

**THE DEVELOPMENT OF A DIABETES RESOURCE TO SUPPORT NURSING
PRACTICE AND PATIENT EDUCATION IN NEWFOUNDLAND AND LABRADOR**

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Abstract

Background: In Newfoundland & Labrador (NL) 33% of individuals live with diabetes or prediabetes. Among the province's 46,550 Indigenous people, rates of diabetes are significantly higher. The burden is greatest in rural and remote communities where geographic disparity and variability in service delivery limit continuity of care, standardized education, and access to culturally relevant resources. NL Health Services (NLHS) lacks a centralized, consistently updated diabetes education resource. To address this gap, this practicum developed a SharePoint-based, evidence-informed diabetes resource to support continuity of care and standardized practice across geographical distances. **Purpose:** The purpose of this practicum was to develop a comprehensive, easy-to-use diabetes resource for nursing staff that contains standardized information that can be shared with patients in the Labrador-Grenfell (LG) zone.

The aim is to promote consistent, culturally responsive diabetes care across the LG zone to improve screening, management, and health outcomes for the population. **Methods:** Three key methods were used: 1) an extensive literature review, 2) consultations with key stakeholders, and 3) an environmental scan of existing provincial and national diabetes resources. **Results:** The literature identified risk factors for diabetes specific to NL, fragmented care, inconsistent information, and limited culturally appropriate resources. There was also strong evidence to support diabetes self-management education (DSME) to improve patient knowledge and clinical outcomes. Stakeholder consultations revealed gaps in standardized up-to-date DSME resources, variable staff confidence, and lack of culturally appropriate materials. The environmental scan revealed inconsistent and outdated provincial resources unaligned with current Diabetes Canada guidelines. In response to these findings, a centralized SharePoint-based resource was developed to consolidate evidence-based tools; standardize resources, and region-specific supports. **Conclusion:** This practicum addressed a significant gap in standardized, accessible diabetes care within NLHS. The resource will support continuity of care, evidence-informed nursing practice across geographic distances, and equitable diabetes management in rural and remote communities. Next steps include dissemination across the LG zone and exploration of broader provincial implementation.

Keywords: *diabetes, diabetes self-management education, diabetes resource, rural and remote, Newfoundland*

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Introduction

Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin or the body cannot effectively use the insulin it produces (Diabetes Canada, 2018). There are two main types of diabetes: Type 1 diabetes (T1DM), an autoimmune condition where the pancreas produces little or no insulin, and Type 2 diabetes (T2DM), which occurs when the body becomes resistant to insulin or the pancreas does not produce enough to meet the body's needs (Diabetes Canada, 2018). While T1DM is typically diagnosed in childhood or adolescence and requires lifelong insulin therapy, T2DM accounts for the vast majority of cases and is closely linked to lifestyle factors and metabolic conditions (Diabetes Canada, 2018). According to Diabetes Canada (2018), modifiable risk factors for T2DM include being overweight and obesity, physical inactivity, unhealthy diet, hypertension, and high cholesterol.

Across Canada, diabetes continues to be a growing public health concern. As of 2024, an estimated 4,007,000 Canadians, approximately 10% of the population, are living with diagnosed T1DM or T2DM (Diabetes Canada, 2024b). Newfoundland & Labrador (NL) has the highest prevalence of diabetes in the country with approximately 33% of its population, or 170,000 individuals, living with diabetes or prediabetes. Additionally, this figure is projected to increase by 20% over the next decade (Diabetes Canada, 2024a). These trends are even more concerning in rural and remote communities, which account for approximately 47% of NL's population. Furthermore, these areas present challenges in relation to access and continuity of care, and planning and implementation of diabetes programs (Lukewich et al., 2020).

NL exhibits notably high levels of individual-level modifiable risk factors affecting T2DM prevalence. According to Diabetes Canada (2024a), 40.3% of adults and youth aged 12 to 17, are physically inactive. Additionally, 35.5% of adults are overweight and 41.8% are living with obesity. Furthermore, 37.5% of youth are either overweight or obese. Nutritional habits

also pose a concern for NL, with 88.1% of adults failing to consume the recommended amounts of fruits and vegetables (Diabetes Canada, 2024a). These are often compounded by broader social determinants of health, such as food insecurity, low income, and lack of access to healthcare services. These factors disproportionately affect vulnerable populations, especially those living in rural and remote areas (Public Health Agency of Canada, 2022).

Geographic disparity is evident in the variability of services across health zones in NL. In the Labrador-Grenfell Zone, care for individuals with T2DM is often fragmented with diabetes nurse educators providing support for management of diabetes, and prevention initiatives only offered periodically or upon request (Labrador-Grenfell Health, n.d.). In contrast, the Central Health Zone provides similar clinical services but places a stronger emphasis on public education aimed at reducing both the incidence and complications of T2DM through prevention and effective disease management (NL Health Services, n.d.). Structural and staffing challenges in NL's healthcare system, such as a limited number of diabetes nurse educators and long wait times for appointments, further delay access to essential education and care. In response to these issues, Action 9.3 of Health Accord NL (2022) explicitly calls for strengthened community-based care and chronic disease management, particularly in underserved regions. A key part of achieving this goal is ensuring that frontline healthcare workers, particularly nurses, are equipped with practical tools to deliver timely, consistent diabetes education.

In my previous role as a diabetes nurse educator, I witnessed firsthand the challenges of meeting increasing service demands across a vast geographic region. Patients and nurses from Central Labrador and the North Coast, regions often staffed by regional nurses, frequently reached out for immediate education and support. However, high caseloads and limited resources

often led to delays, with patients being placed on waitlists for weeks or months. Many patients expressed a clear desire for resources and support “in the moment,” when they felt most ready to learn and take action. Unfortunately, these teachable moments were commonly missed because of systemic barriers that delayed care.

To help address this critical gap, this practicum project proposes the development of a comprehensive, easy-to-use diabetes resource that can be accessed by nurses and shared directly with patients. The resource will consolidate current, evidence-based educational materials, clinical tools, and region-specific resources, supporting consistent diabetes care and empowering nurses to respond quickly and confidently. By providing nurses with practical, point-of-care materials, this resource will empower them to respond quickly and confidently when patients are ready to engage. In turn, the resource has the potential to improve patient outcomes, reduce delays in access to care, and strengthen health equity in rural and remote communities. Most importantly, it supports the delivery of diabetes care in a way that aligns with provincial priorities and responds directly to the needs identified by frontline healthcare workers and patients.

Objectives

The overall goal of this practicum is to develop a comprehensive, easy-to-use diabetes resource for nursing staff that contains standardized information that can be shared with patients in the Labrador-Grenfell zone. The aim is to promote consistent, culturally responsive diabetes care across the Labrador-Grenfell zone to improve screening, management, and health outcomes for the population. To achieve the overall goal of the practicum, the key practicum objectives included:

1. Find the latest evidence-based practices in diabetes management, including prevention of T2DM, treatment options for T2DM, healthy lifestyles, and patient educational materials

relating to self-management, screening measures, and blood glucose monitoring.

2. Develop a well-organized, user-friendly resource of current, evidence-based information on T2DM to support nursing staff in delivering consistent diabetes education and care. It will include Diabetes Canada clinical practice guidelines and protocols from NLHS ensuring alignment with national and provincial standards. Patient-friendly education materials will be compiled from reputable sources, including Diabetes Canada and other publicly available health organizations identified from the environment scan; where necessary, permission will be obtained. The resource will also feature practical, easy-to-understand tips for daily diabetes management tailored to both nurses and patients, enabling timely, point-of-care education. In addition, it will include region-specific healthcare resources such as referral pathways, contact information, and community programs, organized within the same resource using clearly marked sections for each topic. This synthesis of materials will result in a practical resource that supports frontline nurses, particularly those in rural and remote areas, in providing responsive, patient-centered diabetes education.
3. Demonstrate advanced nursing practice competencies by developing a comprehensive, evidence-informed resource, that translates clinical knowledge into practical resources for nurses caring for patients with T2DM in rural and remote areas of NL. This resource will include prevention strategies, healthy lifestyle, treatment options, and primary health care prevention for those living with T2DM.

Overview of Methods

There were 3 main methods of data collection used to inform the development of the practicum project: a comprehensive literature review, consultations with key stakeholders, and an environmental scan of existing provincial and national diabetes resources. First, a comprehensive review of the literature was conducted on the barriers specific to NL, contributing factors of the

prevalence of T2DM in NL, current evidence-based practices, clinical guidelines, and effective educational approaches in diabetes care and patient education, with emphasis on rural/remote, and regional contexts in NL. Additionally, the literature review examined evidence related to rural/remote health inequalities, specific to NL, to ensure the resource meets the intended gaps. Nursing-specific literature was reviewed to align the resource with the scope of practice for community and primary care nurses, including competencies outlined by the College of Registered Nurses of NL (CRNNL), Certified Diabetes Educator (CDE) standards, and First Nations Inuit Health Branch (FNIHB) guidelines. Next, consultations took place across 6 healthcare clinics within NL Health Services (NLHS), with a focus on rural/remote areas within the Labrador-Grenfell zone. These sites were selected to provide a purposive sample that includes regional hub hospitals, community health centres, and very remote community clinics, thereby capturing diverse perspectives from healthcare professionals who experience unique challenges in diabetes management due to geography, access, and resource availability. Through the environmental scan, I aimed to identify and evaluate diabetes education resources available across NLHS and its regional zones. External sources of information were also collected through a targeted review of reputable national and provincial websites, and health authorities that provide diabetes education and resources. This environmental scan was necessary to determine what resources currently exist, evaluate their strengths and limitations, and identify gaps or opportunities for improvement.

I utilized the findings from the literature review, consultations, and environmental scan to guide the development of a practical, context-specific diabetes education resource that supports nurses in delivering consistent, evidence-based education and promotes improved patient self-management filling an identified gap that reflects both local needs and national healthcare standards.

Summary of the Literature Review

Methods

The literature review included a search on databases: CINAHL, MEDLINE, PubMed, and MUN library. Diabetes Canada was also used for literature review referring to the most recent clinical practice guidelines and evidence-based updates. Keywords used in the search included diabetes, diabetes education, self-management, rural health, Indigenous diabetes, diabetes nursing, knowledge, prevention, and strategies. Literature was included if they were peer-reviewed and published since 2015, with the exception of literature used to describe theories. Nursing-specific literature was reviewed to align the resource with the scope of practice for Registered Nurses, including competencies outlined by the College of Registered Nurses of NL (CRNNL), Certified Diabetes Educator (CDE) standards, and First Nations Inuit Health Branch (FNIHB) guidelines. Full details of the literature review and summary tables are provided in the appendices (see Appendix A and Appendix B).

Literature Review Key Findings

T2DM is shaped by both modifiable and non-modifiable risk factors. In NL, modifiable risks such as physical inactivity, being overweight or obesity, and poor diet are highly prevalent with 40.3% of adults and youth aged 12 to 17 physically inactive, 35.5% of adults are overweight and 41.8% are living with obesity, and 88.1% of adults failing to consume the recommended amounts of fruits and vegetables (Diabetes Canada, 2024a). These risks are further compounded by social determinants such as food insecurity, low income, and limited access to care in rural and remote communities (Public Health Agency of Canada, 2022). Non-modifiable risks, including age ≥ 40 , family history, member of a high-risk population, and a history of gestational diabetes, are also common in NL, which has one of the most rapidly aging populations in Canada and more than 46,550 Indigenous residents (Diabetes Canada, 2018;

Diabetes Canada, 2024a; Government of NL, 2025a). Together, these factors contribute significantly to the province's elevated T2DM burden.

NL's diverse geography results in significant disparities in healthcare access across NLHS regions, with rural and remote communities, especially in the Labrador-Grenfell Zone, experiencing fragmented diabetes services and limited prevention programming (NL Health Services, 2025a; Labrador-Grenfell Health, n.d.). Indigenous populations face additional barriers such as lack of culturally appropriate care, high staff turnover, and poor chronic disease management (Diabetes Canada, 2025). These issues reflect national challenges, as rural Canada struggles to retain primary care providers and the country performs below international averages in access, equity, and continuity of care (Wilson et al., 2020; CIHI, 2024). Consequently, more than 41,000 NL residents remain unattached to a primary care provider as of June 2025 (Government of NL, 2025b).

Research shows significant gaps in diabetes knowledge and education for both patients and healthcare providers, especially in rural and underserved settings. In rural NL, Gien et al. (2017) found that people with T2DM often receive outdated or inconsistent information, have limited access to credible resources, and experience fragmented care. Studies of nurse knowledge (Albagawi et al., 2023; Wang et al., 2023) similarly show knowledge gaps among nurses and strong demand for standardized, accessible diabetes training. Evidence from diabetes self-management education (DSME) interventions demonstrates that structured education improves patient knowledge (Tamiru et al., 2023; Hailu et al., 2019), although study limitations reduce generalizability. Overall, the literature highlights the need for consistent, up-to-date, locally relevant diabetes education for both patients and frontline providers.

Lifestyle-based diabetes prevention programs consistently show strong effectiveness in

reducing T2DM among high-risk individuals. In the FIN-D2D study, Rintamäki et al. (2021) found that even modest weight loss during a one-year primary-care lifestyle intervention significantly lowered long-term diabetes incidence. Digital diabetes prevention programs show similar benefits: mobile and virtual models have produced meaningful weight loss, improved physical activity, and reduced diabetes incidence (Fitzpatrick et al., 2022; Fukuoka et al., 2015), making them promising options for geographically isolated or mobility-limited participants. However, digital literacy, limited internet access, and patient preference for in-person care present barriers in rural regions (Graves et al., 2021; Lee et al., 2020; Moulaei et al., 2023).

DSME helps individuals build the knowledge and skills needed to make daily decisions that improve self-care, confidence, and clinical outcomes (Diabetes Canada, 2018; Powers et al., 2015). Three hospital-based studies (Anjali et al., 2023; Chawla et al., 2019; Ji et al., 2019) demonstrated that DSME leads to meaningful short-term improvements in glycemic control. Across all interventions, participants receiving DSME showed significant reductions in HbA1C compared to controls, with enhanced outcomes when additional tools (apps, case managers, role-playing, or take-home materials) were included. Bilgehan and Inkaya (2025) found that holistic nurse coaching (HNC) significantly improved diabetes self-management, empowerment, and glycemic outcomes among adults with T2DM, compared to standard diabetes education and usual care. While both educational and coaching interventions produced benefits, HNC demonstrated the largest effect sizes across all measures.

Nurses are essential to diabetes care in NL, particularly in rural and remote areas where specialist access is limited. Their scope includes assessment, education, and evaluation of patient learning, consistent with CRNNL standards (CRNNL, 2019). National frameworks such as the CDE credential guide best practices, while FNIHB guidelines emphasize culturally safe care in Indigenous and northern communities (CDECB, n.d.; Indigenous Services Canada, 2025). RN

prescribers further enhance access by managing labs and medications, an important role improving chronic disease management in underserved regions (CRNNL, 2022; Government of NL, 2023). Developing an evidence-based diabetes resource supports nurses in delivering consistent, high-quality care across NL.

Theoretical Underpinnings

The development of a diabetes education resource is grounded in Orem's Self-Care Deficit Nursing Theory, which emphasizes empowering individuals to regain or strengthen their self-care abilities through collaborative nurse–patient partnerships (Jandaghian-Bidgoli et al., 2024; Khademian et al., 2020). Kolb's Experiential Learning Theory further guides the resource by promoting a cyclical process of learning through concrete experience, reflective observation, abstract conceptualization, and active experimentation, supporting practical skill development in diabetes care (Dhital et al., 2015; Watson et al., 2025). Together, these frameworks create a patient-centered, nurse-led approach to diabetes education that supports consistent, evidence-informed practice across diverse settings in NL.

Summary of Consultations

Methods

Participants were recruited through the Labrador-Grenfell Zone rural and remote health huddles and email invitations, resulting in 16 participants, including CDEs, dietitians, primary care and rural/remote nurses, primary care providers, clinical nurse educator, and a regional director all within the Labrador-Grenfell zone of NLHS. Data was collected through 2 focus groups and 6 semi-structured interviews held virtually for remote participants and in person for Central Labrador. Semi-structured interview questions were utilized for 3 participant groups (physicians, nurse practitioners, CDEs, dietitians; rural/remote nurses, primary care nurses; regional directors, clinical nurse educators). Triangulation was achieved by comparing

perspectives across participant groups. Detailed notes and records were maintained to ensure transparency and recordability with all information entered anonymously, with no identifying data. Full details of the consultation report is provided in the Appendix C.

Consultation Key Findings

Consultations revealed consistent themes related to resource gaps, diabetes education challenges, and opportunities to strengthen standardized diabetes education across NLHS. Participants described highly variable diabetes education practices, with CDEs and primary care providers delivering comprehensive, guideline-informed care, while rural/remote nurses reported delivering limited direct diabetes education because they had knowledge gaps and low confidence in diabetes counselling skills due to gaps in training, inconsistent resources, and competing clinical demands.

External resources for diabetes education included Diabetes Canada Clinical Practice Guidelines, national nutrition resources, other provincial resources, Indigenous Services Canada materials, and NLHS pediatric resources. Although participants had access to many external resources, they noted inconsistent use across the region and the absence of a single, standardized, easy-to-navigate diabetes resource.

Significant gaps were identified, including limited culturally relevant materials, outdated or inaccessible local resources, inconsistent messaging across providers, and a lack of plain-language, visual tools for patients with varying literacy levels. Rural/remote nurses emphasized substantial challenges supporting diabetes education during acute presentations and noted that patients frequently struggled to understand dietary guidance, glucose targets, HbA1C values, sick-day management, and required screening intervals. Leadership highlighted broader system-level issues, such as long wait times, high numbers of unattached patients, fragmented

follow-up, and limited diabetes-specific support for Indigenous communities.

Participants identified multiple barriers to delivering effective diabetes education, including time constraints, lack of consistent access to updated materials or no resources at all, competing clinical priorities, high staff turnover, insufficient onboarding for new or fly-in/fly-out staff, high number of unattached patients, long wait times for diabetes educator appointments, and broad geographic distribution of communities. Patient-level barriers including low health literacy, cultural and language barriers, inconsistent attendance, and challenges related to social determinants of health further impacted diabetes education.

Despite these challenges, all participant groups clearly identified patient and staff education needs. Recommendations included topics on: Diabetes Basics, Medications, Blood Glucose Targets, Hypoglycemia, Hyperglycemia, Culturally Relevant Food Guidance, Frequently Asked Questions, Routine Screening Requirements, and Self-Management Tools. Participants strongly supported the development of a centralized, standardized diabetes education resource that is practical, culturally appropriate, and easily accessible by nurses to use at all point of care interactions with patients. Suggested formats included printable handouts, short instructional videos, regional dietary examples, visual charts, and a digital platform or NLHS-linked website.

Summary of Environmental Scan

Methods

Data was collected from internal and external sources to examine diabetes education materials available to NLHS staff and the public. Internal data was gathered from NLHS intranet, staff e-learning modules, professional development materials, and consultation feedback from CDEs, primary care providers, nurse educators, rural/remote nurses, and leadership. Additional

input was obtained from Western, Central, and Eastern zones via email to identify regional variations in available resources; however, no sources or feedback was received from the Eastern zone. External sources of information were collected from the Public Health Agency of Canada, National Indigenous Diabetes Association, Indigenous Service Canada, and provincial health authorities of Alberta Health Services, LMC Healthcare, and Fraser Health. To ensure reliability and consistency in the review process, inclusion criteria was applied across all resources to minimize bias and enhance comparability. Resources to be included have been published since 2018 to ensure alignment with current Diabetes Canada Clinical Practice Guidelines. Outdated materials identified through the consultations were clearly documented to highlight areas requiring revision. Full details of the environmental scan report is provided in Appendix D.

Environmental Scan Key Findings

NLHS intranet revealed significant gaps in accessible, current diabetes education resources for staff. No materials were found under Clinical Services training, and the only diabetes-related item listed under Nursing and Chronic Disease Management, a 2015 Canadian Diabetes Guidelines link, resulted in a “404” error. Employees learn portal identified five modules, but most were outdated, inaccessible, or limited in scope. The CorCare Diabetes Nurse Educator module was not yet available, while the Basic Diabetes Self-Management Education module contained outdated content and numerous broken links. Two Western Health Medical Rounds modules, Managing Type 2 Diabetes (2020) and Diabetic Neuropathy (2017), provided some useful information but were topic specific. Only one resource, Obesity & Diabetes: Tips & Tricks for Diagnosis & Treatment (2023), reflected up-to-date, evidence-based practice.

NLHS has adopted MyHealthNL, a personal health records and health information portal that is accessible to patients and providers on the NLHS website (NLHS, 2025b). While the

diabetes content is current and easily accessible across digital platforms, it is produced by WebMD Ignite, a U.S.-based vendor, and is not tailored to the NL context. The resource lacks clarity regarding the specific guidelines used, does not incorporate local referral pathways or community-specific programs, and offers information primarily through short videos rather than printable tools which may limit its usage during clinical education encounters. Importantly, this resource was not identified by participants during consultations, suggesting limited awareness or uptake.

NLHS zonal websites revealed substantial differences in the availability and clarity of diabetes program information across regions. The Labrador-Grenfell Zone lists diabetes nurse educator services and outlines general support but lacks details on clinic locations and provider roles, limiting public accessibility. In contrast, Western and Central Zones provide clearer, more comprehensive program descriptions, including interdisciplinary team involvement, self-referral pathways, and direct links to Diabetes Canada resources. The Eastern Zone primarily highlights pediatric type 1 diabetes services through the Janeway program, with limited information on adult type 2 diabetes education or community-based supports.

Provincial and national nutrition resources commonly used by providers, including UnlockFood.ca (Dietitians of Canada, 2025), Alberta Health Services (n.d.), and Fraser Health (n.d.), offer comprehensive, evidence-based materials including downloadable handouts, culturally inclusive tools, and diabetes-specific booklets such as “On the Road to Diabetes Health”. Many of these resources directly integrate content from Diabetes Canada. LMC Healthcare offers similar resources, including clear, visually supported handouts across major diabetes topics, with easy website navigation. Despite their quality and relevance, the use of these external resources remains inconsistent across NLHS, with uptake varying significantly by

provider and location.

The National Indigenous Diabetes Association (NIDA, 2020) provides several culturally relevant diabetes education tools, including Pathways to Wellness: A Handbook for Indigenous Peoples Living with Diabetes, grounded in the Canadian Diabetes (2018) Clinical Practice Guidelines and incorporating holistic frameworks such as the medicine wheel. NIDA (n.d.) also maintains a NL resource page featuring provincial health data, chronic disease resources, regional service information, and culturally specific programs such as NunatuKavut's Learning for Life – Preventing Diabetes.

The Public Health Agency of Canada (2025) provides comprehensive diabetes education resources for both the public and health professionals, all aligned with the most recent Diabetes Canada guidelines. Indigenous Services Canada (2025) adds culturally grounded materials through its Diabetes in First Nations and Inuit Communities resources, including the Aboriginal Diabetes Initiative and information on the Non-Insured Health Benefits program. Together, these national resources emphasize evidence-based, culturally relevant approaches essential for diabetes care in rural, remote, and Indigenous communities in NL.

Summary of the Resource

Findings from the literature review, consultations, and environmental scan highlight an urgent need for a standardized, accessible, and culturally relevant diabetes education resource to support nursing practice across NLHS, especially in rural and remote communities. The literature review confirms that diabetes self-management education improves knowledge, glycemic control, and patient outcomes (Anjali et al., 2023; Chawla et al., 2019; Hailu et al., 2019; Ji et al., 2019; Tamiru et al., 2023). The consultations highlight the gaps in diabetes care within NLHS, inconsistent diabetes education resources, variations in staff confidence and knowledge, limited culturally appropriate materials, long wait times for diabetes educator appointments, and broad

geographic distribution of communities. The environmental scan further showed the inconsistent internal resources which are often outdated, inaccessible, or not updated to reflect the most recent diabetes Canada guidelines. External results and national resources offer user-friendly, downloadable materials, culturally relevant, that are often linked to the most recent diabetes Canada guidelines.

In response to these findings, a centralized, evidence-informed diabetes education resource was developed and housed on a secure NLHS SharePoint platform. This approach ensures consistent, point-of-care access to reliable information to support both nursing practice and patient education across the Labrador–Grenfell Zone. The resource was specifically designed to address system-level gaps, including fragmentation of materials, inconsistent resource use, and limited access to current, culturally appropriate information. By consolidating evidence-based content, clinical tools, and region-specific supports, the resource enhances continuity of care and enables nurses to respond efficiently and confidently during patient interactions.

The SharePoint resource is organized into clearly defined sections to facilitate rapid navigation and usability in clinical settings. Content is grounded in current evidence and presented using plain language, visual aids, and printable materials to support varying levels of health literacy. Cultural relevance is emphasized through inclusion of locally available foods, traditional practices such as hunting and fishing, and resources tailored to Indigenous communities.

The main page provides centralized access to key tools and resources, including sections on nutrition, diabetes basics, insulin management, self-monitoring of blood glucose, hypoglycemia, and hyperglycemia. It also includes contact information and referral pathways for diabetes educators across the Labrador–Grenfell Zone, additional community and program

supports with contact information, and interactive tools such as a Canadian diabetes risk questionnaire, HbA1c targets, and pharmacologic guidance for T2DM.

Tools and Resources

Nutrition

The nutrition section provides practical, evidence-informed guidance on healthy eating for individuals living with diabetes. It includes culturally relevant resources such as an Inuktitut food guide (Nunatsiavut), the balanced plate model, and food guides available in multiple languages to support diverse populations. Content covers key nutritional components, including healthy snacks, fibre-rich foods, carbohydrates, and protein sources, with all materials available in downloadable PDF formats for ease of use in patient education. To enhance accessibility and cultural relevance, the section incorporates visual tools that present food groups using colour-coded formats, adapted to reflect locally available and affordable foods, as well as traditional dietary practices such as hunting and fishing in rural and remote communities. Additionally, a patient-friendly educational video, *Eating Well with Type 2 Diabetes*, is included to support varied learning styles and reinforce key concepts at the point-of-care.

Diabetes Basics

The diabetes basics section provides foundational knowledge to support both nursing practice and patient education. It includes an overview of T2DM, the ABCDESSS framework for diabetes management, and potential complications. Additional content includes a snapshot of diabetes in Canada, a diabetes fact sheet, information on the relationship between high blood pressure and diabetes, and a sample diabetes flowsheet to support clinical monitoring. All materials are available in downloadable PDF formats. Visual diagrams illustrating the pathophysiology of type 2 diabetes, along with an educational video, are included to enhance

understanding and engagement for patients with varying levels of health literacy.

Insulin

The insulin section provides essential information to support safe initiation and management of insulin therapy in clinical practice. Content includes an overview of insulin, injection guidelines, titration principles, and an insulin initiation checklist to guide practice. Practical tools such as an insulin prescription aid and step-by-step instructions are included to support clinical decision-making. All materials are available in downloadable PDF formats to facilitate point-of-care use. Visual aids illustrating injection sites and rotation techniques, along with an educational video explaining the role of insulin in the body, are incorporated to enhance understanding and support both provider education and patient teaching.

Self-monitoring blood glucose

The self-monitoring blood glucose section provides direct access to Diabetes Canada tools that guide appropriate monitoring frequency and patterns based on individual patient characteristics. This tool supports providers in developing personalized monitoring plans that can be printed and shared with patients, along with clear rationale to reinforce education.

Hypoglycemia

The hypoglycemia section outlines key information on the signs, symptoms, causes, and treatment of hypoglycemia. Content is presented in a simplified, visual format, plain-language to support rapid recognition and response in both clinical and community settings. Guidance on post-hypoglycemia safety, including driving recommendations, is also included.

Hyperglycemia

The hyperglycemia section provides an overview of causes, signs and symptoms, and recommended management strategies for elevated blood glucose levels. Similar to the

hypoglycemia section, content is presented using clear visuals and simplified language to support timely recognition and intervention.

Summary of the Evaluation Done

Following development of the initial SharePoint-based diabetes resource, a formative evaluation was conducted through targeted review with previous stakeholder participants across the Labrador–Grenfell Zone. The purpose of this evaluation was to assess the resource’s accuracy, cultural relevance, literacy appropriateness, and practical usability in real-world clinical settings. Participants were provided access to the draft SharePoint site and invited to attend a Microsoft Teams session, which introduced the resource layout, demonstrated its intended use, and ensured a shared understanding of its purpose. Feedback was collected via a structured questionnaire accessed via QR code, which evaluated alignment with Diabetes Canada Clinical Practice Guidelines, relevance to rural and remote practice, cultural safety for northern and Indigenous populations, point-of-care usability, accessibility, and perceived impact on provider confidence. Open-ended questions were also included to gather recommendations for refinement, dissemination strategies, and potential indicators for future evaluation. Full details of the diabetes practicum resource questionnaire is provided in the Appendix E.

Overall, participants identified the resource as evidence-based, accurate, and highly relevant to clinical practice in rural and remote settings. The resource was reported to be easy to navigate, well-organized, and appropriately designed to support varying levels of health literacy and diverse learning styles. Participants also noted its potential to enhance confidence among providers and improve consistency in diabetes education delivery. Feedback from this formative pilot informed final refinements to the resource prior to broader dissemination across NLHS. Anticipated outcomes of implementation include increased provider confidence, improved

standardization of diabetes education, and enhanced delivery of culturally responsive, evidence-informed care across geographically diverse regions.

Discussion of Advanced Nursing Practice (ANP) Competencies

The Canadian Nurses Association (CNA) defines competencies as the specific knowledge, skills, judgement, and personal attributes required for a nurse to practice safely and ethically in a designated role and setting. Additionally, core competencies of APN are based on a range of nursing knowledge, theory and research, enhanced by clinical experience (CNA, 2019).

Throughout this practicum project, I have demonstrated several ANP competencies, specifically research, leadership, and educational competencies.

Throughout this practicum I have had the opportunity to consolidate APN skills. Research competencies include identifying and implementing research-based innovations for improving client care as well as identify and support research to enhance nursing practice and patient outcomes (CNA, 2019). During my practicum I completed an extensive literature review, conducted consultations with stakeholders, and completed an environmental scan. I critically appraised research using criteria identified in the Public Health Agency of Canada (2014) critical appraisal tool. The intent of these methods are to support nursing staff by providing easy access to relevant diabetes care resources, facilitating evidence-informed decision-making at the point of care with patients.

Leadership competencies are demonstrated when APNs are organizational leaders who identify problems and initiate change to address challenges at the clinical, organizational or system level (CNA, 2019). During this practicum I lead the initiation and development of a diabetes resource, which will serve as both an educational and practice support tool. This resource aims to empower nurses to deliver evidence-based care during all clinical interactions with those living with diabetes. This will ensure that patients have access to the right education

and resources at any given time. I have also actively engaged stakeholders throughout the development to demonstrate leadership in interprofessional collaboration and system-level improvement.

Educational competencies are demonstrated when APNs are committed to professional growth and learning by identifying the learning needs of nurses and other members of the healthcare team and finding or developing resources to meet those needs (CNA, 2019). As part of this practicum, I assessed the diabetes related educational needs of nursing staff by gathering data, to design a resource intended to support their ongoing learning and address the identified gaps. This work reflects my commitment to both professional development and enhancing the quality of patient care for those living with diabetes.

Next Steps

The next steps involve formal approval for implementation of the newly developed diabetes education SharePoint resource across the Labrador-Grenfell zone of NLHS. Initial efforts will focus on engagement with leadership, clinical nurse educators, and rural and remote nurses to support uptake and integration into workflows. Implementation strategies will include targeted education sessions and integrations into staff workflows/orientation, particularly for rural and remote and fly-in/fly-out nurses, and promotion through team channels such as rural and remote Microsoft team huddles. Integrating the SharePoint resource into point-of-care workflows will be essential to support consistent use and sustainability.

Ongoing evaluation is recommended to assess the impact that this newly developed SharePoint diabetes resource has on provider knowledge, confidence, and consistency of diabetes education delivery. Potential evaluation measures include staff feedback surveys, and qualitative interviews with providers and patients accessing diabetes care. Longer-term indicators

may include improvements in diabetes screening, diabetes management strategies, and timely access to diabetes education.

Future iterations of the resource should incorporate continuous feedback, regular updates to align with the most recent Diabetes Canada Clinical Practice Guidelines, and expansion of content areas such as to include T1DM, gestational diabetes, and prediabetes. Strengthening partnerships with Indigenous communities and incorporating additional culturally relevant materials will further enhance the resource's impact. Overall, these steps aim to support sustainable implementation, promote standardization of culturally relevant diabetes care, and strengthen health equity across rural and remote communities in NL.

Conclusion

Diabetes care in NL is complex, particularly across rural and remote communities. Findings from the literature review, stakeholder consultations, and environment scan consistently identified fragmentation of resources, variability in practice, and limited access to current, culturally appropriate diabetes education, particularly in rural and remote areas of NL. This practicum responds directly to the identified system gaps by creating a centralized, SharePoint located, culturally responsive, evidence-based resource accessible across geographic distances. By identifying fragmentation and addressing it through a centralized SharePoint platform, this initiative strengthens alignment with best practice guidelines while acknowledging the realities of rural and remote healthcare delivery. Ultimately, the goal is not to simply provide information, but to support nurses in delivering consistent, confident, and culturally responsive diabetes education at every point-of-care interaction.

This practicum demonstrates how a structured, evidence-informed approach to resource development can address system-level gaps and support meaningful quality improvements in

clinical practice. This SharePoint diabetes resource has the potential to strengthen standardized care delivery, improve patient education and self-management of diabetes, and advance health equity for rural and remote populations in NL. Furthermore, this work aligns with Health Accord NL Action 9.3, which emphasizes strengthening community-based care and chronic disease management in underserved regions. Future iterations of the resource should incorporate continuous feedback, regular updates to align with current Diabetes Canada Clinical Practice Guidelines, and expansion of content areas to ensure ongoing relevance and sustainability.

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Appendix A
Comprehensive Literature Review of Type 2 Diabetes Mellitus

Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin or the body cannot effectively use the insulin it produces (Diabetes Canada, 2018). There are two main types of diabetes: Type 1 diabetes (T1DM), an autoimmune condition where the pancreas produces little or no insulin, and Type 2 diabetes (T2DM), which occurs when the body becomes resistant to insulin or the pancreas does not produce enough to meet the body's needs (Diabetes Canada, 2018). While T1DM is typically diagnosed in childhood or adolescence and requires lifelong insulin therapy, T2DM accounts for most cases and is closely linked to lifestyle factors and metabolic conditions (Diabetes Canada, 2018).

Across Canada, diabetes continues to be a growing public health concern (Government of Canada, 2025). As of 2024, an estimated 4,007,000 Canadians, approximately 10% of the population, are living with diagnosed T1DM or T2DM (Diabetes Canada, 2024a). The lowest rate of diabetes in Canada is reflected in Alberta with 8% of the population, an estimated 403,000 people. Furthermore, Ontario reflects 10%, PEI 11%, and Nova Scotia 12% of the population (Diabetes Canada, 2022). Newfoundland and Labrador (NL) has the highest prevalence of diabetes in the country with approximately 33% of its population, or 170,000 individuals, living with diabetes or prediabetes, representing roughly a 300% higher rate compared to provinces such as Alberta. Additionally, this figure is projected to increase by 20% over the next decade (Diabetes Canada, 2024b). Barriers specific to NL include decreased access to care, continuity of care, and the availability of resources in rural and remote communities. Approximately 47% of NL's population reside in rural and remote communities, which makes the lack of resources particularly concerning. Additionally, continuity of care, planning and implementation of diabetes programs is also problematic (Lukewich et al., 2020).

To fully understand the urgency of addressing T2DM in rural populations, it is essential to explore both the clinical consequences of uncontrolled DM and the broader social and environmental factors that shape its development.

Broader Social and Environmental Factors

T2DM is influenced by a combination of modifiable and non-modifiable risk factors. These factors play a crucial role in the development and progression of the disease and are especially important for guiding prevention strategies. According to Diabetes Canada (2018), modifiable risk factors for T2DM include overweight and obesity, physical inactivity, unhealthy diet, hypertension, and high cholesterol. NL exhibits notably high levels of individual-level modifiable risk factors affecting T2DM prevalence. According to Diabetes Canada (2024b), 40.3% of adults and youth aged 12 to 17, are physically inactive in NL. Additionally, 35.5% of adults are overweight and 41.8% are living with obesity. Furthermore, 37.5% of youth are either overweight or obese. Nutritional habits also pose a concern for NL, with 88.1% of adults failing to consume the recommended amounts of fruits and vegetables (Diabetes Canada, 2024b). These are often compounded by broader social determinants of health, such as food insecurity, low income, and lack of access to healthcare services, factors that disproportionately affect vulnerable populations, especially those living in rural and remote areas (Public Health Agency of Canada, 2022).

According to Diabetes Canada (2018) non-modifiable risk factors include: Age ≥ 40 years; first-degree relative with T2DM; member of high-risk population (e.g. Indigenous, South Asian, African, Hispanic, and East Asian); history of gestational diabetes; history of delivery of a macrosomic infant. The median age in NL is 48.4 years with 23.6% of those being over the age of 65. Furthermore, approximately 3.4 % of NL self-identify as being a member of the high-risk

population and 46,550 indigenous people in NL (Diabetes Canada, 2024b). NLs population has also aged more rapidly than any province in the Country with the median age going from five years younger in NL compared to Canada in 1971, to nearly seven years higher in 2024 (Government of NL, 2025). Risk factors for gestational diabetes are age ≥ 35 years and from a high-risk population (Diabetes Canada, 2018). The NL birth rate for the Labrador rural region in 2022 was 10.1 compared to the provincial rate of 6.9 (Government of NL, n.d.).

Geographic disparity is evident in the variability of health services across Newfoundland and Labrador, which is organized into regional health zones under the provincial health authority, NL Health Services (NLHS). These zones, formerly separate regional health authorities, now operate as administrative divisions within a single integrated system. The zones encompass a wide range of settings, from larger urban centres such as St. John's to rural and remote communities along the coasts and in Labrador (NL Health Services, 2025). This geographic diversity contributes to significant variation in access to services, availability of healthcare providers, and infrastructure, with rural and remote areas often facing greater challenges in accessing timely and comprehensive care. In the Labrador-Grenfell Zone, care for individuals with T2DM is often fragmented with diabetes nurse educators providing support for management of diabetes, and prevention initiatives only offered periodically or upon request (Labrador-Grenfell Health, n.d.). In contrast, the Central Health Zone provides similar clinical services but place a stronger emphasis on public education aimed at reducing both the incidence and complications of T2DM through prevention and effective disease management (NL Health Services, n.d.). Evident in rural and remote areas is the aboriginal population who report barriers of fragmented healthcare, a lack of culturally appropriate care, poor chronic disease management, high health-care staff turnover, and limited tracking of new diabetes cases

(Diabetes Canada, 2025). This is identified in Canada as rural communities experience challenges in accessing health care, attracting and retaining family physicians (Wilson et al., 2020). Canada ranks ninth out of 10 countries, performing below the international average in key areas such as access to care, administrative efficiency, and equity, with the weakest outcomes observed in NL and Nunavut. Additionally, Canada ranks the lowest on a consistent relationship with a family doctor, essential for preventive care, early disease detection and treatment, and chronic disease management (CIHI, 2024). Across NL, 41,748 people are waiting to be connected to a primary care provider as of June 2025 (Government of NL, 2025).

Complications of Uncontrolled Diabetes Mellitus

Poorly managed diabetes can lead to both acute and chronic complications, many of which have serious, life-threatening consequences. One of the most common acute complications is hypoglycemia, a condition where blood glucose levels drop too low. Hypoglycemia can significantly impair brain function, trigger seizures, and, in severe cases, result in loss of consciousness (Fox et al., 2020). Another serious acute complication is diabetic ketoacidosis (DKA), a medical emergency, leading to dangerously high blood glucose levels. Furthermore, DKA requires immediate medical intervention, as it can result in life-threatening outcomes such as cerebral edema, acute respiratory distress syndrome, and sepsis. Alarming, DKA remains one of the leading causes of death among individuals with diabetes (Fox et al., 2020). In individuals with T2DM, the incidence of DKA is estimated to be in the range of 0.32 to 2.0 per 1,000 patient-years (Diabetes Canada, 2018).

Chronic complications of poorly controlled diabetes are equally severe. According to Diabetes Canada (2022), diabetes is responsible for 30% of strokes, 40% of heart attacks, 50% of kidney failures requiring dialysis, and 70% of non-traumatic lower-limb amputations. It is also

the leading cause of blindness in Canada. Moreover, diabetes can significantly shorten lifespan, reducing life expectancy by an estimated 5 to 15 years, largely due to these progressive and cumulative health effects. Worsening glycemic control over time can deteriorate the patient's physical and mental health. People with high glycemic values report a reduced physical and social QOL related to physical disabilities, ongoing management, chronic pain, reduction in independence, emotional burden and restricted involvement in social activities (Engel-Yeger et al., 2018). As the frequency and severity of diabetes-related complications increase, so do the demands on healthcare services and associated expenditures, highlighting the broader financial impact of uncontrolled diabetes.

Financial Impact

Diabetes is associated with a substantial financial burden on the healthcare system, including the costs of disease management and personal expenses for those living with diabetes, due to its increasing prevalence and associated complications. The direct healthcare cost related to diabetes in Canada in 2024 was \$18.25 billion (Diabetes Canada, 2024a). The direct healthcare cost related to diabetes in Canada for 2024 was 5,441 billion (Diabetes Canada, 2024a). NL has an estimated healthcare cost of \$83 million in 2024 (Diabetes Canada, 2024b). People living with DM also have increased costs related to managing their disease. Diabetes Canada (2024b) states that out-of-pocket costs for people living with T2DM in NL can be as high as \$6,394 per year. Considering the rising cost of living in Canada, this extra financial burden can make it difficult for people to manage their disease properly, which can be associated with poorer health outcomes.

Given the growing prevalence and complexity of diabetes management, particularly in rural and remote regions, it is essential to critically examine existing research to identify the strengths, limitations, and gaps related to diabetes education, prevention, and self-management.

Critical Appraisal of Existing Research

Patient Challenges

Research into DM has been ongoing for decades with many researchers focusing on patient challenges, including gaps in their knowledge, the effectiveness of diabetes prevention programs, self/risk assessment screening tool, and patient focused education. Gien et al. (2017) explored the barriers faced by individuals living with T2DM in a rural region of NL using qualitative methods; focus groups with both patients and healthcare providers. The researchers identified several interconnected challenges that make effective diabetes self-management difficult in rural settings. One of the participants identified they were giving misinformation and outdated advice about T2DM resulting in confusion and vulnerability. Another theme of misinformation and outdated information regarding dietary guidelines and suggestions of food that is not available in NL. This led to more anxiety, uncertainty in their ability to manage T2DM. Participants also shared their frustrations with finding credible information about diabetes in their community with limited access to health information and the shortage of health services in rural NL. A lack of access to accurate, up-to-date information about diabetes management further compounded the problem. Many participants relied on word-of-mouth or outdated pamphlets, and there was a general lack of accessible education tailored to the rural context. Interactions with healthcare providers were also a source of frustration for many patients. Inconsistent advice from different professionals and limited follow-up left individuals feeling unsupported. Healthcare professionals echoed many of these concerns, highlighting

systemic issues such as referral policies, limited time for patient education, and lack of coordinated care. The study concluded that diabetes self-management in rural areas is shaped by a complex mix of personal, social, economic, and structural factors. To address these challenges, the authors recommend more locally tailored education, improved access to resources, greater collaboration among healthcare providers, and policy changes to reduce financial and systemic barriers.

This qualitative study brings value for understanding the lived experiences of people living with T2DM in rural settings of NL. The methodology is clearly outlined, and ethical considerations, including informed consent, were followed. The focus groups were appropriate for exploring personal experiences and perceptions of those living in a rural area of NL, which is often underrepresented in healthcare research. By addressing specific challenges faced by rural residents, the study fills a gap in the literature and provides context-specific insights, enhancing its practical relevance. Having perspective from both patients and healthcare professionals improved reliability of findings through triangulation. The authors are transparent about the study's limitations, such as the small sample size of 7 individuals living with T2DM and 5 providers, and limited geographic scope. This may limit the generalizability of the results to all rural communities. Additionally, self-selection bias as those who agreed to take part may differ (more motivated, better connected) than those who did not participate.

Nurse Knowledge

Albagawi et al. (2023) assessed the knowledge of nurses about diabetes care and management from all public hospitals and primary healthcare centers in Hail province. The results were calculated via two questionnaires: the diabetes self-report tool (DSRT) and the diabetes basic knowledge tool (DBKT). The results indicated the average mean score on the

DSRT was 64% and the DBKT was 47.3%. The concern from this study is 79.7% of nurses were directly involved in diabetes care. However, we cannot generalize these results as lack of access to diabetes management guidelines was identified in this study.

Similarly, Wang et al. (2023) conducted a large cross-sectional survey to investigate the level of diabetes knowledge and training needs of non-endocrinology nurses in primary care hospitals and explore the factors affecting their level of knowledge. This study took place in among 70 hospitals in China, where the majority (58.34%) were bachelor trained, 16.37% had prior internship in endocrinology, and 9.69% had received in-service education and training in diabetes. The mean diabetes knowledge score was 13.16 (SD 2.36; 62.68% correct), with mean scores of knowledge on diet 2.23 (SD 0.65; 74.27%), exercise 2.06 (SD 0.81; 68.63%), monitoring 0.84 (SD 0.97; 21.12%), medication 2.09 (SD 0.69; 69.78%), and complications 3.74 (SD 0.88; 74.87%). Additionally, 96.08% of nurses expressed a strong desire for diabetes-related training, particularly in theoretical knowledge, clinical care skills, and health education. Nearly all participants agreed that uniform and systematic training was necessary, with many favoring a model in which centralized education is followed by individualized mentorship. However, work-related time constraints were identified as the primary barrier to participating in such programs. Strengthening the diabetes-related skills of non-endocrinology nurses could improve patient outcomes, particularly in rural and underserved areas where access to specialist care is limited. Ultimately, investing in continuing education for nurses is a strategic step toward enhancing the quality of diabetes care and addressing broader health disparities.

Patient Knowledge

Two studies were conducted to evaluate the effect diabetes self-management education (DSME) has on knowledge. The first study was a strong institutional-based quasi-experimental study design conducted by Tamiru et al. (2023) and the second study was a moderate design

controlled before-and-after study by Hailu et al. (2019). Criteria for Tamiru et al. (2023) were adults' ≥ 18 years of age with T2DM who attended diabetes follow up at public hospitals in Ethiopia. Hailu et al. (2019) included adults with T2DM who were ≥ 30 years of age at time of diagnosis, and have or are taking oral hypoglycemic medications or insulin; also conducted in Ethiopia. The intervention groups in both studies received DSME for six months and the control groups received usual diabetes care. Both studies used various techniques of DSME such as lecturing, demonstration, observance, role-playing and problem-solving scenarios, illustrative handbooks and fliers, experience-sharing, and take-home activities.

The effectiveness of DSME was measured via the Diabetes Knowledge test consisting of 23 multiple choice questions in the Tamiru (2023) study. The results from the intervention group were 62.7% had low knowledge at baseline compared to 20.6% at the end of study; 25.5% had medium knowledge compared to 25.4%; and 11.8% had high knowledge compared to 54%. In the control group 66.7% had low knowledge at baseline compared to 65.7% at the end of study, 23% had medium knowledge compared to 21.7%; 10.1% had high knowledge compared to 12.5%. Baseline knowledge between both groups $p=0.245$ and end of study $p=0.0001$. Hailu et al. (2019) measured knowledge via 20 questions. The intervention group scored 10.41 out of 20 at baseline compared to 11.33 out of 20 at endpoint SD 0.25. The control group scored 10.52 at baseline compared to 10.61 at endpoint SD 0.27. Diabetes knowledge score increased by 0.76 in the intervention group and decreased by 0.16 in the comparison group from baseline at endpoint ($p=0.044$).

Tamiru et al. (2023) had an overall medium quality study. Participants were adults with T2DM who are attending diabetic follow up clinics. This excludes those that are not receiving routine diabetes care and education. There was a lower level of education in the control group as the majority of participants were primary school educated. Assessors and participants were not blinded. Even though $>80\%$ completed the study, only 126 participants finished in the intervention

group compared to 152 in the control group. Hailu et al. (2019) had an overall low-quality study. Participants were from a single source, which may have excluded others from the population, and <80% of participants completed the study with rates differing between intervention and control group. Patients were not classified according to their use of oral hypoglycemic medications or insulin. Patients using different medications may have reacted differently to DSME sessions. Intervention and comparison groups were from the same hospital and at times appointments did overlap; there may have been information spillover. The low attendance rates likely diluted the effects of the intervention as all participants were included in the analysis regardless of sessions attended. The nurses were recruited from different units at the same hospital, which may have influenced social desirability bias among the respondents.

Canadian Diabetes Risk Questionnaire

Public Health Agency of Canada developed the Canadian Diabetes Risk Questionnaire (CANRISK) as a tool to help Canada's multiethnic population identify their risk of developing prediabetes or diabetes. Furthermore, the CANRISK tool supports early detection of diabetes and prediabetes while promoting awareness of the diabetes risk factors (Lemieux et al., 2020).

Talbot & Dunbar (2011) conducted a population-based screening initiative for prediabetes and undiagnosed T2DM in rural Nova Scotia using a mailed survey, followed by community-based lifestyle interventions. The CANRISK questionnaire was mailed to all households within two health regions targeting adults ages 40–74 without prior diabetes diagnoses. Respondents were invited to complete an oral glucose tolerance test (OGTT). Among 417 participants, 84% had normal glucose levels, 13% had prediabetes, and 3% had undiagnosed T2DM. Higher CANRISK risk scores were significantly associated with abnormal glycemic status; specifically, factors such as BMI ($p<0.01$), waist circumference ($p<0.01$), history of hypertension ($p<0.01$), prior hyperglycemia ($p<0.01$), education level ($p=0.04$), and perceived

health status ($P < 0.01$) were significantly correlated with glucose abnormalities. Despite the identification of 54 individuals with prediabetes, only 19 (35%) participated in the offered community-based lifestyle intervention, highlighting a gap between screening and program engagement.

Physicians were invited to complete a feedback form anonymously after the project to understand their perceptions of this population-based T2DM screening. Of those invited, 22% ($n=25$) responded. Among respondents, 40% reported that the CANRISK screening process had no impact on their clinical practice. However, 60% noted a minimal to moderate impact, primarily through facilitating conversations about positive lifestyle changes with patients and aiding in the identification of previously undiagnosed cases of prediabetes or diabetes (40%). These findings suggest that while the perceived impact on workflow was limited, the screening initiative offered value in supporting preventive care and early detection.

The study offers moderate quality evidence for the feasibility of mailed screening using CANRISK in rural settings, with sound methodology for diagnostic processes and intervention design. However, limitations in representativeness, response rate of 400 participants completing the CANRISK and 25 physicians completing the questionnaire, and scalability reduce its strength and external validity. Additionally, this is not a randomized trial and a screening and community program. There is potential selection bias (those who responded may differ systematically).

Diabetes Prevention Programs

Rintamäki et al. (2021) evaluated the long-term effectiveness of a lifestyle intervention aimed at preventing T2DM in high-risk individuals within a primary healthcare setting. The study focused on the impact of weight loss achieved during a one-year intervention on the subsequent incidence of T2DM, cardiovascular events, and all-cause mortality. This moderate

design prospective cohort study was based on data from the Finnish Diabetes Prevention Program (FIN-D2D), with a 7.4-year follow-up of participants recruited between 2003 and 2008 across five hospital districts in Finland. Participants ($N = 2,730$) were adults aged 18–87, identified as high-risk for type 2 diabetes using the Finnish Diabetes Risk Score (FINDRISC ≥ 15), history of impaired fasting glucose, impaired glucose tolerance, ischemic cardiovascular disease, or gestational diabetes. The predominantly Finnish study population may limit the generalizability of findings to other ethnic or cultural groups. Sociodemographic and health-related data were collected via self-administered questionnaires, which may introduce some self-report bias; however, participants also underwent laboratory assessments to provide objective health measures.

The intervention was delivered through over 400 primary and occupational healthcare clinics, where trained nurses conducted brief interviews, collected body metrics, and provided lifestyle counselling focused on diet, physical activity, and weight management. Counselling was offered individually or in groups, with frequency and intensity tailored to local resources. Variation in intensity and frequency of initial intervention could affect intervention fidelity and reproducibility.

Over the follow-up period, 594 participants initiated glucose-lowering medication. The overall incidence of diabetes was 33.2 cases per 1,000 person-years (95% CI: 30.6–36.0), with an annual conversion rate of 0.8%. Weight loss during the intervention was associated with a significantly reduced risk of drug-treated diabetes. Compared to those with stable weight, participants who lost 2.5–4.9% and $\geq 5\%$ of body weight had a 37% (HR = 0.63, 95% CI: 0.49–0.81, $p = 0.0001$) and 29% (HR = 0.71, 95% CI: 0.56–0.90, $p = 0.004$) reduction in risk, respectively, after adjustment for baseline characteristics. Weight gain of $\geq 2.5\%$ tended to increase diabetes risk (HR=1.22, 95% CI: 0.99–1.51, $p=0.059$).

During follow-up, 143 cardiovascular events and 53 deaths were recorded, with no statistically significant differences across weight change groups. This suggests that while weight loss effectively reduces diabetes risk, its impact on cardiovascular outcomes and mortality within the study period was neutral. Overall, the study underscores the value of structured lifestyle interventions delivered through primary care in reducing diabetes incidence among high-risk individuals. It also supports the FINDRISC tool as an efficient method for identifying individuals who may benefit from preventive interventions.

Fukuoka et al. (2015) demonstrated that a mobile phone-based DPP led to meaningful weight loss, reduced blood pressure, and improved physical activity in adults at risk for T2DM. Participants achieved a mean weight loss of 6.8%, with nearly a third reaching the full 10% goal. The success of the DPP was largely attributed to increased physical activity and decreased intake of saturated fats; both of which are modifiable risk factors for T2DM (Arya, 2023). Similarly, Fitzpatrick et al. (2022) found that older adults who enrolled in a digital DPP experienced greater weight loss and lower diabetes incidence over 24 months than nonparticipants. These outcomes are particularly relevant for older, mobility-limited, or geographically isolated populations in NL. Finally, Murfet et al. (2022) emphasized that limited access to diabetes-competent care increases the risk of preventable complications, financial hardship, and reduced quality of life; outcomes that could be mitigated through proactive, accessible virtual and mobile outreach.

Fukuoka et al. (2015) and Fitzpatrick et al. (2022) demonstrate that digital DPPs can lead to meaningful weight loss, improved physical activity, and reduced risk of developing T2DM. Additionally, mobile delivery models increase patient engagement and self-efficacy by providing accessible, flexible, and personalized care. However, several weaknesses must be acknowledged. There may be limited digital literacy and internet access in rural communities, particularly among older adults or low-income populations (Lee et al., 2020). Infrastructure challenges such

as lack of broadband internet, low smartphone ownership, or inconsistent power supply can hinder the successful deployment of virtual services (Graves et al., 2021). Furthermore, some patients may prefer in-person interaction, which digital-only platforms cannot fully replicate, and may require training in virtual service delivery (Moulaei et al., 2023). Despite these risks, mobile and virtual diabetes prevention programs, when designed with equity and accessibility in mind, represent a promising and Health Accord-aligned solution to reducing the burden of T2DM in NL.

Diabetes Self-Management Education Programs

Self-management education (SME) is a process to facilitate individuals in decision-making, resulting in improvements in variables such as knowledge, attitudes and self-efficacy, as well as improvements in healthy behaviors and clinical outcomes (Diabetes Canada, 2018). A person living with diabetes will often make daily, and sometimes hourly, decisions which impact their disease. Diabetes self-management is the process of gaining the knowledge and skills necessary to make better informed decisions, improving self-care behaviors, and incorporating active collaboration with health care providers to improve health status and QOL (Powers et al., 2016). Health care providers educate and empower a person with diabetes to make day-to-day decisions to improve their diet, activity level, and medication adherence (Diabetes Canada, 2018).

Three studies were conducted to evaluate the impact DSME had on glycemic control, in particular hemoglobin A1C (HbA1C). Two of these studies were randomized controlled trials (RCT) and the other was case controlled. All studies were conducted at a tertiary care facility. The first RCT was from a hospital in India and lasted for 3 months (Anjali et al., 2023), the second RCT was located in China and lasted 6 months (Ji et al., 2019), and the third was a case-controlled study, also located in India, and lasted 4 months (Chawla et al., 2019). Given the

cultural differences and location of studies we cannot generalize these results to the Canadian population. All studies measured HbA1C levels at baseline and compared outcomes to the end of the study value. Criteria for Anjali et al. (2023) was ≥ 30 years of age, recent HbA1C completed within the last 3 months, Hindi speaking; Ji et al. (2019), was ≥ 18 years of age, documented diagnosis of T2DM, taken or had taken insulin or oral hypoglycemic drugs for >1 year, HbA1C value during the last 6 months ≥ 7.5 ; and Chawla et al. (2019), was ≥ 40 years of age with normal cognition. All groups used various techniques of DSME to teach the general topics of diet, exercise, medication, problem solving, risk reduction, and self-monitoring of blood glucose. In the Anjali et al. (2023) study, the control group received routine diabetes outpatient care, while the intervention group also received additional educational sessions in conjunction with use of a self-care educational app. A similar design was used by Ji et al. (2019) wherein the control group received DSME while the intervention group received additional education along with role-playing and follow-up education by a case manager. In the case-controlled study by Chawla et al. (2019), the control group did not receive any education, while the intervention group received DSME, along with a take home leaflet to supplement knowledge.

All participants in the interventions and case groups were educated on diabetes self-management which resulted in an improvement in HbA1C results when compared to baseline. Anjali et al. (2023) found intervention baseline HbA1C of 9.0% improved to 7.7% at 3 months, mean difference -1.3%, SD 0.4, p value 0.001, while the control group saw an insignificant improvement from baseline of 9.9% to 9.8% at 3 months, mean difference -0.1%, SD 0.6, p value 0.17. Ji et al. (2019), improvements were achieved in both groups, as both received DSME, but the results in the intervention group were superior. Control group baseline HbA1C was 10.45% compared to 8.35% at 6 months, SD -2.10, $p = < 0.001$; intervention group baseline 10.49% compared to 7.22%, SD -3.27, $p = < 0.001$. Chawla et al. (2019) did not see any

significant improvement in HbA1C in the control group, likely as no education was received, $p=0.159$. In the intervention group 60% of participants were in the target range for HbA1C, at 7%, compared to starting with no participants in this range, $p=0.01$.

Both studies using RCTs were of a strong design compared to a moderate design of the case-controlled study. The quality of study for Anjali et al. (2023) was moderate due to the loss of participants by 9% in the intervention group and 15% in the control group. This may be due to covid-19 restrictions during the time of the study. Other studies did not have a significant loss of participants and were a stronger quality. In all three studies, long term validity was not tested, and they were conducted between three and six months. A longer duration could have assessed whether the interventions maintained improvement in HbA1C or if the knowledge and education need to be reinforced to maintain effects. Another limitation in all three studies was the use of only one source, a tertiary care hospital. In order to make it a stronger representation, a larger geographical area or multiple care settings could have been used. All studies were approved by the ethics board and were clearly focused with measurable outcomes, being HbA1C.

Health Coaching

Bilgehan & Inkaya (2025) evaluated the impact of Holistic Nurse Coaching (HNC) on glycemic control, diabetes self-management, and patient empowerment among individuals with T2DM. This randomized controlled trial compared the HNC intervention, a standard diabetes education group, and a control group that received no additional support. A total of 102 participants were recruited based on clearly defined inclusion criteria, and they were randomly assigned to one of the three groups. Inclusion criteria were: between the ages of 18 and 65; owning and actively using a smartphone; diagnosed with T2DM for at least one year with an HbA1c level > 7 ; having no diagnosed psychiatric disorders; able to speak, understand, read, and write in Turkish; and voluntarily agreeing to participate in the study.

The diabetes education group received structured diabetes education that was conducted online. Educational content was delivered via PowerPoint presentations, incorporating relevant visuals and utilizing an interactive teaching approach over 9 sessions. The HNC group received nine individualized online coaching sessions over 12 weeks. Interviews were tailored to the specific needs of each person with diabetes using established coaching materials and techniques, adapted to the counselee's personal agenda and goals such as planning checklist, a coaching preparation form, a daily habit follow-up chart, a priority focus, the diabetes wheel of life, visualizations, SMART goal setting and priority diabetes management. The participants in the control group had previously received at least one diabetes education session from a diabetes nurse. Outcomes were assessed using valid and reliable tools, including HbA1c levels for glycemic control, the Diabetes Empowerment (DES) Scale, and the T2DM Diabetes Self-Management Scale (T2DM-DSMS).

There were no statistically significant differences between the education, coaching, and control groups at baseline in terms of diabetes self-management (T2DM-DSMS), diabetes empowerment (DES), or HbA1c levels ($p > 0.05$), indicating that all groups were comparable prior to the intervention. However, post-intervention results revealed statistically significant differences across all three measures ($p < 0.05$). Specifically, participants in the control group scored significantly lower on the T2DM-DSMS scale compared to those in both the education and coaching groups, with very large effect sizes of $d = 1.544$ and $d = 3.483$, respectively. Additionally, those in the education group scored significantly lower than the coaching group, with an effect size of $d = 1.856$, also indicating a very large effect. These findings suggest that while both education and coaching interventions improved diabetes self-management outcomes, the coaching intervention had the most substantial impact.

One of the study's strengths was its 100% follow-up rate, reducing the risk of attrition

bias. However, the study's generalizability is limited due to its single-site setting in Turkey and culturally specific sample. Moreover, the short follow-up period, three months, restricts conclusions about the long-term sustainability of the intervention's effects. Despite these limitations, the study demonstrates moderate to high methodological quality and provides compelling evidence that holistic, individualized nursing interventions can significantly enhance diabetes management outcomes. Their findings highlight that beyond standard diabetes education, nurses can provide tailored, motivational coaching that strengthens patients' confidence and skills in managing their condition.

The critical review of the literature demonstrates that DSME is effective in enhancing knowledge among both healthcare providers and patients. Studies consistently show that DSME interventions are effective in improving self-care behaviors, and achieving better glycemic control. However, significant gaps exist in the current body of research, particularly within the Canadian context. There is a noticeable lack of studies conducted in NL, and very limited research focused on the unique needs of rural and remote communities, where challenges such as limited healthcare access, lower health literacy, and socioeconomic barriers are more pronounced. Addressing these gaps in knowledge among both healthcare providers and individuals living with diabetes is essential to improving health outcomes, reducing complications, and ensuring equitable access to care across diverse and underserved populations. Furthermore, many existing studies are short-term and conducted in healthcare systems that differ from Canada's, limiting the generalizability of their findings. The findings also suggest that ongoing professional development is critical to enhancing the competency of non-endocrinology nurses in diabetes management. To be effective, training programs must be practical, accessible, and specifically tailored to the unique needs and constraints of this workforce, particularly those working in primary care and rural settings. These gaps highlight the

urgent need for locally tailored, culturally relevant, and accessible diabetes education resources in NL. Developing such resources has the potential to bridge existing disparities, enhance diabetes outcomes, and support equitable access to healthcare for underserved populations, particularly in rural regions.

Theoretical Framework

A variety of health care professionals including nurses, physicians, dietitians, pharmacists, and community health workers can all provide a variety of diabetes education. Diabetes education incorporates cognitive behavioral interventions, goal setting, self-monitoring of health parameters, dietary modifications, and physical activity; all of which can be delivered via group and individual counselling sessions, as well as strategies that use technology (e.g. mobile phone apps) (Diabetes Canada, 2018). Health care providers educate and empower a person with diabetes to make day-to-day decisions to improve their diet, activity level, and medication adherence (Diabetes Canada, 2018). Diabetes self-management education (SME) has progressed beyond traditional lecture-based approaches to include a wide range of educational, psychological, behavioral, and collaborative methods that are customized to meet each individual's unique needs. Additionally, SME involves any educational efforts aimed at equipping individuals with the knowledge and skills necessary to make informed decisions and to build their confidence and ability to apply these skills in everyday life. Furthermore, these programs often integrate training in both technical skills and strategies for managing the medical, behavioral, and emotional aspects of living with diabetes (Diabetes Canada, 2018).

Dorothy Orem's Self-Care Deficit Theory

Dorothy Orem's self-care deficit nursing theory identifies nursing as assisting others in providing and managing self-care to maintain or improve human functioning at the home level of effectiveness (Jandaghian-Bidgoli et al., 2024). According to Orem, humans can take care of

themselves; if this ability is disturbed, nurses help them regain it. It focuses on each individual's ability to perform self-care and manage their own health, provided they have the necessary knowledge, skills and motivation. When individuals cannot meet their self-care needs, a self-care deficit occurs, and the nurse provides support to bridge the gap between their abilities and needs.

Orem's theory considers patients as active participants in their care, capable of making appropriate health decisions for themselves, rather than recipients of care (Khademian et al., 2020). Furthermore, Orem's theory recognizes that self-care is not just a medical intervention, but a personal one that connects how humans understand and express their own well-being. Orem's theory recognizes humans as holistic, capable of self-care, yet at times vulnerable and dependent on the nurse to assist when experiencing a self-care deficit.

Nursing empowerment means the ability to effectively motivate and mobilize oneself and others to achieve positive outcomes in both nursing practice and the work environment (Radhakrishnan & Anuchithra, 2016). Orem's theory emphasizes empowerment by recognizing the lived experiences of each patient, promoting their self-care agency, and fostering a collaborative relationship in which patients actively participate in managing their health based on their unique needs and circumstances. This collaborative process strengthens the nurse-client relationship, where the nurse values the patient's meaning and values. Client empowerment is crucial for establishing nurse-patient relationships. It facilitates the development of client confidence and satisfaction with the health services provided by nurses (Akpotor & Johnson, 2018).

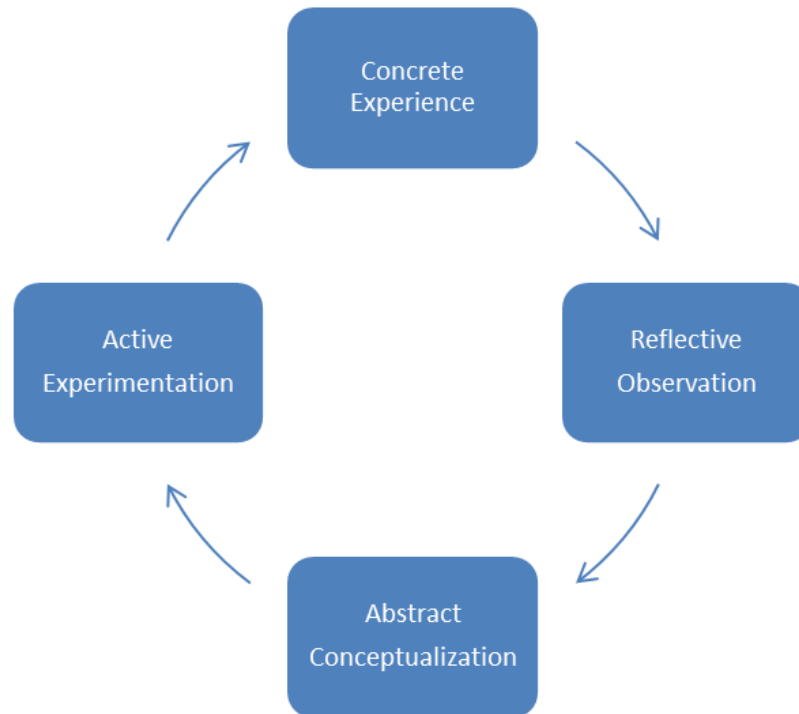
This resource manual is grounded in Dorothy Orem's Self-Care Deficit Nursing Theory, which emphasizes the nurse's role in supporting patients who are unable to meet their own self-care needs. This theory underpins the manual's focus on patient empowerment, collaboration, and restoration of self-care agency in individuals living with diabetes.

Experiential Learning Theory

To operationalize patient education and behavior change, the manual also draws on Kolb's Experiential Learning Theory (ELT). Kolb's (1984) ELT offers a widely recognized framework that explains learning as a process in which knowledge emerges through the transformation of experience (as cited in Watson et al, 2025). The theory outlines a flexible, four-stage cycle consisting of concrete experience, reflective observation, abstract conceptualization, and active experimentation (see Figure 1). The first stage of concrete experience involves learners engaging directly in real situations, such as participating in rural health initiatives. The second stage, reflective observation, the learner will review the experience in order to understand and gain insight. In the third stage, abstract conceptualization, the learner will interpret their reflections, to learn new knowledge. Finally, in the fourth stage, active experimentation, learners apply their newly acquired knowledge in practice (Dhital et al. 2015). Furthermore, experiential learning is an approach that integrates education, work, and personal growth (Watson et al., 2025). In healthcare, Kolb's ELT values the opportunity to practice professional skills within real-world settings making it useful for designing educational approaches that build theoretical knowledge while also developing the competencies required for professional practice (Mukhalalati & Taylor, 2019).

Figure 1

Diagram of Kolb's Experiential Learning Theory



In designing a diabetes resource for nurses, ELT can ensure that the resource is not just theoretical but grounded in real practice and helps build professional competencies. In the concrete experience phase, nurses are able to engage in real or closely simulated diabetes situations such as conducting patient education on diet, exercise, and medication adherence for individuals living with T2DM in rural settings. During the reflective observation phase, nurses can reflect on their performance by facilitating discussions on what went well, what was challenging, and identifying knowledge or skill gaps. In the abstract conceptualization phase, nurses can integrate their reflections to integrate new knowledge, such as by integrating SMART (specific, measurable, achievable, relevant, time bound) goals principals into education plans. Nurses can then apply their new knowledge and understanding in the active experimentation. For the diabetes resource, this could include designing individualized care plans, integrating patient

education from the newly developed resource and implementing SMART goals with patients and evaluating outcomes to inform further cycles of learning.

To operationalize these theories, the diabetes education resource will include practical, modular content tailored to rural nursing practice in NL. Key topics such as: the pathophysiology of T2DM; lifestyle counseling including nutrition and physical activity; medication management and insulin initiation; goal-setting using the SMART framework; health literacy and patient education tools. The manual will also incorporate templates for personalized care plans. These resources will support nurses in applying theory to practice and delivering consistent, evidence-informed diabetes education across diverse care settings. Together, these theories support a nurse-led, patient-centered, and experiential approach to diabetes education, enabling nurses to tailor interventions to individual learning styles, readiness to change, and existing self-care abilities.

Nurses Role in DM

RN Scope of Practice

Nurses play a vital role in diabetes education, particularly in rural and remote areas of NL, where access to specialist care may be limited. According to the College of Registered Nurses of Newfoundland and Labrador (CRNNL) (2019), the nursing scope of practice includes delivering safe, ethical, competent, compassionate, client-centered, and evidence-informed care across the lifespan in response to individual needs. This involves conducting comprehensive, holistic assessments of clients' health, collaborating with both clients and interdisciplinary teams to develop tailored education plans, and implementing strategies to enhance health literacy. Nurses are expected to apply appropriate teaching and learning theories suited to diverse populations, taking into account factors such as age, family dynamics, and cultural background.

Furthermore, nurses are responsible for evaluating the effectiveness of their health teaching and making necessary adjustments to education plans (CRNNL, 2019). While CRNNL does not publish diabetes-specific education competencies, the outlined general competencies are consistent with the roles nurses fulfill in chronic disease management, including diabetes care.

Certified Diabetes Educator Credential

The development of a diabetes resource for nurses in NL aligns with the standards and certification processes established by the Canadian Diabetes Educator Certification Board (CDECB). The Certified Diabetes Educator (CDE) credential provides a nationally recognized standard for healthcare professionals involved in diabetes education and requires applicants to be regulated professionals with at least 800 hours of diabetes education experience in the past three years. The mandate of the CDECB is to provide a voluntary, accessible, valid and relevant process that recognizes multidisciplinary diabetes education specialists who are engaged in promoting the national standards of care for individuals and communities affected by diabetes (CDECB, n.d.). The development of a diabetes resource will help guide and prepare nurses, particularly those who may not yet qualify for certification but are actively involved in diabetes care, toward best practices and recognized standards. In NL, access to Certified Diabetes Educators may be limited, making it essential that registered nurses and other frontline providers have access to reliable, evidence-based tools. Ensuring timely access to nurses, primary care providers, and registered dietitians with diabetes expertise is a recognized best practice (Canadian Diabetes Association, 2014). A well-developed nursing resource on diabetes can bridge gaps in care by supporting nurses in delivering consistent, high-quality education and self-management support, especially in areas with limited specialist availability. Additionally, by incorporating national best practice guidelines, the resource will support community-based care

models that emphasize health promotion, complication prevention, and collaboration with local programs and support networks, aligning with Health Accord NL (2022). Ultimately, this initiative strengthens the diabetes care continuum in NL and supports nurses in advancing their role as competent, confident diabetes educators.

First Nations and Inuit Health Branch

The First Nations and Inuit Health Branch (FNIHB) guidelines further support nursing roles in diabetes care. These guidelines promote evidence-based and culturally safe care, clear direction on managing high-alert medications related to diabetes, and resources in the FNIHB nursing station formulary, which includes a dedicated section for diabetes management (Indigenous Services Canada, 2024). These standards reinforce the need for structured support materials for nurses working in remote and Indigenous communities, ensuring consistent, high-quality care.

RN Prescribers

In NL, Registered Nurses (RNs) who pursue additional education and meet regulatory requirements can expand their scope of practice to include prescriptive authority in certain contexts as authorized by CRNNL. RNs who have prescriptive authority can order laboratory, prescribe pharmacological and non-pharmacological interventions, provide nursing care, and make referrals within the CRNNL RN prescribing framework (CRNNL, 2022). This expanded scope is particularly important in rural and remote areas where access to physicians and endocrinologists may be limited. By enabling nurses to manage and adjust diabetes medications directly, care delivery becomes more efficient and responsive to patients' needs. Supporting RNs in their educational advancement toward prescriptive authority aligns with provincial healthcare strategies aimed at optimizing the nursing workforce and improving chronic disease management

(Government of NL, 2023). Therefore, developing a diabetes resource manual that supports both generalist RNs and those working toward advanced practice roles ensures nurses at all levels have access to evidence-based guidance, facilitating safe and effective diabetes care and medication management across NL. In addition to the various roles that nurses play, they operate within a broader healthcare system that supports and shapes their professional practice.

Healthcare Leadership

Canadian Nurses Association

The development of a diabetes resource for nurses directly aligns with the Canadian Nurses Association's (CNA) definition of nursing competencies, which include the knowledge, skills, judgment, and personal attributes required to practice safely and ethically in any given role or setting (CNA, 2019). This initiative supports the nursing profession's commitment to lifelong learning and continuing competence by providing nurses with access to current, evidence-based information essential for managing a complex and increasingly prevalent condition. Enhancing nurses' competence in diabetes care not only contributes to their professional growth and confidence but also ensures that the public receives safe, high-quality, and contemporary care. As self-regulated health-care professionals, registered nurses play a vital role in promoting health, coordinating care, and supporting clients in managing chronic conditions across all stages of life (CNA, 2015). A diabetes-focused resource strengthens this role by equipping nurses with the tools and knowledge necessary to guide patients in areas such as medication management, lifestyle modification, nutrition, and self-monitoring.

Health Accord NL

A key consideration in developing a diabetes education resource is ensuring alignment with Health Accord NL, the province's 10-year healthcare transformation plan. Health Accord

NL (2022) prioritizes shifting care from hospitals to community-based models, advancing health equity, expanding virtual and digital health infrastructure, and forming interprofessional Family Care Teams. These objectives underscore the need for diabetes education resources to be flexible, scalable, and integrated into primary care workflows.

The development of a diabetes education resource for nurses directly aligns with several key goals and actions outlined in Health Accord NL (2022), especially as they relate to sustainability, chronic disease management, workforce optimization, care coordination, and access. The creation of a diabetes education resource for nurses strongly supports the Health Accord NL's 2022 vision of a sustainable, equitable, and integrated health system that delivers care closer to home, especially in rural and remote communities. By equipping nurses with standardized, evidence-informed, and user-friendly tools to deliver diabetes self-management education (DSME), the initiative ensures that care is delivered in the right place, at the right time, by professionals working to their full scope of practice (Action 9.8).

This resource will support models of care that promote self-management and prevention (Action 9.3), a cornerstone of chronic disease management. Empowering nurses to deliver education tailored to the needs of their clients helps reduce unnecessary travel, minimize system strain, and support sustainability in service delivery (Action 9.11). In addition, the manual will promote health literacy, help clients navigate available services, and serve as a centralized, accessible source of information, in alignment with Action 9.2.

Given ongoing concerns around workforce recruitment and retention, especially in rural areas, the resource also addresses Action 10.6 and Action 10.11 by enabling nurses to work at their highest level of training, reinforcing their role in chronic disease prevention and health

promotion. This can help increase job satisfaction, optimize team-based care, and support system-wide education initiatives through clearly guided, context-specific teaching materials.

Summary

Nurses play a pivotal role in diabetes education and management, particularly in rural and remote areas of NL where specialist access is limited. RNs provide essential, client-centered, evidence-informed care that includes comprehensive assessments, tailored education, and ongoing evaluation, all within their regulated scope of practice (CRNNL, 2019). While RNs deliver foundational diabetes education and support, certification as a CDE enhances their expertise, enabling them to provide specialized, high-quality care aligned with national standards (CDECB, 2025). Further expansion of nursing roles, including prescriptive authority through advanced practice positions such as RN prescribers, enhances access to timely diabetes management and medication adjustments. This is particularly crucial in underserved communities, ensuring that patients receive continuous, integrated care close to home. The development of a diabetes education resource for nurses in NL is both timely and necessary. It aligns directly with the strategic goals of Health Accord NL's 10-year healthcare transformation plan, which emphasize shifting care from hospitals to community-based, integrated, and sustainable models (Health Accord NL, 2022). By equipping nurses with standardized, evidence-based, and user-friendly tools to deliver diabetes self-management education, this resource supports workforce optimization, care coordination, and improved health equity across diverse populations. Such a resource can empower nurses to work at their full scope of practice, support self-management and prevention, reduce system strain, and promote health literacy among patients. Overall, this initiative has the potential to strengthen diabetes care

in NL, ensuring accessible, high-quality, and culturally appropriate care for individuals living with diabetes.

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Appendix B: Literature Summary Table

Key Question:

Legend: DSME: Diabetes self-management education; DSME + SE + CM: Diabetes self-management education + simulation education + case management; FINDRISC: Finnish Diabetes Risk Score; HbA1C: hemoglobin A1C; RCT: randomized controlled trial; T2DM: Type 2 Diabetes Mellitus.

Study/Design	Methods	Key Results	Comments
Tamiru et al. (2023) Quasi-Experimental NRCT <u>Purpose:</u> To assess the effect nurse-led DSME has on self-care knowledge and behavior	N: 321 participants ≥ 18 years of age with T2DM Setting: Public hospitals in the Ilu Aba and Buno Bedelle zones of southwest Ethiopia <u>Intervention group:</u> - Nurse-led DSME education every two weeks for six months along with their usual care - Topics were healthy eating, physical activity, monitoring, medication administration, problem solving, healthy coping and risk reduction. 153 participants, 126 completed <u>Control group:</u> - Usual diabetes follow-up care 168 participants, 152 completed <u>Data collection and outcomes:</u> - The Diabetes knowledge test (DKT) 23 multiple choice questions. Correct scores were graded as 1 and incorrect was 0. Results were reflected as a % of participants with low, moderate, or high knowledge and reflected in a p value.	<u>Intervention:</u> 62.7% had low knowledge at baseline compared to 20.6% at end of study 25.5% had medium knowledge vs. 25.4% 11.8% had high knowledge v.s. 54% <u>Control:</u> 66.7% low knowledge vs. 65.7% 23% had medium knowledge vs. 21.7% 10.1% had high knowledge vs. 12.5% - Baseline knowledge between both groups $p=0.245$ - End of study $p=0.0001$	<u>Strength of Design:</u> Strong – Quasi-experimental <u>Quality:</u> Medium - Participants were attending diabetic follow up clinics at the 4 hospitals excluding those that are not receiving routine diabetes care and education. - Random sampling was not used - Higher level of education in the intervention group compared to the control group. Majority of participants in the control group were primary school educated. - Assessors and participants were not blinded - Differences in dropout rates. $>80\%$ completed the study, 126 participants finished in the intervention group compared to 152 in the control group - Unable to generalize results as not a Canadian study

Study/Design	Methods	Key Results	Comments
Hailu et al., (2019) Controlled before-and-after clinical study design <u>Purpose:</u> To assess the effect nurse-led DSME has on knowledge, self-care behavior, and self-efficacy among adults with T2DM	N: 220 participants with T2DM $\geq$ 30 years of age at time of diagnosis that have or are taking oral hypoglycemic or insulin. Country/setting: Jimma University Medical Center in Ethiopia <u>Intervention:</u> - Six interactive DSME sessions were delivered by illustrative handbooks and fliers, experience-sharing, and take home activities were administered by 2 nurses during a six month period 116 participants, 78 completed <u>Control:</u> - Received usual diabetes care 104 participants, 64 completed <u>Data collection:</u> - Diabetes knowledge Scale. 20 questions were coded as 1 for correct and 0 for incorrect. The higher the score the more knowledgeable the participant	Knowledge <u>Intervention:</u> Baseline 10.41 out of 20; 11.33 out of 20 at endpoint SD 0.25 <u>Control:</u> 10.52 at baseline; 10.61 at endpoint SD 0.27; $p=0.05$ - DKS increased by 0.76 intervention group and decreased by 0.16 ($p=0.044$)	<u>Strength of Design:</u> Moderate <u>Controlled before and after</u> <u>Quality:</u> Low <80% of participants completed the study and rates differed; 116 in intervention, 104 comparison - Single source that may have excluded others from the population - Patients not classified according to their medications. Patients using different medications may have reacted differently to DSME sessions and responded to questioners differently - Both groups were from the same hospital, and appointment times did overlap at times. May have been information spillover - Low attendance rates likely diluted the effects of the intervention as all participants were included in the analysis regardless of attendance - The nurses were recruited from different units at the same hospital which may have influenced social desirability bias among the respondents - Unable to generalize results as not a Canadian study

Study/Design	Methods	Key Results	Comments
Rintamäki et al. (2021) Design: Prospective cohort <u>Purpose:</u> To evaluate how weight loss during a one-year intervention influenced the incidence of T2DM, cardiovascular events, and all-cause mortality over a 7.4-year follow-up	N = 2,730 Finnish adults (18-87 yrs), FINDRISC (>15), IFG, IGT, CVD, or gestational diabetes Setting: Five hospital districts in Finland Initial Intervention: - Completion of a structured 1-year lifestyle intervention focused on diet, physical activity, and weight loss by trained nurses. - Frequency/intensity adapted to local resources Group 1: ≥2.5-4.9 % weight loss Group 2: ≥5% weight loss Group 3: ≥2.5% weight gain <u>Data collection and outcomes:</u> BMI, health status, regular medications, Drug treated DM, CV events, all-cause mortality, collected from nationwide health registers <u>Analysis:</u> - Cox proportional hazard models	T2DM incidence: 33.2 cases per 1,000 person-years (95% CI: 30.6–36.0) = 0.8% ≥2.5-4.9% weight loss 37% reduction in drug-treated T2DM (HR 0.63, CL 0.49-0.81, p=0.0001) ≥5% weight loss 29% reduction (HR = 0.71, CL 0.56,-0.90, p= 0.004) ≥2.5% weight gain (HR = 1.22, CL 0.99-1.51, p= 0.059) 143 CV events and 53 deceased - no statistically significant difference among weight change group	<u>Strength of Design: Moderate</u> <u>Quality: Medium</u> - Variation in intensity and frequency of initial intervention could affect intervention fidelity and reproducibility. - The degree of adherence to the intervention protocol across sites is unclear. - Limited ethnic diversity - Lack of a control group reduces internal validity and the ability to attribute outcomes solely to the intervention. - Potential reporting bias with self-report questionnaires

Study/Design	Methods	Key Results	Comments
Anjali et al. (2023) Design: RCT <u>Purpose:</u> To study the effect DSME has on HbA1C	N: 106 participants ≥ 30 years of age with T2DM, Hindi speaking Setting: Tertiary care center in North India <u>Intervention</u> Group: - Received routine outpatient diabetes care - Two 60 minute education sessions, 15 days apart on general awareness of diabetes, diet and exercise, foot care, medication adherence, blood glucose monitoring, risk reduction strategies, and healthy coping skills. - Added to the WhatsApp to share diabetes routines, blood sugar values, and success stories. 53 participants at baseline, 48 analyzed <u>Control</u> Group: - Received routine outpatient diabetes care. 53 Participants at baseline, 45 analyzed <u>Data collection and outcomes:</u> - HbA1C lab values at baseline and 3 months <u>Analysis:</u> - Mean scores calculated as a percentage with SD.	Difference in HbA1C at 3 months compared to baseline. - Statistically significant improvement in the intervention group HbA1C: <u>Intervention:</u> Baseline 9.0% vs 7.7% at 3 months. Mean difference -1.3%; SD 0.4 - p value 0.001 <u>Control:</u> Baseline 9.9% vs 9.8% at 3 months. Mean difference -0.1%; SD 0.6 - p value 0.17	<u>Strength of Design:</u> Strong <u>Quality: Medium</u> - Long term validity was not addressed - Loss of participants, 9% in intervention group and 15% in control group - Covid-19 lockdown may have affected medication adherence and subsequent follow-ups - Education tools of charts/visuals and PowerPoints were designed in Hindi. Although, this can be easily translated to an alternate language for implementation.

Study/Design	Methods	Key Results	Comments
Ji et al. (2019) Design: RCT <u>Purpose:</u> To analyze the effect DSM and Case management have on HbA1C	N: 100 participants ≥ 18 years of age with T2DM, HbA1C ≥ 7.5 within past 6 months, taken prior or currently insulin or oral hypoglycemic medications Setting: Danyang People's Hospital, Jiangsu, China <u>DSME:</u> 2 hour group education for 2 weeks, 2 x 30 minute education sessions, on diet, exercise, self-monitoring of blood glucose, medication adherence, and problem solving and risk reduction strategies. 50 participants, 46 analyzed <u>DSME + SE + CM:</u> - Same education as DSME group 50 minute video sessions for 5 sessions, focusing on diabetes knowledge, insulin injection, diet and exercise. Followed by role play of actors. - Case manager would follow up once a month for 30 minute sessions either in person or on the phone. Group sessions every 3 months focusing on realistic goals of activity, diet, strategies to overcome barriers and food preparation demonstrations. 50 participants, 45 analyzed <u>Data collection and outcomes:</u> - HbA1C lab values at baseline and 6 months <u>Analysis:</u> - Mean scores calculated as a percentage with SD	Difference in HbA1C at 6 months compared to baseline - Improvements in both groups were significant but more superior in the DSME +SE +CM HbA1C <u>DSME</u> 10.45% compared to 8.35% at 6 months SD -2.10 $p = < 0.001$ <u>DSME + SE + CM</u> 10.49% compared to 7.22%, SD -3.27 $p = < 0.001$	<u>Strength of Design: Strong Quality: High</u> - The characteristics of the study population are similar. In order to make it a stronger representation, a larger sample size would need to be represented. - Interventions are highly likely to be readily implemented into other settings. Considering the economic burden of diabetes, integrating this program into the existing health care system should provide cost effective and efficient care. The various techniques used i.e. role playing, educational videos, group settings are all feasible. However, a constriction could be the need for an increase in patient-educator contact hours.

Study/Design	Methods	Key Results	Comments
Chawla et al. (2019) Case - Control Study <u>Purpose:</u> To assess the impact DSME has on HbA1C	N: 100 participants $\geq$ 40 years of age with T2DM Setting: Department of Medicine of a tertiary care teaching hospital in North-West India <u>Case Group:</u> - Health education on their disease, medications, dietary, and lifestyle modifications 2 follows ups after 2 months each - Patient education leaflet to compliment verbal counselling 50 participants <u>Control:</u> - No education was provided 50 participants <u>Data collection and outcomes:</u> HbA1C values were assessed at baseline, and at final follow-up <u>Analysis:</u> Mean scores calculated as a percentage	HbA1C significantly improved in case group but not in control group HbA1C Case group: - Baseline 44% cases had HbA1C 7.1-8%; 34% between 8.1-9%, 22% between 9.1-10% - Follow-up 60% at 7%; 22% between 7.1-8%, 18% between 8.1-9% - p=0.01 Controls: - Baseline 26% between 7.1-8%, 60% between 8.1-9%, 14% between 9.1-10% - Follow-up: 26% between 7.1-8%, 60% between 8.1-9%, 14% between 9.1-10% - p value= 0.159	<u>Strength of Design:</u> Moderate <u>Quality:</u> High - This is a case control study. It could have been stronger if they had used RCT - Participants were from a single source, a tertiary teaching hospital in North-West India. It could have been stronger if recruited from a variety of locations and used a larger sample size. - Assessors were not blinded but were likely trained in data collection as the study was conducted at the department of medicine

Appendix C

Consultation Report for the Development of a Diabetes Resource to Support Nursing Practice and Patient Education in Newfoundland and Labrador

Newfoundland and Labrador (NL) has the highest prevalence of diabetes in the country, with approximately 33% of its population, or 170,000 individuals, living with diabetes or prediabetes, representing roughly a 300% higher rate compared to provinces such as Alberta. Additionally, this figure is projected to increase by 20% over the next decade (Diabetes Canada, 2024). Rural and remote communities experience significant disparities in access to diabetes education and care, largely due to limited resources, workforce shortages, and fragmented services (Diabetes Canada, 2025). Action 9.3 of Health Accord NL (2022) explicitly calls for strengthened community-based care and chronic disease management, particularly in underserved regions. A key part of achieving this goal is ensuring that frontline healthcare workers, particularly nurses, are equipped with practical tools to deliver timely, consistent diabetes education.

To help address this critical gap, this practicum project proposes the development of a comprehensive, easy-to-use diabetes resource that can be accessed by nurses and shared directly with patients. The resource will consolidate current, evidence-based educational materials, clinical tools, and region-specific resources, supporting consistent diabetes care and empowering nurses to respond quickly and confidently. By providing nurses with practical, point-of-care materials, this resource will enhance their capacity to deliver patient-centred diabetes education, support self-management, and promote early intervention. In turn, the resource has the potential to assist in educating about early recognition of changes or potential complications, improve patient outcomes, reduce delays in access to diabetes care, and strengthen health equity in rural and remote communities. Most importantly, it supports the delivery of diabetes care in a way that aligns with provincial priorities and responds directly to the needs identified by frontline healthcare workers and patients.

Consultations

Consultations were conducted to gather insights from healthcare professionals regarding diabetes education practices and resources across Newfoundland and Labrador Health Services (NLHS) to ensure that the development of the diabetes resource is informed by the real experiences and needs of healthcare professionals, intended users of the resource. The specific objectives of the consultations were:

1. Explore existing education tools or resources that are currently used by nurses providing diabetes education, and whether the information is current and aligned with best practices.
2. Using interviews and focus groups with nurses, to identify gaps in resources and challenges associated with the use of the resources and determine if there is consistency of resources across different areas in primary health care.
3. Using interviews and focus groups with nurses, to explore nurses' experiences with delivering diabetes education, nurses' perceptions of patient education requirements, preferred education delivery formats, and how they manage challenges in resource availability.
4. Using interviews and focus groups with certified diabetes educators, dietitians, and primary care providers, to gather insights regarding best practices, education delivery methods, and interprofessional strategies that support consistent and effective diabetes education.
5. Use information from the critical review, interviews, and focus groups from all participants to inform the content, structure, and delivery method for a new diabetes education resource to ensure it is user-friendly, relevant, and meets the needs of the

frontline nurses providing education to patients living with diabetes.

Participants were identified and recruited via the rural and remote health huddles which are collaborative, multidisciplinary meetings held weekly with the Labrador-Grenfell Zone of NLHS. These huddles invite all regional/remote nurses, regional directors, primary care physicians, and nurse educators for the Labrador Grenfell Zone. The purpose of these huddles is to share updates, address specific challenges in rural and remote healthcare delivery, and provide education to staff. Additionally, CDEs, dietitians, frontline primary care nurses, and providers were recruited via a letter distributed through emails with information on the purpose of my practicum. (see **Appendix A: Participant Invitation Letter; Appendix B: Potential Participant List**).

Consultations took place across 6 healthcare clinics within NLHS, with a focus on rural/remote areas within the Labrador Grenfell zone. Targeted sites included: Labrador Health Centre (Happy Valley-Goose Bay), Mani Ashini Community Clinic (North West River/Sheshatshiu), Makkovik Community Clinic, Natuashish Community Clinic, Nain Community Clinic, Port Hope Simpson Community Clinic, White Bay Central Health Centre (Roddickton), and Charles S. Curtis Memorial Hospital (St. Anthony). However, based on staff availability and scheduling constraints, consultations were conducted with participants from: Labrador Health Centre, Natuashish Community Clinic, Rigolet Community Clinic, White Bay Central Health Centre, Strait of Belle Isle, as well as with regional staff who participated virtually and represented sites across the entire Labrador-Grenfell Zone. These sites were selected to provide a purposive sample that includes regional hub hospitals, community health centres, and very remote community clinics, thereby capturing diverse perspectives from healthcare professionals who experience unique challenges in diabetes management due to geography, access, and

resource availability.

Data Collection

Data was collected through a combination of focus groups and individual semi-structured interviews. A total of 16 participants contributed to the consultations, representing a range of professional roles involved in diabetes care across the Labrador-Grenfell Zone. The sample included eight Certified Diabetes Educators (CDEs), dietitians, and nurses; 4 primary care nurses and rural/remote nurses; 2 primary care providers; 1 clinical nurse educator; and 1 regional director.

Participants included:

- Certified Diabetes Educators (CDEs), nurses and dietitians who provide frontline diabetes management and patient education, to inform the development of a diabetes resource that will be clinically relevant and aligned with current best practice guidelines.
- Primary care nurses and rural/remote nurses, who often serve as the first point of contact for patients in rural and remote areas and are instrumental in ongoing chronic disease support. Their collaboration provides insight into resource needs, barriers, and practical usability.
- Primary care physicians and nurse practitioners involved in the diagnosis and long-term management of diabetes to gather clinical insights and ensure the resource complements existing care pathways and best practice guidelines.
- Clinical nurse educators, who are responsible for staff training and professional development, to assess what education tools are currently in use, identify gaps in staff knowledge, and determine how a new resource could enhance diabetes education delivery in clinical practice.

- Regional directors of primary health care and rural/remote health, to ensure the resource is aligned with organizational priorities and supports system-level goals related to chronic disease management.

Although the initial intention was to conduct 3 separate focus groups, one for primary healthcare providers and those providing the current frontline diabetes education and management (physicians, nurse practitioners, CDEs, dietitians), one for those providing frontline nursing (rural/remote nurses, primary care nurses) and one for those in leadership roles (regional directors, clinical nurse educators), this was not feasible due to staff scheduling constraints, clinical demands, and participant preference for individual sessions. As a result, 2 focus groups were completed, and the remaining 6 participants engaged in individual semi-structured interviews. The focus groups and semi-structured interviews were conducted virtually to those living in rural/remote areas, and in-person to those living in Central Labrador. Separate semi-structured interview questions were asked to primary healthcare providers and those providing the current frontline diabetes education and management (physicians, nurse practitioners, CDEs, dietitians) than those providing frontline nursing (rural/remote nurses, primary care nurses) than those in leadership roles (regional directors, clinical nurse educators). Semi-structured interview questions for each participant group are provided in **Appendix C (CDEs/Dietitians/Primary Care Providers)**, **Appendix D (Rural/Remote Nurses, Primary Care Nurses)**, and **Appendix E (Leadership Roles)**.

To ensure quality data, all interviews and semi-structured questions were consistently utilized. Data was collected from three participant groups (primary healthcare providers and diabetes educators, frontline nursing, and leadership group) to triangulate findings. Detailed notes and records were maintained to ensure transparency and recordability. Data was stored on

password-protected devices, which is only accessible by the researcher (myself). There is no identifying information included in transcription.

Data Management and Analysis

Data from interviews and focus groups were audio-recorded (with verbal consent), transcribed, and anonymized. Recordings were transcribed verbatim by the researcher (myself) to capture participants' exact words and context. Transcriptions were entered into Microsoft Word and organized by questions, participant responses, participant category (primary healthcare provider and diabetes educators, frontline nursing, and leadership group). This was used to compare perspectives across participant groups and identify common themes.

Ethical Considerations

This project is exempt from Health Research Ethics Board approval because it matches item number 3: Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes). This practicum project is focused on critically appraising current diabetes education resources, then using focus groups and semi-structured interviews with providers, CDEs, nurses, and leadership groups to identify gaps in resources or barriers to effective diabetes education, and use this information to inform the development of a diabetes education resource to support consistent and evidence based diabetes education within NLHS based on the needs. The consultations were conducted for the purpose of program improvement and resource development; there is no research question involved (see **Appendix F: Health Research Ethics Authority (HREA) Screening Tool**).

Guided by the SQUIRE 2.0 (Standards for Quality Improvement Reporting Excellence)

framework (Ogrinc et al., 2016), this quality improvement initiative is intentionally narrow in scope, aiming to improve a specific practice and process within a defined context, the development of a diabetes education resource within Labrador-Grenfell zone of NLHS. Following this framework supported a structured process for assessing existing practices, engaging key stakeholders, and translating consultation findings into a resource designed to improve diabetes education delivery and health outcomes within NLHS. The project's outcomes will inform local practice improvement and is not intended for generalization beyond this context. Implementation of the resource is expected to occur promptly, directly benefiting the participants and organization involved. Dissemination will primarily take place within the Labrador-Grenfell zone of NLHS to support organizational learning and quality improvement. While publication is not the primary outcome, findings may be shared to other areas to encourage similar quality improvement efforts, rather than to suggest generalizable results.

Results

The consultations conducted with CDEs, primary care providers, primary care nurses, rural/remote nurses, and leadership revealed consistent themes related to resource gaps, diabetes education challenges, and opportunities to strengthen standardized diabetes education across NLHS. The results are organized by major themes that reflect the consultation objectives and identify how different participant groups perceive diabetes education within their practice settings.

Current Practice

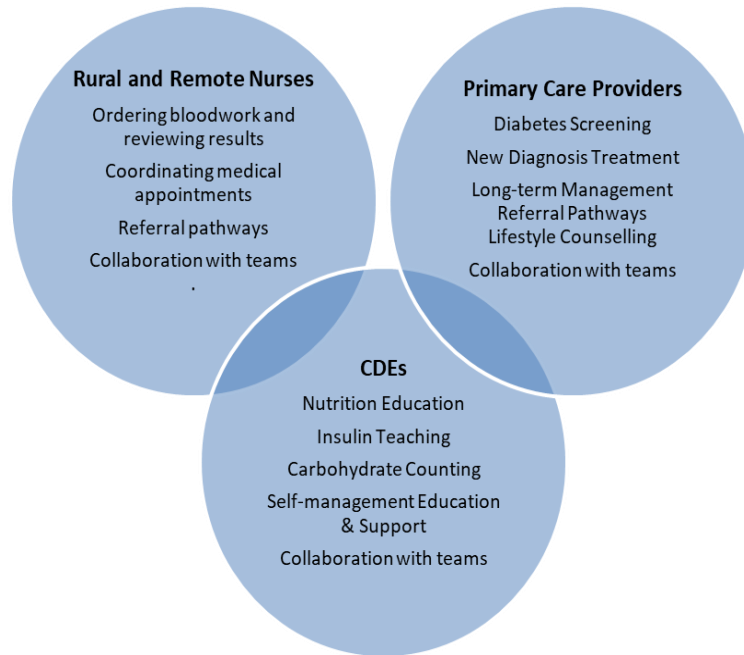
CDEs and primary care providers reported extensive experience delivering diabetes care across the lifespan, including type 1, type 2, pediatric, and gestational diabetes (see figure 1). CDEs practice included broad categories of nutrition education, insulin teaching, carbohydrate

counting, and self-management education and support. CDEs emphasized their ongoing collaboration with coastal clinics, Indigenous community partners, and multidisciplinary teams, including pediatric endocrinology specialists and primary care providers. Primary care providers similarly described a wide scope of practice, noting that diabetes care is integrated alongside numerous other acute and chronic health responsibilities. Primary care providers routinely performed more specific diabetes screening, bloodwork monitoring, new diagnoses treatment, long-term management, referral pathways, and lifestyle counselling. Primary care nurses and rural/remote nurses described routine involvement in ordering bloodwork, reviewing results, coordinating medical appointments, and referring patients to diabetes educators and dietitians. While they conducted diabetes screening and supported ongoing monitoring, they self-reported delivering limited direct diabetes education because they had knowledge gaps and low confidence in diabetes counselling skills. Some nurses had increasing familiarity with new medications like Ozempic but struggled with nutrition teaching and carbohydrate counting. One rural/remote clinic nurse primarily encounters diabetes patients during acute presentations, such as hyperglycemia or hypoglycemia. Diabetes education in this context was minimal, as care focused on stabilization. No standardized educational materials were available to provide to patients at discharge.

Leadership reported that diabetes education within the region aligned with best practice guidelines, with Diabetes Canada materials frequently referenced. However, education remained self-directed, highly variable, and dependent on individual staff initiative.

Figure 1

Roles of CDEs, Rural/Remote Nurses, Primary Care Providers



Resources Used

Across participant groups, commonly used resources included:

- Diabetes Canada Clinical Practice Guidelines
- Print materials, visual aids, and logbooks
- Provincial and national nutrition resources (Alberta Health Services, BC Health, Fraser Health, UnlockFood.ca)
- NLHS pediatric and Janeway diabetes materials
- Indigenous Services Canada resources (traditional foods, food labels, healthy eating on the land)
- Interactive tools such as the Diabetes Canada Pharmacotherapy Tool
- EMR goal setting and monitoring systems (used regularly by rural/remote nurses)

Although participants had access to many external resources, they noted inconsistent use across the region and the absence of a single, standardized, easy-to-navigate diabetes resource.

All resources will be included in the environmental scan report.

Identified Gaps

Across all participant groups, several significant gaps in diabetes education were identified. CDEs and providers noted the lack of culturally relevant materials, outdated information, inconsistent use of resources, and limited plain-language tools, particularly in rural and remote clinics. Rural/remote nurses echoed these concerns, emphasizing the absence of culturally adapted food guides, limited visual teaching tools, and outdated resources that do not reflect current medications or best practices. They highlighted that patients frequently struggled with complex guideline documents, underscoring the need for simplified, plain-language materials and visual aids tailored to varied literacy levels. Another rural/remote nurse highlighted inconsistent patient messaging across providers, the lack of standardized resources for newly diagnosed patients or those discharged from emergency care, and the need for foundational diabetes education for frontline staff. Leadership further identified system-level challenges, including inequitable service delivery across regions, high numbers of unattached patients to a primary care provider, long wait times, geographic and access barriers, insufficient follow-up, and the absence of Indigenous-specific screening guidelines. Information overload and limited staff capacity also contributed to challenges in meeting the growing diabetes burden within the region.

Barriers to Delivering Diabetes Education

Several barriers to delivering effective diabetes education were identified among all participant groups. While each group highlighted challenges specific to their practice environment, a number of themes were consistent across provider types, indicating systemic issues that affect diabetes education throughout the region.

CDEs, rural/remote nurses, and primary care providers all reported substantial time

constraints, competing clinical priorities, and difficulty scheduling adequate education sessions, which frequently limited the ability to provide comprehensive, patient-centered diabetes teaching. Participants consistently emphasized that diabetes education often occurs within brief encounters or during acute presentations, reducing opportunities for meaningful follow-up.

Limited access to up-to-date, standardized educational materials was another barrier identified by all groups. CDEs relied on Diabetes Canada and other external resources, while rural/remote nurses reported inconsistent access to user-friendly tools, outdated local materials, or no available resources at all. The absence of a centralized NLHS diabetes education resource contributed to variation in teaching and reduced confidence among staff, especially in rural and remote areas. Leadership also identified the lack of standardized education materials across the zone.

Patient-level challenges were consistently reported across CDEs, rural/remote nurses, and primary care provider groups, including low health literacy, language and cultural barriers, inconsistent attendance at appointments, and difficulty engaging patients in ongoing self-management. These issues were particularly amplified in remote communities, where social determinants of health including limited transportation, and reduced access to supplies such as glucometers or CGMs further impacted diabetes education.

System-level barriers were also consistently noted, especially by leadership but echoed by CDEs, primary care providers and rural/remote nurses. These included high staff turnover, limited onboarding related to chronic disease management, long wait times for diabetes educator appointments, and the broad geographic distribution of communities that hindered in-person follow-up. Participants across all groups referenced a high number of unattached patients and limited primary care capacity, leading to fragmented diabetes management and reduced

continuity. Many of these systemic barriers cannot be fixed by a diabetes education resource.

Collectively, these common barriers of time constraints, inconsistent resources, patient engagement challenges, and system-level limitations all contribute to significant variability in diabetes education across NLHS and reduce the ability of providers to meet the complex needs of individuals living with diabetes. The alignment of these concerns across all participant groups underscores the importance of developing a standardized, accessible, and evidence-based diabetes education resource to support consistent care throughout the zone.

Patient Education Needs

Across all participant groups, consistent patient education needs were identified. CDEs and providers identified that patients frequently required foundational diabetes knowledge, including understanding of what diabetes is, how it affects the body, and why management is important. Additionally, they identified clear glucose targets and sick day guidelines as instrumental in diabetes management. Rural/remote nurses stated the most common and persistent question across settings was, “What can I eat?”, highlighting a substantial need for culturally relevant dietary guidance tailored to local food availability and literacy levels. Rural/remote nurses also noted gaps in patients’ understanding of hemoglobin A1C (HbA1C) values and blood glucose targets, appropriate blood glucose monitoring frequency, and the management of hypoglycemia and hyperglycemia. Additionally, it was identified that many patients lacked basic emergency preparedness, including having glucagon or blood glucose supplies at home. Furthermore, routine screening requirements such as three-month bloodwork intervals, annual eye exams, and foot care practices were also frequently misunderstood or overlooked. Leadership further emphasized the need for early education at diagnosis, culturally safe and community-appropriate resources, and consistent messaging to ensure that patient

understanding does not vary based on provider, location, or resource availability. Collectively, these findings underscore the need for clear, accessible, visually supported diabetes education resources that reinforce core diabetes concepts and enable patients to confidently participate in their own care across all NLHS settings.

Proposed Resource Solutions

Participants strongly supported the development of a centralized, standardized diabetes education resource that is practical, culturally appropriate, and easily accessible by nurses to use at all point of care interactions with patients. CDEs, providers, and rural/remote nurses recommended the inclusion of simplified, plain-language materials, culturally adapted food guides, visual teaching tools accessible in remote community clinics (injection demos, booklets), updated medication information, clear guidance on blood glucose targets, bloodwork monitoring, and sick-day management. Rural/remote nurses emphasized the importance of take-home materials for newly diagnosed patients and emergency department discharges, while leadership advocated for a toolkit-style resource aligned with best practice guidelines accessible at the point of care across all NLHS sites. Suggested formats included printable handouts, short instructional videos, regional dietary examples, visual charts, and a digital platform or NLHS-linked website containing both patient resources and a staff-only section for pharmacotherapy and teaching tools. Participants also recommended embedding the resource into a sustainable education strategy such as annual modules, regular team-huddle refreshers, and zonal diabetes educator-led sessions to ensure consistent use and long-term impact.

Staff Education Needs

Across all participant groups, staff education needs varied but revealed a clear pattern. CDEs and providers reported being highly trained and primarily reliant on ongoing certification

requirements and updated clinical practice guidelines to maintain competency. In contrast, rural/remote nurses identified a strong need for foundational diabetes education, including simplified teaching tools, structured support for new staff, and refresher sessions to maintain confidence in providing patient education. Rural/remote nurses also emphasized the need for basic diabetes education training to support safe and consistent care during acute presentations to the clinic. One rural/remote nurse identified that diabetes concerns often arise during urgent or unscheduled visits, where nurses consult with on-site providers or utilize telehealth services with providers for management support. Leadership validated these concerns and highlighted additional system-level gaps, including the lack of structured, recurring diabetes education, insufficient onboarding for new and fly-in/fly-out staff, and limited protected time for training and staff development. While these broader education needs extend beyond the scope of this practicum project, leadership emphasized that a standardized diabetes education resource would complement existing efforts by providing consistent, accessible information that supports staff during everyday patient encounters. Together, these findings highlight the need for a standardized, accessible education strategy that supports patients in all nursing encounters across NLHS.

Indicators of Success

Across participant groups, several indicators of success were identified to evaluate the impact of a standardized diabetes education resource. CDEs and primary care providers anticipated improved patient preparedness and more consistent education prior to their consultations. Rural/remote nurses expected enhanced patient understanding, more consistent messaging across providers, improved follow-up, and strengthened self-management and screening adherence. Leadership emphasized broader system-level indicators that would require

ongoing, long-term evaluation, including earlier detection of diabetes, improved primary and secondary prevention outcomes, reduced emergency department utilization for diabetes-related complications, and lower rates of amputations and dialysis. Collectively, participants highlighted that measurable improvements in patient self-management would serve as a key marker of success, demonstrating the effectiveness of a unified, accessible diabetes education resource across NLHS.

Discussion

The consultations identified recurring gaps in diabetes education, many that align with findings from the broader literature on diabetes care in rural and remote settings. Lukewich et al. (2020) described significant challenges related to decreased access to care, limited continuity, and variability in the availability of diabetes education resources across rural and remote communities. These barriers are especially concerning given that approximately 47% of NL's population resides in rural and remote areas, where limited services directly affect access to chronic disease management. The consultations echoed these challenges, highlighting inconsistent teaching tools and messaging across providers, insufficient follow-up care, long wait-times, issues long recognized among NL's large geographic landscape.

The findings from the consultations also align with national literature describing inequities faced by Indigenous peoples in rural and northern regions. Diabetes Canada (2025) reports persistent barriers such as a lack of culturally appropriate care, fragmented healthcare, limited tracking of new diabetes cases, and high staff turnover, all of which were reinforced by participants. Rural/remote nurses working in coastal and Indigenous communities emphasized that existing diabetes education materials often fail to reflect cultural food practices or local dietary availability. Participants noted that one of the most common questions from patients was,

“What can I eat?” This question suggests materials often fail to address the realities in a way that is culturally meaningful or grounded in the lived experience of northern and Indigenous communities. These findings highlight an important opportunity to integrate culturally relevant and community-informed approaches into the new resource.

The consultations further revealed healthcare access issues consistent with national statistics. According to CIHI (2024), Canada ranks ninth out of ten performing below the international average in areas of access to care, administrative efficiency, and equity, with the weakest outcomes observed in NL and Nunavut. The province also faces significant primary care attachment challenges, with over 41,000 residents waiting for a primary care provider as of June 2025 (Government of NL, 2025). These system-level pressures were echoed by participants who described long wait times for diabetes educator appointments, inconsistent follow-up, and limited capacity across primary care. These factors reduce opportunities for structured and timely diabetes education, which can delay early intervention, limit ongoing self-management support, and contribute to the progression of diabetes-related complications. In the context of NLHS, these access issues underscore the importance of developing a resource that can be used reliably across settings, regardless of provider availability, to ensure patients receive consistent, evidence-based education even when access to specialized services is limited.

The findings also reflect themes reported in Gien et al. (2017), who identified that individuals living with type 2 diabetes in rural NL often receive inconsistent or outdated information, leading to confusion, anxiety, and difficulty managing their condition. Similar concerns were raised in the consultations, particularly by rural and remote nurses who expressed limitations in knowledge to provide nutrition teaching, uncertainty about newer medications, and difficulty accessing updated, locally relevant materials. Participants also noted that many existing

patient education pamphlets reference foods unavailable in rural NL, further complicating self-management.

Albagawi et al. (2023) and Wang et al. (2023) both highlight substantial gaps in diabetes knowledge among nurses working outside endocrinology settings, despite their significant involvement in diabetes care. Similarly, rural and remote nurses in this consultation reported limited formal training, lack of confidence in diabetes counselling, and reliance on telehealth or on-site providers during acute diabetes presentations or diabetes educator services for education and management. Diabetes Canada (2018) recommendations identify that diabetes education can and should be delivered by multiple healthcare professionals including nurses, physicians, dietitians, pharmacists, and community health workers. However, participants across NLHS indicated that the absence of standardized, user-friendly resources limits the ability of rural/remote nurses to confidently deliver this type of education, leading to variability in messaging and inconsistent care.

Next Steps

Based on the insights gathered through consultations with CDEs, primary care providers, rural/remote nurses, and leadership, several next steps will guide the continued development and implementation of a standardized diabetes education resource to support nursing practice and patient education in NL. These actions respond directly to identified gaps in diabetes education, system-level barriers, and the need for accessible, culturally relevant materials, particularly in rural and remote communities.

The first step involves synthesizing consultation findings with the results of the environmental scan and publicly available guidance from Diabetes Canada's most recent Clinical Practice Guidelines. This will ensure the new resource is evidence-based, user-friendly, and

reflective of the identified needs of diabetes care within NLHS. The resource will be organized into clearly divided tabs to support quick, point-of-care access for providers. Proposed sections include but are not limited to: Diabetes Basics, Medications, Blood Glucose Targets, Frequently Asked Questions, Culturally Relevant Food Guidance, Sick-day Guidelines, Hypoglycemia, Hyperglycemia, and Self-Management Tools. Each tab will draw from evidence-based recommendations while integrating simplified visuals, plain-language content, and culturally appropriate dietary guidance tailored to the foods locally available in rural and remote NL. Given that one of the most common patient questions remains “What can I eat?”, particular attention will be given to developing nutrition information that reflects regional food availability, traditional hunting and fishing practices, and accessible, affordable options.

The next phase will involve developing the initial version of this resource and engaging key stakeholders including CDEs, primary care providers, nurse educators, rural/remote nurses, dietitians, and leadership for targeted review and feedback. This process will refine the structure, accessibility, literacy appropriateness, and cultural relevance of the resource. Ensuring that the tool enhances provider confidence and supports consistent messaging across all practice settings will be a priority, especially given the variation in diabetes knowledge and training identified during the consultations.

Following revisions, the resource will be prepared for pilot implementation at selected NLHS sites, with an emphasis on rural/remote clinics where diabetes education gaps were most pronounced. During this phase, staff will assess the practicality and accessibility of the resource during patient encounters. The print-friendly design, supported by downloadable tabs and links to the Diabetes Canada guidelines, will allow providers to quickly print patient-ready materials in the clinic, improving timely access to credible, standardized education. Feedback gathered

during the pilot will inform refinements prior to dissemination.

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Appendix A: Participant Information Letter

Dear Potential Participant,

My name is Katie Snow, and I am currently enrolled in the Masters of Nursing program at Memorial University, under the supervision of Dr. Peggy Rauman. The goal of my practicum is to develop a comprehensive diabetes education resource that supports nursing practice and enhances patient understanding and self-management for those living with type 2 diabetes, particularly in rural and remote areas of Newfoundland and Labrador.

To help inform the development of this resource, I am inviting healthcare providers and healthcare leadership, in either a focus group or an individual interview. Your input will help inform the development of the diabetes resource, identify what resources are currently in use, explore the challenges with current diabetes education resources, and explore what supports or format will be both beneficial to the providers and the patients.

If you are interested in participating, please respond to my e-mail or contact me via telephone at the number listed below. Depending on your role and preference, participation will involve a focus group (approximately 45-60 mins), or an individual interview (approximately 30-45 mins). These sessions will be offered virtually for rural/remote participants or offered in person for those in Central Labrador. The information you provide will be anonymous and participation is voluntary.

Your contribution is valuable to the development of a diabetes education resource that reflects the needs of both healthcare providers and patients living with diabetes.

Please feel free to contact me if you have any questions.

Thank you for your consideration.

Katie Snow BN, RN, CDE, MN Student

p32kms@mun.ca

709-899-4763

Appendix B: Potential Participant List

The following individuals and groups represent potential participants for consultation and focus group discussions. Participants were identified based on their roles in diabetes education, management, and leadership within the Labrador-Grenfell Zone of NLHS.

- Certified Diabetes Educators (CDEs), nurses and dietitians.

Role: Provide frontline diabetes education and management to patients.

Sites: Labrador Health Centre, Charles S. Curtis Memorial Hospital, White Bay Central Health Centre, Port Hope Simpson Community Clinic.

- Primary care nurses and rural/remote nurses.

Role: Deliver diabetes education and ongoing diabetes support in community and remote settings.

Sites: Labrador Health Centre, Mani Ashini Community Clinic, Makkovok Community Clinic, Natuashish Community Clinic, Nain Community Clinic, Post Hope Simpson Community Clinic.

- Primary care physicians and nurse practitioners.

Role: Provide medical management and collaborate with nursing and allied health professionals in diabetes care.

Sites: Labrador Health Centre, Mani Ashini Clinic, Makkovik Community Clinic, Natuashish Community Clinic, Nain Community Clinic.

- Clinical nurse educators.

Role: Support nursing practice and provide education across sites to ensure consistency and best practices.

Sites: Labrador Health Centre as they provide coverage for all coastal clinics.

- Regional directors of primary health care and rural/remote health.

Role: Provide leadership and oversight for chronic disease management initiatives and support regional implementation of diabetes education programs.

Sites: Labrador Health Centre as they provide zonal coverage.

Appendix C: Semi-Structured Interview/Focus group - CDEs/Dietitians/Primary Care Providers

1. Can you tell me about your role in providing diabetes education or care?
2. How long have you been involved in providing diabetes education or support to patients?
3. What diabetes education tools or resources are you currently using with patients? Such as print materials, digital tools, or visual aids.
4. What gaps do you see in the current diabetes education resources available to your patients?
5. Which diabetes education or clinical practice guidelines do you typically use in your work, and how do they influence the way you provide education to patients?
6. How do you collaborate with other healthcare professionals to provide diabetes education, and what strategies have you found most effective for interprofessional care?
7. What role do you see nursing playing in diabetes education? What education can be provided to patients prior to their consultation with you?
8. What barriers do you experience in delivering diabetes education in your setting? (e.g., time constraints, language, technology, patient engagement)
9. If you could design a diabetes education resource that would be most helpful to your patients, what would it include?
10. Is there anything else you would like to share regarding diabetes education or patient support?

Appendix D: Interview/Focus Group Questions - Rural/Remote Nurses

1. Can you tell me about your role in providing diabetes education or care?
2. What diabetes resources or clinical tools do you use in providing care to diabetes patients?
3. Do you feel these resources are evidence based and up to date with current clinical practice guidelines?
4. What challenges/barriers do you encounter when trying to provide diabetes education to patients? Such as time constraints, literacy, readily access, accurate information.
5. What education resources or support do you feel you are missing when trying to provide diabetes education?
6. Do you think there is a need to have a standardized evidence based up to date diabetes resource readily available for all patient encounters?
7. What content would be most important to incorporate in a diabetes resource? Such as lifestyle (diet and exercise), monitoring of blood glucose, hypoglycemia, hyperglycemia, screening? Why?
8. What types of questions do you get from patients regarding their diabetes management?
9. What additional training or tools would help healthcare providers deliver better diabetes education?
10. Is there anything else you would like to share about diabetes education in your region or what should be prioritized in developing a new resource?
11. Are there particular topics or formats that would make education more effective for your patients or easier for you to use?

Appendix E: Semi-Structured Interview/Focus group - Leadership

1. How do current diabetes education and resource initiatives align with the region's strategic priorities for chronic disease prevention and management?
2. What system-level goals or quality-improvement indicators guide diabetes care and education in your region?
3. What gaps or challenges have you identified in the delivery of diabetes education across primary care and community settings?
4. How could an updated or centralized diabetes education resource support regional or organizational goals related to chronic disease management?
5. How could a new diabetes resource best be introduced and sustained within NLHS?
6. What training or education is currently available to nursing staff providing diabetes education, and what additional training do they request?
7. How do you ensure staff have access to up-to-date diabetes education and resources?
8. How do you see the roles of frontline educators (CDEs, nurses, dietitians) and regional or primary care nurses evolving in delivering diabetes education?
9. What would success look like for the region in terms of improved diabetes education and patient outcomes?

Appendix F: Health Research Ethics Authority (HREA) Screening Tool

Student Name: Katie Snow

Title of Practicum Project: The Development of a Diabetes Resource to Support Nursing Practice and Patient Education in Newfoundland and Labrador

Date Checklist Completed:

This project is exempt from Health Research Ethics Board approval because it matches item number 3 from the list below.

1. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
2. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
3. Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes).
4. Research based on review of published/publicly reported literature.
5. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
6. Research based solely on the researcher's personal reflections and self-observation (e.g. auto-ethnography).
7. Case reports.
8. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information please visit the Health Research Ethics Authority (HREA) at <https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/>

Appendix D

Environmental Scan for the Development of a Diabetes Resource to Support Nursing Practice and Patient Education in Newfoundland and Labrador

Diabetes represents a growing public health concern in Newfoundland and Labrador (NL), which currently has the highest prevalence of diabetes in Canada (Diabetes Canada, 2024). Diabetes Canada (2025) identified that rural and remote communities experience significant disparities in access to diabetes education and care, largely due to workforce shortages, limited resources, and fragmented services. With approximately 47% of NL's population residing in rural and remote communities, the lack of resources is particularly concerning. Furthermore, continuity of care, planning and implementation of diabetes programs is also a challenge (Lukewich et al., 2020).

The purpose of this environmental scan was to identify and assess the diabetes education resources currently available within Newfoundland and Labrador Health Services (NLHS) and across its regional zones. Conducting this environmental scan was necessary to determine what resources currently exist, evaluate their strengths and limitations, and identify gaps or opportunities for improvement. The scan examined the accessibility and availability of primary care providers, rural/remote nurses, certified diabetes educators (CDEs), and clinicians access to intranet staff resources, determining where staff typically access educational tools, and how these materials support nursing practice and patient education. Additionally, the scan gathers region-specific healthcare information, such as referral pathways, contact details, and available community programs. All identified resources are evaluated for content accuracy and alignment with current evidence-based recommendations outlined in the Diabetes Canada Clinical Practice Guidelines. The results will guide the design of a practical, context-specific diabetes education resource that supports nurses in delivering consistent, evidence-based education and promotes improved patient self-management filling an identified gap that reflects both local needs and national healthcare standards.

Specific Objective(s) for the Environmental Scan

- Identify existing diabetes education resources and programs currently available for healthcare providers and patients within NLHS.
- Identify publicly available diabetes education resources across Canadian provinces.
- Assess the accessibility, quality, and accuracy of identified resources to ensure alignment with evidence-based practices that are consistent with Diabetes Canada Clinical Practice Guidelines.
- Identify gaps or limitations in current diabetes education materials, including the absence of regionally tailored content.
- Explore innovative educational approaches from other provinces that are publicly available that could inform the development of a new, comprehensive diabetes education resource for nurses and patients in NL.

Sources of Information

Sources of information for the environmental scan were collected from internal and external sources to ensure a comprehensive understanding of existing diabetes education resources that are available to employees and the public within NLHS. Data was gathered from internal staff education e-learning modules, intranet sites, internet sites, and professional development materials that relate to diabetes education. Consultations were conducted with the same participants involved in the practicum consultation phase, including CDEs, primary care providers, nurse educators, rural/remote nurses, and leadership. Information from individuals consented to participate in the consultation focus groups were engaged to identify what resources are currently in use, how they are accessed, and any barriers to utilization. Additionally, participants from Western, Central, and Eastern zones within NLHS were contacted via e-mail to request participation in a short discussion or to simply respond and identify the diabetes

education resources available in their respective areas. The purpose was to identify variations of resources in other zones of NLHS (see **Appendix A: Participant Information Letter**).

External sources of information were also collected through a targeted review of reputable national and provincial websites, and health authorities that provide diabetes education and resources. These included the Public Health Agency of Canada, National Indigenous Diabetes Association, Indigenous Service Canada, and provincial health authorities of Alberta Health Services, LMC Healthcare, and Fraser Health. Keywords used in the search included diabetes, patient education, diabetes resources, chronic disease management, nutrition education, Indigenous diabetes, and NL diabetes programs. Inclusion criteria consisted of resources intended for patient or provider diabetes education, materials accessible to NLHS staff or the public, resources aligned with or adaptable to Canadian guidelines, and materials produced by provincial/national health authorities or recognized diabetes organizations.

The identified sources were selected based on their credibility and relevance of diabetes information in Canada. Limiting the scan to NLHS and established national and provincial sources ensures the findings are relevant, evidence-based, current, and applicable to local healthcare contexts in NL. Comparing resources from other provinces to those available within NLHS will help identify potential models to support the development of a new diabetes education resource tailored to NLHS.

Data Collection

Data was collected through a combination of website reviews and provider feedback obtained from consultations and e-mail correspondence. Information was gathered using a data form created in Microsoft Word to ensure consistency across all sources. Relevant details included resource title, accessibility, author or organization, publication date, format, and a brief

content summary. Each source was assessed for alignment with Diabetes Canada Clinical Practice Guidelines.

To ensure reliability and consistency in the review process, inclusion criteria was applied across all resources to minimize bias and enhance comparability. Resources to be included have been published since 2018 to ensure alignment with current Diabetes Canada Clinical Practice Guidelines. Outdated materials identified through the consultations were clearly documented to highlight areas requiring revision. Rather than excluding these materials, they will be updated if incorporated into the new diabetes education resource to ensure all content reflects current evidence-based best practices.

Region-specific healthcare resources, such as referral pathways, contact information, and available community programs were identified through the environmental scan. This information will support the development of a diabetes education resource that is evidence-based, locally relevant, and supportive of existing resources and services within Newfoundland and Labrador.

Data Management and Analysis

All data collected was entered into a Microsoft Word document and stored securely on a password protected electronic file. Resources were categorized according to the environmental scan document template. A content analysis approach involves systematically reviewing information to identify categories or themes, and meaningful categories within the data (Erlingsson & Brysiewicz, 2017). The collected information was compared and analyzed to identify themes, strengths, and gaps across resources using a content analysis approach. This method allows for an objective comparison of existing diabetes education materials and supports the identification of areas that require updating, clarification, or enhancement. For example, resources were analyzed for content such as diabetes self-management education, lifestyle

modification, and physical activity guidelines. Additionally, descriptive analysis involves summarizing past and current data to identify trends and patterns. This approach helps organize information into useful insights that support decision-making (Hassan, 2024). Descriptive analysis was used to group provider responses based on common themes such as accessibility, effectiveness, and gaps in content or delivery of existing resources. Together, these analyses will inform recommendations for developing a new diabetes education resource based on evidence-based guidelines that are current, relevant and tailored to the needs of healthcare providers and patients in NL.

Ethical Considerations

Permissions were obtained from individual healthcare providers (CDEs, nurse educators, primary care providers, rural/remote nurses, leadership) to provide information via email or short discussion. Participation was implied through a response to the initial invitation email, indicating consent to contribute.

This project is exempt from Health Research Ethics Board approval because it matches item number 3: Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes). This practicum project is focused on critically appraising current diabetes education resources, then using focus groups and semi-structured interviews with providers, nurses, and leadership groups to identify gaps in resources or barriers to effective diabetes education, and use this information to inform the development of a diabetes education resource to support consistent and evidence-based diabetes education within NLHS based on the needs. The environment scan was conducted for the purpose of program improvement and resource development; there is no

research question involved (see **Appendix B: Health Research Ethics Authority (HREA) Screening Tool**).

Confidentiality and data security was maintained by storing all information on a password protected device that is only accessible by the researcher (myself). There is no identifying information included in transcription and individual responses are anonymized to ensure confidentiality.

Results

The environmental scan consultations were conducted with CDEs, primary care providers, primary care nurses, rural/remote nurses, and leadership representatives who participated in the initial consultation phase of the practicum. These discussions provided valuable insights into the diabetes education resources currently used across the Labrador-Grenfell Zone, including their accessibility, relevance, and perceived gaps. To broaden the understanding of resource variability across the province, additional consultations were offered to CDEs providing direct patient education in the Western, Central, and Eastern zones of NLHS; however, no sources or feedback was received from the Eastern zone. Input from participants in the Labrador-Grenfell, Western, and Central zones, helped identify regional differences in available materials, inconsistencies in resource utilization, and opportunities to streamline or enhance diabetes education support across NLHS. Collectively, the feedback obtained contributed to a comprehensive assessment of current diabetes education resources and informed the identification of key strengths, limitations, and priority areas for improvement.

NLHS Intranet

A search of the NLHS intranet was conducted to identify internal staff resources related to diabetes education and clinical practice. The initial review began within the Clinical Services

training resources; however, no diabetes-related materials were available in this section. The search then proceeded to Resource Materials under Nursing and Chronic Disease Management, where one entry was listed as Canadian Diabetes Guidelines with posting dates of 2015. Despite appearing relevant, the link resulted in a “404 - File or Directory Not Found” error, indicating that this document was inaccessible or outdated.

To further explore available materials, a keyword search for “diabetes” was conducted within the staff learning portal, which produced 5 resources. The first resource, CorCare Diabetes Nurse Educator, was a super-user training module focused on documenting patient care within CorCare; however, it was not available for use until 2026 and was not designed to provide diabetes education for frontline staff.

The second module, Basic Diabetes Self-Management Education – An Introduction to the Basic Teaching Package Used in Acute Care for All Patients (Western Health), offered information on diabetes self-management principles, blood glucose monitoring, and recognition of hyperglycemia and hypoglycemia. Although intended for nurses caring for inpatients with diabetes, many of the associated links produced “404 - File or Directory Not Found” errors, and several components were outdated, including references to medications no longer commonly used, such as acarbose. Several resources included in the module were undated or dated as far back as 2010, further limiting their relevance. These findings demonstrate gaps in accessibility and accuracy, reinforcing the need for updated and consistently maintained diabetes education materials

The third module, Managing Type 2 Diabetes (Western Health Medical Rounds), published in October 2020, provided more current content, including information on newer pharmacotherapies such as GLP-1 receptor agonists and SGLT2 inhibitors, as well as updates on

Newfoundland and Labrador Prescription Drug Program (NLPDP) coverage. This module was facilitated by a pharmacist and targeted physicians, nurses, and students.

The fourth resource, Diabetic Neuropathy (Western Health Medical Rounds), dated January 6, 2017, reviewed diabetes pathophysiology, classifications of diabetic neuropathy, and treatment options; however, it was outdated and did not reflect more recent clinical practice guidelines. This 45-minute presentation targeted physicians, residents, medical students, and other staff. The resource shared valuable foundational information but was not sufficient to support current evidence-based practice due to its age and lack of alignment with updated Diabetes Canada guidelines recommendations. However, it does provide an opportunity for revisions if incorporated into the new diabetes education resource to incorporate current evidence and best practice standards.

The final resource identified, Obesity & Diabetes: Tips & Tricks for Diagnosis & Treatment, published January 27, 2023, represented the most current and comprehensive module available. The session offered evidence-based recommendations for screening, diagnosis, pharmacological treatment, and lifestyle management for individuals living with obesity and type 2 diabetes, and it aligned with recent Diabetes Canada Clinical Practice Guidelines. This module demonstrates the potential value of high-quality educational support within NLHS; however, in comparison to other learn modules which are outdated or inaccessible resources further highlights the need for a consistent, centralized diabetes education resource to support nursing practice and patient education. The identification of only one recent module supports the objective of this environmental scan by underscoring the current gap in accessible, reliable, and regularly updated diabetes education materials for healthcare providers across the province.

Public Internet Sources: My HealthNL

NLHS has adopted MyHealthNL, a personal health records and health information portal that is accessible to patients and providers on the NLHS website (NLHS, 2025a). It provides users with access to lab results, medication summaries, health information and library resources, all of which are relevant to diabetes education and self-management. Additionally, these resources are available on apps for smartphones and tablets making them more accessible. This portal offers a health library on many chronic conditions, including diabetes. The diabetes health information has been updated as recently as July 7, 2025. This resource provides general information on type 2 diabetes, including risk factors, diagnosis, treatment options, lifestyle recommendations, and self-management strategies.

Although the content is recent and accessible through the provincial portal, it originates from WebMD Ignite (2025), a U.S.-based health information vendor, and is not specifically tailored to the NL context. While the resource sources information from Diabetes Canada and the American Diabetes Association, it does not identify which specific guidelines or evidence sources were used, limiting transparency and traceability of the clinical recommendations presented. It also lacks integration of local referral pathways, regional programs, and community-specific supports relevant to diabetes care in NLHS. Additionally, the information is delivered in a web-based format and relies primarily on short videos rather than printable patient handouts, which may limit its practicality during clinical education encounters.

These findings underscore a gap in accessible, locally tailored diabetes education resources within NLHS and further support the need for the development of a comprehensive, evidence-based diabetes resource that reflects both current clinical guidelines and the unique needs of rural and remote populations in NL. Furthermore, during stakeholder consultations, this resource was not identified as one currently used in practice, suggesting limited awareness or

communication regarding its availability.

ZONAL Care

NLHS (2025b) includes a “Diabetes Care” section on its website that outlines diabetes services across all zones, with each zone providing access to its respective diabetes program. Within the Labrador-Grenfell Zone (Labrador-Grenfell Health, n.d.), diabetes nurse educator services include the care of newly diagnosed clients with type 1 and type 2 diabetes, in both pediatric and adult populations, as well as clients with gestational diabetes. Diabetes education includes insulin initiation, insulin pump therapy, and foot care services, with collaborative clinics offered using a multidiscipline approach. Community education on diabetes and prevention is offered periodically and upon request. However, the website does not outline where diabetes services are specifically located within the zone or identify which providers are involved in the collaborative clinics, limiting clarity and accessibility for the public.

In contrast, Western Health (2016) provides a more detailed and accessible overview of its diabetes services, which aim to improve health outcomes for individuals with diabetes or pre-diabetes living in Western NL. Diabetes services are delivered by interdisciplinary teams who support clients and families in diabetes self-management. The website includes contact information for all diabetes services across the zone and provides direct links to brochures containing clinic-specific contact details, as well as a direct link to Diabetes Canada for up-to-date educational resources.

Similarly, the Central Zone (NLHS, n.d.) describes a diabetes program supported by registered nurses, dietitians, and nurse practitioners working collaboratively with other health professionals in a multidisciplinary approach to the management of the person with diabetes. Their services include education sessions and ongoing counseling and support. Their website

also provides contact numbers for self-referral to diabetes programs across clinical locations, along with direct links to Diabetes Canada resources.

In the Eastern Zone (Eastern Health, 2022), publicly available program information is more limited and primarily focused on paediatric diabetes services delivered through the Janeway Children's Health and Rehabilitation Centre. The Childhood and Youth Diabetes Program provides comprehensive education and clinical support for children and youth with type 1 diabetes, including insulin pump therapy, nutrition counselling, mental health support, and school transition planning. While these specialist services are clearly defined, there is little publicly available information related to adult type 2 diabetes education or community-based resources within the region, indicating a potential gap in publicly accessible information or program documentation.

Independent Resources

The environmental scan also examined publicly available provincial and national nutrition resources frequently used to support diabetes education and chronic disease management that was indicated by providers during consultations. [UnlockFood.ca](https://unlockfood.ca), developed by Dietitians of Canada (2025), provides a comprehensive, evidence-based online platform offering accessible information on healthy eating, diabetes management, chronic disease prevention, menu planning, food skills, and nutrition across the lifespan. Its wide range of downloadable handouts and practical tools makes it a valuable benchmark for assessing the quality of nutrition education resources available to patients and healthcare providers. Alberta Health Services (n.d.), another used resource, offers chronic-disease nutrition handouts, healthy eating guidelines, culturally inclusive materials such as the Newcomer Nutrition Toolkit, and topic-specific support for diabetes, kidney disease, pregnancy, and older adults. Similarly, in British Columbia, Fraser

Health (n.d.) provides nutrition education and an online patient-education portal with a dedicated section for diabetes. Resources are in downloadable formats incorporating many resources and patient education pamphlets from Diabetes Canada. Additionally, Fraser Health developed a dedicated booklet called “On the Road to Diabetes Health” in a PDF and based on Diabetes Canada 2018 guidelines. This resource provides all relevant topics for those managing diabetes and their families, incorporating the basics of what diabetes is, your healthcare team, how to manage your disease with information on medication, diet, sick day guidelines, and activity. The formats are downloadable PDFs and include both general and lifecycle-specific content. While the materials are not developed specifically for remote regions, they provide a broad resource format, scope (type 1 & type 2, family inclusion), and accessibility that may be adapted for rural NL context.

LMC Healthcare (n.d.) provides comprehensive patient-education materials for individuals living with diabetes (type 1, type 2, gestational, insulin-pump/CGM users), as well as prevention for individuals at risk of developing type 2 diabetes, and provider education. The resources include all relevant topics of diabetes management such as carbohydrate counting, healthy eating, self-management behaviours, medications and insulin therapy, pumping/CGM, and exercise. Downloadable handouts are available incorporating clear language and visual aids. This website is easily accessible and able to be navigated to the appropriate health topic of interest. While the LMC model offers many resources, it is largely centred in Ontario and thus may have less direct relevance to remote settings in NL.

Collectively, these provincial and national examples demonstrate a high standard of accessibility, diversity, and comprehensive content that can inform the development of a diabetes education resource for NL. Compared to these models, publicly accessible nutrition and

diabetes-specific resources in NL appear more limited and variable by region, underscoring the need for a consolidated, evidence-based tool to support nursing practice and patient self-management across rural and remote communities.

Indigenous Communities Resources

National Indigenous Diabetes Association (NIDA, 2020) developed “Pathways to Wellness: A Handbook for Indigenous Peoples Living with Diabetes”, a culturally-tailored educational resource designed for First Nations, Inuit and Métis populations. This handbook is grounded in the Canadian Diabetes Association (2018) Clinical Practice Guidelines and covers diabetes fundamentals, prevention, management, nutrition, lifestyle, complications, and mental health, with culturally-relevant frameworks such as the medicine wheel. This resource is highly relevant for Indigenous communities and aligns with holistic wellness and current evidence-based guidelines.

NIDA (n.d.) also provides a “Newfoundland and Labrador” resource page that incorporates key provincial resources related to diabetes management and support. These include population health data from the Centre for Health Information, chronic disease resources from the Department of Health and Community Services, regional service delivery information from Eastern Health, culturally specific programs such as NunatuKavut’s “Learning for Life – Preventing Diabetes”, and regional reports such as “Diabetes in Newfoundland and Labrador”. These resources from the NIDA integrate both clinical education support and broader upstream health-promotion resources.

National Resources

The environmental scan identified several national-level resources from the Public Health Agency of Canada (PHAC) and Indigenous Services Canada (ISC) that provide important

context for diabetes education and prevention in NL. PHAC (2025a) incorporated a broad list of resources including Diabetes Canada, the National Indigenous Diabetes Association, and professional organizations such as Canadian Nurses Association that contribute to evidence-based education, chronic disease management, and health promotion across Canada. Additionally, PHAC (2025b) has a specific site for Diabetes in relation to overview, symptoms, prevention and risk factors, living with diabetes, and a specific health professionals section. Overview and education sections all link to diabetes Canada guidelines and have been modified in 2025 incorporating recent diabetes Canada guidelines and education resources. The dedicated health-professional section further reinforces clinical alignment by directing providers to the Canadian Diabetes Association and the most recent guideline updates.

Indigenous Services Canada (2025) provides an additional set of resources through its section on Diabetes in First Nations and Inuit Communities. This includes detailed information on the Aboriginal Diabetes Initiative (ADI), which supports community-based and culturally grounded programs such as community education sessions, healthy eating and traditional food initiatives, physical-activity programs, land-based learning, screening activities, and diabetes self-management support. ISC also offers general diabetes education links that connect back to PHAC and Diabetes Canada guidelines, ensuring consistency across federal sources. Furthermore, the ISC site provides access to information on the Non-Insured Health Benefits (NIHB) program for First Nations and Inuit, which is an important consideration for diabetes management in Indigenous communities. Together, these national-level resources emphasize the importance of culturally relevant, evidence-based, and guideline-informed education approaches for diabetes prevention and management; key considerations for developing resources tailored to rural, remote, and Indigenous populations in Newfoundland and Labrador.

Conclusion

The environmental scan revealed that NLHS lacks a coordinated, up-to-date, evidence-based diabetes education resource for healthcare providers and patients. Internal materials are often outdated, inaccessible, or inconsistent across zones. Publicly available resources, including MyHealthNL, are not regionally tailored or clearly communicated to providers or patients. In contrast, several Canadian provinces and national organizations (e.g., Albert Health Services, Fraser Health, LMC Healthcare, PHAC) offer comprehensive, accessible, and regularly updated diabetes education material that integrate best practice guidelines and support clinical practice. Additionally, ISC provides Indigenous-focused resources emphasizing the need for culturally grounded, community-directed approaches, particularly relevant for rural and remote communities in NL. These findings directly support the need to develop a comprehensive, centralized, evidence-based diabetes education resource for NLHS nurses and patients, aligned with Diabetes Canada guidelines and tailored to the unique needs of NL's geography, workforce, and populations.

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Appendix A: Participant Information Letter

Dear Potential Participant,

My name is Katie Snow, and I am currently enrolled in the Masters of Nursing program at Memorial University, under the supervision of Dr. Peggy Rauman. The goal of my practicum is to develop a comprehensive diabetes education resource that supports nursing practice and enhances patient understanding and self-management for those living with type 2 diabetes, particularly in rural and remote areas of Newfoundland and Labrador.

As part of my practicum project, I am conducting an environmental scan to identify existing diabetes education resources available across all zones in Newfoundland and Labrador Health Services.

I am reaching out to request your participation in this environmental scan. Participation would involve either a brief discussion (approximately 10–15 minutes) or a written response via email identifying diabetes education resources that are available and used within your practice area or zone. Specifically, I am seeking information about:

- The diabetes education resources currently in use.
- How these resources are accessed.
- Any barriers or challenges associated with their utilization.

The information you provide will be anonymous and participation is voluntary. If you are interested in participating, please respond to my e-mail or contact me via telephone at the number listed below.

Please feel free to contact me if you have any questions.

Thank you for your consideration.

Katie Snow BN, RN, CDE, MN Student

p32kms@mun.ca

709-899-4763

Appendix B: Health Research Ethics Authority (HREA) Screening Tool

Student Name:

Title of Practicum Project:

Date Checklist Completed:

This project is exempt from Health Research Ethics Board approval because it matches item number 3 from the list below.

1. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
2. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
3. Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes).
4. Research based on review of published/publicly reported literature.
5. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
6. Research based solely on the researcher's personal reflections and self-observation (e.g. auto-ethnography).
7. Case reports.
8. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information please visit the Health Research Ethics Authority (HREA) at <https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/>

Appendix E
Diabetes Practicum Resource Questionnaire

Diabetes Practicum Resource





Diabetes Practicum Resource

When you submit this form, it will not automatically collect your details like name and email address unless you provide it yourself.

1. Does the resource meet its intended purpose of supporting nurses in delivering consistent, evidence-based Type 2 diabetes education?

☐ Yes

☐ No

2. Is the content accurate and reflective of the current Diabetes Canada guidelines and NLHS protocols?

☐ Yes

☐ No

☐ Maybe

3. Is this resource relevant to your specific clinical setting, particularly in rural and remote communities within Newfoundland and Labrador?

☐ Yes

☐ No

4. Does the resource reflect cultural safety and relevance for northern and Indigenous populations?

☐ Yes

☐ No

5. Is the resource easy to navigate and use in point-of-care settings (both print and digital formats)?

☐ Yes

☐ No

6. **Are the materials written at an appropriate literacy level for both nurses and patients?**

☐ Yes

☐ No

7. **Would this resource increase your confidence in providing diabetes education?**

☐ Yes

☐ No

8. **What strategies would support effective dissemination and integration of this resource across NLHS (e.g., orientation, training sessions, digital access)?**

Enter your answer

9. **What indicators or outcomes should be used to evaluate whether this resource improves nursing practice or patient education?**

Enter your answer

10. **What revisions, additions, or refinements would strengthen the resource prior to broader dissemination?**

Enter your answer

You can print a copy of your answer after you submit

Submit

Appendix F
SharePoint Diabetes Education Resource



Diabetes Resources

This page is designed to help you familiarize yourself with essential information and provide a quick reference for when you need assistance.

Tools & Resources

🍴 Nutrition

📖 Diabetes Basics

💉 Insulin

💧 Self-Monitoring Blood Glucose

↘ Hypoglycemia

↗ Hyperglycemia

LGZ Diabetes Team

Diabetes Nurse Educators

Central Labrador Family Care Team

- Heather Wiseman
(709) 897-7776
Heather.wiseman@nlhealthservices.ca

- Terri Lucas
(709) 897-7776
Terri.lucas@nlhealthservices.ca

Strait of Belle Isle Health Centre/ White Bay Central Health Centre

- Brada Tucker
(709) 456-2401
(709) 457-2215
Brada.tucker@nlhealthservices.ca

Charlottetown Community Clinic

- CherieLee Campbell-Oram
(709) 960-0271

Additional Contacts

Patient Connect NL

1-833-913-4679

<https://patientconnect.nlchi.nl.ca/>

Freestyle Libre Representative

Christa Sutton

christa.sutton@abbott.com

Dexcom Representative

Paul Stack

paul.stack@dexcom.com

Accu-Chek Representative

Tara O'Keefe

tara.okeefe@roche.com

One Touch

Octavian Nicolescu

onicoles@lifescan.com

Charles S. Curtis Memorial Hospital

- Genista Richards
(709) 454-3333
Genista.richards@nlhealthservices.ca

Labrador West Health Centre

- Janice Walsh
(709) 285-8100
janice.walsh@nlhealthservices.ca

Registered Dietitian

- Heidi Murphy (Regional)
(709) 450-0149
Heidi.murphy@nlhealthservices.ca

Gilbert Reid

gilbert.reid@ascensia.com

211

<https://nl.211.ca/>

Interactive Tools

Canadian Diabetes Risk Questionnaire

The following questionnaire will help you determine if you are at risk for prediabetes or type 2 diabetes



HbA1C Target

The following interactive tool will help you to individualize your patient's HbA1C target



Pharmacology for T2DM

The following interactive tool will help to individualize pharmacology options based on patient characteristics



Stay Informed

Stay informed and equipped with the latest updates and resources to excel in your role. This page will be frequently updated with the most valuable resources. However, it is the users responsibility to ensure the information is the most up to date and accurate.

References



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This resource may be shared and adapted for non-commercial purposes with appropriate attribution.

Nutrition Resources



[Getting Started: Healthy Eating & Diabetes](#)



[Food Guide Snapshot - Inuktitut \(Nunatsiavut\)](#)



[The Balanced Food Plate](#)



[Food Guide Snapshot - Other Languages](#)



[Healthy Snacks](#)



[Foods with Fibre](#)



[Foods with Protein](#)



[Foods with Carbohydrates](#)

Vegetables and Fruit
Fresh, frozen and canned.

Eat at least one dark green and one orange vegetable each day. Choose vegetables and fruit prepared with little or no added fat, sugar or salt. Have vegetables and fruit more often than juice.

Dark green and orange vegetables 125 mL (1/2 cup)	Other vegetables 125 mL (1/2 cup)	Leafy vegetables and wild plants cooked 125 mL (1/2 cup) raw 250 mL (1 cup)	Berries 125 mL (1/2 cup)	Fruit 1 fruit or 125 mL (1/2 cup)	100% Juice 125 mL (1/2 cup)

Grain Products

Make at least half of your grain products whole grain each day. Choose grain products that are lower in fat, sugar or salt.

Bread 1 slice (35 g)	Bannock 35 g (2" x 2" x 1")	Cold cereal 30 g (see food package)	Hot cereal 175 mL (3/4 cup)	Cooked pasta 125 mL (1/2 cup)	Cooked rice White, brown, wild 125 mL (1/2 cup)

Milk and Alternatives

Drink 500 mL (2 cups) of skim, 1% or 2% milk each day. Select lower fat milk alternatives. Drink fortified soy beverages if you do not drink milk.

Milk 250 mL (1 cup)	Powdered milk, mixed 250 mL (1 cup)	Fortified soy beverage 250 mL (1 cup)	Canned milk (evaporated) 125 mL (1/2 cup)	Yogurt 175 g (3/4 cup)	Cheese 50 g (1 1/2 oz.)

Meat and Alternatives

Have meat alternatives such as beans, lentils and tofu often. Eat at least two Food Guide Servings of fish each week.* Select lean meat and alternatives prepared with little or no added fat or salt.

Traditional meats and wild game 75 g cooked (2 1/2 oz)/125 mL (1/2 cup)	Fish and shellfish 75 g cooked (2 1/2 oz)/125 mL (1/2 cup)	Lean meat and poultry 75 g cooked (2 1/2 oz)/125 mL (1/2 cup)	Eggs 2 eggs	Beans - cooked 175 mL (3/4 cup)	Peanut butter 30 mL (2 Tbsp)



Getting started: healthy eating and diabetes

Glucose comes from foods that contain carbohydrates such as fruit, milk, some vegetables, starchy foods and sweet foods like honey, candy and desserts. Healthy eating and physical activity help to manage your blood sugar. You may also need to take pills, insulin and/or other medications.



All bodies need energy in the form of sugar called glucose. Insulin is a hormone that helps our bodies take this glucose and use it for energy. Without insulin, glucose builds up and causes high blood sugar.

Here are some basic tips to help you get started

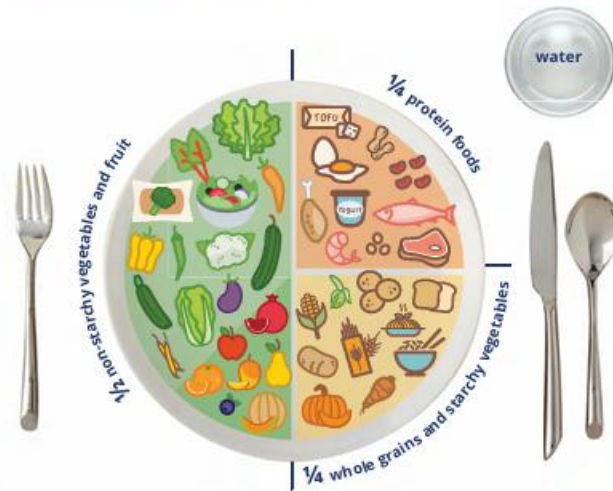
Tips:	Reasons:
Eat a meal or snack every 4-6 hours to ensure you are getting enough energy and nutrients.	Eating at regular times helps manage blood sugar levels.
Eat more high-fibre foods such as whole grains, breads and cereals made with whole grains, beans, peas, lentils, vegetables and fruit.	Foods high in fibre will keep you full longer, lower the impact of carbohydrates on your blood sugar and support overall health.
Eat a balanced breakfast that includes both carbohydrates and protein.	Helps to prevent blood sugar highs and lows
Prepare more meals at home.	Preparing meals gives you more control over how much sugar, salt and added fats you eat.
Limit sugars and sweets such as sugar sweetened drinks, desserts, candies, jam and honey.	Increased intake of sugar increases blood sugar levels.
Choose healthy fats such as olive, canola or vegetable oils in small quantities.	Replacing saturated fats and processed foods high in saturated fats with unsaturated fats helps reduce heart disease risk.
Choose water more often as your drink of choice.	Plain water has no carbohydrates or sugars and will not add to your carbohydrate intake.
Add physical activity to your day.	Regular aerobic and resistance exercise improves blood sugar and is good for overall well-being.
Limit alcohol consumption.	Alcohol can affect blood sugar levels and provides calories but no nutrients.



Diabetes Canada recommends that all people living with diabetes should receive advice on nutrition from a registered dietitian. It's natural to have questions about what food to eat. A registered dietitian can help you include your favourite foods in a personalized healthy eating plan.

Plan for healthy eating

The balanced plate approach applies to all mealtimes, even if you use a bowl! The balanced plate is designed to help you meet your nutrient needs and manage your blood sugar.



Healthy eating tips

- ✓ Eat more vegetables. They are very high in nutrients and fibre and low in carbohydrates.
- ✓ Choose lean animal proteins such as skinless chicken, pork, extra lean beef and fish. Select vegetable proteins such as tofu, edamame, beans and lentils more often.
- ✓ Select heart healthy fats such as olive oil, canola oil, vegetable oils, avocado and nuts and seeds instead of animal fats.
- ✓ Learn more about low-glycemic-index foods such as legumes, whole grains, fruits and vegetables and how to include them in your eating pattern.
- ✓ Eat together as a family more often to model healthy eating behaviours to children and teenagers.
- ✓ Consider learning about counting carbohydrates, and different types of eating patterns (e.g. Mediterranean, DASH).
- ✓ If you are planning on fasting, talk to your health-care team 1 to 2 months in advance.

Handy portion guide

Your hands can be very useful in estimating appropriate portions. When planning a meal, use the following portion sizes as a guide:



Fruits/Grains & Starches Choose an amount the size of your fist for grains or starches, or fruit.



Vegetables Choose as much as you can hold in both hands. Choose brightly coloured vegetables.



Protein Foods Choose an amount the size of the palm of your hand and the thickness of your little finger.



Fats Limit fat to an amount the size of the tip of your thumb.

Sample meal plan 1

Breakfast:

- Scrambled eggs (2)
- Sauteed vegetables-peppers, onion, cabbage, spinach (1 cup, 250 mL)
- Whole wheat toast (2) or tortillas (2x6")
- Reduced sugar Greek yogurt (1 container, 95 g)
- Tea or coffee

Lunch:

- Lentil or bean vegetable soup (2 cups)
- Raw, non-starchy vegetables (1 cup, 250 mL)
- Hummus (1/4 cup, 60 mL)
- 1% or skim milk or alternative (1 cup, 250 mL)
- 1 small mango

Dinner:

- 2 whole grain roti or flat bread (6" round)
- Chicken, fish or lentil curry (1 cup, 250 mL)
- Side salad (1 cup, 250 mL) + dressing (1 Tbsp, 15 mL)
- 1% or skim milk or soy alternative (1 cup, 250 mL)
- Cantaloupe (1 cup, 250 mL)

Evening Snack:

- Roasted, unsalted peanuts (1/4 cup, 60 mL)
- 1 small banana

Increase your physical activity

- Make time for physical activity into your daily routine. Even small amounts of movement add up throughout the day.
- Try to be active most days of the week. Start with a few days and work your way up to daily.
- Slowly increase the amount of effort; for instance, progress from strolling to brisk walking.
- Try new activities like dancing or basketball and make family time active.
- Reflect on how moving your body makes you feel. Many people sleep better, experience reduced stress or have improved energy.



Additional tips

- ✓ Include a protein, carbohydrate/starch and a fruit or vegetables at every meal.
- ✓ Listen to your body's cues for hunger and fullness.
- ✓ Include high-fibre foods such as whole grain breads, cereals, and pastas, fruits, vegetables and legumes.
- ✓ Move your body in a way you enjoy every day.



Sample meal plan 2

Breakfast:

- Old fashioned oatmeal or porridge (3/4 cup, 175 mL)
- Almonds, roasted, unsalted (1/4 cup, 60 mL)
- Frozen blueberries, thawed (1 cup, 250 mL)
- 0% or 2% Greek yogurt (3/4 cup, 175 mL)
- Tea or coffee

Lunch:

- Tuna, packed in water (85 g or 1/2 tin)
- 2 slices whole grain bread or 6" pita
- Reduced fat mayonnaise (1 Tbsp, 15 mL)
- Tomato slices
- Greek Lentil Salad (1 1/2 cups, 375 mL)
- Watermelon (1 cup, 250 mL)

Afternoon Snack:

- Apple (1 medium)
- Cheddar cheese (1 oz, 30 g)

Dinner:

- Brown rice, cooked (2/3 cup, 150 mL)
- Stir-fried broccoli (1 cup, 250 mL) with beef or salmon (4 oz, 120 g)
- Sautéed spinach with garlic (1 cup, 250 mL)
- 1 orange
- 1% or skim milk or soy alternative (1 cup, 250 mL)

Evening Snack:

- Air-popped popcorn (3 cups, 750 mL)
- Pumpkin seeds, unsalted (1/4 cup, 60 mL)

Notes:

For additional nutrition and fitness information, visit diabetes.ca

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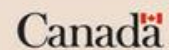
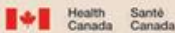
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The Balanced Food Plate



Use the balanced plate approach to make your meals

Using the balanced plate approach applies to all mealtimes, even if you use a bowl! The balanced plate is designed to help you meet your nutrient needs and manage your blood sugar. All foods can fit in the balanced plate approach, it's the portions of each type of food that matter the most.

Here are some examples of meals that follow the plate model:

Breakfast:

- 3/4 cup low-fat plain Greek yogurt + 1 cup strawberries + 1 cup high-fibre wheat cereal
- 1 cup old fashioned oatmeal + 1/4 cup almonds + 3/4 cup frozen blueberries

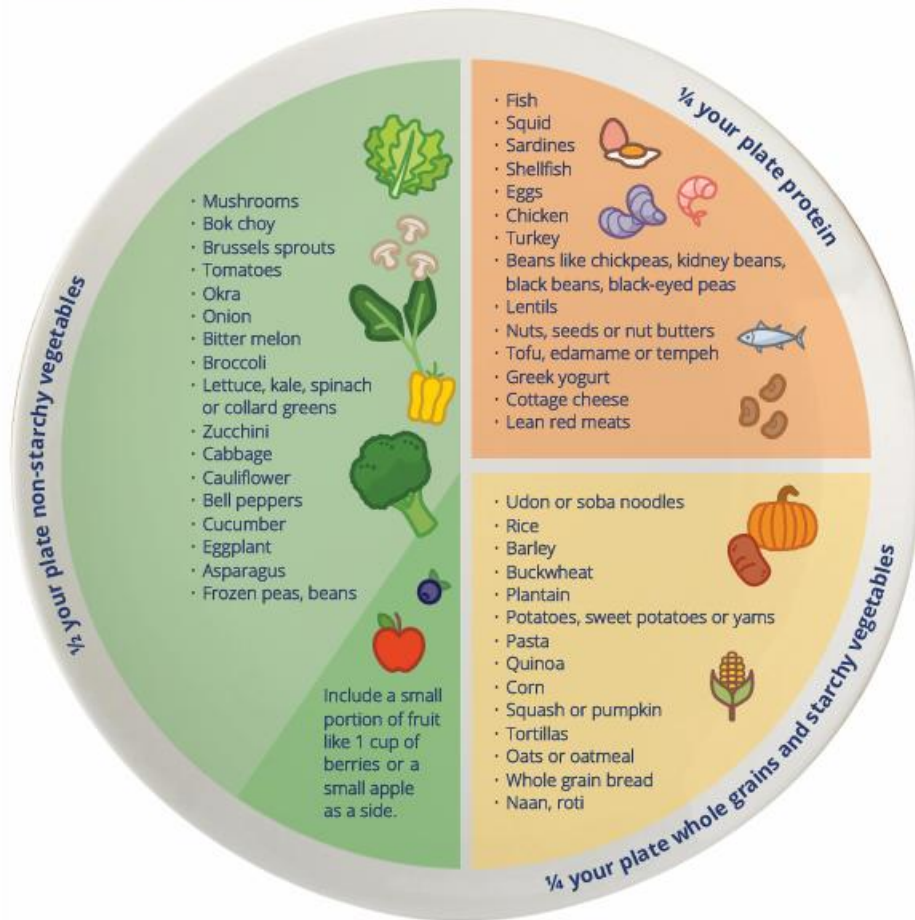
Lunch:

- 2 cups lentil soup + 1 cup cut up vegetables + 1 whole grain bun + 1 cup milk
- 2 slices whole grain bread + 3/4 cup chicken salad + 2 cups salad + 1 orange

Dinner:

- 2 whole grain roti + 1 cup chicken curry + 2 cups cooked vegetables + 1 apple
- 1 1/2 cups whole grain pasta + 1 cup meat sauce + 2 cups sauteed vegetables

The balanced plate model includes:



It's natural to have questions about the food you eat.

A registered dietitian can help you learn about nutrition and answer questions about how to include your favourite foods in a healthy way.

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Canada's food guide

Français Italiano Δεδομένα Español
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LMC Guide to Carbohydrate Sources

What is a carbohydrate?

This is the nutrient in food that breaks down into sugar in our body.
Carbohydrate containing foods have the most impact on our blood sugars.

These foods contain carbohydrates:

1| Grains & Starches



bread, bagels



pasta



potatoes, yams,
sweet potatoes



cold & hot cereals



corn



pita, roti, paratha



rice, quinoa, bulgur, couscous
& other grains



cassava, plantain,
green bananas



pizza dough,
anything made from flour

2| Fruits



any fresh fruit



berries



dried fruits



apple sauce, pureed fruits,
canned fruits

3| Milk & Yogurt



yogurt
plain & flavoured



milk



yogurt drinks



soy milk



kefir,
other cultured products

4| Sweets & Others



candies,
chocolate



soda



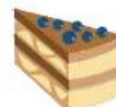
fruit juice



pretzels,
crackers, other
salty snacks



french fries,
potato chips



cakes, cookies,
pastries

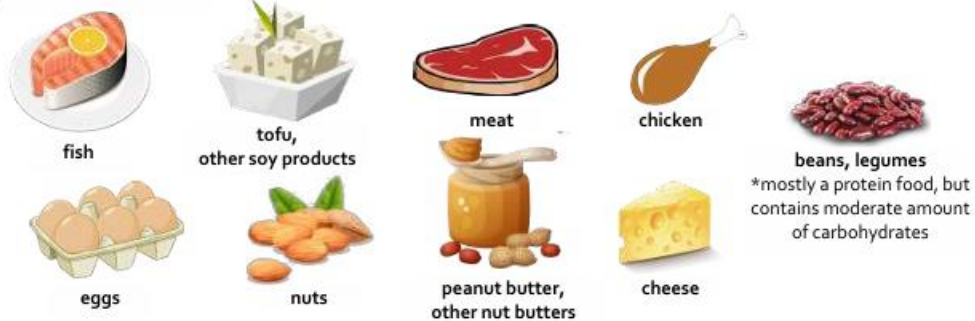
These foods do NOT contain carbohydrates (or contain very little):

1| Vegetables



most vegetables except for corn and potatoes

2| Meat & Proteins

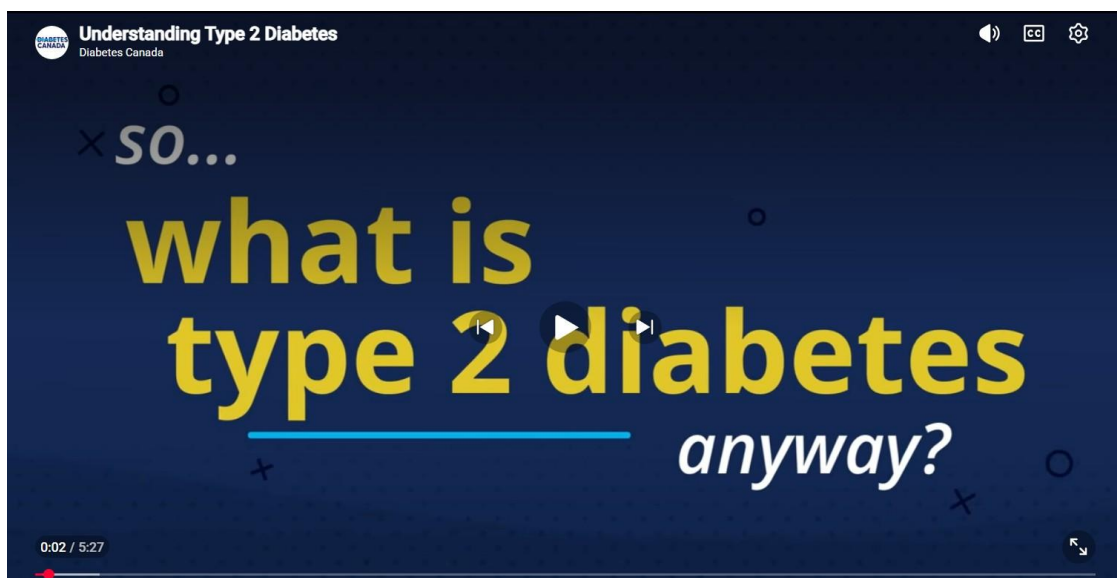
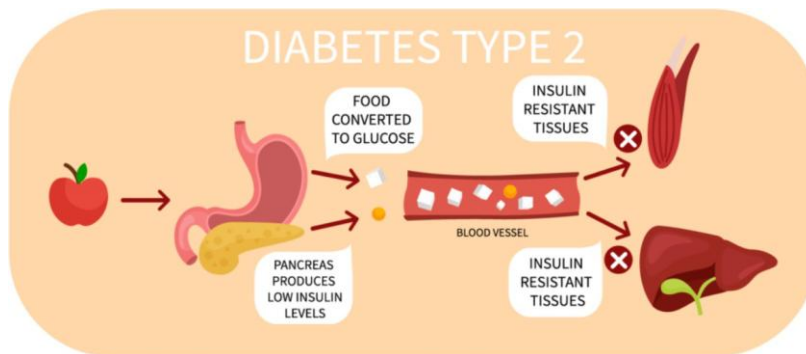


3| Fats



Do I need to avoid carbohydrates?

NO. These foods are needed to supply our body with energy. But you can help manage your blood sugars by watching your portions and choosing the healthier kinds of carb foods.



Type 2 diabetes: the basics

Risk factors for type 2 diabetes

- Being 40 years of age or older;
- Having a close relative (parent or sibling) who has type 2 diabetes;
- Being a member of a high-risk population, such as those of African, Arab, Asian, Hispanic, Indigenous or South Asian descent, low socioeconomic status;
- Having a history of prediabetes (impaired glucose tolerance or impaired fasting glucose);
- Having some evidence of the complications of diabetes, such as eye, nerve or kidney problems;
- Having heart disease;
- Having a history of gestational diabetes mellitus;
- Having high blood pressure;
- Having high cholesterol;
- Being overweight, especially around your abdomen.
- Having a history of giving birth to a baby that weighed over 4 kg (9 lb) at birth;
- Having obstructive sleep apnea;
- Having a history of using glucocorticoid medication

What is type 2 diabetes?

Type 2 diabetes is a disease in which your pancreas does not produce enough insulin, or your body does not properly use the insulin it makes.

As a result, sugar (glucose) builds up in your blood instead of being used for energy. Your body gets sugar from foods like bread, potatoes, rice, pasta, milk and fruit. To use this sugar, your body needs insulin. Insulin is a hormone that helps your body to control the level of sugar in your blood.

The good news

You can live a long and healthy life by keeping your blood sugar levels in the target range set by you and your health-care provider. You can do this by:

- Eating healthy meals and snacks
- Enjoying regular physical activity
- Monitoring your blood sugar using a home blood glucose meter*
- Aiming for a healthy body weight
- Taking diabetes medications including insulin, if prescribed by your doctor
- Managing stress effectively

*Discuss with your health-care provider how often you should measure your blood sugar level



Get the support you need

A positive and realistic attitude towards your diabetes can help you manage it. Talk to others who have diabetes. Ask your local Diabetes Canada branch about joining a peer-support group or taking part in an information session.



Who can help you?

Your health-care team is there to help you. Depending on your needs and the resources available in your community, your team may include a family doctor, diabetes educator (nurse and/or dietitian), endocrinologist, pharmacist, social worker, exercise physiologist, psychologist, foot-care specialist, eye-care specialist. They can answer your questions about how to manage diabetes and work with you to adjust your food plan, activity and medications.

Remember, you are the most important member of your health-care team

Complications of diabetes

Type 2 diabetes is a progressive, life-long disease. It may become more difficult to keep your blood sugar levels within your target range. High blood sugar levels can cause complications such as blindness, heart disease, kidney problems, nerve damage and erectile dysfunction. Fortunately, good diabetes care and management can prevent or delay the onset of these complications.

You can reduce your chances of developing these complications if you:

- Keep your blood sugar within your target range*
- Avoid smoking
- Keep your cholesterol and other blood fats within your target range*
- Keep your blood pressure within your target range*
- Take care of your feet
- Have regular visits with your doctor, diabetes team, dentist and eye-care specialist

*Discuss your target ranges with your health-care provider

Related articles: *Managing your blood sugar, Managing weight and diabetes, Physical activity and diabetes, Just the basics (tips for healthy eating), Cholesterol and diabetes, High blood pressure and diabetes, Smoking and diabetes, Foot care: a step toward good health, and Staying healthy with diabetes*

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Diabetes Canada is making this incredible epidemic of diabetes visible and urgent. Eleven million Canadians have diabetes or prediabetes. More in the future.

ABCDESSS of staying healthy with diabetes

Ask your health-care team about your:

A

A1C – target is usually 7% or less

B

Blood pressure control – aim for less than 130/80 mmHg

C

Cholesterol – LDL cholesterol should be less than 2.0 mmol/L

D

Drugs to decrease heart disease risk: Blood pressure pills (ACE inhibitors or ARBs), cholesterol-lowering pills (statins), medications that lower blood sugar with proven heart benefit, or ASA (Aspirin)

E

Exercise and healthy **Eating** – regular physical activity and following a healthy dietary pattern

S

Self-management support – setting goals, and identifying barriers that may prevent you from reaching your goals

S

Screening or monitoring for complications – heart, feet, liver, kidneys, eyes

S

Stop Smoking

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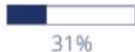
A snapshot of Diabetes Management in Canada

The biggest health burden diabetes creates is through complications like heart attack, stroke, kidney failure, or lower-limb amputation. These complications can often be prevented or delayed by screening. According to Diabetes Canada's (DC) recommendations, adults with diabetes, whether type 1 or type 2, should be screened at least once a year on a variety of measures that determine the management of their diabetes and the risk of complications. These tests include: A1C, blood pressure (BP), LDL cholesterol, and kidney function. Most adults with diabetes in Canada are not getting the recommended number of tests done at the right time.



96%
of adults with diabetes in Canada have at least one result higher than the recommended level.¹

Most people are NOT getting the tests they need²

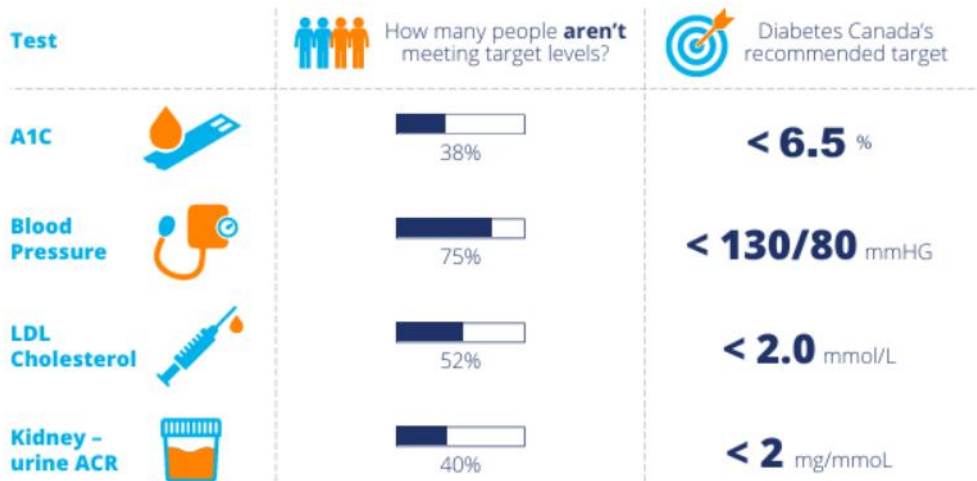
Test	Complications it can help prevent	Diabetes Canada's guidelines on recommended number of tests in a 2-year period	Percentage of people not receiving the right frequency of testing
A1C 	Blindness, amputation, kidney disease, cardiovascular disease	4-8	 83%
Blood Pressure 	Cardiovascular disease, amputation, kidney disease	2 if at target, 3+ if above target	 31%
LDL Cholesterol 	Cardiovascular disease, amputation	2	 68%
Kidney - urine ACR 	Kidney failure	2	 83%



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How many adults with diabetes have test results above recommended target levels?¹



More than three million Canadians have diabetes

There are three main types of diabetes.

Type 1 diabetes, usually diagnosed in children and adolescents, occurs when the pancreas is unable to produce insulin. Insulin is a hormone that controls the amount of sugar in the blood. Approximately 10 per cent of people with diabetes have type 1 diabetes.

The remaining 90 per cent have **type 2 diabetes**, which occurs when the pancreas does not produce enough insulin or when the body does not effectively use the insulin that is produced. Type 2 diabetes usually develops in adulthood, although increasing numbers of children in high-risk populations are being diagnosed.

A third type of diabetes, **gestational diabetes**, is a temporary condition that occurs during pregnancy. It affects approximately 2 to 4 per cent of all pregnancies (higher in the indigenous population) and involves an increased risk of developing diabetes for both mother and child.

Is diabetes serious?

If left untreated or improperly managed, diabetes can result in a variety of complications, including:

- Heart disease
- Kidney disease
- Eye disease
- Problems with erection (impotence)
- Nerve damage

The first step in preventing or delaying the onset of these complications is recognizing the risk factors, as well as signs and symptoms of diabetes.

What are the risk factors for diabetes?

If you are aged 40 or older or you are an individual at high risk on a risk calculator*, you are at risk for type 2 diabetes and should be tested at least every three years. If any of the following risk factors apply, you should be tested earlier and/or more often:

Being:	• a member of a high-risk group (African, Arab, Asian, Hispanic, Indigenous or South Asian descent, low socioeconomic status) • overweight (especially if you carry most of your weight around your middle)
Having:	• a parent, brother or sister with diabetes • health complications that are associated with diabetes • given birth to a baby that weighed more than 4 kg (9 lb) • had gestational diabetes (diabetes during pregnancy) • prediabetes (impaired glucose tolerance or impaired fasting glucose) • high blood pressure • high cholesterol or other fats in the blood • been diagnosed with any of the following conditions: – polycystic ovary syndrome – acanthosis nigricans (darkened patches of skin) – psychiatric disorders: - schizophrenia, depression, bipolar disorder – obstructive sleep apnea – you use glucocorticoid medication

* The Canadian Diabetes Risk (CANRISK) calculator (available at <http://www.healthy Canadians.gc.ca/diseases-conditions-maladies-affections/disease-maladie/diabetes-diabete/canrisk/index-eng.php>).

What are the signs and symptoms of diabetes?

Signs and symptoms of diabetes include the following:

- Unusual thirst
- Frequent urination
- Weight change (gain or loss)
- Extreme fatigue or lack of energy
- Blurred vision
- Frequent or recurring infections
- Cuts and bruises that are slow to heal
- Tingling or numbness in the hands or feet
- Trouble getting or maintaining an erection

It is important to recognize, however, that many people who have type 2 diabetes may display no symptoms.

Can you prevent diabetes?

Research shows that lifestyle changes can help prevent or delay the onset of type 2 diabetes. A healthy meal plan, weight control and physical activity are important prevention steps.

How is diabetes treated?

People with diabetes can expect to live active, independent and vital lives if they make a lifelong commitment to careful diabetes management, which includes the following:

Education:

Diabetes education is an important first step. All people with diabetes need to be informed about their condition.

Physical Activity:

Regular physical activity helps your body lower blood sugar levels, promotes weight loss, reduces stress and enhances overall fitness.

Nutrition:

What, when and how much you eat all play an important role in regulating blood sugar levels.

Weight Management:

Maintaining a healthy weight is especially important in the management of type 2 diabetes.

Medication:

Type 1 diabetes is always treated with insulin. Type 2 diabetes is managed through physical activity and meal planning and may require medications and/or insulin to assist your body in controlling blood sugar more effectively.

Lifestyle Management:

Learning to reduce stress levels in day-to-day life can help people with diabetes better manage their condition.

Blood Pressure:

High blood pressure can lead to eye disease, heart disease, stroke and kidney disease, so people with diabetes should try to maintain a blood pressure level below 130/80. To do this, you may need to change your eating and physical activity habits and/or take medication.

Related article: *Type 2 diabetes: the basics, Type 1 diabetes: the basics, Prediabetes, and Are you at risk*

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High blood pressure and diabetes

Why is controlling blood pressure important for people with diabetes?

When blood pressure is high, it puts stress on the body. This can cause damage to the heart, brain, kidneys, and eyes. High blood sugar levels are a risk factor for high blood pressure (hypertension). Compared to people without diabetes, people with diabetes are much more likely to develop heart disease and/or experience a stroke at an earlier age.

People with diabetes should have their blood pressure checked every time they visit their health-care team.



What is high blood pressure (hypertension)?

Blood pressure is a measurement of the force of your blood against the blood vessel walls. **The recommended target for people with diabetes is less than 130/80 mm Hg.** The top number is the pressure when your heart contracts and pushes blood out (systolic). The bottom number is the pressure when the heart relaxes between beats (diastolic).

There are often no signs of high blood pressure. This means that you may have high blood pressure and not know it.

Am I doing all that I can to control my blood pressure?

	Yes	No
Do I have my blood pressure checked every time I visit my health-care team?	☐	☐
Am I at a healthy weight?	☐	☐
Do I follow a healthy diet that includes vegetables, fruits, low-fat dairy products, and is low in sodium and saturated and trans fats?	☐	☐
Am I physically active on a regular basis?	☐	☐
Am I a non-smoker?	☐	☐
Do I manage stress in a healthy way?	☐	☐
Do I limit my alcohol intake?	☐	☐
Do I take my medication as prescribed?	☐	☐

Strategies to lower blood pressure

Healthy eating

Healthy eating plays an important role in managing blood pressure. It is important to reduce your salt intake.

Foods naturally contain small amounts of sodium, but most of the sodium in our diet is added during food processing. Canned and packaged foods are often high in sodium because it is added to preserve food. **Reduce your sodium intake toward 2,000 mg per day.** One teaspoon of salt has 2,300 mg of sodium.

Try these healthy eating tips:

- Choose vegetables and fruits more often (fresh or frozen without added salt).
- Choose low-fat (1% or skim) dairy products.
- Choose legumes (dried beans, peas and lentils) more often. Rinse canned beans with water.
- Choose whole grains such as whole wheat breads, cereal, pasta and brown rice.
- Eat fish at least twice a week (fresh, frozen or canned without added salt).
- Choose lean meats and poultry without added salt.
- Limit processed, smoked and cured foods.
- Look for unsalted or 'no added salt' items (e.g. crackers, nuts).
- Avoid using salt at the table and in cooking.
- Avoid seasonings that contain the word 'salt' or 'sodium', such as garlic salt, celery salt, kosher salt, sea salt or monosodium glutamate (MSG).
- Flavour your foods with herbs, spices, fresh garlic, garlic powder, onion powder, lemon or vinegars.
- Limit frozen convenience foods and fast food restaurant meals.
- With time, your taste buds will adjust to the natural flavours of food without added salt.

Do the DASH!

Dietary Approaches to Stop Hypertension, or 'DASH' has been shown to help manage and even prevent high blood pressure. The DASH diet can easily be part of a healthy diet for people with diabetes. It emphasizes whole grains, vegetables and fruits, low-fat dairy products, lean meats, and is low in saturated and trans fats.

Food Group	Daily Servings	Serving Sizes (1 serving is equivalent to)
Grains	6-8	• 1 slice bread • 1 ounce dry cereal • ½ cup cooked rice, pasta, cereal
Vegetables	4-5	• 1 cup raw leafy vegetables • ½ cup cut up raw or cooked vegetables
Fruits	4-5	• 1 medium piece of fruit • ¼ cup dried fruit • ½ cup fresh, frozen or canned fruit
Fat-free or low-fat milk and milk products	2-3	• 1 cup milk or yogurt • 1½ ounce cheese
Meat and alternatives: Lean meats, poultry, and fish Nuts, seeds, and legumes	6 or less	• 1 ounce cooked meats, poultry or fish, 1 egg • 1/3 cup nuts • 2 tbsp peanut butter • 2 tbsp of seeds • ½ cup cooked legumes
Fats and oils	2-3	• 1 tsp soft margarine (non-hydrogenated) • 1 tsp vegetable oil • 1 tbsp mayonnaise • 2 tbsp salad dressing

References: (1) Appel, LJ et al, 1997. N Eng J M 336:1117-24. U.S. Department of Health and Human Services; National Institutes of Health; National Heart, Lung, and Blood Institute. *Your Guide to Lowering Your Blood Pressure with DASH*, 2006. (2) Adapted from: Vancouver Coastal Health. *Sodium and Kidney Disease*, 2008.

Talk to a registered dietitian to learn more about healthy eating.

Physical activity

Build physical activity into your day. Regular physical activity can improve blood pressure and heart health.

Check with your health-care team about the exercise routine that is suitable for you. Both aerobic and resistance exercises are recommended for people with diabetes.

Changes I will make:



Read the nutrition facts

Look at the label to make healthy food choices

1		Nutrition Facts		2	
		Per 90 g serving (2 slices)			
Amount		% Daily Value			
Calories 170					
Fat 2.7 g		4 %			
Saturated 0.5 g + Trans 0 g		5 %			
Cholesterol 0 mg					
3 Sodium 200 mg		8 %			
Carbohydrate 36 g		13 %			
Fibre 6 g		24 %			
Sugars 3 g					
Protein 8 g					
Vitamin A	1 %	Vitamin C	0 %		
Calcium	2 %	Iron	16 %		

1. Serving size

Compare the serving size on the package to the amount that you eat.

2. % Daily Value (% DV)

shows if there is a little or a lot of nutrient in one serving. For sodium, the percent Daily Value is based on the maximum intake of 2,300 mg per day. Choose foods with a lower % DV for sodium. Foods with a Daily Value of 5% or less are low sodium. Foods with a Daily Value of 15% or more are considered high in sodium.

3. Sodium

- Try to avoid foods with 400 mg of sodium or more per serving.
- Beware! **Sodium-reduced** does not necessarily mean low sodium
- **Low in sodium** means less than 140 mg sodium per serving
- **Salt-free** means less than 5 mg sodium per serving

For more information on food labels, visit

<http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/index-eng.php>.



Be a non-smoker

- Smoking affects blood pressure in 2 ways: Nicotine in cigarette smoke causes blood vessels to narrow, which increases blood pressure.
- Smoking makes blood pressure medications work less effectively. Ask your doctor about local programs and medications that may help you to quit.

Managing stress

To help cope with stress, try physical activity, socializing, laughter, and healthy eating. Avoid unhealthy stress busters such as smoking, alcohol use, or poor food choices. Help is available if you need it. Remember to make time for yourself!

Alcohol

Alcohol raises blood pressure by interfering with the blood flow to and from the heart. Drinking alcohol can lead to both high and low blood sugar and possibly high triglycerides. Talk to your doctor to see if alcohol is a choice for you.

Medication

When healthy behaviour changes are not enough, your doctor may prescribe medication. Most people need two or more drugs to bring down their blood pressure to a healthy level. It is important to take your medications as prescribed. Try to take them at the same time every day.

Treating high blood pressure may require time, patience and care by both you and your doctor. Your doctor might have to try different medications or combinations of medications to see which ones work the best for you with the fewest side effects. It is important to continue taking your medications, even when your blood pressure is at target.

Talk to your doctor or pharmacist if you have any questions about your medications.

THE BOTTOM LINE

Healthy eating, physical activity, managing weight and stress, and taking your medications as prescribed can all help you to control your blood pressure.

Related articles: *Staying healthy with diabetes, Your guide to lowering your blood pressure with DASH:* https://www.nhlbi.nih.gov/files/docs/public/heart/hbp_low.pdf

**DIABETES
CANADA**

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Appendix 3

Sample Diabetes Patient Care Flow Sheet for Adults

Type of diabetes: ☐ Type 1 ☐ Type 2 ☐ Other Date Diagnosed: _____		Patient Name: _____	
Comorbidities: ☐ Hypertension ☐ Coronary artery disease ☐ Stroke/TIA ☐ Dyslipidemia ☐ Peripheral arterial disease ☐ Depression/Anxiety ☐ CKD - stage _____ ☐ Other(s): _____		Date of Birth: _____	
Healthy behaviour interventions	Weight (kg) _____ Height (cm) _____ BMI _____ Waist circumference (cm) _____	Date: _____ Wt _____ Ht _____ BMI _____ WC _____	Date: _____ Wt _____ Ht _____ BMI _____ WC _____
	Nutrition		
	Physical Activity (Aerobic 150 mins/week, Resistance 2-3x/week)		
	Smoking Status	☐ Non-smoker ☐ Ex-smoker ☐ Smoker	☐ Non-smoker ☐ Ex-smoker ☐ Smoker
Glycemic control	A1C (target: ≤7% or _____ %) (Individualize based on patient characteristics and antihyperglycemic medication(s) - see CPG) (q3 months. If at target and stable - q6 months)	Test Date: _____ Result: _____	Test Date: _____ Result: _____
	Antihyperglycemic Medication(s) Drug Name(s)/Dose(s):		
	Therapy Adherence/Concerns		
	BG Record (targets: premeal: 4-7 mmol/L or _____ mmol/L; 2hr postmeal: 5-10 mmol/L or _____ mmol/L) (Individualize based on ability to achieve A1C target + risk of hypoglycemia) (Annual fasting glucose meter/lab comparison)	Meter/Lab	Meter/Lab
Hypoglycemic Episodes (frequency/pattern/driving risk)			
CV Risk Assessment and Management	BP (target <130/80 mmHg, 3 readings recommended)		
	Pulse		
	Antihypertensive(s) Drug Name(s)/Dose(s):		
	CVD Symptoms (angina, decreased exercise tolerance, SOB, HF symptoms, claudication)	☐ None ☐ Yes	☐ None ☐ Yes
	Resting ECG, every 3-5 yrs If any: age >40 yrs; duration of diabetes >15 yrs + age >30 years; end organ damage (microvascular, CV); >1 CV risk factor(s)	Date: _____ Report: _____	Date: _____ Report: _____
	Lipids (primary target: LDL <2.0 mmol/L or >50% reduction in LDL or non-HDL <2.6 mmol/L or apo B <0.8 g/L)	LDL-C non-HDL-C test date: _____	LDL-C non-HDL-C test date: _____
Lipid-lowering Therapy Statin +/- 2nd line agent(s) Drug Name(s)/Dose(s): (If any: clinical CVD; age ≥40 yrs; age <40 yrs + 1 of the following: diabetes duration >15 yrs and age >30 yrs; microvascular complications; warrants therapy based on presence of other risk factors according to 2016 CCS Lipid Guidelines)	☐ Continue ☐ Start ☐ No - reason: _____	☐ Continue ☐ Start ☐ No - reason: _____	
ACE inhibitor/ ARB Drug Name(s)/Dose(s): If any: clinical CVD; age >55 yrs with an additional CV risk factor or end organ damage (albuminuria, retinopathy, LVH); microvascular complications	☐ Continue ☐ Start ☐ No - reason: _____	☐ Continue ☐ Start ☐ No - reason: _____	

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<https://doi.org/10.1016/j.jcjd.2017.10.042>

	Antihyperglycemic Agent with Demonstrated CV Outcome Benefit Drug Name(s)/Dose(s): (If type 2 DM with clinical CVD not at glycemic target - empagliflozin, liraglutide, canagliflozin)	Date: ☐ Continue ☐ Start ☐ No - reason:	Date: ☐ Continue ☐ Start ☐ No - reason:	Date: ☐ Continue ☐ Start ☐ No - reason:
	Antiplatelet Agent(s) Drug Name(s)/Dose(s): (If established CVD; consider if additional CV risk factors)	☐ Not indicated ☐ Yes	☐ Not indicated ☐ Yes	☐ Not indicated ☐ Yes
CKD	Urine ACR (normal <2 mg/mmol)	Test Date: Result:	Test Date: Result:	Test Date: Result:
	Serum Creatinine/eGFR	Test Date: Result:	Test Date: Result:	Test Date: Result:
	CKD	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
Retinopathy	Dilated Eye Exam (type 1 - annually; type 2 - q1-2 years or as recommended by vision care professional)	☐ Date of last visit: ☐ Reminded	☐ Date of last visit: ☐ Reminded	☐ Date of last visit: ☐ Reminded
	Retinopathy	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Severity/Therapies			
Neuropathy	Neuropathy Symptoms (e.g. pain, paresthesia, GI symptoms, sexual dysfunction)	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Diabetic Foot Exam (includes 10 g monofilament or 128 Hz tuning fork, structural abnormalities, skin changes, pulses) (annually for screening; every visit if diabetic foot complications) See Appendices 11A, 11B and 12	Sensation _____ Pulses _____ Skin _____ Other _____	Sensation _____ Pulses _____ Skin _____ Other _____	Sensation _____ Pulses _____ Skin _____ Other _____
	Neuropathy	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No
	Screen for Depression, Anxiety, Other Stressors (consider use of PHQ-9, GAD-7)	Concerns:	Concerns:	Concerns:
Vaccination	Influenza (annual)	☐ No Reason: _____ ☐ Yes Date: _____	☐ No Reason: _____ ☐ Yes Date: _____	☐ No Reason: _____ ☐ Yes Date: _____
	Pneumococcal (once; repeat if >65 yrs)	☐ Yes Date: _____	☐ No Reason: _____	
Management Plans	Patient Goals			
	Barriers to Self-management (e.g. coverage, accessibility, competing demands)			
	Women Contraception/preconception planning			
	Driving Guidelines Reviewed			
	Sick-Day Management (advise holding metformin, SGLT2i, SU, ACEi/ARB, diuretic, NSAIDs if inadequate fluid intake and ill)			
	Referrals Made			
	Changes to Medications or Other Management			
	Resources Provided			
	RECALL (usually q3-4 months)	☐ Appointment given ☐ Noted in recall system	☐ Appointment given ☐ Noted in recall system	☐ Appointment given ☐ Noted in recall system

For additional diabetes management resources, visit www.guidelines.diabetes.ca.

Type 2 complications

Type 2 diabetes can lead to a variety of complications that affect your body from head to toe, including stroke, blindness, amputation and more. People with diabetes are also at risk for mental health issues, such as anxiety or depression that can result from the stress of managing their diabetes. This is often referred to as diabetes distress.

The following section covers the complications often associated with type 2 diabetes. For a more detailed explanation of symptoms and possible treatments, check out our resources below.

Kidney disease (nephropathy)

Kidney disease—known as nephropathy—is common in people with diabetes. If the kidneys are damaged due to high blood glucose (sugar) levels and high blood pressure, they can no longer filter blood properly and may fail completely. Kidney failure is a serious complication associated with diabetes.

Eye damage (diabetic retinopathy)

Diabetic retinopathy affects about one million people living with diabetes and is the most common form of vision loss affecting people living with diabetes in Canada. Diabetic retinopathy can lead to vision changes or blindness. With blood sugar control, regular eye exams and early treatment, the risk or worsening of eye damage can be reduced.

Heart disease & stroke

Diabetes increases your risk of heart disease and stroke. People with diabetes may develop heart disease 15 years earlier than those without diabetes. The most common form of heart disease in diabetes is coronary artery disease.

High blood pressure

People with diabetes are much more likely to develop heart disease and/or experience a stroke at an earlier age than people without diabetes. High blood pressure (also known as hypertension) along with diabetes puts added stress on your body. This can cause damage to your heart, brain, kidneys, and eyes.

Mental health issues

Many people living with diabetes experience distress, decreased mood and disabling levels of anxiety. Mental health disorders can affect your ability to cope with and care for your diabetes. It's just as important to look after your mental health as it is your physical health.

Nerve damage (diabetic peripheral neuropathy)

Nerve damage or diabetic peripheral neuropathy is one of the long-term complications of diabetes. If left untreated, the damage caused by neuropathy can potentially lead to infection and limb [amputation](#).

Complications associated with type 2 diabetes

Learn more about each kind of complication and what you can do to delay or prevent it.

→ [Kidney disease \(nephropathy\)](#)

→ [Eye damage \(diabetic retinopathy\)](#)

→ [Heart disease & stroke](#)

→ [Mental health issues](#)

→ [High blood pressure](#)

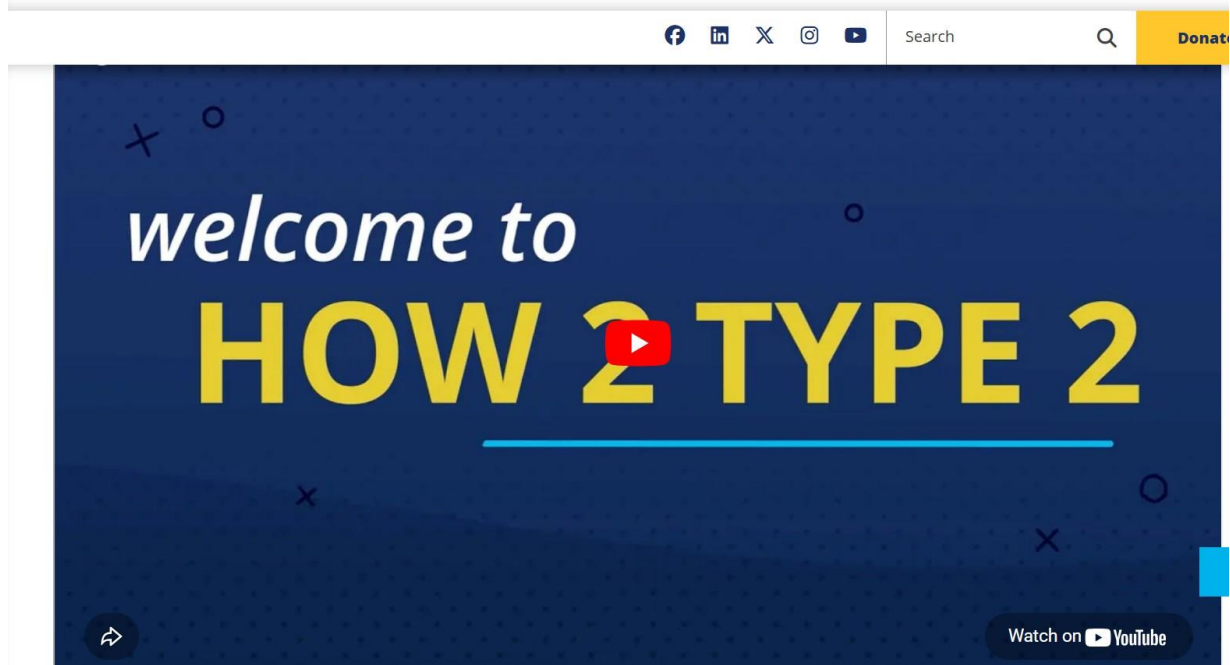
→ [Nerve damage & amputation](#)

How 2 Type 2

Do you live with type 2 diabetes? Do you provide care for a loved one who does? Living with type 2 diabetes can feel overwhelming, but you are not alone. No matter where you are on your journey, understanding the condition can help you feel more in control of well-being, and help others feel more confident with supporting you. The [How 2 Type 2 video series](#) is designed to provide clear, practical guidance for managing type 2 diabetes in a way that fits your lifestyle.

Welcome to How 2 Type 2

Welcome to How 2 Type 2



Insulin



[Getting Started with Insulin](#)



[Insulin Injection Guidelines](#)



[Insulin Prescription Tool and Titration](#)



[Insulin Pen start Checklist](#)



FIT Technique Plus[®] Site Selection & Site Rotation

Did you know?

Where you inject insulin matters.

The preferred areas to inject are:

- ✓ abdomen
- ✓ thighs
- ✓ buttocks



abdomen



thigh



back of arms

The back of the arm is not recommended for self-injection due to difficulty accessing the site. Caregivers who have been properly instructed in insulin injection technique may choose this site for convenience.

Did you know?

A structured rotation pattern can help prevent problems at injection sites. Structured rotation means rotation between injection sites and within an injection site.

For example,

1. Divide your abdomen injection area into 4 areas.
2. Divide each area into smaller sections. Use only one section each week.
3. Rotate within that section, in a circular pattern, spacing injections about 1—2 cm from your last.
4. Rotate to the next section the following week, etc.

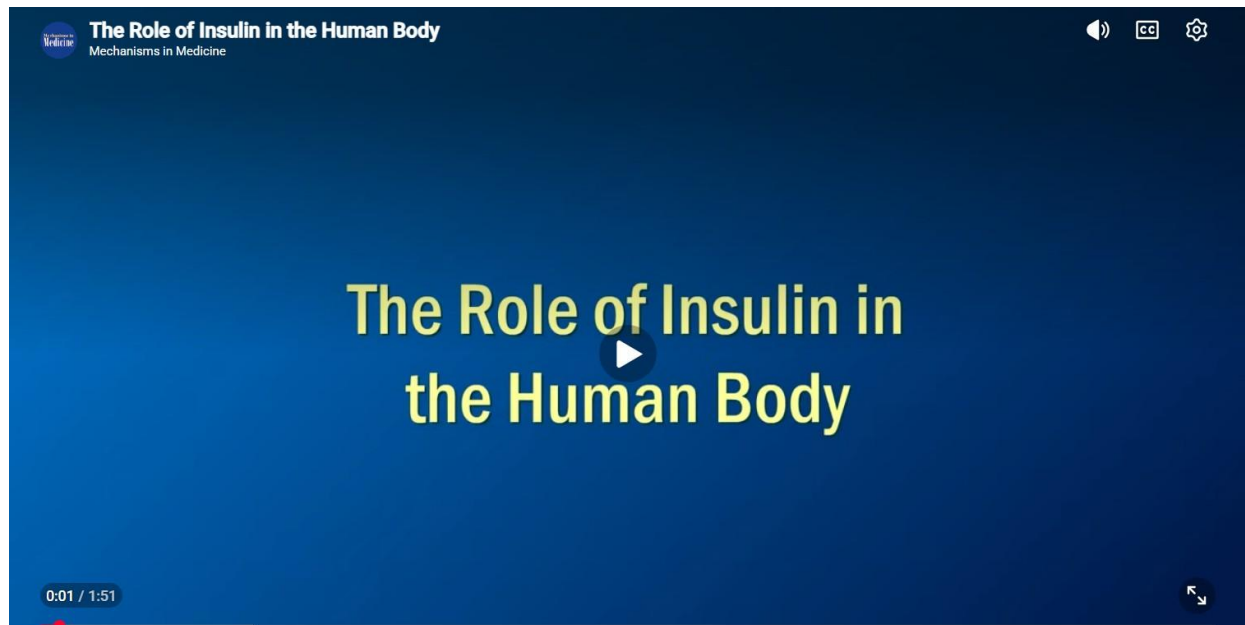
rotate the site you use



rotate the site you use

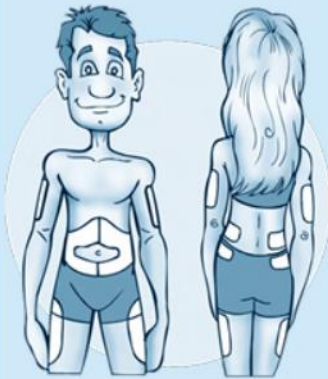
rotate within the site you use





Getting started with insulin

Insulin Injection Sites



NOTE: It is really important to change (rotate) where you give yourself insulin to prevent fatty lumps from forming since these can affect how your body absorbs insulin. For example, you can move from one side of your abdomen to the other side, and you can also move your injection site to a different location within each side of your abdomen.

Avoid a 2-inch area around the belly button as well as scar tissue.

Insulin Pens:

Your pen comes with an instruction book. Please review it to understand how your pen works, how to load the cartridge, and how to prepare your pen for an insulin injection. There are different sizes and lengths of needle tips available. Most often the shortest needle is recommended. Talk with your health care professional about which needle tip would be best for you.

Mixing Insulin:

Insulin that is cloudy (NPH, premixed) needs to be mixed before using. The pen should be rolled ten times, tipped ten times, and checked for a milky-white consistency.

Check Insulin Flow (Prime):

Attach pen needle. Dial up 2 or 3 units (whichever the manufacturers recommends) and, with pen tip facing upwards, push the dosing button. If no stream of insulin appears, repeat this step again.

Giving Your Injection:

After you have checked the insulin flow, dial up the dose of insulin to be taken. Insert pen tip into skin at a 90° angle. Push the dosing button until you see '0'. Count 10 seconds before removing the needle from your skin to ensure you receive the full dose. With longer needles (≥ 8mm), you may need to gently lift the skin before injection or inject on an angle.

Site	Things to think about
Abdomen (tummy) Stay 2 inches (5 cm) away from your belly button	Easy to reach. Insulin absorbs fast and consistently.
Buttock and thigh	Slower absorption rate than from abdomen and arm sites.
Outer arm	After abdomen, arm provides the next fastest absorption rate. This area is hard to reach when injecting yourself, so it is often not recommended.

Insulin Types:

Type	Onset (How quickly it starts working)	Peak (When it is most effective)	Duration (How long it works)	Timing of injection (When should it be given)
Bolus insulins				
Rapid acting analogues • Apidra / Admelog / Humalog (U100, U200) / NovoRapid / Trurapi • Fiasp	10 – 15 min 4 min	1 – 2 hours 30 min – 1.5 hours	3 – 5 hours 3 – 5 hours	Given with one or more meals per day. Should be injected 0 – 15 minutes before or after meals. Fiasp is to be given two minutes before the start of your meal or within 20 minutes after.
Short-acting • Entuzity U500 • Humulin-R / Novolin ge Toronto	15 min 30 min	4 – 8 hours 2 – 3 hours	17 – 24 hours 6.5 hours	Given with one or more meals per day. Should be injected 30 – 45 minutes before the start of the meal.
Basal insulins				
Intermediate-acting • Humulin-N / Novolin ge NPH	1 – 3 hours	5 – 8 hours	up to 18 hours	Often started once daily at bedtime. May be given once or twice daily. Not given at any time specific to meals.
Long-acting analogues • Basaglar / Lantus U100 • Levemir • Toujeo U300 • Tresiba U100, U200	90 min	not applicable	up to 24 hours 16 – 24 hours > 30 hours >42 hours	Basaglar, Lantus U100, and Levemir are often given once daily at bedtime, while Toujeo U300 and Tresiba U100, U200 are given once daily at any time of day. Levemir may be given once or twice daily. Not given at any time specific to meals.
Premixed insulins				
Premixed regular insulin • Humulin 30/70 • Novolin ge 30/70, 40/60, 50/50	The onset, peak, and duration of premixed insulins depend on the amounts of rapid-acting or short-acting insulin and intermediate-acting insulin. See above for more information based on the specific insulins contained in the premixed insulin.			Given with one or more meals per day. Should be injected 30 – 45 minutes before the start of the meal.
Premixed insulin analogues • Humalog Mix 25, Mix 50 / NovoMix 30				Given with one or more meals per day. Should be injected 0 – 15 minutes before or after meals.

Insulin Care and Storage:

Unopened insulin should be stored in the fridge between 2°C and 8°C. The insulin you are using can be stored at room temperature for up to 1 month. Levemir, Toujeo and Tresiba are the exception; Levemir and Toujeo are safe at room temperature for 42 days, while Tresiba is safe at room temperature for 56 days. Discard insulin that has been frozen, exposed to temperatures greater than 30°C, or expired.

Diabetes Identification:

You should always wear identification, such as a bracelet or necklace, to identify that you have diabetes. Identification bracelets, such as MedicAlert®, can be purchased at pharmacies and jewellery stores. Always carry identification in your wallet or purse that provides information about your diabetes.

Low Blood Sugars (Hypoglycemia):

Treatment of Low Blood Sugar (Hypoglycemia)

What is low blood sugar?

When the amount of sugar in your blood (blood glucose) has dropped below your target range (i.e. is generally less than 4.0 mmol/L), a condition called low blood sugar or hypoglycemia occurs.

When this happens, you may feel:

- Shaky, light-headed, nauseated
- A faster heart rate
- Confused, difficulty concentrating or speaking
- Nervous, irritable, anxious
- Sweaty, headachy
- A numbness or tingling in your tongue or lips
- Weak, drowsy, vision changes
- Hungry

How do I treat low blood sugar?

If you are experiencing the signs of a low blood sugar level, check your blood sugar immediately. If you do not have your meter with you, treat the symptoms anyway. It is better to be safe.

Eat or drink a fast-acting carbohydrate source (containing 15 grams). For example:

- 15 g of glucose in the form of glucose tablets (preferred choice)
- 15 mL (1 tablespoon) or 3 packets of table sugar dissolved in water
- 5 cubes of sugar
- 150 mL (2/3 cup) of juice or regular soft drink
- 6 LifeSavers® (1 = 2.5 g of carbohydrate)
- 15 mL (1 tablespoon) of honey (do not use for children less than 1 year)

Low blood sugar can happen quickly, so it is important to treat it right away. If your blood sugar drops very low, you may need help from another person.

Causes of low blood sugar:

- More physical activity than usual
- Eating less than usual
- Not eating on time
- Taking too much medication
- Drinking alcohol

If you are planning on fasting, consult your diabetes health-care team well in advance.

Checking Blood Sugars and Adjustment of Insulin:

Insulin: _____ Starting Dose: _____ units at _____

Blood sugar goals: _____

Contact for help with insulin adjustments: _____

What to do with your diabetes pills: _____

Please check blood sugars using the following schedule.

	Breakfast		Lunch		Supper		Bedtime	Night
	before	after	before	after	before	after		
Insulin								
Blood sugar								

Proper Use of Pen Tips (needles):

Use pen tips only once; they are thin and can become bent or broken if re-used. Reusing pen tips can make the injection more painful. Leaving pen tips on the cartridge may cause leaking or allow air into the cartridge which may affect the concentration of the insulin.

Safe Sharps Disposal:

Pen tips and lancets should be disposed of in a sharps container. Check with your local pharmacy. Many pharmacies supply safe, puncture-proof containers. When the container is full, it is returned to the pharmacy in exchange for a new container. Sharps otherwise should be disposed of in accordance with local regulations.

Diabetes Driving Guidelines

Prevention of low blood sugar for all insulin-treated drivers

- Measure your blood sugar level immediately before and at least every 4 hours during long drives.
- Always carry blood sugar monitoring equipment and an emergency supply of fast-acting carbohydrate within easy reach (e.g. attached to the visor).
- Do not start driving if your blood sugar is less than 4.0 mmol/L. If you feel symptoms of low blood sugar while you are driving, stop the vehicle in a safe location and remove the keys from the ignition.
- If your blood sugar is less than 4.0 mmol/L, you should have 15 grams of carbohydrate and not begin to drive until your blood sugar is at least 5.0 mmol/L. It is suggested to wait for 40 minutes to recover fully from low blood sugar.
- If your blood glucose is < 2.8 mmol/L while driving you must refrain from driving immediately, and notify a member of your health-care team as soon as possible.

Professional Drivers

- You should follow the above recommendations as well as perform any diabetes self care as required by your licensing province.

Each province has its own rules regarding sugar control and being able to drive.

I want to apply for a commercial licence.

Can I drive in Canada? In the United States?

Canadians with diabetes who are using insulin can apply for a commercial licence. Motor vehicle licensing authorities require a greater level of medical fitness for drivers operating passenger vehicles (buses/commercial vans), trucks, and emergency vehicles. Commercial drivers spend more time driving and are often under more adverse conditions than private drivers.

Canadians with diabetes who are using insulin can be licensed to drive a commercial vehicle in Canada. The Canada/US Medical Reciprocity Agreement (effective March 1999) recognizes the similarity between Canadian and American medical standards and provides for reciprocal arrangements on medical fitness requirements for Canadian and American drivers of commercial vehicles.

However, Canadian commercial drivers who have diabetes requiring insulin, are not permitted to drive in the United States.

What is Diabetes Canada's position on diabetes and driving and licensing?

Diabetes Canada believes people with diabetes should be assessed for a driver's licence on an individual basis.

For more information, see <http://www.diabetes.ca/about-cda/public-policy-position-statements/driving-licensing>.

Related articles: *Lows and highs: blood glucose Levels, Thinking of starting insulin, Managing your blood sugar*

Interactive Self-monitoring of Blood Glucose Tool

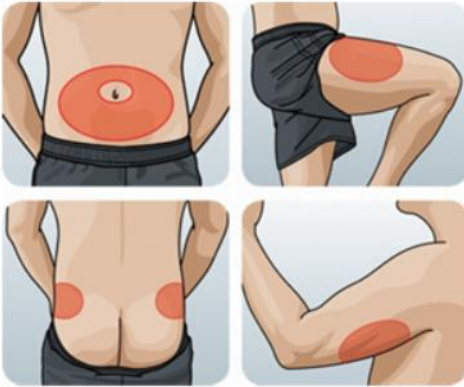
See Diabetes Canada on YouTube for videos about using insulin.

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Insulin Injection Guidelines

Where do I inject my medication?



- The abdomen, thighs and buttocks are the recommended injection sites.
- The abdomen is the area that absorbs insulin most consistently. Avoid injecting within 3.5 cm (1.5 inches) of the belly button.
- It is important to rotate your injection sites to prevent lipohypertrophy (rubbery, hard skin tissue).
- Exercise makes insulin absorb faster. Try to avoid injecting into an arm or a leg if you are about to exercise.
- Increased skin temperature caused by a hot bath or sauna can cause insulin to absorb faster.

How do I use my pen and inject my medication?

STEP 1: Put a new needle tip onto your pen.

STEP 2: Mix your cloudy insulin by gently rolling it 10 times AND tipping it (not shaking it) 10 times for a total of 20 times.

STEP 3: Prime your pen: remove both of the caps from the needle tip and dial the pen to 2 units, then push the end button. Repeat this step until you see a flow of insulin at the needle tip, not just a drop.

STEP 4: Dial the dose of medication that you need.

STEP 5: Choose a site to inject your medication.

STEP 6: Insert the needle straight into the fat, at a 90-degree angle to the skin.

STEP 7: Slowly push the end button all the way down until it stops.

STEP 8: Hold the needle under your skin for 10 seconds. Remove the needle from your skin and look at your injection site. If the medication beads on your skin or blood appears, apply gentle pressure.

STEP 9: Check to make sure you see a **0** in the dose window to confirm that the full dose was given.

STEP 10: Using the outer needle cap, remove the needle from your pen and dispose of it in a sharps container.

My Insulin Schedule

Name of Insulin	Before Breakfast	Before Lunch	Before Supper	Evening/Bedtime

Where do I keep my medication?

- Unopened insulin and Victoza/Byetta should be stored in the fridge (2–8°C) and can be available to use until the expiry date. ALWAYS CHECK THE EXPIRY DATE.
- Once an insulin cartridge, vial or prefilled pen is opened, it can be used for 28 days, with the exception of Levemir, which can be used for 42 days. Once Victoza/Byetta are opened, they can be used for 30 days.
- Insulin and Victoza/Byetta in use do not have to be refrigerated but should be kept at a temperature below 25°C, away from direct heat and sunlight and protected from freezing.

Tips for Success

- Make sure you mix your cloudy insulin before injecting, by gently rolling it 10 times, then tipping it (not shaking it) 10 times (total of 20 times). Visually check to ensure the insulin has a consistent milky white appearance.
- Prior to each insulin injection, prime your pen with 2 units of insulin. Repeat this step until you see a flow of insulin—not just a drop.
Victoza/Byetta only need to be primed with the first use, not with each injection.
- Do not use alcohol to clean the skin at the injection site.
- Do not use alcohol to clean the needle tip, as it removes the protective coating and dulls the needle.
- If the medication beads on your skin after the injection, apply gentle pressure; do not massage. With all future injections, hold the needle under the skin for 15 or 20 seconds before removing it to make sure all the medication has been injected.
- If blood appears at the injection site, apply gentle pressure; do not massage.
- Remove the needle tip from your pen after each injection. This prevents the entry of air (or other contaminants) into the cartridge as well as the leakage of medication out of the cartridge.
- Change your insulin cartridge once the plunger is below the white/coloured line.

Reference: Berard L, Desrochers F, Husband A, MacNeill G, Roscoe R. Forum for Injection Technique (FIT) Canada - Recommendations for Best Practice in Injection Technique. 2011.
Reference: Site selection graphic courtesy of BD Medical.

Insulin Prescription

Choose insulin(s) from one of the columns and then complete the dosing and titration column.

Prescriber's Name:

Address:

Tel:

Fax:

Patient's Name:

Address:

Tel:

STEP 1: Choose Insulin Type		STEP 2: Dosing and Titration		
BASAL Long-acting analogues (Clear)	☐ Basaglar™ ☐ Cartridge ☐ Kwikpen® (prefilled)	☐ Levemir® ☐ Cartridge ☐ FlexTouch® (prefilled) ☐ Tresiba® ☐ FlexTouch® 100 U/mL (prefilled) ☐ FlexTouch® 200 U/mL (prefilled)	☐ Lantus® ☐ Cartridge ☐ Vial ☐ SoloSTAR® (prefilled) ☐ Toujeo® ☐ SoloSTAR® (prefilled) ☐ DoubleSTAR® (prefilled)	Starting dose: _____ units at _____ Increase dose by _____ units every _____ until fasting blood glucose has reached the patient's individual target of _____ mmol/L.
Intermediate-acting (Cloudy)	☐ Humulin® N ☐ Cartridge ☐ Kwikpen® (prefilled)	☐ Novolin® ge NPH ☐ Cartridge ☐ Vial		
PRANDIAL (BOLUS) Rapid-acting analogues (Clear)	☐ Humalog® ☐ Cartridge ☐ Kwikpen® (prefilled) ☐ Humalog® 200 units/mL ☐ Kwikpen® (prefilled)	☐ Fiasp® ☐ Cartridge ☐ Vial ☐ FlexTouch® (prefilled) ☐ NovoRapid® ☐ Cartridge ☐ Vial ☐ FlexTouch® (prefilled)	☐ Apidra® ☐ Cartridge ☐ Vial ☐ SoloSTAR® (prefilled) ☐ Admelog™ ☐ Cartridge ☐ Vial ☐ SoloSTAR® (prefilled) ☐ Trurapi™ ☐ Cartridge ☐ SoloSTAR® (prefilled)	Starting dose: _____ units ac breakfast _____ units ac lunch _____ units ac supper
Short-acting (Clear) Give 30 minutes before meal.	☐ Humulin® R ☐ Cartridge ☐ Vial	☐ Novolin® ge Toronto ☐ Cartridge ☐ Vial		
PREMIXED Premixed analogues (Cloudy)	☐ Humalog® Mix25™ ☐ Cartridge ☐ Kwikpen® (prefilled) ☐ Humalog® Mix50™ ☐ Cartridge ☐ Kwikpen® (prefilled)	☐ NovoMix® 30 ☐ Cartridge		Starting doses: _____ units ac breakfast _____ units ac supper Increase breakfast dose by _____ units every day until pre-supper blood glucose has reached the target of _____ mmol/L. Increase pre-supper dose by _____ units every day until fasting blood glucose has reached the target of _____ mmol/L. Beware of hypoglycemia post-breakfast or post-supper. Stop increasing dose if hypoglycemia occurs.
Premixed regular (Cloudy) Give 30 minutes before meal.	☐ Humulin® 30/70 ☐ Cartridge ☐ Vial	☐ Novolin® ge 30/70 ☐ Cartridge ☐ Vial ☐ Novolin® ge 40/60 ☐ Cartridge ☐ Vial ☐ Novolin® ge 50/50 ☐ Cartridge		
PEN DEVICE Required if insulin cartridges selected.	☐ HumaPen® Savvio™ ☐ HumaPen LUXURA® HD	☐ NovoPen® 4 ☐ NovoPen Echo® ☐ NovoPen® 5	☐ ClickSTAR™	
OTHER SUPPLIES	☐ Pen needles (if using a pen): ☐ 4mm ☐ 5mm ☐ 6mm ☐ 8mm OR ☐ At discretion of pharmacist ☐ Glucose test strips ☐ Lancets ☐ Insulin Syringe (if using vials) ☐ Ketone Strips (if applicable) ☐ Glucagon ☐ Nasal Glucagon			
QUANTITY and REPEATS	Insulin Mitte: _____ boxes Repeats x _____	Supplies Mitte: _____ boxes Repeats x _____		

Signature:

Print Name:

Date:

License #:

This tool was developed by the Ontario College of Family Physicians and the New Brunswick Diabetes Task Group and was re-produced with permission by Diabetes Canada. Diabetes Canada will keep this tool updated and available at guidelines.diabetes.ca.
Updated March 2022 416584

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Insulin Initiation and Titration Suggestions for Type 2 Diabetes	
People starting insulin should be counseled about the prevention, recognition and treatment of hypoglycemia. The following are suggestions for insulin initiation and titration. Clinical judgment must always be used as the suggestions may not apply to every patient.	
Basal Insulin (only) as an add-on to Antihyperglycemic Agents (Basaglar™, Lantus®, Levemir®, Toujeo™, Tresiba®, Humulin® N, Novolin® ge NPH) - Target fasting blood glucose (BG) of 4-7 mmol/L. The fasting BG target can be changed to 4-5.5 mmol/L if not achieving adequate overall glycemic control. - Most patients will need 40-50 units a day to achieve target but there is no maximum dose. - Start at a low dose of 10 units at bedtime (may start at lower dose [0.1 -0.2 units/kg] for lean patients (<50 kg)). - If using Tresiba®, the dose can be increased by 2-4 units every week until fasting BG target is achieved. - If using other basal insulin, patient should self-titrate by increasing the dose by 1 unit every 1 night until fasting BG target is achieved. - If fasting hypoglycemia occurs, the dose of bedtime basal should be reduced. - Basaglar™, Metformin and the secretagogue are usually maintained when basal insulin is added. - If daytime hypoglycemia occurs, reduce the oral antihyperglycemic agents (especially secretagogues). - Lantus®, Levemir®, Toujeo™ or Tresiba® can be given at bedtime or in the morning.	Dosing and Titration Example Starting dose 10 units at bedtime. Increase dose by 1 unit every 1 night until fasting blood glucose has reached the target of 4-7 mmol/L.
Basal + Bolus Insulins - When basal insulin added to antihyperglycemic agents is not enough to achieve glycemic control, bolus (prandial) insulin should be added before meals. The regimens below incorporate bolus (prandial) insulin. There is the option of only adding bolus insulin to the meal with the highest postprandial BG as a starting point for the patient who is not ready for more injections. - Typically, insulin secretagogues are stopped and only metformin is continued when bolus (prandial) insulin is added. - For current basal insulin users, maintain the basal dose and add bolus insulin with each meal at a dose equivalent to 10% of the basal dose. For example, if the patient is on 50 units of basal insulin, add 5 units of bolus insulin with each meal. - For new insulin users starting a full Basal + Bolus regimen, calculate Total Daily Insulin dose (TDI) as 0.3 to 0.5 units/kg, then distribute as follows: 40% of TDI dose as basal insulin (Basaglar™, Lantus®, Levemir®, Humulin® N, Novolin® ge NPH) at bedtime. If using Toujeo™ or Tresiba®, may give morning or bedtime. 20% of TDI dose as prandial (bolus) insulin prior to each meal. - Rapid-acting insulin analogues (Apidra®, Fiasp®, Humalog®, Admelog™, NovoRapid®, Trurapi™) should be given 0-10 minutes before eating. - Short-acting insulin (Humulin® R, Novolin® ge Toronto) should be given 30 minutes before eating. - An alternative distribution is 50% basal insulin (at bedtime) and 50% bolus insulin (distributed among the meals of the day). - Adjust the dose of the basal insulin to achieve the target fasting BG level (usually 4-7 mmol/L). - Adjust the dose of the bolus (prandial) insulin to achieve postprandial BG levels (usually 5-10 mmol/L) or pre-prandial BG levels for the subsequent meal (usually 4-7 mmol/L).	Dosing Example (100kg person) Total daily insulin = 0.5 units/kg: 0.5 x 100kg (TDI) • TDI = 50 units Basal insulin = 40% of TDI: 40% x 50 units • Basal bedtime = 20 units Bolus insulin = 60% of TDI: 60% x 50 units • Bolus = 30 units = 10 units with each meal
Premixed Insulin Before Breakfast and Before Dinner (Humalog® Mix25™, Humalog® Mix50™, NovoMix® 30, Humulin® 30/70, Novolin® ge 30/70) - Target fasting and pre-supper BG levels of 4-7 mmol/L. - Most patients with type 2 diabetes will need 40-50 units twice a day to achieve target but there is no maximum dose. - Start at a low dose of 5 to 10 units twice daily (before breakfast and before supper). - Patient can gently self-titrate by increasing the breakfast dose by 1 unit every day until the pre-supper BG is at target. - Patient can gently self-titrate by increasing the supper dose by 1 unit every day until the fasting BG target is at target. - Beware of hypoglycemia post-breakfast or post-supper. Stop increasing dose if this occurs. - Premixed analogue insulins (Humalog® Mix25™, Humalog® Mix50™, NovoMix® 30) should be given 0 to 10 minutes before eating. - Premixed regular insulins (Humulin® 30/70, Novolin® ge 30/70) should be given 30 minutes before eating. - Continue Metformin and consider stopping secretagogue.	Dosing and Titration Example 10 units ac breakfast, 10 units ac supper. Increase breakfast dose by 1 unit every 1 day until pre-supper blood glucose has reached the target of 4-7 mmol/L (usual target). Increase supper dose by 1 unit every 1 day until fasting blood glucose has reached the target of 4-7 mmol/L (usual target).
Selection of Pen Needle Forum for Injection Technique (FIT) Canada recommends that 4, 5, and 6mm needles are suitable for all people with diabetes regardless of BMI. In addition, there is no clinical reason for recommending needles longer than 8mm. Initial insulin therapy should start with the shorter needle length (Berard L, et al. FIT Forum for Injection Technique Canada. Recommendations for Best Practice in Injection Technique. 4th edition 2020).	

Insulin pen start checklist

Topic	Instruction date & initials	Comments
1. Cognitive Assessment		
2. Insulin delivery		
• loading		
• appropriate mixing		
• priming shot		
• dialing up dose		
• delivery of insulin		
3. Insulin		
• type/action time		
• frequency/timing		
• injection sites		
• needle length		
• storage/expiry		
4. Return demonstration		
5. Hypoglycemia		
• signs/symptoms		
• causes/preventions		
• treatment		
• diabetes identification		
6. Glucose checks		
• recommend a monitoring schedule		
7. Sharps disposal		
8. Snacks		
9. Driving		
10. Instructions for oral medication		
11. Follow-up		
• dose adjustment		
• A1c every 3 months		

March 27, 2026

Self-monitoring blood glucose (SMBG)



Frequency & pattern tool

Use this calculator to determine how frequently your patient should be checking their blood glucose, with some suggested patterns for monitoring.

[Print](#)

STEP 1: Frequency

Reset

What type of diabetes does your patient have?

- ☐ Type 1 diabetes
- ☐ Type 2 diabetes
- ☐ Gestational diabetes mellitus (GDM)
- ☐ Prediabetes

STEP 2: Pattern

Please complete step 1

This is only to be used as a decision support tool and is subject to these terms.
For more information, please see [terms of use](#).

Self-Monitoring Blood Glucose (SMBG) Frequency & Pattern Tool

<http://guidelines.diabetes.ca/self-management/smbg-tool>

Pattern Recommendation: Basal Insulin Only (To Target)

NPH or long-acting insulin analogue, typically given at bedtime.
SMBG at least as often as insulin is being given.

- Optional, less frequent SMBG can be done at other times of day to ensure glycemic stability through the day, or to detect hypoglycemia caused by secretagogue, if applicable.
- Basal insulin may be given in combination with secretagogue, non-secretagogue or injectable (GLP-1 analogue) medications.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Insulin							NPH / long (basal)	
SMBG pattern	SMBG test							
Adjustment	Basal insulin ↑ if BG hi ↓ if BG low							

Pattern Recommendation: Basal Insulin Only (Not To Target)

NPH or long-acting insulin analogue, typically given at bedtime.

SMBG ≥ 2 times per day, to assist in lifestyle and/or medication changes until glycemic targets are met.

- Optional, less frequent SMBG can be done at other times of day to detect hypoglycemia caused by secretagogue, if applicable.
- If initiating basal insulin, focus should be mostly on the before breakfast SMBG test; the before supper and bedtime SMBG testing is less important / optional.
- If patient is on basal insulin, before breakfast SMBG test is to target but A1C is not to target, focus should be more on the before supper and bedtime SMBG testing.
- Basal insulin may be given in combination with secretagogue, non-secretagogue or injectable (GLP-1 analogue) medications.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Insulin							NPH / long (basal)	
SMBG pattern: Alternating daily	SMBG test				SMBG test			
	SMBG test						SMBG test	
Adjustment	Bedtime insulin ↑ if BG hi ↓ if BG low							

Pattern Recommendation: Premixed Insulin (or NPH twice daily)

Insulin doses are typically given pre-breakfast and pre-supper.

SMBG at least as often as insulin is being given.

- SMBG QID until glycemic targets are met
- SMBG BID (alternating times) is usually sufficient once glycemic targets are met.
- Premixed insulin may be given in combination with non-secretagogue or injectable (GLP-1 analogue) medications.
- Premixed insulin would not typically be used in combination with secretagogue medications.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Insulin	Premix/ NPH				Premix/ NPH			
SMBG pattern 1: Starting	SMBG test		SMBG test		SMBG test		SMBG test	
SMBG pattern 2: Stable Alternating daily	SMBG test				SMBG test			
			SMBG test				SMBG test	
Adjustment	Pre-supper insulin ↑ if BG hi ↓ if BG low		Pre-breakfast insulin ↑ if BG hi ↓ if BG low		Pre-breakfast insulin ↑ if BG hi ↓ if BG low		Pre-supper insulin ↑ if BG hi ↓ if BG low	

Pattern Recommendation: Basal Plus

Insulin doses are typically given as a rapid-acting analogue or regular insulin (bolus) before one meal plus NPH or long-acting insulin analogue given at bedtime.

SMBG at least as often as insulin is being given.

- In the example shown, the bolus insulin is given at supper but could be given at breakfast or lunch.
- The bolus insulin is typically given with the largest meal or the meal with the highest post-meal BG.
- Basal plus NPH or a long-acting insulin may be given in combination with secretagogue (at a different time than bolus insulin), non-secretagogue or injectable (GLP-1 analogue) medications.
- SMBG QID until glycemic targets are met.
- SMBG BID (alternating times) is usually sufficient once glycemic targets are met.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Insulin					Rapid/ regular (bolus)		NPH/long (basal)	
SMBG pattern 1: Starting	SMBG test				SMBG test	SMBG test	SMBG test	
SMBG pattern 2: Stable Alternating daily	SMBG test					SMBG test		
	SMBG test						SMBG test	
Adjustment	Basal insulin ↑ if BG hi ↓ if BG low						Pre-supper bolus insulin ↑ if BG hi ↓ if BG low	

Pattern Recommendation: QID (Basal-Bolus/Multiple Daily Injections [MDI])

Insulin doses are typically given as a rapid-acting analogue or regular insulin (bolus) before each meal, and NPH or long-acting analogue (basal) typically given at bedtime.

SMBG at least as often as insulin is being given.

- After meal testing is usually done 2 hours after the start of a meal.
- SMBG should be QID, pre-meal and bedtime, in order to assess previous dose, and to adjust next dose. Some patients find post-prandial checking can also be helpful.
- For people with type 2 diabetes, basal-bolus / MDI may be given in combination with non-secretagogue or injectable (GLP-1 analogue) medications.
- Basal-bolus / MDI would not typically be used in combination with secretagogue medications.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Insulin	Rapid/ regular (bolus)		Rapid/ regular (bolus)		Rapid/ regular (bolus)		NPH/long (basal)	
SMBG pattern 1: Starting or Stable	SMBG test		SMBG test		SMBG test		SMBG test	
SMBG pattern 2: Intensive management	SMBG test	SMBG test	SMBG test	SMBG test	SMBG test	SMBG test	SMBG test	SMBG test
Adjustment	Basal insulin ↑ if BG hi ↓ if BG low		Pre-breakfast bolus insulin ↑ if BG hi ↓ if BG low		Pre-lunch bolus insulin ↑ if BG hi ↓ if BG low		Pre-supper bolus insulin ↑ if BG hi ↓ if BG low	

Pattern Recommendation: Insulin pump

Typically given as a rapid-acting analogue (bolus) before each meal and a continuous rapid-acting insulin analogue throughout the day and night.

SMBG at least as often as insulin is being given.

- SMBG should be QID, pre-meal and bedtime in order to assess previous dose and to adjust next dose. Some patients find post-prandial checking can also be helpful.
- For people with type 2 diabetes, insulin pump therapy may be given in combination with non-secretagogue or injectable (GLP-1 analogue) medications.
- Insulin pump therapy would not typically be used in combination with secretagogue medications.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Insulin	Rapid (bolus)		Rapid (bolus)		Rapid (bolus)			
	Rapid (basal)							
SMBG pattern 1: Starting or Stable	SMBG test		SMBG test		SMBG test		SMBG test	
SMBG pattern 2: Intensive management	SMBG test	SMBG test	SMBG test	SMBG test	SMBG test	SMBG test	SMBG test	SMBG test
Adjustment	Basal insulin (night)	Pre-breakfast bolus insulin		Pre-lunch bolus insulin		Pre-supper bolus insulin		Basal insulin (night)
	↑ if BG hi ↓ if BG low	↑ if BG hi ↓ if BG low		↑ if BG hi ↓ if BG low		↑ if BG hi ↓ if BG low		↓ if BG low
	Or adjust basal insulin (day)							

Pattern Recommendation: Diagnosis of type 2 diabetes in the past 6 months or not meeting glycemic targets

Check ≥ 1 time per day, on average, and at different times of day to learn the effects of various meals, exercise and/or medications on blood glucose.

- Please pick one of the following SMBG patterns below

SMBG basic pattern

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Sunday								
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								

SMBG pattern to learn the effects of various meals

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Sunday								
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								

Pattern Recommendation (continued): Diagnosis of type 2 diabetes in the past 6 months or not meeting glycemic targets

SMBG pattern to learn the effects of exercise

- Sometimes benefit is seen 4 – 8 hours later, so alternate post-exercise testing times.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Sunday				Exercise	TEST			
Monday								
Tuesday								
Wednesday								
Thursday						Exercise	TEST	
Friday								
Saturday								

SMBG to get a snapshot of blood glucose levels throughout the day, on one day of the week, which is a typical day.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Sunday								
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								

Pattern Recommendation: Type 2 diabetes treated with lifestyle and oral agents AND is meeting glycemic targets

Infrequent checking recommended. Check 1 to 2 times per week.

- After meal testing is usually done 2 hours after the start of a meal.
- If on a secretagogue, check also when hypoglycemia occurs and/or has occurred.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Sunday								
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								

Pattern Recommendation: Patient is sick or starting a steroid medication

Check >2 times per day, to assist in lifestyle and/or medication changes until glycemic targets are met.

- If on a secretagogue, check also when hypoglycemia occurs and/or has occurred.
- Please pick one of the following SMBG patterns below.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Sunday								
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								

Check >2 times per day, to assist in lifestyle and/or medication changes until glycemic targets are met.

- If on a secretagogue, check also when hypoglycemia occurs and/or has occurred.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Sunday								
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								

Pattern Recommendation (continued): Patient is sick or starting a steroid medication

Check >2 times per day, to assist in lifestyle and/or medication changes until glycemic targets are met.

- If on a secretagogue, check also when hypoglycemia occurs and/or has occurred.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Sunday								
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								
Sunday								

Pattern Recommendation: Gestational diabetes

SMBG needs to be individualized and may involve ≥ 4 times per day.

- Please pick one of the following SMBG patterns below.

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Sunday								
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								

	breakfast		lunch		supper		bedtime	night
	before	after	before	after	before	after		
Sunday								
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								



guidelines.diabetes.ca | 1-800 BANTING (226-8464) | diabetes.ca

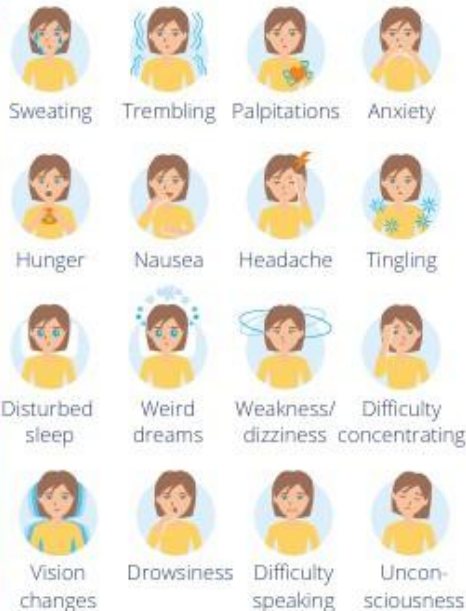
Hypoglycemia low blood sugar in adults

What are the signs?

Each person will have their own way of recognizing low blood sugar.

Some of the signs include:

Severity



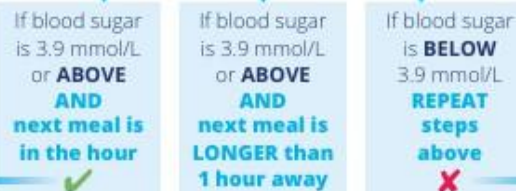
How to take action

If able to swallow, EAT fast-acting sugar



With more severe signs (affecting mental/physical ability):

- If able to swallow → EAT 20g fast-acting sugar
- If unable to swallow → GIVE 3 mg glucagon intranasal or 1 mg SC/IM



Eat ONE of:

Starch:
ex. 7 crackers OR 1 slice of bread
AND
Protein:
ex. 1 piece of cheese OR
2 tablespoons of peanut butter



Why does low blood sugar happen?

Have you:

- Eaten less than planned?
- Eaten later than normal?
- Taken more medication than planned?
- Been more active than planned?
- Drunk any alcohol within the past 24 hours?

Fear of lows is common and may cause excess anxiety, stress, reducing the ability to function and quality of life. If you are having lows, speak with your diabetes health-care team:

- Doctor • Nurse practitioner • Pharmacist
- Nurse • Dietitian

Are you Driving?

After treating a low, **Wait** until your blood sugar is above 5 mmol/L to start driving. Your brain might need up to 40 minutes to recover before you can safely drive again.

diabetes.ca

1-800-BANTING (226-8464) | info@diabetes.ca

DIABETES
CANADA

High Blood Glucose (HYPERGLYCEMIA)

There's a lot you can do to help keep yourself healthy with diabetes.



High blood glucose (blood sugar) is also called hyperglycemia, which happens when there is too much glucose in your blood. Over time, it can cause serious health problems.

Causes

High blood glucose can happen if you:

- Miss a dose of insulin or other diabetes medication
- Eat differently or more than planned
- Are less active than usual
- Are under stress or sick

High blood glucose can also happen as your diabetes changes over time.

Signs and Symptoms

Here's what may happen when your blood glucose is high:



Or you may have no symptoms at all.

High Blood Glucose (HYPERGLYCEMIA)

What to do about high blood glucose

The best way to avoid high blood glucose is to follow your diabetes care plan:



FOLLOW

Take your medicines as directed



Follow your meal plan



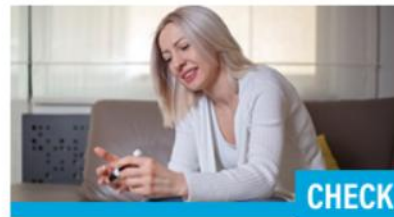
Follow your physical activity plan

Call your diabetes care team if your blood glucose has been higher than your goal for 3 days and you don't know why.



CALL

The best way to know if you have high blood glucose is to check your blood glucose regularly, as directed by your doctor.



CHECK

Visit www.NovoCare.com for additional resources and helpful information! Point your smartphone camera at the QR code for quick access to the website on your phone.



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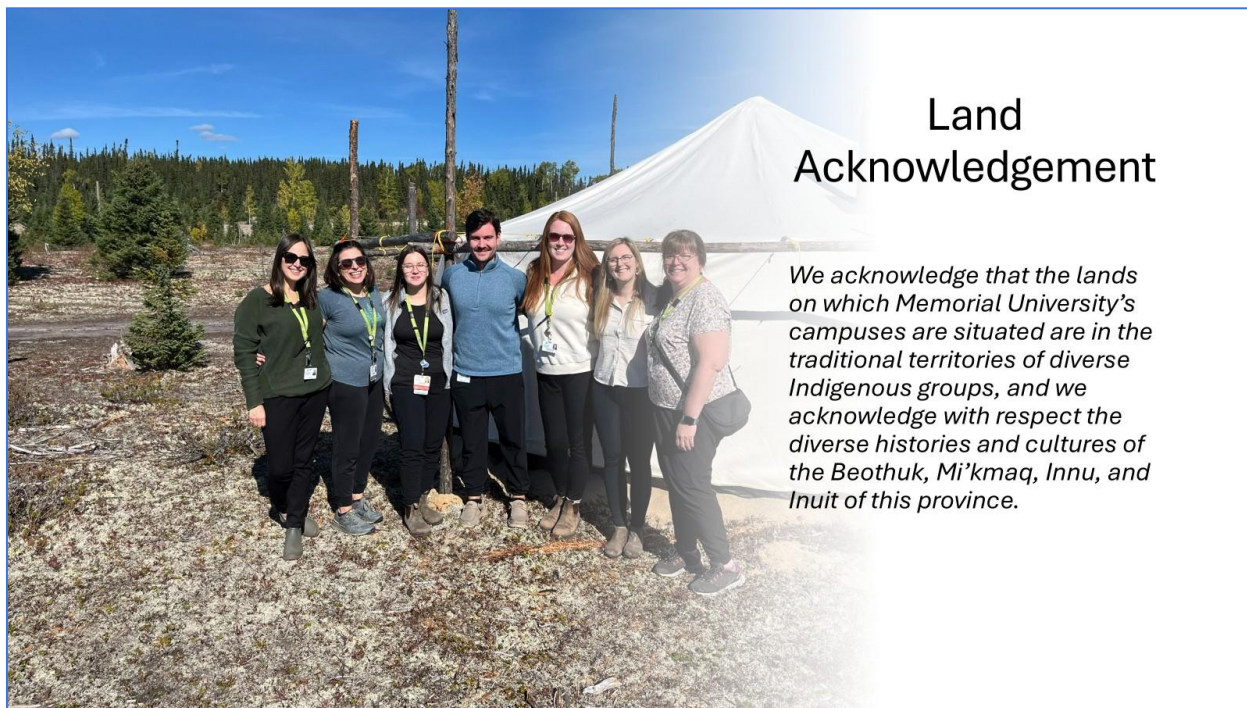
Appendix G
PowerPoint Presentation

The Development of a Diabetes Resource to Support Nursing Practice and Patient Education in Newfoundland & Labrador

Katie Snow BN RN CDE
March 2026

Speaker Notes:

My name is Katie Snow and today I will be presenting on “The development of a diabetes resource to support nursing practice and patient education in Newfoundland & Labrador”.



Land Acknowledgement

We acknowledge that the lands on which Memorial University's campuses are situated are in the traditional territories of diverse Indigenous groups, and we acknowledge with respect the diverse histories and cultures of the Beothuk, Mi'kmaq, Innu, and Inuit of this province.

Speaker Notes:

We acknowledge that the lands on which Memorial University's campuses are situated are in the traditional territories of diverse Indigenous groups, and we acknowledge with respect the diverse histories and cultures of the Beothuk, Mi'kmaq, Innu, and Inuit of this province.

Above is a picture of our diabetes team and family care team in Central Labrador during the Innu Gathering at Gull Island.



What I have seen...Gaps

- No centralized, standardized, and consistently updated diabetes education resources within NLHS
- Rural and remote communities face additional challenges
 - Geographic Disparity
 - Access and continuity of care inconsistent use of educational materials
 - Limited culturally relevant resources
 - Variability in patient education

Speaker Notes:

My name is Katie Snow. I have been a DNE for >10 years working in Northern Labrador. I witnessed firsthand the challenges of meeting increasing service demands across a vast geographic region. Patients and nurses from Central Labrador and the North Coast, regions often staffed by regional nurses, frequently reached out for immediate education and support. However, high caseloads and limited resources often led to delays, with patients being placed on waitlists for weeks or months.

Many patients expressed a strong desire for support when they were first diagnosed or when they were motivated to make changes. They wanted information in the moment, when they felt ready to learn and take action. Unfortunately, these teachable moments were often missed due to systemic barriers that delayed care. In many cases, patients could have begun simple lifestyle changes earlier, changes that could have had lasting impacts on their health outcomes. These experiences made it clear to me that while patients were ready to learn and take action, the health system did not always have the tools available to support them in those critical moments. Patients have said “if it was that important, why didn’t I have to come sooner”. I wasn’t told the seriousness until I saw you. Others have said “I have waited months to find out what I can eat”. What stood out the most was that simple dietary education could have been done at the home community.

During my diabetes nurse educator training and certification, the importance of early and structured diabetes self-management education was strongly emphasized. Best practice guidelines recommend education at the time of diagnosis, consistent messaging, culturally responsive care, and consistent follow-up.

However, in rural and remote practice, I observed something different. Patients were often placed on waitlists, regional nurses did not always have access to standardized educational materials, and education varied depending on geography or provider. This created a clear discrepancy between what evidence-based guidelines recommend and what the system was able to deliver in real time.



Background

- Align with Health Accord Action 9.3 - Strengthen community-based care and chronic disease management, particularly in underserved areas
- NL has the highest prevalence of diabetes in the country
- 33% of individuals live with prediabetes or diabetes
- Projected 20% increase
- 46,550 Indigenous people live in NL

Speaker Notes:

Health Accord NL, specifically Action 9.3, emphasizes the importance of strengthening community-based care and chronic disease management, particularly in underserved regions.

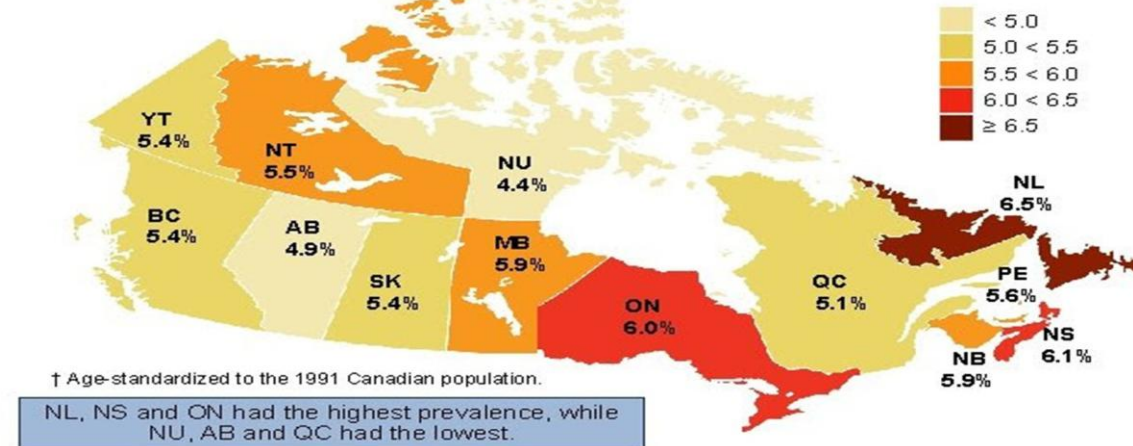
Diabetes is a chronic disease that is largely managed in community settings. Effective management depends heavily on timely education and self-management support.

NL has the highest prevalence of diabetes in Canada. Currently, approximately 33% of the population, or 170,000 individuals, are living with diabetes or prediabetes, and this number is projected to increase by 20% over the next decade.

Additionally, approximately 46,550 Indigenous people live in NL and experience disproportionately higher rates of diabetes and related health complications. Given this context, equipping frontline nurses with accessible, standardized tools is essential to strengthening community-based chronic disease management across the province and aligning with provincial healthcare transformation priorities

Diabetes in Canada: Prevalence by Province and Territory

Age-standardized[†] prevalence of diagnosed DM among individuals ≥ 1 year, 2008/09



Public Health Agency of Canada. *Diabetes in Canada: Facts and figures from a public health perspective*. Ottawa, 2011.

Speaker Notes:

This map illustrates age-standardized diabetes prevalence across Canada. Newfoundland and Labrador has the highest prevalence at 6.5%, exceeding the national average.

This is particularly significant given our aging population and the additional challenges faced in rural and remote regions, including Labrador.

These epidemiological trends underscore the urgency for standardized, accessible, and evidence-informed diabetes resources across NL Health Services.

The date of this map is 2008/08 which is older, however, this map still illustrates the same prevalence of diabetes in NL at almost two decades later.



Purpose of Practicum

- Develop a comprehensive, easy-to-use diabetes resource for nursing staff that contains standardized information that can be shared with patients in the Labrador-Grenfell (LG) zone.

Speaker Notes:

After witnessing these repeated challenges (delayed education, inconsistent messaging, missed teachable moments) I found myself asking: What would truly support nurses working in rural and remote communities? What type of resource would allow them to provide education in the moment, rather than placing patients on a waitlist? And what could work not just for nurses, but also directly for patients?

It became clear that what was needed was not another standalone handout or isolated guideline, but a centralized, practical, easy-to-use resource. One that consolidated current evidence-based education materials, clinical tools, and region-specific supports into a single accessible location. From here I decided that the purpose of my practicum would be to develop a comprehensive, easy-to-use diabetes resource that could be accessed by nurses and shared directly with patients, during those point of care moments, supporting timely, consistent, and community-based diabetes care with culturally relevant resources.



Aim

- Consolidate current evidence-based diabetes information into one accessible location
- Promote standardized care across geographic distances
- Strengthen health equity in rural and remote communities
- Support continuity of care
- Reduce delays in access to education
- Enhance screening and management of diabetes
- Improve patient outcomes

Speaker Notes:

The resource consolidates diabetes information into one accessible location for healthcare providers. It integrates current best practices from Diabetes Canada and other national organizations and includes region-specific resources that were previously lacking. This information can be easily shared with patients at the point of care, allowing nurses to provide timely education in the moment.

By standardizing and centralizing this information, the resource promotes more consistent diabetes care across geographic distances, particularly in underserved rural and remote regions, aligning with Health Accord NL priorities.

In turn, this strengthens health equity in rural/remote areas, supports continuity of care, reduces delays in access to education, enhance screening and management of diabetes, and ultimately has the potential to improve patient outcomes.



Methods



An extensive literature review



Consultations with key stakeholders



An environmental scan of existing provincial and national diabetes resources

Speaker Notes:

Three methods were used:

An extensive literature review

Consultations with key stakeholders

Environmental scan of existing provincial and national diabetes resources



Literature Review

- Barriers to diabetes management in NL
- Contributing factors of T2DM prevalence in NL
- Current evidence-based practices
- Clinical practice guidelines
- Education approaches in diabetes care
- Rural and remote health inequalities
- Diabetes self-management education & support
- Nursing scope of practice (CRNNL, CDE, FNIHB)

Speaker Notes:

A comprehensive review of the literature was conducted of the barriers specific to NL, contributing factors of the prevalence of T2DM in NL, current evidence-based practices, clinical guidelines, and effective educational approaches in diabetes care and patient education, with emphasis on rural/remote, and regional contexts in NL.

Additionally, the literature review examined evidence related to rural/remote health inequalities, specific to NL, to ensure the resource meets the intended gaps. Nursing-specific literature was reviewed to align the resource with the scope of practice for community and primary care nurses, including competencies outlined by the College of Registered Nurses of NL (CRNNL), Certified Diabetes Educator (CDE) standards, and First Nations Inuit Health Branch (FNIHB) guidelines. Key sources included Diabetes Canada Clinical Practice Guidelines, scholarly research articles, institutional diabetes programs, and Government of Canada health reports. Additionally, the review incorporated the objectives and priorities of the Health Accord NL, ensuring alignment with provincial healthcare transformation goals.

The literature review included a search on databases: CINAHL, MEDLINE, PubMed, and MUN library. Diabetes Canada was also used for literature review referring to the most recent clinical practice guidelines and evidence-based updates. Keywords used in the search included diabetes, diabetes education, self-management, rural health, Indigenous diabetes, diabetes nursing, knowledge, prevention, and strategies. Literature was included if they were peer-reviewed and published since 2015. Inclusion criteria consisted of peer-reviewed literature published from 2015 onward to ensure alignment with current evidence and practice standards. Studies were selected based on relevance to rural and remote health contexts, diabetes education, practice standards, and system-level considerations applicable to NL.



Literature Review Findings

NL modifiable risk factors	NL non-modifiable risk factors	Patient Challenges	Diabetes self-management education improves
• Inactivity (40.3%) • Overweight (35.5%) • Obesity (41.8%) • Unhealthy diet (88.1% inadequate fruit/vegetable intake)	• Age ≥ 40 (Median age 48) • NL fastest aging province in Canada • Member of high-risk population	• No primary care provider (41,748 people) • Misinformation and outdated advice • Lack of accessible education tailored to the rural context • Inconsistent advice from HCP • Fragmented care	• Patient knowledge • Clinical outcomes

Speaker Notes:

The literature strongly supports what I experience in practice as a diabetes nurse in NL.

First, at a population level, NL has significant modifiable risk factors. Over 40% of adults and youth are physically inactive. More than 75% of adults are either overweight or living with obesity. Nearly 90% do not meet recommended fruit and vegetable intake.

These lifestyle risk factors, combined with high rates of hypertension and hyperlipidemia, create an environment where type 2 diabetes risk is elevated.

In addition, NL has substantial non-modifiable risk factors. The median age is 48.4 years, and 23% of the population is over 65. Our province is aging faster than any province in Canada.

There are also 46,550 Indigenous people living in NL, a population that faces disproportionately higher rates of diabetes and related complications.

Together, these factors confirm that NL has a high-risk population for type 2 diabetes.

The literature also identified important system-level gaps. Canada ranks lowest among comparable countries for consistent access to a primary care provider, and as of June 2025, over 41,000 people in NL are waiting to be connected to a primary care provider.

Literature studies in rural/remote NL also reported misinformation and outdated advice particularly around diet, lack of accessible education tailored to the rural context such as the availability of foods, inconsistent advice from different healthcare providers and limited follow-up, leaving them feeling unsupported. In the Labrador-Grenfell zone, services are often fragmented. Diabetes nurse educators provide management support, but prevention initiatives are limited and sometimes episodic.

These findings validate what I see in clinic - fragmented care, inconsistent education, and limited access to reliable, standardized resources.

The literature also clearly demonstrates that diabetes self-management education is effective.

Studies show that structured education improves patient knowledge, self-care behaviors, weight, blood pressure, and hemoglobin A1C.

Digital and virtual diabetes prevention programs have shown improved outcomes which is particularly relevant for geographically isolated populations in NL.

Importantly, limited access to diabetes-competent care increases preventable complications and financial hardship, outcomes that could be reduced with proactive, accessible education.

These findings highlight a clear gap, NL has a high-risk population and documented system barriers, yet lacks a centralized, standardized, culturally relevant diabetes education resource for nursing staff. This gap is what my practicum project was designed to address.



Consultations



6 healthcare clinics within NLHS, with a focus on rural/remote areas within the Labrador Grenfell zone



Diabetes Educators, regional/remote nurses, primary care providers/nurse practitioners, nurse educator, regional director



Focus Groups and semi-structured interviews

Speaker Notes:

Consultations were conducted across 6 rural/remote sites within the Labrador-Grenfell zone, including both community clinics and regional centres. These sites were selected to provide a purposive sample that includes regional hub hospitals, community health centres, and very remote community clinics, thereby capturing diverse perspectives from healthcare professionals who experience unique challenges in diabetes management due to geography, access, and resource availability.

A total of 16 participants contributed, including Certified Diabetes Educators, dietitians, rural/remote and primary care nurses, primary care providers / Nurse Practitioners, a clinical nurse educator, and a regional director. This ensured representation across frontline practice and decision-making levels.

While the original plan was to conduct three distinct focus groups by roles, this was not feasible due to clinical workload and scheduling constraints. Instead, two focus groups were completed, and the remaining participants engaged in individual semi-structured interviews. . The focus groups and semi-structured interviews were conducted virtually to those living in rural/remote areas, and in-person to those living in Central Labrador.



Consultation Findings



Speaker Notes:

The consultations identified recurring gaps in diabetes education, many that align with findings from the broader literature on diabetes care in rural and remote settings. The dominant theme across consultations was a simple but powerful question: ‘What can I eat?’ This reflected persistent uncertainty around nutrition guidance and inconsistent messaging provided to patients.

As a DNE, this was always the most asked questions that I experienced from patients. Rural/remote nurses working in coastal and Indigenous communities emphasized that existing diabetes education materials often fail to reflect cultural food practices or local dietary availability.

Limited access to up-to-date, standardized educational materials was another barrier identified. CDEs relied on Diabetes Canada and other external resources, while rural/remote nurses reported inconsistent access to user-friendly tools, outdated local materials, or no available resources at all. The absence of a centralized NLHS diabetes education resource contributed to variation in teaching and reduced confidence among staff, especially in rural and remote areas. Leadership also identified the lack of standardized education materials across the zone.

Patient-level challenges were consistently reported across all groups including patients with low health literacy, language and cultural barriers, inconsistent attendance at appointments due to geographic barriers, and long wait times. Patient level challenges were particularly amplified in remote communities, where social determinants of health including limited transportation, and reduced access to supplies such as glucometers or CGMs further impacted diabetes education.



Environmental Scan

Purpose: To identify and evaluate diabetes education resources available across NLHS and its regional zones.

Areas Assessed

- Existing NLHS intranet staff resources
- Where clinicians access educational tools
- Accessibility across rural/remote settings
- Region-specific referral pathways & community programs
- Alignment with Diabetes Canada Clinical Practice Guidelines
- External national and provincial resources

Speaker Notes:

Conducting this environmental scan was necessary to determine what resources currently exist within NLHS and across the zones, evaluate their strengths and limitations, and identify gaps or opportunities for improvement. The scan examined the accessibility and availability of primary care providers, rural/remote nurses, CDEs, and clinicians access to intranet staff resources, determine where staff typically access educational tools, and how these materials support nursing practice and patient education. Additionally, the scan gathered region-specific healthcare information, such as referral pathways, contact details, and available community programs. All identified resources were evaluated for content accuracy and alignment with current evidence-based recommendations outlined in the Diabetes Canada Clinical Practice Guidelines.

External sources of information were also collected through a targeted review of reputable national and provincial websites, and health authorities that provide diabetes education and resources. Comparing resources from other provinces to those available within NLHS helped identify potential models to support the development of a new diabetes education resource tailored to NLHS.

This process allowed for identification of strengths, limitations, and system-level gaps, directly informing the development of a centralized, standardized, evidence-aligned diabetes resource.



Environmental Scan Findings

NLHS

- Participants: LG, Western, and Central zones of NLHS
- Outdated materials
- Inaccessible - 404 - File or Directory Not Found
- No contact or location of diabetes service in LG zone
- No centralized, up-to-date diabetes education resources

External Provincial & National Resources

- Comprehensive, accessible, up-to-date resources
- Indigenous service Canada provides culturally-focused resources

Speaker Notes:

The environmental scan included participation from the Labrador–Grenfell, Western, and Central zones, with no representation from Eastern.

Only five internal learning modules were identified within the NLHS staff portal. Most were outdated, inaccessible, or limited in scope. Several contained broken links and content misaligned with current Diabetes Canada guidelines. Only one module, published in 2023, reflected comprehensive, evidence-based content. Importantly, no coordinated, centralized diabetes education resource exists across zones. Materials vary significantly in availability and quality. There was also limited region-specific pharmacotherapy coverage information, and no Indigenous-specific educational content.

Publicly available platforms such as MyHealthNL were not regionally tailored or clearly integrated into clinical workflows. During consultations no participants identified this as a used resource.

In contrast, several Canadian provinces and national organizations (e.g., Albert Health Services, Fraser Health, LMC Healthcare, PHAC) offer comprehensive, accessible, and regularly updated diabetes education material that integrate best practice guidelines and support clinical practice. Additionally, ISC provides Indigenous-focused resources emphasizing the need for culturally grounded, community-directed approaches, particularly relevant for rural and remote communities in NL.

These findings directly support the need to develop a comprehensive, centralized, evidence-based diabetes education resource for NLHS nurses and patients, aligned with Diabetes Canada guidelines and tailored to the unique needs of NL's geography, workforce, and populations.



Outcomes



Culturally adapted



Plain language



Visual tools & take-home materials



Various formats: Print handouts, short videos, regional dietary examples, visuals, digital format



Locally available foods in rural and remote NL



Centrally housed on NLHS SharePoint

Speaker Notes:

The findings from the literature review, stakeholder consultations, and environmental scan directly informed the development of the resource.

It became clear that the resource needed to be culturally adapted, written in plain language appropriate for varying literacy levels, supported by visual tools, and include printable take-home materials in multiple formats to accommodate different learning styles.

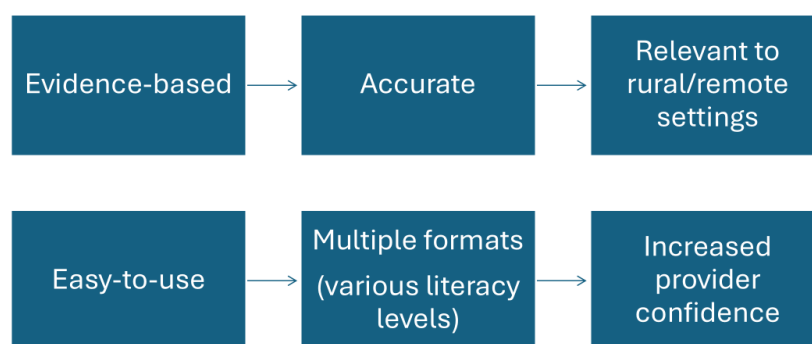
It also needed to reflect locally available foods in rural and remote Newfoundland and Labrador and be accessible across geographic distances.

To address this, the resource is centrally housed on the NL Health Services SharePoint platform, ensuring consistent, point-of-care access for providers across all regions.

The SharePoint site is organized into clearly divided tabs to support easy navigation during clinical encounters. Sections include Diabetes Basics, Medications, Blood Glucose Targets, Hypoglycemia and Hyperglycemia Management, Culturally Relevant Food Guidance, and Self-Management Tools.

Given that the most common patient question remains, “What can I eat?”, particular attention was given to developing nutrition content tailored to locally available foods, traditional hunting and fishing practices, and affordable options relevant to rural and remote communities.

Pilot Evaluation: Feedback



Speaker Notes:

The initial draft of the SharePoint resource was piloted through targeted consultation with previous key stakeholder participants across the Labrador–Grenfell zone.

Participants were provided access to the draft SharePoint site and invited to complete a structured questionnaire. The evaluation tool assessed alignment with Diabetes Canada Clinical Practice Guidelines, relevance to rural and remote settings, cultural safety for northern and Indigenous populations, usability at the point of care, literacy appropriateness, and perceived impact on provider confidence.

Open-ended questions gathered additional feedback regarding dissemination strategies, potential evaluation indicators, and recommended revisions prior to broader implementation.

Overall, participants identified the resource as evidence-based, accurate, and highly relevant to rural and remote practice settings. They reported that it was easy to navigate and appropriately structured to support varying literacy levels and learning styles.

Feedback from this formative pilot informed refinements prior to wider dissemination.

The anticipated outcome of this design is increased provider confidence and greater consistency in delivering culturally responsive, evidence-informed diabetes education.



Newly Developed Diabetes Education Resource

- Demonstration
-

Speaker Notes:

I will now give you a demonstration of the newly developed SharePoint diabetes resource



Conclusion Next Steps

- Dissemination across the Labrador-Grenfell zone and exploration of broader provincial implementation.

Speaker Notes:

Next steps include dissemination across the Labrador–Grenfell Zone. This will include orientation and demonstration sessions. Future steps include exploration of broader provincial implementation and additional folders specific to T1DM, and gestational.

Conclusion:

Diabetes care in Newfoundland and Labrador is complex, particularly across rural and remote communities; communities where I work and continue to advocate.

This project responds directly to identified system gaps by creating a centralized, SharePoint located, culturally responsive, evidence-based resource accessible across geographic distances.

It demonstrates how literature, stakeholder consultation, and environmental assessment can translate into meaningful practice change.

By identifying fragmentation and addressing it through a centralized SharePoint platform, this initiative strengthens alignment with best practice guidelines while acknowledging the realities of rural and remote healthcare delivery.

Ultimately, the goal is not simply to provide information, but to support nurses in delivering consistent, confident, and culturally responsive diabetes education at every point of care.



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Speaker Notes:

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The healthcare providers, Diabetes Nurse Educators, rural/remote nurses, primary care providers, and leadership across the LG zone who participated in consultations and pilot testing. They have generously shared their time and expertise.

My colleagues, friends, and family for their encouragement throughout this journey.

My husband and children

My parents

My friends Kathryn King & Marlyce Lunnen

Questions?



Speaker Notes:

Thank you all for attending my practicum presentation today. I now welcome questions, comments, or feedback.