chronic wounds and infections.² Other lesions that may be confused with a pyogenic granuloma are: amelanotic melanoma, Kaposi's sarcoma, hemangioma, glomus tumours and warts.¹

Treatment options have been reviewed. Surgical excision provides the lowest overall recurrence rate and provides a sample for histological confirmation for diagnosis.² Other options, such as cryotherapy and silver nitrate, have also been used.³ RW's risk factors for developing this lesion were the location of

the original ulcer causing friction from his footwear as well as the infection/osteomyelitis.

A review of the literature did not indicate the incidence of PG occurring in a diabetic foot ulcer. 🩹

Robyn Evans BSc MD CCFP, FCFP and **Ahmed Kayssi** MD MSc MPH CWSP FRCSC FACS are Wound Physicians, Women's College Hospital Wound Healing Clinic, Toronto, ON.

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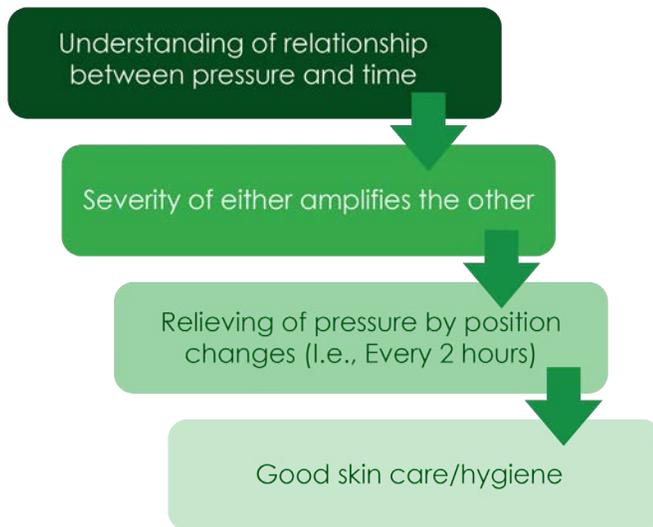
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Mölnlycke Sponsored Learning: Pressure Injury Prevention

Presenter: Charleen Singh, PhD MBA MSN/ED FNP-BC CWO CN RN*



Pressure Injury Prevention: What We've Known



Since the time of Florence Nightingale, there has been an understanding that both time and pressure can contribute to tissue injuries. The severity of both time and pressure can amplify one another, predisposing patients to pressure injuries (PIs). A low amount of pressure over an extended period of time or a high amount of pressure over a short period of time can both cause PIs. Additionally, intrinsic patient factors, such as nutritional status (e.g., dehydration) and comorbidities (e.g., anemia, inflammatory diseases), may increase the likelihood of the patient developing PIs. Regular turning of the patient (i.e., every two hours)

is a well-established strategy to relieve pressure and prevent PIs. Good skin care and hygiene are also important components of pressure injury prevention.

The Evolution of Pressure Injury Prevention

Pressure injury prevention research and strategies have evolved tremendously with the help of technology and engineering. Pressure mapping and pressure measurement have been used to identify areas of highest risk of skin breakdown (e.g., bony prominences) and to evaluate pressure relieving modalities (e.g., support surfaces). Moreover, recent research for pressure injury prevention includes the use of 3-dimensional anatomical modelling and computer simulation. These models and simulations have been utilized to evaluate the efficacy of prophylactic dressing application and pressure reduction.^{1,2,3}

The Impact of Pressure Injuries

The management and treatment of PIs is financially costly to the health-care system. It can also strain the system by increasing the amount and complexity of work for medical professionals, especially nurses, drawing them away from other important tasks. PIs can also be burdensome to the patients' families and caregivers, who are integral members of the care team. They are often relied on for tasks like driving the patient to and from appointments and dressing



Table 1. Costs Associated with PI Occurrence

	2018	2019	2020
Number of PIs	206	54	26
Estimated cost of PIs, \$	2,204,200	779,086	536,488
t-Test year over year		p= 0.00018	p=0.2237

Table 2. Cost of PI Prevention

	2018	2019	2020
Cost of prevention, \$	13,944	123,930	375,954
t-Test year over year			p=0.315

changes. These tasks can add physical and mental stress to the patients’ families and caregivers. More importantly, PIs can be devastating to patients. They can affect the patients’ general health, mobility, activities of daily living and mental health.

Pressure injury prevention is not always intuitive in the hospital setting. Often times it can be difficult to balance the need to maintain physiologic stability and skin integrity. For example, it is good practice to turn the patient routinely for pressure relief. However, a patient who recently had orthopedic surgery and

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requires a period of immobilization may not be suitable for turning. Additionally, implementation of pressure injury prevention strategies can add extra stress and physical strain to the medical staff.

As the saying goes, “an ounce of prevention is better than a pound of care.” The cost savings of pressure injury prevention is tremendous. A study in 2021 demonstrated that the implementation of a pressure injury prevention bundle in a health care facility led to a significant decrease in pressure injury occurrences and associated cost (over \$2 million) over two years.² The bundle included patient positioning systems (i.e., Mölnlycke® Tortoise® and Z-Flo™ fluidized positioners), specialized dressings (e.g., sacral and border heel foam dressings), pressure offloading devices (Mölnlycke® Z-Flex™ boots) and standardized work flow for the medical staff.

Pressure Prevention as a Bundle

Pressure prevention strategies can be effectively implemented with a bundled approach. The following steps can guide the implementation of a pressure prevention bundle:

- Step 1: Have policies in place for workflow
- Step 2: Have supplies (e.g., support surfaces, dressings, turning aids) ready to go
- Step 3: Educate staff on implementation
- Step 4: Have clear guidelines of when to implement the bundle.

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Charleen Singh PhD MBA MSN/ED FNP-BC CWOCN RN started her career as a registered nurse in the neonatal ICU at the British Columbia Children's Hospital. She currently practices at the Cottage Hospital and teaches at the UC Davis Betty Irene Moore School of Nursing and the San Jose State University Wound Ostomy Program in California.

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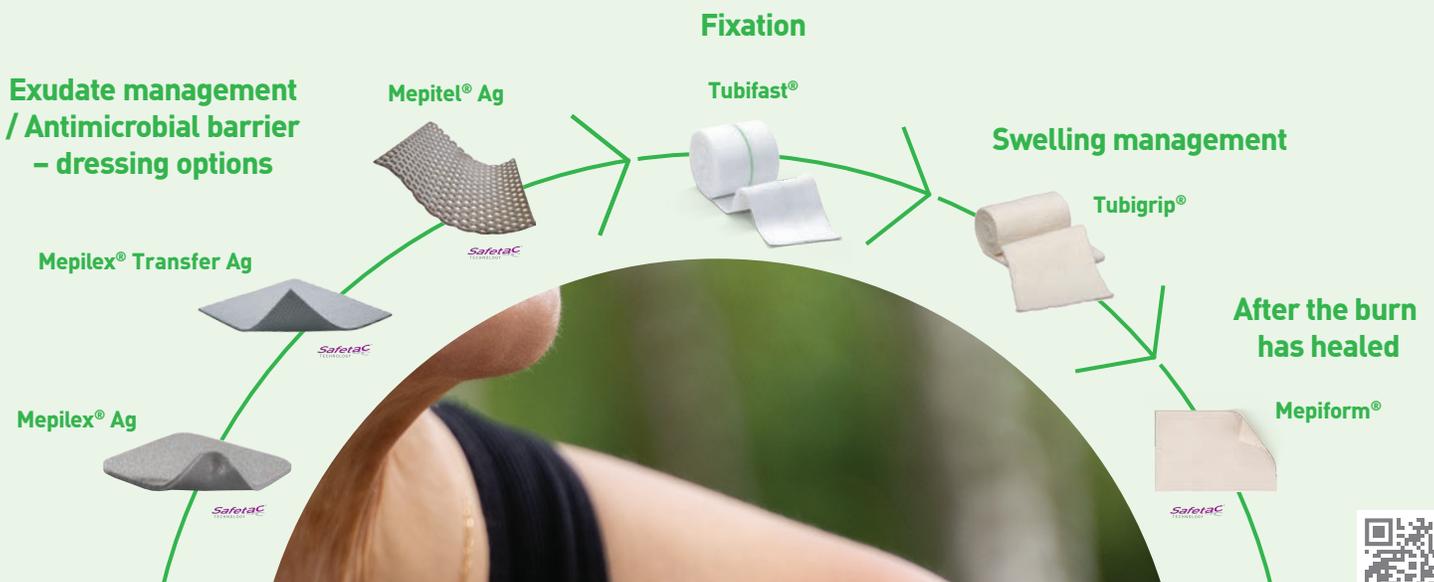
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