

Wound Care

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C A N A D A

THE OFFICIAL PUBLICATION OF THE CANADIAN ASSOCIATION OF WOUND CARE

The Impact of **Obesity**

on Wound
Development
and Healing

**Preventing
Diabetic Foot
Complications
through Policy Change**

**All Skin is
NOT
Created Equal**

**Improving Skin Health:
The Role of a Dietitian
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The Canadian Association of Wound Care (www.cawc.net) 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.

The CAWC was formed in 1995, and its official meeting is the CAWC annual conference held in Canada each year. The association's efforts are focused on four key areas: education, research, advocacy and awareness, partnerships.

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Niagara Falls 2016



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News from Our Industry Partners

New Educational Program from Coloplast

Coloplast Canada Corp. is proud to announce the launch of our all-new global wound and skin care educational program, the *Coloplast® Wound Institute – CWI*.

Coloplast Wound Institute (CWI) is designed for health-care professionals working with wounds. The program aims to increase the knowledge of modern wound healing principles and improve the standard of care for patients with wounds around the world. It is a part of our ongoing dedication to supporting wound care education.

CWI contains 14* interactive courses covering various wound and skin care topics. Each course is developed in collaboration with world-renowned wound care experts, peer reviewed and endorsed by the European Wound Management Association (EWMA). To learn more about how you can make

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CAWC News

Early 2016 has been an exceptionally busy time at the CAWC as we work to fulfill our mandate of being Canada's leading wound-related knowledge mobilization organization. New opportunities and challenges have been welcomed by our growing staff contingent, particularly in the areas of professional education, advocacy and the implementation of the latest communications technology.

Professional Education

This spring we partnered with health authorities and others across Canada to deliver on-site education.

The two-day foundational case-based workshop, called Changing Practice through Applied



Knowledge, provides frontline clinicians with basic knowledge and decision-making tools on the major wound types they see in daily practice. In addition, this program supports institutions in the development of their communities of practice. So far in 2016, our schedule has included:

- Cobourg, Ontario, March 4 and 5 – In partnership with Pharmacy 101
- White Point, Nova Scotia, March 30 and 31 – In partnership Nova Scotia Health Authority
- Moose Factory, Ontario, April 2 and 3 – In partnership with Moose Cree First Nation and Health Canada
- Stratford, Ontario, May 20 and 21 – In partnership with South West Regional Wound Care Program

Advances for the Management of Diabetic Foot Complications is an interprofessional workshop that addresses the educational needs of health-

care practitioners involved in the management of the diabetic foot. The 2016 schedule to date for this workshop includes:

- Mississauga, Ontario, April 9 – In partnership with the Ontario Society of Chiropractors
- London, Ontario, April 30 – In partnership with South West Regional Wound Care Program

Best Practice Recommendation Updates

We have begun updating best practice recommendation (BPR) articles and plan to complete two foundational documents and four BPRs (pressure ulcers, diabetic foot ulcers, skin tears and surgical wounds) in 2016. Health-care professionals around the world use these documents to assist with care and policy decision making. We are proud to be the leading Canadian organization

Spread the Word!



Be part of our grassroots communications by connecting with us on our social media channels. Like, share and retweet our messages so your friends and colleagues become aware of the work we all do together.

CAWC:

Facebook: www.facebook.com/woundcarecanada

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Diabetic Foot Canada:

Facebook: www.facebook.com/DiabeticFootCanada

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

addressing the specific and universal issues relating to best practice in wounds in a user-friendly format. We are looking forward to updating the remaining BPRs in 2017 and creating new ones for areas that have not yet been addressed. See page 8 for more on this initiative.

Our Growing Reach

The CAWC continues to use the latest technology to ensure our message gets out to everyone who needs it. Our social media channels continue to grow, in both number and level of engagement. If you are not yet part of the conversation, please consider connecting to our Facebook and Twitter channels.

We are also working on creating a bigger, better website with additional features and functionality to connect with our stakeholders—from frontline clinicians to the general public, media and government decision makers—with the type of information they need, in formats that are useful for them. We will be sharing more information about the new website in the near future.

On the more intimate side, the CAWC is the lead organization in developing and presenting education in April for Ontario lawmakers aimed at increasing awareness about gaps in policy relating to low-cost interventions to prevent complications in the diabetic foot. See page 15 for more on this initiative.

Annual Conference

Building on the great success of past years, the Canadian Association of Wound Care will be holding its 2016 Annual Conference November 3–6 in Niagara Falls, Ontario.

Participants will include researchers, scholars, clinicians, administrators, students and policy-makers from leading universities and other research institutions, hospitals, the community, long-term care, acute care and organizations with a stake in skin health and wound management. Together they will explore pressing wound-related health issues, discuss health promotion technology and share their experiences on this rapidly expanding field.

The title of this year's conference is ***Wounds Across the Continuum of Care: Access, Innovations and Integration***. This title reflects an acknowledgement that gaps in care occur not just within an agency or facility but also when patients transition from one agency or facility to another. It is also reflective of the areas where solutions to the gaps can be found. The intention of conference sessions is to put the focus squarely on the patient.

The general objectives for the conference are:

1. Explore existing and new practice strategies that relate to the prevention and management of wounds.
2. Explore creative practice integration strategies that relate to the prevention and management of wounds.
3. Create an environment that supports collegial and industry interactions and networking.

After every conference we conduct an extensive evaluation to determine what worked, what needs to be improved and what might be missing. As a result, this year we will be adding some special programs and features. Stay tuned for more details!



Niagara Falls 2016

Best Practice Recommendations Update 2016

By Katie Bassett, BMus, and Heather L Orsted, RN, BN, ET, MSc

Best practice recommendations (BPRs) are documents developed by experts in a given clinical field as resources based on the most up-to-date research findings (including expert opinion). The goal of these documents is to better inform patient care across all health-care settings. In 2000 and 2001, the Canadian Association of Wound Care (CAWC) published its first best practice recommendation articles. The topics covered included wound bed preparation, prevention and treatment of pressure ulcers, diabetic foot ulcers and venous leg ulcers.^{1,2,3,4} These articles have been used by clinicians not only in Canada but also around the world as guides to support best practice.

The collection of BPR articles has since been expanded and updated and now covers the original topics as well as the basic principles of wound healing, open surgical wounds and skin tears.^{5,6,7,8,9,10,11} Each paper includes a Pathway to Best Practice algorithm, a Quick Reference Guide (QRG), which provides a short outline of the recommendations and their levels of evidence, and a detailed discussion of the evidence that supported each recommendation.

Updating the BPRs

Starting this year, the CAWC is undertaking a comprehensive review and update of all the previously published articles.

The Pathway to Best Practice algorithm, which guided the flow of the original papers, has evolved to become the Wound Management Cycle. The updated articles will follow the five key steps outlined in the cycle to support best practice. These are:

- Assess and/or reassess the patient, the environment and system
- Assemble an integrated team, including the patient, family and caregivers
- Set goals addressing skin integrity, wound healing and additional factors
- Establish and implement a plan of care addressing factors, co-factors and local wound care
- Evaluate outcomes and ensure sustainability

In each of the articles, these five steps are broken down into topic-specific best practice recommendations and are accompanied by the evidence that supports them.

- In 2016 the updates will include:
- Two foundational articles to lay the groundwork for future clinically specific papers:



- Anatomy and Physiology of Skin and Its Underlying Structures
- Clinical Pathway to the Prevention and Management of Wounds
- Four clinically specific papers that address:
 - Diabetic foot ulcers
 - Pressure ulcers
 - Skin tears
 - Surgical wounds

Additional BPRs will be updated and created in 2017. Stay tuned for topics and timing.

The CAWC believes these revised best practice recommendation articles will continue to assist clinicians in providing the best possible care to their patients.

Beyond the Bedside

The CAWC also plans to use the information in these articles as the basis for revisions to CAWC educational programs and materials to ensure our information is up to date and consistent across all delivery methods.

As always, our goal is to use the most recent evidence as a foundation of support for our efforts to raise awareness about chronic wounds and to highlight the need for co-operation between health-care leaders and government policy makers. In doing so, we hope to ensure that preventing and managing wounds is not only efficient but also successful and sustainable. 🤝

Katie Bassett, *Education Co-ordinator at the CAWC, has a keen interest in the neuroscience behind auditory perception, sound organization and musical development.*

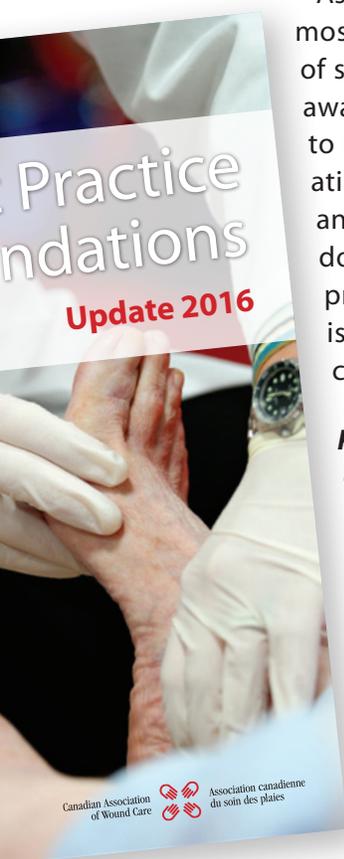
Heather L. Orsted, *Director of Education and Professional Development at the CAWC, is an experienced adult health-care educator, program developer and*

For a sneak peak at a small section of the Anatomy and Physiology of Skin and its Underlying Structures article, please see page 10.

author with a special interest in knowledge mobilization and wound prevention and management.

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Normal Changes and Differences in Skin

By Heather L. Orsted, RN, BN, ET, MSc; David H. Keast, BSc, MSc, Dip Ed, MD, CCFP, FCFP; Louise Forest-Lalande, RN M.Ed ET; Janet L. Kuhnke, BSN, MS, ET; Deirdre O'Sullivan-Drombolis BScPT, MCISc (Wound Healing); Susie Jin, RPh CDE CPT CGP; Jennifer Haley, BMSc, MSc, Robyn Evans, BSc, MD, CCFP, IIWCC

In this excerpt adapted from "The Physiology of Skin and Its Ability to Heal," we look at the different characteristics of healthy human skin throughout a lifetime.*

Skin is known as the great protector, and one of its many functions is to provide a barrier to defend the body from the outside world. As wound clinicians, our understanding of the complexities of skin aids in our provision of assessment, treatment and wound management. However, we need to recognize that skin and its properties differ with the age and sex of the individual.

Infant Skin

Infant skin differs from adult skin in several ways. The thickness of infant skin is 40% to 60% that of adult skin. Weak rete ridges provide limited surface attachment to an immature dermis. As well, an infant's ratio of body surface area to weight is up to five times that of an adult. These factors place the infant at greater risk for skin damage.¹

At birth, the surface layer of the skin is relatively neutral,



*In press, as a supplement to Wound Care Canada.

with a pH of about 6.5. The acid mantle forms as a result of changes on the skin surface, such as the presence of sweat, sebum and normal micro-biota, and metabolic processes, such as lactic acid and free fatty acid production, within the stratum corneum. Over the first few postnatal weeks the skin's pH falls to about 5.5, a level that is beneficial for antimicrobial defence through the inhibition of the growth of pathogenic bacteria.²

Skin Changes in the Adolescent

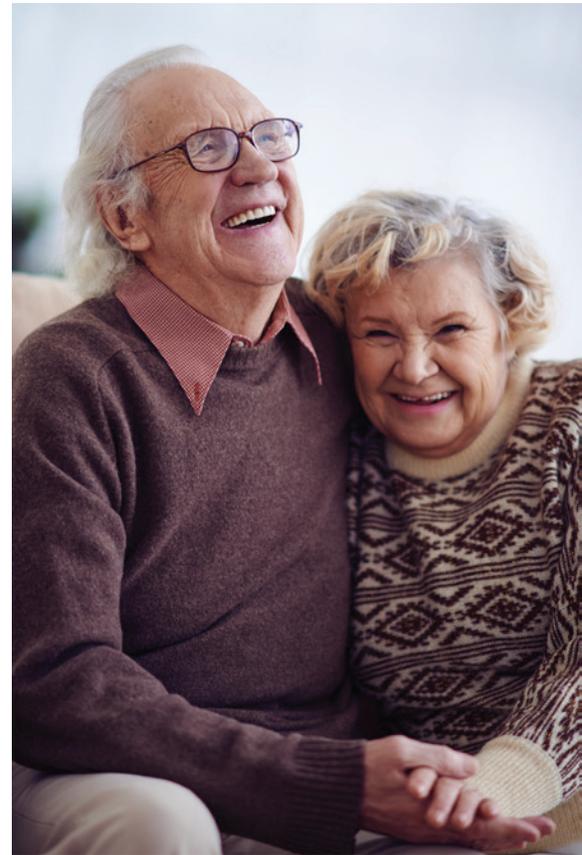
Adolescence brings about the maturation of the hair follicles, sebaceous (oil-producing) glands and sweat glands in the skin. Stimulation of the sebaceous glands, caused by a surge in the sex hormones estrogen, androgen and progesterone, results in increased production of oil, or sebum. These sex hormones are also responsible for the development of apocrine glands in the pubic region and

armpits. The resulting thick sweat mixed with bacteria on the surface of the skin can cause body odour. At the same time hair growth occurs in these areas.

An increase in the lipid content during this time enhances the heat-insulating properties of skin, improving temperature regulation. The higher fat content also helps to retain moisture, making the skin of teenagers and young adults less susceptible to drying out.^{2,3}

Skin Changes in the Older Adult

As individuals age, skin goes through many changes based on genetics, environment, lifestyle and any existing chronic disease states. Despite individual variations, the normal aging process of all skin causes many predictable changes. Biochemical changes occur in collagen and elastin, the connective tissues underlying the skin that give skin its firmness (collagen) and elasticity (elastin), though the rates of loss



of skin firmness and elasticity differ from individual to individual. Also, as the skin becomes less elastic, it becomes drier. The underlying fatty tissue begins to disappear and skin begins to sag. The skin becomes less supple and wrinkles begin to form. Atrophy of subcutaneous fat in the hands, face, shins, waist (men) and thighs (women) results in sagging and folds. At this stage, skin is more easily injured, heals more slowly and tends to dry out more quickly.^{3,4}

The dermis becomes increasingly avascular with age, leading to a reduction in blood supply. Langerhan's cells, which serve as macrophage and immune moderators of the epidermis, also decrease in number. There is





also a 50% decrease in the turnover of the epidermal layer.

The pH of the skin becomes more neutral (less acid) and thus more susceptible to bacterial growth and resulting infections. Interestingly, the pH value rises beyond 6 when a person actually experiences a skin problem or skin disease.

The skin's ability to perceive sensation to pressure and light touch is also reduced, along with an increased threshold for pain.

Melanocytes, the pigment-producing cells, decrease in number. Hair follicles also decrease in number and growth rate, with associated greying due to the decrease and loss of melanin.

Differences between Male and Female Skin

Skin is affected by sex hormones. Estrogen increases collagen and skin moisture and promotes wound healing, while testosterone stimulates oil production and the growth of facial hair. Of note, men and women have both sex hormones; skin is able to convert testosterone to estrogen and ovaries produce a small amount of testosterone.

Women's skin is generally thinner and less oily than men's skin. Therefore, women are more likely to experience wrinkles because thinner, drier skin is more prone to damage from the sun and cigarette smoke. Women also sweat less than

men do and thus are more likely to suffer heat stroke.

During menopause the loss of sex hormones accentuates wrinkles. Estrogen-deprived skin thins, loses collagen and slows down its cell renewal.⁵

Impact on Care

For wound clinicians, knowledge of the anatomy and physiology of skin and its properties is essential to being able to prevent, assess, treat and manage acute and chronic wounds effectively. The take-home message here is "all skin is not equal."

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QUOTABLE Quotes

We've been asking some of Canada's top wound leaders a number of questions about their personal experiences in wound care. Their responses are both unique and share common wisdom. Here are a few quotes. We hope they challenge and inspire you.

Q What's your top tip to avoid clinician burnout?

"Know your limits and listen to yourself. Before being able to heal your patients, you must be able to heal yourself."

—Richard Belley, MD, CMFC, BSc

"Get regular exercise. Your personal life should be number 1."

—Kyle Goettl, RN, BScN, MEd, IIWCC

"Have a good work/life balance and make sure your work does not encroach on your personal life."

—Sunita Coelho, RN

"Recognize that this role takes an emotional toll: we care for the cell and the soul. Monitor your internal meter. Talk to other clinicians as an outlet—this helps."

—Marlene Varga, MSc, BScN, IIWCC

"Keep a good balance between work and play. Exercise!! And avoid answering or dealing with work emails on the weekends."

—Robyn Evans, MD, CCFP, IIWCC

"The best way to avoid burnout is to take vacation! And really take it. Don't check in. Make yourself unavailable. Set boundaries and stick to them. Rejoice in the everyday. Focus on the patient that is in front of you at the time and do the best you can at that moment. Don't worry about all the other things that are happening around you. And attend conferences and training."

—Deirdre O'Sullivan, BScPT, MCISc

"Pace yourself. Hit the Refresh button every time you see the next patient. Focus and listen!"

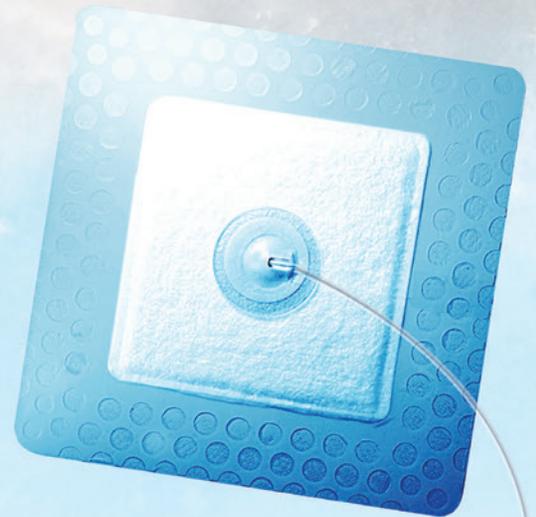
—Brian Scharfstein, CPed (C)

"Work as part of a team whenever possible (virtual or actual). Share ideas. Brainstorm. Support each other. Complex patient care requires a multi-disciplinary approach."

—Barbie Murray, BScN RN MCISc



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Working for Change:

The CAWC's Advocacy Campaign for the Prevention of Diabetic Foot Complications

At the end of 2014, a coalition composed of the Canadian Association of Wound Care (CAWC), Canadian Diabetes Association, Registered Nurse's Association of Ontario, Canadian Association for Enterostomal Therapy and nearly 50 other supporters delivered a letter to the top levels of the Government of Ontario (view this letter at <http://bit.ly/1R4aVk0>). The letter and subsequent meetings have focused on increasing awareness of provincial legislators by outlining cost-effective methods for improving foot care for people with diabetes and, ultimately, reducing the number of preventable amputations in the province.

The CAWC and others are now turning this initiative into a nation-wide campaign. The theme of the campaign is **Save Limbs, Save Lives – Today!**



“The Canadian Association of Wound Care is looking forward to working with other provincial organizations and key stakeholders to address the gaps in care and policy in the area of diabetic foot ulcers and ensuring we reduce the growing numbers of preventable diabetes-related amputations,” said Mariam Botros, Executive Director of the CAWC.

The materials on the following pages form part of the legislators’ information packages. These materials are designed to help them understand the problem and impact of NOT changing policies related to the prevention of foot complications in person with diabetes.

Stay tuned for more on what impact this campaign is having and how you can get involved in your province/territory. 🍷

Diabetes and Foot Care

The Problem and Solutions

Problem

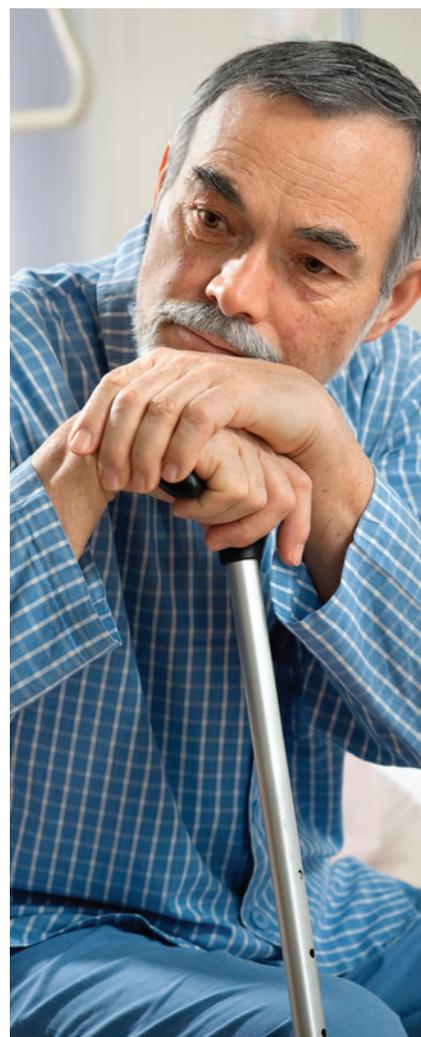
Foot care is a major issue for the Canadians who live with diabetes. It especially impacts seniors and people with limited incomes. Too many Canadians with diabetes undergo devastating and expensive foot/leg amputations that could have been prevented if they previously had had simple, low-cost interventions. Policy options exist that can rapidly improve the lives of people in need of diabetes foot care, while significantly reducing complications, improving patients' lives and reducing health system costs.

Why is the prevention of every diabetes complication funded EXCEPT foot care?



Impact on Canadians and Health-care Systems:

- Thousands of Canadians have a diabetes-related amputation each year. 85% of diabetes-related amputations are preventable with early intervention. The direct system cost of a diabetic foot amputation is \$70,000 per patient. This results in over \$100 million in unnecessary costs to the Canadian health-care systems annually.
- Patients who have undergone foot amputations on average have a lower quality of life, higher rates of depression and a five-year mortality rate of 50%.
- Lost productivity due to time off work or loss of job for each patient with an amputation has a direct financial impact on the country.



In a survey of patients who had just had a diabetes-related amputation, 46% had never received instructions on how to inspect their feet.

Goettl K. Foot care practices of persons living with diabetes prior to amputation. *Wound Care Canada* 2008;6:64-7.

Early screening and appropriate foot care can prevent up to 85% of diabetes-related amputations.

85%

Current Obstacles:

Solutions:

<p>1. Primary care providers do not necessarily check the feet of their patients with diabetes, despite the fact that annual foot checks take very little time and are the gold standard of practice.</p>	<p>Every person living with diabetes should have their feet inspected at every visit with a health-care provider. Recommendations: a) Embed foot screening within the EMR programs. b) Initiate dedicated funding for foot screening. c) Develop policies that enable every resident with diabetes to have at least one foot assessment per year by a qualified health provider.</p>
<p>2. Primary care providers do not necessarily know what action to take next or who to refer a patient to if they notice a warning sign during the foot check.</p>	<p>Primary care providers need access to information about preventative care. Recommendation: Primary care providers receive education about a) foot complications and their prevention and management, b) foot care clinics in their areas.</p>
<p>3. Preventative foot care specialists, like chiropodists, podiatrists and foot care nurses charge fees directly to patients, which can inhibit the use of their services by persons with diabetes.</p>	<p>All preventative foot care services for persons living with diabetes should be made free at the point of care. Recommendation: Provincial/territorial governments fully fund preventative foot care for every person living with diabetes.</p>
<p>4. There are too few foot clinics to handle existing patient load.</p>	<p>Persons living with diabetes need timely and local access to foot care services. Recommendation: Provincial/territorial governments create a policy for each region to increase the numbers of funded foot care clinics or reimburse providers for preventative diabetic foot care.</p>
<p>5. There is no funding available to persons with diabetes for devices like preventative footwear, socks and offloading devices that prevent foot problems from beginning or worsening, unless they have private insurance. This sets Canada apart from most high-income jurisdictions.</p>	<p>The cost of preventative devices should be removed as an obstacle for all persons with diabetes. Recommendation: Provincial/territorial governments implement public reimbursement by the province/territory for preventative footwear, socks and offloading devices for people with no private insurance coverage.</p>
<p>6. Fewer than half of all persons with diabetes who had an amputation had received instructions on how to look after their feet prior to the amputation.</p>	<p>All persons with diabetes should receive formal education about foot care to prevent complications. Recommendation: Provincial/territorial governments establish a policy to ensure every person with diabetes receive education on self-care, early detection and treatment of foot complications.</p>

Other recommendations to support the above solutions:

The creation of a policy that supports a nationwide interprofessional approach to diabetic foot care, with at least one multidisciplinary diabetes foot care team, with a well-defined referral pattern, in each region.

“The costs of amputations have been found to be 10 to 40 times greater than the cost of effective initiatives to prevent amputation.”

Canadian Institute of Health Information 2013. Compromised Wounds in Canada. Retrieved from www.cihi.ca.

A Canadian Report Card on Funding for Offloading Devices for Persons with Diabetes

In 2015 a scan was undertaken to investigate which jurisdictions in Canada provide defined public coverage for offloading devices for persons with diabetes.

Jurisdiction	Defined Public Coverage	Grade
Alberta	*None ¹	C
British Columbia	*None ²	C
Manitoba	None ³	F
New Brunswick	None ⁴	F
Newfoundland and Labrador	None ⁵	F
Nova Scotia	None ⁶	F
Ontario	None ⁷⁻¹⁰	F
PEI	None ¹¹	F
Quebec	None ¹²	F
Saskatchewan	None	F
The Territories	None	F
Federal – Inmates	Full ³	A
Federal – RCMP Benefits	Full ³	A
Federal – Veteran’s Affairs	Partial ³	B
Federal – Non-Insured Health Benefits for First Nations and Inuit (NIHB)	Partial ³	B

**Alberta and British Columbia have some partial subsidization of services performed by a podiatrist but no explicitly defined coverage for offloading devices.*

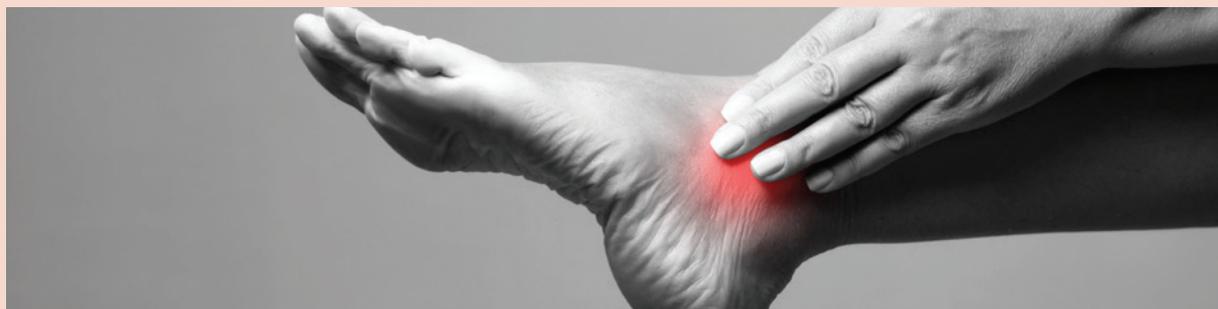
Defined public funding for offloading devices is rare in Canada, in contrast to other industrialized countries like the UK and U.S. Full coverage in Canada is offered to inmates of federal prisons and members of the RCMP. Veterans Affairs and the NIHB program offer partial coverage. Partial coverage of podiatry services, which may include offloading, was found for Alberta (up to \$250 per year) and British Columbia (variable and means tested). For all other Canadian jurisdictions no sources were found or sources were found that confirmed the absence of defined public coverage.

Opportunities for Offsetting Costs of Investment

- Decrease in emergency room visits
- Lower hospital occupancy
- Avoided amputations
- Reclaimed operating room time
- Lower provincial drug benefit costs
- Fewer CCAC nursing home visits

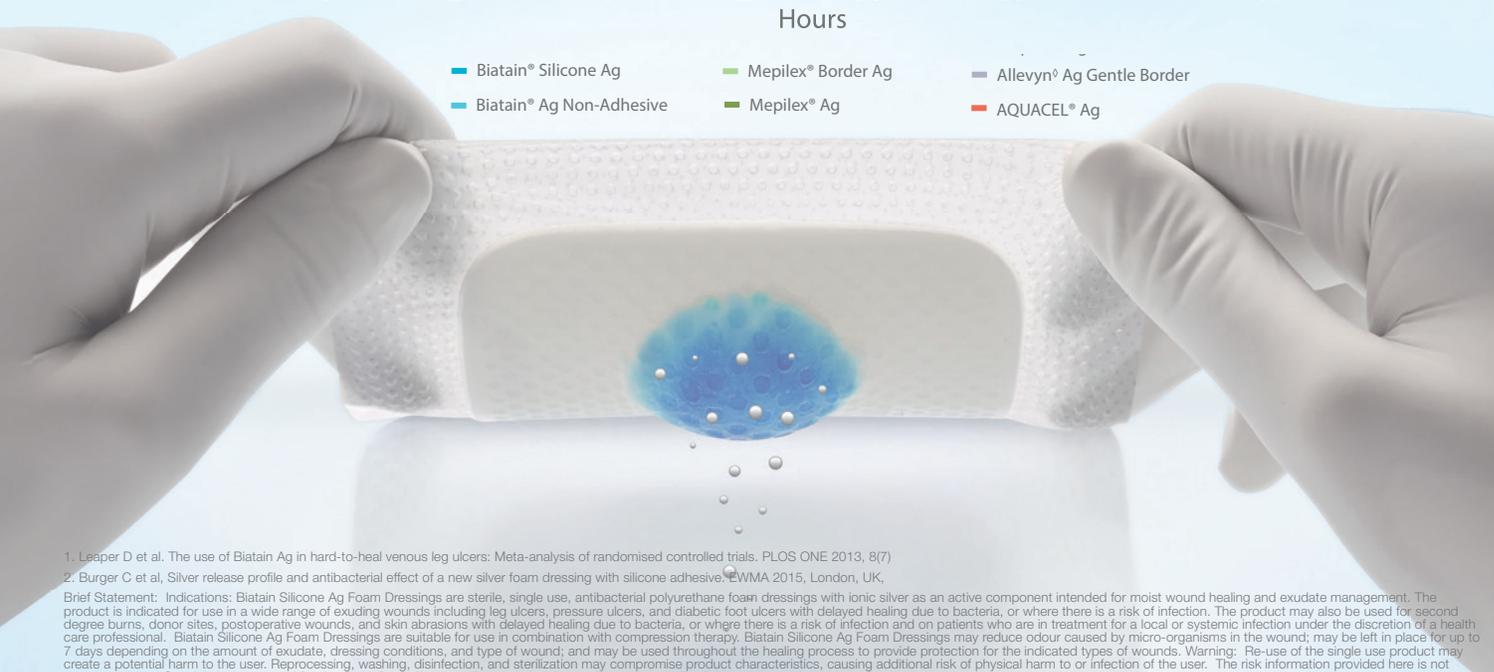
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Make Every Day Count with Faster Healing for Infected Wounds

Biatain® Silicone Ag has demonstrated the highest accumulated sustained silver release among competitors starting from 37 hours after application and up to 168 hours (7 days).^{1,2}



1. Leaper D et al. The use of Biatain Ag in hard-to-heal venous leg ulcers: Meta-analysis of randomised controlled trials. PLOS ONE 2013, 8(7)
 2. Burger C et al. Silver release profile and antibacterial effect of a new silver foam dressing with silicone adhesive. EWMA 2015, London, UK.

Brief Statement: Indications: Biatain Silicone Ag Foam Dressings are sterile, single use, antibacterial polyurethane foam dressings with ionic silver as an active component intended for moist wound healing and exudate management. The product is indicated for use in a wide range of exuding wounds including leg ulcers, pressure ulcers, and diabetic foot ulcers with delayed healing due to bacteria, or where there is a risk of infection. The product may also be used for second degree burns, donor sites, postoperative wounds, and skin abrasions with delayed healing due to bacteria, or where there is a risk of infection and on patients who are in treatment for a local or systemic infection under the discretion of a health care professional. Biatain Silicone Ag Foam Dressings are suitable for use in combination with compression therapy. Biatain Silicone Ag Foam Dressings may reduce odour caused by micro-organisms in the wound; may be left in place for up to 7 days depending on the amount of exudate, dressing conditions, and type of wound; and may be used throughout the healing process to provide protection for the indicated types of wounds. Warning: Re-use of the single use product may create a potential harm to the user. Reprocessing, washing, disinfection, and sterilization may compromise product characteristics, causing additional risk of physical harm to or infection of the user. The risk information provided here is not comprehensive. See the device manual for detailed information regarding complete instructions, contraindications.

Wound Sleuth

By Rob Miller, MD, FRCPC (derm)
and Cathy Burrows, RN, BScN, MScCH

History

The patient is a 36-year-old male with type I diabetes. He is a non-smoker, is single, lives alone and is employed at a butcher shop.



Figure 1



Figure 2



Figure 3

Q What is the cause of this wound?

A This patient experienced frostbite secondary to per-

ipheral neuropathy while working in a meat freezer. Peripheral neuropathy (PN) is damage to nerves that most often is caused by chronic elevated glucose levels. Although elevated glucose is the leading risk factor for PN, other risk factors such as renal failure, exposure to toxins, vitamin B deficiencies and chronic alcohol abuse can also lead to PN. Patients with PN can experience pain, numbness and loss of sensation. Foot ulceration and possible amputation can result from PN. According to P.J. Dyck, K.M. Kratz and J.L. Karnes (cited by Brill et al.), “detectable sensorimotor polyneuropathy will develop within 10 years of the onset of diabetes in 40% to 50% of people with type 1 or type 2 diabetes.”¹

Q How would you treat this wound?

A The toe wound would be treated with standard best practice dressings. The key to management is to address the causes of PN. Sensorimotor testing should be conducted to determine the degree of PN. This can be done using a 10 g monofilament or a 128-Hz tuning fork. For further detail, refer to the

appendix in Brill et al.¹ (<http://guidelines.diabetes.ca/Browse/Appendices/Appendix8>.)

Annual screening should be performed on patients with PN and glucose levels should be monitored to ensure glucose control. Patients should be educated on diabetes management and referrals to the appropriate health-care professionals for footwear and foot care management should also be completed. Patients who experience pain or numbness may get relief with anticonvulsants, antidepressants or opioid analgesics. All risk factors need to be addressed. For a more comprehensive overview of treatment and management for PN refer to the Diabetes: Healthy Feet and You program at <http://cawc.net/en/index.php/public/feet/>.

Rob Miller is a dermatologist and **Cathy Burrows** is an independent wound care consultant, both in Halifax.

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The Impact of Obesity on the Development and Care of Acute and Chronic Wounds

By Simon Palfreyman, RN, PhD

Introduction

At the turn of the last century and for the first time ever in world history, the number of adults who were overweight became greater than those who were malnourished and underweight.¹ Since then the pace of worldwide weight gain has only accelerated, and we are currently in the midst of a global obesity epidemic. Not only has the number of people who are obese increased, but the weight of those who are obese has also increased.² These increases will have and are having profound impacts on public health and the delivery of health-care services.³ If current trends continue, obesity will become the “new normal” for the majority of the population, with over 50% of the U.S. population being classified as obese by 2030.⁴

The phenomenon of excess weight gain is not confined to one country; obesity is a worldwide public health problem in both developed and less developed countries.³ In 2013, over 14 million people in Canada classified themselves as obese or overweight. This equates to approximately 40% of the population. Over 5 million people (15%) were in the highest obesity category.⁵

The steady increase in the number of obese people has also meant that more obese people need access to health services for both primary and secondary care. However, health-care providers have been slow to adapt to the challenges in delivering care for this group of patients. Those who are obese can experience poorer quality care and be forced to compromise their safety, dignity and health-care experience.⁶

“There are multiple challenges in caring for this group of patients . . . including the need for additional staffing, training and equipment.”

Obesity and the BMI Classification

Ethnic and gender differences can make it difficult to define obesity precisely.⁷ Nonetheless, the Body Mass Index (BMI) has been adopted worldwide as a classification of weight.⁸ The BMI is the ratio of weight to height and is calculated by dividing weight in kilograms by height in metres squared (i.e., $BMI = (\text{weight in kg}) / (\text{height in metres})^2$).



The BMI is in essence a proxy measure of body fat as it is a measure of weight rather than excess fat and can be influenced by age, ethnicity and muscle mass.⁸ The most widely accepted boundaries for BMI classification are shown in Table 1.

Table 1. Classification of BMI based on the Canadian Guidelines for Body Weight Classification⁹ in Adults and National Obesity Education Initiative Expert Panel¹⁰

BMI Range	Classification
Less than 18.5	Underweight
18.5 to 24.9	Normal weight
25 to 29	Overweight
30 to 34.9	Obese class 1
35 to 39	Obese class 2
Over 40	Obese class 3 (Morbid obesity)
Over 50	Super obesity

The consequences of being overweight and obese have been well documented and include increased rates of cardiovascular disease, diabetes, liver disease, certain cancers, hypertension and early death.¹¹ In addition, those who are overweight and obese often face stigmatization and discrimination by society and health providers.¹²

Obesity and Wound Care

The increasing prevalence of obesity means that there is an ever-increasing number of obese patients who have chronic and acute wounds or who are at risk of developing a wound. There are multiple challenges in caring for this group of patients from their admission through to discharge, including the need for additional staffing, training and equipment.¹³ In order to effectively manage and deliver care for this vulnerable group of patients, there is an urgent need to evaluate the strategies for preventing, treating and caring for their chronic and acute wounds.

There are risks associated with being obese compared to being normal weight in terms of developing different types of wounds and also in relation to how wounds may develop or ultimately heal.¹⁴ First, patients who are obese and have difficulty mobilizing can be at increased risk of developing pressure ulcers. Second, mobility issues may result in spending long periods sitting or sleeping overnight in a chair. This inactivity leads to the development of dependent edema and venous stasis and the risk of venous leg ulceration.¹⁵ Finally, those patients who need surgical intervention are at greater risk of wound dehiscence.

cence, hematoma development and infection.¹⁶

The greater the level of obesity the more likely that a wound will result in an adverse outcome.^{17,18} Figure 1 illustrates how obesity can be linked to wounds and wound outcomes. Many wounds can be linked to the direct impact of obesity on a person's mobility, physiology and environment.

In addition to developing wounds, obese patients can also experience other skin conditions that could predispose them to further skin breakdown.¹⁹ These conditions include those linked to friction between skin folds such as intertrigo and dermatitis associated with moisture and incontinence.

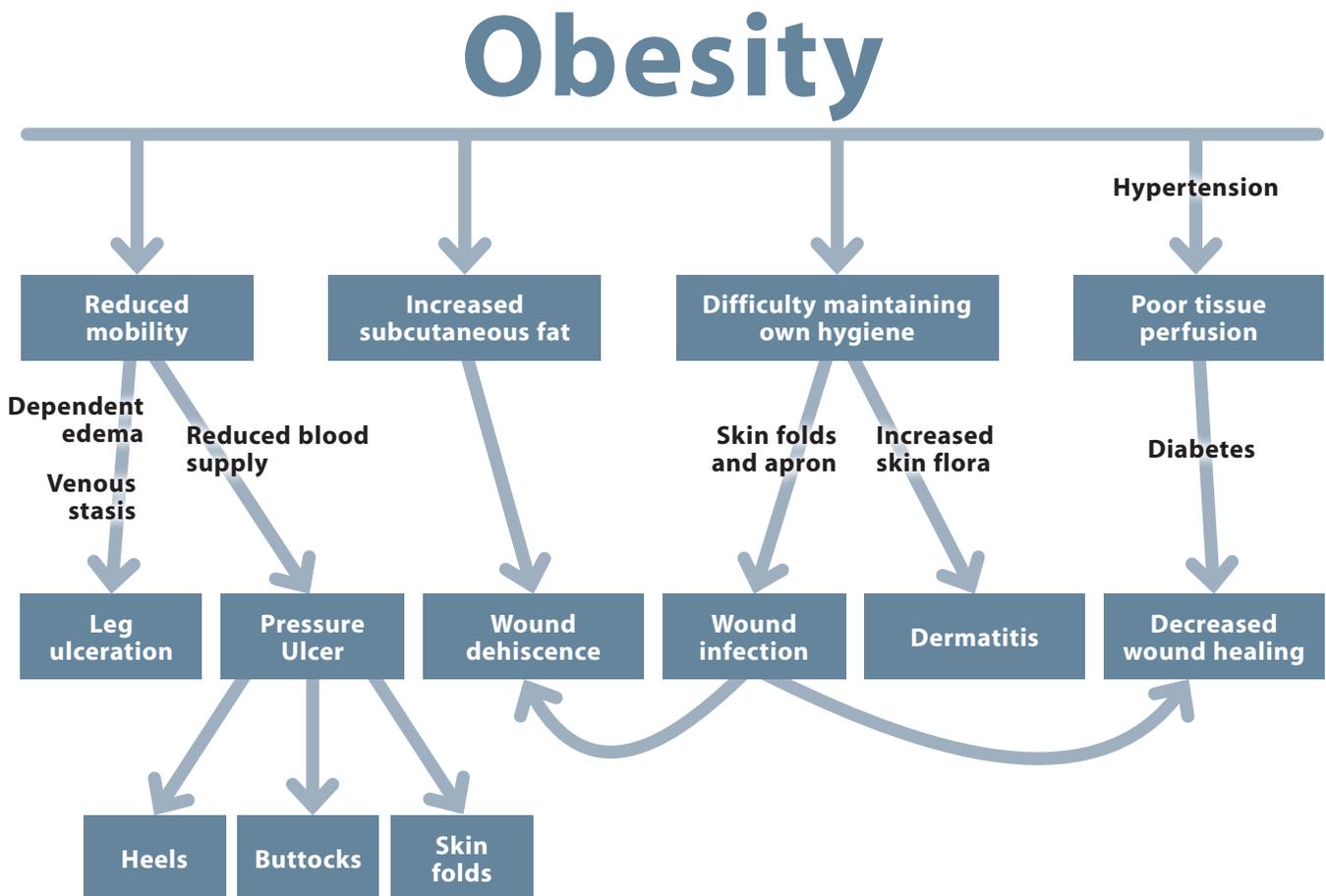
Surgical Wounds

The number of surgical patients who are obese has increased right along with the number of

obese people in society. Although being obese may have a negative impact on mortality and morbidity in general, there is some evidence that this may not necessarily be the case for surgical interventions. There exists an "obesity paradox" for those undergoing general surgery who are not in the highest class of BMI (> 40), which seems to provide a protective benefit to being overweight.²⁰ Those who are overweight or moderately obese have a lower risk of death, but as weight increases the risk of complications, including complications with the surgical wound, increases.²¹

Being obese can have a major impact on wound outcomes for many different surgical procedures. For example, in colorectal surgery, obesity prolongs the time taken to perform the operation and can increase the risk of wound dehiscence, development of a hernia at the incision site and stoma complications.²² In vascular surgery and

Figure 1. The links between obesity and wound development



spinal surgery, wound infection rates for those in the highest obese group can be twice as high as those for a normal weight patient.^{23,24}

There are many potential factors that can increase the risks of wound complications for those who are obese. These factors could be linked to the likelihood of obesity predisposing the patient to having co-morbidities that can result in wound complications such as diabetes, hypertension or anemia.¹¹ The risks may also be related to surgery for obese patients taking longer and being more complex.²⁵

In general, those patients who are both obese and have a surgical wound have higher risks of infection, dehiscence and poor wound healing.²⁵ Wound infection in particular is a common complication in the post-operative period for this group of patients²⁶ and can be eight times higher compared to non-obese patients.²⁷ The evidence for higher rates of infection is strong and consistent across different types of surgery.^{16,27,28,29} However, the evidence for wound dehiscence has been criticized as being contradictory, with some studies indicating a higher rate linked to obesity but others showing no statistical link.³⁰ It is unclear whether these variations are related to surgical technique, time in theatre or wound-specific factors.³¹

The surgical wound can also take longer to heal in obese patients compared to those who are not obese.^{25,32} The reasons for increased healing times are not fully understood but could be related to obesity impairing micro-circulation, tissue perfusion and the immune response to infections.^{33,34} Increased healing time may also be affected by the comorbidities associated with obesity such as diabetes, immobility, poor nutrition and reduced pulmonary function.²⁵

Leg Ulcers

Obesity can also be associated with leg ulceration, with more than two-thirds of those having a venous ulcer having a BMI of over 30.³⁵ This increased incidence of leg ulceration is thought to be related to the weight of the abdomen

and restrictions with movement, which can lead to impaired function of both the one-way valves in the major leg veins and the calf-muscle pump.³⁶

The consequences of impaired blood flow include development of venous hypertension and chronic venous insufficiency.³⁷ Additionally, the interconnected nature of the venous and lymphatic systems means that obesity also has an adverse effect on the movement of fluid in the lymphatic system.³⁸ Accumulation of lymph fluid in the skin tissue and lymphedema can be localized to the lower limb but can also occur in the abdominal apron.³⁹ Because lymph fluid is an ideal medium for bacteria, recurrent cellulitis and infections are common.⁴⁰



“The care of obese patients requires significantly more nursing time and resources.”

For those who are obese, the treatment of the venous ulcer through compression bandages and hosiery can also be more challenging for clinical staff, more complex and less effective. Obese patients often require additional resources in terms of time, equipment and skills. Clinical staff

often report that it can be difficult to achieve therapeutic compression pressures with the application of compression bandages to obese legs due to the shape of the legs and the physical effort that can be necessary to apply the bandages.⁶

Pressure Ulcers

Pressure ulcers occur over bony prominences and are a consequence of reduced mobility and inability of the patient to relieve their own pressure areas.⁴¹ Those who are obese have additional body fat over bony prominences but also have difficulty with movement and turning themselves when in bed. The pressure on the skin tissue results in a chronic reduction in blood that can result in the development of pressure ulcers.⁴² Other risk factors in the development of pressure ulcers in obese patients include moisture, shear and friction.⁴³ These factors can occur in areas of the body where skin rubs together and moisture collects, such as in skin folds, under breasts, between the buttocks and between the thighs.

There can be differences in the incidence, location, category and type of pressure ulcer for those who are obese. There is still some debate regarding whether obesity can be a risk factor in the development of pressure ulcers, with some studies showing that there is no linkage and perhaps even a reduced chance of pressure ulcers in the

obese elderly.⁴⁴ Yet obese patients have also been shown to have a higher risk of pressure ulcers than those in the normal weight range, with those in the higher obesity categories having the most risk.⁴⁵ The chance of developing a pressure ulcer has been found to be nearly 20% higher for nursing home residents who were moderately or severely obese compared with those who were not obese.⁴⁶ Such studies have suggested that being moderately or severely obese should be classified as a risk factor for pressure ulcers and that allowance should be made for the proportion

“Being obese can have a major impact on wound outcomes for many different surgical procedures.”

of obese patients when evaluating the prevalence of pressure ulcers within an institution. The risk of pressure ulcers for those with obesity can be higher and the consequences more severe compared to the normative population. A recent review of patient safety reports in the U.S. highlighted that those with Class III obesity can have a greater risk of pressure ulceration (33.1% compared to 15.5%) and that they are more likely to have a serious event (resulting in patient harm) than the normative population (20.7% compared to 2.3%).⁴⁷

Obese people may also be at increased risk



Key Points

Clinicians should keep in mind the following key points for preventing or treating wounds in overweight or obese patients:

- ☞ All wounds: Wounds may take longer to heal in obese patients due to comorbidities and other factors.
- ☞ Following surgery: Obese patients have a higher risk for complications, including wound infection and dehiscence.
- ☞ Pressure, friction, shear and moisture: Don't assume body fat will prevent pressure ulcers. Look in non-typical locations such as heels for PUs and in skin folds for intertrigo.
- ☞ Lower leg: Watch for dependent edema in the legs, which may indicate risk for development of leg ulceration in this high-risk population.
- ☞ Protect your patients and yourself with special equipment, training and teamwork!
- ☞ Treat obese patients with the same consideration as all other patients.

of heel pressure ulcers due to the increased weight of their legs and restricted movement.^{48,49} However, the link between obesity and the risk of heel pressure ulcer development remains unproven and some studies have found no link.⁵⁰

One hypothesis for an increased risk of pressure ulcers is that the presence of skin folds may increase friction and harbour bacteria, which may predispose obese individuals to infection and skin breakdown.⁵¹ However, the increased risk could simply be a result of clinical staff finding it more difficult to identify and manage pressure ulcers in

this group of patients.⁵²

The care of obese patients requires significantly more nursing time and resources.⁵³ This may mean that if there are shortages of personnel, lack of equipment or increased workload, obese patients may not get the necessary assistance with mobility or pressure area care. There may also be issues within health-care organizations in terms of a lack of awareness of the additional needs and specialist training that may be necessary to care for obese patients.⁶

Clinical Implications

Caring for the increasing number of obese patients can be challenging and time intensive.⁵² It requires effective systems of communication to co-ordinate care in order to maximize the use of resources—both personnel- and equipment-related.⁴⁵ Health-care providers also need to be aware of the additional training that staff may require to improve moving and handling techniques and reduce the risk of injury.⁵⁴ Health-care provision for obese patients requires more resources compared to non-obese patients in terms of staffing, environment, specialist equipment and supplies.^{6,13} Those who are obese can be vulnerable and at risk of discrimination; they are blamed by society for their condition and looked on as “repulsive.”⁵⁵ Although there are signs that increased exposure to caring for those who are obese is improving attitudes, health-care professionals can still stigmatize and discriminate in favour of non-obese patients.^{56,57} This stigmatization and discrimination can impact the care that obese patients receive in terms of both access to services and quality.⁵⁸

The evidence suggests that patients who are obese have an increased risk of certain types of wounds and poorer outcomes once the wound has developed. These are the result of both physical and physiological differences from non-obese patients. Clinical staff need to be aware of these differences in order to both reduce the risk of wounds occurring and to improve wound healing. Table 2 highlights some key best practice strategies for caring for those who are obese.

Table 2. Best practice considerations for obese patients who have or are at risk of a wound

Skin assessment and pressure relief	<ul style="list-style-type: none"> • Skin and pressure area assessment on initial admission or transfer • Regular evaluation of turning/pressure-relief regimen • Checking of areas prone to pressure ulcers such as buttocks and between skin folds • Listening to patients regarding any areas of the skin where they are experiencing pain
Moisture management	<ul style="list-style-type: none"> • Use of barrier creams • Personal hygiene – keeping skin dry and clean • Use of incontinence aids – pads, etc.
Specialist equipment	<ul style="list-style-type: none"> • Beds and mattresses designed for the obese patient • Lifting aids • Reduction of shear and friction through low-friction slides and covers • Mobility aids • Pressure-relieving seat cushions
Training for staff	<ul style="list-style-type: none"> • Physical and emotional care • Use of equipment • Identification of at-risk patients • Assessment of wounds to identify issues such as wound infection and dehiscence

Summary

The rising incidence of obesity has resulted in an increased number of patients with obesity within all health-care settings. Obesity is linked to comorbidities and impacts that can result in poorer health outcomes. In addition, obese individuals are at risk of developing wounds; these wounds can be more complex and difficult to heal compared to those of non-obese individuals. Examples include:

- When having surgical interventions, those who are obese have a higher risk of wound complications, including wound infection and dehiscence.

- Due to issues with mobility, moisture, shear and friction, obese patients can be at increased risk of developing pressure ulcers compared to normal weight patients. The location of pressure ulcers may also differ significantly compared to other patients.
- Dependent edema in the legs means that obese patients are at increased risk of leg ulceration compared to non-obese patients.

The development of wounds, and the additional care necessary, can further increase the complexity and costs of care for obese patients. It is important that health-care providers rise to the challenge of caring for this group of patients. 🙌

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A Day in the Life: The Role of a Dietitian in Wound Care

By Andrea Illyas, RD



There is no doubt that members of the interprofessional team share responsibilities for the prevention and treatment of wounds. Because nutrition plays a key role in any comprehensive care plan for the prevention and treatment of pressure ulcers, the registered dietitian is an essential team member, particularly in long-term-care settings.

Ontario's Long-Term Care Homes Act, 2007, requires all homes to have a wound program to promote skin integrity, prevent the development of wounds (including pressure ulcers) and provide effective skin and wound interventions.

Adequate nutrition is especially important when working with older, frail and/or malnourished residents. Compromised nutritional status in this population can include unintentional weight

loss, protein energy malnutrition (PEM), hyperglycemia, dehydration, iron deficiency anemia and other vitamin or mineral deficiencies. Other nutrition-related risk factors associated with increased risk of pressure ulcers and other types of skin breakdown include low body mass index

(BMI), reduced food intake, impaired ability to eat independently as well as decreased mobility and loss of muscle mass. These factors become barriers to healing once a wound has developed. Adequate calories, protein, fluids, vitamins and minerals are required for the body to maintain tissue integrity and prevent tissue breakdown.

As a dietitian in long-term care, my role is to ensure that residents are provided with optimal nutrition. When a resident is first admitted to a home, I complete a comprehensive nutrition assessment, which includes obtaining information on the resident's personal dietary habits, medical history, medication review, laboratory results and anthropometric information.

From these data, I can create an individualized nutrition plan for each resident, including the resident's individualized diet and texture needs, provision of special snacks and nutritional supplements as well as other specific dietary interventions.

I complete these nutrition assessments on at least a quarterly basis for every resident so that I have an ongoing opportunity to reassess and make appropriate changes to the resident's nutritional care plan. The nursing staff takes weights monthly for all residents and the nurse will complete a referral for any significant weight loss. I then complete a nutrition review to make individualized adjustments in the resident's plan of care. For residents with wound issues, we recommended obtaining weekly weights.¹ Through



the assessment process, I must take into account the resident's interest in food, ability to chew and swallow, management of pain, need for assistance with meals and other factors that can sometimes affect a resident's oral food intake significantly. For residents with intact skin, this detailed focus on nutrition and hydration works toward keeping the skin healthy and preventing skin breakdown.

It has been shown that adequate nutrition and hydration aid in skin health to reduce hospital admissions, improve residents' activity levels and improve quality of life. Adequate nutrition and hydration also lower health-care costs because wound prevention is much less expensive than wound treatment.¹ Further, expensive wound treatments are sometimes used unsuccessfully because of inadequate nutrition; however once nutrition and hydration deficits are rectified, the wound treatments are much more effective.

To stay on top of each resident's skin integrity issues, I receive a dietary referral from nursing

Screening and Assessment Recommendations^{1,2}

- **Nutrition and Hydration Screening:** Use a validated screening tool to identify those at nutritional risk upon admission.
- **Comprehensive Nutrition Assessment:** Assessment is to be completed upon admission, with each change in condition and when progress toward pressure ulcer closure is not observed.
- **Weight Monitoring:** Regular weight monitoring is the most non-invasive, time-efficient, inexpensive, most reliable indicator of nutritional adequacy. Failure to monitor weight is a barrier to healing. Weekly monitoring is recommended.
- **Blood Work Screening:** Screening identifies underlying, resolvable barriers to wound healing.

Key Nutrient Recommendations^{1,2}

- **Water:** A minimum intake of 27 ml/kg body weight with considerations made to wound and hydration status and fluid losses.
- **Energy:** Caloric intake is individualized based on underlying medical conditions and level of activity. Provide 30–35 kcal/kg body weight for those with or at risk of a pressure ulcer who are assessed as being at risk for malnutrition.
- **Protein:** Provide 1.25–1.5 g/kg body weight for adults (as high as 2.0 g/kg) who are at risk for or have existing pressure ulcers and are assessed as

being at risk for malnutrition. Reassess as condition changes. It is important to note that whey protein is superior in the treatment of pressure ulcers.

- **High-Calorie/Protein Supplements:** Offer high-calorie, high-protein oral nutritional supplements between meals in addition to the usual diet for those with nutritional and pressure ulcer risk if nutritional requirements cannot be achieved by dietary intake.
- **Vitamins/Minerals:** Provide and encourage those with or at risk of pressure ulcers to consume a balanced diet that includes good sources of vitamin and minerals. If dietary intake is poor or deficiencies are suspected or confirmed for these individuals, provide a vitamin and mineral supplement.



staff for any resident who has a reddened area, skin tear or any open area of skin. Although pressure ulcers are the most prevalent type of wound in long-term care, I must also be made aware of surgical wound healing, venous and arterial leg ulcers or other possible skin breakdown concerns. While the causes of pressure ulcers can vary, early assessment, prevention and treatment are all essential as part of a preventative approach.

As in any setting, it is important that all members of the interprofessional team—which includes the physician, dietitian, pharmacist, occupational therapist, physiotherapist, social worker, nursing staff, resident and family members—be involved and work together as a team to develop comprehensive care plan.^{1,2,3} 🍷

Andrea Illyas, RD is a corporate dietitian with Seasons Care Dietitian Network and has been working in long-term care for the past 12 years. She is an active member of Dietitians of Canada's Ontario Long Term Care Action Group as well as a member of Ontario Woundcare Interest Group.

Resources

1. Food for Thought: Nutrition and Hydration for Pressure Ulcer Prevention and Management presentation at the Dietitians of Canada Gerontology Network Fall 2015 workshop by Chris Fraser, HBSc, RD.
2. National Pressure Ulcer Advisory Panel (NPUAP) guidelines for pressure ulcers at www.npuap.org.
3. Registered Nurses' Association of Ontario (RNAO) best practice guidelines at www.rnao.org.

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