THE DIABETES
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Summer 2020

EDITORIAL

The Value of Feedback

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We want to start this publication by thanking the entire professional membership section who have been on the front lines (physically and remotely) during the COVID-19 pandemic. Despite constant change, you have continued to ensure that patients across the country are getting the care and support they require. Many of you have been redeployed, worked extra hours and adapted to different work environments and workflows. For all that you do, thank you!

Caring and helping others is a part of what we, as professional members, do every day – whether it is conducting meticulous research to help inform future treatment and education, or assessing, counselling and providing care for patients with diabetes. So, for this summer issue of *The Diabetes Communicator*, the editorial team wanted to ensure that we meet your needs.

Last autumn, we circulated a survey asking our readers to identify topics of interest that you looked forward to seeing in future publications. We had over 90 responses and we are grateful for all of you who took the time to provide this invaluable input. Almost 40 per cent of respondents indicated they wanted to hear more about what other programs were doing and were interested in some practice pearls. In this issue, Julia Bannister's article, "Think Like a Social Worker: Then and Now," provides some practice pearls on the role of the social worker in diabetes care. This year's autumn issue will feature more articles like this.

Twenty-four per cent of respondents requested that we include a news/updates/hot topics section. We are happy to report that we have now added a regular column under the "News You Can Use" banner. In this edition of News You Can Use, two of our editorial team members, Elaine M. Cooke and Susan Harris, include an article on glucagon mini doses and the newly available Baqsimi® (Eli Lilly Canada Inc.), a nasally administered glucagon. Over one-quarter of respondents asked us to include updates on new medications and insulins. Dr. Robert A. Hegele provides an excellent overview of icosapent ethyl (Vascepa, HLS Pharmaceuticals, Canada), including the cardiovascular benefits shown in the Reduction of Cardiovascular Events with Icosapent Ethyl–Intervention Trial (REDUCE-IT). Vascepa was approved for prescription by Health Canada earlier this year. One-fifth of all respondents

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FROM THE CHAIR'S DESK

The New Normal

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Chair, Professional Section National Executive



When the first cases were reported globally, no one could have predicted the impact of COVID-19 – with over 22 million cases, over 750,000 lives lost and the lockdown of multiple countries. All our lives, both personal and professional, changed dramatically. Many hoped that the changes would be temporary, but then the days turned into weeks and the weeks turned into months. The provision of diabetes care had to pivot from in-person (which we had all taken for granted) to virtual within days. Some of you were redeployed into different roles within your institutions to meet the COVID-19-related demands. All of us had to learn new skills and technologies, adapt existing procedures, and become more creative and flexible so as to provide the least interruption to care.

At the same time, we had to try to keep up with the rapidly changing medical literature on COVID-19 to address the fears and concerns of people living with diabetes. The Diabetes Canada webinar series provided some of that support and a sense of community. The Ask-the-Expert video series also provided some information directly to people living with diabetes. At this point, the knowledge around COVID-19 and diabetes can be summarized in the following points:

- People living with diabetes are not at a higher risk of getting COVID-19 infection, but are at higher risk of complications from COVID-19 (1).
- The usual risk factors for more severe disease apply in those living with diabetes as it does in the general population (e.g. age, male, obesity, hypertension, socioeconomic status, ethnicity, etc.) (1).
- Type 1 diabetes in adults is associated with more adverse outcomes compared to type 2 diabetes adults (reasons unclear) (1).
- Glycemic control closer to target before and during infection is associated with better outcomes (1).
- Diabetes sick-day management must continue to be emphasized.

In the early days of COVID-19, chronic disease management was put on hold (to some extent) because of the uncertainty. People were afraid to go for laboratory tests (or in some areas, certain tests were deemed not essential and cancelled) and medication adjustments were often delayed. However, now that we are months into the pandemic, it is recognized that we can no longer delay change. In fact, this may be an opportunity for some to make changes to lifestyle or medications while they are at home. It may be an opportunity to learn more about food and cooking or engage in physical activity. There may also be an opportunity to focus on one's own health. Laboratory

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Diabetes and Cognitive Dysfunction: The Diabetes Educator's Role

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An aging population has led to rising rates of type 2 diabetes and cognitive dysfunction (1). As these conditions share common risk factors, they often coexist (1). Deterioration in cognitive function will lead to problems with diabetes self-care activities and can increase the risk for hypoglycemia. Evidence suggests early identification of cognitive dysfunction is essential to mitigate the problems associated with memory loss (1-3).

Diabetes educators play an important role in the care of older adults with diabetes. Through careful questioning and use of validated screening tests, they can alert the primary care provider when cognitive issues are recognized (personal communication, 2020). In these situations, blood glucose targets should be reviewed and individualized based on functional status and cognitive status (4). Medication regimens can be simplified and appropriate education and support initiated to assist in all aspects of diabetes care (2,3).

Identifying Cognitive Dysfunction

People who experience cognitive dysfunction are on a spectrum that ranges from mild cognitive impairment (MCI) to severe dysfunction, commonly known as dementia. Signs that an older adult's cognitive function is deteriorating will vary depending on individual circumstances and where they are on the spectrum (2). During a focused diabetes assessment, older adults and/or their family members should be asked if they have noticed any changes in cognitive function and, if present, how these changes affect their day-to-day activities (5). This is an important step as moderate-to-severe cognitive decline is usually noted by older adults and/or their family members, while early cognitive decline may go unrecognized and, as a result, is not addressed (2).

A significant deterioration in clinical status should be investigated, especially if it is accompanied by functional impairment or episodes of hypoglycemia. Missing or inappropriate content in meals, incorrect medication administration and missed appointments are signals that an older adult may be having difficulty coping (1). They may also have difficulty recognizing, preventing and treating hypoglycemia (3). Memory problems may impact the successful monitoring of blood glucose levels and interpretation of results. Some individuals who develop MCI may appear disengaged with their diabetes care, which may be misinterpreted as lack of adherence (1).

Screening

There are several quick and sensitive assessments that can be utilized in the outpatient setting for patients with diabetes.



These tests should be performed on the first visit and annually thereafter or if there is a change in status. The most common tests are the Montreal Cognitive Assessment Test, the Mini-Mental State Examination and the Mini-Cog (2,3). The Mini-Cog is well validated for use in older adults with type 2 diabetes and does not require specialized training to use. It consists of a three-item recall and a component known as the Clock Drawing Test (CDT) (6).

The CDT is an effective assessment tool for diabetes educators to use prior to initiating insulin in an older adult. It has been shown to predict which patient will have difficulty learning to self-inject insulin (7,8). If the clock is drawn incorrectly, the result is considered positive for dysfunction. In this situation, diabetes educators are advised to take extra time to teach insulin injections and ensure there is adequate support in the community (7). As noted earlier, any test results for the CDT or other cognitive screening tests should be forwarded to the older adult's primary care provider for their evaluation and follow up. The Mini-Cog and the CDT with instructions for use are available at this link: https://mini-cog.com/.

Diagnosis

Some conditions, such as depression, hypothyroidism and vitamin B_{12} deficiency, are known to occur in higher rates in people with diabetes. They can present with cognitive dysfunction; therefore, cognition should be reassessed after appropriate treatment and management of these conditions. Many other tests and assessments are required, such as brain scans and full social histories, before a formal diagnosis is made (8).

Support and Management

Diabetes Canada has classified older adults with dementia as functionally dependent, and recommends more focus on functional status and life expectancy and less on glycemic targets. Safety is a priority, and personalized care plans are paramount (4).

Self-care should be supported as long as possible in those who are experiencing early stages of cognitive dysfunction. Losing independence may result in a sense of loss and frustration if the older adult is not allowed to continue with things they can still manage. Care plans should record the preferences of the person with dementia while they are still able to make decisions for themselves. Family or caregiver involvement (if available) is crucial in this stage as well (1). Frequent reassessment is required as the individual is more likely to progress to dementia than the general population (1,8).

Education

Cognitive dysfunction will affect the ability to learn and retain knowledge. Family members should be included in education sessions where possible (1,9). The focus should be on the older adult by speaking directly to them, using their name and maintaining eye contact. Breaking concepts into simple, smaller pieces of information is recommended, as well as providing adequate time to reply to straightforward, open questions. Videos, such as those found on the Diabetes Canada website, may be helpful for patients and their family members. Providing appointments and education earlier in the day may facilitate learning as concentration and confusion may be worse in the early evening (1). Elimination of distractions is helpful, and hearing and visual (glasses) aids should be used if necessary (9).

Home care (where available) may need to be initiated to assist with diabetes care. Education sessions in the home environment may be less stressful and will allow for immediate assessment of learning. As dysfunction progresses, the family (if available) will need to take a more active role, such as performing insulin injections and home blood glucose monitoring (9). Eventually, most people with dementia will require 24-hour supervision and care (1).

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EDITORIAL...CONTINUED FROM PAGE 1

requested nutritional information. Dr. Tharsan Sivakumar provides us with important information on what patients with diabetes need to know about intermittent fasting. We also received several requests for tools and resources that people with diabetes and educators can use. Gabrielle Schmid delivers with an overview of four different apps available for Apple and Android users. Information related to seniors with diabetes was also requested by survey respondents and Sharon Dinsmore's article, "Diabetes and Cognitive Dysfunction: The Diabetes Educator's Role," provides an overview of the role certified diabetes educators can play in identifying cognitive dysfunction and how to improve safety and functional independence of older adults with diabetes.

Our summer edition is completed with some important lifestyle topics for patients with diabetes. The articles on shift work, as well as alcohol and diabetes, provide us with important reminders of the need to consider all lifestyle factors in the individualized care we provide our patients. Lastly, the article by Dr. Jean-Phillipe Chaput and Dr. Caroline Dutil provides us with the latest evidence on the importance of sleep in diabetes, insulin sensitivity and glucose homeostasis.

To conclude, we hope you enjoy reading this edition and that you find time to relax, unwind and recharge over the summer. Stay safe!

Diabetes and Shift Workers

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Shift work is difficult for many people, and can be especially challenging for people with diabetes. Shift work can be defined as work that rotates to have varying start times and lengths of working hours. For example, shift work can be eight to 12 hours in length; can be days, nights, afternoons or evenings; and can alternate between shifts or permanent hours. To date, there are limited studies and mixed results on glycemic control in relation to shift work; however, some suggest deteriorating glycemic control (1,2). Suboptimal blood glucose control could be due to the type or scheduling of medication/insulin, timing of meals and alterations in metabolism, or difficulty with self-management activities (such as healthy meal planning and exercise). In any situation, however, an assessment of the type of shift work is important as it plays a vital role in how to manage one's diabetes.



Medication

Frequent changes in routine, as in those that occur during shift work, can lead to difficulty in the timing of oral medications and the timing and dosing of insulin, which can then lead to inconsistent glucose control. The use of metformin is still the mainstay of therapy in the treatment of those with type 2 diabetes. Metformin does not have a high risk of hypoglycemia and, hence, would not necessarily need to be changed for use in shift workers. The timing of the drug may, however, be changed to coincide with meals, so as to minimize abdominal discomfort, which can occur with metformin use.

With respect to oral medications, the most worrisome are sulphonylureas, since these are well known to potentially cause hypoglycemia. Therefore, if there are changes in the timing of meals during any particular set of shifts, this must be kept in mind. Long periods of time between meals may result in unwanted hypoglycemia, which may put the patient in harm's way.

Several oral and injectable medications used to treat diabetes work in a glucose-dependent fashion (as is the case of the dipeptidyl peptidase-4 inhibitors and glucagon-like peptide-1 receptor agonists). Hence, postprandial insulin secretion is stimulated only when there is a rise in plasma glucose levels, such as when a patient has a meal or snack (3). Therefore, in the case of shift workers, taking the newer oral medications (which are glucose dependent) at a consistent time, no matter what time of day, will allow for stable glucose control in the context of postprandial rise of glucose.

In the case of the now popular sodium-glucose cotransporter-2 (SGLT2) inhibitors, similar principles apply. These agents reduce the reabsorption of glucose in the kidneys and increase its excretion via the urine (4). Therefore, once again, consistency of the timing of the medication, whatever time that may be, will allow for stable glucose control. Since this class of medication can cause dehydration (4), it is essential that the patient be educated and encouraged to remain well hydrated while on an SGLT2 inhibitor. It is important to note that if the patient is at risk for dehydration, as can occur with concurrent acute illness, then the medication should be temporarily discontinued until oral intake returns to preillness levels (4).

The difficulty in glucose control for shift workers arises with the use of insulin. Variability in timing of insulin can result in highly varied glucose control throughout the day and night as the insulin profiles may overlap with timing changes. The older generation twice-daily insulins, such as biphasic aspart and lispro, as well as the intermediate-acting insulins (such as NPH) are related to a significant incidence rate of nocturnal and symptomatic hypoglycemia (5). Luckily, new insulins are now available that are virtually "peak less" and that have a very long duration of upwards of 40 hours. These ultra-long insulins (i.e. insulin glargine 300 units per millilitre [u/mL] or insulin degludec 100 u/mL or 200 u/mL) allow for some flexibility of insulin timing, as well as more stable control throughout the day and night compared to other older insulins.

When comparing premixed insulin to multiple daily injections (MDI), it is clear that MDI is the safer option for shift workers as they would have the flexibility to dose their insulin prior to eating a meal rather than having insulin on board

and needing to eat. Various mealtimes is a mainstay of shift work, and MDI will allow the patient to safely delay a meal (if necessary) as deemed by the patient's working schedule.

Ultimately, a thorough understanding by the clinician of the medication's mechanism of action will enable a sound foundation of education for the patient, ensuring the patient's safety and the safety of those around them.

Nutrition

Our body's circadian rhythm (sleep/wake cycle) impacts many body processes, including food intake, energy expenditure, insulin sensitivity (8) and digestion (9). Glucose metabolism is not only affected by what and how much is eaten, it is also affected by when food is eaten. Late night eating, which is common for shift workers, can negatively impact glucose control (10). Some studies have found that meals consumed in the night can cause exaggerated blood glucose and lipid response compared to meals eaten during the day (11). Late night eating may also impact intestinal motility (12), leading to indigestion, heartburn and loss of appetite. These potential metabolic effects can make meals more challenging for those who do shift work.

Evidence suggests that shift workers have poorer quality food choices, unbalanced distribution of energy intake and snack more frequently (13). Lack of suitable food availability in the workplace may encourage the use of high-fat, high-sugar snacks and more frequent fast food choices. Shift timing often contributes to unbalanced energy intake, with higher intake later in the evening. We know that lifestyle management, including healthy food choices and exercise, is essential to optimal health. Unfortunately, some of these self-management activities are more challenging for shift workers.

There is insufficient evidence to make recommendations about what should be eaten or avoided when comparing day to night. However, considering the potential barriers to heathy eating and the metabolic effects of eating at night, the following tips for healthy eating while on a night shift may be helpful (14):

- Maintain regular eating patterns as best as possible. Consuming the main meal earlier in the day or early evening may help keep blood glucose balanced. For example, night shift workers may have better blood glucose response by having their main meal before the shift, and lighter meals/snacks during the shift to avoid a large carbohydrate load during the night.
- Time meals carefully to minimize gastrointestinal discomfort. Afternoon workers may be more comfortable eating their main meal in the middle of the day instead of during the shift. Night shift workers may do better with having their main meal before starting their shift, lighter meals during the shift to avoid gastrointestinal discomfort, and having a moderate breakfast after the shift to avoid waking to hunger while trying to sleep during the day.
- Plan and prepare all meals and snacks to take to work since healthy food choices may not be available for purchase during different shifts.
- Avoid choosing foods from vending machines or fast food restaurants.
- Consider timing of meals and snacks; for example, how much time is allotted for breaks during different shifts.
- Choose lower glycemic index foods, consider whole grain crackers with lean protein, or nuts and fruit instead of pop, chips or candy.
- Reduce caffeinated beverages and choose water.

Physical Fitness

Depending on the type of job they have, a shift worker may generally have decreased opportunity to engage in physical activity, either self-regulated exercise or group/team exercise. Physical activity has numerous benefits, including improved glycemic control and decreased insulin resistance, both of which are known to be altered in those who do shift work (14). Adding light activity midway through a shift (whether it is day, afternoon or an evening shift) can help increase overall energy levels and improve mood and blood glucose (14).

Conclusion

There are some potential barriers to optimal diabetes management for individuals with diabetes who perform shift work. Rotating shifts, varied meals, meal timing and fluctuating activity levels must be considered when developing a plan for both medication and lifestyle modifications. One plan will not fit all: an individual treatment plan to optimize diabetes control is a necessity.

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TECH WATCH

Diabetes Apps

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It goes without saying that technology has exploded in the world of diabetes. Diabetes apps continue to evolve to meet the needs of people living with the condition – what better way to help with carbohydrate counting, logbook keeping and, for some, calculating insulin doses than directly on a smartphone, computer or tablet.

Carbohydrate counting can be like learning a whole new language for some – it is challenging and often can be imprecise. The app "Carbs & Cals" helps the user visually calculate carbohydrates in grams based on the serving size. Other nutrients, like fibre, can also be included to help with carbohydrate counting calculation. The glycemic index is also a helpful tool that assists the patient with diabetes to make better food choices. The app "GI Cho" assigns a green, yellow or red tab for low-, medium- and high-glycemic foods based on the user's search.

Logbook keeping may be a thing of the past; with the choice of Bluetooth glucose meters, data can be synced to an app that will keep the patient's logbook organized to aid them, as well as their health-care team, with recognizing glucose trends. Accu-Chek Guide (Roche Canada), OneTouch Reveal (LifeScan IP Holdings, LLC, Canada) and Contour next ONE (Ascensia Diabetes Care Canada Inc.) are some examples of Bluetooth meters that are currently available.

For those on multiple daily injections, remembering to take their long-acting insulin and calculating their meal time dose isn't always an easy task. Using a bolus calculator may be the key to success. The Accu-Chek Bolus Advisor and the OneTouch Reveal Insulin Mentor are apps that can be used; however, patients will need a code from their health-care professional to access these features. RapidCalc is another quick and interactive bolus calculator. There are basal dose reminders and features to help change the dose for planned activity and recent hypoglycemia. It is important that the patient sets up the app with their diabetes health-care team to ensure that it is reliable and, ultimately, safe to use.

Table 1: App cost and availability

Apps	Cost ($)	Availability
Carbs & Cals	6.99	Apple and Android
GI Cho	Free	Apple
Accu-Chek Guide	Free	Apple and Android
OneTouch Reveal	Free	Apple and Android
Contour next ONE	Free	Apple and Android
RapidCalc	10.99	Apple
Medical ID:ICE	Free	Android

In terms of safety, patients should consider using a medical ID on their phone. They can create a medical profile by using the Apple health app "Medical ID" (they can access the Medical ID under the Health App → right hand corner → tap the profile → Medical ID) or download the Medical ID:ICE app in Google Play for Android users. These medical profiles can be accessed from a locked phone in the case of an emergency.

Note: When downloading any medical app, patients should be sure to read the privacy policies and terms and conditions to understand where their data is going.

NEWS YOU CAN USE

Glucagon to the Rescue

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Elaine M. Cooke



Susan Harris

People with diabetes must rely on others to administer glucagon for the treatment of severe hypoglycemia where impaired consciousness precludes the use of oral carbohydrates (1). Injectable glucagon (previously the only type available) must first be reconstituted by mixing the diluent with glucagon powder prior to injecting subcutaneously or intramuscularly (2). One study found only 13 per cent (%) of instructed caregivers gave a full glucagon dose, while none of the uninstructed acquaintances gave a full dose; and there were errors including injecting diluents only, bending the needle and injecting with an empty syringe (2).

Baqsimi® (Eli Lilly Canada Inc.), a nasally administered glucagon, is now available. In the study by Yale et al (2), 94% of instructed caregivers and 93% of uninstructed acquaintances administered a full dose of nasal glucagon. Baqsimi® is a prefilled, single-use nasal device containing three micrograms of glucagon in a shrink-wrapped tube (1) with a two-year shelf life from the date of manufacture (3). The instructions state that the shrink wrap should not be removed until ready to use as this may expose Baqsimi® to moisture, thus preventing the product from working as expected (1). The recommended dose is three micrograms administered as one actuation of the intranasal device into one nostril for both children (four years or older) and adults (1). The dose is administered by inserting the tip of the internasal device into one nostril and pressing the device plunger all the way in until the green line is no longer visible (1). The dose does not need to be inhaled and will work even if the patient has a cold (1). Videos demonstrating the use are available in English, French, Punjabi and Japanese at www.baqsimi.ca/en/got-your-baq. Note that a single dose of Baqsimi® costs approximately $40 more than the injectable product.

One consideration with injectable glucagon is that it can be used in mini doses. If a child with nausea or vomiting is unable or unwilling to consume a carbohydrate food or drink, and hypoglycemia is impending, mini doses of glucagon can be injected to bring the blood glucose up three to five millimoles per litre (mmol/L) within 30 minutes and maintain the blood glucose for about an hour. Step-by-step instructions for reconstituting glucagon can be found at: www.lillyglucagon.com/taking-glucagon/how-to-inject. Using an insulin syringe, inject the dose based on age. If after 30 minutes the blood sugar remains under 5 mmol/L, a second dose of double the original dose (up to 30 units) can be given.

Table 1: Recommended dosing guidelines

Age	Dose
Mini dose	
Two years and younger	Two units
Three to 15 years	One unit per year of age
16 years and older	15 units
Double dose	
Two years and younger	Four units
Three to 15 years	Two units per year of age
16 years and older	30 units

Continue to check the child's blood glucose every 30 minutes. The recommended mini dose can be repeated every hour while trying to encourage the child to eat or drink. Reconstituted glucagon is good for 24 hours if stored in the refrigerator between use (5).

Glucagon mobilizes stored liver glycogen; it is of little or no help in states of starvation, adrenal insufficiency or chronic hypoglycemia (1). When drinking alcohol, glucagon may not work effectively to raise the blood glucose level since the glucagon hormone stimulates the liver to release glucose and alcohol impairs that process (6).

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Can Sleep Extension Prevent Type 2 Diabetes?

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Approximately one-third of Canadians sleep less than what public health authorities recommend for optimal health benefits (1,2) – children five to 13 years: nine to 11 hours per day; adolescents 14 to 17 years: eight to 10 hours per day; adults 18 to 64 years: seven to nine hours per day and adults 65 years or more: seven to eight hours per day. Insufficient sleep can contribute to many health problems, including obesity, type 2 diabetes, cardiovascular diseases and depression (3,4). Important sleep characteristics that should be assessed by clinicians include: sleep duration, sleep quality, sleep timing, daytime alertness and the absence of a sleep disorder. Assessing patients' sleep health can be done efficiently (in less than two minutes) using validated questions during routine visits; these quick and comprehensive questions have been recently published in the literature (5). Addressing the causes of poor sleep, to allow for better sleep, can greatly improve patients' health and quality of life through physiological mechanisms and improvements in lifestyle behaviours, such as diet and physical activity (6-8).

Insufficient Sleep Leading to Type 2 Diabetes

There is robust scientific evidence showing that insufficient sleep is a contributor to the development of type 2 diabetes (9,10). A recent systematic review and meta-analysis of prospective cohort studies showed that compared with seven hours of sleep per day, a one-hour decrease in sleep duration was associated with a nine per cent (%) increased risk of type 2 diabetes incidence in adults (11). Experimental studies have reported that sleep restriction decreases insulin sensitivity (12-14). The mechanisms that explain the association between insufficient sleep and type 2 diabetes are not fully understood, but include direct effects on neuroendocrine and metabolic hormones, resulting in insulin resistance and increased food intake (9,15).

Increasing Sleep Duration to Improve Glucose Control: Myth or Reality?

Several studies, including people with and without type 2 diabetes, have used sleep extension paradigms to examine the effects of getting more sleep on various health outcomes. These experiments have highlighted the benefits of obtaining additional hours of sleep, including improvements in attention, memory, problem solving, emotional regulation, depression symptoms, eating behaviours and body weight (16-22). Most importantly, these studies have been instrumental in showing that improving sleep duration in a natural setting is feasible with a high level of adherence.

For example, Broussard et al (23) showed that two nights of recovery sleep reverses the adverse effects of short-term sleep restriction on diabetes risk. Using a randomized crossover study design conducted under controlled laboratory conditions, they observed that two nights of recovery sleep, averaging nearly 10 hours per night following four consecutive nights of sleep restriction (4.5 hours in bed), was sufficient to improve insulin sensitivity and restore the disposition index (a marker of diabetes risk) to the levels observed after normal sleep. These results are supported by Killick et al (24) who showed that three nights of "catch-up" sleep improved insulin sensitivity by 45% in men with chronic sleep restriction. These findings are clinically relevant because catch-up sleep on weekends to compensate for insufficient sleep on weekdays is common in our society (25). Future studies conducted in real-life conditions are needed to determine the long-term impact of this strategy on diabetes risk.

Leproult et al (26) recently investigated whether sleep extension (one hour more per day for six weeks) in the home environment is a feasible intervention that can result in more long-term beneficial effects on insulin sensitivity in healthy



adults who are chronically sleep deprived. They observed that increases in objectively assessed sleep duration were strongly associated with improvements in indices of insulin sensitivity. Although more research is needed, these novel findings are promising and suggest that a simple low-cost intervention, such as sleep extension, can bring benefits to glucose control and insulin sensitivity.

The next research question is to determine whether sleep duration has an impact on glycemic control in people with type 2 diabetes. Unfortunately, studies available to answer this question are only cross-sectional in nature at present. These studies show that both short- and long-sleep durations are associated with worse glucose control in people with type 2 diabetes (27). Randomized trials with sleep extension protocols in individuals with type 2 diabetes are, thus, definitely needed.

Preliminary findings from our research group at the CHEO Research Institute in Ottawa suggest that a modest sleep increase over a one-week period improves insulin sensitivity in adolescents with severe obesity and at risk of insulin resistance. Using a randomized crossover study design, preliminary results (n=18, 50% female, body mass index over the 99.8th percentile) showed that sleep extension by an average of 54 minutes per night resulted in a 25% increase in insulin sensitivity (Matsuda index) and a 23% decrease in insulin resistance (homeostatic model assessment of insulin resistance) compared to habitual sleep. When completed, this study will provide much needed evidence and additional tools for health-care providers on the benefits of a good night's sleep for the prevention of type 2 diabetes in high-risk patients.

In conclusion, a growing body of research is pointing towards the benefits of healthy sleep to improve glucose homeostasis. Inadequate sleep could be the result of either behavioural sleep restriction or due to an underlying sleep disorder. For example, it is well known that obstructive sleep apnea plays an important role in poor sleep quality and undiagnosed sleep apnea is common. Examples of simple questions to assess sleep health have recently been published (5). Concerning answers should illicit a thorough history to identify barriers and root causes of unhealthy sleep. While longer sleep extension interventions are needed in future research, when it comes to the prevention or treatment of type 2 diabetes, there is little downside to promoting healthy sleep hygiene and addressing barriers with your patients, as the whole 24-hour period seems to matter.

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Icosapent Ethyl: A New Treatment for Cardiovascular Risk in Diabetes

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Patients with diabetes have an increased risk of developing atherosclerotic cardiovascular disease (ASCVD), such as myocardial infarction (MI), stroke and peripheral arterial disease (1). Clinical trials have shown that reducing low-density lipoprotein (LDL) cholesterol with statins or ezetimibe in patients with diabetes translates into tangible years of life saved, with reduced need for hospitalizations for MI and overall cost savings for the health-care system (2). But ASCVD risk has not been zeroed out: the so-called "residual risk" of stroke and MI remains high in many patients with diabetes who take statins (2).

The atherogenic dyslipidemia complex, including elevated triglycerides and reduced high-density lipoprotein (HDL) cholesterol levels, contributes to residual risk (3). However, randomized clinical trials using either niacin or fibrates to reduce triglycerides failed to show benefits on cardiovascular outcomes (2). As a result, current clinical practice guidelines, such as those from Diabetes Canada, do not recommend triglyceride-reducing medications in combination with statins in patients with diabetes (2). Fibrates are still recommended for severely elevated triglyceride levels (greater than 10 millimoles per litre [mmol/l]) in order to reduce pancreatitis risk (2). However, results from a recent clinical trial will likely motivate reconsideration of guidelines for patients with mild-to-moderate hypertriglyceridemia.

For years, researchers have wondered about the potential of fish oils, which have been linked epidemiologically to populations with a low ASCVD prevalence, such as circumpolar societies (4). Fish oils are complicated mixtures of various fatty acids. Omega-3 fatty acids are a family of fats found in fish oils; their name derives from the fact that the first double bond involves the third carbon from the methyl end. The main omega-3 fatty acid that has cardiovascular benefit is eicosapentaenoic acid (EPA), so named because it contains five double bonds along its 20 carbon backbone. EPA reduces triglyceride levels, among other helpful effects.

However, studies using over-the-counter fish oils and omega-3 supplements produced contradictory results, possibly because regulatory laxness does not guarantee adequate quality or quantity of EPA in these supplements (5). Furthermore, some prescription forms of omega-3 fatty acids, available in the United States, contain other fats that may neutralize EPA's benefits (6). However, the Reduction of Cardiovascular Events with Icosapent Ethyl–Intervention Trial (REDUCE-IT), published in 2019, showed that treatment of four grams daily of icosapent ethyl (IPE), an extremely purified ethyl ester of EPA, significantly reduces ASCVD events in high-risk statin-treated patients with hypertriglyceridemia, including those with diabetes (7).

REDUCE-IT was inspired by a trial from Japan that showed cardiovascular benefit of high-dose pure EPA. In that trial, called the Japan Eicosapentaenoic Acid Lipid Intervention Study (JELIS), 18,645 patients were randomly assigned to receive either 1.8 grams EPA daily plus statin (N=9,326) or statin alone (N=9,319) (8). After 4.6 years, there were 262 major coronary events in EPA-treated patients compared to 324 events in controls: EPA reduced events by 19 per cent (%) (p=0.011). This suggested that high doses of pure EPA can prevent ASCVD. Since EPA lowered plasma triglycerides, it was logical to focus on patients with mild-to-moderate hypertriglyceridemia when designing REDUCE-IT.

REDUCE-IT was a multinational study that randomized 8,179 high-risk statin-treated patients to receive either IPE four grams daily or placebo (7). Fifty-eight per cent of patients had type 2 diabetes and 0.7% had type 1 diabetes; the remaining patients did not have diabetes but did have a history of cardiovascular disease. Entry criteria included well-controlled LDL cholesterol (mean baseline level of 1.94 mmol/L) but elevated triglycerides between 1.5 and 5.7 mmol/L. After 4.9 years, there was a 20% reduction in triglycerides and a 25% relative risk reduction in the composite primary end point: cardiovascular death, nonfatal MI, nonfatal stroke, revascularization procedures and hospitalization for angina. The number needed to treat (NNT) was 21 patients to prevent one event. The composite outcome of cardiovascular death, nonfatal MI and nonfatal stroke was reduced by 26%, corresponding to an NNT of 28. Subgroup analyses showed comparable benefits for patients with and without diabetes.

At the recent virtual American Diabetes Association sessions, REDUCE-IT investigators presented the findings in 4,787 patients with diabetes (9). They showed a 24% reduction in total cardiovascular events (764 vs. 998 events in IPE vs. placebo, p=0.0003). IPE was especially beneficial in patients who had both diabetes and established ASCVD: a relative risk reduction of 30%, absolute risk reduction of 24% and NNT of five. Safety of IPE in patients with diabetes was similar to the full REDUCE-IT population, with a 1% increased risk of atrial fibrillation and 0.7% increased risk of bleeding events. The authors concluded that IPE had a substantial positive impact in high-risk patients with diabetes with a good safety profile.

What do the REDUCE-IT findings mean for patients with diabetes? First, adding IPE to patients with diabetes well

treated on statins, but with elevated triglycerides, yields positive outcomes. Second, a four grams daily dose of purified prescription IPE was necessary. Third, more work is required to understand how ASCVD outcomes were reduced: was it simply triglyceride reduction or possibly other mechanisms, such as an anti-inflammatory or anticoagulant effect? Finally, the benefits cannot be mimicked by taking over-the-counter supplements. IPE was approved for prescription by Health Canada on Jan. 1, 2020 (Vascepa, HLS Pharmaceuticals, Canada). Coverage by provincial drug plans is currently being evaluated. Whether the REDUCE-IT findings affect future Canadian lipid guidelines remains to be seen.

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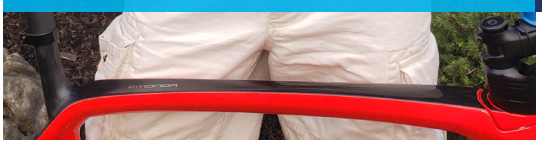
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Alcohol and Diabetes

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Drinking alcohol can have short- and long-term health risks to individuals even without pre-existing chronic diseases, such as diabetes, hypertension and heart disease (1); although, this will depend on how much alcohol is consumed daily (2). Excessive alcohol intake can increase the risk for injuries, such as motor vehicle accidents and falls (4). It can also impair judgment and cause violence and inappropriate behaviours (4). This is because alcohol weakens the brain mechanisms that generally restrain careless actions (6). Over time, excessive alcohol use can increase the chance of developing chronic diseases, such as high blood pressure, diabetes, liver disease, cancer, mental health problems (e.g. depression and/or addiction), memory loss and social issues (e.g. with family and/or work) (1,2). As a result, excessive alcohol over time can affect individuals physically, mentally, socially and financially.

A combination of uncontrolled diabetes and excessive alcohol can worsen an individual's health and harm their lifestyle. In fact, individuals with diabetes who drink alcohol on an empty stomach are at risk for severe hypoglycemia for up to 24 hours after consumption (4), if taken in combinations with insulin or diabetes pills, such as sulfonylureas, which stimulate insulin production (4). Since alcohol can mask the symptoms of low blood glucose, it can cause the individual to be less aware of their hypoglycemic episode to seek appropriate treatment (4). With a severe hypoglycemic episode, glucagon injections may not work effectively to increase blood glucose because the liver is processing the alcohol and, thus, will not respond to the injected glucagon (5). Moreover, health-care professionals may face challenges prescribing the right treatment to control diabetes in their clients with a history of excessive alcohol intake.

Most individuals with type 2 diabetes and prediabetes have overweight or obesity when they are diagnosed (4). Some of the current diabetes treatments, such as insulin and sulfonylureas, contribute to weight gain (4). Drinking alcohol on a daily basis can also add extra calories and make weight management a challenge (3). Many individuals tend to mix their alcohol with sugar-containing beverages and consume snacks often high in fat, salt and carbohydrates. Alcohol switches the brain into starvation mode, increasing hunger and appetite (6), which can lead to subsequent weight gain. Excessive or moderate alcohol intake for an extended period can also increase blood pressure and triglycerides (1). Therefore, a combination of uncontrolled diabetes, high blood pressure, increased triglycerides and alcohol consumption can speed the arrival of diabetes complications, such as kidney disease; diabetic retinopathy; sexual difficulties; heart disease and dementia; and worsen mental health conditions, such as depression (1).

Excess daily alcohol consumption can seriously harm an individual's health, regardless of whether they are living with or without diabetes (6). However, with uncontrolled diabetes, excessive alcohol intake can speed up diabetes-related complications, worsen current diabetes complications, and increase the risk of developing other chronic diseases and worsen the quality of life. As a result, healthy eating, regular physical activity, compliance with prescribed medications, monitoring blood glucose at home, regular follow ups with health-care professionals and practicing positive stress management skills are the best tools to control diabetes. Alcohol can be a part of healthy living if done in moderation. *Canada's Low-Risk Alcohol Drinking Guidelines* have recommended that women should not exceed 10 drinks per week, and men shouldn't exceed 15 drinks per week. It is necessary that patients speak with their health-care team if they are already consuming alcohol to see how they can include alcohol as part of their lifestyle without jeopardizing their life and others.

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Intermittent Fasting: What Do People With Diabetes Need to Know?

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What is Intermittent Fasting?

Intermittent fasting (IF) has been a popular topic in the media and, as health-care providers, we are often asked about our thoughts on this approach. IF is an eating pattern where a person cycles between periods of fasting and eating. This approach does not specify which foods should be eaten, but rather dictates when they should be eaten. Common IF approaches involve daily 16-hour fasts or fasting for 24 hours, twice per week. For this reason, it's not a diet in the conventional sense, but more accurately described as an eating pattern.

Considerations for People with Diabetes

People with diabetes have special considerations if they wish to engage in IF. If an individual is on diabetes medications, which can cause hypoglycemia, such as sulfonylureas or insulin, then they need to be careful to avoid precipitating hypoglycemia during periods of fasting. Depending on their current level of control, it may be difficult to practice IF if an individual is on oral agents that can result in hypoglycemia. It would be challenging to devise a medication regimen schedule in order to facilitate IF without causing hypoglycemia.

If an individual is taking insulin, there are still some challenges; however, it may be easier to accommodate IF depending on their insulin regimen. Basal insulin doses may need dosage adjustments depending on the half-life of the insulin being used and the person's current level of control. An individual should only take rapid-acting insulin before eating meals, and avoid this insulin during the period of fasting. Furthermore, if one loses weight as a result of IF, then there may need to be adjustments (usually, reductions) to their oral diabetes medications or insulin doses to avoid hypoglycemia.

Does IF Work?

Most people ascribe to such an eating pattern in an effort to lose weight. Studies have shown that IF can result in weight losses from 2.5 per cent to 9.9 per cent of body weight (1,2). This would be due to a caloric deficit as these periods of fasting would reduce the amount of time that people can consume calories. As a result of this weight loss, people can notice an improvement in their glycemic control, and may require less medication and/or insulin.

Is IF Safe?

There is very little data on either the safety or the benefits of IF, especially in people with diabetes. Most of the recommendations are based on animal studies and advocation by weight loss "gurus" (3). Furthermore, there are no long-term studies showing the safety of this approach. IF goes against what we have been teaching about diabetes for decades – that the best approach is to allow the body to avoid large glycemic spikes. Thus, until further studies are available, we should be careful about recommending this approach to people with diabetes.

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Think Like a Social Worker: Then and Now

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Introduction

During the early stages of the COVID-19 pandemic, our national and provincial public health authorities frequently spoke about social, emotional and mental wellbeing as critical elements for maintaining population health. These authorities have continually reminded Canadians to reach out to mental health workers, including registered social workers, resulting in hospitals actively recruiting social workers at an unprecedented rate (1). Sometimes health-care providers are not sure which mental health-care professional to refer their patients to; other times, when options are so limited, thinking like a social worker might be a useful thing to do.

In a recent Ontario-based study (2) on the emerging role of social work in primary health care, many social workers identified barriers to working within their full scope of practice, partly because other health-care professionals have limited understanding of the social work role and how it contributes to patient-centred care. Dell Medical School, at the University of Texas at Austin (United States), has forged a teaching partnership with the university's social work faculty, so that medical interns get well-rounded training for patient-centred care (3).

The demands of COVID-19 on all facets of Canadian health care provides opportunities for interprofessional team-based models of care to deepen their understanding and experience of how social workers can enhance delivery of patient-centred care. It may be helpful to explore highlights of the evolution of the profession and what distinguishes it from other professions. Finally, this could be an excellent opportunity to demonstrate how using an old and simple tool, Maslow's Hierarchy of Needs, could not only help initiate and leverage dialogue about diabetes patients' psychosocial needs, but also to conceptualize and communicate referral to social work.

History

The earliest record of social workers in Canada showed that they were volunteers called "friendly visitors." In that early period of social reform of the Canadian welfare state, issues (such as unemployment and illness) were still considered local and personal problems (4).

After World War I and the 1918 Spanish flu pandemic, social work graduates began to emerge and join the ranks of paid professionals within Canadian government social services. Since then, social workers have been contributing substantially to the body of knowledge that has come to be known as the social determinants of health.

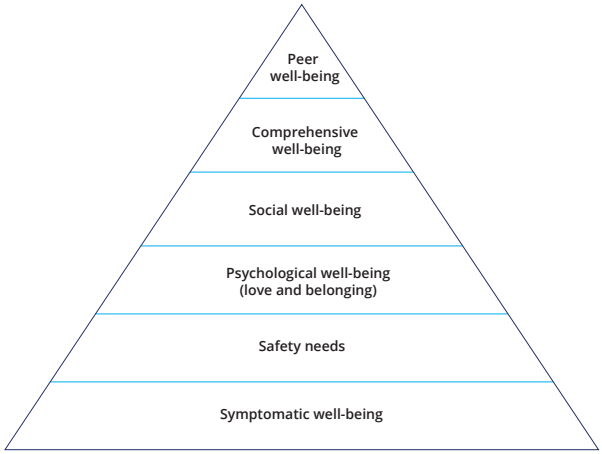


Figure 1: The Tripod of Diabetes Needs and Therapy (TRIDENT) model of diabetes-related needs..

Defining Features of Social Work

Social workers focus on individuals in their environment in an effort to alleviate human suffering, and they take an active role toward social, political and economic change. Human rights, peace, economic and social justice are hallmarks to only one professional body code of ethics and professional practice – social work (4).

Emergence of Social Work Role

By the year 2000, Canadian health-care reform was moving from disease-focused approaches to patient-centred approaches (2), and the role of social work began to emerge in a variety of health-care settings.

A social worker contributes to patient-centred care by providing psychosocial assessments and interventions, such as counselling services (including navigation of complex health-care systems), linking patients with community resources and providing patient education, as well as training other health-care professionals on psychosocial aspects related to health. As the prevalence of chronic disease rises, even more individuals will be faced with complex psychosocial and mental health challenges (2). The need for social work will continue to grow, as will the preference for specializations, such as medical social work, and particularly with knowledge, experience and certification, such as the Canadian Certified Diabetes Educator (CDE).

Social Workers Supporting Diabetes Education

As part of their early education, social workers embraced and adapted the model of "Hierarchy of Needs" (as first

conceptualized by Abraham Maslow in 1943 [5]) to the field of social work, dependant on practice – community, family, mental health or medical. Medical social workers must work with evidence-based assessment tools, and those working with patients with diabetes will often use specific screening tools, such as the Diabetes Distress Scale. Considering that not all diabetes educators and social workers have access or familiarity with the same specific screening and assessment tools, a hierarchy of needs model may still be a tool to begin a meaningful patient-centred dialogue and engage in shared decision-making (SDM).

The Tripod of Diabetes Needs and Therapy (TRIDENT) are two proposed clinical and teaching diabetes-related decision-making models (5), which have been inspired by Maslow's Hierarchy of Needs.

The first TRIDENT model shows two layers of psychosocial considerations, which are interwoven into a six-step hierarchy, to demonstrate the interconnectedness of the biopsychosocial patient needs.

The second TRIDENT model has been simplified for a concentrated focus on diabetes care and, while the titles in each section suggest that the authors have eliminated psychosocial considerations all together, their narrative state that psychosocial considerations are an integral part of this biomedical decision-making model (5).

Choose whichever model will be helpful in leveraging meaningful patient-centred dialogue and SDM. If the client is struggling to be specific or if you want to explore other areas of concern, you can always refer to the World Health Organization's social determinants of health diagram (6).

In the difficult months ahead, when in-person diabetes education appointments resume, it will be a timely opportunity to think like a social worker by exploring an individual's concern through the lens of a hierarchy of needs model and according to social determinants of health, as well as to consider motivational setbacks in diabetes self-management as possibly relating to patients' connections with their new environment. A social worker would say that as long as patients are engaged in the dialogue, there is a fluid relationship with their diabetes self-management and to carry on.

At any point, however, feel free to consult with or refer to a social worker, and know that including a few words about your dialogue with the individual regarding their hierarchy of needs and social determinants of health would be an excellent introduction of presenting issues to be addressed.

Conclusion

While there remains much work to be done in shedding light on the role of social work, particularly as it pertains to supporting chronic disease management and diabetes education, it is hoped that this article has provided valuable insight into the history of social work before it became a recognized profession, during the years of social reform and health-care reform, and during the early stages of the Canadian health-care experience with the COVID-19 pandemic. Finally, while the Hierarchy of Needs models may seem quite simplistic and subjective, they are, at the very least, tools and visual aids to engage in meaningful patient-centred dialogue.

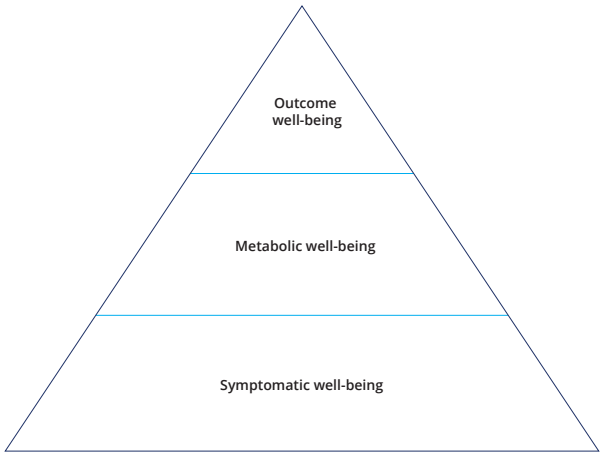


Figure 2: The Tripod of Diabetes Needs and Therapy (TRIDENT) simplified model of diabetes-related needs.

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FROM THE CHAIR'S DESK...CONTINUED FROM PAGE 2

investigations can still be done safely and we should encourage people accordingly. The potential cost of delaying treatments could result in long-term complications.

To that end, Diabetes Canada's efforts to update components of the clinical practice guidelines and provide ongoing online learning continues. Three new resources are worth highlighting:

- Diabetes Canada's position statement on low-carbohydrate diets for adults with diabetes: A rapid review (www.canadianjournalofdiabetes.com/article/S1499-2671(20)30097-6/fulltext)
- Language matters – a Diabetes Canada consensus statement (www.canadianjournalofdiabetes.com/article/S1499-2671(20)30146-5/fulltext)
- Carry letters for those living with diabetes on insulin or insulin pump therapy to facilitate future hospitalizations (www.jdrf.ca/sitejdrfca/assets/Insulin%20Pump%20Carry%20Letter_April%202020%20ENG(1).pdf)

At the time of writing this, various provinces and territories across the country are cautiously beginning the process of reopening. What will this mean for diabetes care in the future? What will the new normal look like? These are questions that are prominent in all of our minds. A hybrid model of care that combines in-person with virtual visits will likely become the new routine. We should continue to share best practices within our community on Diabetes365 as the transitions take place.

Although COVID-19 has brought significant suffering, it has also shown us many positive things. It has reminded us that humanity is fragile and we need each other. Family, friendships, community and human interaction are critical to our existence. When we could no longer see each other in person, we sought other means of connection. It has reminded us of the importance of essential workers, and our appreciation for their efforts must continue beyond the pandemic. It has also reminded us that what we, as health-care providers, do on a day-to-day basis is important and impactful, and a privilege that we should not take for granted. We must continue to be motivated to provide that care in adaptive ways. At the same time, we will continue to lean on and learn from each other as we navigate this ever-changing "new normal."

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