

Wound Care

SUMMER 2019
VOL. 17 NO. 2



C A N A D A

THE OFFICIAL PUBLICATION OF WOUNDS CANADA

An Overview of Lymphedema

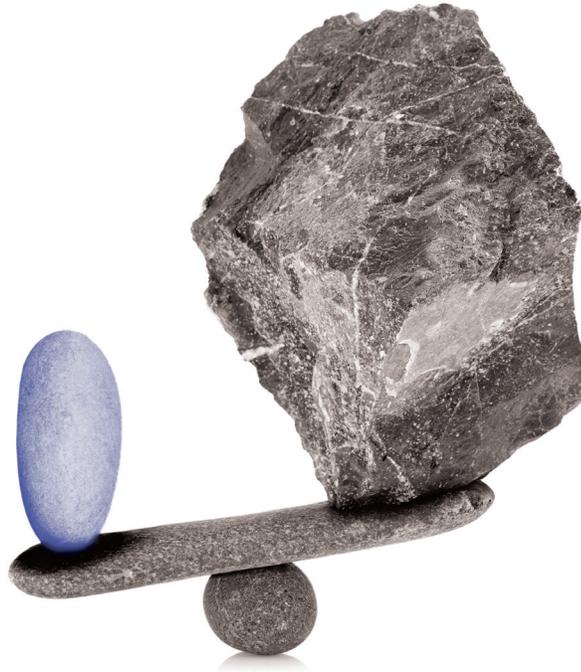
A Case Study for
**Preventing
Amputation**

Wound Sleuth:
**An Unusual
Callus Formation**

**Improving
Access to Care
with Telehealth
Technology**

**Plus,
Highlights from
our Spring
Conference!**

When it comes to balancing
debridement cost,
blue outweighs the competition.



Use *blue* for natural, autolytic debridement.

Gentle but naturally powerful, Hydrofera Blue™ CLASSIC antibacterial dressings have a unique capillary action that continuously pulls harmful bacteria-laden exudate, slough, and devitalized tissue away from the wound bed.¹⁻⁴ This same action helps draw the body's natural healing agents to the wound, resulting in a balanced healing environment. Non-cytotoxic and compatible with enzymatic debriders, Hydrofera Blue CLASSIC can provide a natural alternative to costly and painful surgical debridement.

Find natural balance in *blue*.
Change to blue at hydrofera.com.



1. Applewhite AJ, Attar P, Liden B, Stevenson Q. Gentian violet and methylene blue polyvinyl alcohol foam antibacterial dressing as a viable form of autolytic debridement in the wound bed. *Surg Technol Int*. 2015. In press.
2. Coutts PM, Ryan J, Sibbald RG. Case series of lower-extremity chronic wounds managed with an antibacterial foam dressing bound with gentian violet and methylene blue. *Adv Skin Wound Care*. 2014; 27(3 Suppl 1):9-13.
3. Edwards K. New twist on an old favorite: gentian violet and methylene blue antibacterial foam dressings. *Adv Wound Care (New Rochelle)*. 2015. In Press.
4. Woo K, Hell J. A prospective study to evaluate methylene blue and gentian violet dressing for management of chronic wounds. *CAWC (Toronto)*. Oct 2018.

Appulse represents Hydrofera Blue in the U.S. and Canada.
Hydrofera Blue is a registered trademark of Hydrofera, LLC.
020-0419

Hydrofera **BLUE**™

Contents

- 4** News in Wound Care
- 8** Corporate News
- 10** Lymphedema: Issues and Interventions
By David Keast, Janet L. Kuhnke and Heather Hettrick
- 23** Preventing Amputation in Cases of Diabetes Distress: A Case Study
By Mariam Botros, Janet L. Kuhnke, Peggy Dunbar and Cheryl A. Smith
- 28** Wounds Canada Halifax Spring 2019 Conference: We're All in This Together
Writing team: Leah MacDonald, Tim Murray, Carolyn Kelly and Denise Bond
- 34** Improving Access to Specialized Wound Care in Rural Cape Breton Using Telehealth Technology
By Annie Gillis, Stacey Lake and Katie Heckman
- 38** WCI Spotlight
Holistic Approach to Diabetic Foot Offloading: Knowledge and Skills
- 40** BPR Briefs ...
By Popular Demand
- 41** New Perspectives in Diabetic Limb Preservation
- 43** Wound Sleuth
By R. Gary Sibbald and Patricia M. Coutts



Volume 17, Number 2 · Summer 2019
ISSN 1708-6884

Editor Sue Rosenthal

Editorial Assistant Katie Bassett

Art Director Robert Ketchen
wccproduction@woundscanada.ca

Editorial Advisory Board

Maryse Beaumier, MSc, RN, PhD(c)
Patricia M. Coutts, RN, IIWCC
Chester Ho, MD
Pamela Houghton, BScPT, PhD
David H. Keast, MSc, MD, FCFP
Janet Kuhnke, RN, BA, BScN, MS, NS-WOC

Clinical Advisor

Cathy Burrows, RN, BScN, MScCH

Advertising Sales

416-485-2292 · info@woundscanada.ca

Wound Care Canada is published by Wounds Canada (Canadian Association of Wound Care). Canada's first publication devoted entirely to wound care, *Wound Care Canada* addresses the needs of clinicians, patients, caregivers and industry.

All editorial material published in *Wound Care Canada* represents the opinions of the writers and not necessarily those of Wounds Canada.

Discussions, views and recommendations as to medical procedures, choice of treatments, dosage or other medically specific matters are the responsibility of the writers. No responsibility is assumed by the

publisher or publishing partners for any information, advice, errors or omissions contained herein.

The inclusion of advertising and sponsored material in *Wound Care Canada* does not constitute a guarantee or endorsement of any kind by Wounds Canada.

All rights reserved. Contents may not be reproduced without written permission of the Canadian Association of Wound Care. © 2019.

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

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

Wounds Canada Board of Directors

President Morty Eisenberg, MD, MScCH, CCFP, FCFP

Past President Greg Archibald, MD, CCFP, FCFP

Sébastien Hains, DPM
Jolene Heil, RN, BScN, NS-WOC
John Hwang, MD, MSc, FRCSC
Janet Kuhnke, RN, BA, BScN, MS, NS-WOC
Ellen Mackay, MSc, RD, CDE
Barbie Murray, BScN, RN, MCScWH
Petra O'Connell, BSc, MHSA
Deirdre O'Sullivan-Drombolis, BScPT, MCISC
Andrew Springer, DCh

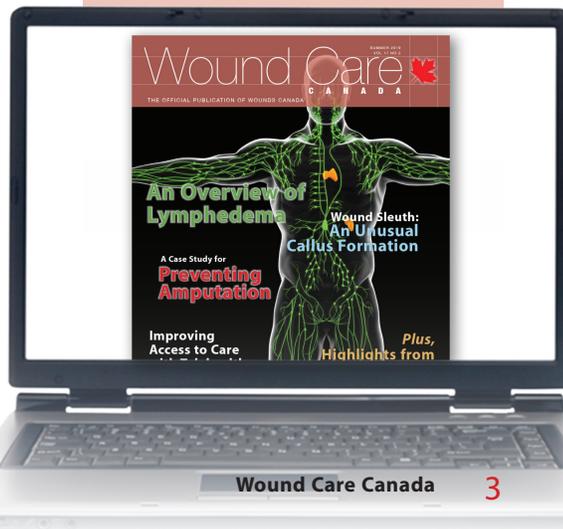
Chairman Emeritus R. Gary Sibbald, BSc, MD, FRCPC (Med, Derm), MACP

CEO Mariam Botros, DCh, IIWCC

Don't Miss Out

Each time a new issue becomes available, subscribers will be notified by an email that contains a live link to the online magazine. If you are not already a subscriber, get on the list by sending an email to info@woundscanada.ca.

It's free!





News in Wound Care

Wounds Canada News

Wounds Canada is pleased to announce that our two most recent events—the spring conference, *We're All in This Together*, held in Halifax in April, and the Spring 2019 Symposium: *New Perspectives in Diabetic Limb Preservation*, held in Toronto in May—were both great successes!

In Halifax, we welcomed almost 600 delegates and industry personnel to the two-day conference for sessions covering topics of both national and regional interest. A total of 33 companies and organizations presented their services and products in the exhibit hall, which also included three demo pods for hands-on demonstrations. Prior to and during the main conference, the Wounds Canada Institute (WCI) ran the Skills Lab for Venous Leg Ulcers and live events for unregulated care providers and primary care practitioners. The day before the conference, Wounds Canada facilitated a regional leadership summit for 50 local leaders and changemakers who met to discuss pressure injuries in Nova Scotia.

The inaugural event in Wounds Canada's symposium series, *New Perspectives in Diabetic Limb Preservation*, attracted more than 100 delegates

for a full day of informative sessions delivered by national and international experts. See page 41 for an exciting announcement about an upcoming supplement

to *Wound Care Canada*, which will provide a full summary of this event.



Upcoming Conferences and Other Live Educational Events

The line-up for 2019 covers a range of topics and formats, allowing individuals to choose the program that best suits their current learning needs.

October 2, 2019, Niagara Falls, ON: Skills Lab for Local Wound Care*

This skills lab is one component of the Best Practice Approach to Skin Health and Wound Management: Knowledge and Skills program (A100NWS). During the hands-on skills lab, students will have the opportunity to refine fundamental skills relevant to local wound care, including wound cleansing, debridement (including conservative sharp debridement), infection management and moisture management (dressing selection).



October 2, 2019, Niagara Falls, ON: Skills Lab for Venous Leg Ulcers*

This skills lab is one component of the Focus on the Prevention and Management of Venous Leg Ulcers: Knowledge and Skills program (A105MWS). During the hands-on skills lab, students will have the opportunity to practise the skills of lower leg assessment, including ankle-brachial pressure index testing, monofilament sensation testing, assessment of range of motion, footwear and gait, and application and removal of compression bandaging systems, garments and devices.



October 2, 2019, Niagara Falls, ON: Skills Lab for Offloading the Diabetic Foot*

This skills lab is one component of the Holistic



Symposium Series

Approach to Diabetic Foot Offloading:
Knowledge and Skills program (A108MWS).

During the hands-on skills lab, students will have the opportunity to practise the skills of diabetic foot screening and risk stratification, assessment of footwear and gait, application and use of removable cast walkers and surgical shoes/half shoes, and application and removal of total contact casts.



*These WCI courses require separate registration and are not included in the fall conference registration fee.

October 3, 2019, Niagara Falls, ON: Hands-on Workshops at the Fall Conference

Hands-on workshops are small group events where attendees will have a chance to interact closely with faculty and use materials related to one of the following topics:

- Supporting Self-Management
- Suturing, Biopsy and Bedside Sharp Debridement
- Ostomy Care 101

These three workshops are not WCI programs and their cost is not included in the general conference registration fee. To attend, participants must pay a separate fee and must be registered for the fall conference (see below).

October 3–6, Niagara Falls, ON: 2019 Wounds Canada Fall Conference

Driving Change in Wound Care

Canada's largest wound-related event—you won't want to miss it! Four days of stimulating sessions, networking opportunities, poster presentations and access to industry partners for health professionals from a variety of disciplines. Register [here](#).



The Wounds Canada Institute

The Wounds Canada Institute offers self-paced online and in-person learning opportunities for those wanting to improve their knowledge and skills in the areas of skin health and wound prevention and management. The formats and variety of programs, courses and events allow students to engage in the type of education best suited to their current level of expertise, specific interests, time availability and resources. For a complete list of programs currently offered, click [here](#).



October 6, 2019, Niagara Falls, ON: Skin and Wound Care for Unregulated Care Providers* (C100NNL)

Case studies and discussions will explore risk factors for skin damage, common prevention measures, presentation and causes of common types of skin damage such as pressure injuries, incontinence-associated dermatitis and foot fungus, and strategies for managing skin damage as an unregulated care provider.

*This WCI live event requires separate registration and is not included in the fall conference registration fee.

Details about these and other programs are listed on the [Wounds Canada](#) and [Wounds Canada Institute](#) websites. New WCI programs are added regularly, so check in often to see what's new.

Wounds Canada Publications Best Practice Recommendations

Wounds Canada is publishing two BPRs in English this year: Best Practice Recommendations for the Prevention and Management of Venous Leg Ulcers and Best Practice Recommendations for the Prevention and Management of Arterial Ulcers. Stay tuned for more information about publication dates.

A French version of Best Practice Recommendations for the Prevention and

Management of Skin Tears (Recommandations pour les pratiques exemplaires pour la prévention et la gestion des déchirures cutanées) has just been released and is available for download [here](#).

To view the complete suite of BPR documents, click [here](#).



care, community care and home-care nursing. She had her “aha” moment when she was a high school student at summer camp and met the inspirational camp nurse. Jackie knew then that she wanted to help people and that nursing was her calling.

Her most recent accomplishment is establishing a home health care start-up in the Cayman Islands, where she had to fulfill many roles and responsibilities.

Although challenging, the endeavour was also gratifying, as it successfully provided islanders with much-needed home care where none had previously existed.

Other rewarding health-care experiences included working for a medical supply company, in outreach at Ontario’s Telehealth, and in social media marketing, as well as curating her own blog and even hosting a radio show. She is definitely a “Jackie of all trades,” and a master at providing, facilitating and improving delivery of quality health care in any role.

Wound Care Canada

The next issue of *Wound Care Canada* is scheduled for release in November 2019. Don’t miss an issue—click [here](#) to join our email list. To view archived issues of this publication, click [here](#).

Wounds Canada Foundation

Wounds Canada is pleased to announce the launch of its sister charity, the Wounds Canada Foundation. For more information about the foundation, see below.



Meet Jackie

Managing Director of the Wounds Canada Foundation

Wounds Canada is pleased to introduce Jackie Hickey, managing director of the new [Wounds Canada Foundation](#). Jackie brings to the foundation a wealth of experience, enthusiasm and excellence, and we are delighted to have her on the team to launch and promote Wounds Canada’s fundraising arm. (Look for upcoming announcements about the foundation, including the launch of the full website this fall.)



Jackie’s experience includes more than 30 years in both public and private sector nursing, covering a range of disciplines: acute nursing, primary

“If you’re not excited when you wake up in the morning to go to work, then you’re in the wrong job. I found my niche and am very happy to be working in health care.”

With this latest opportunity, Jackie foresees the fulfillment of three important foundation goals:

1. to build awareness about preventive care and wound healing among health-care practitioners and the public;
2. to provide easy access to wound research and education to make learning and fact-finding more streamlined for health-care practitioners, the community, partners, families, patients and their caregivers;
3. to be an advocate and support for the community, caregivers and patients.

For more information about the Wounds Canada Foundation, contact Jackie at jackie.hickey@woundscanadafoundation.ca. 

أبو ظبي



WUWHS 2020

GLOBAL HEALING
CHANGING LIVES

ABU DHABI UAE

MARCH 8-12



WWW.WUWHS2020.COM
INFO@WUWHS2020.COM

Congress Organizer:



cci

centro congressi
internazionale

Congress Organizer:

CENTRO CONGRESSI INTERNAZIONALE s.r.l.

Abu Dhabi (UAE) Branch
info@ccicongress.ae

Headquarter: Turin (Italy)
info@ccicongress.com



News from Our Industry Partners

The geko™ wound therapy device: Faster recovery and an estimated cost savings of \$2,500 per patient

Worn at the fibular head, this wireless and wrist-watch-size device (weight 10 g) enables the body's mechanisms to promote wound healing by activating lower leg muscle pumps. Stimulation of the common peroneal nerve results in increased blood volume and velocity in the veins and arteries, and perfusion in the microcirculatory system. This translates into about 60% of the blood flow generated by continuous walking.

With five peer reviewed papers published (with two more accepted) from work in Ontario, the geko™ device is attracting attention in home and long-term care across Canada as an innovative tool to improve circulation, promote wound healing and reduce edema. A recent Ontario evaluation with new venous leg ulcer patients demonstrated a cost savings of approximately \$2,500 per patient while significantly shortening the healing time. Learn more at www.gekowound.ca.

TrioMed antimicrobial medical tapes and dressings

Based out of Canada and Europe and present globally, I3 BioMedical Inc. manufactures and pro-

vides the patented TrioMed medical tapes and dressings series.

The TrioMed technology incorporates a broad-spectrum and powerful tri-iodide antimicrobial engineered to eliminate the microbiological reservoir found on all medical tapes and dressings, without releasing chemicals to the patients. The global contamination scientifically demonstrated and published internationally can now be eliminated from patient care without cost increase or procedure changes.

TrioMed product features:

- Neutralizes up to 99.9% of harmful pathogens on contact
- Hypoallergenic
- Latex free, flexible and conformable
- Strong and reliable adherence
- Class 1 medical device
- Approved in more than 50 countries
- Available in breathable non-woven and waterproof

TrioMed Antimicrobial Medical Adhesive products provide the ultimate interactive antimicrobial shield by effectively killing harmful microbiological contaminants found on the external surfaces of medical tapes and dressings and are an effective solution to stop this widespread contamination.





1st and only self-cleaning medical tapes and dressings

IT'S TRIOMED OR IT'S CONTAMINATED



It's scientifically proven:
There's widespread microbial contamination of
standard bandages.

Breathable and waterproof,
TrioMed contains a powerful, non-irritating
antimicrobial agent proven to eliminate
99.9% of microbes†.

www.i3biomedical.com

Discover the clean solution to regular bandages

Now available in drugstores across Canada

TrioMed is made exclusively by I3 BioMedical Inc, a Canadian and European company. Trusted all over the world :



† Proven to eliminate microbes on the external surface of the tapes and dressings.

Lymphedema: Issues and Interventions

By David Keast, MSc MD FCFP, Janet L. Kuhnke, RN BA BScN MS NSWOC DrPsych
and Heather Hettrick, PT PhD CWS CLT-LANA CLWT

Lymphedema, also known as lymphatic edema (LE), may occur when there is a failure and subsequent overload of the lymphatic system. The condition leads to localized retention of fluid, resulting in swelling of the extremities.

The underlying epidemiology of LE can be difficult to determine. It may occur as an isolated, single condition or alongside multiple other local or systemic, sometimes life-threatening, diseases.¹ It may be caused by congenital abnormalities, trauma to the lymphatic system, lymphatic bacterial infections and/or venous congestion, resulting in protein-rich fluid in the tissues.² Determining the cause may be complicated by the challenges of quantifying (testing diagnostically) the edema severity and the changes identified to the affected tissues and surrounding skin.³

Therefore, careful and focused health assessment and history taking are essential, particularly in determining if there have been previous risk events that may contribute to development of LE, or, for example in the case of lower-extremity edema, the cause is heart failure or venous insufficiency.

Who is affected by LE?

Lymphedema affects persons at any age and occurs more often in women.⁵ In Canada, a recent analysis estimates the number of people living with LE and chronic edema to be more than a million, including persons with venous disease, obesity/morbid obesity, cancer(s), disabilities, non-cancer-related surgeries and primary or congenital LE.⁶ Clinicians frequently identify LE as a

Note: This document does not address the complexity and speciality education required to assess, treat or manage clients with compression bandaging systems, manual lymphatic drainage, simple lymphatic drainage, modified/multilayer bandaging systems, intermittent pneumatic compression, or any maintenance stocking, device or therapy.



result of cancer, yet many common risk factors for chronic edema and LE are non-cancer related and not readily identified.⁶ Identified LE causes include underlying co-morbidities such as heart failure, renal (kidney) failure, liver disease, venous reflux disease, cancers (both the cancer and the treatment/surgery), lymphatic congestion or failure, side-effects from medications, protein cal-

orie malnutrition, and local (micro) and systemic (macro) inflammatory conditions.⁴

What is the impact of LE?

Lymphedema is rarely fatal, but it can be debilitating if not diagnosed, treated and managed early. It affects a person's quality of life

Useful Definitions⁴

Lymphedema is an abnormal swelling of a limb and/or the related quadrant of the trunk due to the accumulation of protein-rich fluid in the tissue spaces of the skin.

Chronic LE is chronic edema lasting more than three months that is minimally responsive to overnight leg elevation or diuretics and is accompanied by skin changes such as thickened skin, hyperkeratosis and papillomatosis.

Primary LE is related to congenital absence or malformation of lymphatics and may appear at birth or later in life:

- If it develops before one year of age it is called Milroy's disease.
- If onset is during puberty it is often referred to as Meige's disease, or lymphedema praecox.
- If onset is after age 35 it is usually called lymphedema tarda.

Secondary LE results from damage to lymphatics.

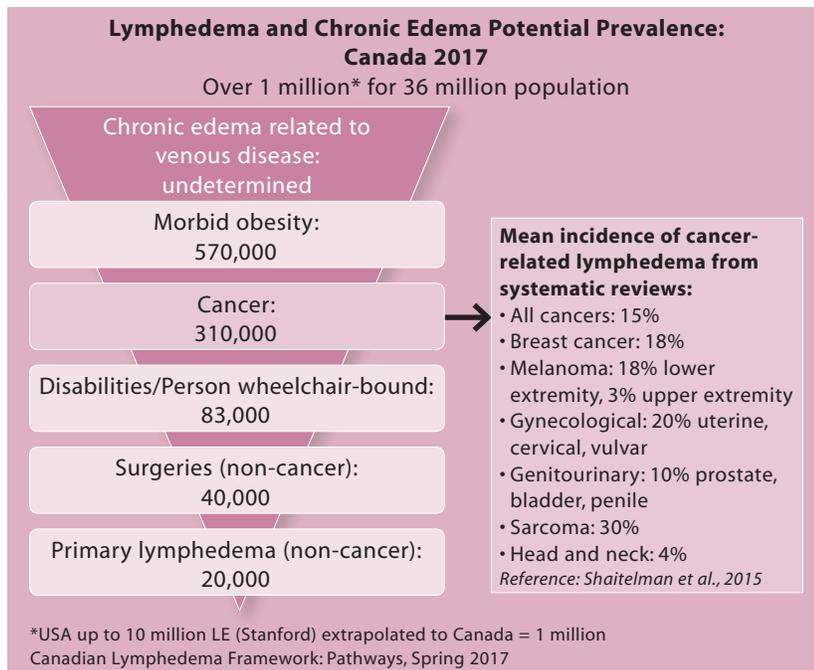


Figure 1: Lymphedema and Chronic Edema Potential Prevalence, Canada 2017⁷

and the ability to manage day-to-day activities.⁷ Persons living with LE experience psychosocial stress and physical changes that may be related to body image distortion, pain, depressive symptoms leading to diagnosed depression, skin infections and related cellulitis, reduced range of motion and subsequent reduced mobility (upper and lower limbs), loss of income and possible employment changes.⁸

Lymphedema-related swelling usually presents in the legs or arms due to an obstruction or inadequate function of a lymph channel.⁹ Congestion of the lymphatic fluid accumulates in the interstitial compartment, leading to local and extensive limb swelling that may present unilaterally or bilaterally. Though LE and chronic edema are frequently assessed in the extremities, they can occur throughout the body, and the trunk and genitals are often involved.

Types of Lymphedema: Primary and Secondary Lymphedema

Primary (idiopathic) LE occurs when a person is born with a congenital abnormality or has an

inherited abnormality of the lymphatic system.⁵ The prevalence of primary LE is 1.15 per 100,000 people.⁷ Primary LE is more common in women (lower limbs), and signs may be evident at birth or develop as an individual grows or when experiencing hormone-level changes.⁵ Keast and Towers state that based on epidemiological data, primary LE cases are estimated to affect 20,000 persons⁶ (see Figure 1).

Secondary (acquired) LE is more common and the causes are wide-ranging. Secondary LE develops when the lymphatic system is damaged or traumatized.⁵ In developed countries, leading causes of LE include cancers and radiation. The BC Cancer Agency states that tumours that obstruct the lymphatic channels or nodes occur with breast cancer, and gynecological, colorectal and genitourinary surgery, lymphoma, melanoma, sarcoma, and head and neck cancer.⁸ Radiation therapy used to treat lymph nodes, or lymph node biopsies and/or dissections can further contribute to LE development. In Canada, of growing concern is an increase in LE cases related to substantially increased rates of obesity and morbid obesity. Consequently, understanding LE is an important issue for clinicians.

In developing countries, a common cause of secondary LE is lymphatic filariasis (LF) (see Figure 2).¹⁰ LF is a severe type of edema resulting from infection from parasites (three types of filarial roundworms) that impair the lymphatic system.

LF leads to debilitating pain, deformity of body parts, emotional strain, social stigma and employment changes.¹¹ It is estimated that 1.3 billion people globally are at risk of LF infection, with more than 120 million already infected,⁴ mostly in tropical and sub-tropical regions, particularly in poor countries, where sanitation and housing are of poor quality.⁴

Stages of Lymphedema

The International Society of Lymphology presents a four-stage clinical system with associated features specifically related to the physical condition of the extremities.¹ Table 1 outlines the stages.

How is lymphedema classified?

Lymph-related edema is classified as acute or chronic (see Table 2). The true epidemiology of risk factors for the development and progression of LE remains uncertain, and more research is needed. Further complicating the identification of risk factors is that there may be a considerable delay between the causative event and the onset of LE.⁴

Consistent physical assessment includes vital signs, patient's general appearance (inspection, palpation), measurement of upper and lower limb(s) starting with the unaffected side to establish a baseline.

It Takes a Committed Team

Standards of practice have been developed under the umbrella of the International Lymphoedema Framework. This collaboration of stakeholder groups includes academics, health professionals, patients/families, industry and community organizations to promote research, best practice guidelines, and to set clinical lymphedema stan-



Figure 2: Lymphatic filariasis

dards worldwide. Current standards of practice for lymphedema services, as taken from the International Lymphoedema Framework's 2006 document titled "International Consensus: Best Practice for the Management of Lymphoedema," are as follows:¹³

Table 1: Stages of Lymphedema¹

Stage	Features
0 – Subclinical or latent condition	<ul style="list-style-type: none"> Swelling is not yet evident; there are subtle changes in fluid/tissue composition and changes in subjective symptoms. Symptoms may exist months or years before overt edema occurs. Heaviness and discomfort and aching are experienced.
1 – Spontaneously reversible	<ul style="list-style-type: none"> There is early accumulation of fluid relatively high in protein content (compared with venous-related edema), which subsides with limb elevation. Pitting may occur. An increase in various types of proliferating cells may also be seen.
2 – Spontaneously irreversible	<ul style="list-style-type: none"> Early stage: Limb elevation alone rarely reduces the tissue swelling, and pitting is manifest. Later stage: Limb may not pit as excess subcutaneous fat and fibrosis develop.
3 – Lymphostatic elephantiasis	<ul style="list-style-type: none"> Swelling is present. Pitting can be absent. Trophic skin changes such as acanthosis, alterations in skin character and thickness, further deposition of fat and fibrosis, and warty overgrowths may be present.

Note: A limb may exhibit more than one stage, which may reflect alterations in different lymphatic territories.

Common Risk Factors*

As part of careful assessment and history taking, clinicians should consider the following risk factors:

- Trauma such as a sprain
- Trauma in at-risk regions due to punctures, blood pressure measurement, injections, wound/drainage complications
- Surgery that interferes with lymph nodes or vessels (lymph node dissection, breast surgery), varicose vein surgery, orthopedic surgery
- Chemotherapy (taxanes)
- Scar formation in the form of fibrosis/radio-dermatitis from post-op
- Cancer, various forms (melanoma, gynecological cancer, head and neck cancer, sarcoma)
- Intra-pelvic or intra-abdominal tumours that involve/compress lymphatic vessels
- Radiotherapy in the regions of the lymph nodes, mammary glands or pelvis (postoperative)
- Recurrent infections, infection of soft tissues
- Chronic skin disorders and inflammation
- Cording (axillary web formation)
- Seroma formation
- Obesity, poor nutrition
- Congenital predisposition
- Hypertension
- Insertion of a pacemaker
- Arteriovenous shunt for dialysis
- Living in or visiting a geographic area endemic for lymphatic filariasis
- Thrombophlebitis and chronic venous insufficiency
- Varicose vein stripping and vein harvesting
- Unresolved asymmetrical edema
- Concurrent medical illnesses such as phlebitis, hyperthyroidism, kidney or cardiac disease
- Bed/chair-dependency, immobilization and prolonged limb dependency (pelvic and genital-scrotal edema)

*Not all inclusive

Various medications can cause edema, including calcium channel blockers (amlodipine), non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen, corticosteroids such as prednisolone, and hormonal therapies such as tamoxifen for hormone-receptor-positive breast cancers.¹³

- **Identify people at risk for or with lymphedema** via systemic organization for the identification of those at risk, regardless of cause. Implement and monitor to ensure patients receive high-quality education and lifelong care.
- **Empower people at risk for or with lymphedema** through the creation of individual plans of care with emphasis on self-management developed in partnership with patients, and involving relatives and caregivers where appropriate.
- **Provide treatment services** that deliver high-quality clinical care that integrates community, hospital and hospice-based services. Provide universal access to trained health-care professionals, including specialists, that incorporates ongoing assessment, planning, education, advice, treatment and monitoring.
- **Provide high-quality clinical care for people with cellulitis/erysipelas** involving agreed-upon protocols for the rapid and effective treatment of skin infections such as cellulitis/erysipelas, as well as the prevention of recurrence. Care should be implemented and monitored by trained and certified health-care specialists.
- **Provide compression garments for people with (or at risk for) lymphedema** and provide protocols for assessment and provision of these garments.
- **Provide multi-agency health and social care** to enable comprehensive assessment for any client at risk for or with lymphedema who requires multiagency support, to ensure access and care appropriate to their needs are met by health and social services.

Why is assessing and diagnosis LE so challenging?

Careful history taking and a comprehensive assessment support identification of risk factors to distinguish LE from other conditions (see sidebar).

Early assessment and diagnosis enhance the opportunity of successful treatment and management. Investigations may include but are not limited to ultrasound to assess tissue characteristics,

Table 2: Clinical Parameters of Lymphedema

Type	Clinical Characteristics
Acute	<ul style="list-style-type: none">• Short-lived and self-limiting – less than 3 months• Imbalance of filtration and reabsorption• Local inflammation
Chronic	<ul style="list-style-type: none">• Longer-term – greater than 3 months• Minimal responsiveness to elevation of the limb(s) and/or use of diuretics and a positive Kaposi-Stemmer's sign:• The normal thickness of the skin fold at the 2nd toe is 2 to 4 mm.• A positive Kaposi-Stemmer's sign – inability to raise skin fold – means fibrosis is already present (at least Stage 2).• A negative Kaposi-Stemmer's sign does not exclude the diagnosis of LE but means the limb/patient should be monitored, as it may be too early in the LE development to show signs of fibrosis.

ankle-brachial pressure index (APBI), toe-brachial pressure index (TBPI), colour duplex Doppler ultrasound to rule out deep vein thrombosis and evaluate venous abnormalities, a screening lab panel and a filarial antigen test (if the person is at high risk).⁴ Assessment includes overall physical health, pain with and without activity, mobility, employment and work capacity, and psychosocial and spiritual well-being.

Differential Diagnosis of Lymphedema

Regardless of the underlying cause, lymphedema is a manageable condition with established interventions. In order to adequately manage the condition, early and proper diagnosis is essential.

For clinicians, one of the challenges is learning to differentiate between lymphedema and other types of edema (e.g., from health failure or venous insufficiency). Of particular importance is the current paradigm shift in thinking that all edema is the result of lymphatic drainage failure.^{14,15} This represents the prevailing thought that all edema is on a lymphedema continuum; when the body's system is overwhelmed, it results in a transient form of LE, whereas true damage or impairment to the lymphatic system leads to the disease of LE.¹⁴ For example, a sprained ankle will lead to swelling—which involves lymphatic dysfunction—which will resolve. This is sometimes called lymph stasis, because it resolves within a few weeks. If the problem does not resolve, the damage to the lymphatics becomes permanent, and at

that point would be considered lymphedema.

One of the most common forms of lower extremity LE is phlebolymphe¹⁴dem¹⁵a. Chronic venous hypertension leads to a high filtration pressure that results in increased fluid levels in the interstitial tissues. This excess water load begins to exceed the lymphatic transport capacity. Over time, this can lead to lymphatic hypertension that damages the lymphatic structures. When the lymphatic system becomes damaged/ impaired, the high protein fluid in the interstitial tissues creates an inflammatory reaction, resulting in the fibrotic changes commonly seen in patients with chronic lymphedema. This disruption, combined with the venous insufficiency, contributes to venous ulceration. Excessive demand on the lymphatics results in a loss of fluid homeostasis. Clinically, this is seen as edema. However, the underlying pathophysiology is damage and



Figure 3: The effects of lymphedema

dysfunction in both the venous and lymphatic systems leading to phlebolymphe­dema—mixed venous and lymphatic disease.¹⁶

Further adding to the diagnostic challenge is lipedema, which is often confused with LE. Lipedema is a fat disorder associated with bilateral adipose deposition (typically from the ankles to the hips), and when present, it hinders and constricts lymphatic flow. However, the presence of lipedema can result in the development of LE¹⁸ and is referred to as lipolymphe­dema. Additionally, patients can present with lipedema along with phlebolymphe­dema, a condition termed *phlebolipolymphe­dema*.

As a general guideline, lymphedema or any chronic edema lasting more than three months, and minimally responsive to limb elevation and/or diuretics and with one or more secondary skin changes such as a positive Kaposi-Stemmer's sign⁶ is clinically relevant to support the diagnosis of lymphedema.

Complications Related to Lymphedema

Complications related to LE vary by individual and may involve physical signs such as swelling, heaviness in the extremity, numbness, pain and infection.¹⁸ Persons with lower-limb extremity LE report a higher symptom burden and increased infection complications (episodes of infection, hospitalizations) when compared with those with upper-limb extremity LE.^{4,18} Quality of life domains affected by LE include physical health, psychological well-being, level of independence, social relationships, environment, spirituality/religion and personal beliefs. The following section describes these aspects in relation to living with LE.²⁷

Treatment and Management Goals for Patients with LE

The following are the primary goals for treatment and management for LE patients:

- Patient education related to pain and psychosocial and spiritual issues
- Promotion of a healthy lifestyle
- Prevention of skin and tissue infections

- Creation of mobility and activity plans
- Implementation of a compression bandaging strategy and garment management
- Pharmacological management

An integrated team, which includes a variety of health-care professionals and other service providers along with the patient/family, should establish treatment and management goals for underlying diseases and conditions. For LE, overall management includes meticulous skin care and hygiene, education and patient/family engagement and participation, manual lymphatic drainage (MLD), compression bandaging, simple lymphatic drainage (SLD) involving limb elevation, and regular exercise to activate the muscle pumps (upper and lower extremities). Intermittent pneumatic compression (IPC) can help to maintain reduced limb volume; however, the long-term use of compression garments is essential to help control LE after the initial treatment phase. Although there currently is no cure, lymphedema can be successfully managed as described above, but it does require a lifelong commitment. Throughout this time, communication among team members and across settings (home and community care, long-term care, rehabilitation unit, and acute or emergency care) is crucial. It is essential that clinicians collaborate with the patient and work as a team to identify key persons who will support and aid the patient in all decision-making and activities throughout the lifelong LE management process.

What do you see, and how do you treat LE?

Skin Complications/Infections

The Impact

Disorders of the lymph system, whether systemic (macro-lymphedema) or localized (micro-lymphedema), produce cutaneous regions susceptible to infection, inflammation and carcinogenesis.^{20–22}

Some of the most common skin complications include:

- Dryness (cracked, flakey, rough); fissures
- Cellulitis/erysipelas (infection of the skin and

Figures 4 to 8: Common Skin Complications Caused by Lymph System Disorders



Figure 4: Dry skin



Figure 5: Taut, shiny skin



Figure 6: Papillomatosis



Figure 7: Skin folds



Figure 8: Lymphorrhoea

Images used with permission (Keast, 2017).

- subcutaneous tissues most commonly caused by streptococci and *Staphylococcus aureus*)
- Hyperkeratosis (over-proliferation of the keratin layer, producing scaly grey or brown patches)
- Folliculitis (inflammation of hair follicles)
- Fungal infections
- Lymphangiectasis, also known as lymphangiomas (soft fluid-filled projections caused by dilations of lymphatic vessels)
- Papillomatosis (raised firm projections on the skin due to dilatation of lymphatic vessels and fibrosis. This may be accompanied by hyperkeratosis.)
- Lymphorrhoea (occurs when lymph leaks from the skin surface)
- Ulcerations (occurs with underlying arterial and venous disease)
- Venous eczema (also known as varicose eczema,

- or stasis dermatitis)
- Contact dermatitis (an allergic or irritant reaction)
- Lymphangiosarcoma (a rare form of lymphatic cancer)^{4, 10, 13}

The Interventions

Prevention of skin damage such as cuts and irritations for patients at risk for or with LE involves consistent skin hygiene and care to keep the skin intact, clean, dry and moisturized. Cuticles should not be cut, and artificial nails should not be applied on patients with upper extremity LE. If skin damage occurs, the area should be washed and patted (not rubbed) dry, and hydrating, low-pH lotions and/or emollients applied. If needed, and in consultation with a physician/nurse practitioner, topical antibiotics should be applied and progress monitored. Signs of possible infection

include rash, itching, increased skin temperature or fever, and flu-like symptoms. Any symptom should be monitored and reported to a health-care professional.⁴ Pain is reported in 50% of persons with LE and associated skin complications, so proper management is essential, as it affects a person's well-being and ability to cope and participate in care.¹³

Skin care for the limb at risk for or with LE includes the following:

- Monitor skin, especially in less visible areas. Skin should be monitored daily for dryness, cuts, scrapes or bruising on the limb or affected area. It is important to look between the toes and fingers and under skin folds if present.
- Avoid any type of constriction on the affected limb, such as tight clothing, shoes and jewellery, as well as blood pressure cuffs and venipunctures.
- Assess and treat infection if present with the proper dressings and compression bandages.
- Maximize nutritional status with a referral to a registered dietitian.
- Manage moisture, with a referral to a nurse specialized in wound, ostomy and continence.
- Assess and address for continence if appropriate, with a referral to a nurse specialized in wound, ostomy and continence, and/or a nurse continence adviser.
- Assess pain using a validated tool, and manage the pain based on the assessment.

Level of Independence – Mobility and Range of Motion

The Impact

Limb weight may preclude a patient living with LE from engaging in and performing activities of daily living and instrumental activities of daily living. Immobility primarily refers to lower extremity edema and failure of the calf-muscle pump, and includes those with fixed ankles and those who are chair-bound.⁶ Maintaining adequate levels of energy, managing fatigue, and achieving sleep and rest are important for supporting patient activity plans. Clinicians should emphasize to the patient that being active improves lymphatic and venous flow to reduce limb size/volume. There should be

ongoing and consistent measurement of the limb's affected area and comparison to baseline.

The Interventions

Maintenance of a healthy weight in persons at risk for LE or who are obese has been shown to be of benefit.^{1,23-25} Nutritional support to optimize weight in combination with activity and exercise benefits the patient's overall health. It is important to monitor the affected area during and after activity for changes in size, shape, texture, soreness and similar symptoms.⁴ Rest periods between work and activity allow for limb recovery.⁴

Functional care planning includes the following:

- Optimize mobility and activity through light exercises that encourage lymph drainage. All exercise should be performed while wearing compression bandages or garments. Clinicians should refer their patients to a certified lymphedema therapist, who will be expert at assessing and treating the condition. These therapists may be nurses, physiotherapists, occupational therapists and massage therapists who have undergone specialized training to meet national training standards.²⁶
- Ensure equipment and mobility aid(s) are frequently assessed and monitored, as a patient's needs may change.
- Assess and modify situations where the affected area is experiencing pressure from equipment, garments, medical-devices and clothing (e.g., sitting, standing or crossing legs).
- Refer the patient for professionally fitted compression hosiery. If personal finances preclude obtaining appropriate garments, the clinician should refer the patient to a social worker or other appropriate support professional.
- Ensure the patient protects limb tissues while engaged



in activity. Clinicians should refer the patient to a certified garment specialist for long-term management. Limbs that are at risk should have compression for strenuous activities except where there are contraindications such as open wounds or poor circulation.⁴

- Encourage the patient to obtain professionally fitted footwear.
- Assess the ability of the patient to safely participate in work or school, social and leisure activities through self-pacing, protection of the limb and skin, and learning the most efficient and safe way to participate. Referrals can be made to an occupational or physical therapist for support.
- Prevent falls through education about fatigue and about the correct use of equipment and devices.
- Discuss proper sleep hygiene and positioning with the patient.

Management of LE

The Impact

Day-to-day management of LE includes the use of compression. The proper type of compression will be prescribed and may include compression hosiery, stockings, hook-and-loop fastened devices or wraps, sleeves, bandages, night garments, bandaging systems (modified/multilayer inelastic lymphedema bandaging [MLLB]), and intermittent pneumatic compression used to encourage fluid management back to the trunk of the body. These

treatments vary and may be used in combination depending on the situation.

The Interventions

The standard of care for the management of LE is complete decongestive therapy (CDT).¹ Interventions focus primarily on decreasing the edema to return the limb to normal, or as close to normal as possible. Early assessment and treatment are

essential.⁴ Certified massage therapists,²⁷ certified compression garment therapists and nurses play an important role. Therapy includes providing skin care and hygiene, manual lymph drainage (MLD), compression therapies such as intermittent pneumatic compression (IPC), exercise, and extensive patient education for lifelong self-management.²⁸

Once the limb has been decongested and has returned to as near normal as possible, ongoing therapy and protection of the limb are essential. All aspects of complete decongestive therapy should be continued by the patient or with assistance from a caregiver or family member, for life. If the patient has skin breakdown or open wounds, single-use bandage systems (2-, 3-, or 4-layer) can be used until the wound or skin issue has resolved, in combination with appropriate wound management. Patients should wear appropriate compression for their skin condition, lymphedema and lifestyle at all times other than during personal hygiene activities. For patients requiring long-term use of garments and devices, education should be provided to the patient/family and caregivers. Clinicians should provide education to patients, family and caregivers regarding the care, washing and drying of each garment, and should support patients if finances preclude them from obtaining appropriate garments.

Psychological Health

The Impact

Psychological health is affected when learning about and learning to live with LE. Living with LE is complex and is associated with poor self-esteem, altered body image, depression and anxiety.⁴ In addition, loneliness, isolation and loss of sense of self can interfere with one's ability to cope. Lowered well-being may affect the patient's ability to engage and participate in their health-care decisions, family relationships and community. Patients may present with distress, poor coping skills and limited engagement with caregivers and treatment planning.¹³

The Interventions

It is important use validated tools to screen for depressive symptoms, depression, anxiety, feelings



of worthlessness and reduced hope. If feelings of worthlessness, depression or anxiety persist for longer than three months, the patient should be referred to mental health services.¹³ Psychologists, social workers and counsellors may offer therapy, counselling and culturally relevant supports. Sleep and rest patterns should be reviewed. Some patients may benefit from complementary and alternative therapies (relaxation therapy, mindfulness, mind-body therapy) as is reported in populations living with chronic illnesses.²⁹ Furthermore, the role of traditional, cultural or folk healers should be considered.³⁰ Delivery of culturally sensitive education for the patient and family members is of benefit. It is important that the focus be on LE prevention and management strategies, including the benefits of activity, exercise and relaxation to help the patient adapt.³¹⁻³² For employed patients and those in active volunteer roles, clinicians should consider their work-ability, and support work adaptations as needed. Caregiver burnout can be prevented by engaging and supporting the family unit.

Social Activities

The Impact

Adapting to life with LE may be challenging. Changes in body image, the perception of self, sexual activity and the ability to participate in social activities may change or be impeded. It is important when living with a chronic disease to maintain social contacts and engagement with friends, family and community.

The Interventions

Clinicians should consider referring the patient to and engaging the patient in a chronic-disease self-management program³⁵ and, if possible, encourage family members or close friends to attend classes. Self-management of LE is complex and includes a modified version of complete decongestive therapy.³⁴ In addition, self-care includes lifestyle modifications, nutrition and weight management, organization of medical appointments and day-to-day management of other aspects of living. As patients' underlying health issues change, so does their ability to

manage self-care when living with LE, which needs to be taken into consideration when planning long-term care.

Patients should be encouraged to participate in treatment and management planning as much as possible. Clinicians should be conscious of caregiver fatigue and burnout. For patients with cognitive impairment or fatigue, family members or friends should be engaged as a care partner in communication and decision-making as part of the integrated care team.³⁵ Throughout the process it is important that the clinician provide privacy and build trust, so the patient feels free to discuss issues relating to sexual activity and intimacy.

Spirituality

The Impact

Patients living with LE often receive hope, solace and encouragement from friends and family members through their spiritual values, beliefs and traditions.³⁶ Health-care professionals are in a unique position to encourage clients regarding their spiritual health, as it can promote psychological well-being and emphasize holistic care. Spirituality is defined as the patient's "belief in and experience of a supreme being or an ultimate human condition, along with an internal set of values and active investment in those values, a sense of connection, a sense of meaning, and a sense of inner wholeness."³⁷ Hengen further describes spirituality as a balance between a client's social, emotional, and spiritual wellness;³⁸ this is not just an individual process, as individuals live in social circles and in community.

The Interventions

Spiritual wellness, while adapting to life with LE, may be challenging, as one's ability to participate in spiritual readings and meditations, religious and faith-based activities or rituals may be altered. Conducting a spiritual assessment encourages the patient to remain connected with their practices, faith or religious community. Patients often identify more strongly with health-care professionals who assess them as whole individuals with spiritual needs. Any spiritual well-being assessment should be conducted using a

validated tool, for example the HOPE Approach to Spiritual Assessment; Spiritual Assessment Tool.³⁹ Clinicians should support their patients by encouraging them to be in contact with members from their spiritual community and spiritual leaders. These efforts support the patient's psychological health and well-being.

Conclusion

Living with LE is complex. This paper has focused on key complications, assessment, and conducting a careful history taking and a focused health assessment, as well as identification of interventions and considerations for patients living with or at risk for LE. Patients with LE experience physical, psychosocial and spiritual issues and require care from an integrated care team. Communication and education are essential for proper assessment, treatment and management. 

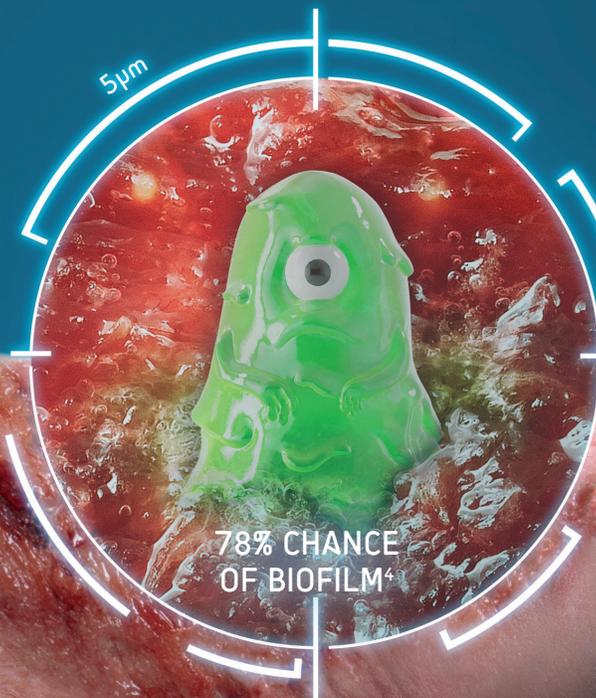
References

1. International Society of Lymphology. The diagnosis and treatment of peripheral lymphedema: 2016 consensus document of the International Society of Lymphology. *Lymphology*. 2016;49:170–184.
2. Macdonald JM, Ryan TJ. Lymphoedema and the chronic wound: The role of compression and other interventions. In: *Wound and Lymphoedema Management*. Geneva: World Health Organization; 2010. pp. 63–84.
3. Fife CE, Sieggreen MY, Kline RA. Lymphedema. In: Baranoski S, Ayello EA, editors. *Wound Care Essentials: Practice Principles*. 4th ed. Wolters Kluwer; 2012. pp. 358–375.
4. Keast D. Lymphedema. PowerPoint Presentation, unpublished. 2012.
5. Canadian Lymphedema Network. What is Lymphedema? 2015. Retrieved from <https://canadalymph.ca>.
6. Keast D, Towers A. The rising prevalence of lymphedema in Canada: A continuing dialogue. *Canadian Lymphedema Magazine*. 2017(Spring):5–8.
7. Cellina M, Oliva G, Menossi A, Soresima M, Martinenghi C, Gibelli D. Non-contrast magnetic resonance lymphangiography: An emerging technique for the study of lymphedema. *Clin Imaging*. 2019;53:126–133. Retrieved from: <https://doi.org/10.1016/j.clinimag.2018.10.006>.
8. BC Cancer Agency. Symptom management guidelines: Lymphedema. Vancouver, Canada: Provincial Health Services Authority; 2014. Retrieved from: www.bccancer.bc.ca/nursing-site/Documents/9.%20Lymphedema.pdf.
9. Polsdorfer JR, Davidson T. Lymphedema. In: *The Gale Encyclopedia of Nursing and Allied Health*. 3rd ed. Farmington, MI: Gale; 2013. Retrieved from: <https://login.ezproxy.cbu.ca/login?url=https://search.credoreference.com/content/entry/galeгнааh/lymphedema/0?institutionId=7684>.
10. Grada AA, Phillips TJ. Lymphedema: Diagnostic workup and management. *J Am Acad Dermatol*. 2017;77:995–1006. Retrieved from: <http://dx.doi.org/10.1016/j.jaad.2017.03.021>.
11. World Health Organization. Key Facts: Lymphatic Filariasis. Geneva: World Health Organization; 2018. Retrieved from: www.who.int/en/news-room/fact-sheets/detail/lymphatic-filariasis.
12. Keeley V, Piller N. Edema-causing medications. *Pathways*. 2017:1–2. Retrieved from: <https://canadalymph.ca/wp-content/uploads/2015/04/Edema-causing-medications.pdf>.
13. International Lymphoedema Framework. International Consensus: Best Practice for the Management of Lymphoedema. London, UK: MEP Ltd.; 2006.
14. Mortimer PS, Rockson SG. New developments in clinical aspects of lymphatic disease. *J Clin Invest*. 2014;124(3). Retrieved from: www.jci.org/articles/view/71608.
15. International Union of Phlebology. UIP consensus documents. San Francisco [Secretariat]: International Union of Phlebology; 2013. Retrieved from: www.uip-phlebology.org/uip-consensus-documents.
16. Pearson IC, Mortimer PS. Lymphatic function in severe chronic venous insufficiency. *Phlebology*. 2004;44:253–257. Retrieved from: www.phlebology.org/wp-content/uploads/2014/09/Phlebology44.pdf.
17. Ratliff CR. Lymphedema. In: Bryant RA, Nix DP, editors. *Acute & Chronic Wounds: Current Management Concepts*. 5th ed. St. Louis, Miss: Elsevier; 2016. pp. 227–238.
18. Ridner SH, Deng J, Radina FE, Thaidens SRJ, Weiss J, Dietrich MS, et al. Symptom burden and infection occurrence among individuals with extremity lymphedema. *Lymphology*. 2012;45:113–123.
19. World Health Organization. Programme on mental health: WHOQOL measuring quality of life. Geneva: World Health Organization; 1997. pp. 1–15. Retrieved from: www.who.int/iris/handle/10665/63482.
20. Carlson JA. Lymphedema and subclinical lymphostasis (microlympedema) facilitate cutaneous infections, inflammatory dermatoses, and neoplasia: A locus minoris resistentiae. *Clinical Dermatology*. 2014;32(5):599–615.
21. Ruocco E, Brunetti B, Brancaccio G, LoSchiavo A. Phlebolympedema: Disregarded cause of immunocompromised district. *Clinical Dermatology*. 2012;30(5):541–543.
22. Ruocco E, Puca RV, Brunetti G, Schwartz RA, Rucco V. Lymphedematous areas: Privileged sites for tumors, infections, and immune disorders. *International Journal of Dermatology*. 2007;46(6):662.
23. Government of Canada. Canada's Food Guide. Ottawa: Government of Canada; 2019. Retrieved from: <https://food-guide.canada.ca/en>.

24. Dietitians of Canada [UnlockFood.ca]. BMI Calculator. Toronto: Dietitians of Canada; 2019. Retrieved from: www.unlockfood.ca/en/Articles/Weight-Loss/BMI-Calculator.aspx.
25. Twells LK, Gregory DM, Reddington J, Midodzi WJ. Current and predicted prevalence of obesity in Canada: A trend analysis. *CMAJ*. 2014;2(1):E18–E26.
26. Canadian Lymphedema Framework. Certified lymphedema therapists. Toronto: Canadian Lymphedema Framework; 2015. Retrieved from: <https://canadalymph.ca/certified-lymphedema-therapists>.
27. Canadian Lymphedema Framework. Clinical Guidelines, Position Papers, and Publications. 2019. Retrieved from <https://canadalymph.ca/health-professionals/clinical-guidelines-position-papers-and-publications/>.
28. Jobst LymphCARE. Complete Decongestive Therapy. Luxembourg: BSN Medical; 2018. Retrieved from: www.lymphcareusa.com/professional/therapy-solutions/complete-decongestive-therapy.html.
29. Larson PD, Woods JM. Complementary and alternative therapies. In: Kramer-Kile ML, Osuji JC, Larsen PD, Kubkin IM, editors. *Chronic Illness in Canada*. Burlington, MA: Jones & Bartlett; 2014. pp. 393–427.
30. Kleinman A. Client and Healer in the Context of Culture. California: University of California Press; 1980. pp. 36–72.
31. Abbasi B, Mirzakhany N, Angooti Oshnari L, Irani A, Hosseinzadeh S, Tabatabaei SM, et al. The effect of relaxation techniques on edema, anxiety and depression in post-mastectomy lymphedema clients undergoing comprehensive decongestive therapy: A clinical trial. *PloS One*. 2018;13(1):e0190231.
32. Ha K, Choi S. The effect of PNF technique program after mastectomy on lymphedema patients' depression and anxiety. *J Phys Ther Sci*. 2014;26(7):1065–1067.
33. Lorig K, Sobel D, Gonzalez V, Minor M. *Living a Healthy Life with Chronic Conditions*. Boulder, CO: Bull Publishing, 2007.
34. Todd M. Self-management of chronic oedema in the community. *Br J Community Nurs*. 2014;19(Sup 4):S30–6.
35. Heppner PP, Tierney CG, Wang Y-W, Armer JM, Whitlow NM, Reynolds A. Breast cancer survivors coping with lymphedema: What all counsellors need to know. *J Couns Dev*. 2009;87:327–339.
36. Ridner SH, Bonner CM, Deng J, Sinclair VG. Voices from the shadows: Living with lymphedema. *Cancer Nurs*. 2012;35(1):E18–E26.
37. McLeod DL. Spirituality and illness in professional literature. In: Wright LM, editor. *Spirituality, Suffering, and Illness: Ideas for Healing*. Philadelphia: F.A. Davis; 2005. pp. 63–108.
38. Hengen T. *Medicine Wheel Model of Mental Health*. Victoria, Canada: Friesen Press; 2012.
39. American Family Physician. Spiritual assessment tool and HOPE approach to spiritual assessment. Kingston, Canada: Queen's University, Faculty of Health Sciences, School of Medicine; 2001. Retrieved from: <https://meds.queensu.ca/source/spiritassesstool%20FICA.pdf>.



YOU HAVE THE POWER TO
DISRUPT AND DESTROY BIOFILM¹
 TO ADVANCE HEALING^{2,3}



NON-HEALING WOUNDS
 NEED **MORE THAN SILVER™**

Specifically developed to win the battle against biofilm, **MORE THAN SILVER™** technology harnesses the synergistic power of three key components; ionic silver, a surfactant and a metal chelating agent working together to deliver superior¹ performance.*

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

AQUACEL, Hydrofiber and MORE THAN SILVER are trademarks of ConvaTec Inc. ©2019 ConvaTec Inc. AP-019908-MM

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



Preventing Amputation in Cases of Diabetes Distress: A Case Study

By Mariam Botros, DCh CDE IIWCC, Janet L. Kuhnke, BScN MS NSWOC DrPsychology, Peggy Dunbar, MEd PDt CDE and Cheryl A. Smith, RN NP DNP

Case Presentation: Ms. L.K.

Ms. L.K. is a 43-year-old female who has been living with type 1 diabetes for 30 years. Her routine care has been with her primary care provider, focused on ensuring general well-being and routine monitoring for disease progression. But are self-management and her usual approaches to care adequate? The patient had been referred to a diabetes centre to address diabetes care, education needs and a refinement of her treatment plan.

Ms. L.K. tends to keep her blood glucose high because she lives alone, to reduce the chance of hypoglycemia. She does not currently adjust her insulin levels and does not practise routine preventative foot care. She does not smoke and states that she feels “healthy.” Ms. L.K. has confirmed background retinopathy, and reports changes in leg/foot sensation as well as a small callus.

The patient presents with a BMI of 28.* Her most recent A1c was 7.9%. She reports wearing slip-on flat shoes, as they are easiest on her feet for the job roles she performs. A diabetic foot screening revealed unkempt toenails, neuropathy and loss of protective sensation (LOPS), as well as a deformity in the left hallux and a large callus on the left plantar surface (first digit). Based on a conversation with her diabetes educator, it was determined that the patient’s understanding of good preventative foot care practices requires a refresh. According to *Inlow’s 60-Second Diabetic Foot Screen*, Ms. L.K. is at high risk of requiring a lower leg amputation. She falls into Category 2 due to the presence of LOPS, deformity and evidence of pressure.

Ms. L.K. reports feeling some distress and being overwhelmed with care issues, as well as the emergence of some diabetes complications. At times she is burdened and is trying her best to improve her situation and minimize her stress and worry regarding her condition. She has verbalized her fear of amputation. She also faces financial difficulties, including possible food insecurity and a lack of health/medical insurance, and feels anxious at the thought of her declining overall health.

*A BMI of 30 kg/m or higher is considered obese for adults aged 18 and over. A BMI between 25 and 30 kg/m is considered overweight.⁴ [Click here](#) to access the Health Canada BMI calculator online.



Risk Assessment

Patients living with diabetes face a high risk of amputation; these patients are 15 to 40 times more likely to require lower-leg amputation than the general population,¹ and the five-year mortality rate following amputation is 50%.² In addition, individuals with type 1 diabetes are approximately 15 years younger than those with type 2 diabetes at the time of lower-extremity amputation. The rate of lower-extremity amputation in those with diabetes aged 29 to 59 is 50 times higher than that of the non-diabetic population.³ Therefore, it is essential that clinicians first consider care plans that focus on comprehensive foot assessments and preventing amputations.

As part of the patient's examination a foot screen was conducted (see box below). Foot screening is essential to the identification of risk. "Loss of sensation to the 10g Semmes-Weinstein monofilament at the plantar surface of the foot is a significant and independent predictor of a future foot ulcer and lower-extremity amputation."⁵

Inlow's 60-Second Diabetic Foot Screen tool aids clinicians in identifying at-risk feet. The basic 12 elements of the tool require only a 10 g monofilament, as well as good clinical knowledge and assessment skills.⁶

Barriers to Care

Since 85% of diabetes-related amputations are caused at least in part by non-healing wounds, clinicians need to address the issues underlying the wound's non-heal-

ing status. Wound healing may stall for multiple reasons, including neuropathy and the resulting repeated trauma to the wound, infection, vascular factors and poor nutrition. Barriers to care, whether they are patient factors, system factors or wound factors are many, and in Ms. L.K.'s case include:

- Social determinants of health
- Limited access to care, for example high parking cost to attend a diabetes clinic⁶ or geographical distance from appropriate clinics
- Language/communication difficulties
- Poor health literacy levels
- Poor public and professional awareness of optimal care

Barriers to care in other cases might include:

- Jurisdictional confusion, that is, a lack of understanding of which health-care professional or program is responsible for providing patient, family and community education or resources
- Lack of cultural competency among health-care providers, such as poor knowledge of cross-cultural beliefs and traditions and health-care knowledge⁸

Potential Paths

Depending on the barriers faced by the patient living with a diabetic ulcer, there are two paths that can be followed:

Path 1: If a patient lacks the knowledge and supports to understand the severity of their condition, they will be unable to advocate for their care and might become lost in a fragmented health-care system. In these cases,

it is common for the patient's condition to escalate until their wound becomes infected and amputation is necessary.

Path 2: If a patient enters the health-care system with the knowledge and support of their primary care physician, they and their care provider can better advocate for their health and better engage in preventative and self-care measures, leading to improved patient outcomes.

What can clinicians and systems do?: Effective Steps to Treatment

The first step in the effective treatment of diabetic foot conditions is assessing the patient and determining their level of risk for amputation.

Patient Needs

All patients with diabetes need to receive:

- Affordable, consistent and timely access to the medications, devices, self-care education and care necessary for achieving optimal diabetes control to help prevent serious complications such as amputation
- Access to publicly funded services and devices to prevent and treat foot ulcers and avoid amputation, including:
 - preventative foot care (routine foot assessments)
 - foot care education
 - footwear education
 - for the moderate- to high-risk foot:
 - professionally fitted footwear and devices
 - timely referrals to multidisciplinary teams

Using Inlow's 60-Second Diabetic Foot Screen, clinicians can quickly determine the needs of the patient and the type of treatment required. Goals of care should be identified.⁶ Based on the findings of this assessment and the goals of care, the clinician should address and manage identified factors by creating a care plan with the patient that is personalized, cost-effective and continuously evaluated.

When developing a plan of care, clinicians should consider the following factors:

- Co-morbidities and existing health factors (e.g., infection)
- Risk factors for potential skin breakdown
- Causes of actual skin breakdown (e.g., trauma, footwear)
- Patient needs (physical, emotional, spiritual, social, financial)
- Skin and wound status (if present)
- Environmental and system challenges

Once a care plan is created, it must be re-evaluated at regular intervals to determine if the goals of care are being met. Clinicians should determine if the plan is meeting the goals through discussion with the patient and reassessment of the patient, wound, system and environment using validated assessment tools, and adjust the plan of care with the patient as required.

It is important for health professionals to engage patients in preventative measures, including proper foot care, footwear and self-management. The patient's risk status should be communicated in a gentle, consistent and com-

Upgrade to the NEW PICO 7 single-use NPWT system today!

www.smith-nephew.com/pico

smith&nephew
PICO[®] 7
Single Use Negative Pressure Wound Therapy System



Supporting healthcare professionals

What's NEW?

Device performance

Enhanced management of air leaks helping to support healthcare professionals in delivering negative pressure and could potentially be used in problematic 'hard to seal' awkward areas.^{1,2}

Ease of use

The user interface with a 'dressing full' indicator, optimising dressing changes and an area to write start date of therapy, helping with healthcare protocols.

Patient quality of life

An even quieter pump than before and a transparent belt clip for greater portability.^{3,4}

Now indicated for deeper wounds >2cm



New deeper wound indication

PICO 7 dressing has been shown to be capable of managing low to moderate exudate, and deliver nominal -80mmHg therapeutic negative pressure in large wounds of depths >2cm. (when used with an appropriate NPWT filler)⁶

**as demonstrated *in vitro*

Smith & Nephew
2280 Argenta Rd
Mississauga ON
L5N 6H8 Canada

T 1-800-463-7439
F 1-800-671-9140

www.smith-nephew.com/canada

[†]Trademark of Smith & Nephew
All Trademarks acknowledged
©May 2019 Smith & Nephew
PICO-SA-1904EN | CA37405

The decision to use Smith & Nephew products should be made by a healthcare professional, in line with applicable local protocols. For detailed product information, including indications for use, contraindications, precautions and warnings, please consult the product's applicable Instructions for Use (IFU) prior to use.

References

1. DS.16.352.R Measurement of NPWT device air leak tolerance – PICO vs PICO II. October 2016.
2. Data on file report OR-DOF/42, A Volunteer trial to assess dressing performance of Palermo (PICO) Multisite vs control, March 2014.
3. DS.16.351.R Comparison of noise levels generated by the PICO and PICO II devices in operation. September 2016.
4. WMP.11446.UEF/R10 Project Fairbanks Human Factors Summary Report Issue. 5.
5. G. Walker, January 2018.
6. Smith & Nephew 2018. The review of evidence supporting the use of PICO in wounds ≥2cm in depth. Internal report. EO.AWM.PCS230.001.v2

Suggested Next Steps for Health Regions/Authorities

- Prevent and manage foot complications by providing a well-defined referral pathway, and coordination of care and communication among health-care professionals who support individuals with diabetes as part of a collaborative multidisciplinary team.
- Publish, on an annual basis, reliable data on diabetes-related foot care, using internationally recognized metrics, to assist ongoing quality improvement efforts.



passionate manner. Clinicians should support patients by sharing the knowledge, tools and other resources needed to prevent foot complications. This includes ensuring patients understand and feel confident in their ability to manage blood glucose levels, perform daily foot exams and carry out regular foot and nail care and hygiene. Practitioners should encourage their patients to seek help with

urgent foot problems and link them to community supports. They should discuss the importance of preventative footwear and having footwear professionally fitted with their patients.

By helping patients see their role as active team members in their care and by providing them with the knowledge, tools and supports they need, clinicians can empower patients to make changes that can prevent unnecessary amputations.

Ms. L.K.'s Care

In Ms. L.K.'s case, clinicians must take a consistent, compassionate and optimistic approach to her treatment. Fear of amputation can overwhelm her and work against her best interests and chances of recovery. As a result, it is critical for health-care providers to focus their efforts on prevention and self-management support, as it will help Ms. L.K. to see her own active role in healing and recovery.

Over time, as Ms. L.K. and her clinicians establish their trusting relationship, a treatment plan should be established that focuses on small, gradual changes. Some of these changes might include:

- Routine, regular insulin timing and doses. Consistency in timing and doses makes adjustments easier and the results more predictable.
- Self-monitoring, recording and adjustment of blood glucose (with phone support as needed), and eventual self-adjustment with tools to support her decision making (for an example, see the Self-Monitoring Blood Glucose tool from [Diabetes Canada](#))
- Establishing regular meals/breaks for consistency in CHO (carbohydrate) amounts.
- Establishing realistic glycemic targets including A1c and pre- and post-meal BG values, as needed.
- Connecting her to financial resources such as provincially funded insurance plans for individuals with low-income, community assistance programs, or local supports to assist with budgeting, access to healthy foods and so on.

References

1. Boulton AJM, Vileikyte L, Ragnarson-Tennvall G, Apelqvist J. The global burden of diabetic foot disease. *Lancet*. 2005;366(9498):1719–1724. Retrieved from: [www.thelancet.com/journals/lancet/article/PIIS0140-6736\(05\)67698-2/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(05)67698-2/fulltext).
2. Armstrong DG, Boulton AJM, Bus SA. Diabetic foot ulcers and their recurrence. *N Engl J Med*. 2017;376(24):2367–2375. Retrieved from: www.podimetrics.com/publications/Armstrong%202017%20Diabetic%20Foot%20Ulcers%20and%20their%20Recurrence.pdf.
3. Diabetes Care Program of Nova Scotia. Diabetes and Lower Extremity Amputations in Nova Scotia. Halifax. 2017. Retrieved from: <http://diabetescare.nshealth.ca/sites/default/files/LEARreportFinalMarch2018.pdf>.
4. Data Blog: Obesity in Canadian Adults: It's About More Than Just Weight. Public Health Agency of Canada. 2017. Retrieved from: <https://infobase.phac-aspc.gc.ca/datalab/adult-obesity-blog-en.html>.
5. Foot Care. Diabetes Canada. 2018. Retrieved from: <https://guidelines.diabetes.ca/cpg/chapter32>.
6. Foot Screen. Wounds Canada. 2018. Retrieved from: www.woundscanada.ca/health-care-professional/resources-health-care-pros/foot-screen.
7. Kuhnke JL, Keast D, Rosenthal S, Evans RJ. Health care professionals' perspectives on delivering patient-focused wound management: A qualitative descriptive study. *Journal of Wound Care* (in press). 2019.
8. Battiste, M. *Decolonizing Education: Nourishing the Learning Spirit*. Saskatoon, SK: Purich Publishing. 2016.

RECOGNIZING HS

DO YOU RECOGNIZE PATIENTS WITH HIDRADENITIS SUPPURATIVA (HS)?



DR. NEIL SHEAR

Head of Dermatology, Sunnybrook Hospital

"People with HS come to the emergency room in severe pain and discomfort requiring assistance with the draining of the boils during a flare-up. It's not unusual for patients to go home undiagnosed."



DR. RALPH GEORGE

Associate Professor, University of Toronto,
Division of General Surgery



DR. VU KIET TRAN

ER physician at University Health Network

"HS is a chronic, painful, inflammatory skin disease that affects 1-4% of the general adult population. It is characterized by boils usually occurring where certain sweat glands are located, such as under the breasts, buttocks, and inner thighs."

"There is currently no cure for HS. Early diagnosis and proper management is important for a patient's quality of life. The first step for those with HS is to speak to their dermatologist to get an accurate diagnosis."

To learn more about HS from these specialists, go to www.RecognizingHS.com/WCC

WHEN YOU SEE THESE LESIONS, DO YOU SUSPECT HS? DO YOU ASK ABOUT RECURRENCE?



Photo compliments of Dr. Afsaneh Alavi.



Photo compliments of Dr. Marc Bourcier.

ASSESSING PATIENTS WITH RECURRENT BOILS

Most HS cases can be recognized with high reliability by the presence of 3 main features:¹⁻³

- 1. Typical lesions:** nodules, sinus tracts, abscesses, scarring
- 2. Typical anatomical location:** axilla, groin, genitals, under the breasts, others (perianal, neck, abdomen, buttocks)
- 3. Relapses and chronicity:** ≥ 2 times per 6 months

Questions to ask your patients with suspected HS:²

- 1. Have you had outbreaks of boils during the last 6 months?**
- 2. Where were the boils and how many did you have?**

To confirm an HS diagnosis,
please refer your patient to a dermatologist.

References: 1. Zouboulis CC, et al. European S1 guideline for the treatment of hidradenitis suppurativa/acne inversa. *JEADV* 2015;29:619-44. 2. Lockwood SJ, et al. Diagnostic workup. In: Kimball AB, Jemec GBE, eds. *Hidradenitis Suppurativa: A Disease Primer*. Cham, Switzerland: Springer; 2016:27-37. 3. Poli F, et al. Clinical presentation. In: Jemec GBE, Revuz J, Leyden JJ, eds. *Hidradenitis Suppurativa*. Berlin, Germany: Springer; 2006:11-24.

Wounds Canada Halifax Spring 2019 Conference: We're All in This Together

April 12–13, 2019, Halifax Convention Centre, Halifax, NS



Session Summaries

Writing team: Leah MacDonald, Tim Murray, Carolyn Kelly, Denise Bond

Wounds Canada held its spring 2019 conference in Halifax, NS, April 12 to 13. Local volunteers attended sessions and prepared the summaries that follow, which include highlights and practice pearls from expert speakers.

ACROSS THE SECTORS: WOUND CARE REALITIES AND DISPARITIES

Presenters: Mary-Ellen Gurnham, Kimberly Lacey, Suzanne D'Entremont, Lynne Kavanagh

This session reviewed and discussed the extent and quality of evidence related to the prevention and management of wounds, and practical, patient-centred and cost-effective approaches to wound care. Speakers also discussed how clinical decisions affect policy and vice versa.

Nova Scotia recently amalgamated its nine

health districts, and the province's vision is for standardized delivery of evidence-based best practices in wound prevention and management across Nova Scotia's entire health-care system.

According to its goals, this province-wide approach must be:

- collaborative (establishing strong and lasting relationships)
- built on previous efforts (learning from other successes)
- adoptive and adaptive (adopting best practice guidelines and recommendations, adapting them to the local context)
- interconnected (bringing together policy, edu-

cation and clinical resources to drive practice change)

It was emphasized that while programs can provide facilitation and leadership, it takes the efforts of every clinician and administrator to create a truly unified, provincial approach. A cultural shift is required to see separate practice areas as part of one integrated team.

The presenters conducted a room poll asking attendees to identify the two biggest barriers to best practice. The answer? Human resources and funding.

Highlighted were a number of disparities in care across the region and either how the province is addressing them or what barriers exist to handling them.

Disparity: Shortage of human resources across all sectors

Provincial response: Providing ongoing assessment of service delivery to inform future directions within the provincial framework

Disparity: Lack of coordination in terms of geography, facility type and across teams

Provincial response: Standardizing resources and tools for clinical practice and communication among clinicians and patients, and exploring ways to improve coordination of care across sectors.

Disparities: Lack of standardized education, organizational changes, competing priorities (limited time committed to education), complexity of care, difficulty keeping pace with changes (e.g., ongoing research means new programs can be out of date even before they are launched).

Barriers and opportunities:

- Education doesn't always translate into practice when policies are in place that prohibit change or critical thinking by frontline providers.
- Accountability is needed to support best practice.
- Need a way to access decision-makers in organizations to pass on valuable learning.
- Integrated teams should be educated together, so members can see the value of all roles, where

they fit in, and the importance of communication.

Disparity: Cost of care

It is difficult to collect cost data without standard reporting or standardized documentation. Often what little information is collected is not collated.

Provincial response: Exploring feasibility of data-collection framework using technology, and working on a pilot in the Eastern Zone

Disparity: Funding

The province needs to invest so it can see future savings, but all sectors are competing for money. It is important to ensure changes in one sector don't negatively impact another.

Barriers:

- Lack of data makes it difficult to advocate for policy change.
- When everyone owns it (wound prevention and care) but nobody owns it, there is no accountability.

A room poll asked the following: What has been most effective for practice change? Answer: Practice enablers/resources, education. (Note that there was little response to process change or policy.) Enablers allow nurses to do something today.





WHEN WOUNDS DON'T HEAL

Presenters: Pat Coutts and Justin Paletz

This session took the standing-room only audience through several case studies and reviewed the differences between healing and non-healing wounds.

The presenters referenced the Wounds Canada Wound Prevention and Management Cycle (WPMC), with a focus on wound assessment and involving the patient and family as much as possible. They stressed that clinicians should be aware of pain during assessments and that some patients anticipate pain with difficult dressing removal. Clinicians should develop a plan of care around monitoring and controlling a patient's pain.

Also discussed were intrinsic and extrinsic factors that affect wound healing, and presenters emphasized the importance of establishing goals of care with a patient based on whether the wound is healing, non-healing or non-healable.

Since cancer can be a factor in a wound not healing, there followed a review of the three most common skin cancers in North America, the risk factors and what to do when a biopsy confirms cancer.

Presenters discussed clinical clues to melanoma, and a number of pictures illustrated what to look for in a questionable malignant ulceration. If suspicious, the clinician should refer the patient for biopsy. When the pathology reveals a skin cancer, the patient must be referred on for excision (depending on the goals of care). Delay in diagnosis can be detrimental for the patient. Clinicians should be mindful of the risk factors for skin cancer and consider it as a possible cause for these non-healing ulcers. The discussion encouraged the audience members to reflect on their own practices and potential patients who may have a skin cancer.

Key Points

- Not all wounds are healable. Be a detective and investigate what is causing the wound.

The presenters highlighted two recent success stories that provide models for moving forward:

- Cost-effectiveness was demonstrated for total contact casts (TCCs) for diabetic foot ulcers (DFUs). DFUs precede 85% of lower-extremity amputation. The business case around this statistic shows that home care for 30 weeks is \$3,176 more expensive than a TCC for 12 weeks.
- The Northwood Wound Care Program (2012) in Nova Scotia was successful. See the article [Developing a Wound Care Program in Long-term Care: Changing the Focus from Products to Prevention in *Wound Care Canada* \(vol. 16, no. 2, Winter 2018\)](#) for a detailed overview of how changes implemented resulted in improvements in a number of areas.

- Know potential team members in your facility and community.
- Make care goals simple and easy for the patient and family.
- Consider “malignancy” for non-healing wounds. If suspicious, ask for a biopsy. Early detection and diagnosis are key. Delays in diagnosis have a negative impact on outcomes for patients.
- Consider next steps when pathology reports a malignant ulcer and review goals of care.

PRESSURE INJURIES

Presenters: Sheila Moffatt, Natalie Cheng, Caroline Kelly

Here are some of the key points shared during this session:

- In Nova Scotia, a province-wide pressure injury prevalence study is completed each fall in acute-care facilities.
- Each year the United States sees an average of 17,000 lawsuits related to pressure injuries, with an average settlement of \$250,000. This is coming to Canada, and we have recently seen lawsuit actions in Nova Scotia for pressure injuries.
- "Deep tissue injury" will be a new stage added to the pressure injury staging categories.
- Promotion and implementation of best practice is carried out using the Wounds Canada Wound Prevention and Management Cycle (WPMC).
- A barrier to prevention in Nova Scotia is the lack of funding for effective offloading equipment.
- Pressure reduction is now termed *pressure redistribution*.
- Ideally wheelchair repositioning should take place every 15 to 30 minutes if the patient can do this independently. If the person requires assistance from staff, repositioning should be done every hour while the patient is sitting.
- Team care is required for the effective prevention and management of pressure injuries. Health-care providers need to

empower the patient, who is the key person on the team.

SKIN FRAILTY: PREDICTION, PREVENTION AND MANAGEMENT AT THE EXTREMES OF LIFE

Presenters: Kerri Coulson, Janet Kuhnke, Sheila Moffatt, Emily Woodgate

Emily Woodgate discussed premie and newborn skin and its susceptibility to absorption and damage due to the skin not having its full protection capability until approximately age three.

Kerri Coulson presented information about the causes and management of moisture-associated skin damage (MASD). Key recommendations included ensuring the use of pH neutral soaps, being gentle when cleansing, moisturizing and using a barrier product, and properly charting the intervention(s). Interigo was identified as associated with skin-on-skin touching (the “jiggly and rubbing bits”). Periwound MASD and peristomal MASD were also discussed.

Sheila Moffatt discussed aging skin in special populations and used case studies to illustrate the causes of skin damage. One case outlined the situation of a spina bifida patient with heel ulceration through to the bone. After a clinician took a history and investigated to determine the cause, it was discovered that the foot pedals on the patient’s wheelchair had been adjusted. It was

Stay connected!  

Get on the Wounds Canada mailing list!

To receive notifications, information, invitations and more, send an email to info@woundscanada.ca.

Follow us on social media!

Wounds Canada:

Facebook: www.facebook.com/woundscanada

Twitter: [@woundscanada](https://twitter.com/woundscanada)

Diabetic Foot Canada:

Facebook: www.facebook.com/DiabeticFootCanada

Twitter: [@DiabeticFootCa](https://twitter.com/DiabeticFootCa)



stressed that a specialist occupational therapist should be engaged to make this type of adjustment.

The concept of a “patient care village” was discussed, where staff involved with the patient work collaboratively to produce a more efficient and better outcome for the patients.

Janet Kuhnke led an engaging session, involving Q and A, that looked at three different cases, pre-term, term and older adult, and highlighted the skin frailty issues at these ages.

She encouraged the use of online resources and stressed the importance of using validated assessment tools.

She also emphasized the importance of noting and recording the condition of a patient’s skin when sending them to, or receiving them from, another’s care. This helps identify when the breakdown likely occurred. The clinician should also ensure that the results from assessments such as the Braden are acted upon in a timely way.

Key Points

Practitioners should be able to do the following:

- Recognize incontinence-associated dermatitis

- (IAD), moisture-associated skin damage (MASD) and issues at the extremes of age
- Understand the effects of pressure and moisture on the skin
- Learn prevention and management strategies

LOWER LIMB ULCERS

Presenters: Caroline Everett, Barbie Murray, Matt Smith

This session provided information on options for interventions and care in healable ulcers, the importance of foot care in high-risk feet and the use of BPRs for prevention and management of lower leg issues.

Key Points:

- The prevalence of peripheral arterial disease (PAD) in Nova Scotia requires attention. Diabetes and smoking are major factors. Early detection and treatment of PAD are essential for health-related quality of life and limb preservation.
- The management of lower-leg edema is key to preventing ulcers and recurrent infection.
- Regular podiatry care is essential for high-risk feet, ulcer prevention and prevention of lower extremity amputation.

SKIN DISEASES AND INFECTION

Presenters: Lynn Johnston, Rob Tremaine, Paul Bonnar, Barbie Murray

This session helped delegates identify common skin diseases, conditions and disorders, explore the stages of the wound infection continuum, define clinical infections, identify the signs and symptoms of local, spreading and systemic infections, and explore BPRs for information and resources related to the prevention and management of common skin and wound infections.

Several case studies were presented, illustrating stasis dermatitis, vasculitis, pyoderma gangrenos-

Improving Access to Specialized Wound Care in Rural Cape Breton Using Telehealth Technology

By Annie Gillis, RN, Stacey Lake, MSc RD and Katie Heckman, MPH

In 2017 the Ambulatory Care Department at Cape Breton Regional Hospital (CBRH) reached out to Virtual Care, a service that connects patients with health-care providers using video-conferencing technology, to re-launch a virtual wound clinic. A service called Tele-Wound had been offered in Cape Breton on and off since 2013; however, usage had declined over time for the following reasons:

- The rural sites were left to initiate the consults, which did not routinely occur.
- Staff engagement was low.
- Some rural sites did not have a handheld HD camera (a requirement for virtual wound appointments).
- Nursing staff at the rural sites needed to improve their comfort level and skill with using the handheld camera.
- Relationships with telehealth support staff at rural sites needed strengthening.
- The telehealth equipment used by the special-

ist was located in a distant area of the hospital, which was inconvenient.

Another major concern was the extreme congestion in the Ambulatory Care and Emergency Departments at CBRH, intensified by the large number of patients being seen in-person by the wound specialist.

As a result, the hospital's health service manager for ambulatory care identified a need to ramp up this service again, but this time taking into consideration some lessons learned:

- Planning a coordinated, collaborative approach

Data show the Virtual Wound Clinic saves patients an average of 3 hours and 40 minutes per visit (2 hours travel via ambulance transport, in addition to 1 hour and 40 minutes of wait time for the ambulance to return to CBRH for pickup).





- Engaging clinical staff at rural sites (e.g., nurses developed a transfer tool to use for virtual wound care appointments)
- Strengthening relationships with support staff at rural sites
- Enlisting a clinical champion
- Reinforcing the initial implementation with a hands-on approach by the health service manager
- Identifying a staff member to organize the weekly clinic at CBRH
- Ensuring equipment is accessible and that staff feel comfortable using it

The goal of the new Virtual Wound Clinic was to improve access to specialized wound care services

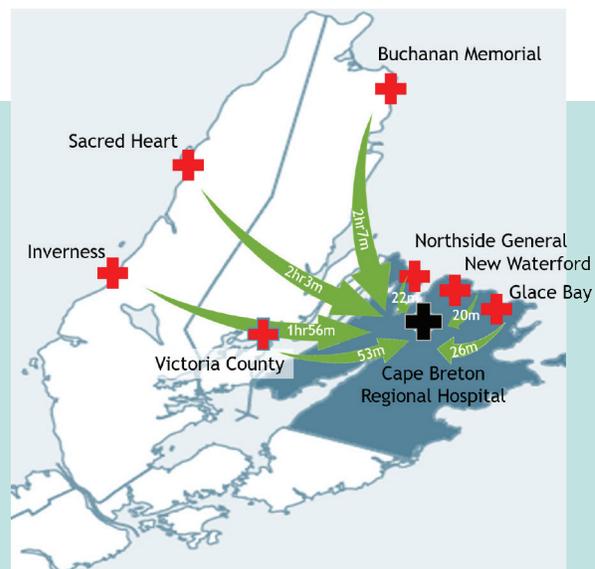
for patients living in rural Cape Breton. Prior to this, wound patients were transported to Cape Breton Regional Hospital from eight rural health-care facilities up to two hours away to receive wound care from one of the few wound specialists on the island.

The Clinic's Process

The Cape Breton (CB) Virtual Wound Clinic takes place every Monday morning from 8 a.m. to noon, with appointments every 15 minutes. Patients attend the clinic from the health-care facility closest to their home (referred to as the "patient site"). Some appointments take more or less time depending on the severity of the wound. The specialist sees a patient at site A at 8:00, site B at

Cape Breton Facts

Cape Breton Island is Canada's 18th largest island and accounts for 15% of the province of Nova Scotia's total population. Approximately 75% of the island's population resides within Cape Breton Regional Municipality (CBRM), while the other 25% is dispersed across the remainder of rural Cape Breton (CB). Sydney, which is located in CBRM, is the island's largest commercial centre and home to Cape Breton Regional Hospital (CBRH) and the CB Virtual Wound Clinic.



Travel times for patients in rural Cape Breton

8:15, and site C at 8:30, then comes back to site A at 8:45 to see a different patient. This allows for exam room changeover at each site without the specialist having to wait.

Currently new consults are seen face-to-face before virtual appointments are arranged. This allows for an opportunity to develop a care plan and provide education for patients and families about virtual care, including information on confidentiality and privacy, as well as the benefits and risks of using telehealth. Patients verbally consent to receiving care using telehealth, and the provider documents this on the chart. Patients are selected for virtual appointments based on variables such as whether the wound is healing or non-healing and/or their travel distance.

At the patient site, a member of the nursing team takes the patient to the telehealth room, where a support staff person has the equipment set up for the appointment. Members of the patient's family can also be present during the virtual appointment, if they so choose.

The nurse at the patient site uses a handheld general examination camera connected to the telehealth system (see Figure 1) to deliver an accurate image of the wound to the specialist. The types of wounds seen during the virtual wound clinic include pressure injuries, diabetic ulcers, stasis ulcers, complications from stasis disease, dermatitis-type wounds and occasionally other atypical types of wounds.

About Virtual Care

"Virtual Care" was chosen as the name of the service to stimulate new ways of thinking about care delivery and to allow for the addition of new technologies in the future.

Over the years Virtual Care has cultivated relationships with hundreds of NSHA health-care providers and other staff at many facilities and community partners throughout the province, who support and facilitate virtual appointments. One of these groups is the Ambulatory Care Wound Clinic located at Cape Breton Regional Hospital (CBRH) in Sydney.

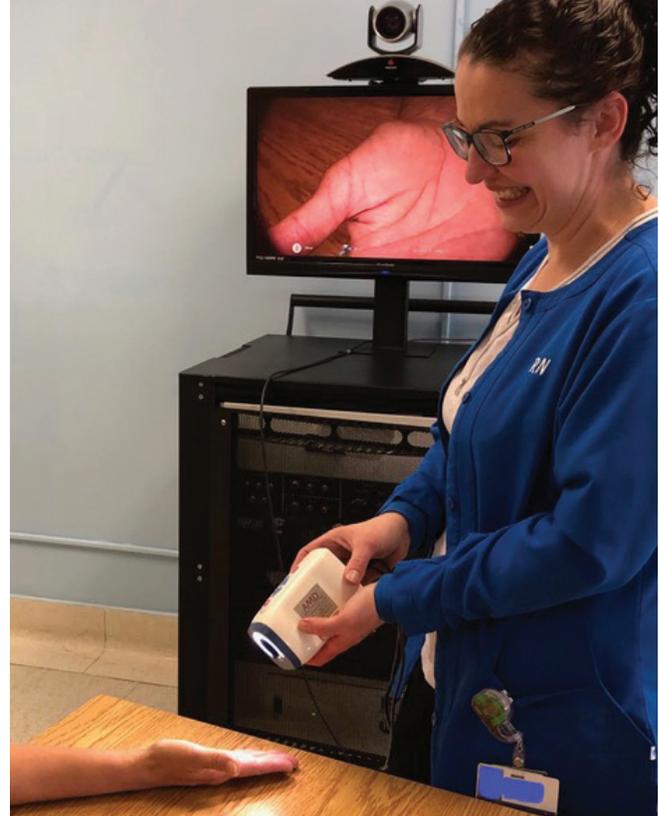


Figure 1: A nurse demonstrates the handheld HD camera used for consultations.

When the specialist at CBRH is ready, he connects to the patient site using video-conferencing software installed on a laptop with an external webcam, and a headset if needed, depending on whether he is in an office or clinic setting.

The specialist then assesses the wound, provides a diagnosis, decides if the wound needs to be swabbed, and prescribes or recommends follow-up treatment. During the virtual appointment, the specialist provides patient-specific instructions to the nursing staff who will be treating the wounds at the patient site. He also provides education on skin care, decubitus ulcer treatment and prevention to the patient, nursing staff and families.

Telehealth systems are located at each NSHA health-care facility as a bookable resource for patient care. The software is available for download by providers at no cost; concurrent usage licence costs are covered by NSHA. Several handheld cameras were already purchased by NSHA and were distributed according to usage or identified need (though these cameras are due to be replaced in the near future). It is the responsibility of the clinical service area (in consultation with a Virtual Care

In 2018:

- 169 consults were received by the CB Virtual Wound Clinic
- 245 patients were scheduled for the CB Virtual Wound Clinic

team member) to purchase computer equipment, tablets, carts and peripheral devices (e.g., webcam, speakers, headset, microphone and monitor).

The Effect

Results after one year of the Virtual Wound Clinic showed that the number of patient appointments, on average, tripled from four in-person visits to 12 virtual appointments during the weekly clinic—a 300% increase.

Many positive patient-centred outcomes have resulted from the Virtual Wound Clinic, including:

- Reduced patient travel time
- Increased patient satisfaction with their health-care experience:
 - increased comfort and convenience by eliminating disruptive, lengthy ambulance transfers
 - eliminated wait time for ambulance transfers back to home hospital
 - eliminated risk associated with patient being left unattended while awaiting ambulance transfer back to home hospital (e.g., needing assistance to bathroom)
- Enhanced communication with patient's circle of care
- Increased number of patients seen due to efficiencies associated with virtual appointments
- Reduced risk of missed appointments due to ambulance unavailability

Many patients have expressed to staff that they prefer being at their home hospital, because they "know all the staff and trust" them. Other patients have said:

- "I have a lot of pain overall, so being able to see the specialist while staying in my own community means so much to me."
- "[This] will be great in wintertime, [it is] terrible to travel those roads and is so unpredictable."

Tips for Success in Using Telehealth

Personnel in other jurisdictions that are considering using telehealth technology for wound management may want to incorporate the following suggestions into their planning:

- Engage health services managers early in the planning/development of the project.
- Examine nursing workflow at patient sites to ensure their workload can accommodate the additional task.
- Consider taking virtual care technology to the bedside, and evaluate the benefits/risks.
- Enlist a clinical champion; this can be extremely beneficial to the success of a program.
- Measure clinical outcomes to gain insight for continuous quality improvement.



- "... [I] don't want to go to Sydney, this is great. [I] got to get back to work."
- "[I] don't have to go out in the cold."

Staff members have also noted:

- "This is great! Patients are seen quicker."
- "Virtual appointments allow for frequent reassessments."

Wider Applicability

The success of this project suggests that the expansion of virtual clinics to other areas of the province and other service areas should be explored, particularly in rural areas. This method of care delivery could also be introduced in other clinical settings, such as chronic disease management (e.g., congestive heart failure, diabetes), geriatric assessment and pain management. The development of a virtual home-based wound care service, involving partnerships with community-based nursing services, has also been considered.

For More Information

Please contact VirtualCare@nshealth.ca. 

WCI Spotlight

Holistic Approach to Diabetic Foot Offloading: Knowledge and Skills

(A108MWS)

Consisting of two online modules, one full-day on-site skills lab and an interactive webinar (completed in the order listed), the Holistic Approach to Diabetic Foot Offloading: Knowledge and Skills program is based on concepts in Wounds Canada's *Best Practice Recommendations for the Prevention and Management of Diabetic Foot Ulcers*.

This program, developed and delivered by national experts in diabetic foot prevention and care, is aimed at nurses, allied health professionals and physicians who self-identify as advanced beginner related to their ability to identify people living with diabetes who require offloading and to select, apply and evaluate the effectiveness of offloading devices.

The most popular of all Wounds Canada Institute (WCI) offerings that contain a skills lab component, this program allows students—under the guidance of expert faculty—to learn about and practise skills relevant to the prevention and treatment of diabetic foot ulcers.

Practical skills reviewed during the skills lab component include diabetic foot screening and risk stratification, assessment of footwear and gait, application and use of removable cast walkers and surgical shoes/half shoes, and the application, use and removal of total contact casts.

Following the skills lab, students are expected to seek out mentorship opportunities in their workplaces to perfect their skills and attain proficiency.

Arlene, a registered nurse working in acute care in Hamilton, ON, said in her evaluation, "It is a well-organized event. Instructors are know-

What Programs Are Right for You?

To find out more about the Holistic Approach to Diabetic Foot Offloading: Knowledge and Skills program and other Wounds Canada Institute (WCI) programs, visit the WCI website at www.woundscanadainstitute.ca.

ledgeable, and the skills in all areas of the presentation are excellent."

Following the skills lab, a wrap-up webinar invites

It is an excellent program. If you do not have the experience in offloading, etc., you will learn lots. If you do have the experience, you will still learn lots." —Recent program attendee



students to discuss with faculty the challenges they faced, and strategies used in implementing the acquired knowledge and skills in their everyday practice and, for some, at an organizational level. Wendy, a nurse practitioner from a long-term care facility in Milverton, ON, stated in her evaluation, "Excellent program with excellent speakers – top notch."

When asked what advice she would give to another health-

care professional considering taking this program, Dianne, an RN working for a home-care agency in Owen Sound, ON,

wrote, "Go for it. Full of useful tools for assessments (and) the modules are full of good education materials." 🇨🇦

Skills Lab Coming Up in Niagara Falls in October

The Skills Lab for Offloading the Diabetic Foot, part of the Holistic Approach to Diabetic Foot Offloading: Knowledge and Skills program, will be offered next in Niagara Falls, ON, prior to the 2019 Wounds Canada fall conference. Join our expert faculty on October 2 to practise your skills.

For more information on the Niagara Falls skills lab, [click here](#).

Become a member of Wounds Canada



As the leading wound care organization in Canada we provide you, our member, with the information and tools to help advance your career, your practice and your team. Your membership provides you with:

- Exclusive access to members-only sections (coming soon) and quarterly newsletters
- Discounts on our **professional educational programs**; for example, save \$40 on this year's fall conference registration fee
- Access to our organizational updates that outline how your membership supports our mission
- The opportunity to become involved as a regional representative and/or board member
- Networking opportunities with other regional, national and international health professionals
- Discounts on wound care tools and resources sold in our **eBoutique**
- Complimentary subscription to *Wound Care Canada*

Find out more about us at www.woundscanada.ca.

BPR Briefs . . .

By Popular Demand

The Wounds Canada Best Practice Recommendations (BPRs) are resources developed by wound care experts based on the most up-to-date research findings, including expert opinion. The goal of these documents is to better inform delivery of care across all health-care settings.

The BPR library currently includes the following:

- Skin: Anatomy and Physiology and Wound Healing
- Prevention and Management of Wounds
- Prevention and Management of Pressure Ulcers, Diabetic Foot Ulcers, Open Surgical Wounds, Burns and Skin Tears

There are more to come, including recommendations on care for venous leg ulcers, arterial wounds, and moisture-associated skin damage.

These BPRs have been widely used as guides by clinicians not only in Canada but also around the world.

They follow the five key steps in the wound prevention and management cycle (WPMC), which was introduced in the BPR for the Prevention and Management of Wounds:

Step 1: Assess and/or reassess the patient, the environment and the system.

Step 2: Set goals addressing skin integrity, wound healing and additional factors.

Step 3: Assemble an integrated team, including the patient, family and caregivers.

Step 4: Establish and implement a plan of care addressing factors, co-factors and local wound care.

Step 5: Evaluate outcomes and ensure sustainability.

Due to the complex nature of wounds and wound prevention, these articles are comprehensive and therefore tend to be long. But in the next few months you will begin to see something new, BPR Briefs, which will appear on the Wounds Canada website adjacent to the BPRs. These are shorter documents that will capture elements that will capture components of the associated BPRs. To ensure a complete appreciation of prevention and management strategies for a specific wound type, the clinician should be well versed in the full BPR, but BPR Briefs can

offer quick and efficient access to “cues for care.”

As always, our goal is to ensure that the most recent evidence and advice for the prevention and management of wounds is available and usable for clinicians, health-care leaders and educators, as well as government policy makers.

BPRs and soon-to-come BPR Briefs are just two of the tools Wounds Canada provides.

For additional tools, visit the Wounds Canada website at www.woundscanada.ca.



New Supplement Coming Soon!

New Perspectives in Diabetic Limb Preservation

An upcoming supplement to *Wound Care Canada* will provide readers with a comprehensive overview of Wounds Canada's Spring 2019 Symposium: New Perspectives in Diabetic Limb Preservation, held in Toronto on May 31. In the session summaries readers will discover a wealth of diabetic-foot-related information from Canadian and international wound experts, with a special focus on limb preservation.

Topics will include:

- Multidisciplinary approach to limb preservation: Past. Present. Future.
- The impact of diabetic foot complications: national and global trends
- Limb preservation clinics
- Medical management of people with diabetic foot ulcers
- Vascular topics
- Infection
- Wound management
- Offloading (surgical and non-surgical)
- Special topics (such as renal patients, heel ulcers, non-healing/non-healable wounds)
- What do we need to succeed?
- Plus: A summary of the dinner meeting held the evening before the Symposium, which brought interested parties together to discuss building a strong community of practice.



A Special Bonus

As a bonus, the supplement will feature a brand-new diabetic foot enabler, which outlines the course of action required to prevent diabetic-foot-related amputations at a systems level. Wounds Canada's Diabetic Foot Task Force created this enabler to allow decision-makers in government to understand the issues around caring for people at risk for diabetic foot complications. The enabler addresses three groups of patients—those with diabetes but no history of ulceration, those with diabetes and a current foot ulcer or complication, and those with diabetes and a healed foot ulcer or complication—and covers risk assessment, care planning, re-screening and reassessment/evaluation of interventions.

About the Event

The first program in Wounds Canada's Symposium Series, *New Perspectives in Diabetic Limb Preservation*, featured a

full day of sessions led by faculty who explored important topics in the management of patients with diabetic foot ulcers, with a particular focus on the reduction of amputations.

The event was aimed at health-care providers from a range of disciplines with an interest in this topic and/or who work with patients with lower limb complications that can lead to amputation—including primary care professionals and specialists such as surgeons, family physicians, pharmacists, nurse practitioners, chiropodists and surgical podiatrists.

The symposium was a joint venture between Wounds Canada and the Canadian Podiatric Medical Association. It was supported by the Division of Vascular Surgery at the University of Toronto and officially endorsed by the Canadian Society for Vascular Surgery.

Don't miss the release of this supplement. Join *Wound Care Canada's* mailing list by emailing info@woundscanada.ca. 

Register NOW!

SEE YOU IN NIAGARA FALLS



Niagara Falls 2019

Fall
Conference

Driving Change in Wound Care

NIAGARA FALLS, ONTARIO

OCTOBER 3 – 6, 2019

Fallsview Casino Resort and Hilton Fallsview Hotel & Suites



Wound Sleuth

By R. Gary Sibbald, BSc MD MEd DSc (Hon) FRCPC (Med)(Derm)
FAAD MAPWCA JM and Patricia M. Coutts, RN IIWCC

An Unusual Callus Formation

Mr. A, a 50-year-old male, attended a clinic at the request of the diabetic nurse educator. He had a non-resolving callus with an atypical erosion on the proximal plantar aspect of the left first toe measuring 1.5 x 1.5 cm and a proximal ulcer measuring 0.5 x 0.5 cm.

He has a history of diabetes for 12 years, largely uncontrolled on sitagliptin and metformin (combined) and gliclazide (his A1c was 12.1 in April 2018), and hyperlipidemia and weight loss (45 kg in 2016). He had smoked one package of cigarettes per day and has managed to reduce that to half a pack, but he does not wish to quit smoking. He has palpable pulses with triphasic wave sounds on handheld doppler. Mr. A is employed in a warehouse, where he is on his feet 8 to 10 hours a day and is required to wear safety shoes.

In June 2016 he noticed an ulcer on his left toe, which was diagnosed with secondary cellulitis. It was treated with cephalexin 500 mg, four times a day. The area improved after one week of treatment with no residual ulceration.

In May 2017 a callus was first



Figure 1: During debridement procedure. This callus is not over a weight-bearing surface.

noted on the plantar surface of the foot associated with a proximal ulceration, which did not resolve with numerous debridements. A large amount of curetted surface tissue was sent for a skin biopsy. The histology revealed minimal epithelial hyperplasia, but the architectural irregularity was highly suggestive of verrucous carcinoma, a well differentiated variant of squamous cell carcinoma.



Figure 2: Post debridement. Red friable tissue and the callus re-form within 7 to 10 days.

Questions for the Reader

Q What is the cause/diagnosis? How would you investigate this patient?

A **Diagnosis** The diagnosis on biopsy is verrucous carcinoma (epithelioma cuniculatum, or carcinoma cuniculatum).¹ This is a rare slow-growing but well-differentiated, wart-like squamous cell carcinoma (SCC). This form of

cancer can be diagnosed in the mouth, genital area and foot. It is often associated with human papillomavirus (HPV) subtypes 6, 11, 16 and 18.^{1,2} These lesions are usually detected on the plantar aspect of the foot. This lesion was not on the tip of the toe but on the plantar proximal non-weight-bearing part of the foot. There was a proximal ulcer that could have formed from the rabbit-burrow type of irregular spaces that often exist within the lesions, which can be exophytic or endophytic (outward or inward growing).

Investigations

- Biopsy x 2: surface with scissors and deep with curette, and extensive electrocautery of the base

- Pressure offloading
- Plain X-ray: no osteomyelitis
- Blood work: ESR-2, CRP 0.6, and HbA1c = 10
- Swab: grew Group B *Streptococcus*, and *Staphylococcus aureus*

Q What other diagnoses/ causes would you consider?

A • Verruca (warts) presents as a series of punctate bleeding points on the surface of the lesion. They also cause a separation of the skin-surface furrows, with the wart tissue occupying the expanded space.

- Diabetic neuropathic foot ulceration presents as a loss of epidermis with a dermal or deeper base. The callus does not have the irregular chan-

nels through the tissue, and most of the callus is on the rim of the ulcer.

- Callus formation is over pressure points and should not have punctate bleeding points.
- Deep fungus infections are often hyperkeratotic nodules on the surface of the skin, with central ulceration possible. These infections are also slow growing, and the centre of the lesions need to be biopsied for atypical mycobacteria.

Management

- Diabetes control: patient may need insulin if oral agents do not give adequate control for T2DM
- Callus control: may not be



Did you know...

...the 5 year mortality risk of DFUs & Amputations is higher than breast cancer

How are you managing DFUs



V.A.C. VERAFLOR CLEANSE CHOICE™ DRESSING



PROMOGRAN PRISMA™ WOUND BALANCING MATRIX



SNAP™ THERAPY SYSTEM

Reference: Armstrong DG, Wrobel J, Robbins JM. Are diabetes-related wounds and amputations worse than cancer? *Int Wound J*. 2007;4(4):286-7. 5.

NOTE: Specific indications, contraindications, warnings, precautions and safety information may exist for Systagenix and KCI (Acelity companies) products. Please consult a healthcare provider and product instructions for use prior to application.

Copyright 2018 KCI Licensing, Inc. Unless otherwise designated, all trademarks are proprietary to KCI Licensing, Inc., its affiliates and/or licensors. PRA-PM-CA-00031 (06/18).



effective, as this could represent residual verrucous carcinoma

- Offloading: pneumatic walker plus orthotics in work boots
- Infection management: amoxicillin/clavulanic acid 875 mg bid, when there's evidence of deep infection according to three or more of the STONEES criteria
- Smoking cessation: but the patient is not ready to change
- Referrals:
 - to plastics for further biopsies that have so far been negative for residual verrucous carcinoma
 - to orthopedics for amputation of the left first toe only if there is residual verrucous carcinoma that cannot be adequately resected. Verrucous carcinoma can occasionally be metastatic

but more usually involves local spread.

Conclusions

Mr. A was very frustrated with the lack of progress toward healing and the amount of time taken to diagnosis the problem. In this case it was just over a year, but up to 15 years has been reported in the literature. Identifying the cause proved to be challenging. His wound was not in a typical point of pressure, although a thorough gait assessment had not been performed.

The recommended plan of care was amputation of the affected toe. As Mr. A had recently lost a close relative to cancer, he wanted to consider his options carefully. Until Mr. A made the decision about amputation, this wound was classi-

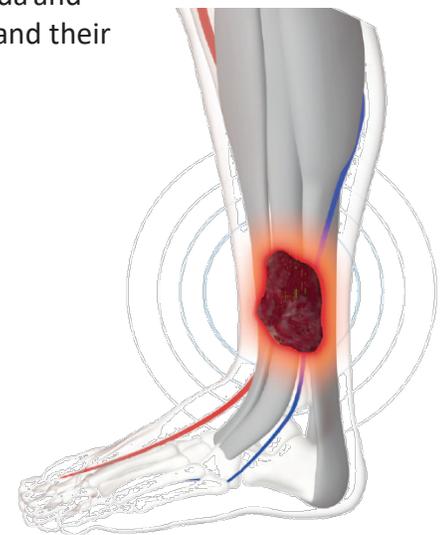
fied as non-healable, with the presence of moisture increasing the possibility of the incidence of bacteria in the wound that would put the host (patient) at a greater risk of developing an infection. In this case, the goal of local wound care would be to keep the wound as free as possible from bacteria, with povidone-iodine and a dry, sterile dressing as thin as possible to prevent any increase in plantar pressure. 🩹

References

1. Lesic A, Nikolic M, Sopta I, Starcevic B, Bumbasirevic M, Atkinson HDE. Verrucous carcinoma of the foot: A case report. *J. Orthop Surg (Hong Kong)*. 2008;16(2):251–3.
2. Schell BJ, Rosen T, Rády P, Arany I, Tschen JA, Mack MF, et al. Verrucous carcinoma of the foot associated with human papillomavirus type 16. *J Am Acad Dermatol*. 2001;45(1):49–55.

Lower Leg Ulcers

Wound management is a considerable burden on health systems, in Canada and elsewhere, significantly impacting health and quality of life of individuals and their families (CIHI Compromised Wounds in Canada, 2013).



www.gekowound.ca

info@perfusemedtec.com

Estimated cost-savings of \$2,500.00 per patient if used as a first-line adjunctive therapy for Venous Leg Ulcers along with best practices (WW LHIN Evaluation 2018 Perfuse Medtec Report)



Advance your career ...



WoundsCANADA
Institute

... from virtually anywhere!

The Wounds Canada Institute offers a wide range of educational programs to help you reach your full potential and fulfill your continuing education requirements. Regardless of your role in health care, you will find a program that suits your needs. View the full program list at www.WoundsCanadaInstitute.ca.

Click [here](#) to learn more and register online.

View the full program list at www.WoundsCanadaInstitute.ca.

Powered by

