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Best Practice Guideline

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Diabetic foot ulcers: Prevention, assessment and management

Third edition

RNAO
Registered Nurses' Association of Ontario
L'Association des infirmières et infirmiers autorisés de l'Ontario

Disclaimer

These guidelines are not binding on nurses, other health providers or the organizations that employ them. The use of these guidelines should be flexible and based on individual needs and local circumstances. They constitute neither a liability nor discharge from liability. While every effort has been made to ensure the accuracy of the contents at the time of publication, neither the authors nor the Registered Nurses' Association of Ontario (RNAO) gives any guarantee as to the accuracy of the information contained in them or accepts any liability with respect to loss, damage, injury or expense arising from any such errors or omissions in the contents of this work.

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Declaration of Conflict of Interest

In the context of RNAO best practice guideline development, the term "conflict of interest" (COI) refers to situations in which an RNAO staff member or expert panel member's financial, professional, intellectual, personal, organizational or other relationships may compromise their ability to conduct panel work independently. Declarations of COI that might be construed as constituting a perceived and/or actual conflict were made by all members of the RNAO expert panel prior to their participation in guideline development work using a standard form. Expert panel members also updated their COI at the orientation meeting, the recommendation build meetings, and prior to guideline publication. Any COI declared by an expert panel member was reviewed by the RNAO best practice guideline development and research team and expert panel co-chairs. No limiting conflicts were identified by members of the expert panel. See "Declarations of Conflicts of Interest Summary" under the "methodology documents" tab on the BPG webpage.

Land Acknowledgement

We recognize that RNAO's office is located on the traditional and unceded territory of the Huron-Wendat, Haudenosaunee, and the territory of the Mississaugas of the Credit. This territory was the subject of the Dish with One Spoon Wampum Belt Covenant, which is an agreement between the Iroquois Confederacy and the Ojibwe and allied nations to peaceably share and care for the resources around the Great Lakes. We also acknowledge that Toronto is covered by Treaty 13 under the Toronto Purchase Agreement with the Mississaugas of the Credit. Today, this land is still the home to many First Nations, Inuit and Métis peoples from across Turtle Island and we are grateful to have the opportunity to work on this territory. By making a land acknowledgement we are taking part in an act of reconciliation, honouring the land and Indigenous heritage which dates back more than 10,000 years. We encourage readers to learn about the land where you reside and the treaties that are attached to it. Land acknowledgements are an act of reconciliation and we must all do our part.

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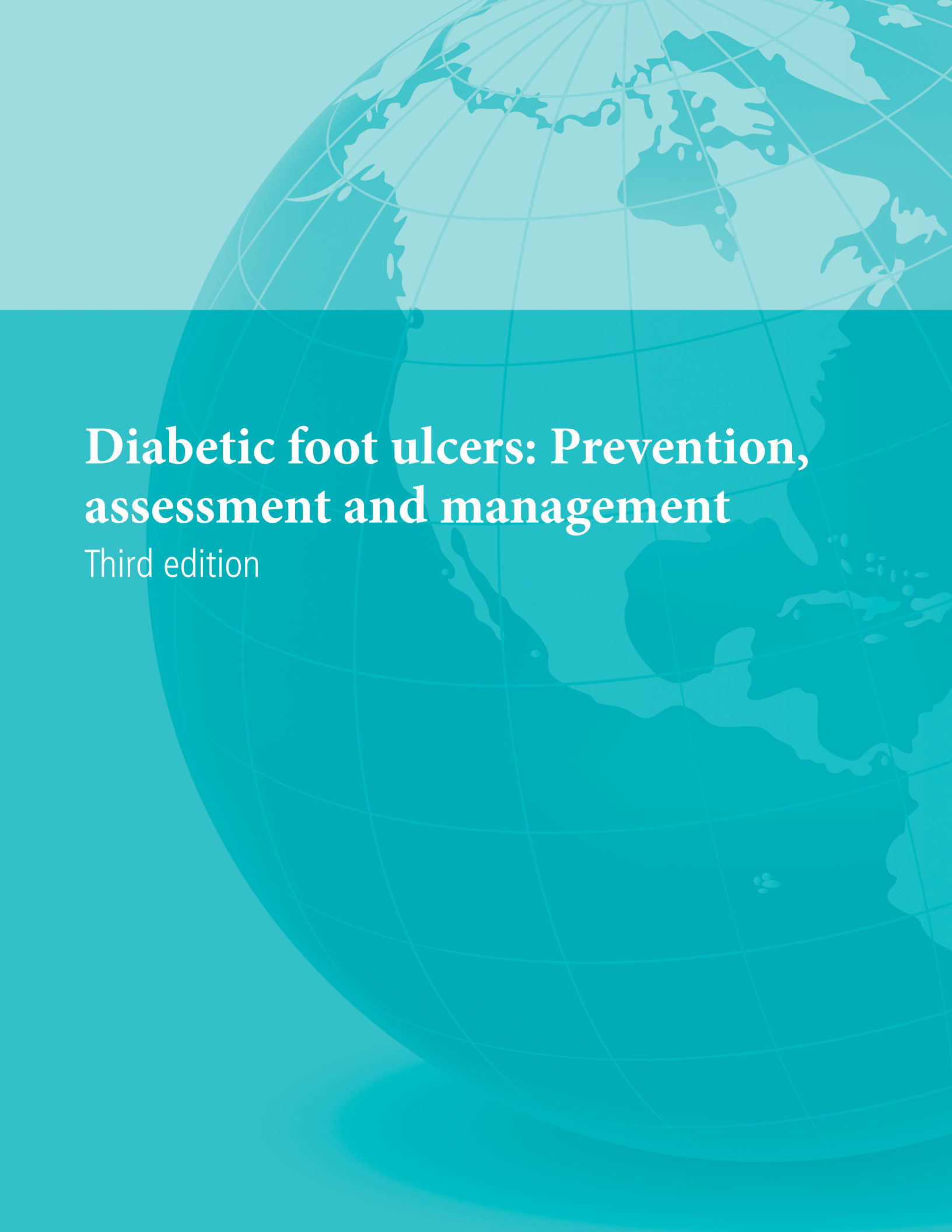

Diabetic foot ulcers: Prevention, assessment and management

Third edition

Greetings from Dr. Doris Grinspun,
Chief Executive Officer, Registered Nurses' Association of Ontario

The Registered Nurses' Association of Ontario (RNAO) is delighted to present the third edition of the clinical best practice guideline (BPG) *Diabetic Foot Ulcers: Prevention, Assessment and Management*. Evidence-based practice supports the excellence in service that health providers are committed to delivering every day.

We offer our heartfelt thanks to the many partners who made this BPG a reality. First, and most important, we thank the Government of Ontario that recognized in 1999 RNAO's capacity to lead a program that has gained worldwide recognition and is committed to funding it. We also thank the co-chairs of the RNAO expert panel for their invaluable expertise and stewardship of this BPG:

- Dr. Kevin Woo, RN, NSWOC, WOCC(C), PhD, Professor, Faculty of Health Sciences, School of Nursing, Queen's University
- Mariam Botros DCh, DE, IIWCC, MEd, Chief Executive Officer, Wounds Canada

Thanks to RNAO staff RN Gladys Hui and RN Deborah Baiden (guideline development co-leads), Glynis Gittens (guideline development project coordinator), RN Lyndsay Howitt and RN Amy Burt (senior managers, guideline development and research) and the rest of the RNAO best practice guideline development and research team for their intense and expert work in the production of this BPG. Special thanks to the expert panel for generously providing their time, knowledge and perspective to deliver a rigorous and robust evidence-based resource that will guide the education and practice of millions of health providers. We couldn't have done it without you!

Successful uptake of BPGs requires a concerted effort from educators, clinicians, employers, policy makers, researchers and funders. The nursing and health communities, with their unwavering commitment and passion for excellence in patient care, provide the expertise and countless hours of voluntary work essential to developing new and next edition BPGs. Employers have responded enthusiastically by becoming Best Practice Spotlight Organizations® (BPSO®), joining more than 1,500 service and academic institutions in Canada and abroad, committed to implementing RNAO's BPGs. They have sponsored best practice champions, now numbering more than 150,000 nurses, other health professionals and persons with lived experience – all eager to advance person-centred evidence-based care. BPSOs are also diligently monitoring and evaluating the impact of BPG implementation on patients, organizations, and health system outcomes.

We invite you to share this BPG with nursing and all other team members, client navigators and advisors in the wider health systems within which you work. We have so much to learn from one another. Together, we must make sure that the public have access to and receive the best possible health and wellness services, always.

Dr. Doris Grinspun, RN, BScN, MSN, PhD, LLD (hon), Dr (hc), DHC, DHC, FAAN, FCAN, O.ONT.
Chief Executive Officer and Founder of the Best Practices Guidelines Program
Registered Nurses' Association of Ontario

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How to use this document

Throughout this document, terms that are bolded and marked with a superscript G ([G]) can be found in the **Glossary of terms** in **Appendix A**.

This **best practice guideline**[G] (BPG) is a comprehensive document that provides guidance and resources for **evidence-based practice**[G]. It is not intended to be a manual or "how-to" guide; rather, it is a tool to guide best practices and enhance decision making for **nurses**[G], the **interprofessional team**[G], educators, **health service organizations**[G], academic institutions, and **persons**[G] and their **care partners**[G]. This BPG should be reviewed and applied in accordance with the needs of individual health service organizations, academic institutions or other practice settings, and with the preferences of persons at risk or living with **diabetic foot ulcers**[G] (DFU) and their care partners. This document provides evidence-based **recommendations**[G] and **good practice statements**[G] and descriptions of: a) practice and organizational policy; b) benefits and harms; c) values and preferences; and d) health equity considerations.

Nurses, members of the interprofessional team, educators and administrators who lead and facilitate practice changes will find this document invaluable for developing policies, procedures, protocols and educational programs to support service delivery. Nurses and members of the interprofessional team in direct care will benefit from reviewing the recommendations and supporting evidence.

If your organization(s) (or integrated system of care) is adopting this BPG, the Registered Nurses' Association of Ontario (RNAO) recommends organizations establish change teams whose responsibilities include but are not limited to the following:

1. Conduct a gap/opportunity analysis: assess your existing policies, procedures, protocols and educational programs in relation to the good practice statements, recommendations and supporting discussions of evidence in this BPG, and identify any strengths, needs or gaps.
2. Note the recommendations and good practice statements applicable to your setting and that can be used to address existing priorities, needs or gaps within your organization(s).
3. Develop a plan for implementing recommendations and good practice statements, sustaining best practices and evaluating **outcomes**[G] by applying the Social Movement Action Framework (1,2) and/or the Knowledge-to-Action Framework (3).

Implementation science[G] resources, including the Leading Change Toolkit, are available online (4). A description of the Leading Change Toolkit can be found in **Appendix M**. For more information, see **Implementation strategies** on page 84.

All RNAO BPGs are available for download, free of charge, from the RNAO website at RNAO.ca/bpg. To locate a particular BPG, search by keyword or browse by topic. Additional supplementary materials such as evidence profiles and search strategies related to each recommendation can be found under the "methodology documents" tab on the BPG webpage.

We are interested in hearing your feedback on this BPG and how you have implemented it. Please share your story with us at RNAO.ca/contact.

The two-decade journey of RNAO BPGs is documented in the following resource: Grinspun D, Bajnok I, editors. Transforming nursing through knowledge: best practices for guideline development, implementation science, and evaluation. Indianapolis (IN): Sigma Theta Tau International; 2018.

Purpose and scope

Purpose

RNAO's BPGs are systematically developed, evidence-based documents that include recommendations on specific clinical, healthy work environment and health system topics. They are intended for nurses, members of the interprofessional team in direct care positions, educators, administrators and executives, policy-makers, and researchers in health service and academic organizations. **Persons with lived experience**[G] and care partners are encouraged to become familiar with the BPGs to support their involvement in evidence-based decision-making related to their care. BPGs promote consistency and excellence in clinical care, administrative policies, procedures and education, with the aim of achieving optimal health outcomes for people, communities, and the health system as a whole. RNAO aims to meet international reporting standards for clinical practice guidelines, including the standards outlined in the Appraisal of Guidelines for Research and Evaluation (AGREE II) Instrument and the Reporting Items for practice Guidelines in HealThcare (RIGHT) statement (5,6).

This BPG replaces two RNAO BPGs: *Reducing Foot Complications for People with Diabetes* (7) published in 2007 and *Assessment and Management of Foot Ulcers for People with Diabetes* (8) published in 2013. These BPGs were merged because of the overlapping clinical concepts in each BPG. Additionally, RNAO's **Best Practice Spotlight Organizations®** (**BPSO®**)[G] provided feedback that merging the two previous editions would streamline the implementation and evaluation of the BPGs.

The purpose of this third edition guideline is to provide nurses and members of the interprofessional team, persons at risk of or living with a DFU and their care partners with evidence-based recommendations on the prevention, assessment and management of DFUs. This BPG recognizes that persons at risk of or living with a DFU and their care partners are experts in their health and decision making; collaboration among the interprofessional team, the person receiving care and their care partners is therefore essential to achieving improved health outcomes.

In April 2022, RNAO convened an expert panel to determine the scope of the third edition of this BPG and to develop **recommendation questions**[G] to inform the **systematic reviews**[G]. The interprofessional expert panel included a person with lived experience and individuals with knowledge and experience in all domains of practice: administration, clinical, education, research and policy across a range of health service organizations and academic institutions. They shared their insights on supporting and caring for persons at risk of or living with DFUs across the continuum of care, including (but not limited to) primary care, home and community care, acute care, rehabilitation and long-term care (LTC).

A comprehensive review and analysis were completed by the RNAO best practice guideline development and research team and the RNAO expert panel to determine the scope and priority recommendation questions for this BPG (refer to supplementary materials under the "methodology documents" tab on the BPG webpage).

Scope

To determine the scope of this BPG, the RNAO best practice guideline development and research team conducted the following steps:

- reviewed the previous RNAO BPGs: *Reducing Foot Complications for People with Diabetes* (7) and *Assessment and Management of Foot Ulcers for People with Diabetes* (8);

- conducted an environmental scan of existing guidelines and standards on this topic;
- undertook a review of the literature to determine available evidence on prevention and management strategies to support members of the interprofessional team caring for persons at risk of or living with DFUs;
- led 15 key informant interviews with **health providers**[G], educators and researchers;
- held two discussion groups with health providers; and
- consulted with the expert panel.

This BPG is to be used by nurses and members of the interprofessional team across the health care continuum and in all domains of practice supporting adults at risk of or living with DFUs (i.e., greater than 18 years of age) and their care partners. It is also to be used by employers, including health service organizations and academic institutions.

Topics outside the scope of this best practice guideline

The following populations and topics are not covered within the scope of this BPG:

- persons less than 18 years of age
- prescribing treatments
- adjunctive or alternative treatments

Key concepts in this guideline

Care partner: A care partner provides physical, psychological and emotional support, as deemed important by the person receiving care. This care can include support in decision making, care coordination and continuity of care. Care partners can include family members, close friends or other caregivers and are identified by the person or substitute decision-maker (9).

Diabetic foot ulcer (DFU): A foot ulcer in a person with current or previously diagnosed diabetes mellitus, and usually accompanied by **peripheral neuropathy**[G] and/or **peripheral artery disease**[G] in the lower extremity (10).

Foot ulcer: A break of the skin of the foot that involves as a minimum the epidermis and part of the dermis (10).

Health provider: Refers to both regulated (e.g., nurses, physicians, **chiropodists**, **podiatrists**[G], physiotherapists and dietitians) and unregulated (e.g., personal support workers) workers who are part of the interprofessional team.

> **Regulated health provider:** In Ontario, the Regulated Health Professional Act, 1991 (RHPA) provides a framework for regulating 26 health professions, outlining the scope of practice and the profession-specific controlled or authorized acts that each regulated professional is authorized to perform when providing health care and services (11).
>
> **Unregulated health provider:** Unregulated health providers fulfill a variety of roles in areas not subject to the RHPA. They are accountable to their employers but not to an external regulating professional body (such as the College of Nurses of Ontario). Unregulated health providers fulfill their roles and tasks determined by their employer. Unregulated health providers only have the authority to perform a controlled act as set out in the RHPA if the procedure falls under one of the exemptions set out in the Act (12).

Person: An individual with whom a health provider has established a therapeutic relationship for the purpose of

partnering for health. Replaces the terms "patient," "client" and "resident" used across health service organizations (13).

Specialized health provider: In this BPG, a specialized health provider refers to one educated, trained and competent in advanced lower limb assessment, prevention, and treatment (e.g., an advance foot care nurse holding International Interprofessional Wound Care Course [IIWCC], or Nurse Specialized in Wound, Ostomy and Continence [NSWOC] certifications, or other country-specific formally recognized certificates or a chiropodist or podiatrist).

Specialized wound care team: In this BPG, a team consisting of two or more health providers from different professional backgrounds who possess the competencies and scope of practice required to care for persons at risk of or living with DFUs (based on the person's risk levels; refer to **Good practice statement 1.0** and **Recommendation 3.0**).

Overview of methodology: Good practice statements and recommendations

Good practice statements and recommendations

This BPG includes both good practice statements and graded recommendations. RNAO BPGs are developed using the **Grading of Recommendations Assessment, Development and Evaluation (GRADE)**[G] methods. For more information about the guideline development process, including the use of GRADE methods and evidence profiles, refer to supplementary materials under the "methodology documents" tab on the BPG webpage.

Good practice statements

Good practice statements are actionable statements that should be done in practice (14). These are believed to be so beneficial that summarizing the evidence would be a poor use of the expert panel's time and resources (14). Moreover, researchers may no longer be conducting studies on the topic, or the alternative to the action may be unethical or studying them may go against human rights (14,15). Given the high level of certainty that the benefits derived from the good practice statement outweigh the harms, they are not based on a systematic review of the evidence and they do not receive a rating of the certainty in their evidence or a strength (i.e., a rating of conditional or strong, which is further discussed below) (16). This does not diminish certainty in the evidence: while they may be supported by indirect evidence, there is a well-documented clear and explicit rationale connecting the indirect evidence to the statement (14). As such, good practice statements should be interpreted as strong recommendations as there is an underlying assumption that there is high certainty in the benefits of implementing the action (14). It is important to note that good practice statements are not made due to a lack of evidence, nor are they based on expert opinion.

Graded recommendations

Graded recommendations are also actionable statements; however, the recommendation statements are formed based on a direct or indirect link to a body of evidence found through the systematic review process (15). Recommendations are formulated as strong or conditional by considering the certainty in evidence, values and preferences of persons who are impacted by the recommendation, and health equity (see **Interpretation of evidence and recommendation statements** on page 13). The expert panel formulates recommendations using **Evidence-to-Decision (EtD) frameworks**[G] through a process of informal consensus facilitated by the RNAO best practice guideline development and research team. Since the recommendations are explicitly linked to the body of evidence, agreement is generally reached (17); if agreement cannot be reached, formal voting methods are used to determine the action and strength of the recommendations (17,18).

Despite the fact that good practice statements and recommendations are developed differently, both provide comprehensive guidance on an action/intervention that should (or should not) be done (15). Therefore, both good practice statements and recommendations should follow the same process for implementation (see **Implementation strategies** on page 84).

Recommendation questions

Recommendation questions are priority areas of practice identified by the expert panel that require a systematic review of evidence to answer. These recommendation questions inform the **PICO research questions**[G] (population, intervention, comparison, outcomes) that guide the systematic reviews and subsequently inform recommendations. Potential outcomes are brainstormed and prioritized by the expert panel for each recommendation question, and an individual systematic review is conducted for each question, in alignment with GRADE methods (19).

The following are priority recommendation questions and outcomes developed by the RNAO expert panel that informed the development of the recommendations in this BPG. The outcomes are presented in order of importance, as rated by the expert panel.

- **Recommendation question #1:** Should **person-engagement strategies**[G] be recommended or not for health providers delivering **self-management**[G] support for diabetic foot care (e.g., motivational interviewing, cognitive behavioural therapy, or other psychosocial interventions)?

  Outcomes: Person satisfaction, **self-efficacy**[G], person adherence, **DFU occurrence/recurrence**[G] and **amputation**[G] rates.
- **Recommendation question #2:** Should **self-screening**[G] for DFU risk assessment be recommended or not for persons at risk of or living with DFUs and their care partners?

  Outcomes: Screening rates, person satisfaction, DFU occurrence/recurrence, neuropathy screening, and amputation rates.
- **Recommendation question #3:** Should support from a **specialized wound care team**[G] be recommended or not for persons at risk of or living with DFUs?

  Outcomes: DFU occurrence/recurrence, amputation rate, DFU healing rates, person satisfaction, and re-admission rates.
- **Recommendation question #4:** Should **virtual care**[G] (e.g., **telepractice**[G], **social media**[G]) be recommended or not to support/supplement (in conjunction with in-person service) the delivery of diabetic foot care services?

  Outcomes: Self-efficacy, screening rates, provider satisfaction, person satisfaction, DFU occurrence/recurrence, and **neuropathy**[G] screening.

Note: These priority recommendation questions are condensed versions of the more comprehensive PICO research questions developed by the RNAO expert panel to guide the systematic reviews. For more on the PICO research questions and the detailed process of how the RNAO expert panel determined the priority recommendation questions and outcomes, refer to supplementary materials under the "methodology documents" tab on the BPG webpage.

No recommendation questions were identified that addressed the core education and training strategies required for curricula — or the ongoing education and professional development of nurses or the interprofessional team — in order to support adults at risk of or living with DFUs and their care partners. Please refer to **Appendix L** for education statements that educators, managers, administrators, and academic and professional institutions can use to support the uptake of this BPG.

Summary of recommendations and good practice statements

This BPG replaces and merges the RNAO BPGs: *Reducing foot complications for people with diabetes* (7) and *Assessment and management of foot ulcers for people with diabetes* (8).

A summary of how the recommendations in this BPG compare to those in the previous editions is available under the "methodology documents" tab on the BPG webpage.

RECOMMENDATIONS AND GOOD PRACTICE STATEMENTS	STRENGTH OF THE RECOMMENDATION
Screening	
Good practice statement 1.0: It is good practice that health providers conduct diabetic foot screening for persons living with diabetes at regular intervals based on risk stratification.	Not applicable*
Self-management	
Good practice statement 2.0: It is good practice that health providers support and educate persons at risk of or living with diabetic foot ulcers (and their care partners) about self-management aimed at preventing and managing foot ulcers.	Not applicable*
Recommendation 1.0: When delivering self-management support, the expert panel suggests that health providers use person-engagement strategies that are tailored to persons at risk of or living with a diabetic foot ulcer and their care partners.	Conditional
Recommendation 2.0: The expert panel suggests that persons and/or care partners perform self-screening to prevent and manage diabetic foot ulcers.	Conditional
Wound assessment	

RECOMMENDATIONS AND GOOD PRACTICE STATEMENTS	STRENGTH OF THE RECOMMENDATION
Good practice statement 3.0: It is good practice for health providers to regularly conduct a comprehensive and consistent wound assessment and document the presence and characteristics of a diabetic foot ulcer.	Not applicable*
Specialized wound care team	
Recommendation 3.0: The expert panel suggests that health service organizations implement a specialized wound care team to support persons at risk of or living with diabetic foot ulcers.	Conditional
Plan of care/ treatment	
Good practice statement 4.0: It is good practice for health providers to implement a plan of care with the person living with a DFU and their care partners that includes evidence-informed management options.	Not applicable*
Recommendation 4.0: The expert panel suggests that health providers use virtual care platforms in conjunction with in-person services to supplement the provision of diabetic foot care services.	Conditional

*Good practice statements are established, robust practices. They do not have a strength associated. For more information, refer to the **Overview of methodology.**

Interpretation of evidence and recommendation statements

GRADE provides a transparent framework and a systematic approach for rating the certainty of evidence and determining the strength of recommendations (19).

Certainty of evidence

The certainty of evidence (i.e., the level of confidence we have that an estimate of effect is true) for **quantitative research**[G] is determined using GRADE methods (19). After synthesizing the evidence for each prioritized outcome, the certainty of evidence is assessed. The overall certainty is determined by considering the certainty of evidence across all prioritized outcomes per recommendation. GRADE categorizes the overall certainty of evidence as *high*, *moderate*, *low* or *very low* (see **Table 1** for the definitions of these categories).

Table 1: Certainty of evidence

CERTAINTY OF EVIDENCE	DEFINITION
High	We are very confident that the true effect lies close to that of the estimate of the effect.
Moderate	We are moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low	Our confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the effect.
Very Low	We have very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of effect.

Source: Reprinted with permission from: Schünemann HJ, Brozek J, Guyatt G, Oxman A, editors. Handbook for grading the quality of evidence and the strength of recommendations using the GRADE approach [Internet]. [place unknown: publisher unknown]; 2013 Oct [cited 2018 Aug 31]. Table 5.1, Quality of evidence grades. Available from: https://gdt.gradepro.org/app/handbook/handbook.html#h.9rdbelsnu4iy.

Note: The assigned certainty of evidence can be found directly below each recommendation statement. For more information on the process of determining the certainty of the evidence and the documented decisions made by RNAO guideline development methodologists, refer to supplementary materials under the "methodology documents" tab on the BPG webpage.

Strength of recommendations

Recommendations are formulated as *strong* or *conditional* by considering the *certainty of evidence* and the following key criteria (see **Discussion of evidence** for definitions):

- balance of benefits and harms
- values and preferences
- health equity

According to Schunemann et al., "A strong recommendation reflects the expert panel's confidence that the desirable effects of an intervention outweigh its undesirable effects (strong recommendation *for* an intervention) or that the undesirable effects of an intervention outweigh its desirable effects (strong recommendation *against* an intervention)" (19). In contrast, "A conditional recommendation reflects the expert panel's confidence that the desirable effects probably outweigh the undesirable effects (conditional recommendation for an intervention) or undesirable effects probably outweigh desirable effects (conditional recommendation against an intervention), but some uncertainty exists" (19). **Table 2** outlines the implications of strong and conditional recommendations.

When the overall certainty of the evidence is high or moderate, expert panel members can be confident in the effects of the intervention of interest and will support a strong recommendation. In addition, expert panel members need to ensure that the benefits outweigh the harms and that there is reasonable confidence and limited variability in the values and preferences of persons (20). However, when the overall certainty of the evidence is low or very low, there is uncertainty regarding the impact of the intervention of interest, and expert panel members should expect conditional recommendations (20).

Table 2: Implications of strong and conditional recommendations

IMPLICATIONS OF STRONG AND CONDITIONAL RECOMMENDATIONS		
POPULATION	**STRONG RECOMMENDATION**	**CONDITIONAL RECOMMENDATION**
For health providers	■ The benefits of a recommended action outweigh the harms. Therefore, most persons should receive the recommended course of action. ■ There is little variability in values and preferences among persons in this situation. ■ There is a need to consider the person's circumstances, preferences and values.	■ The benefits of a recommended course of action probably outweigh the harms. Therefore, the majority of persons could receive the recommended course of action. ■ There is greater variability in values and preferences, or there is uncertainty about typical values and preferences among persons in this situation. ■ There is a need to consider the person's circumstances, preferences and values more carefully than usual.

IMPLICATIONS OF STRONG AND CONDITIONAL RECOMMENDATIONS		
POPULATION	**STRONG RECOMMENDATION**	**CONDITIONAL RECOMMENDATION**
For persons receiving care	■ Most persons would want the recommended course of action and only a small portion would not.	■ The majority of persons in this situation would want the suggested course of action, but many would not.
For policy-makers	■ The recommendation can be adapted as policy in most situations.	■ Policy-making will require substantial debate and involvement of many stakeholders. Policies are also more likely to vary between regions.
For researchers	■ The recommendation is likely supported by high certainty evidence or other convincing judgments that make additional research unlikely to alter the recommendation.	■ The recommendation is likely to be strengthened by additional research. An evaluation of the conditions and criteria that determined the conditional recommendation will help to identify possible research gaps.

Source: Adapted with permission from: Schünemann HJ, Brozek J, Guyatt G, Oxman A, editors. Handbook for grading the quality of evidence and the strength of recommendations using the GRADE approach [Internet]. [place unknown: publisher unknown]; 2013 Oct [cited 2020 May 11]. Table 6.1, Implications of strong and weak recommendations for different users of guidelines. Available from: https://gdt.gradepro.org/app/handbook/handbook.html#h.33qgws879zw.

Note: The strength of each recommendation statement is detailed directly below it and in the **Summary of recommendations and good practice statements**. For more information on the process used by the expert panel to determine the strength of each recommendation, refer to supplementary materials under the "methodology documents" tab on the BPG webpage.

Discussion of evidence

The discussion of evidence that follows each recommendation includes the following main sections.

1. **Benefits and harms:** Identifies the potential desirable and undesirable outcomes reported in the literature when the recommended practice is used. Content in this section solely includes research from the systematic review.
2. **Values and preferences:** Denotes the relative importance or worth placed on health outcomes derived from following a particular clinical action from a person-centered perspective. Content for this section may include research from the systematic reviews and, when applicable, observations and/or considerations from the RNAO expert panel.
3. **Health equity:** Identifies the potential impact that the recommended practice could have on health across different populations, settings and/or the barriers to implementing the recommended practice in particular settings. This section may include research from the systematic reviews and, when applicable, observations and/or considerations from the RNAO expert panel.

4. **Expert panel justification of recommendation:** Provides a rationale for why a decision was made to rate a recommendation as strong or conditional.
5. **Implementation tips:** Highlights practical information for nurses and members of the interprofessional team to support implementation in practice. This section may include supporting evidence from the systematic review and/or from other sources (e.g., the RNAO expert panel).
6. **Supporting resources:** Includes a list of relevant resources (e.g., websites, books and organizations) that support the recommendations. Content listed in this section was assessed based on five criteria: relevancy, credibility, quality, accessibility and timeliness of publication (published within the last 10 years). Further details about this process and the five criteria are outlined in the supplementary materials under the "methodology documents" tab on the BPG webpage. The list is not exhaustive and the inclusion of a resource in one of these lists does not imply an endorsement from RNAO. Some recommendations may not have any identified supporting resources.

Best practice guideline evaluation

As you implement the recommendations and good practice statements in this BPG, we ask you to consider how you will monitor and evaluate their impact.

The Donabedian model, which informs the development of indicators for evaluating quality health care, includes three categories: structure, process and outcome (21).

> **Structure** describes the required attributes of the health system or health service organization to ensure quality care. It includes physical resources, human resources, and information and financial resources.
>
> **Process** examines the health-care activities being provided to, for and with persons or populations as part of the provision of quality care.
>
> **Outcome** analyzes the effect of quality care on the health status of persons and populations, health workforce, health service organizations or health systems (21).

For more details, see the **Monitor knowledge** use and **Evaluate outcomes** sections in the Leading Change Toolkit (4).

The following indicators have been developed to support evaluation and quality improvements in health service and academic organizations. Consider **Tables 3** and **4**, which provide a list of process and outcome indicators along with their operational definitions, numerators and denominators. Given that there is a lack of good practice statements and recommendations related to health provider education, there are no associated structure indicators in this BPG. Each table also identifies if the indicator aligns with other indicators in local, provincial, national and/or international organizations. Alignment with organizations is determined by comparing the following criteria with the developed indicators: the operational definition; if the indicator is nursing sensitive; and the inclusion/exclusion criteria. Depending upon the level of alignment, an indicator may be described to have full, partial or no alignment with external organizations. Indicators may be adopted (in their current state) or adapted (modified) from organizations.

The following indicators will support quality improvement and evaluation. Select the indicators most relevant to the changes being made in practice, education and/or policy, based on BPG recommendations and good practice statements that are prioritized for implementation.

Table 3 provides a list of process indicators that support the evaluation of practice changes during implementation and corresponding process improvements. Process indicators are derived from BPG recommendations and good practice statements.

Table 3: Process indicators

RECOMMENDATION OR GOOD PRACTICE STATEMENT	PROCESS INDICATORS	ALIGNMENT WITH INDICATORS IN OTHER ORGANIZATIONS
Good practice statement 1.0	Percentage of persons with diabetes who were screened for risk of developing a diabetic foot ulcer ***Numerator:*** *Number of persons with diabetes who were screened for risk of developing a diabetic foot ulcer* ***Denominator:*** *Total number of persons with diabetes who received care*	Adopted from Nursing Quality Indicators for Reporting and Evaluation® (NQuIRE®)
Good practice statement 2.0	Percentage of persons with diabetes who received self-management education aimed at preventing and managing diabetic foot ulcers ***Numerator:*** *Number of persons with diabetes who received self-management education aimed at preventing and managing diabetic foot ulcers* ***Denominator:*** *Total number of persons with diabetes who received care*	Adopted from NQuIRE Full alignment with Partnership for Quality Measurement Partial alignment with Institute for Clinical Evaluative Sciences (ICES)
Good practice statement 3.0	Percentage of persons with diabetic foot ulcer(s) who received a comprehensive diabetic foot ulcer assessment ***Numerator:*** *Number of persons with diabetic foot ulcer(s) who received a comprehensive diabetic foot ulcer wound assessment* ***Denominator:*** *Total number of persons with diabetic foot ulcer(s) who received care*	Adopted from NQuIRE

RECOMMENDATION OR GOOD PRACTICE STATEMENT	PROCESS INDICATORS	ALIGNMENT WITH INDICATORS IN OTHER ORGANIZATIONS
Good practice statement 4.0	Percentage of persons who have a documented plan of care related to the management of diabetic foot ulcer(s) developed ***Numerator:*** *Number of persons who have a documented plan of care related to the management of diabetic foot ulcer(s) developed* ***Denominator:*** *Total number of persons with diabetic foot ulcer(s) who received care*	New
Recommendation 4.0	Percentage of persons with diabetes who received virtual care in conjunction with in-person services to supplement their diabetic foot care services ***Numerator:*** *Number of persons with diabetes who received virtual care in conjunction with in-person services to supplement their diabetic foot care services* ***Denominator:*** *Total number of persons who received diabetic foot care services*	Partial alignment with ICES and Ontario Health

RECOMMENDATION OR GOOD PRACTICE STATEMENT	PROCESS INDICATORS	ALIGNMENT WITH INDICATORS IN OTHER ORGANIZATIONS
Recommendation 2.0	Percentage of persons with diabetes who reported that they performed self-screening to prevent and manage diabetic foot ulcer(s) ***Numerator:*** *Number of persons with diabetes who reported that they performed self-screening to prevent and manage diabetic foot ulcer(s)* ***Denominator:*** *Total number of persons with diabetes who received care*	New

Table 4 provides outcome indicators to assess the impact of implementing evidence-based practice changes. Outcome indicators are associated with outcome(s) of the research question(s) and/or reflections of outcomes of all recommendations and good practice statements.

Table 4: Outcome indicators

OUTCOME INDICATORS	ALIGNMENT WITH INDICATORS IN OTHER ORGANIZATIONS
Percentage of persons who develop one or more new diabetic foot ulcer(s) ***Numerator:*** *Number of persons who develop one or more new diabetic foot ulcer(s)* ***Denominator:*** *Total number of persons with diabetes who have never had diabetic foot ulcer(s) who received care*	Adopted from NQuIRE Full alignment with Resident Assessment Instrument Minimum Data Set (RAI MDS) Partial alignment with Agency for Healthcare Research and Quality (AHRQ) and ICES
Percentage of persons who had a recurrence of diabetic foot ulcer(s) ***Numerator:*** *Number of persons who had a recurrence of diabetic foot ulcer(s)* ***Denominator:*** *Total number of persons with a* **diabetic foot ulcer in remission**[G] *who received care*	Adapted from NQuIRE Partial alignment with AHRQ, ICES and RAI MDS
Percentage of persons with diabetic foot ulcer(s) with demonstrated evidence of at least 40 per cent reduction in wound size ***Numerator:*** *Number of persons with diabetic foot ulcer(s) with demonstrated evidence of at least 40 per cent reduction in wound size* ***Denominator:*** *Total number persons with diabetic foot ulcer(s) who received care*	Adapted from NQuIRE
Percentage of persons with diabetic foot ulcer(s) that have closed ***Numerator:*** *Number of persons with diabetic foot ulcer(s) that have closed* ***Denominator:*** *Total number of persons with diabetic foot ulcer(s) who received care*	Adapted from NQuIRE

OUTCOME INDICATORS	ALIGNMENT WITH INDICATORS IN OTHER ORGANIZATIONS
Percentage of persons with diabetic foot ulcer(s) who reported improvements in their quality of life ***Numerator:*** *Number of persons with diabetic foot ulcer(s) who reported improvements in their quality of life* ***Denominator:*** *Total number of persons with diabetic foot ulcer(s) who received care*	Partial alignment with ICES, Ontario Health, Partnership for Quality Measurement, Public Health Ontario and Statistics Canada
Percentage of persons with diabetes who reported improvements in self-efficacy related to diabetic foot ulcer self-management education ***Numerator:*** *Number of persons with diabetes who reported improvements in self-efficacy related to diabetic foot ulcer self-management education* ***Denominator:*** *Total number of persons with diabetes who received care*	New
Rate of lower extremity amputation(s) associated with diabetic foot ulcer(s) ***Numerator:*** *Number of persons with diabetic foot ulcer(s) who had one or more lower extremity amputation(s) on the affected leg(s)* ***Denominator:*** *Total number of persons with diabetic foot ulcer(s)*	Full alignment with AHRQ and Partnership for Quality Measurement Partial alignment with ICES, Ontario Health and Organisation for Economic Co-Operation and Development (OECD)
Percentage of persons with diabetic foot ulcer(s) who were satisfied with the self-management support received from health providers ***Numerator:*** *Number of persons with diabetic foot ulcer(s) who were satisfied with the self-management support received from health providers* ***Denominator:*** *Total number of persons with diabetic foot ulcer(s) who received care*	Partial alignment with ICES, Ontario Health and Partnership for Quality Measurement

Other RNAO resources for the evaluation and monitoring of BPGs:

- Nursing Quality Indicators for Reporting and Evaluation® (NQuIRE®), a unique international data system housed at RNAO, allows BPSOs® to monitor and evaluate the impact of BPG implementation. The NQuIRE data system collects, compares and reports data on human resource structure indicators as well as guideline-specific, nursing-sensitive structure, process and outcome indicators. NQuIRE indicator definitions are aligned with available administrative data and existing indicators wherever possible, adhering to a "collect once, use many times" principle. By complementing other established and emerging repositories, NQuIRE strives to leverage reliable and valid measures, minimize the reporting burden and align evaluation measures to enable comparative analyses. The NQuIRE data system was launched in August 2012 to create and sustain evidence-based practice cultures, optimize the safety of persons, improve health outcomes and engage staff in identifying relationships between practice and outcomes to advance quality and advocate for resources and policy that support best practice changes (22). Please visit RNAO.ca/bpg/initiatives/nquire for more information.
- RNAO Clinical Pathways™ are digitized recommendations and good practice statements embedded into electronic medical records through third-party software. Currently, these clinical pathways are available to all Canadian LTC homes. The ability to link structure and process measures with specific outcome measures helps determine the impact of BPG implementation on specific health outcomes.

Background context

Diabetes and diabetic foot ulcers

According to the International Diabetes Federation (IDF), **diabetes**[G] is one of the largest global health emergencies of the 21st century. By 2045, 784 million people worldwide (one in eight) are projected to have diabetes (23). In Canada alone, around 3.7 million people over a year old live with diagnosed diabetes (9.4 per cent of the population); this percentage is expected to continue to increase as Canada's population grows and ages (24).

Diabetes leads to many complications including DFUs, blindness, non-traumatic amputation, cardiovascular disease, depression, and premature death in Canada (25). DFUs are one of the most common and serious complications of diabetes; up to 34 per cent of people with diabetes will develop a DFU during their lifetime (26). A foot ulcer is a breakdown of the skin of any area of the foot that involves a minimum of the epidermis and part of the dermis (10). A DFU is a type of foot ulcer in a person with current or previously diagnosed diabetes mellitus and is usually accompanied by peripheral neuropathy and/or peripheral artery disease in the lower extremity (10). Though risk factors for DFUs are varied, a common factor is that the person is living with uncontrolled **Type 1 diabetes**[G] or **Type 2 diabetes**[G] characterized by elevated levels of blood glucose (27). Glycemic variability, poor fitting or inadequate foot wear, and difficulties performing foot self-care also contribute to the development of DFUs (28,29).

Pre-ulcerative signs such as blisters, hemorrhages or fissures are important to monitor to prevent DFUs from occurring (30). DFUs are categorized as neuropathic, ischemic, and neuro-ischemic types (30). Neuropathic DFUs are a result of loss of protective sensation to the foot and often in pressure-bearing areas (31). Ischemic DFUs tend to occur in a poorly perfused foot, usually located at the lateral fifth metatarsal head region or the medial first metatarsal head region, and are associated with pain (31). Neuro-ischemic DFUs occur in persons who have both peripheral neuropathy and ischemia resulting from peripheral artery disease (31). DFUs are staged using assessment tools such as the Site, Ischemia, Neuropathy, Bacterial infection, Area and Depth (SINBAD) classification system and the Wound, Ischemia, and foot Infection (WIfI) classification (32) (see **Good practice statement 3.0** and **Appendix H**).

Physical, psychosocial and financial impact of diabetic foot ulcers

DFUs can negatively impact the physical and psychosocial quality of life and functioning of affected persons, and this is exacerbated by DFU recurrence or non-healing DFUs (33,34). DFUs can lead to **gangrene**[G], infection, amputations or even death (27,35). Low physical functioning, such as the need to avoid pain or the use of offloading boots, may influence the amount of walking and ability to participate in leisure activities and recreational pastimes, overall affecting a person's quality of life (33). All of these factors can contribute to depression, mood fluctuations, feelings of hopelessness and social isolation (33). Generally, persons at risk of or living with DFUs are more likely to experience mental health challenges, including anxiety, depression and **self-stigma**[G], compared to the general public and persons with diabetes who do not have DFUs (34). Being diagnosed with diabetes is associated with negative stereotypes since many people perceive diabetes as a lifestyle-related disease (36). Self-stigma affects self-management, especially when glucose levels are not controlled. Self-stigma is then reinforced, which leads to a decline in self-management motivation and thus decreased quality of life (36). A **wholistic**[G] approach to care that focuses on both physical care of the DFU and the person's mental health and well-being will allow for the continuity of the person's leisure activities and recreational pastimes, allowing the person to manage their DFU successfully (33).

The prevalence of DFUs have increased worldwide; North America has the highest prevalence rate at 13.0 per cent,

followed by Africa at 7.2 per cent, Asia at 5.5 per cent, Europe at 5.1 per cent and Oceania at 3.0 per cent (35). Treatment of DFUs is costly due to high incidence rates, amputation rates, mean in-hospital length of stay, and discharge to continuing care (37). In Canada, admitting one person with a DFU to hospital costs approximately $22,754 CAD more than admitting a person without a DFU (37); DFUs have a higher median in-hospital cost compared to other diseases such as congestive heart failure ($6,727), pneumonia ($6,009), or urinary tract infection ($5,071) (37). For person's with DFUs, the cost of DFU management supplies (e.g. offloading shoes or dressing supplies) is also a financial constraint which may hinder adherence to DFU self-management.

Health equity

In Canada, there are marked disparities in diabetes incidence and subsequent DFUs; for example, South Asian, Black and **Indigenous**[G] populations are identified as high-risk (39). The prevalence of diabetes is 2.3 times higher among South Asian adults and 2.1 times higher among Black adults compared to white adults (39). Indigenous people are affected by type 2 diabetes three to five times more than the general population (26). Disparities in the prevalence of diabetes and DFUs are acutely linked to the **social determinants of health and wellness**[G] (see **Guiding principles**). There are correlations between lifestyle factors, comorbidities and the occurrence of DFUs, especially for those with lower education and socio-economic status (40). This is due to many factors including environmental exposures, poverty, scarcity of resources, racism, geographical isolation, education status, and employment disadvantage (26,41). In Ontario, amputation rates resulting from DFUs also vary greatly by geographic regions, illustrating gaps and variations in access to services and quality care (42).

Prevention and management of diabetic foot ulcers

The prevention and management of DFUs involves collaboration between the person living with diabetes, their care partners, and an interprofessional team in order to ensure successful health outcomes. Prevention and management of DFUs also involves strategies to prevent DFU occurrence, promote early detection, and manage DFUs appropriately to prevent complications.

There are four levels of prevention, as per the population health approach: primordial, primary, secondary and tertiary (43). In relation to DFUs, these levels of prevention are as follows:

1. **Primordial level of prevention**
   The primordial level of prevention involves strategies directed at reducing risk factors promptly among populations from the early years of life by addressing structural and or/systemic determinants of health (43). For example, the inclusion of green spaces when planning urban neighbourhoods could promote exercise as a way to reduce risk factors for diabetes (43).
2. **Primary level of prevention**
   The primary level of prevention involves strategies to prevent disease incidence by targeting populations most at risk of diabetes or DFUs (43). For example, tailored education for people at risk of diabetes or DFUs can be provided to persons and their care partners.

3. **Secondary level of prevention**
   The secondary level of prevention involves strategies aimed at early identification of DFUs (43). Examples include glycemic control, proper nutrition, tailored foot self-screening interventions and access to proper footwear and foot care for people at risk of DFUs.
4. **Tertiary level of prevention**
   The tertiary level of prevention involves strategies aimed at preventing the progression or complication of DFUs, such as physical therapy and rehabilitation (43).

Self-management of diabetic foot ulcers

Diabetes is a chronic disease and persons living with diabetes and/or their care partners often need to handle most day-to-day care. As diabetes impacts the person's life in multiple aspects, it requires the person to make frequent and ongoing self-management decisions. Self-management is "often associated with self-care and includes an array of activities that persons undertake to live well with one or more chronic conditions" (44). Examples of essential self-care behaviours include adequate nutrition and hydration, physical activity, monitoring blood glucose levels, medication adherence, and developing problem-solving and healthy coping skills (45). However, it is important to note that not every person or care partner will have the mental, physical or financial capabilities to perform self-management. Health providers are to **co-design**[G] a **plan of care**[G] with the person and care partner and assess what is feasible for them.

The ability to self-manage diabetes, whether within or outside of the control of the person or care partner, has the potential to decrease the risk of developing DFUs. For example, monitoring blood glucose levels can lead to a decreased risk of potential DFUs forming and thus lead to less severe complications than infection or amputation (46). Self-management of DFUs subsequently will have a positive impact on quality of life for persons living with DFUs (47).

Management

Although self-management can help prevent DFUs, they still occur. Management of a DFU is complex. In addition to self-management, management of a DFU requires specialized care and support from various health providers and care partners. Management options are to be based on the person's needs, contributory factors and causes that affect the skin integrity. Principles of wound management, including debridement, wound bed preparation and more, can facilitate healing.

Conclusion

DFUs are a serious complication of diabetes. Preventing and managing DFUs is essential to improve the individual's well-being, enhance overall quality of life, and decrease health-care costs. Disparities in the prevalence of diabetes and DFUs are acutely linked to the social determinants of health and wellness. Therefore, it is even more important to provide care and self-management support to populations facing multiple and intersecting disadvantages. The ability to self-manage diabetes has the potential to decrease the risk of developing DFUs. The prevention and management of DFUs involves collaboration between the person living with diabetes, their care partners and an interprofessional team in order to ensure successful health outcomes. RNAO has updated this BPG to provide nurses, health providers and persons at risk of or living with DFUs with evidence-based recommendations for the prevention, assessment and management of DFUs.

Guiding principles

Guiding principles[G] are overarching concepts that denote a philosophy, belief, value, and/or standard of behaviour that nurses, members of the interprofessional team and health service organizations should apply to their practice. It is important that guiding principles are followed to improve health outcomes for persons, families and populations. The following guiding principles were selected by the expert panel and are considered foundational to all recommendations and good practice statements in this BPG.

Person-and family-centred care

Person- and family-centred care[G] refers to strategies directed toward centring and collaborating with the person and family. "It is important to acknowledge that person- and family-centred care focuses on the whole person as a unique individual and not just on their illness or disease" (13). Person- and family-centred care in DFU prevention and management is focused on co-designing care with the person living with or at risk of DFUs, and their care partners, based on their personalized goals. Supporting empowerment and engagement in care allows persons and their care partners to take charge of their health care and become active participants in their own self-management. Person- and family-centred care also involves assessing and considering health literacy, language barriers, neurodiversity and other factors that may impact self-management.

Social determinants of health and wellness

Social determinants of health are socially constructed factors that play a role in the outcome of health or disease (48). The relationship between social determinants of health and DFUs is multifaceted, and many social determinants of health place persons at higher risk of developing diabetes and DFUs. Persons facing health inequities, such as limited access to good-quality health services and healthy food choices, low income, and lower levels of education, often experience a higher prevalence of diabetes and difficulties managing diabetes. These are considered proximal and intermediate social determinants of health (49). Persons experiencing homelessness may face additional challenges maintaining self-care measures that may further increase their risk of DFUs and/or complicate existing DFUs (50). It is important that health providers consider how the social determinants of health affect prevention and management of DFUs when conducting assessments and tailoring a plan of care to the person's unique needs. For example, health providers can ask about access to healthy food, and connect persons with resources if they require financial assistance to access wound care products.

Distal social determinants of health have the most influence on the health of populations because they represent political, economic and social contexts that influence both proximal and intermediate social determinants of health (49). A distal social determinant of health is colonialism, where a foreign group of people pursues, establishes, maintains control and exploits the people and resources of a country, which then creates social, political and economic inequalities (49). Colonialism still exists in today's world in the forms of racism, racial discrimination, xenophobia and intolerance (51), which can lead to unequal access within health-care systems. For example, in Ontario there are Indigenous communities who do not have access to clean drinking water due to years-long water advisories (52). Not having access to clean water can impact hydration and skin integrity. Combating the systemic issues of racism and colonialism in health care through policy and political action is a critical step toward supporting effective type 2 diabetes management (53).

While the social determinants of health help identify factors that contribute to health disparities, reframing the conversation to focus on wellness offers an opportunity to identify strengths associated with health promotion and *mino- pimatisiwin* ("living a good life") (54). This Cree concept aligns with Indigenous beliefs and values about health, where health is an overarching concept that comprises physical and mental well-being, as well as spiritual and cultural cohesion (55). The determinants of wellness recognize elements of self-determination, identity, language and land as fundamental to health (54). "By recognizing these determinants of wellness, health systems can address structural drivers of health inequity, including dismantling the systems and policies that undermine self-determination and perpetuate dispossession of land, language and identity" (54).

Cultural safety

Cultural safety[G] is based on respectful engagement that identifies and seeks to address power imbalances inherent across the health system. Cultural safety helps to build a setting free of racism and discrimination where persons feel safe when receiving health care (56). Culturally safe care in health service delivery ensures that populations most at risk of poor health outcomes receive appropriate care that does no harm to their cultural identity, sense of self and well-being. It is important to note that only the person receiving care can determine whether their health care is culturally safe.

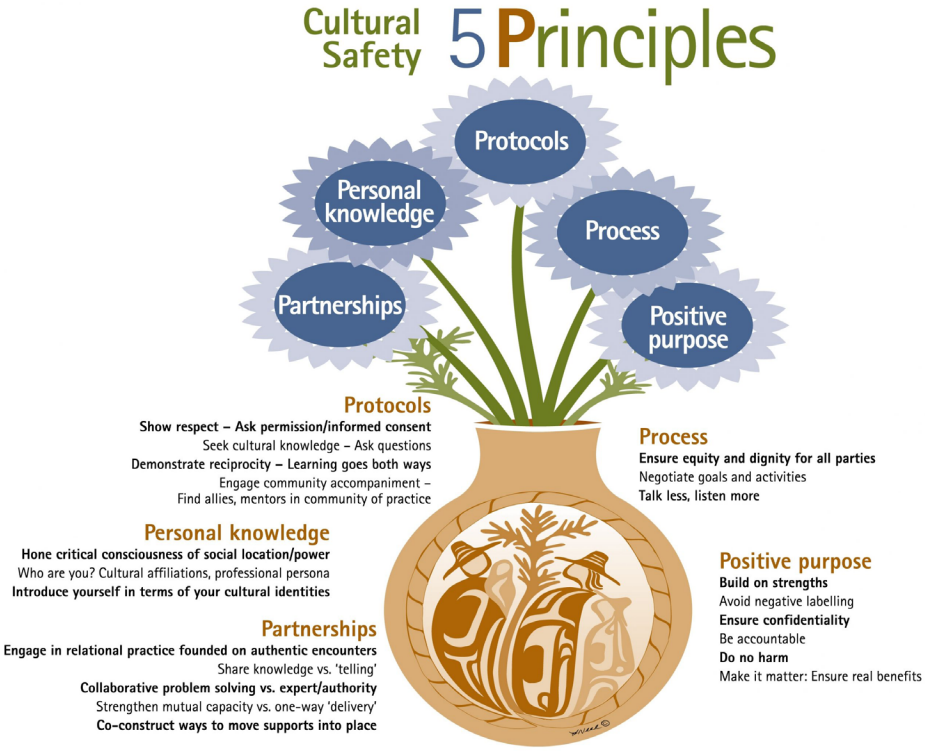
The term cultural safety was first introduced in 1990 by Irihapeti Ramsden, a Māori nurse in Aotearoa, New Zealand (56). In Canada, the Truth and Reconciliation Committee (TRC) calls to action for health (in particular numbers 19, 22 and 24) have emphasized the need to close gaps in health outcomes for Indigenous Peoples, recognize the value of Indigenous healing practices and promote culturally safe care (57). Although the term cultural safety originally arose from concerns related to the care of Indigenous people, it has been adopted more broadly to help create respectful environments that are safe for persons of diverse cultural backgrounds.

Several terms have been used interchangeably to denote cultural safety, including cultural awareness, cultural sensitivity, cultural humility and cultural competency. However, these are distinct concepts that exist on a continuum (58). *Cultural awareness* occurs when health providers are cognizant of the differences and similarities that exist between cultures (59). *Cultural sensitivity* occurs when health providers are aware of their own culture and its impact on their behaviours, knowledge and biases (59). *Cultural humility* involves listening without judgment, being open to learning from and about others and learning about one's own culture and biases (59). *Cultural competency* involves developing knowledge, skills and attitudes for working effectively and respectfully with diverse groups of people (59).

Culture may be an important part of a person's identity, and it is important for health providers to discuss culture in relation to a person's care plan (56). Health providers are to be self-reflective and self-aware regarding their position of power when providing care. As shown in Figure 1, health providers are to consider five principles to promote cultural safety when providing care to persons at risk of or living with DFUs: protocols, personal knowledge, partnerships, process and a positive purpose.

To inform this guideline, a scoping review was conducted to explore the current evidence on culturally safe strategies that can be used in the care of persons with diabetes and persons who are at risk of or living with DFUs and their care partners. Findings can be found in **Appendix C**. More information on the scoping review's methodology can be found under the "methodology documents" tab on the BPG webpage.

Figure 1: Five principles to promote cultural safety



Source: Reprinted with permission from: Ball J. Cultural safety. In: Early Childhood Development Intercultural Partnership [Internet]. Victoria (BC): University of Victoria; c2024. Available from: https://ecdip.org/cultural-safety/

Trauma-informed care approach

It is important that health providers understand how the complex experiences of living with a DFU can impact the psychological, physical, social and financial well-being of a person, ultimately affecting their ability to connect with and utilize support services. Persons living with DFUs often experience a lower quality of life associated with pain, suffering, grief, shame and psychological burden. This emotional trauma is attributed to multiple factors, such as the risk of amputation, dependency on others, feelings of loss, social stigma and blame, fear, helplessness, frustration, malodorous discharge from the DFU and loss of mobility associated with the severity of ulceration (34,60). Symptoms of depression, such as low motivation and cognitive impairment, can negatively impact a person's self-care ability (34). In addition, health providers are to be cognizant that adversity in childhood is connected to chronic diseases in adulthood, including diabetes. Adverse childhood experiences — including abuse, neglect and household challenges experienced before the age of 18 — can cause stress so severe or prolonged that it has lasting, damaging impacts on a person's health (61). In the USA, people with four or more adverse childhood experiences are 1.4 times more likely to have diabetes (61).

A trauma-informed care approach strives to understand the person as a whole and is sensitive to how one's lived experiences shape health status and behaviours (62). Working in a trauma-informed way integrates the knowledge of trauma into all aspects of health service delivery so that a person is not re-traumatized while receiving care (63). There are five principles to trauma-informed care: ensuring physical and emotional safety; providing an opportunity for choice; ensuring collaboration and connection; emphasizing consistency and trustworthiness; and prioritizing empowerment and skill building (63). For persons living with DFUs, a trauma-informed approach to care has the potential to promote healing.

Intersectionality

Kimberlé Crenshaw described intersectionality, a term that she coined, as follows: "When it comes to social inequality, persons' lives and the organization of power in a given society are better understood as being shaped not by a single axis of social division, be it race or gender or class, but by many axes that work together and influence each other" (64). The main tenets of intersectionality include historically oppressed populations, overlapping identities and social determinants of health; the categories of race, class, gender, age, sexuality, and disability are viewed as interrelated (64,65).

The effects of many interlocking factors contribute to health disparities and poor outcomes in persons at risk of or living with DFUs. Research suggests that there is an increased prevalence of DFUs among persons from equity-deserving groups, low socio-economic status, as well as those living in rural areas and disadvantaged neighbourhoods (65). The intersecting experiences of marginalization among equity-deserving groups create additional barriers, including a lack of timely access to health care. Disparities exist in the delivery of health-care services for persons with DFUs among equity-deserving groups, so it is important to use an intersectionality lens to understand how to address these disparities and barriers to obtaining proper care.

Intersectionality is also woven into the One Health approach that emphasizes the interconnectedness of humans, animals and the environment and the importance of promoting health for all beings and the broader ecosystem (66). Adopting a One Health lens in DFU care involves considering environmental factors contributing to DFUs, as well as the impacts of DFU treatments, such as antibiotics and wound dressings, on the environment. A One Health approach may require a paradigm shift, but it will allow health providers to identify and advocate for innovative and sustainable approaches that promote health and well-being for both people and the planet.

Recommendations and good practice statements

SCREENING

GOOD PRACTICE STATEMENT 1.0:

It is good practice that health providers conduct diabetic foot screening for persons living with diabetes at regular intervals based on risk stratification.

Preventative diabetic foot screening

The goal of preventative diabetic **foot screening**[G] is to prevent, detect and manage signs and symptoms early on related to foot complications in persons living with diabetes (67). Diabetic foot screening remains important for caring for persons who have healed DFUs as well, as there could be about a 40 per cent chance of recurrence of a DFU within a year and a 65 per cent within three years (68). Preventative diabetic foot screening is important to reveal early risks or signs and symptoms of DFUs for prompt prevention and management and can provide a baseline for health providers to compare to if a DFU occurs in the future. Diabetic foot screening includes history taking, visual inspection and assessment of the foot, and conducting pulse and monofilament tests (see **Table 5** for more details). Diabetic foot screening is to be comprehensive and capture all aspects of screening and early detection rather than screening for only certain elements. Screening is to be tailored to the person's relative risk level, needs, and special considerations. It is essential to engage persons and their care partners in preventative foot screening. A systematic review of evidence was not required for this good practice statement; however, the importance of conducting diabetic foot screening is essential to communicate to all health providers (69).

If DFU signs and symptoms are present during a preventative foot screening, an appropriate referral is to be made to a specialized wound care team. See **Recommendation 3.0** for more details.

Implementation tips

From the expert panel

- When conducting screening, listen to the voices, concerns and experiences of persons at risk of or living with a DFU and their care partners, and tailor care to their needs.
- Begin screening by collecting information about a person's (and care partners') education level, reading ability, learning preferences, and physical and cognitive capacity for self-care. Assess the person's perceptions of foot health and self-care routines.
- Screening can be used as a teaching opportunity for persons and care partners.
- Engage key health providers within the practice area when conducting a risk assessment (**primary health providers**,[G] diabetes nurses, chiropodists, community agencies, etc.). Refer to an appropriate specialized health provider if needed. Conducting a full risk assessment requires training and expertise, but any health provider can identify skin changes and refer to an appropriate provider for further care. For example, personal support workers often provide personal hygiene care and view skin on a routine basis. As such, they can help to detect changes in skin integrity.
- Routinely conduct comprehensive risk screening according to organizational policies. Utilize the same screening tool and document the results each time.
- Use algorithms to facilitate a standardized and consistent screening process (see **Supporting resources** and **Appendix D** for Inlow's 60-second diabetic foot screen). If using Inlow's 60-second diabetic foot screen, all content of risk screening outlined in the tool is to be assessed.
- Utilize a mnemonic "DFU-VIPS" (diabetes management, foot/find the cause, ulcer, vascular access, infection, pressure, and sharp debridement/social determinants of health) as a memory aid for items to assess in a person at risk of or living with a DFU (see **Appendix J**).
- Health service organizations are to ensure availability of required resources at all times (for example, having monofilaments, screening tools, educational handouts/pamphlets, electronic health records systems where feasible, etc., in every clinic room to facilitate screening).
- Health service organizations are to ensure that primary health providers receive adequate training to screen and assess risk for DFUs.
- Health service organizations are to ensure that health providers with specialized training provide preventative foot treatments, such as callus debridement and nail care, as appropriate. If in doubt, consult organizational policies.

Table 5: Preventative diabetic foot screening: Implementation context

CONTEXT	EVIDENCE
Tools for screening	■ It is important that health providers use validated assessment tools when available to perform screening and risk stratification. An example of a validated diabetic foot screening tool is Inlow's 60-second diabetic foot screen (see **Appendix D** for more details).
Frequency of screening	■ Minimum annual foot screening is recommended by the International Working Group on the Diabetic Foot (IWGDF) (30) and Diabetes Canada (70) for early detection of DFU risks. ■ The IWGDF risk stratification system is an example of a validated tool that health providers can use in risk assessment (see **Table 6** and **Appendix E**). Once screening is complete, the health provider is to stratify each person using the IWGDF risk stratification system to guide subsequent preventative screening frequencies and management strategies (30). More frequent screenings are to be done for persons at higher risk of developing DFUs (see **Table 6** and **Appendix E**).
History taking	■ Begin screening by collecting information regarding the person's demographic details and current medications. ■ Collect information on general medical history of past or active medical conditions (i.e., comorbidities such as rheumatoid arthritis, renal disease, vascular disease, cognitive disorders, physical limitations that may hinder foot care such as visual acuity or obesity) and previous or current foot complications (30). ■ Screen for nutritional status, quality of life and glycemic control and complications of diabetes, including **retinopathy**[G], nephropathy, neuropathy and vasculopathy (67).

CONTEXT	EVIDENCE
Visual inspection and assessment of the foot  	■ Note the presence of deformities and neuropathy (67). □ Neuropathy can be detected using a monofilament test and a tuning fork (30). If a monofilament test is unavailable, health providers can use the Ipswich Touch Test (69). ■ Assess the skin colour, the temperature and the presence of calluses, **corns**[G], edema, infection and pre-ulcerative signs such as hemorrhage or fissures (30). ■ Assess for deformities (e.g., claw or hammer toes), abnormally large bony prominences or limited joint mobility. Examine the feet when the person is lying down and standing up (30). ■ Assess toenails (e.g., length, thickness, shape, infection) (71). **DFUs are more likely to be undetected in persons with dark skin tones (72).** ■ **Some strategies to assess dark skin tones include the following:** □ **Position the person where natural light will fall directly onto their skin. If this is not possible, use a bright, focused light source (e.g., a pen light or a mobile phone's flashlight) to see the skin. Fluorescent light is to be avoided as it can cast a blue tone on dark skin tones (72).** □ **Assess the foot for general signs and symptoms — for example, swelling, redness, warmth and changes in skin texture (72).** □ **Place first and second fingers lightly on the person's skin with the aim of finding at least one pedal pulse in each foot. If uncertain or no pulse can be felt, use a Doppler machine to confirm. Assess for other signs of ischemia[G] (72).** □ **If the person consents, take photographs for documentation and monitoring purposes (72). Aim to take photographs from a similar angle and lighting.**
Pulse test  	■ Peripheral vascular disease can be detected by pedal Doppler waveforms, ankle brachial index and toe brachial index (30). ■ Palpate pedal pulses to check vascularity status of the feet (30). **Clinical examination alone (such as palpating pedal pulses) is not a sufficient assessment. It is important to conduct non-invasive diagnostic tests (73).** ■ **In case of absent foot pulses or other signs of peripheral arterial disease consider performing pedal Doppler waveforms in combination with measurement of the ankle pressure and ankle-brachial index, and toe pressure and toe-brachial index (30).** ■ See **Supporting resources** on how to conduct an ankle-brachial pressure index (ABPI) assessment.

CONTEXT	EVIDENCE
Monofilament and tuning fork evaluation	■ Conduct a touch test or monofilament and tuning fork evaluation to test for peripheral neuropathy (30). Monofilament testing involves using a 10 gram (5.07 Semmes-Weinstein) monofilament for examining the presence/absence of protective sensation. Tuning fork evaluation involves using a 128 hertz tuning fork for examining the presence/absence of vibratory sensation (30). ■ The Ipswich Touch Test can be used if the monofilament or tuning fork is not available. Ask the person to close their eyes and to say yes when they feel the touch. The health provider lightly touches the tip of their index finger to the tips of the first, third and fifth toes of both feet for one to two seconds (30). ■ See **Supporting resources** for more details on how to conduct monofilament testing.
Preventative foot treatments	■ Provide preventative foot treatments, including callus debridement and nail care, as appropriate for the person (74).
Assessment of other items	■ Assess and educate about ill-fitting or inadequate footwear or lack of footwear (30). See **Supporting resources** for a checklist on proper shoe fitting. ■ Assess for abnormal walking patterns (gait and balance), foot deformities and bony prominences (30).
Person and care partner education	■ See **Good practice statement 2.0** for more details.

Table 6: The IWGDF risk stratification system

CATEGORY	ULCER RISK	CHARACTERISTICS	SCREENING FREQUENCY*
0	Very low	No LOPS and no PAD	Once a year
1	Low	LOPS or PAD	Once every 6-12 months
2	Moderate	LOPS + PAD, or LOPS + **foot deformity**[G] or PAD + foot deformity	Once every 3-6 months
3	High	LOPS or PAD, and one or more of the following: ■ history of a foot ulcer ■ a lower-extremity amputation (minor or major) ■ end-stage renal disease	Once every 1-3 months

Note: LOPS = Loss of protective sensation; PAD = peripheral artery disease. *Screening frequency is based on expert opinion since the IWGDF reported no available evidence to support these intervals. When the screening interval is close to a regular diabetes check-up, consider screening the foot at that check-up.

Source: Adapted with permission from: Bus SA, Sacco IC, Monteiro-Soares M, et al.; International Working Group on the Diabetic Foot (IWGDF). Guidelines on the prevention of foot ulcers in persons with diabetes: IWGDF 2023 update [Internet]. [place unknown]: IWGDF; 2023. Available from: https://iwgdfguidelines.org/wp-content/uploads/2023/07/IWGDF-2023-02-Prevention-Guideline.pdf.

Supporting resources

RESOURCE	DESCRIPTION
Blanchette V, Kuhnke JL, Botros M, et al. Inlow's 60-second Diabetic Foot Screen: update 2022. Limb Preservation Journal [Internet]. 2023 Apr 28;4(1):22-8. Available from: https://www.woundscanada.ca/news/618-inlow-s-60-second-diabetic-foot-screen-update-2022	■ This screening guide provides a systematic method that can be used by persons, care partners and health providers for foot ulcer prevention and ongoing screening after an ulcer or complication occurs. ■ See **Appendix E**.
Bus SA, Sacco IC, Monteiro-Soares M, et al. Guidelines on the prevention of foot ulcers in persons with diabetes (IWGDF 2023 update). Diabetes Metab Res Rev. 2024 Mar;40(3):e3651. Available from: https://iwgdfguidelines.org/wp-content/uploads/2023/07/IWGDF-2023-02-Prevention-Guideline.pdf	■ This guideline covers prevention of DFUs and is targeted to health providers. ■ Includes recommendations for persons with very low risk, low-risk and low-to-moderate risk of foot ulceration.
Dhoonmoon L, Nair HK, Abbas Z, et al. International consensus document: wound care and skin tone signs, symptoms and terminology for all skin tones [Internet]. London (UK): Wounds International; 2023. Available from: https://woundsinternational.com/consensus-documents/wound-care-and-skin-tone-signs-symptoms-and-terminology-for-all-skin-tones/	■ This document provides practical guidance on accurate assessment and diagnosis for all skin tones, language and descriptors to use for clear communication, and different geographical and cultural considerations across the globe.
Embil JM, Albalawi Z, Bowering K, Trepman E; Diabetes Canada Clinical Practice Guidelines Expert Commitee. Foot care. Can J Diabetes. 2018 Apr;42(Suppl 1):S222-7. Available from: https://www.diabetes.ca/health-care-providers/clinical-practice-guidelines/chapter-32	■ Guidance document that covers risk assessment and preventative care and treatment for persons at risk of or living with a DFU. ■ Includes guidance related to foot examination, foot education and the role of the interprofessional health-care team, as well as relevant appendices and resources. ■ Appendix 12 covers how to conduct monofilament testing on the diabetic foot. ■ See the resources tab for "Finding the proper shoe fit."

RESOURCE	DESCRIPTION
Evans R, Kuhnke JL, Blanchette V, et al. A foot health pathway for people living with diabetes: integrating a population health approach. Limb Preservation in Canada [Internet]. 2022 Spring;3(1):12-24. Available from: https://www.woundscanada.ca/docman/public/limb-preservation-in-canada/2022-vol-3-no-1/2501-lpc-spring-2022-v3n1-final-p-12-25-foot-health-pathway/file	■ This article presents the Foot Health Pathway which outlines a prevention-based, wholistic approach for people living with diabetes. The focus is on prevention, or "upstream" interventions to prevent "downstream" complications. ■ An infographic of the Foot Health Pathway can be found on pages 22-23.
PRACTICAL GESTURES. In: E-footcare: International on-line course for healthcare professionals on diabetic foot [Internet]. [place unknown]: D-Foot international & UNFM; c2019. Available from: https://www.e-footcare.org/e-footcare/practical-gestures/	■ These videos provide basic instructions to health providers caring for people at risk of or living with a DFU. Includes videos that focus on monofilament, tuning fork assessments, shoe examinations, and assessing for foot deformity. ■ Closed captions are available in English, French, Spanish and Portuguese.
Rodd-Nielsen E, Ketchen R. Part 1: clinical digital photography: tips and techniques for community nurses. Wound Care Canada [Internet]. 2014 Spring;12(1):14-24. Available from: https://www.woundscanada.ca/docman/public/wound-care-canada-magazine/2014-vol-12-no-1/509-wcc-spring-2014-v12n1-remote-consult-part-1-digital-photography/file	■ This document outlines practical tips and advice for achieving reliable and accurate digital wound images.
Wounds Canada Institute Faculty. How to assess blood flowing using an ankle-brachial pressure index (ABPI) assessment. Wound Care Canada [Internet]. 2019 Spring;17(1):22-24. Available from: https://www.woundscanada.ca/docman/public/wound-care-canada-magazine/wcc-2019-v17-no1/1404-wcc-spring-2019-v17n1-final-p-22-24-abpi-how-to-tool-pdf/file	■ This fact sheet discusses how to conduct an ankle-brachial pressure index.

SELF-MANAGEMENT

GOOD PRACTICE STATEMENT 2.0:

It is good practice that health providers support and educate persons at risk of or living with diabetic foot ulcers (and their care partners) about self-management aimed at preventing and managing foot ulcers.

Self-management is "often associated with self-care and includes an array of activities that persons undertake to live well with one or more chronic conditions" (44). Diabetes is a chronic disease, and persons living with diabetes and/or their care partners often need to handle most day-to-day care. Diabetes self-management requires the person to make various dietary and lifestyle modifications with support from health providers in order to influence successful behaviour changes and maintain a higher level of self-confidence. Self-care behaviours include adequate nutrition and hydration, physical activity, monitoring blood glucose levels, daily foot checks and footwear considerations, problem-solving skills, medication adherence, managing health-care appointments, healthy coping skills and risk reduction behaviours (75–77).

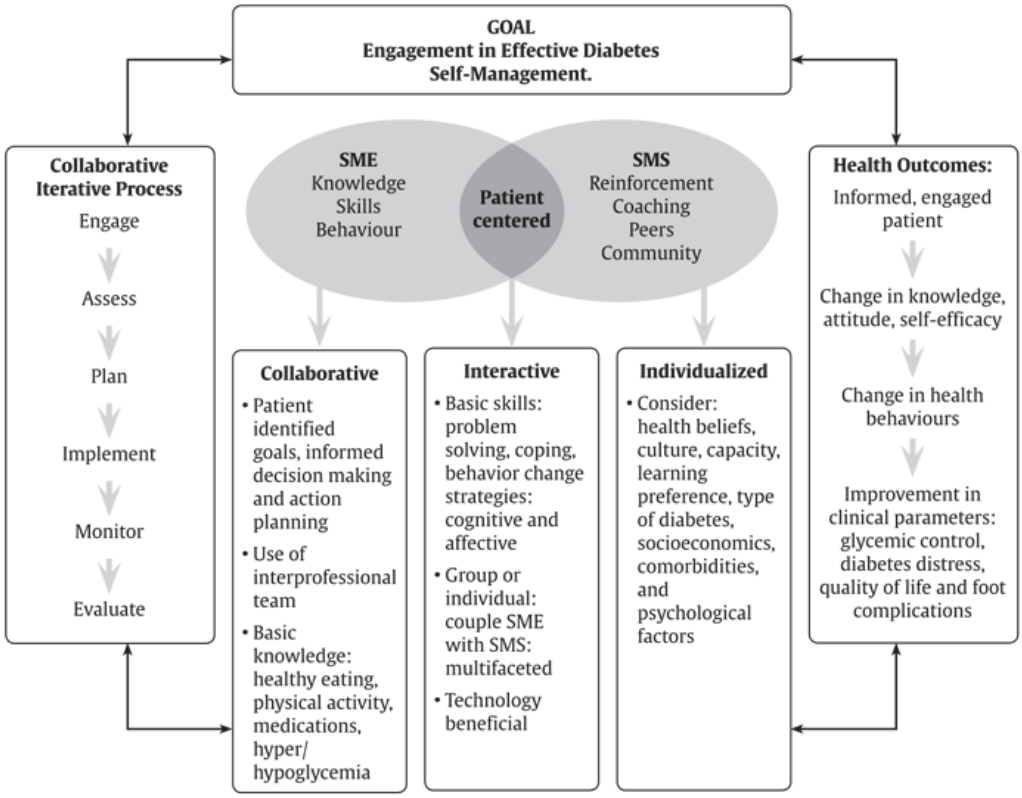
Self-management support and education are significant in the prevention and management of DFUs. For example, if a person receives support and education to self-monitor blood glucose levels and perform foot hygiene and daily assessments, this can lead to a decreased risk of DFUs and related complications (78). Thus, providing both self-management support and education to persons and their care partners for effective prevention and management of DFUs is good practice. A review of the evidence was not required to determine the benefits and harms of this good practice statement; however, the expert panel felt it was necessary to communicate the importance of providing diabetes self-management support and education to all health providers (78). Other guideline panels also emphasized this practice such as the IWGDF and Diabetes Canada (45,69).

Self-management support refers to fostering a person's ability to self-manage their diabetes (79). Self-management support includes frequent follow-ups with a health provider, diabetes coaching and peer, community or interest group support (as available) (79). It is important that self-management strategies involve care partners and include psychosocial and behavioural support as well (80). Psychosocial and behavioural support includes the following: screening for and addressing emotional concerns, providing wholistic and culturally safe care, empowering persons and care partners and providing accessible resources. It also involves setting realistic timelines for persons and their care partners to learn and become confident in performing self-care behaviours (80).

Self-management education[G] refers to educational activities that equip persons with the necessary knowledge and skills to inform healthy choices and build capacity in skill application (79). When possible, an interprofessional team of health providers are to engage with persons and their care partners when providing self-management education (79). Collaborative self-management education includes goal setting tailored to a person's needs and current knowledge (79). Education can be delivered individually or in group settings and in-person or virtually (79). For the person to engage effectively in their own diabetes care, health providers are to combine both self-management education and self-management support. A model of how to do so is shown in **Figure 2**.

While it is good practice to provide self-management support and education, health providers must recognize that the ability to self-manage care is profoundly impacted by the social determinants of health (40). For example, a person's ability to manage diabetes and focus on DFU care may be impeded by circumstances that do not allow for access to basic life needs such as food insecurity, limited access to services and resources in rural and remote areas, financial constraints, homelessness, and trauma and mental health challenges (26,81). Health providers are to incorporate person- and family- centred care and cultural safety guiding principles when providing self-management support to persons. Refer to the **Guiding principles** and **Appendix C**.

Figure 2: A model for self-management education and self-management support



Source: Reprinted with permission from: Sherifali D, Berard LD, Gucciardi E, et al.; Diabetes Canada Clinical Practice Guidelines Expert Committee. Self-management education and support. Can J Diabetes. 2018 Apr;42 (Suppl 1):S36-41. Available from: https://guidelines.diabetes.ca/cpg/chapter7

Implementation tips

From the expert panel

- Begin by establishing a therapeutic relationship. A therapeutic relationship is required between health-care providers and the person seeking health services so they can establish trust, partner, and share decisions on appropriate health care and services.
- There is no "one size fits all" approach to self-management. Taking the time to assess the person's abilities, expectations, preferences, needs and priorities, and tailor the approach to the person is important for successful self-management.

- Some people (or their care partners) may not be able to participate in all aspects of diabetes and DFU self-management due to their physical and/or cognitive functions. It is important that health providers respect the person's capabilities and co-design a plan of care where the person and care partner can conduct some aspects of self-management.
- Engage persons and their care partners when providing self-management education, and create environments where they can vocalize their preferences, needs, concerns and questions. If providing passive education (e.g., a pamphlet), ensure to explain the resource and answer any questions.
  - Ensure that persons and care partners have an active voice and are truly engaged in the discussion. Signs of engagement may include asking questions, requesting information, and sharing observations and/or concerns.
  - Ensure that all materials are accessible for persons and care partners (e.g., large print, plain language, culturally appropriate, and responsive to different learning styles and health literacy levels; see **Appendix C**).
  - Ensure that persons and care partners understand the self-management education provided. A sign of understanding includes demonstrating newly taught skills on how to perform nail care.
- Empower persons and care partners by assisting them to develop knowledge, confidence and a sense of autonomy regarding their own care and help them make their own informed choices as part of their plan of care (see **Recommendation 1.0**). Set specific, measurable, achievable, relevant, and time-bound (SMART) goals, use a strengths-based approach and provide empowerment tools (e.g., encourage questions and get feedback from the person and care partner; see **Supporting resources**).
- There are multiple guides listed in the **Supporting resources** and an example of a self-screening tool in **Appendix F** that can assist health providers when educating persons on DFU self-management. Content of self-screening education usually includes assessment of skin (redness, cuts, sores, swelling, calluses), nails, the shape of the foot, blood flow (warmth, pain) and proper footwear.

Supporting resources

RESOURCE	DESCRIPTION
RESOURCES FOR PERSONS AND CARE PARTNERS	
Harvard Longwood Campus, Office of Employee Development and Wellness. Crafting your S.M.A.R.T. goal statement [Internet]. Boston (MA): Harvard University; 2020. Available from: https://hlc.harvard.edu/wp-content/uploads/sites/2412/2020/09/SMART-Goal-Handout.pdf	■ Template that assists persons and care partners in creating SMART goals.
Information about Diabetes and Healthy Feet. In: Healthy Feet [Internet]. North York (ON): Wounds Canada; c2017-2024. Available from: https://www.woundscanada.ca/for-patients-public/240-diabetic-healthy-feet-and-you/for-patients-and-public/267-information-about-diabetes-and-healthy-feet#plan	■ This webpage provides persons living with DFUs with information on how to assess their health and feet, put together a plan of care and monitor DFUs.

RESOURCE	DESCRIPTION
Living with diabetes. In: Centers for Disease Control and Prevention (CDC) [Internet]. Atlanta (GA): CDC; 2024 May 15. Available from: https://www.cdc.gov/diabetes/living-with/?CDC_AAref_Val=https://www.cdc.gov/diabetes/managing/index.html	■ Self-management resources from the Centers for Disease Control and Prevention for persons living with diabetes.
RESOURCES FOR PERSONS, CARE PARTNERS AND/OR HEALTH PROVIDERS	
Printable Resources. Indigenous Diabetes Health Circle (IDHC) [Internet]. Thorold (ON): IDHC; c2024. Available from: https://idhc.life/resources/	■ This webpage provides Indigenous people, organizations and communities with printable resources on diabetes.
Registered Nurses' Association of Ontario (RNAO). Strategies to support self-management in chronic conditions: collaboration with clients. Toronto (ON): RNAO; 2010 Sept. Available from RNAO.ca/bpg/guidelines/strategies-support-selfmanagement-chronic-conditions-collaboration-clients *New edition in progress. Expected date of publication in 2026.	■ This RNAO BPG provides evidence-based recommendations regarding self-management support to enhance an individual's ability to manage their chronic health condition(s).
Support Self-management. Diabetes Canada: Clinical practice guidelines [Internet]. Toronto (ON): Diabetes Canada; [date unknown]. Available from: https://guidelines.diabetes.ca/self-management	• Resources from Diabetes Canada developed for health providers and persons to assist with self-management of diabetes.

RECOMMENDATION 1.0:

When delivering self-management support, the expert panel suggests that health providers use person-engagement strategies that are tailored to persons at risk of or living with a diabetic foot ulcer and their care partners.

Strength of the recommendation: Conditional

Certainty of the evidence of effects: Very low

Discussion of evidence:

Benefits and harms

For the purposes of this BPG, person-engagement strategies refer to a process through which persons gain greater control over decisions and actions affecting their health and increase their desire, ability and confidence in actively participating in their own care (82). For details describing the person-engagement strategies noted in the literature, refer to **Table 8** below. For this recommendation, the intervention of interest was person-engagement strategies when delivering DFU self-management education. The intervention was compared to usual DFU care or the delivery of self-management education where no person-engagement strategies were used.

There were five **randomized controlled trials (RCT)**[G], four non-randomized controlled trials (non-RCTs) and one non-randomized single-arm study included for this recommendation (83–92). The evidence was focused on DFU self-management education provided with various person-engagement strategies, including individualized or person- and family-centred care, hands-on sessions where persons had opportunities to practise foot care, psychoeducation, focused counselling and motivational interviewing. These studies took place in various care settings, including hospitals, a community health-care centre and a facility for older adults. In the included studies, the intervention was provided by researchers, podiatrists, nurses, a psychologist and/or a health provider with a master's degree in nutrition. Participants in the included studies had various levels of education, spanning from below primary education to post-secondary education (84).

It is important to note that one person-engagement strategy does not fit all. Health providers must actively seek out and listen to concerns that persons at risk of or living with a DFU and their care partners may have and tailor care and strategies to their needs.

Evidence suggests that using person-engagement strategies when delivering self-management education may increase person satisfaction and self-efficacy and may decrease DFU occurrence or recurrence. However, the effect of the intervention on adherence was inconsistent. One non-RCT (83) reported that one-to-one education to support the delivery of self-management education to persons at risk of or living with DFUs increased the person's satisfaction with nursing care. Four RCTs (84,85,91,93), three non-RCTs (83,87,88) and one non-randomized single-arm study (89) reported improved self-efficacy scores when person-engagement strategies were used. In one RCT (84), self-confidence (related to efficacy) scores were higher for those who received the intervention (where they received collaborative patient education); however, this difference was only seen among participants with secondary or tertiary levels of education. Two out of three studies that reported on DFU occurrence or reoccurrence reported decreased DFU reoccurrence. One RCT reported there were no important differences in regards to the proportion

of participants who developed one or more ulcers during the one year follow-up period (92). However the two non-RCTs (87,90) reported that person-engagement strategies decreased DFU occurrence or recurrence compared to usual care. In one non-RCT (90), the odds of developing foot risk factors for a DFU (i.e., dry skin, cracked skin, corn/callus) in the intervention group (where persons participated in a self-efficacy theory-based foot care education program) were 22.22 times lower than the odds of having dry skin, cracked skin or corn/callus in the control group after six months. In the other non-RCT (87), the incidence of new DFUs was lower in the group who received psychoeducation compared to the standard care group. The average time to the development of new DFUs was also longer in the psychoeducational group compared to the standard care group. Finally, two studies (one RCT and one non-RCT) measured adherence but had inconsistent results. One non-RCT reported increased adherence with self-management behaviour compared to basic care (88), however one RCT (92) reported that a higher number of participants in the control group wore their orthopedic shoes compared to the intervention group after 3 months.

Amputation rate was identified by the panel as an important outcome, but it was not measured in any of the included studies. There were no harms reported in the evidence.

The evidence suggests that using person-engagement strategies when delivering self-management education to persons at risk of or living with DFUs tailored to the person and their care partners may increase person satisfaction, adherence and self-efficacy and may decrease DFU occurrence/recurrence; however, the evidence is very uncertain. The overall certainty of the evidence was rated as very low due to serious and very serious risk of bias in most of the included studies, some inconsistency in the results, imprecision related to small sample sizes and serious or very serious imprecision for all outcomes.

For more detailed information on the impact of person-engagement strategies on the prioritized outcomes, refer to the evidence profiles under the "methodology documents" tab of the BPG webpage.

Values and preferences

From the systematic review evidence:

Three studies reported on preferences for the intervention (94–96). In one study, podiatrists were trained to use motivational interviewing strategies to empower persons with DFUs to actively engage in self-management. The podiatrists found the strategies valuable but reported some challenges putting the strategies into practice including the time commitment required to implement the strategies and competing demands during consultations, other health providers using a more directive communication style, and lack of confidence using the strategies (96).

From the perspective of persons with DFUs, one study reported when person-engagement strategies were used to deliver self-management support, persons at risk of or living with DFUs preferred their care partners to also receive education as they were vital in helping with foot care (95). Persons also preferred to receive self-management education materials early following diagnosis and throughout management (95). In another study, persons at risk of or living with DFUs reported that they needed more time to talk to their physician during each visit and suggested decreasing the number of scheduled appointments to allow more time for discussion (94). Persons at risk of or living with DFUs and their care partners wanted to be understood and centred in self-management education, and they preferred if health providers utilized a strengths-based approach where providers focused on the person's internal strengths and resourcefulness (94). They noted that some health providers were slow to praise them for accomplishments but quick to ridicule them when they were unable to meet goals set by the health provider (94). Peer support was also valued for long-term disease management. It was also noted that it would be useful to provide education and care in the language or dialect the person or care partner is most familiar with (94).

Health equity

From the systematic review evidence:

One study (90) that was conducted in a health-care setting in an urban area noted that the generalization of the study outcomes to rural settings is limited and should be further explored.

Expert panel justification of recommendation

The expert panel noted that there may be benefits to using person-engagement strategies when delivering self-management education to persons at risk of or living with DFUs. However, the evidence is very uncertain. The panel also noted that one strategy does not fit all, and health providers must actively seek out and listen to concerns that persons at risk of or living with a DFU and their care partners may have, and tailor care and strategies to their needs. The expert panel determined the strength of the recommendation to be conditional.

Implementation tips

Table 7: Using person-engagement strategies to provide self-management support: Implementation tips from the expert panel

CONSIDERATIONS	DETAILS
Readiness for change	■ Identify the person's and care partners' health priorities and readiness for change. Readiness for change is essential for self-management and improving one's health. Signs of readiness for change include being open to learn about self-management or feeling confident to manage a DFU. ■ Emphasize person and care partner empowerment. Build their confidence in decision making to prevent DFUs and know when to seek health care when signs of a DFU are discovered. ■ Assess and address self-stigma to avoid the cycle of self-stigma, demoralization, and disengagement from DFU management.
Health literacy	■ Assess the person's and care partners' health literacy levels. Health literacy is important to help persons find, understand and use information and services to inform their health-related decisions and actions (97). ■ Use plain language, preferred language and communication channels, and culturally and linguistically appropriate language (97).
Person- and family-centred care	■ If the person consents, include care partners when providing diabetes education or care. Some people prefer to include care partners when receiving health care to help provide psychological and emotional support. ■ Listen to persons at risk of or living with a DFU and their care partners' voices, concerns, and experiences, and tailor care and strategies to their needs.

CONSIDERATIONS	DETAILS
Adult learning principles	■ An understanding of different learning theories can help health providers select the best instructional strategies, learning objectives, and assessment and evaluation approaches, when providing education to persons and their care partners (98). ■ Adult learning principles are important to consider during the design and implementation of health care education programs (98). Adult learning principles recognize that: □ learning involves change, which can cause anxiety in adult learners; □ adult learners come with a wide range of previous experiences, knowledge, interests and abilities and they appreciate when their assets are recognized and utilized; □ adult learners are self-directed and want to be actively involved in the learning process; □ adult learners appreciate programs that address relevant challenges in their lives and provide solutions that are immediately useful; and □ adult learners learn best in informal settings where they can interact socially (99). ■ Assess for learning preferences (e.g., face-to-face versus virtual education modalities, written versus oral, online versus printed resources).
Trauma-informed care	■ When using person-engagement strategies to deliver self-management education to persons at risk of or living with DFUs, ensure trauma-informed care approaches are utilized (for further details see **Guiding principles**).
Culturally safe care	■ Provide culturally safe health care to persons and their care partners (for further details see **Guiding principles** and **Appendix C**).

Table 8: Using person-engagement strategies: Implementation context and details from the evidence

CONTEXT	EVIDENCE
The section below describes the person-engagement strategies used by health providers in the studies when providing self-management education to persons at risk of or living with a DFU.	
Motivational interviewing	Baccolini et al., 2022; Jongebloed-Westra et al., 2023; Kes et al., 2022 ■ The communicative style of each psychoeducational session was collaborative and aimed at strengthening motivation and commitment to change, in keeping with the principles of motivational interviewing-based counselling.
Care informed by person's experiences	Bahador et al., 2017 ■ Practical self-care training was tailored to the person, based on the person's experience. Heng et al., 2020 ■ The patient education approach involved: a) collaboration with the patient; b) respecting that persons are experts on their own lives; and c) drawing out persons' intrinsic self-motivation and know-hows to co-create a treatment plan. Vakilian et al., 2022 ■ The educational intervention was based on Pender's health promotion model in which one portion of the intervention was on the person's self-actualization. The researcher investigated the feelings and beliefs of persons with DFUs.
One-to-one education	Fu et al., 2021 ■ Nurses provided one-to-one education to improve the person's self-care skills and ability. A comprehensive assessment of the person's education level, personality and severity of the illness at the time of admission provided basic guidance for the formulation of subsequent individualized health education programs.
Bandura's self-efficacy theory	Nguyen et al., 2019; Ahmad Sharoni et al., 2018; Toygar et al., 2022 ■ The education interventions were based on Bandura's self-efficacy theory. Performance accomplishments, vicarious experiences, verbal persuasion, and physical and emotional states were utilized as intervention strategies.

Supporting resources

RESOURCES	DESCRIPTION
Bennett WL, Pitts S, Aboumatar H, et al. Strategies for patient, family, and caregiver engagement [Internet]. Baltimore (MD): Agency for Healthcare Research and Quality; 2020 Aug. Available from: https://www.doi.org/10.23970/AHRQEPCTB36	■ This technical brief provides person and care partner engagement strategies that have been used to help persons manage chronic conditions. ■ Person and care partner engagement strategies are categorized into direct care, health system and community/policy levels.
Case Western Reserve University (CWRU). Motivational interviewing: an evidence-based treatment [Internet]. Cleveland (OH): CWRU; 2021. Available from: https://case.edu/socialwork/centerforebp/sites/default/files/2021-03/miremindercard.pdf	■ This reminder card provides tips for health providers on what to do and what not to do when conducting motivational interviewing.
Health Quality Ontario. Ontario's patient engagement framework: Creating a strong culture of patient engagement to support high quality health care [Internet]. Toronto (ON): Government of Ontario; 2017. Available from https://www.hqontario.ca/Portals/0/documents/pe/ontario-patient-engagement-framework-en.pdf	■ This guide provides a brief introduction to each part of Health Quality Ontario's Patient Engagement Framework, to support patients, care partners and health providers to engage effectively with each other.
Our Voices, Our Stories. In: Wounds Canada [Internet]. North York (ON): Wounds Canada; c2024 Available from: https://www.woundscanada.ca/patient-or-caregiver/patient-stories	■ This series of videos focuses on the patient experience and journey through wound care in Canada. A key component of this series is learning about balancing everyday life while living with complex wounds. Health providers will also learn about the implications of social determinants of health and how they impact the person's life and management of their complex wounds.
Registered Nurses' Association of Ontario (RNAO). Person- and family-centred care [Internet]. Toronto (ON): RNAO; 2015 May. Available from: RNAO.ca/bpg/guidelines/person-and-family-centred-care *New edition in progress. Expected date of publication in 2025.	■ This RNAO BPG provides evidence-based practices to help nurses and members of interdisciplinary teams become more adept at practising person- and family-centred care.

RECOMMENDATION 2.0:

The expert panel suggests that persons and/or care partners perform self-screening to prevent and manage diabetic foot ulcers.

Strength of recommendation: Conditional

Certainty of the evidence of effects: Very low

Discussion of evidence:

Benefits and harms

For the purposes of this BPG, self-screening refers to screening and risk assessment performed by persons at risk of or living with DFUs and/or their care partners. For this recommendation, the intervention of interest was self-screening performed by persons and/or care partners to prevent DFUs, compared to no self-screening or standard care by persons or care partners.

There was one systematic review and one RCT included for this recommendation (100,101). The interventions in the evidence were focused on the effects of self-screening by persons or care partners for DFU risk assessment. Interventions included self-screening of feet using diabetic foot mirrors with/without a reminder or infrared thermometers for daily foot temperature monitoring (100,101). Participants were recruited from high-risk diabetic foot clinics, health centres within a veteran health-care system, hospitals, hospital-affiliated podiatry practices (100) and the outpatient clinic of a university hospital (101). For further details of the intervention noted in the literature, refer to **Table 10** below.

Evidence suggests that performing self-screening may increase screening rates and decrease DFU occurrence and recurrence. The systematic review reported that participants who self-monitor foot skin temperature using an infrared thermometer develop fewer DFUs when compared to participants who adhere to standard care alone (100). In terms of absolute effects, for every 100 people who use an infrared thermometer for daily foot temperature monitoring, 15 less people will have a DFU reoccurrence (ranges from 21 less to 5 less) (100). An additional 3-arm RCT (101) reported on screening rates among: 1) patients who received training to screen their feet (the control group), 2) patients who received training to screen their feet and a mirror for screening and 3) patients who received training and a mirror that provided them with a reminder to screen their feet. Screening rates were highest in the last group, where participants received training and a mirror that reminded them to screen their feet.

Person satisfaction was identified by the panel as a critical outcome, and neuropathy screening and amputation rates were important outcomes; however, these outcomes were not measured in the studies.

There were no harms reported in the body of evidence.

The evidence suggests that performing self-screening may reduce DFU occurrence/recurrence and improve screening rates. However, the evidence was rated as very low certainty due to very serious risk of bias and serious imprecision.

For more detailed information on the impact of self-screening performed by persons at risk of or living with DFUs and/or their care partners on the prioritized outcomes, refer to the evidence profiles under the "methodology documents" tab of the BPG webpage.

Values and preferences

From the systematic review evidence:

No studies reported values or preferences for self-screening.

From the expert panel:

The expert panel noted that persons and/or their care partners appreciate when health providers use non-judgmental language when discussing self-screening (e.g. if the person is wearing inadequate footwear or has foot fungi). The expert panel also noted that preferences for self-screening may be very related to a person's culture and context.

Health equity

From the expert panel:

From a provider perspective, the expert panel noted that it is important to understand that social determinants of health can impede one's ability to engage in self-screening and management. For instance, if a person has more than one job due to their socio-economic status or other personal or care partner commitments, they may not have time or physical, mental and/or emotional energy to engage in self-screening and management. Another issue is that a person may self-screen and identify a potential issue but may not have access to a health provider for follow-up.

Expert panel justification of recommendation

The expert panel noted that there may be benefits when persons and/or care partners perform self-screening to prevent and manage DFUs, including reduced DFU occurrence/recurrence and increased screening rates. However, the evidence is very uncertain. The panel also noted that not all persons will be able to engage in self-screening. As such, the expert panel determined the strength of the recommendation to be conditional.

Implementation tips

Table 9: Guided self-screening: Implementation tips from the expert panel

CONSIDERATIONS	DETAILS
Evaluation prior to self-screening  	■ Evaluate persons at risk of or living with DFUs and/or care partners on their understanding of self-care and knowledge of self-screening. ■ Assess care partners' knowledge, skill and competency regarding self-screening and self-care (e.g., they may be unable to assist persons at risk of or living with DFUs if they have a limited ability to care for themselves). ■ Assess for any vision issues that may impact the person's and/or care partner's ability to conduct self-screening. **Some people or care partners may not be able to participate in all aspects of diabetes and DFU self-management due to their physical and/or cognitive functions. It is important that health providers respect the person's capabilities and co-design a plan of care where the person and/or care partner can conduct some aspects of self-management.** ■ **Ensure that persons and/or their care partners have the knowledge and skills to understand and perform self-screening. Tailor education about self-screening to the person's and /or care partners' education and health literacy level, age, and culture.** ■ **Assess the person's and/or care partners' preferences for receiving education about self-screening and adapt care methods in order to have meaningful conversations.**
Frequency of self-screening	■ Self-screening is to be done daily by persons and/or care partners.
Content of self-screening education and self-screening guides	■ Content of self-screening education usually includes assessment of skin (redness, cuts, sores, swelling, calluses), nails, shape of foot, blood flow (warmth, pain) and proper footwear. The bottom of each foot is to be assessed with a mirror for any changes. ■ Self-screening guides outline what persons and/or care partners are to screen for. These guides will direct them to consistently assess the same items when conducting daily self-screening. See **Supporting resources** for examples of self-screening guides to provide to persons and/or care partners. ■ Health providers are to provide destigmatizing and culturally competent care (see **Guiding principles** and **Appendix C**).

CONSIDERATIONS	DETAILS
Provision of resources for self-screening	■ Provide varied and comprehensive resources to persons and/or care partners for self-screening tailored to the needs of the person and their care partners. See **Supporting resources** below for examples. ■ Provide resources in the preferred language of persons and/or care partners (if available).
Health provider collaboration	■ Self-screening is not a replacement for screening conducted by a health provider. While self-screening is to be done daily, health providers are to continue to screen persons for DFUs at regular intervals based on risk stratification (see **Good practice statement 1.0**). ■ Collaborate with health providers from a specialized wound care team in order to meet the specific care needs of persons and/or care partners when teaching DFU self-screening. For example, if a person has mental health needs, it may impact their ability to engage in self-screening. ■ Engage health providers with expertise in mental health when providing education about self-screening.
Early reporting of signs and symptoms of DFU 	■ **Encourage persons and/or care partners to see a health provider as soon as early signs of DFU are identified such as red spots, warmth, minor wounds and loss of sensation in the affected foot immediately or as soon as possible (69).** □ **Health providers are to educate persons and/or care partners on interpreting self-screening results so that they can act on any abnormal findings and report them to their health provider.** ■ If a person and/or care partner reports signs and symptoms of a DFU, connect them to health providers with appropriate skills and provide navigation support if needed. Consider the fact that not every emergency room or primary health provider has a DFU **clinical pathway**[G] for prompt and effective screening, management and/or referral. ■ Demonstrate awareness of preventative measures to address health needs and promote health outcomes at every interaction with persons and care partners. ■ Refer to **Appendix F** for an example of a self-screening tool that provides guidance on when to reports signs and symptoms.
Re-assessment	■ Regularly reassess persons' and/or care partners' understanding of self-screening and answer questions. This can promote continuity of self-screening. ■ Re-assess whether the person can independently conduct self-screening. If not, educate the care partner on self-screening techniques. ■ Ask persons and/or care partners about the impact of self-screening on their quality of life.

Table 10: Guided self-screening: Implementation context and details from the evidence

CONTEXT	EVIDENCE
Methods of self-screening	Akça Doğan & Enç, 2022, 2021 ■ The study reported on the use of a diabetic foot mirror with and without a reminder. The diabetic foot mirror consists of a round magnifying mirror, with an adjustable handle. The diabetic foot mirror with a reminder consists of an alarm clock attached to the mirror. van Netten et al., 2024 ■ The systematic review reported on the use of infrared thermometers to self-monitor foot skin temperature. The thermometer is a handheld device that uses sensors to detect foot temperature. Participants were taught to use the thermometer by a health provider. ■ Participants were told to check their foot temperature at least twice a day. Two studies reported that if participants noted a difference in skin temperature of >2.0 degrees Celsius to contact a health provider and reduce physical activity.
Elements of self-screening	Akça Doğan & Enç, 2022 ■ The diabetic foot-check follow-up list was designed as a dated form containing changes that the patient should check for daily (discoloration, scratches-abrasions, dryness, swelling, blisters, calluses, warts, fungus, ulcers, thickening-stinging and deformity of the nail).

Supporting resources

RESOURCE	DESCRIPTION
Alberta Health Services. Diabetes foot health self-screening tool. [Internet]. [place unknown]: Government of Alberta; 2021 Sep. Available from: https://myhealth.alberta.ca/Alberta/AlbertaDocuments/diabetes_foothealth_selfscreening_tool_sep2021.pdf	■ This plain language tool for persons living with diabetes provides a checklist of self-screening items for foot assessments.
Botros M, Ketchen R, Kuhnke J, et al. Care at home series: diabetic foot complications: when is it an emergency? [Internet]. North York (ON): Wounds Canada; 2021. Available from: https://www.woundscanada.ca/docman/public/patient-or-caregiver/1727-home-emergency-df-care-1941e/file	■ This plain-language guide can be used by persons and care partners for preventing or caring for DFUs. ■ On page 4, persons and care partners can rate the condition of the foot and plan their course of action, ranging from regular self-care to when to seek immediate, urgent care. ■ On page 5, there is a checklist for persons and care partners on steps that can be taken to prevent and manage DFUs.
Diabetes and foot care: a checklist. Can J Diabetes [Internet]. 2018 Apr:42(Suppl 1);S323. Available from: https://guidelines.diabetes.ca/appendices/appendix13	■ This plain language factsheet for persons living with diabetes provides a checklist of dos and don't's for assessment and management of foot care, including self-screening.
Indigenous Diabetes Health Circle (IDHC). IDHC's foot care program (FCP) resource kit [Internet]. [place unknown]: IDHC; 2021. Available from: https://idhc.life/wp-content/uploads/2021/06/Foot-Care-Resource-Guide-APRIL-2021.pdf	■ This fact sheet for Indigenous persons living with diabetes provides a list of tools to conduct self-screening of the foot. ■ *Although tailored to Indigenous people, this resource can be used by any person with a DFU.
Wound Canada. Diabetes, Healthy Feet and You: A Conversation with Marina [video file]. In: YouTube [Internet]. 2021 Feb 5. Available from: https://www.youtube.com/watch?v=fVDV6mC1Kgk	■ This video was developed by Wounds Canada in collaboration with a person with lived experience. It includes information about self-screening.

RESOURCE	DESCRIPTION
Wounds Canada. Health feet: finding the proper shoe fit [Internet]. North York (ON): Wounds Canada; 2020. Available from: https://www.woundscanada.ca/dhfy-doc-man/public/diabetes-healthy-feet-and-you/780-proper-shoe-fit-english	■ This plain-language fact sheet provides tips for shoe fitting and describes features of a supportive shoe.
Your Feet and Diabetes. In: CDC Diabetes [Internet]. Atlanta (GA): U.S. Centers for Disease Control and Prevention; 2024 May 15. Available from https://www.cdc.gov/diabetes/diabetes-complications/diabetes-and-your-feet.html	■ This plain-language fact sheet for persons living with diabetes provides tips for healthy feet and when to see a health provider.

WOUND ASSESSMENT

GOOD PRACTICE STATEMENT 3.0:

It is good practice for health providers to regularly conduct a comprehensive and consistent wound assessment and document the presence and characteristics of a diabetic foot ulcer.

When a person with diabetes presents with signs and symptoms of a DFU, conducting a comprehensive and consistent wound assessment and documenting the presence and characteristics of the DFU is part of good practice. A consistent approach is to be used for regular, ongoing comprehensive wound assessments. It is a standard of practice to complete an assessment prior to enacting a plan of care (102). Routinely conduct comprehensive wound assessments according to organizational policies, and utilize the same assessment tool each time. A review of evidence was not required to determine the benefits and harms of conducting an assessment; however, the expert panel felt this statement was necessary to communicate to all health providers. The IWGDF guideline panel also emphasized this practice (30).

A person with a healed DFU has a higher risk of ulceration and the foot is considered to be in remission (30). Routine assessment is a lifelong ulcer prevention strategy that can prevent tissue deterioration, infections, amputations and/or ulcer recurrence (103). **Appendix I** describes and illustrates different types of chronic wounds that health providers may encounter and need to differentiate in clinical practice (e.g., DFUs, pressure injuries, venous and arterial ulcers).

Validated foot assessment tools provide a uniform and evidence-based approach that assists health providers in conducting a comprehensive foot exam. Health providers utilizing the validated tools are to have the education, organizational and system supports in place so that the tool is appropriately used (104). Using validated foot assessment tools, documenting the assessment and if possible, providing photographs of DFUs allow health providers to collect a baseline and identify any wound changes, such as healing or deterioration, which can then guide ongoing treatment plans (104). Documentation of the baseline and any reassessment of the wounds are to be completed based on organizational policies. Although validated diabetic foot-assessment tools will cover multiple areas of assessments, there may be other factors for which health providers should assess (see **Table 13**).

Types of validated diabetic foot-classification and wound progression tools

Using validated diabetic foot-classification tools can assist health providers in conducting a comprehensive baseline assessment of a DFU. Validated wound progression tools can assist health providers in monitoring for any wound changes. Reassessments of a DFU are important to track wound healing or deterioration. There are multiple validated diabetic foot-assessment tools available. The IWGDF's systematic review found 28 proposed classification and scoring systems for DFUs, which suggests that different tools can be utilized for different populations based on different situations and circumstances (32). Differing purposes include indications for communication among health providers, clinical prediction of the outcome of an ulcer, assessment of an infected DFU, assessment of a person with peripheral artery disease and conducting audits of outcomes across units and populations (32). See **Table 11** for a description of diabetic foot classification tools, **Table 12** for a description of wound progression tools and **Appendix H** for website links to these tool.

Table 11: Types of validated diabetic foot-classification tools

TOOL	BRIEF DESCRIPTION	INDICATION AND OTHER CONSIDERATIONS
Site, Ischemia, Neuropathy, Bacterial Infection, Area and Depth (SINBAD) system	▪ Assesses site, ischemia, neuropathy, bacterial infection, area and depth.	▪ Allows for communication about the characteristics of a DFU between health providers about the presence or absence of each variable (32). ▪ Simple and quick to use, requires no specialist equipment beyond clinical assessment alone and contains the necessary information to allow for triage to a specialized interprofessional foot care team (32). ▪ Useful for regional/national/international audits to allow comparisons between health-care organizations on the outcomes of persons with diabetes and foot ulcers (32). ▪ The SINBAD has been validated in 12 studies for several foot ulcer–related clinical outcomes (including healing, hospitalization, amputation, death, etc.) (32).
Wound, Ischemia, and foot Infection (WIfI) system	▪ Uses a combination of scores for wound, ischemia and foot infection (based on IDSA/IWGDF criteria), to provide a 1-year risk for amputation and 1-year benefit for revascularization.	▪ Allows for communication about the characteristics of an ulcer between health providers, focusing on the description of the grade of each composing variable (32). ▪ In a person with diabetes, peripheral artery disease and a foot ulcer, the WIfI system can estimate the likelihood of healing or amputation (32).
Infectious Diseases Society of America/ International Working Group on the Diabetic Foot (IDSA/IWGDF) classification	▪ Consists of four grades of diabetic **foot infection**[G].	▪ Can be used for management of an infected foot ulcer, in particular to identify whether a person requires hospital admission (32). ▪ In a case of suspected or confirmed infected ulcer complicated by ischemia, using the WIfI classification could be considered (32).

TOOL	BRIEF DESCRIPTION	INDICATION AND OTHER CONSIDERATIONS
Wagner wound classification system	■ Assesses ulcer depth and the presence of **osteomyelitis**[G] or gangrene.	■ Other variables (such as loss of protective sensation) are not considered, and infected and/or ischemic DFUs cannot be adequately differentiated by this classification system (105).
University of Texas diabetic wound classification system	■ Assesses ulcer depth, the presence of wound infection and the presence of clinical signs of lower-extremity ischemia.	■ Loss of protective sensation and size are not included in this classification (105).
Bates-Jensen Wound Assessment Tool (BWAT)	■ Assesses, depth, edges, undermining, necrotic tissue type and amount, exudate type and amount, skin colour, peripheral edema and induration, granulation tissue, and epithelization (106).	■ To assess wound status and track healing.

Table 12: Types of validated diabetic foot-wound progression tools

TOOL	BRIEF DESCRIPTION	INDICATION AND OTHER CONSIDERATIONS
Photographic Wound Assessment Tool (PWAT)	■ Assesses wound edges, necrotic tissue type and amount, skin colour surrounding wound, granulation tissue type, and epithelialization (107).	■ To assess wound status and track healing. ■ Can be used when assessing wound photographs or when directly visualizing the wound at the bedside.
MEASURE mnemonic	■ Mnemonic outlining items to assess. ■ Stands for measure wound size, exudate quality and quantity, appearance of the wound bed, suffering (pain scale), undermining, re-evaluate, and edge (108).	■ Acts as the basis for developing a consistent wound assessment approach.

Table 13: Other items to be included in a DFU assessment

OTHER ITEMS TO BE INCLUDED IN A DFU ASSESSMENT	
1. Risk factors of the DFU:	■ When possible, determine the preceding event that led to the formation of the DFU. ■ Assess for abnormal walking patterns, foot deformities, bony prominences, foot abnormalities, ill-fitting shoes and footwear behaviours. This information can assist with treatment plans and prevent reoccurring DFUs (30).
2. Person-related factors:	■ Assess for other health-related issues that may contribute to the formation of a DFU. Such factors include cardiovascular disease, retinopathy, neuropathy, peripheral arterial disease, renal disease, edema, malnutrition, poor metabolic control, psycho-social issues, frailty, smoking, high body mass index, inadequate self-care or lack of awareness (30,109). ■ Assess for perceptions of foot health and self-management routine as intense and prolonged management and slow healing rates of DFUs can increase disease fatigue (38).
3. Considerations for dark skin tones	DFUs are more likely to be undetected in persons with dark skin tones (72). Health providers are to use validated wound assessment tools when conducting assessments on dark skin tones. Some strategies to assess dark skin tones include the following: ■ Position the person where natural light will fall directly onto their skin. If this is not possible, use a bright, focused light source (e.g., a penlight or a mobile phone flashlight) to see the skin. Fluorescent light is to be avoided as it can cast a blue tone on dark skin tones (72). ■ To assess the person's DFU, check for temperature, firmness, inflammation, or pain (72). ■ If a more accurate measure is needed to assess temperature, an infrared thermometer can be used (110). ■ Avoid over-reliance on "redness" as a symptom of infection since diabetes impacts inflammatory responses, and consider other signs — for example, warmth, swelling, new or increasing pain, purulent discharge, increasing malodour and delayed healing (72). Health providers can use the IDSA or WIfI classification tools. ■ Take photographs for documentation and monitoring purposes if the person consents (72). Aim to take photographs from a similar angle and lighting.

Implementation tips

From the expert panel

- Engage persons and care partners during wound assessments to ensure that the assessment is tailored to their needs.
- Routinely conduct comprehensive wound assessments according to organizational policies and utilize the same assessment tool each time (e.g., do not use the SINBAD system for the initial assessment and then the WIfI system for subsequent assessments unless clinically indicated). To monitor wound progression, it is helpful to re-assess the wound at every visit for changes in vascularity, infection, pressure and trauma. It is helpful to re-assess the wound's surface area weekly.
- After every assessment, document characteristics of the wound including the location, dimensions (length, width and depth), abnormal findings (e.g. odour, **slough**[G]) and grading of the ulcer according to the wound classification system used.
- Utilize wound photographs to accurately assess wound appearances when possible if the person consents. See the Photographic Wound Assessment Tool (PWAT), which is a validated tool that assists with documentation of the wound (see **Table 12** and **Appendix H**).
- Health providers are to review assessments recently conducted by other team members before conducting a new assessment. Collaboration has the potential to promote effective communication and information transfer.
- Health providers can use appropriate clinical pathways to ensure that the person has access to a specialized wound care team where available (see **Recommendation 3.0** for more details).
  - Engage social workers, home care nurses and other appropriate interprofessional team members for support when assessing the DFU. Assessments can be done in any health-care setting (not just acute care).
- Utilize the mnemonic "DFU-VIPS" (which stands for diabetes management, foot/find the cause, ulcer, vascular access, infection, pressure and sharp debridement/social determinants of health) as a memory aid for items to assess in a person at risk of or living with a DFU (see **Appendix J**).

Supporting resources

RESOURCE	DESCRIPTION
Botros M, Kuhnke J, Embil J, et al. Best practice recommendations for the prevention and management of diabetic foot ulcers. In: Foundations of best practice for skin and wound management. North York (ON): Wounds Canada; 2017. Available from: https://www.woundscanada.ca/docman/public/health-care-professional/bpr-workshop/895-wc-bpr-prevention-and-management-of-diabetic-foot-ulcers-1573r1e-final/file	■ Guidance document from Wounds Canada that provides recommendations for the prevention and management of DFUs. Focuses on assessment, goal setting, interprofessional collaboration, developing a plan of care and evaluation.
Dhoonmoon L, Nair HK, Abbas Z, et al. International consensus document: wound care and skin tone signs, symptoms and terminology for all skin tones [Internet]. London (UK): Wounds International; 2023. Available from: https://woundsinternational.com/consensus-documents/wound-care-and-skin-tone-signs-symptoms-and-terminology-for-all-skin-tones/	■ This document provides practical guidance on accurate assessment and diagnosis for all skin tones as well as language and descriptors to use in aiding clear communication. It also discusses different geographical and cultural considerations across the globe.
Monteiro-Soares M, Hamilton EJ, Russel DA, et al.; International Working Group on the Diabetic Foot (IWGDF). Guidelines on the classification of foot ulcers in people with diabetes: IWGDF 2023 update [Internet]. [place unknown]: IWGDF; 2023. Available from: https://iwgdfguidelines.org/wp-content/uploads/2023/07/IWGDF-2023-03-Classification-Guideline.pdf	■ This guideline provides five recommendations on using tools to classify DFUs in routine clinical practice.
Wounds Canada. Diabetes, healthy feet and your patients [Internet]. North York (ON): Wounds Canada; c2017. Available from: https://www.diabetes.ca/DiabetesCanadaWebsite/media/Health-care-providers/2018%20Clinical%20Practice%20Guidelines/diabetes-healthy-feet-and-your-patients-brochure.pdf?ext=.pdf	■ This brochure provides health providers with key elements to assess when caring for persons at risk of or living with a DFU.
Wounds Canada Institute Faculty. How to assess blood flowing using an ankle-brachial pressure index (ABPI) assessment. Wound Care Canada [Internet]. 2019 Spring:17(1);22-24. Available from: https://www.woundscanada.ca/docman/public/wound-care-canada-magazine/wcc-2019-v17-no1/1404-wcc-spring-2019-v17n1-final-p-22-24-abpi-how-to-tool-pdf/file	■ This fact sheet discusses how to conduct an ankle-brachial pressure index.

SPECIALIZED WOUND CARE TEAM

RECOMMENDATION 3.0:

The expert panel suggests that health service organizations implement a specialized wound care team to support persons at risk of or living with diabetic foot ulcers.

Strength of the recommendation: Conditional

Certainty of the evidence of effects: Very low

Discussion of evidence:

Benefits and harms

For this recommendation, the intervention of interest was support from a specialized wound care team, compared to no support from a specialized wound care team (i.e., standard care or care by one individual provider) for DFU prevention and management. For the purposes of this BPG, a specialized wound care team consists of two or more specialized health providers from different professional backgrounds who possess the competencies and scope of practice required to care for persons at risk of or living with DFUs (based on the person's level of risk). Members of this team could be either directly caring for the person with a DFU or could be consulted if needed. A specialized health provider is educated, trained and competent in advanced lower limb assessment, prevention and management, such as an NSWOC. The NSWOC equivalent in other jurisdictions may be represented with other credentials, such as (but not limited to) a wound, ostomy, continence care nurse (WOC nurse) or an International Interprofessional Wound Care Course (IIWC) certification. IWGDF suggests there should be at least three levels of foot-care management with specialized health providers (30). Typically, a team involves nurses, chiropodists, physicians of differing specialties and more.

A health service organization delivers health-care services to a defined community or population. Examples include, but are not limited to, family health teams, community health centres, home care organizations and hospitals.

As with all procedures, specialized health providers must be aware of their scope of practice and follow regulatory body guidelines. Specialized health providers should only care for persons at risk of or living with a DFU when they possess the necessary knowledge, skill and judgment. Specialized health providers should also follow organizational policies and procedures related to DFU treatment and care.

There were two systematic reviews and five **non-randomized studies**[G] included for this recommendation (100,111–116). DFU care was provided by a variety of regulated and unregulated health providers. No studies had the exact same team composition. In some circumstances, the specialized wound care team would consult with additional specialized providers (e.g., psychologist if the person had mental health concerns).

The teams provided a variety of services such as assessment (including history taking and conducting non-invasive vascular studies), management (including wound care management, amputation or surgery, limb salvage, ordering and prescribing diagnostic tests), evaluation, providing follow-up visits, preventing future DFUs and providing **offloading**[G] modalities, proper orthotics or footwear. For further details regarding the intervention noted in the literature, refer to **Table 15**.

Evidence suggests that deploying a specialized wound care team may prevent DFU occurrence/ recurrence, decrease amputation rates, improve DFU healing rates, and decrease re-admission rates within 30 days. One systematic review reported that in people with diabetes at high risk of developing a DFU, a specialized wound care team may reduce the risk of a recurrent ulcer (100). In terms of absolute effects, one RCT from this systematic review reported that for every 100 persons who received care from a specialized wound care team, 24 less persons will have a DFU recurrence (ranges from 33 less to 12 less people) (100). Another systematic review reported that multidisciplinary care teams offer protection from amputation, estimating a 39 to 56 per cent amputation rate reduction (111). In terms of absolute effects, for every 100 persons who received care from a specialized wound care team, nine less persons will have a major amputation (ranges from six less to 11 less) (111). Of four studies that examined DFU healing rates, three non-randomized single arm studies reported the use of a specialized wound care team improved DFU healing rates (113–115). One non-RCT reported little to no difference in DFU healing rates between the intervention and control groups; there was a 33.4 per cent reduction in the total number of DFUs in the intervention group and a 37.3 per cent reduction in the control group. After five months, both groups had a comparable reduction in wound size: 60.1 per cent reduction in the intervention group and 52.4 per cent reduction in the control group. Finally, one non-randomized single-arm study reported the use of a specialized wound care team decreased re-admission rates within 30 days (116).

Person satisfaction and readmission rates were identified by the panel as critical outcomes; however, these outcomes were not measured.

There were no harms reported in the evidence.

The evidence suggests that using a specialized wound care team to support persons at risk of or living with DFUs may prevent occurrence/recurrence, decrease amputation rates, improve the DFU healing rate, and decrease re-admission rates within 30 days. The overall certainty of the evidence was rated as very low due to a serious/very serious risk of bias for all individual studies, serious inconsistency for one outcome, as well as very serious imprecision for some outcomes.

For more detailed information on the impact of a specialized wound care team on the prioritized outcomes, refer to the evidence profiles under the "methodology documents" tab of the BPG webpage.

Values and preferences

From the systematic review evidence:

In one study, persons with DFUs received care from a specialized wound care team at a hospital's high-risk foot services clinic. Persons reported they valued receiving sharp debridement, dressing changes, pressure offloading and education on foot self-care (117). However, a high proportion of persons with DFUs had mobility challenges that impacted their ability to attend and travel to the clinic (117).

In another study, where an integrated diabetic foot care program composed of a specialized wound care team was implemented, health providers emphasized knowing the roles of other health providers in the specialized wound care team (118). In addition, participants highlighted the importance of processes and pathways being developed to support the integration of services between hospital and community services (118).

Health equity

From the expert panel:

The expert panel emphasized that implementing a specialized wound care team composed of specialized health providers may not be feasible in all geographical settings. In remote areas or under-resourced settings, there may be difficulties accessing specialized health providers. In addition, the expert panel recognized the current human resources crisis across Canadian and international health-care systems due to low retention and workplace conditions that place pressure on health providers (119). See **Table 14** for strategies to increase access and mitigate these concerns.

Expert panel justification of recommendation

The expert panel noted that there may be benefits to deploying a specialized wound care team with the necessary scope and skill sets to support persons at risk of or living with DFUs, and no harms were reported in the literature. However, the evidence is very uncertain. The panel also noted that it may not be feasible to implement specialized wound care teams in all geographic settings. Therefore, the expert panel determined the strength of the recommendation to be conditional.

Table 14: Specialized wound care team: Implementation tips from the expert panel

CONSIDERATIONS	DETAILS
Timely access to specialized DFU wound care team	■ It is important to note that the person may first inform their primary health provider of any foot changes that they notice. The primary health provider is to provide basic foot care and to refer to a specialized wound care team. ■ If any health provider without DFU expertise notices signs and symptoms of a new DFU, they should arrange a referral to a specialized wound care team within 24 hours of the initial examination of the person's feet (120). An example of a diabetic foot risk assessment triage referral can be found in **Appendix G**. In the meantime, it is important to provide basic wound care for the DFU. ■ Ensure that persons with a DFU who present with a major complication are seen within 24 hours by emergency services, and refer them to a specialized wound care team for ongoing care (121). ■ Different specialties of health providers can provide care for a person with a DFU as indicated. The type of health provider will depend on the assessment and care plan. Consultation requests can be entered through clinical pathways. ■ IWGDF suggests there should be at least three levels of foot-care management with specialized health providers (30): □ Level 1: Primary health provider, diabetes nurse, and podiatrist or chiropodist □ Level 2: Diabetologist/endocrinologist; surgeon (general, orthopaedic or foot/podiatric); vascular specialist (endovascular and open revascularization); infectious disease specialist or clinical microbiologist; podiatrist or chiropodist; diabetes/NSWOC nurse working in collaboration with a pedorthist, orthotist or prosthetist □ Level 3: A level 2 foot centre specialized in care for diabetes-related foot disease, with multiple experts from several disciplines each specialized in this area working together as a tertiary reference centre (adapted from (30)) ■ To avoid duplication of services and streamline care, establish clear communication pathways between health providers to ensure that the team is aware of who is responsible for what aspect of care. Incorporating a designated health provider can facilitate the communication pathway. Documentation is necessary to assess the progression of the DFU and prevent unnecessary repetition of care. □ TeamSTEPPS is an evidence-based framework to optimize team communication and collaboration across the health system (122). See **Supporting resources** for more information.

CONSIDERATIONS	DETAILS
Timely access to specialized DFU wound care team (cont.)	■ It may be helpful for networks of organizations such as Ontario Health Teams (OHT) or a regional grouping of diabetic education centres to assist in the plan of care. OHTs are groups of providers and organizations accountable for delivering a full and coordinated continuum of care to an attributed population in Ontario, Canada (123). OHTs offer a unique opportunity for organizations to offer integrated care for persons at risk of or living with DFUs.
Specialized health providers' skills, scope, and competencies	■ Specialized health providers must have the appropriate skills, scope and competencies when providing care to persons with or at risk of DFUs. ■ Specialized health providers must practise within their scope and limitations. ■ Specialized health providers must stay up to date on the current evidence-based practices of DFU care. ■ Persons and health providers should be aware that anyone, with or without knowledge, can sell orthotics and footwear and claim that they are for diabetic care. The wrong attempt at treatment can create significant harm and potentially delay access to appropriate care.
Prevention and assessment of risk levels	■ The specialized wound care team should assess the person's risk of DFU using the IWGDF's Risk Stratification System and establish foot screening and examination frequency based on the resulting risk category (See **Good practice statement 1.0** for more details on IWGDF's Risk Stratification System). Follow-up should occur at appropriate frequencies.

CONSIDERATIONS	DETAILS
Remote areas or under-resourced settings	■ In remote areas or under-resourced settings, there may be difficulties accessing specialized health providers. Clinical pathways and timely consultations are essential to provide appropriate care to persons living with DFUs. Health service organizations are to consider setting up and maintaining appropriate clinical pathways for persons and health providers. ■ It is the responsibility of the organization taking care of the person at risk of or living with a DFU to set up and maintain a clinical pathway outlining who will be responsible for wound care. A clinical pathway has robust protocols and clear pathways for the continued and integrated care of people across all settings including emergency care and general practice (120). The protocols should set out the relationship between the primary health provider and the specialized wound care team. Clinical pathways may need to be tailored depending on the needs of each person receiving care and person- and family-centred care should be applied in any clinical pathway (see **Guiding principles**). Utilizing a plan of care can be helpful when setting up and maintaining a clinical pathway. See **Good practice statement 4.0** for more information on developing a plan of care. ■ If a virtual care appointment is being arranged with a specialized health provider (such as a dietitian), the primary care provider, or an alternate, is to attend with the person receiving care to discuss the plan of care to ensure continuity. Another possibility is for the health service organization to hire and/or arrange for a specialized health provider to visit on an as-needed basis such as in rural communities or LTC homes. ■ Health service organizations are to provide specialized wound-care training to health providers or funds to receive training from appropriate external organizations.
Person- and family-centred care	■ The specialized wound care team is to include the person at risk of or living with a DFU and their care partner when co-designing care plans. ■ Persons at risk of or living with a DFU and their care partner have the right to request a specialized health provider be involved in their care plan. ■ All DFU education provided by any member of the specialized wound care team is to be centred around the person's and care partners' needs.

Table 15: Specialized wound care team: Implementation context and details from the evidence

CONTEXT	EVIDENCE
Study population and setting	■ The studies took place in the following settings: clinics (112,113,115), a hospital in-patient unit and out-patient clinic (111,114,116) and a veterans medical centre (111). ■ Some persons required a referral from a health provider to be seen by a specialized wound care team (112–115).
Types of providers	■ In some circumstances, a specialized wound care team would consult with specialized providers. ■ In five studies, the specialized wound care team included diabetic nurses/educators (111,112,115), wound care nurses (111,114,115) and/or nurse specialists (116). ■ In five studies, the specialized wound care team included physicians/surgeons: endocrinologists/diabetologists (111,112,114,116), wound care physicians (113), vascular, orthopaedic and/or plastic surgeons (111,112,116), internal medicine physicians/family practice (111) and infectious disease physicians (114,116). ■ In five studies, the specialized wound care team included a chiropodist/podiatrist, orthotist and/or prosthetist (100,111,112,114,116). ■ In the remaining studies, the specialized wound care team included a counselor (115), dietitian (112), psychologist (112), physician assistant (114), social worker (116), physiotherapist/occupational therapist (116) and a hospital bed management team member (116).
Types of services provided	The studies described a variety of forms of support provided to individuals with DFUs by the specialized wound care team, including the following: ■ Assessment (including history taking and conducting non-invasive vascular studies) (100,112–116) ■ Treatment (including wound care management, amputation/surgery, conservation of foot, ordering and prescribing diagnostic tests) (100,111–116) ■ Evaluation and providing follow-up visits/ preventing future DFUs (100,113–116) ■ Providing offloading modalities and proper orthotics/footwear (100,113–116)

Supporting resources

RESOURCE	DESCRIPTION
Alberta Health Services. Diabetes foot risk assessment triage referral [Internet]. Edmonton (AB): Alberta Health Services; [revised 2020 June]. Available from: https://www.albertahealthservices.ca/frm-20709.pdf	■ This form is an example of a triage framework for diabetic foot risk assessment referrals for health providers.
Bus SA, Sacco IC, Monteiro-Soares M, et al.; International Working Group on the Diabetic Foot (IWGDF). Guidelines on the prevention of foot ulcers in persons with diabetes: IWGDF 2023 update [Internet]. [place unknown]: IWGDF; 2023. Available from: https://iwgdfguidelines.org/wp-content/uploads/2023/07/IWGDF-2023-02-Prevention-Guideline.pdf	■ This guideline provides a recommendation (#14) on integrated foot care for persons with diabetes who are at moderate or high risk of foot ulceration.
Health Quality Ontario (HQO). Diabetic foot ulcers: care for patients in all settings [Internet]. Toronto (ON): HQO; 2017. Available from: https://www.hqontario.ca/Portals/0/documents/evidence/quality-standards/qs-diabetic-foot-ulcers-clinical-guide-en.pdf	■ This quality standard informs health providers and organizations about what high-quality health care looks like for persons at risk of or living with a DFU. ■ Quality statement 3 focuses on referral to an interprofessional team.
National Institute for Health and Care Excellence (NICE). Diabetic foot problems: prevention and management [Internet]. Manchester (UK): Public Health England; 2015 Aug 26 [updated 2019 Oct 11]. Available from: https://www.nice.org.uk/guidance/ng19/chapter/Recommendations	■ Recommendation 1.1 of this NICE guideline speaks to the use of a multidisciplinary foot care service.
TeamSTEPPS Canada Essentials Course. In: Healthcare Excellence Canada [Internet]. Ottawa (ON): Healthcare Excellence Canada; c2023. Available from: https://www.healthcareexcellence.ca/en/what-we-do/all-programs/teamstepps-canada-essentials-course/ Agency for Healthcare Research and Quality (AHRQ). Pocket guide: TeamSTEPPS 3.0: team strategies & tools to enhance performance and patient safety [Internet]. Rockville (MD): AHRQ; [revised May 2023]. Available from: https://www.ahrq.gov/teamstepps-program/resources/pocket-guide/index.html	■ TeamSTEPPS is an evidence-based framework to optimize team communication and collaboration across the health system. ■ Healthcare Excellence Canada is the TeamSTEPPS Canada educational lead. The TeamSTEPPS Canada Essential Course is a free, 20-minute e-learning course. ■ The pocket guide from the Agency for Healthcare Research and Quality (AHRQ) contains strategies and tools to enhance team performance and safety.

PLAN OF CARE/TREATMENT

GOOD PRACTICE STATEMENT 4.0:

It is good practice for health providers to implement a plan of care with the person living with a DFU and their care partners that includes evidence-informed management options.

Implementing a plan of care with the person living with a DFU (and their care partners) with treatment strategies based on the risk assessment and/or assessment of the DFU is a part of good practice. For the purposes of this BPG, a plan of care is a written or electronic plan created and maintained by the person, care partners and health providers that outlines the person's short- and long-term needs, goals and coordination requirements and identifies who is responsible for each part of the plan (124). A plan of care is to reflect the person's stated values, beliefs, goals, needs and preferences in a person- and family-centred approach. Typically, a plan of care would consist of the person's demographics, priorities and concerns, a list of the care team (including care partners), consent and advance care planning, past medical and social history, goals of care, medication coordination and allergies (125). Health providers are accountable for reassessing the plan of care frequently to ensure that it still meets the person's (and care partners') needs and addresses any changes required (102). Consistently reassessing the person and updating the plan of care is a key component for maintaining safety and improving health outcomes (102). Steps for implementing a plan of care can be found in the **Supporting resources**. A review of evidence was not required to determine the benefits and harms of implementing a plan of care; however, the expert panel felt this statement was essential to communicate to all health providers.

A plan of care will consist of potential DFU evidence-informed management options, which should be based on the person's needs, contributory factors and causes of the DFU that affected the skin integrity. See **Table 16** for more details.

Implementation tips

Table 16: Best practice management options for DFUs

OPTIONS	DETAILS
Wound debridement[G]	■ Debridement involves the removal of dead tissue (**necrosis**[G] and slough) from wounds in order to create a clean wound bed to promote wound healing (126). ■ Vascular assessment is to be done before any wound debridement is considered (127). ■ There are several different types of debridement including physical (e.g., surgical, sharp, hydro-debridement, or gaseous debridement), biological (larvae), autolytic (hydrogels) or biochemical (enzymes) (126). A specific type of wound debridement is to be utilized depending on the organization's resources, training programs, sterile instruments available and scope of specialized health providers (126,128).

OPTIONS	DETAILS
Wound dressings	■ Wound dressings can help to manage moisture, decrease risk of infection, assist with shear forces and manage optimal wound temperature (129). ■ Health providers are to choose a dressing based on dressing properties, wound characteristics, person's preferences and cost and availability of the dressings. Appropriate application of dressings are to be followed as directed by their manufacturer. ■ Foot inspections are still to be completed even if a dressing is in place. To monitor wound progression, it is helpful to re-assess the wound at every visit for changes in vascularity, infection, pressure and trauma. It is helpful to re-assess the wound's surface area weekly.
Offloading	■ Offloading can be done both preventatively and as a treatment modality, non-surgically or surgically: □ Preventative offloading involves taking pressure off, decreasing friction, shearing and/or compressing in vulnerable plantar areas, through proper fitting, use and inspection of insoles and footwear (130). Where feasible, footwear is to be professionally fitted and worn both indoors and outdoors when the person is awake. □ Offloading as a treatment modality involves modifying or removing inappropriate pressure that result in pressure-induced ischemia, due to poor-fitting or inappropriate footwear, poor walking patterns, excess callus, traumatic accident and/or surgery (69,130). See **Appendix K** for a guide on offloading device choices. When choosing appropriate offloading devices, consider the person's adherence and ability to wear the off-loading device, including their ability to afford it.
Controlling foot infection	■ Diabetic foot infections are a common complication and may lead to lower extremity amputations (131). A diabetic foot infection is defined clinically with manifestations of an inflammatory process involving a foot wound located below the malleoli (131). Any breakage of the foot skin barrier can increase risk of infection. A person with diabetes and peripheral neuropathy may not always exhibit the usual inflammatory responses (erythema, warmth, pain, etc.) (131). **Thermometry**[G] devices are tools that may identify early signs of foot infections (132). ■ Health providers can bone probe, order x-rays, culture samples and biomarkers of infection such as C-reactive protein, erythrocyte sedimentation rate, or procalcitonin (131,133). ■ A diabetic foot infection may involve the bone and osteomyelitis or **active Charcot neuro-osteoarthropathy**[G] (131).

OPTIONS	DETAILS
Revascularization	■ Peripheral arterial disease is a common complication of diabetes that can increase the risk of adverse limb and cardiovascular events (46). ■ Revascularization can assist persons living with diabetes who have peripheral arterial disease, a foot ulcer and clinical findings of ischemia to prolong survival, salvage the limb and avoid major amputation (46,134).
Medical management	■ Optimal glycemic control is fundamental for the management of diabetes overall and may decrease amputation rates related to DFUs. Glycemic target ranges are to be personalized according to the person's medical conditions, risk factors, and functional status (135). Diabetes Canada recommends the following targets: □ Ideally, intensive glucose control with lowering A1C values to ≤7.0 per cent in both type 1 and type 2 diabetes which may decrease microvascular complications and increase cardiovascular benefit. □ More intensive glucose control, A1C ≤6.5 per cent, may be targeted for people with a shorter duration of diabetes and longer life expectancy, especially in those people who are on treatment with antihyperglycemic agents with a low risk of hypoglycemia. □ A more lenient target of A1C ≤8.5 per cent may be more appropriate in people with type 1 and type 2 diabetes with limited life expectancy, higher level of functional dependency and a history of repeated severe hypoglycemia with hypoglycemia unawareness. □ Daily targets for most persons with diabetes include a fasting plasma glucose target of 4.0-7.0mmol/L and a two-hour postprandial plasma glucose target of 5.0-10.0mmol/L. □ Nutritional therapy and counselling are integral to treatment and self-management of diabetes. Nutritional therapy can improve glycemic control and reduce A1C levels by 1-2 per cent (136). A starting point for persons living with diabetes is to follow a validated food guide. Assessment (and frequent re-assessment) from a registered dietitian can assist persons with individualizing their nutritional therapy and supporting the person's targeted glycemic range. See **Appendix C** on how to ensure cultural safety when discussing food options.

OPTIONS	DETAILS
Amputation 	**Decisions to do an amputation must be discussed between the person, care partners and the interprofessional team since there is a significant impact on the person's (and care partners') quality of life (137).** ■ Many persons with diabetes are concerned about the risk of having a lower limb amputation. Preventative interventions, including minor amputations have been essential to decreasing major amputation rates in recent years (137). Diabetic foot surgical management often includes correction of bone, soft tissue and vascular components (137). ■ However, there are times when major amputation can be a preferred option to lengthy or failed limb salvage attempts.

Further evidence-informed treatment options available in different circumstances are outlined in the IWGDF management and NICE guidelines. See **Supporting resources.**

It is important to provide early, proactive management of a DFU before it becomes chronic. However, if a DFU becomes chronic, the Wound Bed Preparation is a paradigm to optimize chronic wound treatment (138). The paradigm's wholistic approach examines the treatment of the DFU and person- and family-centred concerns to determine if a wound is healable, a maintenance wound or non-healable/palliative (138). There are 10 consensus statements that guide clinical practice to help improve the outcomes of a person living with a DFU and health-care system (138). See **Supporting resources** below.

Implementation tips from the expert panel

- Treatment options are based on the causes, complications and achievable outcomes of the DFU. Achievable outcomes are based on the person's and care partners' goals of care.
  - Engage persons and care partners during the co-creation of all care plans to ensure that they are tailored to their needs; understand the best practice management options before creating the plan of care.
  - Consider any barriers or factors that may affect the plan of care (i.e., language barriers or neurodiversity; see **Recommendation 1.0, Guiding principles**, and **Appendix C** for more details).
  - Health providers are to help the person and care partners navigate the different evidence-informed management options by discussing the benefits and harms of each option, and understanding what is most important to the person and care partner. Assess whether persons can access wound care products and medications that are part of their plan of care and advocate as needed for access to these supplies.
  - Each time a health provider assesses or re-assesses a person, document the plan of care (or its progression status). Consult organizational policies and professional colleges for documentation standards (and frequency of documentation).
- Use appropriate clinical pathways to ensure that the person has access to a specialized wound care team; see **Recommendation 3.0** for more details).

Supporting resources

RESOURCE	DESCRIPTION
Ahearn P, Ketchen R, Kuhnke J, et al. Caring for your wound at home: changing a dressing [Internet]. North York (ON): Wounds Canada; c2020. Available from: https://www.woundscanada.ca/docman/public/patient-or-caregiver/1680-care-at-home-series-changing-a-dressing/file	■ Persons and care partners can use this assessment and treatment guide when doing dressing changes at home.
Canada's food guide. Government of Canada [Internet]. Ottawa (ON): Government of Canda; [modified 2024 Aug 17]. Available from: https://food-guide.canada.ca/en/	■ Canada's food guide outlines healthy eating recommendations, cooking skills and recipes. ■ The food guide is available in multiple languages.
Diabetes Canada. Diabetic foot ulcers—essentials of management. Can J Diabetes [Internet]. 2018 Apr:42(Suppl 1); S324. Available from: https://doi.org/10.1016/j.jcjd.2017.10.049	■ This appendix from Diabetes Canada outlines essential components of DFU management for health providers.
Health Quality Ontario. Coordinated care plan user guide version 2.1 [Internet]. Toronto (ON): Government of Ontario; 2018 Jun 12. Available from: https://www.hqontario.ca/Quality-Improvement/Quality-Improvement-in-Action/Health-Links/Health-Links-Resources/Update-and-Action-Care-Plan	■ This user guide (version 2.1) describes how the coordinated care plan template is intended to be used. A coordinated care plan is a communication tool for persons, their care partners and health providers to meet the person's goals and support wholistic care.
Mackay E. Feeding the foot: Nutrition and diabetic foot ulcers. Wound Care Canada [Internet]. 2020 Fall:18(3);40-46. Available from: https://www.woundscanada.ca/docman/public/wound-care-canada-magazine/2020-v19-n3/1857-wcc-fall-2020-v18n3-final-p-40-47-nutrition/file	■ This article focuses on key nutritional areas to consider in the prevention and treatment of DFUs.

RESOURCE	DESCRIPTION
PRACTICAL GESTURES. In: E-footcare: International on-line course for healthcare professionals on diabetic foot [Internet]. [place unknown]: D-Foot international & UNFM; c2019. Available from: https://www.e-footcare.org/e-footcare/practical-gestures/	■ These videos provide basic knowledge to health providers of people at risk of or living with a DFU. Some videos focus on debridement and scalpel use. ■ Closed captions are available in English, French, Spanish and Portuguese.
Smart H, Sibbald RG, Goodman L, et al. Wound bed preparation 2024: Delphi consensus on foot ulcer management in resource-limited settings. Adv Skin Wound Care [Internet]. 2024 Apr;37(4):180-196. Available from: https://doi.org/10.1097/ASW.0000000000000120	■ This framework outlines the Wound Bed Preparation Paradigm with 10 consensus statements that emphasize treating the whole person as a foundation of optimal local wound care. ■ This 2024 edition focuses on foot ulcer management in resource-limited settings where there may be minimal or restricted funding in remote, isolated or rural settings.
Wounds Canada. Quick reference guide: wounds prevention and management cycle [Internet]. North York (ON): Wounds Canada; c2017. Available from: https://www.woundscanada.ca/docman/public/health-care-professional/575-wound-management-bpr-qrg/file	■ This publication guides health providers through a systematic method for developing a person- and family-centred plan for the prevention and management of wounds.

VIRTUAL CARE

RECOMMENDATION 4.0:

The expert panel suggests that health providers use virtual care platforms in conjunction with in-person services to supplement the provision of diabetic foot care services.

Strength of recommendation: Conditional

Certainty of the evidence of effects: Very low

It is important to note that virtual care is an adjunct to in-person services. It is not to replace all in-person services. Health providers should assess whether using virtual care services is appropriate and ask persons and care partners if they are willing to utilize virtual care services after the providers explain and demonstrate what virtual care services entail.

Discussion of evidence:

Benefits and harms

For this recommendation, the intervention of interest was virtual care for the delivery of diabetic foot care services, compared to no use of virtual care. For the purposes of this BPG, the term virtual care refers to using mobile applications, telepractice, and social media to deliver diabetic foot care services. Rationale for virtual care services typically include presentation of educational information, follow-up of educational teaching, counselling, self-care practices (including monitoring or reminders), remote monitoring, problem-solving, motivation and communication (139).

There were four RCTs, and one non-randomized single-arm study included for this recommendation (132,140–143). The interventions in the evidence focused on virtual care platforms used to augment in-person DFU prevention or management strategies. Interventions included using mobile phone applications and/or virtual care platforms, including foot thermometry devices (132,140–143). These were compared to usual care or to a different type of virtual technology. Multiple health-care settings provided virtual diabetic foot care services. Most studies described using virtual care to provide diabetic foot care services in outpatient departments of hospitals, during home visits, or within a large integrated health care system (132,140,142,143). One study (141) reported that virtual care was used to provide diabetic foot care services in community health-care centres. For further details of the intervention noted in the literature, refer to **Table 17**.

Evidence suggests that using virtual care platforms may increase self-efficacy and screening rates, but the effect on DFU occurrence or recurrence is less certain. One RCT reported that persons at risk of or living with DFUs who used virtual care scored 11 points higher on the final assessment of self-efficacy using the Diabetic Foot Care Self-Efficacy Scale compared to the control group (the highest obtainable scale score was 90) (140). Another RCT reported that the mean score for screening rates increased from 1.90 to 6.27 (maximum score of 10) in the intervention group among persons at risk of or living with DFUs with the use of virtual care (141). Regarding ulcer occurrence/recurrence, one RCT found that foot thermometry combined with **mHealth**[G] may result in little to no difference in the incidence of DFU occurrence or recurrence (132). Another RCT demonstrated that the intervention group who received risk assessment with smartphone thermography evaluation had a lower DFU recurrence rate compared to the control group (143). Similarly, one **non-randomized study**[G] found that participants had a lower rate of DFU recurrence after the intervention was conducted (142).

Provider satisfaction and person satisfaction were identified by the panel as critical outcomes, and neuropathy screening as an important outcome but they were not measured in any of the included studies. There were no harms reported in the body of evidence.

The evidence suggests that using virtual care platforms in conjunction with in-person services to supplement providing diabetic foot care may increase self-efficacy and screening rates but the effect on DFU occurrence and reoccurrence is less certain. The overall certainty of the evidence was very low due to a serious/very serious risk of bias, very serious inconsistency and very serious imprecision.

For more detailed information on the impact of virtual care to support providing diabetic foot care services on the prioritized outcomes, refer to the evidence profiles under the "methodology documents" tab of the BPG webpage.

Values and preferences

From the systematic review evidence:

Nine studies reported on persons' and health providers' values and preferences for virtual care platforms to supplement the provision of in-person DFU care (139,144–151). Persons with DFUs preferred using technology that was straightforward and appreciated having technology support available (144–146,148). Straightforward technology was especially valued by older adults who tend to be a larger proportion of persons with DFUs (148). Personal preferences and diabetes-related complications (e.g., age, vision and mobility difficulties) can impact the usability of virtual care technologies (145,147,148). In one study, some participants sought help from their care partners to reduce logistical and physical barriers when using technology (147).

Two studies reported on the usability of various virtual care platforms to self- screen and self-monitor DFUs; therefore empowering persons with DFU self-management (147,151,152). In two studies, participants reported that using technology prompted them to assess or monitor their foot and facilitate discussions about foot health with their health providers (147,151). One study noted that social media was an alternative method for empowering persons at risk of a DFU as it created more opportunities for persons to learn at their own pace and reduced barriers to self-management education and support programs (152). However, there were also challenges utilizing the technologies including confusion regarding the purpose and use of the technology, difficulty interpreting the findings and misunderstanding of what to consider a concern and when to take action (147).

One significant aspect captured in the studies was the convenience of virtual care in providing diabetic foot care services (139,144–147), including allowing persons to connect with health providers without travelling to a clinic (148–150). This further allowed persons in rural areas to stay in their home communities and increased the ability of care partners to attend appointments with them (149,150). However, participants in two studies also acknowledged that some DFU services (such as offloading and cleaning the wound) and establishing an in-person therapeutic relationship can only be accomplished face-to-face (148,149). Some participants felt they would receive higher quality care if their health provider could assess their wound in-person (148).

Health equity

From the systematic review evidence:

One study acknowledged that all study participants were digitally literate and could use a mobile phone, which may have impacted the results (140).

From the expert panel:

The expert panel noted that the socio-economic status and education level of persons at risk of or living with DFUs can impact access to and utilization of virtual care technology. For instance, virtual care platforms that use the Internet may require a level of digital literacy to use the device or personal finances to purchase the device. Additionally, the expert panel acknowledged that persons living in rural and remote regions may have limited virtual care access due to phone or Internet connectivity issues. The importance of keeping persons at risk of or living with DFUs in their home community when possible was also recognized by the expert panel, and virtual care services may help facilitate this. Health providers are also to assess and support physical disabilities such as poor hand dexterity that may affect the use of a computer mouse and retinopathy that may affect vision. From a health service organization perspective, the expert panel noted that cost may impede the purchase of DFU virtual care platforms.

Expert panel justification of recommendation

The expert panel noted that there may be benefits to using virtual care platforms in conjunction with in-person services to supplement providing diabetic foot care services, and no harms were noted in the literature. However, the evidence is very uncertain. In addition, the expert panel noted some health equity considerations, such as the feasibility of implementing virtual care platforms in areas with limited Internet connectivity. For these reasons, the expert panel determined the strength of the recommendation to be conditional.

Implementation tips

Table 17: Virtual care platforms: Implementation tips from the expert panel

CONSIDERATIONS	DETAILS
Assessing suitability of virtual care platforms	■ Assess persons at risk of or living with DFUs and their care partners for their ability to use virtual care platforms in-conjunction with in-person diabetic foot care delivery. Items to assess include the following: □ digital health literacy □ comfort using technology □ motivation for using technology □ how frequently they are willing to use the technology □ how it fits into their current routines □ what virtual care platforms are accessible □ costs associated with using the technology ■ Health providers using virtual care platforms should consider whether they have appropriate training, experience and qualifications to provide virtual diabetic foot care services. ■ Health providers are to educate persons and care partners on interpreting virtual technology results so that they can act on any abnormal findings and report them to their health provider (e.g., when a foot thermometry mat indicates an abnormal temperature). ■ Routine in-person assessment is necessary for persons at high-risk of developing a DFU. See **Good practice statement 1.0** for risk stratification. Some in-person services including debridement and wound care are important components of diabetic foot care services and cannot be done virtually. ■ Virtual care (and clinical pathways) can assist in providing care in remote or under-resourced settings as there may be difficulties accessing specialized health providers. See **Recommendation 3.0** about specialized wound care teams. CAUTION **If issues or concerns arise during a virtual visit, an in-person assessment is to be conducted. Escalation guidelines are to be followed by health providers (including those remotely monitoring persons), persons and care partners to clearly establish and outline communication methods, and response timelines.**
Partnership with persons at risk of or living with DFUs and their care partners	■ Actively engage persons at risk of or living with DFUs and their care partners through communication, involvement, support and shared decision-making when using virtual care or discussing the option of using virtual care.

CONSIDERATIONS	DETAILS
Security, privacy and confidentiality considerations	Comply with local health information legislation (e.g., Personal Health Information Protection Act) and organizational policies related to privacy and confidentiality when choosing or providing virtual platforms for diabetic foot care services. See **Supporting resources** on guidance for privacy and security considerations for virtual health-care visits.

Table 18: Virtual care platforms: Implementation context and details from the evidence

CONTEXT	EVIDENCE
For more detailed information on the virtual care technologies, refer to the evidence profiles under the "methodology documents" tab of the BPG webpage.	
Virtual care technology	In the included studies, mobile applications and virtual care platforms were used. Virtual care platforms included an animation-supported Mobile Diabetic Foot Care Education app (140), a diabetes coaching intervention in a smartphone application (141), a daily-use telemedicine foot temperature monitoring mat (142) and smartphone thermography (143). One study used a combination of a foot thermometry device and mHealth component, which consisted of foot care promotion messages through text and video messaging (132). Dincer et al., 2021 ■ A mobile app delivered cartoon animation videos containing health education information on preventing DFUs. The application would send push notifications to the persons to conduct self-care twice a week. Isaac et al., 2020 ■ The daily-use telemedicine foot temperature monitoring mat contained software that spontaneously kept track of foot inflammation by measuring differences in foot temperature exceeding 2.2 degrees Celsius over two consecutive uses. When inflammation was detected, a nurse was alerted by a configured electronic health record (EHR). The EHR also alerted health providers on recommended actions and treatment plans.

CONTEXT	EVIDENCE
Virtual care technology (cont.)	Lazo-Porras et al., 2020 ■ In the intervention group, a foot thermometry device was used alongside a mHealth component. The foot thermometry device used liquid crystal technology to provide a visual image of foot temperatures (where the different colours indicated temperature changes). Participants were told to use the device daily and to contact providers by phone or text message if one of the alarm signs appeared in the device. Further escalation was conducted if alarm signs persisted more than one week. The mHealth component delivered alarms to signal foot temperature changes, weekly reminder messages and health promotion messages related to foot care. Pamungkas et al., 2022 ■ A smartphone app for diabetes personalized coaching intervention was used over a period of 12 weeks. Participants reported self-management activities in the reporting menu of the app, and online consultation was delivered through virtual meetings and a telephone call to monitor diabetic self-management activities and potential complications to address program implementation barriers. Additionally, emotional support was provided by sending empowering messages, addressing questions using mindfulness-based coaching and small group interaction. Qin et al., 2023 ■ The smartphone thermography application captured infrared thermal images to detect early signs of inflammation near or on pre-ulcerative lesions. Early signs of inflammation were defined as an area of increased temperature surrounding the pre-ulcerative lesion. The temperature was measured relative to both the surrounding area and the other foot.

Supporting resources

RESOURCE	DESCRIPTION
Canada Health Infoway (Infoway), Healthcare Excellence Canada (HEC). Providing safe and high-quality virtual care: a guide for new and experienced users: clinician change virtual care toolkit: version 1.0 [Internet]. [place unknown]: Infoway; 2022 May. Available from: https://www.allianceon.org/resource/Providing-safe-and-high-quality-virtual-care-guide-new-and-experienced-users-Clinician	■ Contains information and resources to support health providers with the tools they need to provide safe, high quality virtual care. ■ Includes sections about appropriateness, use and optimization of virtual care services, quality and safe virtual care interactions, virtual care evaluation, and other tools and resources.
Nurses Specialized in Wound, Ostomy, and Continence Canada (NSWOCC). Virtual care toolkit [Internet]. Ottawa (ON): NSWOCC; 2024 Apr. Available from: https://www.nswoc.ca/toolkit	■ This toolkit can assist health providers to safely provide virtual care for persons living with wounds including DFUs. ■ Five sections cover legal and regulatory considerations, technology, equity-oriented care, delivery of virtual care and knowledge transfer.
Ontario Health. Clinically appropriate use of virtual care in primary care: guidance reference document [Internet]. Toronto (ON): Ontario Health; 2022 Nov. Available from: https://www.ontariohealth.ca/sites/ontariohealth/files/2022-11/ClinicallyAppropriateUseVirtualCarePrimaryCare.pdf	■ This guidance document supports decision-making related to the clinically appropriate use of virtual care modalities (i.e., email, secure messaging, telephone, video) in the delivery of primary care services. ■ It is intended for primary care health providers and those who plan and support primary care health delivery.
Registered Nurses' Association of Ontario (RNAO). Clinical practice in a digital health environment [Internet]. Toronto (ON): RNAO; 2024 Mar. Available from: RNAO.ca/bpg/guidelines/clinical-practice-digital-health-environment	■ This RNAO BPG fosters nurses' ability to maintain, advance and strengthen professional practice in the context of a digital health environment.

Research gaps and future implications

The RNAO best practice guideline development and research team and the expert panel identified priority areas for future research (outlined in **Table 19**). The left-hand column of **Table 19** outlines the recommendation questions and outcomes, and the right-hand column outlines priority research areas identified by the expert panel based on the systematic reviews conducted for each question. Future studies conducted in these areas would provide further evidence to support high-quality, equitable support for persons at risk of or living with a DFU and their care partners. The list is not exhaustive; other areas of research may be required.

Table 19: Priority research areas per recommendation question

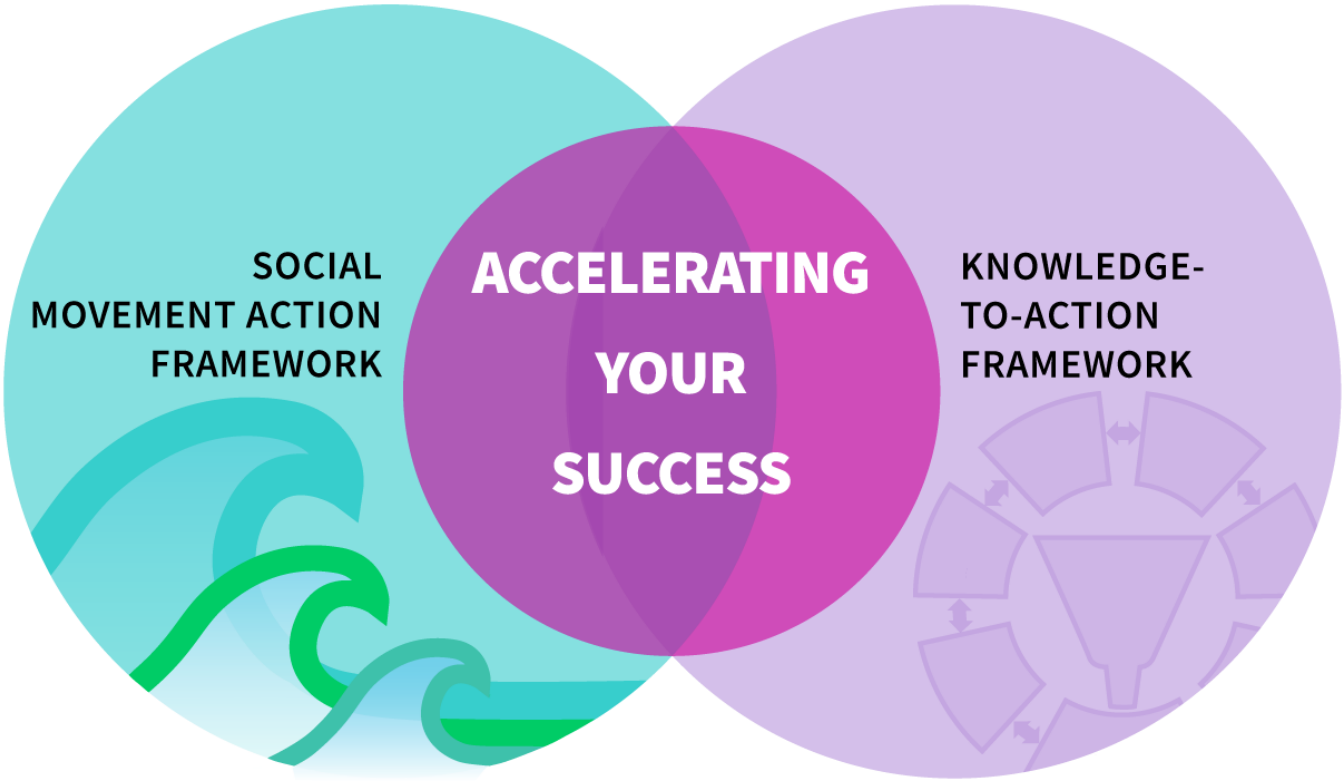
RECOMMENDATION QUESTION	PRIORITY RESEARCH AREA
RECOMMENDATION QUESTION #1: **Should person-engagement strategies be recommended or not for health providers delivering self-management support for diabetic foot care (e.g., motivational interviewing, cognitive behavioural therapy or other psychosocial interventions)?** **Outcomes:** Person satisfaction, self-efficacy, person adherence, DFU occurrence/recurrence, amputation rates	▪ More studies exploring the impact of using person-engagement strategies to deliver self-management support on amputation rates.
RECOMMENDATION QUESTION #2: **Should self-screening for DFU risk assessment be recommended for persons at risk of or living with DFUs and their care partners?** **Outcomes:** DFU occurrence/recurrence, screening rates, person satisfaction, neuropathy screening, amputation rates	▪ More studies exploring the impact of self-screening by persons and their care partners on person satisfaction and neuropathy screening.
RECOMMENDATION QUESTION #3: **Should support from a specialized wound care team be recommended or not for persons at risk of or living with DFUs?** **Outcomes:** DFU occurrence/recurrence, amputation rate, DFU healing rates, person satisfaction, readmission rates	▪ More studies exploring the impact of specialized wound care teams on person satisfaction.
RECOMMENDATION QUESTION #4: **Should virtual care (e.g., telepractice, social media) be recommended or not to support/supplement (in conjunction with in-person service) the delivery of diabetic foot care services?** **Outcomes:** Self-efficacy, screening rates, provider satisfaction, person satisfaction, DFU occurrence/recurrence, neuropathy screening	▪ More studies exploring the impact of using virtual care to support/supplement the delivery of diabetic foot care services on person satisfaction and neuropathy screening.

Implementation strategies

Implementing guidelines at the point of care is multi-faceted and challenging. It takes more than awareness and access to BPGs for practice to change: BPGs must be adapted for each practice setting in a systematic and participatory way to ensure that recommendations fit the local context (153). The Leading Change Toolkit (developed by RNAO in partnership with Healthcare Excellence Canada), provides evidence-informed processes for this (see **Appendix M**) (4).

The Leading Change Toolkit uses two complementary frameworks to guide evidence uptake and sustainability (see **Figure 3**). They can be used together to maximize and accelerate change.

Figure 3: The Leading Change Toolkit: Two complementary frameworks to accelerate your success



Source: Reprinted with permission from: Registered Nurses' Association of Ontario (RNAO), Healthcare Excellence Canada (HEC). Leading change toolkit [Internet]. 4th ed. Toronto (ON): RNAO; 2024. Available from: https://www.RNAO.ca/leading-change-toolkit

The Social Movement Action Framework (1,2) is descriptive and identifies the defining elements of a social movement for knowledge uptake and sustainability. It integrates a bottom-up, people-led approach to change for a shared concern (or common cause) in which change agents and change teams mobilize individual and collective action to achieve goals. The framework's elements — categorized as preconditions, key characteristics and outcomes — are dynamic, inter-related and develop spontaneously as the social movement evolves.

The Knowledge-to-Action Framework uses a process model of action cycle phases to systematically guide the adaptation of the new knowledge (e.g., a BPG) to the local context and implementation. This framework suggests identifying and using knowledge tools/products (such as guidelines) to determine gaps and begin the process of tailoring the new knowledge to local settings.

The Leading Change Toolkit is based on emerging evidence in health and social sciences that successful uptake and sustainability of best practice in health care is more likely when the following occurs:

- BPGs are selected for implementation through a participatory process led by change agents and change teams.
- The selected BPGs reflect priority areas for a shared concern that are credible, valued and meaningful, or an urgency for action.
- Others impacted by the change are identified and engaged throughout implementation to engage in individual and collective action.
- Receptivity for implementing BPGs, including environmental readiness, is assessed.
- Implementation strategies are tailored to the local context and designed to address barriers.
- Use of the BPG is monitored and sustained.
- Evaluation of the BPG's impact is embedded in the process to determine if the goals and outcomes have been met.
- There are adequate resources to complete all aspects of the uptake and sustainability of the BPG.
- The BPG is scaled up, out or deep, where possible, in order to widen its influence and create lasting health improvements.

RNAO is committed to widespread dissemination, implementation and sustainability of our BPGs. We use a systematic approach deploying various strategies, including:

1. The RNAO Best Practice Champion Network®, which powers the capacity of change agents to foster awareness, engagement, adoption and sustainability of BPGs. RNAO best practice champions are persons and organizations who are passionate about implementing evidence-based practices and mobilize others so together they improve care and health through integration of competencies defined by RNAO's Best Practice Champions Competency Framework. Champions include nurses and other health professionals from all roles and health sectors, students, advocates, persons with lived experience and caregivers.
2. RNAO Clinical Pathways™ are digitized recommendations and good practice statements embedded into electronic medical records through a third-party software. Currently, these clinical pathways are available to all Canadian Long-Term Care homes.
3. The BPSO® designation supports implementation at the organization and system levels. BPSOs focus on developing evidence-based cultures with the specific mandate to implement, evaluate and sustain multiple RNAO BPGs.

In addition, we offer annual capacity-building learning institutes on the implementation of practice change.

Information about our implementation strategies can be found at:

- RNAO Best Practice Champions Network®: RNAO.ca/bpg/get-involved/champions
- RNAO BPG Clinical Pathways™: RNAO.ca/bpg/implementation/clinicalpathways
- RNAO BPSO®: RNAO.ca/bpg/bpso
- RNAO capacity-building learning institutes and other professional development opportunities: RNAO.ca/events

Appendix A: Glossary of terms

Active Charcot neuro-osteoarthropathy: "The presence of a red, warm, swollen foot with osseous abnormalities on imaging in a person with diabetes mellitus and neuropathy. During the course of the disease, as long as there are signs of inflammation in the affected foot, the Charcot neuro-osteoarthropathy is presumed to be 'active'" (10).

Amputation: "Resection of a segment of a limb through a bone or through a joint.

- Major amputation: Any resection proximal to the ankle.
- Minor amputation: Any resection through or distal to the ankle" (10).

Best practice guidelines (BPG): "Best practice guidelines are systematically developed, evidence-based documents that include recommendations for nurses and the interprofessional team, educators, leaders and policy-makers, persons and their families on specific clinical and healthy work environment topics. BPGs promote consistency and excellence in clinical care, health policies and health education, ultimately leading to optimal health outcomes for people and communities and the health system" (154).

Best Practice Spotlight Organization® (BPSO®): A health service or academic organization that has partnered formally with RNAO over a three-year time period with a goal of creating evidence-based practice cultures through the systematic implementation and outcome evaluation of multiple best practice guidelines (155).

Callus: "Increased thickness of the outer layer of the skin caused by excessive mechanical loading" (10).

Care partner: A care partner provides physical, psychological and emotional support, as deemed important by the person. This care can include support in decision making, care coordination and continuity of care. Care partners can include family members, close friends or other caregivers and are identified by the person or substitute decision marker (9). In other RNAO BPGs, care partners have been called caregivers, families or family members.

Chiropodist, podiatrist: Regulated health professionals who assess, diagnose and treat a broad range of medical conditions of the foot (156). Chiropodists and podiatrists are registered with the College of Chiropodists and hold protected titles (156). Chiropodists and podiatrists can perform similar but distinct authorized acts. Chiropodists represent the largest number of foot specialists in Ontario. Practitioners in the US, or those who came to Ontario before 1993, are referred to as Podiatrists (156). See the College of Chiropodist of Ontario website for more information on scope of practice.

Clinical pathway: Robust protocols and clear pathways for the continued and integrated care of people across all settings including emergency care and general practice. The protocols should establish the relationship between the primary health provider and the specialized wound care team (120).

Corn: A thick round skin lesion with a hardened central core that forms from repetitive rubbing or pressure or over a bony prominence (157).

Co-design: A reconceptualization of the role of persons and a structured process for involving them throughout all stages of quality improvement. There is a strong emphasis on the importance of the persons', care partners' and health providers' experiences and emotions to understand and improve health services (158).

Complementary and alternative medicine: "A broad set of health care practices that are not part of that country's own tradition or conventional medicine and are not fully integrated into the dominant health-care system. They are used interchangeably with traditional medicine in some countries" (159).

Cultural safety: Cultural safety is an outcome based on respectful engagement that recognizes and aims to address power imbalances inherent across the health system. Cultural safety creates an environment free of racism and discrimination where people feel safe when receiving health care (56).

Debridement: The removal of callus or dead and devitalised tissue (necrosis and slough) through various methods (10).

See wound debridement

Diabetes: "Diabetes mellitus is a heterogeneous metabolic disorder characterized by the presence of hyperglycemia due to impairment of insulin secretion, defective insulin action or both" (160). Type 1 and Type 2 diabetes are the two main types of diabetes (160).

See Type 1 diabetes and Type 2 diabetes

Diabetic foot ulcer (DFU): "A foot ulcer in a person with current or previously diagnosed diabetes mellitus, and commonly accompanied by peripheral neuropathy and/or peripheral artery disease in the lower extremity" (10).

See foot ulcer

Diabetic foot ulcer in remission: "Intact skin, and absence of infection, of the complete foot after healing of any foot ulcer(s)" (10).

Diabetic foot ulcer occurrence: "A foot ulcer occurring in a person who has never before had a foot ulcer" (10).

Diabetic foot ulcer recurrence: "A new foot ulcer in a person who has a history of foot ulceration, irrespective of the location and time since the previous foot ulcer" (10).

Evidence-based practice: The integration of research evidence with clinical expertise and patient values. It unifies research evidence with clinical expertise and encourages the inclusion of patient preferences (161).

Evidence-to-Decision (EtD) frameworks: A table that helps guideline panels make decisions when moving from evidence to recommendations. The purpose of the Evidence-to-Decision framework (EtD) is to summarize the research evidence, outline important factors that can determine the recommendation, inform panel members about the benefits and harms of each intervention considered and increase transparency about the decision-making process in the development of recommendations (19).

External reviewer: Individuals or groups who commit to reviewing and providing feedback on the draft RNAO best practice guideline prior to publication. External reviewers often include individuals or groups directly impacted by the guideline topic and recommendations (e.g., people accessing health services, people working in health service organizations or people with subject-matter expertise).

Foot deformity: "Alterations or deviations from the normal shape or size of the foot, such as hammer toes, mallet toes, claw toes, hallux valgus, prominent metatarsal heads, pes cavus, pes planus, pes equinus, or results of Charcot neuro-osteoarthropathy, trauma, amputations, other foot surgery or other causes" (10).

Foot infection: The presence of manifestations of an inflammatory process involving a foot wound located below the malleoli (131).

Foot screening: To test for the presence or absence of diabetes- related foot disease or dysfunctions (10).

Foot ulcer: "A break of the skin of the foot that involves as a minimum the epidermis and part of the dermis" (10).

Gangrene: "A condition that occurs when the body tissue dies because of insufficient blood supply, infection or injury. Without infection this generally results in dry and black tissue, frequently called dry gangrene; when the tissue is infected, with accompanying putrefaction and surrounding cellulitis, it is often called wet gangrene" (10).

Good practice statement: Good practice statements are directed primarily to nurses and the interprofessional teams that provide care to persons and their families across the continuum of care, including (but not limited to) primary care, home and community care, acute care and LTC.

Good practice statements are actionable statements that should be done in practice (14). These are believed to be so beneficial that summarizing the evidence would be a poor use of the expert panel's time and resources (14). Moreover, researchers may no longer be conducting studies on the topic, or the alternative to the action may be unethical or studying them may go against human rights (14,15). Given the high level of certainty that the benefits derived from the good practice statement outweigh the harms, they are not based on a systematic review of the evidence, and they do not receive a rating of the certainty in their evidence or a strength (i.e., a rating of conditional or strong) (16). This does not diminish certainty in the evidence. While they are often supported by indirect evidence, there is a well-documented, clear and explicit rationale connecting the indirect evidence to the statement (14). As such, good practice statements should be interpreted as strong recommendations as there is an underlying assumption that there is high certainty in the benefits of implementing the action (14).

Grading of Recommendations Assessment, Development and Evaluation (GRADE): A methodological approach to assess the certainty of a body of evidence in a consistent and transparent way and to develop recommendations in a systematic way. The body of evidence across identified important and/or critical outcomes is evaluated based on the risk of bias, consistency of results, relevance of studies, precision of estimates, publication bias, large effect, dose-response and opposing confounding (19).

When using GRADE, five components contribute to the assessment of confidence in the evidence for each outcome. These components are as follows:

1. Risk of bias, which focuses on flaws in the design of a study or problems in its execution.
2. Inconsistency, which looks at a body of evidence and assesses whether the results point in the same direction or if they are different.
3. Imprecision, which refers to the accuracy of results based on the number of participants and/or events included and the width of the confidence intervals across a body of evidence.
4. Indirectness, whereby each primary study that supports an outcome is assessed and a decision is made regarding the applicability of the findings to the population, intervention and outcome outlined in the research question.
5. Publication bias, where a decision is made about whether the body of published literature for an outcome potentially includes only positive or statistically significant results (19).

Guiding principles: Overarching concepts that denote a philosophy, belief, value and/or standard of behaviour that nurses, members of the interprofessional team and health service organizations should apply to their practice when implementing recommendations and good practice statements.

Health provider: Refers to both regulated (e.g., nurses, physicians, dietitians and social workers) and unregulated (e.g., personal support workers) workers who are part of the interprofessional team.

Regulated health provider: In Ontario, the *Regulated Health Professional Act, 1991* (RHPA) provides a framework for regulating 26 health professions, outlining the scope of practice and the profession-specific controlled or authorized acts that each regulated professional is authorized to perform when providing health care and services (11).

Unregulated health provider: Unregulated health providers fulfill a variety of roles in areas that are not subject to the RHPA. They are accountable to their employers but not to an external regulating professional body (such as the College of Nurses of Ontario). Unregulated health providers fulfill their roles and tasks that are determined by their employer. Unregulated health providers only have the authority to perform a controlled act as set out in the RHPA if the procedure falls under one of the exemptions set out in the Act (12).

See primary health provider and specialized health provider

Health service organizations: Organizations delivering health-care services to defined communities or populations. This includes, but is not limited to, family health teams, home care organizations and hospitals.

Implementation science: "The scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services and care" (162).

Indigenous: Introduced and used in a global context following the international efforts of Aboriginal peoples to achieve a greater presence in the United Nations (UN). The UN broadly defines Indigenous persons as peoples of long settlement and connection to specific lands who practise unique traditions and retain social, cultural, economic and political characteristics that are distinct from those of the dominant societies in which they reside (163). Under the UN definition, Indigenous is generally understood to include the following: self-identification at the individual level and acceptance by an Indigenous community as a member; historical continuity with pre-colonial or pre-settler societies; strong links to territories and surrounding natural resources; distinct social, economic or political systems; and distinct language, culture and beliefs. Indigenous peoples form non-dominant groups within society and resolve to maintain and reproduce their ancestral environments and systems as distinctive peoples and communities (163).

The Canadian Constitution recognizes three groups of Indigenous peoples: First Nations, Inuit and Métis. These are three distinct peoples with unique histories, languages, cultural practices and spiritual beliefs (164).

Interprofessional team: A team comprised of multiple health providers (regulated and unregulated) who work collaboratively to deliver comprehensive and quality health services to persons within, between and across health care (165). Key interprofessional team members supporting persons at risk of or living with a DFU may include: nurses, primary health providers, chiropodists, podiatrists, dietitians and pharmacists. It is important to emphasize that persons and their care partners are at the centre of the interprofessional team as active participants.

See specialized wound care team

Ischemia: "Blood supply to the foot or part of the foot that is insufficient to meet the metabolic demands of tissue, associated with signs or symptoms of reduced perfusion" (10).

mHealth: "The use of mobile and wireless technologies to support health objectives" (166).

Necrosis: A form of irreversible cell injury that is almost always associated with inflammatory responses, which leads to the premature death of cells in living tissue (167).

Neuropathy: Diabetes-induced neuropathy is a symmetric polyneuropathy that affects the sensory, motor and autonomic components of the peripheral nerves. Diabetes-induced neuropathy results in loss of protective sensation (27).

Motor neuropathy causes atrophy of foot muscles by denervation of muscle groups and typically presents with sensory damages that result in unequal foot load and unequal gait with pain insensitivity, causing hyperkeratosis and promoting DFUs. Autonomic neuropathy is the impairment of peripheral autonomic nerves that may affect multiple organ systems (27).

Non-randomized study: A quantitative study estimating the effectiveness of an intervention, where participants are allocated to different interventions using methods that are not random (168).

Nurse: Refers to registered nurses, licensed practical nurses (referred to as "registered practical nurses" in Ontario), registered psychiatric nurses and nurses in advanced practice roles, such as nurse practitioners and clinical nurse specialists (169).

Offloading: "The relief of mechanical stress (pressure) from a specific region of the foot. Techniques can include surgical offloading techniques, offloading devices, footwear, and other offloading techniques" (10).

Osteomyelitis: "An infection of the bone, with involvement of the bone marrow" (10).

Outcomes: A dependent variable, or the clinical and/or functional status of a patient or population, used to assess if an intervention is successful. In GRADE, outcomes are prioritized based on whether they are: a) critical for decision making, b) important but not critical for decision making or c) not important. The use of these outcomes helps make literature searches and systematic reviews more focused (19).

Peripheral artery disease: "Obstructive atherosclerotic disease of the arteries from the distal aorta to the foot, with clinical symptoms, signs or abnormalities on non-invasive or invasive vascular testing or medical imaging, resulting in disturbed or impaired circulation in one or both of the lower extremities" (10).

Peripheral neuropathy: "The presence of symptoms or signs of peripheral nerve dysfunction" (10). Common symptoms include: loss of sensations in the toes and feet, sharp shooting pains, burning, tingling, a feeling of being pricked with pins, throbbing and numbness (170).

Person: An individual with whom a health provider has established a therapeutic relationship for the purpose of partnering for health. Replaces the terms "patient," "client" and "resident" that are used across health service organizations (13).

Person- and family-centred care: An "approach to care [demonstrating] certain practices that put the person and their family members at the centre of health care and services. Person- and family-centred care respects and empowers individuals to be genuine partners with health-care providers for their health" (13).

Person-engagement strategies: A process through which people gain greater control over decisions and actions affecting their health and increase their desire, ability and confidence in actively participating in their own care (82).

Person with lived experience: Members of the community who have first-hand experience and knowledge of the topic of interest either as a person, unpaid caregiver or advocate. Persons with lived experience are a diverse group with an array of backgrounds and experiences (171).

PICO research question: A framework to outline a focused question. It specifies four components:

1. Patient or population being studied
2. Intervention to be investigated
3. Comparison or alternative intervention
4. Outcome of interest (19).

Plan of care: A written or electronic plan that is created and maintained by the person, care partners and health providers that outlines the person's short- and long-term needs, goals and coordination requirements and identifies who is responsible for each part of the plan (124).

Primary health provider: A nurse practitioner or family physician who provides primary health-care services that typically involve routine care, care for urgent but minor or common health problems, chronic disease prevention and management, mental health care, maternity and child care, psychosocial services, liaison with home care, health promotion and disease prevention, nutrition counselling and end-of-life care (172).

Qualitative research: An approach to research that seeks to convey how human behaviour and experiences can be explained within the context of social structures, and through the use of an interactive and subjective approach to investigate and describe phenomena (173).

Quantitative research: An approach to research that investigates phenomena with tools that produce statistical measurements/numerical data (174).

Randomized controlled trial (RCT): An experiment in which the investigator assigns one or more interventions to participants who are randomly allocated to either the experimental group (receives intervention) and the comparison (conventional treatment) or control group (no intervention or placebo) (168).

Recommendation: A course of action(s) that directly answers a recommendation question (also known as a "PICO research question"). A recommendation is based on a systematic review of the literature and is made in consideration of its a) benefits and harms, b) values and preferences and c) health equity. All recommendations are given a strength — either *strong* or *conditional* — through panel consensus.

It is important to note that recommendations should not be viewed as dictates, because recommendations cannot take into account all of the unique features of individual, organizational and clinical circumstances (19).

Recommendation question: A priority research area of practice, policy or education identified by expert panel members that requires evidence to answer. The recommendation question may also aim to answer a topic area around which there is ambiguity or controversy. The recommendation question informs the research question, which guides the systematic review.

Retinopathy: Retinopathy involves changes to retinal blood vessels that cause them to bleed, leak fluid, or distort vision and is defined by the extent of retinal vascular disease detected by ophthalmoscopy. Diabetic retinopathy is the most common cause of blindness (175).

Scoping review: A form of knowledge synthesis that addresses an exploratory research question aimed at mapping key concepts, types of evidence and gaps in research related to a defined area or field by systematically searching, selecting and synthesizing existing knowledge (176).

Self-efficacy: A cognitive process where persons learn new behaviours that affect their ability to improve future events through environmental and social influences (177).

Self-management: This term is often associated with self-care and includes an array of activities that persons undertake to live well with one or more chronic conditions (44).

Self-management education: Educational activities that equip persons with the necessary knowledge and skills to inform healthy choices and build capacity in skill application (79).

Self- screening: A screening refers to screening performed by a person at risk of a DFU or their care partners to identify potential risk factors that may lead to the development of a DFU.

For example:

- Checking feet daily for cuts, cracks, bruises, blisters, sores, infections, unusual markings
- Using a mirror to see the bottom of the foot
- Checking the colour of the legs and feet
- Checking legs and feet for swelling, warmth, redness and pain (178)

Slough: "Non-viable tissue of varying colour (e.g., cream, yellow, greyish or tan) that may be loose or firmly attached, slimy, stringy or fibrinous" (179).

Social determinants of health and wellness: "Non-medical factors that influence health outcomes. They are the conditions in which people are born, grow, work, live and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems" (180).

The social determinants of wellness offers an opportunity to identify strengths associated with health promotion (54). This concept aligns with Indigenous beliefs and values about health, where health is an overarching concept that comprises physical and mental wellbeing, as well as spiritual and cultural cohesion (55). The determinants of wellness recognize elements of self-determination, identity, language and land as fundamental to health (54).

Social media: "Various user-driven platforms that facilitate diffusion of compelling content, dialogue creation, and communication to a broader audience. It is essentially a digital space created by the people and for the people, and provides an environment that is conducive for interactions and networking to occur at different levels (for instance, personal, professional, business, marketing, political, and societal)" (181).

Social movement for knowledge uptake and sustainability: "Various user-driven platforms that facilitate diffusion of compelling content, dialogue creation, and communication to a broader audience" (2).

Specialized wound care team: A team consisting of two or more health providers who possess the competencies and scope of practice required to be involved in the care of persons at risk of or living with DFUs (based on the person's risk levels).

Specialized health provider: In this BPG, a specialized health provider refers to one educated, trained and competent in advanced lower limb assessment, prevention, and treatment (e.g., an advance foot care nurse holding International Interprofessional Wound Care Course [IIWCC], or Nurse Specialized in Wound, Ostomy and Continence [NSWOC] certifications, or other country-specific formally recognized certificates or a chiropodist or podiatrist).

Stigma: Labelling of persons to devalue them so that discrimination occurs (36). Self-stigma refers to "negative attitudes, including internalized shame, that people with mental illness may have about their own condition" (182).

Systematic review: A comprehensive review of the literature that uses clearly formulated questions and systematic and explicit methods to identify, select and critically appraise relevant research. A systematic review collects and analyzes data from the included studies and presents them, sometimes using statistical methods (168).

See meta-analysis

Telepractice: The use of communications technologies to provide health care at a distance (152). "The delivery, management and coordination of care and services provided via information and telecommunication technologies. This may include the use of telephone and cell phone communication; email; video and audio conferencing; instant messaging (e.g., texting, multimedia, online chat); teleradiology; and telerobotics" (153).

This term is also referred to as telehealth, teleconsultation or telemedicine in this BPG.

Type 1 diabetes: A condition characterized by high blood glucose levels caused by a lack of insulin. This occurs when the immune system attacks the insulin-producing beta cells in the pancreas and destroys them. The pancreas then produces little or no insulin. Type 1 diabetes develops most often in young people but can appear in adults (183).

Type 2 diabetes: A condition characterized by high blood glucose levels caused by either a lack of insulin or the body's inability to use insulin efficiently. Type 2 diabetes develops most often in middle-aged and older adults but can appear in young people (183).

Virtual care: "Interaction between patients and/or members of their circle of care, occurring remotely, using any forms of communication or information technologies, with the aim of facilitating or maximizing the quality and effectiveness of patient care" (184).

Wholistic: Includes balancing the mental, emotional, spiritual and physical aspects of health. The term "wholistic" is used by many Indigenous communities to reflect the wholeness of the person, and a focus on wellness of the person rather than focusing on an illness or disease. This can include relationships with a person's family, community, spirituality, culture and the land (185).

Wound debridement: "Debridement from a wound in order to create a clean wound bed. There are several different types of debridement including physical (e.g., surgical, sharp, hydro or gaseous), biological (larvae), autolytic (hydrogels) or biochemical (enzymes)" (10).

Appendix B: RNAO guidelines and resources that align with this guideline

The following are some topics and suggested RNAO guidelines and resources that align with this BPG.

TOPIC	RESOURCE(S)
Clinical practice in a digital health environment	Registered Nurses' Association of Ontario (RNAO). Clinical practice in a digital health environment [Internet]. Toronto (ON): RNAO; 2024 Mar. Available from: RNAO.ca/bpg/guidelines/clinical-practice-digital-health-environment
Implementation science, implementation frameworks and resources	Registered Nurses' Association of Ontario (RNAO), Healthcare Excellence Canada (HEC). The leading change toolkit [Internet]. 4th ed. Toronto (ON): RNAO; 2024. Available from: RNAO.ca/leading-change-toolkit
Person- and family-centred care*	Registered Nurses' Association of Ontario (RNAO). Person-and family-centred care [Internet]. Toronto (ON): RNAO; 2015 May. Available from: RNAO.ca/bpg/guidelines/person-and-family-centred-care *New edition in progress. Expected date of publication in 2025.
Strategies to support self-management in chronic conditions: collaboration with clients*	Registered Nurses' Association of Ontario (RNAO). Strategies to support self-management in chronic conditions: collaboration with clients [Internet]. Toronto (ON): RNAO; 2010 Sep. Available from RNAO.ca/bpg/guidelines/strategies-support-selfmanagement-chronic-conditions-collaboration-clients *New edition in progress. Expected date of publication in 2026.
Transitions in care and services	Registered Nurses' Association of Ontario (RNAO). Transitions in care and services [Internet]. Toronto (ON): RNAO; 2023 Jun. Available from: RNAO.ca/bpg/guidelines/transitions-in-care

Appendix C: Strategies to provide culturally safe care

Using the Arksey and O'Malley framework (186), a scoping review was conducted to explore the current evidence on culturally safe strategies that can be used in the care of persons with diabetes or at risk of or living with DFUs and their care partners. For a detailed description of the steps taken to conduct the scoping review, refer to supplementary materials under the "methodology documents" tab on the BPG webpage.

In total, 117 articles were included in the review. The five most frequent types of studies were quantitative studies (n=49), literature reviews or discussion papers (n=20), qualitative studies (n=12), systematic reviews and/or meta-analyses (n=8) and mixed-methods studies (n=9). The articles were from 38 countries. The top five countries that reported on this topic area were the United States (n=55), India (n=35), Australia (n=11), China (n=8) and Sweden (n=6). There were three articles from Canada. The articles focused on persons living with diabetes and their care partners.

In the included articles, a wide range of culturally safe strategies were provided to, or used by, persons living with diabetes in different health-care settings. The articles highlighted the importance of health providers becoming familiar with the alternative methods used by persons, or preferred by persons, inquiring about their use and understanding their potential impact on diabetes care. Topics included: traditional medicines, complementary and alternative medicines, healthy food choices tailored to cultural preferences, language modifications of educational content, inclusion of care partners, religion and spirituality, and health provider education and behaviour. Cultural safety involves acknowledging complementary and alternative medicine as well as traditional medicines that may be used for medicinal, spiritual, sacred and ceremonial purposes to promote healing. It is important to understand that people can be dissatisfied with the Western-medicine management of their diabetes and may turn to **complementary and alternative medicine**[G] (CAM) (187). Therefore, health providers are to assess what kinds of traditional medicines or CAMs are utilized and discuss with the person any potential interactions between Western and traditional medicines or CAMs.

The chart below provides a detailed description of the culturally safe strategies found in the literature. This table does not provide information about the effects of each strategy as systematic reviews were not conducted to determine this. RNAO is not recommending a certain strategy over another strategy.

TYPES OF CULTURALLY SAFE STRATEGIES	DESCRIPTION	REFERENCE
TRADITIONAL MEDICINE		
Medicinal plants and traditional medicines	Health providers are to be aware that in multiple cultures, medicinal plants and traditional medicines are used as an adjunct method of treating diabetes. There are multiple types of plants utilized such as cinnamon, fenugreek, garlic, aloe vera, black seed, and more. **Note:** Many Indigenous Peoples refer to traditional medicine as knowledge and practices that promote health and well-being. The knowledge that informs traditional medicines is often imparted through multiple methods such as herbal medicines, dances, ceremonies and counselling (188). For more information, refer to the Religion and spirituality section below.	(189–204)
COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM)		
Mind–body interventions	Mind–body interventions that focus on the interaction among thoughts, feelings, body and behaviour have been gaining popularity in recent years due to their potential to be adapted as healthy lifestyle behaviours for diabetes management. The most described mind–body interventions are yoga, progressive muscle relaxation and mindfulness meditation. ■ Yoga is a wholistic intervention that includes positive affirmations, asanas (physical postures), pranayama (breathing) and meditation (dyhana) (753). ■ Progressive muscle relaxation includes systematic voluntary contraction and then the relaxation of particular muscle groups and deep breathing, which causes a feeling of calmness and enables participants to achieve a deep state of relaxation (574). ■ Mindfulness meditation focuses on developing an intentional, moment-to-moment, nonjudgmental awareness of experience. It helps in enhanced attention to the experiences of the present moment, including thoughts, feelings, breathing and physical sensations (574).	(192,198–200,205–237)

TYPES OF CULTURALLY SAFE STRATEGIES	DESCRIPTION	REFERENCE
Other types of CAM	Other frequent CAM modalities include the following: multivitamins/ supplements, culturally-appropriate nature analogies (e.g., tide changes and effects on glucose readings), homeopathy, naturopathy, massage, acupuncture, chiropractic care, ayurveda, hypnosis, energy healing, Reiki therapy, chelation and biofeedback.	(192,193,198, 199,225, 238–243)
HEALTHY FOOD CHOICES TAILORED TO CULTURE		
Culturally specific food	Food is an important part of every culture and many cultures have preferred foods. Tailoring a diabetic diet to fit a person's culture can assist with self-management. Culturally safe strategies include the following: ■ custom meal planning based on the person's preferences; ■ cooking classes specific to the person's culture and that are suitable for diabetic diets; ■ use of international nutrition guidelines or food guides; ■ guidance on what to do when fasting for a religious event or how to handle social gatherings and eating out; ■ providing suggestions on local and community resources to improve food choices; ■ being aware of food insecurity and potential unavailability of nutritious food; ■ using technology applications that can track cultural foods and blood glucose; and ■ having a registered dietitian who is familiar with the person's cultural and linguistic background conduct a culturally oriented nutrition evaluation.	(192,195,197–199,202,214, 223,238,240–242,244–270)
PHYSICAL ACTIVITY		
Physical activity	Exercise plans can be culturally adapted. Gender differences and cultural barriers to physical activity can be discussed between health providers and persons living with diabetes. E.g., if people enjoy cultural dancing, dancing can be used as a method of physical activity.	(202,204,214, 223,240,241, 245,247,248, 251,260)

TYPES OF CULTURALLY SAFE STRATEGIES	DESCRIPTION	REFERENCE
LANGUAGE AND LEARNING STYLE		
Interpreters	The use of professional interpreters to translate written or oral content on diabetes is often preferred, compared to lay interpreters (such as family members or health providers who do not speak the person's language fluently).	(192,223,247, 250,257, 262,271)
Bilingual health providers	Bilingual health providers who speak the person's native language can make education material more accessible and understandable.	(192,199,224, 245,246,249, 251,255,256, 259,260,262, 263,269, 271–277)
Written/oral materials	Translating written and oral materials into the person's native language ensures the person can understand the information provided to them about their health and make informed decisions about their care. Suggestions include the following: ■ Using specific colours, graphics, fonts and images from the person's culture where applicable as sociocultural strategies apply a group's cultural values, beliefs, and behaviours to provide context and meaning to information and messages. ■ Using declarative titles, stories, analogies from the person's culture. ■ Tailoring materials to cultural values, preferred terminologies and inclusive language practices. For example, in one article written in Spain, the term diet (*dieta*) was removed and replaced with the term for food (*alimentación*) as dieting was understood to have a negative connotation implying overly restrictive eating patterns. ■ Considering the person's health literacy levels.	(192,199,200, 202,224,229, 238,240,242, 245,246,250, 252,253,257, 258,260,262, 263,265,267, 268,271,272, 274,278–291, 291–294)

TYPES OF CULTURALLY SAFE STRATEGIES	DESCRIPTION	REFERENCE
Learning styles	Persons and care partners have individual learning styles that may be influenced by their culture. Health providers can tailor diabetic education to suit the person's learning style. For example: ■ In one study, Chinese learners appreciated the inclusion of homework and found that an examination of knowledge during the final session helped to consolidate their understanding. ■ Feltman, a colourful life-sized felt body, has been used to depict the organs impacted by diabetes. In one study, Indigenous people in Australia appreciated the visual and interactive nature of Feltman.	(278,295)
INCLUSION OF CARE PARTNERS OR COMMUNITY		
Inclusion of care partners	Some cultures place a strong emphasis on including care partners when delivering health care to help provide psychological and emotional support with self-management. If the person consents, include care partners when providing diabetes education or care.	(202,204,223, 224,241,242, 245,255,257, 260,263,269, 273,274,278, 279,281,291, 294,296,297)
Inclusion of community	Some cultures prefer to include community members and meet to share information, provide social support and solve community issues. For example, in one article, Indigenous people met together in talking circles to discuss diabetes care.	(280,298,299)

TYPES OF CULTURALLY SAFE STRATEGIES	DESCRIPTION	REFERENCE
RELIGION AND SPIRITUALITY		
Religion and spirituality	Religion and faith may influence diabetes care. Sometimes, persons may feel guilty for having diabetes and potentially believe the disease is a punishment for what they have done in their lives. Supporting persons to accept the disease and understand the nature of the condition is important. Discussing religion and faith may not be natural for some health providers. However, it is important to understand that health-related behaviours may derive from religious practices. Health providers can ask persons if they practise any religion or spirituality and whether it influences their diabetes related self-care behaviours (651). Some cultural safety strategies include the following: ■ prayer; ■ reciting verses from holy books; ■ use of holy water; ■ spiritual audio therapy; ■ ceremonies, drumming, incense, sweat lodges, dancing; ■ spiritual healing; ■ providing spiritual care training to health providers; and ■ providing diabetic care in places of worship if persons feel more comfortable there.	(192,193, 197–199,204, 223–225,242, 252,280,294, 296,300)

TYPES OF CULTURALLY SAFE STRATEGIES	DESCRIPTION	REFERENCE
HEALTH PROVIDER STRATEGIES		
Education and behaviours	There are multiple ways health providers can learn about and utilize culturally safe strategies. Examples include the following: ■ Health providers and people collaborating and co-designing a plan of care together. However, in certain cultures, people may prefer that health providers make decisions for them. ■ Health providers making efforts to identify implicit or unconscious bias that may influence or affect their perception of a person's use of CAM or other self-management strategies. ■ Health providers discussing common cultural misconceptions regarding diabetes with persons and their care partners. ■ Health providers discussing stress management, mental health and psychosocial well-being with persons based on the person's comfort discussing mental health concerns. Some cultures may avoid discussing mental health issues. ■ Health providers building on cultural strengths/resources to motivate health behaviour change. For example, in Hispanic populations, a high value is placed on family and other interpersonal relationships. ■ Health providers utilizing communication tools to help them initiate conversations and aid persons in understanding how to better manage sociocultural issues related to diabetes. ■ Health providers considering each culture's orientation to time. Some cultures may have a relaxed attitude towards time. Being flexible on appointment times is a way of being culturally sensitive. ■ Health service organizations inviting persons with diabetes and care partners to participate in program planning for diabetes education. ■ Health service organizations providing cultural safety training to health providers. ■ Health service organizations training health providers in relevant cultural and regional clinical nutrition guidelines.	(192,199,214, 224,241,253, 256,257,259, 260,269,280, 284,287, 294,301)

Appendix D: Inlow's 60-second diabetic foot screen

This screening guide provides a systematic method that can be used by health providers for foot ulcer prevention and ongoing screening after an ulcer or complication occurs.

Figure 2: Inlow's 60-second Diabetic Foot Screen (2022)

Inlow's 60-second Diabetic Foot Screen

2022 RISK SCREENING AND PLAN OF CARE

WoundsCANADA.ca

Patient Name: **Clinician Signature:**

ID number: **Date:**

▶ Step 1: Complete Screen of the Right and Left Feet

Instructions: Screen both feet using the parameters identified within Inlow's 60-second Diabetic Foot Screen[1] to identify clinical indicators and/or care concerns. Once each parameter has been assessed move on to Steps 2 and 3.

Self-Reported Risk Factors/Comorbidities

☐ Retinopathy ☐ Nephropathy ☐ Poor glycemic control ☐ Cardiovascular disease ☐ Peripheral Arterial Disease ☐ Smoking

RIGHT FOOT	1. Screen for Foot Skin and Nail Changes	LEFT FOOT	Risk Status and Care Planning
	**Skin:** ☐ Intact and healthy ☐ Dry with fungus or light callus ☐ Heavy callus build up ☐ Prior ulceration ☐ Existing ulceration (± warmth and erythema) ☐ Macerated web space **Nails:** ☐ Well-groomed and appropriate length ☐ Unkempt and ragged ☐ Thick, damaged, or infected		

RIGHT FOOT	2. Screen for Loss of Protected Sensation	LEFT FOOT	Risk Status and Care Planning
	**Foot Sensation – do they ever:** ☐ • feel numb? ☐ • tingle? ☐ • burn? ☐ • feel like insects are crawling on them? **Foot Sensation – monofilament testing:** ☐ No: Loss of protective sensation was not detected (sensation was present at all sites) ☐ Yes: Loss of protective sensation detected (sensation was missing at one or more sites)		

RIGHT FOOT	3. Screen for Peripheral Arterial Disease	LEFT FOOT	Risk Status and Care Planning
	☐ **Pain:** Pain in the feet or legs when walking, limiting mobility **Dependent rubor:** ☐ No ☐ Yes **Cool foot:** ☐ No ☐ Yes **Pedal Pulses:** ☐ Present ☐ Absent		

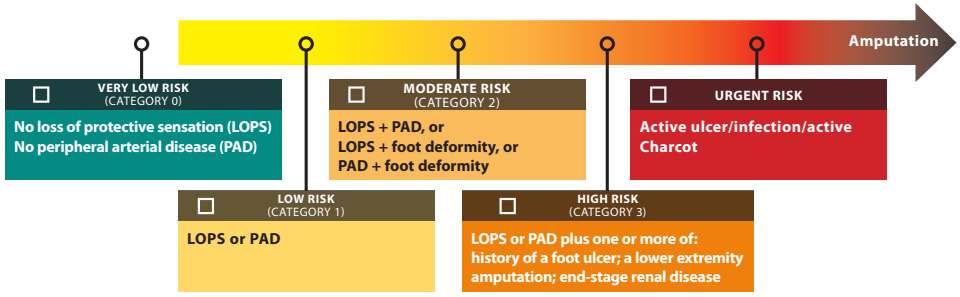
RIGHT FOOT	4. Screen for Bony Deformity (and Footwear)	LEFT FOOT	Risk Status and Care Planning
	**Deformity:** ☐ No deformity ☐ Deformity (i.e. dropped metatarsal heads or bunion, chronic Charcot changes, hammertoes) ☐ Prior lower extremity amputation ☐ Acute Charcot (+ warmth and erythema) **Range of Motion:** ☐ Full range in hallux ☐ Limited range of motion in hallux ☐ Rigid hallux **Footwear:** ☐ Appropriate ☐ Inappropriate ☐ Causing trauma		

* Refer to Steps 2 and 3 before completing this area.

Page 1

▶ Step 2: Determine the Risk for Ulceration and Amputation

Instructions: Review the results from Inlow's 60-second Diabetic Foot Screen to identify parameters that put the patient at risk. *Very low risk involves no loss of protective sensation, peripheral arterial disease or related comobidities/risk factors. If comorbidities exist, consider increasing to Category 1.



▶ Step 3: Create a Plan of Care with Your Patient Based on Identified Risks

Instructions: Based on the risk classification and clinical indicators develop a plan of care with your patient that best meets their needs.

Risk Category	Clinical Indicators	Screening Frequency	Recommendations and Actions**
Very Low Risk (Category 0)	No loss of protective sensation (LOPS) and no peripheral arterial disease (PAD)	Screen every 12 months	☐ Education on: risk factors; daily foot inspection; appropriate footwear and foot- and nail-care;† when/how to seek medical attention if needed ☐ Daily inspection of feet ☐ Appropriate foot and nail care ☐ Well-fitting footwear ☐ Exercise as able
Low Risk (Category 1)	LOPS or PAD	Screen every 6–12 months	☐ Education on: risk factors (including LOPS or PAD); daily foot inspection; appropriate footwear and foot- and nail-care; when/how to seek medical attention if needed ☐ Daily inspection of feet ☐ Professional foot and nail care, including treatment of onychomycosis and Tinea pedis if present ☐ Well-fitting, sensible footwear with custom, full-contact foot orthoses and diabetic socks ☐ Vascular studies ± referral to a vascular investigation +/- vascular surgeon ☐ Pain management for ischemic pain, if present ☐ Referral to a rehab specialist to provide a plan for fitness (exercise prescription) based on risk factors
Moderate Risk (Category 2)	LOPS + PAD, or LOPS + foot deformity, or PAD + foot deformity	Screen every 3–6 months	☐ Education on: risk factors (including LOPS ± PAD ± foot deformity); daily foot inspection; appropriate footwear and foot- and nail-care; when/how to seek medical attention if needed ☐ Daily inspection of feet ☐ Professional foot and nail care, treatment of onychomycosis and Tinea pedis if present ☐ Well-fitting, orthopaedic footwear with custom full-contact total contact casted foot orthoses and diabetic socks. Footwear must accommodate any deformities present ☐ Vascular studies ± referral to a vascular surgeon ☐ Pain management for ischemic or neuropathic pain ☐ Referral to a general, orthopedic or foot surgeon, if indicated, surgically manage foot deformities ☐ Recommend fittness and excercise program
High Risk (Category 3)	LOPS or PAD plus one or more of: • history of a foot ulcer • a lower extremity amputation • end-stage renal disease	Screen every 1–3 months	☐ Education on: risk factors (including LOPS ± PAD ± foot deformity); risk of ulcer recurrence; daily foot inspection; appropriate footwear and foot- and nail-care; when/how to seek medical attention if needed ☐ Daily inspection of feet ☐ Professional foot and nail care, including treatment of onymycosis and Tinea pedis, if present ☐ Well-fitting, orthopedic footwear with custom full-contact total contact casted foot orthoses and diabetic socks. Footwear must accommodate any deformities present ☐ Modified footwear and/or prosthesis based on level of amputation ☐ Vascular studies ± referral to a vascular surgeon ☐ Pain management for ischemic or neuropathic pain ☐ Referral to a rehab specialist to provide a plan for fitness (exercise prescription) based on risk factors
Urgent Risk	Active ulcer/infection/ active Charcot	Urgent care required	☐ Education on: signs of wound infection and wound care; risk factors (LOPS ± PAD ± foot deformity); risk of ulcer recurrence; daily foot inspection; appropriate footwear and foot- and nail-care; when/how to seek medical attention ☐ Daily inspection of feet ☐ Professional foot and nail care, including treatment of onymycosis and Tinea pedis, if present ☐ Offloading with total contact cast, removable cast walker or wound shoe to close ulcers and/or to immobilize Charcot foot ☐ Vascular studies ± referral to vascular surgeon or limb preservation clinic, as indicated ☐ Pain management for ischemic pain or neuropathic pain ☐ Referral to a general, orthopedic or foot surgeon, if indicated, to surgically manage foot deformities ☐ Referral to infectious diseases to manage infection, if indicated, and/or to a general, orthopedic or foot surgeon to debride infectious tissue ± bone, if indicated

** These recommendations and actions are not all-inclusive. Actions need to be customized to meet each patient's needs. Encourage patients (and caregivers) to manage their glycemic levels, triglycerides, weight, hypertension, and lifestyle choices such as smoking. Ensure the patient knows where to access professional assistance in the event of an urgent foot complication.

† Tools and educational materials are available online from Wounds Canada:
For patients (and caregivers): https://dhfy.ca/for-patients-public
For clinicians: https://dhfy.ca/for-clinicians

References:
1. Adapted from Inlow S. The 60-second foot exam for people with diabetes. Wound Care Canada. 2004;2(2):10–11.
2. Bus S, Lavery L, Monteiro-Soares M, Rasmussen A, Raspovic A, Sacco I et al. Guidelines on the prevention of foot ulcers in persons with diabetes (IWGDF 2019 update). Diabetes Metabo Res Rev. 2020;36(S1).
3. Botros M, Kuhnke J, Embil J, Goettl K, Morin C, Parsons L, et al. Best practice recommendations for the prevention and management of diabetic foot ulcers. In: Foundations of Best Practice for Skin and Wound Management. A supplement of Wound Care Canada; 2017. 68 pp. Retrieved from: www.woundscanada.ca/docman/ public/health-care-professional/bpr-workshop/895-wc-bpr-prevention-and- management-of-diabetic-foot-ulcers-1573r1e-final/file.

Source: Reprinted with permission from: Blanchette V, Kuhnke JL, Botros M, et al. Inlow's 60-second diabetic foot screen: update 2022. Limb Preservation Journal [Internet]. 2023 Apr 28;4(1):22-8. Available from: https://www.woundscanada.ca/news/618-inlow-s-60-second-diabetic-foot-screen-update-2022.

Appendix E: IWGDF risk stratification system

The IWGDF risk stratification system allows health providers to establish foot screening and examination frequency based on resulting risk categories. A person with no LOPS or PAD is considered risk 0 (very low risk for ulceration and requires only annual screening). A person with either LOPS or PAD but no other additional risk factors is risk 1 (low risk and requires screening every 6-12 months. A person with a combination of risk factors is risk 2 (moderate risk and requires screening every 3-6 months). A person with either LOPS or PAD and a history of DFU or lower-extremity amputation is risk 3 (high risk and requires screening every 1-3 months). A person with LOPS or PAD with end-stage renal disease is also risk 3 (69).

CATEGORY	ULCER RISK	CHARACTERISTICS	SCREENING FREQUENCY*
0	Very low	No LOPS and no PAD	Once a year
1	Low	LOPS or PAD	Once every 6-12 months
2	Moderate	LOPS + PAD or LOPS + foot **deformity**[G] or PAD + foot deformity	Once every 3-6 months
3	High	LOPS or PAD and one or more of the following: ■ history of a foot ulcer ■ a lower-extremity amputation (minor or major) ■ end-stage renal disease	Once every 1-3 months

Note: LOPS = Loss of protective sensation; PAD = peripheral artery disease. *: Screening frequency is based on expert opinion since the IWGDF reported no evidence was available to support these intervals. When the screening interval is close to a regular diabetes check-up, consider screening the foot at that check-up.

Source: Adapted with permission from: the IWGDF. Bus SA, Sacco IC, Monteiro-Soares M, et al.; International Working Group on the Diabetic Foot (IWGDF). Guidelines on the prevention of foot ulcers in persons with diabetes: IWGDF 2023 update [Internet]. [place unknown]: IWGDF; 2023. Available from: https://iwgdfguidelines.org/wp-content/uploads/2023/07/IWGDF-2023-02-Prevention-Guideline.pdf

Appendix F: Self-screening tool example

This self-screening tool provides a systematic method for foot ulcer prevention and ongoing screening, which can be used by individuals and care partners.

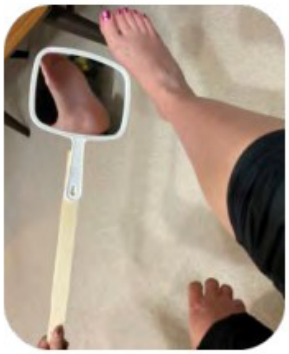
Alberta Health Services Inspiring solutions. Together.
Diabetes, Obesity & Nutrition Strategic Clinical Network™

Diabetes Foot Health Self-Screening Tool

This tool will help you find problems with your feet caused by diabetes. It should be shared with your healthcare provider. They will talk with you about your results and decide if you need an in-person foot exam.

Diabetes may cause foot problems, such as very dry skin, changes in your foot shape, loss of feeling in your feet, and poor circulation. These foot problems can lead to a diabetic foot ulcer, which increases your risk for losing your foot (amputation).

Regularly examining your feet at home is important to make sure they stay healthy.



Instructions:

1. Find a well-lit area to do your foot exam. If you have trouble seeing the bottom of your feet, you can ask a family member or caregiver to help. You can also use a selfie stick with your smart phone camera, a telescopic mirror, or a mirror with a handle. Make your mirror handle longer by taping it to a paint stick or ruler (see picture).
2. Use the Foot Exam table on pages 2 to 5 to check your feet. Check all of the boxes that apply in the Results section. Put an X in either the "Left foot" or "Right foot" box. If the problem is on both feet, put an X in both boxes.
3. Note your risk level (low, moderate, high, or urgent) for where you have boxes checked in the Results section. For example, if you checked the box "Callus buildup" – "Left foot", then your risk level for the skin area is "Moderate".
4. Find out your overall risk based on your foot exam. This is the **highest risk identified for any area**. For example, if you have 2 low risk areas, 3 moderate risk areas, and 1 high risk area, your overall risk is high.
5. Share the filled-out tool with your healthcare provider.
6. Refer to the care plan (page 6) to find out what to do based on your risk level.
7. Optional: You can send pictures to your healthcare provider of any signs of infection, foot problems, or any concerns you have about your feet. Ask your healthcare provider for instructions on how to send pictures.

Name:

Date:

Foot exam

Skin

Instructions:

- Look at the top and bottom of your feet, and between your toes.

Results	Risk level
☐ Healthy skin: no broken skin, cuts, cracks, or sores ☐ Left foot ☐ Right foot 	Low ○
☐ Callus buildup ☐ Left foot ☐ Right foot 	Moderate ○
☐ Corn: found on bottom, top, or between toes ☐ Left foot ☐ Right foot 	
☐ Fissure or crack from very dry skin that is not bleeding or draining ☐ Left foot ☐ Right foot 	
☐ History of a diabetic foot ulcer (sore or wound) that required medical help to heal, like dressing changes by a healthcare provider ☐ Left foot ☐ Right foot 	
Broken skin, such as: ☐ Blister ☐ Left foot ☐ Right foot 	High ○
☐ Crack that is bleeding or draining ☐ Left foot ☐ Right foot 	
☐ Ulcer (open sore or wound) that is bleeding or draining ☐ Left foot ☐ Right foot 	
☐ Infected foot ulcer: sore or wound that also has fever, pain, redness, swelling, discharge, odour, or elevated blood sugars ☐ Left foot ☐ Right foot 	Urgent ○

2

Nails	
Results	**Risk level**
☐ Healthy nails with no discoloration ☐ Left foot ☐ Right foot 	**Low** ○
☐ Thickened, discoloured, irregular edges ☐ Left foot ☐ Right foot  ☐ Infected ingrown toenails ☐ Left foot ☐ Right foot 	**Moderate** ○

Foot shape	
Results	**Risk level**
☐ No changes in the shape of your foot ☐ Left foot ☐ Right foot 	**Low** ○
Changes in the shape of your foot, such as: ☐ Bunions ☐ Left foot ☐ Right foot  ☐ Hammer or claw toes ☐ Left foot ☐ Right foot  ☐ Overlapping toes ☐ Left foot ☐ Right foot 	**Moderate** ○
☐ Redness over your bunion, hammer toes, or overlapping toes related to pressure from footwear ☐ Left foot ☐ Right foot 	**High** ○
☐ Foot is red, warm, painful, or swollen (Charcot foot) ☐ Left foot ☐ Right foot  Image Source: Rafi Mahandaru https://www.slideshare.net/rafimahandaru/charcot-foot	**Urgent** ○

3

Sensation testing

Instructions:

- You will need somebody to help you do this test.
- Use the links to see how to assess the sensitivity in your feet with the Touch the Toes test.
  - Touch the Toes test
  - Testing for sensitivity in your feet (video)

Results	Risk level
☐ All 6 tested toes have sensation	Low ○
☐ Lost sensation in one or more toes in the Touch the Toes Test ☐ Left foot ☐ Right foot **Click on the circles on the toes where you don't have sensation** ☐ Numbness or tingling in your feet ☐ Left foot ☐ Right foot ☐ Burning sensation in your feet ☐ Left foot ☐ Right foot ☐ Feeling like insects are crawling on your feet ☐ Left foot ☐ Right foot	Moderate ○
☐ Sudden sharp pain in your foot when you did not have sensation before ☐ Left foot ☐ Right foot	Urgent ○

Footwear

Instructions:

- Check all of your footwear, including boots, work shoes, and running shoes.
- Take out and inspect the insoles in your footwear.
- Learn more about finding the proper shoe fit.

Results	Risk level
☐ Footwear fits well, accommodates foot shape, and is supportive. Footwear does not rub on your skin and is not too tight. No signs of red areas when you take your shoes off. ☐ Left foot ☐ Right foot	Low ○
☐ Footwear is too small, tight, loose, or worn-out ☐ Left foot ☐ Right foot	Moderate ○
☐ Inadequate footwear that causes redness and pressure, or a breakdown of the skin such as a blister ☐ Left foot ☐ Right foot	High ○

4

Blood circulation • Learn more about peripheral arterial disease (circulation problems)	
Results	**Risk level**
☐ No circulation problems (see below for examples of circulation problems) ☐ Left foot ☐ Right foot	Low ◯
Circulation problems, such as: ☐ Legs hurt when you walk, and pain goes away when you rest ☐ Left foot ☐ Right foot ☐ One foot that feels colder than the other ☐ Left foot ☐ Right foot ☐ Leg or foot pain that disturbs your sleep ☐ Left foot ☐ Right foot ☐ Foot looks pale, discolored, purple, or blue ☐ Left foot ☐ Right foot ☐ Loss of hair on the legs or foot ☐ Left foot ☐ Right foot	High ◯
☐ Cold, white, or painful foot or toes ☐ Left foot ☐ Right foot 	Urgent ◯

Find out your overall risk level. This is the highest risk identified for any area. For example, if you have 2 low risk areas, 3 moderate risk areas, and 1 high risk area, your overall risk is high.

My overall risk level is:

◯ Low ◯ Moderate ◯ High ◯ Urgent

You are more likely to have foot problems if you use tobacco or if you have:

- high blood pressure
- high blood sugars
- high cholesterol

Talk with your healthcare provider about your levels and about cutting down and quitting tobacco.

5

Diabetes foot care plan: What should I do?

Low risk

Foot exam results:

- healthy skin and nails
- no open sores
- no loss of sensation in your feet
- no changes to the shape of your foot
- no circulation problems
- adequate footwear

Moderate risk

Foot exam results:

- skin and nail issues
- changes in the shape of your foot
- loss of sensation in your feet
- footwear not fitting well.

For an infected ingrown toenail, call your doctor as soon as possible.

High risk

Foot exam results:

- blister, fissure or crack, or sore (ulcer)
- problems with blood circulation
- redness over bunions, overlapping toes, or claw toes
- footwear that causes redness over the pressure points

Urgent risk

Foot exam results:

- infected ulcer (wound or sore)
- sudden sharp pain in your feet
- foot is red, warm, painful, swollen
- cold, white painful toes or feet

What should I do?

Follow a daily foot care routine for the low, moderate, and high risk foot:

- Check your feet daily.
- Care for your feet and toes.
  - Cut your toenails straight across.
  - Wash your feet every day with mild soap. Make sure you dry well between the toes.
  - Apply moisturizer every day, but not between your toes.
- Always wear shoes and socks, even inside your house. Wear shoes that fit well. Learn how to find the proper fit for your shoes.
- Always check for objects inside of your shoes before you put them on.
- Learn more about foot care from Diabetes Canada.

What should I do?

- Book an appointment with your healthcare provider in the next 24 hours.
- Stay off of the sore or ulcer.
- Read diabetes foot care for the high risk foot.
- Repeat your foot screen every 1 to 4 weeks.

What should I do?

Go to the nearest emergency department in the next 24 hours.

Low risk

- Repeat your foot screen every year.
- Read diabetes foot care for the low risk foot.

Moderate risk

- Repeat your foot screen every 4 to 6 months.
- Read diabetes foot care for the moderate risk foot.
- Have your toenails cut by someone trained in foot care.
  - Foot care nurse list
  - College of Podiatric Physicians of Alberta

6

Source: Reprinted with permission from: Alberta Health Services (AHS). Diabetes foot health self-screening tool [Internet]. Edmonton (AB): AHS; 2021. Available from: https://myhealth.alberta.ca/Alberta/AlbertaDocuments/diabetes_foothealth_selfscreening_tool_sep2021.pdf

Appendix G: Diabetes foot risk assessment triage referral example

This risk assessment triage referral form is an example form for primary health providers to utilize when requesting referrals to a specialized wound care team.

Alberta Health Services

Diabetes Foot Risk Assessment Triage Referral

Date of Screening and Triage *(dd-Mon-yyyy)*	
HRFT Fax #	

Last Name *(Legal)*	First Name *(Legal)*	
Preferred Name ☐ Last ☐ First	DOB*(dd-Mon-yyyy)*	
PHN	ULI ☐ Same as PHN	MRN
Administrative Gender ☐ Male ☐Non-binary/Prefer not to disclose (X)	☐ Female ☐ Unknown	

- Send the completed Diabetes Foot Screening Tool and Foot Risk Assessment Triage Referral Form to the High Risk Foot Team (HRFT). Prior to referral, contact the HRFT to ensure they accept referrals for the criteria listed below.
- If there is no HRFT in your area, refer to the Diabetes Foot Care Referral Process Guidelines for recommendations for referrals.

Risk Features *(check all that apply)* **(✓)**

Low Risk ► Routine annual foot exam & diabetes education — **Managed by Primary Care**

Moderate Risk Criteria with or without Loss of Protective Sensation
☐ Callus/Corn/Fissure/Crack *(not bleeding or draining)*
☐ Inadequate foot care - missing, sharp, unkept, thickened, long or deformed toe nails
☐ Inadequate foot wear ☐ Infected ingrown toe nail
☐ Sensation of numbness/tingling/throbbing/burning
► **Refer to Foot Care Provider: podiatrist or trained foot care nurse**
► **Foot exam every 4-6 months or as per assessed need** — **Managed by Primary Care**

Moderate Risk Criteria - Loss of Protective Sensation at one or more of 5 identifed sites, **PLUS** any of the following:
☐ Prior history of Diabetic Foot Ulcer *(ulcer in remission)* and or amputation
☐ Decreased range of motion at ankle or toe joint ☐ Foot Deformities
☐ Inadequate footwear requiring therapeutic/custom footwear ☐ Altered structure
► **Refer to High Risk Foot Team or local health care professional** *(recommended patient be seen within one month of referral)* — **Managed by High Risk Foot Team**

High Risk Criteria - Patient presents with **one or more** of the following:
☐ Blister, fissure or crack *(bleeding or draining)* and or hemorrhagic callus
☐ Diabetic Foot Ulcer
☐ Redness over structural deformity of the foot /toes related to pressure
☐ Signs of arterial insufficiency *(PAD; ischemia)* cool skin with pallor, cyanosis or mottling, dependent rubor
☐ One or more pedal pulses not palpable or audible
☐ Inappropriate footwear causing pressure and/or skin breakdown
Refer to:
► **High Risk Foot Team or local health care professional(s)** *(recommend patient be seen within 2 weeks of referral)*
► **Infectious Disease** for consultation if warranted
► **Vascular Surgeon** if appropriate
► **Antibiotic therapy** *(Guided by Diabetic Foot Infection Guidelines in BUGS AND DRUGS 2012 or consult Infectious Disease)* — **Managed by High Risk Foot Team**

Urgent Risk Criteria - Patient presents with **one or more** of the following :
☐ Infection - draining Diabetic Foot Ulcer and /or wet gangrene
☐ Red, hot, painful joint, or acute Charcot foot
☐ Acute onset of pain in a previously insensate foot
☐ Absent pedal pulses with cold white painful foot or toes
► **Primary Provider Initiates antibiotic therapy** guided by Diabetic Foot Infection Guidelines in BUGS AND DRUGS 2012 and/or consult Infectious Disease
► **Offload the affected foot**
► **Refer to the appropriate health care provider** based on the patient assessment findings *(ie Foot and Ankle Surgeon, or Vascular Surgeon if absent pedal pulses on auscultation)*
► **May Require Acute Care Admission**
► **Refer to High Risk Foot Clinic once patient is stable and specialist referrals have been arranged**

Comments

Date Faxed *(dd-Mon-yyyy)*	High Risk Foot Team	Signature

20709(Rev2020-06)

Source: Reprinted with permission from: Alberta Health Services (AHS). Diabetes foot risk assessment triage referral. Edmonton (AB): AHS; [revised 2020 Jun]. Available from: https://www.albertahealthservices.ca/frm-20709.pdf

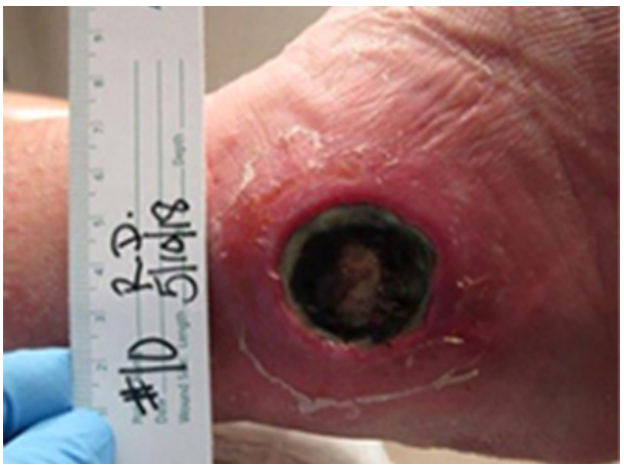
Appendix H: Examples of validated diabetic foot assessment tools

These validated assessment tools will assist health providers in conducting a comprehensive assessment of a DFU and provide a baseline for the DFU. Examples of diabetic foot classification tools and wound progression tools are provided. See Tables 11 and 12 for a brief description of each tool in **Good practice statement 3.0**. Refer to each tool's reference for indication and instructions on how to interpret the final numerical result. This list of tools is not exhaustive.

VALIDATED TOOL	LINK
Site, Ischemia, Neuropathy, Bacterial Infection, Area and Depth (SINBAD) system	https://iwgdfguidelines.org/wp-content/uploads/2023/07/IWGDF-2023-03-Classification-Guideline.pdf Page 15
Wound, Ischemia, and foot Infection (WIfI) system	https://iwgdfguidelines.org/wp-content/uploads/2023/07/IWGDF-2023-03-Classification-Guideline.pdf Pages 17-18
Infectious Dis-eases Society of America/ International Working Group on the Diabetic Foot (IDSA/IWGDF) classification	https://iwgdfguidelines.org/wp-content/uploads/2023/07/IWGDF-2023-03-Classification-Guideline.pdf Page 19
Wagner wound classification system	https://doi.org/10.1177/107110078100200202
University of Texas diabetic wound classification system	https://www.ncbi.nlm.nih.gov/books/NBK409609/figure/diab-foot.F2/
Photographic wound assess-ment tool	https://www.southwesthealthline.ca/healthlibrary_docs/B.9.3c.PWATResources.pdf

Appendix I: Images and comparisons of different chronic wounds

This table compares different types of chronic wounds to assist health providers in differentiating wounds they may see in clinical practice.

WOUND TYPE	APPEARANCE	SAMPLE IMAGE
Diabetic foot ulcer	Located on plantar aspect of foot, extensive callus formation, superficial to deep	
Arterial ulcer	Deep; eschar; punched-out, well-demarcated borders; deep structures may be exposed	

WOUND TYPE	APPEARANCE	SAMPLE IMAGE
Pressure injury	Located over bony prominences, superficial to deep	
Venous ulcer	Shallow, no eschar; located over medial aspect of lower extremity (gaiter region)	

Source: Adapted with permission from: Bowers S, Franco E. Chronic wounds: evaluation and management. Am Fam Physician [Internet]. 2020 February 1:101(3);159-166. Available from: https://www.aafp.org/pubs/afp/issues/2020/0201/p159.pdf

Appendix J: DFU-VIPS

The DFU-VIPS is an acronym that assists as a memory aid for items to assess when providing care to a person at risk of or living with a DFU (302).

As with all procedures, specialized health providers must be aware of the scope of practice and follow regulatory body guidelines. Specialized health providers should only care for persons at risk of or living with a DFU when they possess the necessary knowledge, skill and judgment. Specialized health providers should also follow organizational policies and procedures related to DFU treatment and care.

	EXPLANATION
D – Diabetes management	■ Optimize blood glucose control ■ Manage co-morbidities (e.g., blood pressure, lipids, kidney function, nutrition, smoking) ■ Assess psychosocial status
F – Foot/find the cause	■ Determine the cause of ulcer and remove the risk factor (e.g., inadequate footwear, poor self-care, trauma, vasculopathy) ■ Foot screening inspection ■ Assess for neuropathy ■ Educate client on appropriate self-care
U – Ulcer	■ Wound assessment ■ Wound treatment plan: moisture balance, bacterial burden and debridement
V – Vascular supply	■ Assess for blood flow
I – Infection	■ Clinical signs and symptoms* ■ Wound swabs, tissue/bone culture ■ Imaging
P – Pressure	■ Offloading devices ■ Decrease weight bearing activities ■ Appropriate footwear ■ Pressure can be from foot deformity, inappropriate footwear, callus
S – Sharp debridement and social determinants of health	■ Sharp debridement ■ Removal of callus and necrotic tissue in persons with adequate blood flow ■ Social determinants of health ■ Assess the person's social supports, medical supplies and assistive devices, financial support, and travel arrangements

* Health providers are to be aware that diabetes impacts inflammatory responses

Source: Adapted with permission from: Skin and Wound Care: Diabetic Foot or Neuropathic Ulcer. In: Nova Scotia Health [Internet]. Halifax (NS): Nova Scotia Health Authority; [updated 2024 Aug 1]. Available https://library.nshealth.ca/WoundCare/DiabeticFoot

Appendix K: Offloading devices

This fact sheet outlines factors to consider regarding offloading pressures, recommendations for offloading devices for forefoot ulcers and offloading device choices (with advantages and disadvantages).

PRODUCT PICKER

WoundsCANADA.ca

Offloading Plantar Pressures in Diabetes

Key Messages

- Pressure is a factor in 90% of diabetic plantar ulcers and the pressure must be modified or removed in order to heal the ulcers and prevent recurrence.
- Diabetic foot ulcer (DFU) recurrence is significantly reduced with professionally fitted footwear and insoles/orthoses.
- Three main factors contribute to elevated foot pressures that result in ulceration:
  1. **Intrinsic:** neuropathy, altered blood flow, genetic or structural deformity
  2. **Extrinsic:** shoes, ambulation and weight-bearing activity, traumatic accident or surgery
  3. **Behavioural:** poor choice of footwear, lifestyle choices, type of ambulatory activity
- Offloading is the key to managing patients with a DFU and preventing further ulceration for the rest of the patient's life. Clinicians should always remember that considerations when offloading the foot are not limited to the device itself, but also include patient characteristics, environmental factors, appropriate use of the device, modofication of activity, reduction of walking speed and alteration of gait.

Treatment Strategy

The best device is a mechanically supportive device the patient will wear at all times when up, whether they are inside or outside the house.

Prevention Strategy

Footwear for persons with diabetes always needs to:

- Fit the foot
- Protect the foot
- Support the foot
- Be appropriate for the occasion

Factors to Consider When Offloading Pressures to Support Healing of Diabetic Foot Ulcers

Factors	Description
Disease	•Neuropathy •Retinopathy •Peripheral arterial disease (PAD) •Inflammatory disorder •Condition of contralateral limb
Foot Ulcer	•Type of ulcer: ·Neuropathic ·Ischemic ·Neuroischemic •Location •Dressing selection •Type of ulcer: ·Healing ·Non-healing ·Non-healable
Pressure	•Combination of: ·Shear stress ·Vertical pressure •Intrinsic ·Structural modifications (deformity/limited range of motion/tissue quality loss) ·Infection ·Malignancy •Extrinsic ·Biomechanics, gait and balance ·Deformity ·Condition of contralateral limb ·Footwear: socks, shoes, insoles ·Wound dressing bulk
Activities of Daily Living	•Occupation •Home lifestyle •Motor vehicle use •Sports/recreational activity
Funding	•Ability to pay for device •Third-party insurance •Inability to fund •Unwillingness to fund
Behavioural	•Commitment to meeting clinic appointments •Ability to adhere to plan of care •Ability to explore barriers and make recommendations for change

Recommendations for Offloading Devices for Forefoot Ulcers

Treatment	Offloading Device
First Line	•Above the ankle joint – requires that patient have adequate balance: ·Total contact casts (irremovable)* ·Cast walker (removable or irremovable)
Second Line	•Below the ankle joint: ·Surgical shoes ·Customized or custom-made footwear and orthotics
Third Line	•Shoes and orthotics

* Not to be used in the presence of peripheral arterial disease (PAD) or infection

Offloading Plantar Pressures

Offloading Device Choices

Offloading Device		Wound Location: Toes	Wound Location: Forefoot	Wound Location: Midfoot	Wound Location: Heel (Rearfoot)	Advantages	Disadvantages
Total contact cast (TCC)		✓✓	✓✓✓	✓✓✓	✓✓	•Gold standard •Reduces pressure under ulcer site between 84 and 92% •Custom moulded to shape of foot •Most studies indicate the shortest healing time as 8 to 12 weeks •Forced patient adherence to device	•Requires a trained professional to apply weekly •Can result in secondary ulceration with improper application •Contraindicated for infected or ischemic wounds; use with caution for heel ulcers •Difficult to sleep with •May prevent patient's ability to work •Patient may not tolerate device
Cast walker		✓✓✓	✓✓✓	✓✓	✗	•Effective at reducing plantar pressure at ulcer site with peak pressures similar to TCC •Can be used for infected wounds •All clinicians can be trained to apply •Same device can be used for the full the duration of treatment •Can be made irremovable with the application of a cohesive bandage to become an Instant Total Contact Cast (iTCC) (see below)	•Generic fit to the foot •Complicated by patients not wearing the device as prescribed because it is removable •Use of removable device results in longer healing times •Patient needs time to learn how to use device •May prevent patient's ability to work •Contraindicated for those with heel ulcers and poor balance
Instant total contact cast (iTCC)	 	✓✓✓	✓✓✓	✓✓	✗	•Cast walker made irremovable with the application of a cohesive bandage to become an iTCC •Same advantages as the Cast Walker •Same device can be used throughout the duration of treatment – and will require a change of the irremovable component	•Generic fit to the foot •May prevent patient's ability to work •Patient may not tolerate device
Half shoe (forefoot)		✓✓	✓✓	✗	✗	•Transfers pressure to mid-foot and rearfoot by eliminating propulsion •Low cost	•Very unstable •Contraindicated for patients with gait instability •High risk of falls
Half shoe (rearfoot)		✗	✗	✗	✓	•Low cost	•Difficule to ambulate

cont'd...

Offloading Plantar Pressures

Offloading Device Choices

Offloading Device		Wound Location: Toes	Forefoot	Midfoot	Heel (Rearfoot)	Advantages	Disadvantages
Surgical shoe		❣	✓✓	❣	❣	•Low cost •Accommodates edema •Good for short-term management	•Offloading properties are limited •Use with orthotic or insert devices •Not ideal for activity
Over-the-counter walking footwear		✓	✓✓	✓	✓	•Affordable •Easy to access •For preventative care	•Offloading properties are limited •Use with orthotic or insert devices
Footwear modifications (rocker toe)		✓✓	✓✓	✓	✗	•Moves pressure from forefoot to rearfoot	•Requires trained professional to apply •Expensive
Custom-made footwear		✓✓	✓✓	✓✓	✓✓	•Distributes pressure under foot evenly •Ideal for foot deformity	•Requires trained professional to apply •Very expensive
Custom-made orthotics		✓	✓✓	✓✓	✓	•Distributes pressure under foot evenly •May be used with over-the-counter footwear	•Requires trained professional to apply •Expensive
Padding		✓	✓	✓	✓	•Low cost •Easily modified	•Offloading properties are limited •Can cause increased pressure at wound edge
Crutches/cane		✓	✓	✓	✓	•Low cost •Adjustable •Walking aid to support balance	•Offloading properties are limited •Can cause shoulder dislocation

✓ = indicated; ✗ = contraindicated; ❣ = can be used

For more information:

1. Botros M, Kuhnke J, Embil J, et al. Best practice recommendations for the prevention and management of diabetic foot ulcers. In: Foundations of Best Practice for Skin and Wound Management. A supplement of Wound Care Canada; 2017. 68 p. Available from: www.woundscanada.ca/docman/public/health-care-professional/bpr-workshop/895-wc-bpr-prevention-and-management-of- diabetic-foot-ulcers-1573r1e-final/file.
2. Diabetes, Healthy Feet and You (DHFY): https://www.woundscanada.ca/about-dhfy.

Source: Reprinted with permission from Wounds Canada. Product picker: offloading plantar pressures in diabetes [Internet]. North York (ON): Wounds Canada; [updated 2018 Jun]. Available from: https://www.woundscanada.ca/docman/public/health-care-professional/1214-wc-product-picker-offloading-ltr-1703e/file

Appendix L: Education statements

Education statements for this BPG

RNAO has been at the forefront of creating BPGs since 1999, with its first BPGs being issued in 2001. From the outset, RNAO recognized the importance of individual and organizational approaches to the delivery of education on clinical BPG content to support evidence-based practice changes. As such, RNAO clinical BPGs included education recommendations directed to those responsible for the academic and in-service education of nursing students, nurses and the interprofessional team. These recommendations outlined core content and training strategies required for entry-level health programs, continued education and professional development.

An in-depth analysis of RNAO's educational recommendations was conducted in 2018. It included clinical BPGs published within a five-year period, as all clinical BPGs published within this period are based on a systematic review of the literature. It examined 26 education recommendations from nine different BPGs with diverse clinical topics and populations.

A rigorous thematic analysis showed similarities across BPGs. Thus, it was deemed appropriate to create standard education statements that would be applicable to all clinical BPGs to support evidence-based practice changes. The resultant two education statements and the associated discussion of the literature are described below. These statements can be contextually adapted within health service organizations and academic institutions to support the implementation of clinical recommendations for various guideline topic areas.

EDUCATION STATEMENT 1: ACADEMIC INSTITUTIONS INTEGRATE EVIDENCE-BASED GUIDELINES INTO CURRICULA FOR PRE- AND POST-LICENSURE NURSES AND OTHER REGULATED HEALTH PROVIDERS.

Discussion of literature

The thematic analysis of the education recommendation statements described above, found a particular theme to be the foundation of evidence-based practice capacity building:

Academic institutions integrate evidence-based guidelines into curricula for pre- and post-licensure nurses and other regulated health providers.

The following RNAO BPGs were analyzed:

- *Assessment and Management of Pain, Third Edition* (2013)
- *Care Transitions* (2014)
- *Person- and Family-centred Care* (2015)
- *Engaging Clients Who Use Substances* (2015)
- *Preventing and Addressing Abuse and Neglect of Older Adults: Person-centred, Collaborative, System-wide Approaches* (2014)
- *Primary Prevention of Childhood Obesity, Second Edition* (2014)

- *Delirium, Dementia and Depression in Older Adults: Assessment and Care, Second Edition* (2016)
- *Working with Families to Promote Safe Sleep in Infants 0-12 Months of Age* (2014)

Academic institutions should consider integrating BPG content into theoretical and practice-based courses for nurses and other regulated health providers, including social workers, physiotherapists, occupational therapists, dietitians and pharmacists in pre-licensure (e.g., diploma and undergraduate) and post-licensure (e.g., graduate) programs. Pre-licensure education establishes foundational knowledge that can be strengthened and augmented, as necessary, within health service organizations. Post-licensure education at the graduate level may include preparing nurses and other regulated health providers for advanced practice roles and functions within clinical practice, education, administration, research and policy (303). As such, the integration of guideline content into curricula will differ in terms of educational content and complexity based on the overall educational objectives of the program. In both cases, integrating guideline content into curricula supports student learning consistent with evidence-based practices, with the goal of enhancing the health outcomes of persons and families.

To support the integration of evidence-based BPGs into curricula, the following approaches may be utilized: 1) developing multi-level guideline-related learning objectives; and 2) designing BPG-related teaching and learning strategies. Both approaches are outlined below.

1. Developing multi-level guideline-related learning objectives: Guideline-related learning objectives at multiple levels of a program (pre-licensure and post-licensure) facilitate integration of guideline content into curricula.
   - At the program level, such integration broadens student knowledge, attitude, judgment and skill. For instance, a program-level outcome at the graduate level may include student awareness of elements of implementation science to support uptake and sustained use of guidelines in clinical settings (304).
   - At the course level, integration of guideline content supports student learning that is consistent with evidence-based practices within academic and practice settings. For example, course-level outcomes at the undergraduate level may include students being able to gain increased knowledge about guidelines, to select guidelines relevant to practice (and provide rationale for their selection) and to integrate guideline recommendations into plans of care for persons and families (304).
2. **Designing guideline-related teaching and learning strategies:** Teaching strategies should be tailored to address the program-level educational objectives and needs of learners and to equip the learner to improve practice and promote positive outcomes (305). The various guideline-related teaching and learning strategies are outlined below.
   - **Lectures:** Educators can use lectures as a means of providing a broad understanding of guidelines, specifically the rigorous process of developing guidelines and their various recommendations. Lectures can provide students with an understanding of the scope and strength of evidence that inform the recommendations (304).
   - **Interactive classroom activities:** Interactive learning activities within the classroom setting can support students to obtain additional information, participate in problem-solving and articulate knowledge gained. Examples include the following: assigning group work to help students learn how to navigate a guideline and become familiar with its recommendations; using case studies to provide students with opportunities to identify and apply guideline recommendations in care plans; and using videos and role playing to promote skills in articulating the rationale for selecting specific guidelines/recommendations in care plans (304).

- **Simulation:** High-quality digital simulation within skills lab settings can ease the uncertainty of students related to clinical practice; it can also increase skill acquisition, self-confidence and satisfaction. Faculty trained in pedagogy can use simulation to teach students content related to safe and effective person and family-centred care within a standardized clinical environment. Educators can also support students to incorporate guideline content into simulated practice sessions when teaching evidence-based practice (304).
- **Pre- and post-clinical conference discussions:** Focusing on a guideline at pre- and post-clinical conference discussions can support the critical thinking of students when they develop care plans, consider modifications based on guideline recommendations, articulate rationale for clinical decisions and evaluate the outcome of interventions. Students have the opportunity to evaluate if policies and procedures within the practice setting align with best evidence, and they can identify potential areas for practice change and consider how to initiate change (304).
- **Access to BPG-related resources:** Educators can promote and facilitate access to BPG-related links and resources (304).
- **Assignments and tests:** Students may be asked to incorporate guidelines into their learning plans or to write a reflective journal related to a guideline that is important to their area of practice. Tests or exam questions that demonstrate critical thinking related to guidelines can also be used. Overall, guideline-related assignments and tests can assist students to reflect upon guidelines, understand their application and critique them (304).
- **Preceptorship or mentorship in clinical placements:** Preceptors within clinical settings play an integral role in teaching practical skills that complement the theoretical learning of students. Preceptors are responsible for providing clinical teaching and supervision, and they perform formal student evaluation (306). Preceptors can support students to integrate guideline content into their learning objectives and clinical activities to promote evidence-based knowledge and practice.

EDUCATION STATEMENT 2: HEALTH SERVICE ORGANIZATIONS USE STRATEGIES TO INTEGRATE EVIDENCE-BASED GUIDELINES INTO EDUCATION AND TRAINING OF NURSES AND MEMBERS THE INTERPROFESSIONAL TEAM.

Discussion of literature:

The thematic analysis of the education recommendation statements in several BPGs found a second theme to be foundational to evidence-based practice capacity building:

Health service organizations use strategies to integrate evidence-based guidelines into the education and training for nurses and members of the interprofessional team.

The following BPGs were analyzed:

- *Assessment and Management of Pain, Third Edition* (2013)
- *Care Transitions* (2014)
- *Person- and Family-centred Care* (2015)
- *Engaging Clients Who Use Substances* (2015)
- *Preventing and Addressing Abuse and Neglect of Older Adults: Person-centred, Collaborative, System-wide Approaches* (2014)

- *Primary Prevention of Childhood Obesity, Second Edition* (2014)
- *Delirium, Dementia and Depression in Older Adults: Assessment and Care, Second Edition* (2016)
- *Working with Families to Promote Safe Sleep in Infants 0-12 Months of Age* (2014)

Nurses and members of the interprofessional team should continually seek new knowledge, identify opportunities for professional growth and pursue ongoing learning throughout their careers. Participation in education and training ensures congruence with evidence-based practices, enhances competence and improves care quality and individual outcomes (307). Integrating guideline content into education and training programs within health service organizations can improve evidence-based knowledge and skills for post-licensure nurses and members of the interprofessional team.

Education and training programs should be based on the principles of adult learning, including the following:

- Adults have an awareness of learning needs/goals.
- Adults are self-directed and autonomous.
- Adults value and utilize prior life experiences.
- Adults have a readiness to learn.
- Adults are motivated to learn.
- Adults are presented knowledge and skills in the context of practical, real-life situations (308).

Furthermore, education and training should be appropriate to the health provider's scope of practice and their defined role. Education and training strategies may include the following:

- **In-service education sessions:** In-service education sessions can be planned by clinical experts within practice settings to support the utilization of a specific BPG or recommendations stimulating evidence-based practice among staff. The education may include one-on-one or group sessions, and it should address the needs of learners. It is recommended that the education sessions are followed with refresher or booster sessions to provide feedback and enhance staff learning (309,310).
- **Workshops/seminars:** Highly interactive workshops/seminars help nurses and health providers maintain practice based on best evidence when they incorporate a variety of teaching–learning strategies, including pre-circulated materials, small group discussions using case studies and multimedia such as PowerPoint and videos that integrate relevant BPGs/recommendations. RNAO's Best Practice Champions Workshop and BPG Learning Institutes are examples of programs that provide education on how to implement BPGs within practice settings (311).
- **Quality improvement:** Participating in quality improvement within workplace settings can support nurses and health workers to recognize sentinel events and examine ways to improve care. Meeting accreditation standards is an important quality improvement activity that bridges gaps between current and best practices and supports continued competence. Examples of strategies that nurses and members of the interprofessional team can use to meet accreditation standards include the following:
  - participating in a unit-based guideline implementation process to promote patient safety, reduce risks and improve care outcomes;
  - choosing guideline-specific recommendations to facilitate practice change; and
  - sharing knowledge and lessons learned from reviewing guidelines with the accreditation committee (312,313).

Additional quality improvement opportunities include participating in incident reporting, patient safety initiatives and other health initiatives within areas of practice.

- **Post-licensure mentorship:** Post-licensure mentorship involves providing new graduates or less experienced staff with guidance for skill development and support for the growth of professional roles. Research suggests that working with mentors reduces stress and improves satisfaction for new staff during the transition process (314). Mentors can support integration of guideline content while teaching evidence-based practice.

EVALUATION

All educational strategies require evaluation to a) monitor the adoption of knowledge; and b) measure the impact on clinical outcomes.

RNAO has developed the *Practice Education in Nursing* BPG (315) to provide evidence-based recommendations that support the application of knowledge to various practice settings by student nurses. The BPG also assists nurses, nurse educators, preceptors and other members of the interprofessional team to understand the effective use of teaching–learning strategies in clinical settings.

The Leading Change Toolkit (4) identifies many strategies to support the evaluation of health outcomes at the levels of the person, provider, organization and health system. Examples of evaluation strategies may include the following:

- pre- and post-tests for staff educational sessions
- staff focus groups/interviews
- observation of patient–provider encounters
- chart audits to determine the impact on person and family outcomes
- person and family satisfaction surveys or interviews

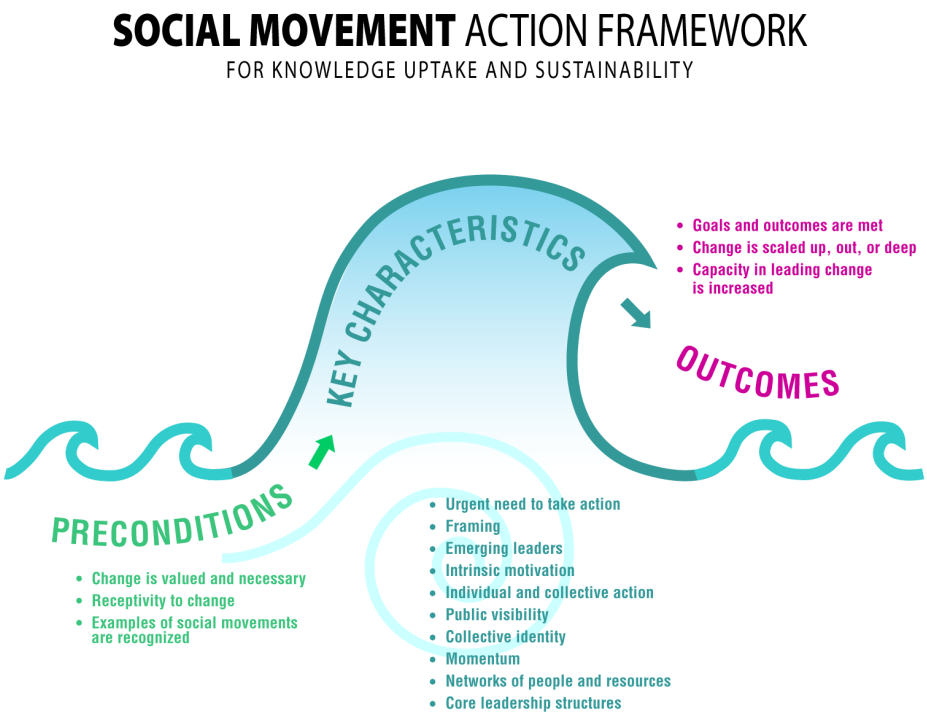
Appendix M: Description of the Leading Change Toolkit

BPGs can only be successfully implemented and sustained if planning, resources, organizational and administrative supports are adequate and there is appropriate facilitation. Active engagement and involvement of formal and informal leaders (e.g., change agents and peer champions) are also essential. To encourage successful implementation and sustainability, an international expert panel of nurses, researchers, patient/person advocates, social movement activists and administrators has developed the Leading Change Toolkit (4). The toolkit is based on available evidence, theoretical perspectives and consensus. We recommend the Leading Change Toolkit for guiding the implementation of any BPG in health care or social service organizations, including academic centres.

The Leading Change Toolkit includes two frameworks — the Social Movement Action (SMA) Framework (1,2) and the Knowledge-to-Action (KTA) Framework (3) — for change agents and change teams leading the implementation and sustainability of BPGs. Both frameworks outline the concept of implementation and its interrelated components. As such, either framework — the SMA or the KTA — can be used to guide change initiatives, including the implementation of BPGs. Using both frameworks serves to enhance and accelerate change (1).

The SMA Framework includes elements of **social movements for knowledge uptake and sustainability**[G] that have demonstrated powerful impact and long-term effects. Based upon the results of a concept analysis, the framework includes 16 elements categorized as preconditions (i.e., what must be in place prior to the occurrence of the social movement), key characteristics (i.e., what must be present for the social movement to occur) and outcomes (i.e., what will likely happen as a result of the social movement) (1,316). The three categories and elements of the SMA Framework are shown in **Figure 5**.

Figure 5: Social movement action framework

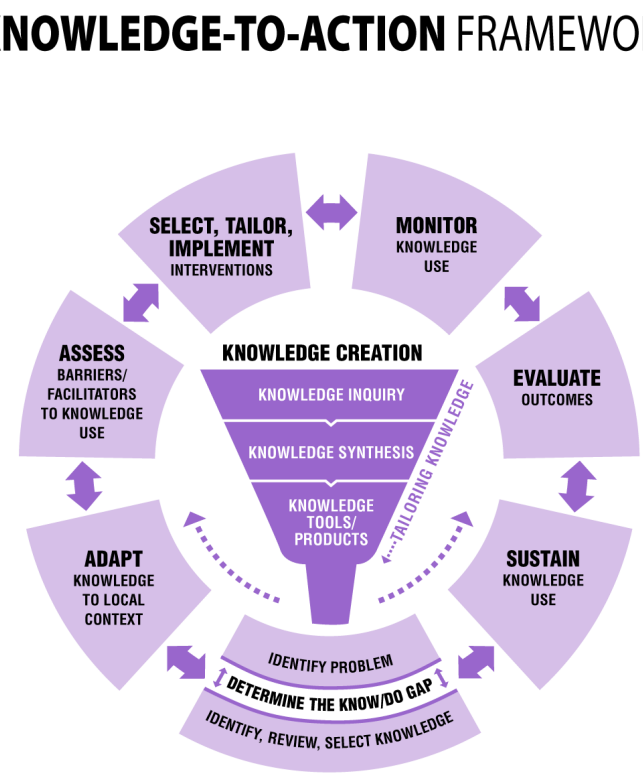


Source: Reprinted with permission from: Grinspun D, Wallace K, Li SA, et al. Exploring social movement concepts and actions in a knowledge uptake and sustainability context: a concept analysis. Int J Nurs Sci. 2022 Oct;9(4):411-21.

Grinspun D, Wallace K, Li SA, et al. Leading change through social movement. Registered Nurse Journal. 2020 Spring:32(1).

The KTA Framework is a planned cyclical approach to change that integrates two related components: the knowledge creation and the action cycle. The knowledge creation process is what researchers and guideline developers use to identify critical evidence results to create a knowledge product, like an RNAO BPG. The action cycle is comprised of seven phases in which the knowledge created is implemented, evaluated and sustained (3). Many of the action cycle phases may occur or need to be considered simultaneously. The KTA Framework is depicted in Figure 6 (4).

Figure 6: Knowledge-to-action framework



Source: Adapted with permission from: Graham ID, Logan J, Harrison MB, et al. Lost in knowledge translation: time for a map? J Contin Educ Health Prof [Internet]. 2006 Winter;26(1):13-24. Available from: https://journals.lww.com/jcehp/Abstract/2006/26010/Lost_in_knowledge_translation__Time_for_a_map_.3.aspx

Implementing and sustaining BPGs to effect successful practice changes and positive health outcomes for patients/ persons and their families, providers, organizations and systems is a complex undertaking. The Leading Change Toolkit is a foundational implementation resource for leading this process.

RNAO best practice guideline development and research team

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Canadian Association of Foot Care Nurses
CAFCN/ACIISP
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October 17, 2024

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Dear Dr. Grinspun,

The Canadian Association of Foot Care Nurses (CAFCN) is pleased to support and endorse the third edition of RNAO's best practice guideline, *Diabetic foot ulcers: Prevention, Assessment, and Management*.

It is an aim of CAFCN to support the development of evidenced-based resources and publications related to foot health. Diabetic foot ulcers are a significant problem in Canada, and the negative impact on individuals with diabetes and their families is great, and the cost to our healthcare system is staggering. These guidelines, as a practical tool, will be an invaluable resource for advanced footcare nurses across Canada who are committed to preventing diabetic foot ulcers, promoting optimal care, and improving foot health outcomes for people with diabetes.

We extend our congratulations on the completion of the third edition of *Diabetic foot ulcers: Prevention, Assessment, and Management*. We are thankful for the dedication and effort put into the development of this resource.

Sincerely,

L. Kathleen Stevens

Kathleen Stevens RN, PhD
Executive Board Member,
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Dear Dr. Grinspun,

Nurses Specialized in Wound, ostomy and Continence Canada (NSWOCC) is pleased to offer our support for and endorsement of the third edition of RNAO's best practice guideline – *Diabetic foot ulcers: Prevention, assessment and management*.

This best practice guideline is aligned with the vision of NSWOCC which is every person deserves specialized wound, ostomy and continence care and supports excellence in this care delivery. NSWOCC strives to ensure evidence based care delivery in all aspects of wound care including diabetic foot prevention and management. This best practice guideline will support our nurses by providing current evidence based information and will be an invaluable resource for them to use to guide their clinical practice.

Through the use of this best practice guideline, quality patient care will be positively impacted. We look forward to implementing this among all of our members across Canada.

Thank you for producing this excellent RNAO best practice guideline – *Diabetic foot ulcers: Prevention, assessment and management*.

Sincerely,

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Dear Dr. Grinspun,

The Ontario Society of Chiropodists are pleased to offer our support for and endorsement of the third edition of RNAO's best practice guideline – *Diabetic Foot Ulcers: Prevention, Assessment and Management*.

The RNAO's BPG is in accordance with the OSC's commitment to advocating for qualified and safe foot care practices backed by evidence based documents and practice outcomes. It provides a proactive comprehensive approach and is an invaluable resource for all members of the interprofessional multidisciplinary team. Implementing these best practice guidelines fosters a collaborative healthcare environment ensuring all stakeholders are equipped to address this critical aspect of diabetes management and helps to improve the quality of life for individuals living with diabetes.

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