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EDITORIAL

A Taste of the Power of Food

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This past March we celebrated nutrition month, the title of which was "Unlock the Potential of Food." The themes included the potential of food to heal and fuel our bodies, to bring us together and the discoveries we can make with our food. The campaign also focused on the potential of food to prevent chronic conditions, such as type 2 diabetes (www.nutritionmonth2018.ca/index.html?ref=banner).

Dietary education and meal planning are among the cornerstones of diabetes prevention and management, and are important parts of the counselling provided by diabetes educators. A key message in our clinical practice guidelines is that nutrition therapy can reduce glycated hemoglobin by one to two per cent. Nutrition lies at the intersection of diabetes with the social determinants of health, our different life stages, weight loss or maintenance, medical management of comorbidities, and nourishment.

We believe food has great power to influence our health. In this nutrition-themed issue of *The Diabetes Communicator*, we have a variety of topics demonstrating just that.

The landscape in which dietitians in the field of diabetes practise has shifted dramatically over the past several decades, as explained by Evelyne Pytka. She provides this reflection on diabetes nutrition recommendations, wearing the hats of both a dietitian and a person living with type 1 diabetes.

While nutrition education is offered by dietitians and other health-care providers, the Internet and mobile apps are increasingly being used by our patients as another resource for information. MyFitnessPal and MyPlate are two popular nutrition apps endorsed by many diabetes educators. Elaine Cooke provides information on how their various functions and extensive databases can be used to monitor food intake and physical activity levels for diabetes management. Food insecurity affects 12 per cent of Canadian households (over four million individuals), which means a large proportion of people living with prediabetes or diabetes face a deficit of healthy and reliable food choices. Michelle Corcoran and Bonita Nowe-Matheson describe what it means to be unable

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A Diabetes Canada Professional Section Publication

FROM THE CO-CHAIRS

Springing Forward

Shelley Jones, RN, B.Sc.N., CDE; Peter Senior, MBBS. Ph.D.
Co-Chairs, Professional Section National Executive

Spring is a time to celebrate the return of warm weather and new growth. It is also a time to reflect on the cultivation of the past and how it has planted the seeds of innovation and creativity in the work that we do today supporting people living with diabetes. We are fast approaching the deadline for the professional section award nominations, and we encourage you to nominate a colleague who you feel deserves recognition. There are also several positions open for election on the professional section executive; if this is a challenge that interests you, consider putting your name forward. The deadline for nominations and most awards is June 1, 2018. Visit www.diabetes.ca/for-professionals for more information.

Just prior to the mailing of this edition, our annual Leadership Forum was held in Toronto. Here we learned more about the vision and direction of Diabetes Canada moving forward, and the development of a Canadian strategy for diabetes with a focus on population impact. We also participated in workshops that focused on aiding chapters to disseminate and implement the 2018 clinical practice guidelines (CPG) within their respective communities. Ask your chapter chair how you can become a guideline ambassador.

The professional section executive held our first 2018 meeting on a cold January night via teleconference, and it was decided that the co-chairs and past chairs from the steering committee will review the standard operating procedures for the professional section. The goal is to update the terminology to reflect our combined membership and identify which executive portfolio should be responsible for updating specific sections of the document when needed. Here are just a few other highlights from that meeting:

Research/Resident Council

By the time this issue mails, applications for research funding will have been received and the 2018 peer-review panels will begin their work. Diabetes Canada-supported research is divided into three streams: mid-career, new investigator and postdoctoral fellowships. The resident council is increasing membership from medical schools, will be assisting with the 2018 CPG dissemination and implementation and is working to develop diabetes resource manuals for different areas across Canada.

Marketing and Communications

Planning has begun for Diabetes Educator Day 2018. There has been some discussion on broadening the term to be more inclusive of the professional section and the interprofessional makeup of the diabetes health-care team. More to come as this discussion progresses!

Membership and Awards/Professional Interest Groups

As noted above, the awards nomination deadline is June 1, 2018, so we encourage you to nominate a deserving colleague. There was much discussion on how to grow membership

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and the desire to target primary care and engage more family health-care practitioners to become involved and connect with a chapter. Susie Jin and Parmjit Sohal will begin to work more closely with the membership and awards committee by participating on calls when chapter reports are reviewed, and when the chapter of the year recipient is chosen.

Quality

To date, we have received applications from eight diabetes education centres for the standards recognition program; the committee will be reviewing the applications shortly.

We hope you enjoy this edition of *The Diabetes Communicator*, and find a few practice pearls to share with your colleagues.

ASK THE EXPERT

How Do I Help My Clients with Gastroparesis?

Debbie Stiles, B.Sc., RD, CDE
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Diabetic gastroparesis (DGP) is a complication of diabetes mellitus characterized by decreased or delayed stomach emptying. It is typically found in clients with long-standing diabetes (1,2), presenting with symptoms such as nausea, vomiting, early satiety and postprandial fullness. Clients may also have abdominal pain and bloating (1). Research shows that the first sign may be erratic blood glucose levels (2). Depending on the severity of DGP, altered drug absorption, weight loss, malnutrition, dehydration and electrolyte imbalances can occur.

Dietary modification can reduce symptoms as well as prevent or treat nutrient deficiencies and weight loss. It is recommended to refer your client to a dietitian for a full assessment. Clients who have lost five to 10 per cent of their body weight in three to six months are at increased nutritional risk (2). Nutritional supplements and even enteral nutrition may be needed if the target weight is not reached and/or maintained (2). Suggestions for dietary modifications (2-4):

- Eat small frequent meals (four to six or more per day)
- Choose low-fibre foods
- Test semi-solid, blended or liquid foods when solid foods are poorly tolerated (i.e. scrambled eggs; cottage cheese; soft meats, such as pureed chicken; blended fruit, etc.)
- Switch to more liquid calories as the day progresses as it may ease symptoms
- Switch to a lower-fat diet as fats digest slowly and delay gastric emptying, except for liquids with fat (milkshakes, puddings), which can be tolerated and can improve caloric intake
- Chew foods well
- Sit up for one or two hours after meals
- Walk within one or two hours after meals
- Take a multivitamin supplement, if intake is inadequate

Make one change at a time to assess improvement in symptoms. Supporting clients is important; changing a diet is difficult, especially when feeling ill. Symptoms may fluctuate and diet consistency may need to vary to meet nutritional needs.

When a client is symptomatic, low-fibre foods are encouraged to speed transit. The amount of fibre that should be limited is unknown. However, when transit is slow, insoluble fibre may build up in the stomach forming a bezoar (a solid mass of indigestible food fibre [3]) that can block the gastric outlet.

Some medications, such as glucagon-like peptide-1 inhibitors, can cause or contribute to gastroparesis and should be reviewed and/or held to assess effect (1,3). Alcohol, carbonated beverages and tobacco can slow emptying, while peppermint, chocolate, fat and caffeine can decrease the lower esophageal sphincter pressure, possibly worsening symptoms (1,2). Medications, including antiemetics, prokinetic agents and psychotropic agents in low doses can help manage symptoms. Acupuncture has been associated with some improvement in symptoms (1).

Controlling blood glucose is key, but is frustrating due to the variable gastric emptying rate. Poor control can actually contribute to DGP symptoms, since glucose levels of more than 11.1 millimoles per litre may delay gastric emptying (1,2).

For individuals requiring insulin, timing the insulin action with blood glucose rise is critical to prevent hypoglycemia risk. Newer glucose monitoring technologies can help to frequently track blood glucose so insulin injection/infusion and insulin type can match glucose rise. For clients on fixed-dose or intermediate-acting insulins, an improved glucose level is seen with day-to-day consistency in the amount of carbohydrates consumed (4).

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A Review of Key Nutrients in Pregnancy

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Pregnancy presents new dietary challenges to women with diabetes. These include meeting blood glucose targets and obtaining proper nutrients for growth and development of their baby. Healthy food choices will assist in providing many of the nutrients required to meet the demands of the growing fetus and help to achieve euglycemia.

Carbohydrate requirements should meet the needs of a pregnant women and support glucose control. The *Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada* do not offer specific carbohydrate (CHO) guidelines, except to suggest the moderation of CHO consumption spread over three meals and three snacks (1). The Institute of Medicine states that CHO requirements in pregnancy are based on fetal brain and maternal requirements, and thus proposes 175 grams per day (2). An informal survey of diabetes clinics in southern Ontario that educate women with diabetes in pregnancy indicated that recommendations for CHO intake range from 45 to 60 grams per meal and 15 to 20 grams per snack. Some clinics recommend 30 grams of CHO at breakfast to prevent the morning spike of blood glucose, supplemented with 30 grams of CHO for a morning snack.

Vitamin D is important during pregnancy because lower maternal 25-hydroxyvitamin D levels may lead to an increased incidence of fetal growth restrictions, lower birth weight and higher risk of preterm birth, increased risk of preeclampsia and small-for-gestational-age infants (3,4). Women are advised to have 2,000 international units (IU) of vitamin D per day (5). Dietary sources include fortified yogurt, milk, margarine and orange juice, as well as fatty fish and eggs (6). Those at higher risk of lower serum levels of vitamin D include women with a darker skin tone; who have a high body mass index; who have had bariatric surgery; who have poor dietary sources of vitamin D, such as vegans; and who have inflammatory bowel disease or celiac disease (7). A detailed nutritional assessment will assist the health-care provider (HCP) in making appropriate recommendations for blood testing and levels of supplementation.

Zinc is an essential mineral that is used in over 100 enzyme reactions (8). Low maternal serum zinc, particularly in the first trimester, may increase the risk of preterm birth (9) and may affect growth of the fetus (10). It is found in most foods in varying amounts, except fruits and vegetables (11). Supplementary iron and dietary phytates and large doses of calcium will compete at the intestinal border with zinc, interfering with zinc absorption (12). There is no one specific identifiable symptom of deficiency. Chronic inadequate intake

will cause body reserves to become deplete (12). This may happen with prolonged nausea and vomiting or when women have food aversions or in those who are strict vegans.

Docosahexaenoic acid (DHA) is a long-chain polyunsaturated omega-3 fatty acid that has benefits for fetal health. DHA has positive associations with an infant's immunity, allergy resistance, visual scores and sleep patterns, and for increased neurocognitive development, and it may decrease the risk of preterm birth (13-16). Recommended DHA intake is 200 to 300 milligrams per day or two six-ounce servings of fatty fish per week (16). Encouraging healthy fish intake on a weekly basis while avoiding fish with high-mercury content should be part of an HCP's discussion with the mother.

Vitamin B_{12} is a water-soluble vitamin found predominantly in meat, with lesser amounts in dairy and fortified food products, such as milk-alternative beverages (17). Long-term use of metformin for diabetes and polycystic ovary syndrome, as well as the use of proton pump inhibitors, increases the risk of B_{12} deficiency (18,19). Lower levels of B_{12} are found in pregnant women whose diets are predominantly vegetarian compared to those who consume meat (20). Women with serum B_{12} less than 147 picomoles per litre (pmol/L) have a threefold risk of neural tube defects (NTD) compared to women with higher values (21). It is suggested that women have B_{12} levels greater than 221 pmol/L to reduce the risk of NTD (21). A Canadian analysis suggests that five per cent of women may be vitamin B_{12} deficient during the early weeks of the first trimester, thus increasing the risk of NTD (22). An assessment of B_{12} status may be useful in the first trimester.

In summary, fetal health and growth are affected by many nutrients working in tandem. Other nutrients of importance include calcium, folate, iron and others. To promote optimal outcomes, there are windows of opportunity during the changing trimesters of pregnancy for the different nutrients discussed. As HCPs, we can intervene with our specialized knowledge and encourage women with diabetes to engage in

healthy eating and supplementation prior to conception and throughout pregnancy.

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The Diabetes Communicator editorial board is seeking one new board member.

To ensure a multidisciplinary team on the editorial board, we are seeking a candidate in the professions of medicine, nursing, nutrition, pharmacy, social work and physical activity. Other professions, as related to diabetes, will be considered. The successful candidate will serve an initial two-year term and may be reappointed for two additional terms of office.

Please find further information and the application form at **www.diabetes.ca/communicator**.

The deadline for applications is **June 1, 2018.**

Nutritional Considerations After Bariatric Surgery

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Bariatric surgeries result in anatomical and physiological alterations of the gastrointestinal tract, affecting nutrition intake by decreasing the appetite (orexigenic hormone, ghrelin), increasing satiety (anorexigenic hormones, such as glucagon-like peptide 1 [GLP-1], peptide YY [PYY], cholecystokinin [CCK] and gastric inhibitory polypeptide [GIP]) and decreasing the absorption of macronutrients and micronutrients (1-3). Decreased intestinal absorptive surface area, intestinal dysfunction, food aversions (such as red meat, poultry, dairy foods, breads and some grains) and pre-existing micronutrient deficiencies prior to surgery can all precipitate and/or exacerbate micronutrient deficiencies after surgery (4,5).

Table 1: Supplements for Micronutrient Deficiency Prevention

Nutrients	SG	RYGB	BPD/DS
Multivitamins/ minerals	One to two per day providing at least the following:		
Thiamine	12 mg/day (50 to 100 mg/day for patients at risk)		
Folate	400 to 800 µg/day or 800 to 1,000 µg/day for females of childbearing age		
Vitamin E	15 mg/day (30 IU/day)		
Vitamin A	5,000 to 1,000 IU/day		10,000 IU/day
Vitamin K	90 to 120 µg/day		300 µg/day
Zinc	Eight to 11 mg/day	Eight to 22 mg/day	16 to 22 mg/day
Copper	One mg/day	One to two mg/day	Two mg/day
Vitamin B_{12}	350 to 500 µg/day oral, sublingual, liquid or 1,000 µg/month IM		
Vitamin D_3	At least 3,000 IU/day to maintain vitamin D 25 (OH) levels greater than 75 nmol/L		
Calcium citrate	1,200 to 1,500 mg/day		1,800 to 2,400 mg/day
Iron	18 mg/day (males/females without menses); 45 to 60 mg/day (females with menses/patients with history of anemia)		

µg, micrograms; BPD/DS, biliopancreatic diversion/duodenal switch; IM, intramuscular; IU, International unit; mg, milligrams; nmol/L, nanomoles per litre; RYGB, Roux-en-Y gastric bypass; SG, sleeve gastrectomy; vitamin D 25 (OH), 25-hydroxy vitamin D. Adapted with permission from reference 3.

Patients and health-care providers (HCPs) need to ensure adequate nutrient intake from both dietary and supplemental sources to prevent micronutrient deficiencies after the surgery (Table 1). Additionally, HCPs need to be aware of common and rare signs/symptoms associated with micronutrient deficiencies. Micronutrient levels should be evaluated within the first year (one, three, six and 12 months) and annually for life thereafter, with identified deficiencies treated appropriately (3,6). Referral to a registered dietitian with training in obesity management, including bariatric nutrition, is essential to ensure adequate nutritional status before and after surgery (6).

Most patients are instructed to take one to two multivitamin/mineral supplements, vitamin B_{12}, vitamin D, calcium and iron (pending blood work and physical symptoms), contributing to difficulties tolerating and sustaining supplements long term (7-8). According to self-reports, adherence rates vary from 90 per cent in the first six months postsurgery (9) to 57 per cent (7) and 37 per cent (9) at three and four years postsurgery, respectively. Studies using electronic monitoring systems to track supplementation adherence found approximately 30 per cent adherence at six months (8) with an inverse relationship for adherence versus length of time after postsurgery (8,10). HCPs, especially primary care providers and dietitians, need to be aware of the supplementation recommendations to prevent deficiencies postsurgery, as well as to provide evidence-based, but patient-centred, care for those struggling with daily supplement regimens (refer to the online appendix: www.diabetes.ca/publications-newsletters/the-diabetes-communicator. Log in with your username/password).

Common complaints for nonadherence to supplement regimen include forgetting to take supplements; side effects, such as taste fatigue, difficulty swallowing, nausea and/or vomiting; the inconvenience of taking multiple supplements; cost and a lack of belief in the benefits of taking supplements (8-10). HCPs should use a nonjudgmental approach when counselling patients around supplementation adherence by normalizing the difficulty in taking supplements (i.e. say, "Many patients have difficulty taking their supplements every day. It's normal to miss doses or have problems taking all the required supplements. Are you having any difficulties? From the seven days per week, how many days, on average, are you able to take your supplements?"). Building a rapport with your patients and normalizing the difficulties can help determine their barriers and readiness to change as well as set patient-centred goals that minimize their risk for micronutrient deficiencies.

Dietary habits and behaviours are also influenced by both anatomical changes from surgery and neurohormonal changes

Table 2: Nutrition and Behaviour Recommendations		
Macronutrient requirements	Protein: one to 1.5 g/kg ideal body weight per day (minimum 60 g/day). Typically 20 to 30 g/meal and five to 15 g/snack Carbohydrates: ideally more than 130 g/day (depending on time since surgery). Patients may benefit from 60 to 100 g/day to start Fat: approximately 20 to 30 per cent of caloric needs	
Meal size and timing	Once patients can tolerate solid-textured meals (portions vary depending on individual needs and tolerance), aim for the following: • Per meal: two to three ounces of cooked protein + one-quarter to one-half cup of grains/starch + one-quarter to two cups of vegetables + one-quarter cup of fruit or half of a small fruit • Per snack (if needed): one to two ounces of protein + one-quarter cup of a carbohydrate • Eat every four hours	
Eating habits	• Aim to drink approximately 30 minutes after solid foods • Take about 15 to 30 minutes to eat solid meals/snacks • Eat mindfully: focus on taste/texture, enjoyment of food and the body's hunger/appetite level	• Chew food well • Stop eating when feeling full
Foods to avoid	• Deep-fried foods • Sugar-added foods (baked goods, ice cream, candy, etc.) • Caffeine (decaffeinated beverages are appropriate)	• Highly processed food • Carbonation • Alcohol

g, grams; kg, kilograms

to appetite-related peptides (1,2). HCPs need to be aware that patients are often advised to consume more protein, eat smaller meals, change eating habits (i.e. avoid drinking liquids with solids) and avoid foods that can result in the dumping syndrome (6,11) (Table 2). Dumping syndrome occurs when food is rapidly emptied from the stomach or gastric pouch into the intestines, resulting in physical symptoms of nausea, vomiting, diarrhea, abdominal pain, diaphoresis and dizziness.

While bariatric surgery is considered an effective treatment option for people with type 2 diabetes and obesity, it is by no means a cure for these chronic diseases (12). Patients and providers need to be aware of the positive and negative effects of these surgical options, including the nutrition-related risks requiring a lifetime of adherence to micronutrient supplementation, specific dietary behaviour changes, and long-term management of obesity and/or diabetes.

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Food Insecurity in Canada: Realities, Challenges and Opportunities

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Household food insecurity (HFI) takes a toll on all of us – our individual health and mental wellness and, ultimately, our health-care system. It is defined as the inadequate or insecure access to food due to inconsistent or insufficient financial resources (1).

The Canadian Community Health Survey (CCHS) classifies food insecurity into marginal, moderate or severe categories. People in the marginal food-insecure group worry about running out of food and/or limit their food choices due to the lack of money to buy food; those in the moderate food-insecure group compromise food quality due to lack of money; and those in the severe food-insecure group often miss meals, reduce food intake and, in the most extreme cases, go day(s) without food. Figure 1 summarizes the 2014 household food-insecurity rates in Canada.

Since 2005, Canada has been monitoring food insecurity through the Household Food Security Survey Module, which is part of the CCHS. Sadly, we are not improving (1). About one in eight (12.0 per cent [%]) Canadian households (over four million people), including more than one in six children (under the age of 18) are living in households that have experienced food insecurity (1).

Just as where you live affects access to diabetes medications and supplies, similarly, where you live in Canada affects how food secure you are. The Northwest Territories and Nunavut HFI prevalence rose to its highest levels in 2014 (24.1% and 46.8%, respectively), with the highest prevalence in children under age of 18 (29% and 60%, respectively) (1). The Maritime provinces also have some of the highest insecurity levels across the country (Nova Scotia – 15.2%, New Brunswick – 15.2%, Prince Edward Island – 15.1%) (1).

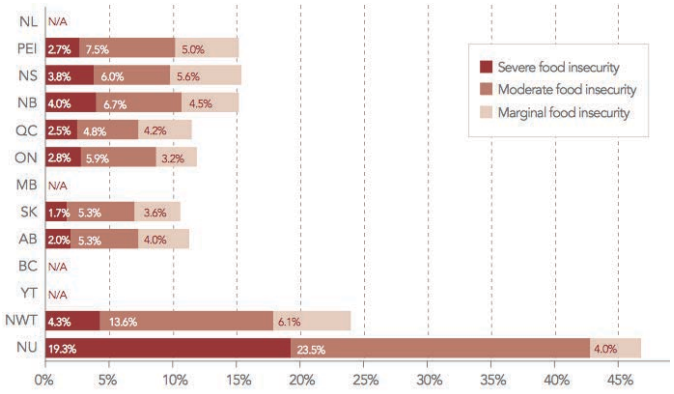

Figure 1: Household food insecurity in Canada by province and territory, 2014. AB, Alberta; BC, British Columbia; MB, Manitoba; N/A, not applicable (did not participate in survey); NB, New Brunswick; NL, Newfoundland and Labrador; NS, Nova Scotia; NU, Nunavut; NWT, Northwest Territories; ON, Ontario; PEI, Prince Edward Island; QC, Quebec; SK, Saskatchewan; YT, Yukon Territories. Reproduced from reference 1.

Can We Afford to Eat Healthy?

Food costs continue to rise, as shown by the Nova Scotia Food Action Research Centre's 2015 survey. For a family of four, the 2015 monthly cost of nutritious foods averaged $907 per month in urban areas and $942 per month in rural areas (2). This is out of reach for low-income earners and those receiving social assistance. Add the additional costs when living with chronic illnesses, such as diabetes, and this forces our clients to make difficult decisions, often leading to significant life distress and ultimately poor diabetes management.

The Underlying Cause of HFI

Household food insecurity is connected to income; as income declines, severity of food insecurity rates increase. Households experience food insecurity when there is not enough money for adequate, secure access to food after paying for rent, utilities and other basic living expenses. The majority (62.2%) of food-insecure households rely on employment wages; we sometimes refer to this group as the working poor (those with low wages/salaries or who are self-employed, including part-time or inconsistent employment) (1). Insecurity is four to six times higher in low-income households that rely on government income, like social assistance or Employment Insurance/Workers' Compensation (1,3).

Individuals Living in Food-Insecure Households Have More Health Problems and Use More Health-Care Services

Much of the inequality in the prevalence, severity and impacts of HFI is related to the social determinants of health, which include the conditions in which people are born, grow, live, work and age. Those more insecure are 1.5 to 3.5 times more likely to have one or more chronic physical and/or mental health issues, and they are 1.5 times more likely to be a "high-cost user" of health-care services in the next five years (1).

Those working-age adults with greater food insecurity have higher total health costs (23% higher [marginal HFI], 49% higher [moderate HFI] and 121% higher [severe HFI]), compared to adults in food-secure households (1). The additional cost of poverty in the Canadian health-care system was estimated at $7.6 billion (1). It has been estimated that an increase of $1,000 annually to the income of the poorest 20%

of Canadians would lead to 10,000 fewer chronic conditions and 6,600 fewer disability days every two weeks (1).

So, should we be encouraging budgeting, cooking skills and gardening to offset food insecurity? Unfortunately, research shows these skills are not indicative of food security as there is no difference in possessing such skills between food-secure and food-insecure households (4). Programs aimed at improving these skills are unlikely to impact food-insecurity levels (4). This is upsetting for those of us that encourage these skillsets. Social policy changes that improve material circumstances have been shown to be more effective in reducing food-insecurity rates (5). One example is in Newfoundland and Labrador where provincial food-insecurity rates fell from 15.7% to 10.6% following the implementation of their poverty-reduction strategy to increase income-support rates and indexing rates to inflation (5).

Adults in food-insecure households are four times more likely to report using a budget when shopping for food, but they do not differ from food-secure households in shopping behaviours, such as using a grocery list, planning meals before shopping or using Canada's food guide (4). Adults who gardened were as likely to be food insecure as those who didn't (4).

Don't Give Up; We Can Still Make a Difference

The first steps in identifying insecurity are as follows:

1. Screen your clients: never assume anyone has adequate food resources. Remember that many families may not appear to be struggling financially. Using a validated universal screening tool (such as the 2-Item Food Insecurity Screen described here) can be a starting point to identifying food insecurity (6). Answering yes to one or both questions identifies households at risk. For each statement, ask – is this situation often true, sometimes true or never true for your household:
   - Within the past 12 months, we worried whether the food would run out before we got money to buy more.
   - Within the past 12 months, the food we bought just didn't last and we didn't have money to get more.
2. Sensitivity is key: patients may be afraid to share concerns if they feel they are being judged or could be reported to child and family services.
3. Keep food-insecurity status in mind when making diagnoses and care plans; consider these potential issues:
   - Lack of access to nutritious food could exacerbate a patient's symptoms of hyperglycemia or hypoglycemia.
   - Financial stress could cause the patient to fail to take prescribed medications.
   - Emphasize cost-neutral diet strategies, such as reducing portions.
   - Days with unreliable food access may require lower doses of medication (such as insulin).
   - Medication/insulin schedules could be defined by when a patient eats rather than by the time of day.
   - Smoking cessation or reduction could divert money back into the food budget.
4. Follow up is important: check food access and program enrolment with a follow-up call or conversation at the next appointment.

> About one in eight Canadian households (over four million people), including more than one in six children are living in households that have experienced food insecurity.

Let's Advocate Change

Food security, ultimately, is an income-based issue. There is growing interest in a basic income for all Canadians. Pilot projects are underway and the federal government should be encouraged to implement a nationwide program. Many provincial and territorial governments have made efforts to address food insecurity through living-wage changes. It's time for a coordinated, comprehensive poverty-reduction strategy, and it needs to be a priority for all of us – government (all three levels), business, communities and individuals. It is simply too costly not to address HFI.

Other Resources

1. Maple Leaf Centre for Action on Food Security: www.feedopportunity.com/en/
2. The Well: thewellhealth.ca/poverty

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Update on the *2018 Diabetes Canada Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada*

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April 2018 sees the launch of the *2018 Diabetes Canada Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada*. The guidelines represent the hard work of 135 health-care professional volunteers from across Canada over the past three years. This set of guidelines includes broader representation from more allied health/interprofessional stakeholder groups with expertise from diverse practice settings across the country. People with diabetes have also played an active role to ensure the views and preferences of all people living with diabetes have been represented.

One key change is that each chapter starts with key messages for health-care providers and includes a separate set of key messages written in lay language for people living with diabetes. It is hoped that these key messages will be useful in developing educational tools for both populations.

Development of the 2018 clinical practice guidelines involved a more rigorous systematic review of the literature, with the assistance of the McMaster Evidence Review and Synthesis Centre. An online database enhanced the communication and documentation within and across each chapter's review of the literature, and created a guideline "memory" for future iterations of the clinical practice guidelines. At the end of each chapter is a flow diagram that outlines how citations were initially identified, and then underwent screening, and were found to be eligible to inform on any recommendation change that was eventually included.

A more rigorous review of the grading of recommendations was performed. In the event of a discordance between the author-assigned grade and the Independent Methods Review Committee (IMR)-assigned grade, the recommendation was arbitrated by an IMR co-chair. A wider external review was performed by specialists, community primary care providers, academic departments of family medicine across Canada, and specialty and disease support organizations. Additional efforts were undertaken to manage and minimize conflicts of interest among all expert and steering committee members, and disclosures are listed in each chapter.

The 2018 guidelines include increased recognition of ethnocultural diversity in Canada and its relationship to diabetes care. The "Organization of Care", and "Self-Management Education and Support" chapters summarize studies that have shown that culturally appropriate diabetes education results in improvements in diabetes-related knowledge, self-management behaviours and clinical outcomes. The "Reducing the Risk of Developing Diabetes" chapter outlines diabetes prevention strategies in high-risk ethnic populations. The "Nutrition" chapter outlines the importance of a transcultural approach to nutrition therapy that takes into account the distinct foods, food preparation techniques, dining habits and dietary patterns of different ethnic groups. The chapter also includes new information on Ramadan fasting and diabetes.

Development of the chapter on "Type 2 Diabetes and Indigenous Peoples" included increased involvement of Indigenous authors and organizations and health-care providers working with Indigenous populations. The chapter acknowledges the legacy of colonization and residential schools and their ongoing effects on Indigenous people's health, as well as the calls to action of the 2015 Truth and Reconciliation Commission. The chapter outlines "Educating for Equity" strategies for addressing social barriers in order to improve diabetes outcomes plus strategies for facilitating outcomes using a cultural approach.

Other Key Highlights

The introduction section includes new information on oral health and diabetes, and recommends that people with diabetes see a dental professional regularly for oral health check-ups, and that people with diabetes should be reminded that daily dental care is a normal part of diabetes self-management.

The "Definition, Classification and Diagnosis of Diabetes, Prediabetes and Metabolic Syndrome" chapter includes new information on methods to differentiate between type 1, type 2 and monogenic diabetes. The "Screening for Diabetes in Adults" chapter includes an updated algorithm for screening and diagnosis of type 2 diabetes, which incorporates a de-emphasized role for the 75-gram oral glucose tolerance test. The "Targets for Glycemic Control chapter" reinforces the need to individualize glycemic targets based on the individual's age, duration of diabetes, risk of severe hypoglycemia, presence or absence of hypoglycemia awareness, cardiovascular (CV) disease, frailty or functional dependence and life expectancy. It also strengthens the recommended target of a glycated hemoglobin (A1C) level of 6.5 per cent or lower in people with type 2 diabetes to further decrease the risk of chronic kidney disease and retinopathy if they are at low risk of hypoglycemia based on the class of antihyperglycemic agent(s) taken and patient characteristics.

The chapter includes an updated figure that outlines the recommended targets for glycemic control in various populations with diabetes. It includes a new recommendation supporting lower fasting plasma glucose (FPG) and postprandial plasma glucose (PPG) targets in individuals not meeting an A1C target of seven per cent or less (i.e. if an A1C target of seven per cent or less cannot be achieved with an FPG target of four to seven millimoles per litre [mmol/L] and a PPG target of five to 10.0 mmol/L, further FPG lowering to four to 5.5 mmol/L and/or PPG lowering to five to eight mmol/L may be considered, but must be balanced against the risk of hypoglycemia).

The "Monitoring Glycemic Control" chapter contains new recommendations supporting the use of continuous glucose and flash glucose monitoring. The "Physical Activity and Diabetes" chapter contains new information on the importance of minimizing sedentary time, setting exercise goals and prescriptions, and the role of step-count monitoring with a pedometer.

The Glycemic Management in Adults with Type 1 Diabetes chapter was renamed from "Pharmacotherapy in Type 1 Diabetes" in the 2013 guidelines to reflect the inclusion of material on other treatment modalities, such as continuous subcutaneous insulin infusion (CSII) therapy and continuous glucose monitoring. The chapter includes new recommendations related to the use of new bolus and basal insulin preparations, as well as CSII and continuous glucose monitoring. The "Pharmacologic Glycemic Management of Type 2 Diabetes in Adults" chapter contains new information on antihyperglycemic agents released after the 2013 guidelines as well as information on recent trials, including CV outcomes studies. The algorithm on management of hyperglycemia in type 2 diabetes was updated to reflect this new evidence. The "Antihyperglycemic Medications and Renal Function" figure, and the "Therapeutic Consideration for Renal Impairment" appendix have also been updated. The "Hyperglycemic Emergencies in Adults" chapter contains new information on diabetic ketoacidosis with sodium-glucose co-transporter 2 inhibitor therapy. The "In-hospital Management of Diabetes" chapter contains new information on screening inpatients for diabetes, as well as a new table summarizing glycemic targets for various categories of inpatients.

The "Diabetes and Transplantation" chapter was expanded to include new information on post-transplant diabetes, and includes recommendations on screening for, and management of, this condition. The 2018 guidelines contain a new chapter on "Diabetes and Driving" with a recommendation that drivers with diabetes should not drive when their blood glucose (BG) level is lower than four mmol/L. If the BG level is lower than four mmol/L, persons should not drive until at least 40 minutes after successful treatment of hypoglycemia has increased their BG level to at least five mmol/L.

The "Cardiovascular Protection in People with Diabetes" chapter includes new information on the role of antihyperglycemic agents with demonstrated CV benefit. The 2013 guidelines contained a recommendation that all people with diabetes who are 55 years of age or older be started on an angiotensin-converting enzyme inhibitor or an angiotensin receptor blocker, at doses that demonstrate vascular protection, even in the absence of a CV risk factor or end organ damage (i.e. albuminuria, retinopathy, left ventricular hypertrophy). This Grade D, Consensus recommendation has been eliminated from the 2018 guidelines as no studies have clearly demonstrated CV benefits for this specific lower-risk population. However, it is important to recognize that the overwhelming majority of people with diabetes have additional compelling indications that they should be on renin angiotensin aldosterone system (RAAS) inhibitors by age 55, that they almost always require multiple medications to achieve blood pressure targets and that they almost always have suboptimal blood pressure control. Therefore, the clinical likelihood that people with diabetes will end up on some form of RAAS inhibition remains extremely high. While the recommendation to use RAAS therapy in all adults 55 years or older has been removed, the authors strongly encourage clinicians to regularly evaluate CV risk in all persons with diabetes to ensure people with diabetes who would benefit from RAAS inhibition are identified and treated appropriately.

The "Management of Acute Coronary Syndromes" chapter contains a new algorithm for screening for diabetes in all people with acute coronary syndrome but with no history of diabetes. The "Neuropathy" chapter contains new information on the diagnosis and management of diabetic autonomic neuropathy. The "Foot Care" chapter contains a new appendix outlining instructions on the use of the 10-gram monofilament to screen for protective sensation.

The "Type 1 Diabetes in Children and Adolescents" includes a new recommendation for an A1C target of less than 7.5 per cent for all children and adolescents. It also discusses the use of a psychosocial risk index aid to identify children and adolescents at high risk of poor glycemic control. The "Type 2 Diabetes in Children and Adolescents" chapter contains new recommendations on limiting sugar-sweetened beverage intake, limiting screen time, improving sleep quantity and quality, decreasing sedentary behaviours and increasing physical activity for all children to prevent type 2 diabetes. It also provides guidance on how to screen for type 2 diabetes in this age.

The "Diabetes and Pregnancy" chapter contains the most recommendations (42 in total) and reflects the complexity of caring for this population. Some recommendation revisions include the following:

- Women with pre-existing diabetes should supplement their diet with a multivitamin containing one milligram of folic acid (previously five milligrams in the 2013 guidelines) at least

three months preconception and continuing until at least 12 weeks' gestation.
- Women on metformin and/or glyburide may continue on these agents preconception if glycemic control is adequate until pregnancy is achieved. Women on other antihyperglycemic agents should switch to insulin.
- Women with type 2 diabetes should switch to insulin once they are pregnant; however, noninsulin antihyperglycemic agents should only be discontinued after insulin is started.

Space limitations do not allow me to outline further revisions, but future editions of *The Diabetes Communicator* will cover some of these changes. The 2018 guidelines are freely available on the Diabetes Canada website (guidelines.diabetes.ca), along with expanded health-care provider tools and resources, and patient education resources. To receive a free printed version of the 2018 clinical practice guidelines, simply sign up for a two-year professional membership. Also, printed copies are now available for purchase through Diabetes Canada's online store (orders.diabetes.ca). Cost per issue is $30.

Finally, plans are underway for the next set of guidelines and the professional section is exploring a change in the guideline revision process to one that consistently updates the clinical practice guidelines as new evidence arises rather than waiting through a five-year cycle.

Stay tuned for more information, and if you are interested in becoming involved in the next set of guidelines, please email houldenr@queensu.ca.

Medications in Complex Mental Illness: Impacts on Weight Gain, Appetite and Food Cravings

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Complex mental illness (CMI) encompasses individuals with a serious and persistent mental illness, including schizophrenia and mood disorders (e.g. bipolar and major depressive disorders). Treatment of CMI usually includes a combination of medication and psychosocial interventions. Common medications used to treat CMI are called second-generation antipsychotics (SGAs) (1). These agents, introduced in the 1980s and 1990s, became popular because they had fewer extrapyramidal symptoms (drug-induced movement disorders) than their first-generation counterparts (1). However, unlike first-generation antipsychotics, SGA medications cause serious metabolic side effects, such as substantial weight gain, intra-abdominal obesity, hyperlipidemia, insulin resistance, hyperglycemia and type 2 diabetes mellitus (2).

The SGA medications most commonly used with CMI include clozapine, olanzapine, quetiapine, aripiprazole and risperidone. Multiple studies have shown that compared with placebo treatment, these SGAs are associated with weight gain (3). Results from a meta-analysis show that, in these short-term (less than one year) trials, olanzapine, quetiapine and clozapine were associated with the greatest weight gain, but there was less mean weight gain from risperidone, and essentially no weight gain from aripiprazole (3).

The mechanisms behind increased appetite, food cravings and weight gain with SGA medications are complex. Most research has looked primarily at clozapine and olanzapine, which were identified as the agents causing the highest amount of weight gain. Potential physiological mechanisms behind weight gain with SGAs include their impact on hormone signalling and appetite-regulating neuropeptides. However, many of these studies were based on animal models or small sample sizes, and are still poorly understood with some restrictions and conflicting results (4).

A randomized double-blind study completed by Kluge et al (5) in 2007 looked at the impact of clozapine and olanzapine on binge-eating behaviours and food cravings in 30 individuals with schizophrenia. Their findings suggest that both clozapine and olanzapine induced binge eating and food cravings, potentially through alterations in the 5-hydroxytryptamine satiety signalling system (5).

Appetite changes and weight gain while taking SGA medication are likely multifactorial – a combination of physiological changes, and behavioural, environmental and societal influences. Some of these precipitating factors include:
- Food insecurity: being on social assistance/limited budgets, living in a "food desert," living in an environment that lacks cooking facilities or storage for food (shelters, transitional housing)
- Lack of social and community supports (no family doctor, no access to community health programs)
- Low education or dual diagnosis (mental illness and developmental delay)
- Prominent negative symptoms with CMI, meaning no motivation to eat healthy, to exercise or participate in self-care
- Cognitive impairment from substance use; years of untreated mental illness
- Sedative effects of medication
- Multiple life stressors leading to emotional/comfort eating – mental illness, medical diagnoses, stigma
- Boredom and lack of routine

Monitoring: How Often and What to Do

Applies to patients prescribed antipsychotics and metabolically active mood stabilizers and antidepressants

Frequency: As a minimum review those prescribed a new agent at baseline and at least once after 3 months. Weight should be assessed monthly in the first 3 months of taking a new antipsychotic as rapid early weight gain may predict severe weight gain in the longer term. Subsequent review should take place annually unless an abnormality of physical health emerges, which should then prompt appropriate action and/or continuing review at least every 3 months.

	Baseline	4 weeks	8 weeks	12 weeks	Quarterly	Annually
Personal/FHx	X					X
Lifestyle Review[1]	X	X	X	X	X	X
Weight/WC	X	X	X	X	X	X
BP	X			X		X
FPG/HbA1C	X			X		X
Lipid Profile[2]	X			X		X

History: Ask about family history (diabetes, obesity, CVD in first degree relatives <60 yrs), gestational diabetes. Note ethnicity.

[1]Smoking, diet, and physical activity [2]If fasting lipid profile cannot be obtained, a non-fasting sample is satisfactory

Figure 1: BP, blood pressure; CVD, cardiovascular disease; FHx, family history; FPG, fasting plasma glucose; HbA1C, glycated hemoglobin; WC, waist circumference; yrs, years. Reproduced with permission from reference 10.

It is also important to consider the priority that weight gain takes when treating CMI. Many clinicians focus on improving a patient's mental status (reducing hallucinations, delusions, manic states, suicidality); physical health is often a lower priority. Qualitative research has shown that patients themselves will place healthy behaviours secondary to their mental illness, as seen in this patient example from Barre et al (6):

"My mother bought me Chinese food one time... and I go for another serving, and she is like "Do you really need that?" and I am like "I am homeless, I am trying to work on my mental health first, you know that is my priority, and I don't need to be pestered about my weight."

So why should clinicians address food cravings, appetite and weight gain in patients taking SGA medications? One particularly important reason is the relationship among obesity, cardiovascular risk factors and early mortality risk. Individuals with CMI, specifically psychotic disorders, die on average 20 years before their peers and predominantly (greater than 80 per cent) from cardiovascular diseases (7). Especially in the early onset of a mental illness, smoking and obesity are seen as common cardiovascular risk factors in this population (8). In addition, weight gain is often a negative side effect that results in patients discontinuing their medication. With clozapine, clinicians tend to place greater emphasis on adverse effects that are in fact of lesser importance to patients, such as the frequent blood tests required with treatment (9). If weight gain is concerning to a patient, their adherence to the medication may be impacted (9).

The following are some strategies that clinicians can consider:

- Address the risk of weight gain and increased appetite with patients when starting a new medication.
- A patient's metabolic parameters (weight, waist circumference, glycated hemoglobin, blood glucose, lipid profile, blood pressure) should be measured regularly. See Figure 1 (10) for a suggested metabolic monitoring timeline when starting a new SGA agent.
- Patients should be directed to appropriate community supports, such as a family doctor or community health centre.
- The patient's psychiatrist may consider switching to an agent with a lesser tendency to cause weight gain, if the side effect is causing nonadherence and subsequent deterioration of mental status.
- Dietary counselling with a registered dietitian, exercise programs and cognitive-behavioural techniques can be effective in helping patients manage these side effects.
- Barriers to healthy eating and exercise should be addressed when developing weight-management programs for CMI patients (budget, food deserts, stigma, emotional eating, etc.)
- Add-on medications are an option that may provide modest weight loss in the CMI population. Metformin currently has the best evidence in this respect (11).

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Mindful Eating: An Approach to Aid Dietary Self-Management

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There has been an increased use of mindfulness in the health-care setting. In the nutrition field, mindful-eating interventions are being explored with individuals living with diabetes. The *Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes* continues to be our reference for the management of people living with diabetes, recommending initial education and skill building around well-balanced diet patterns appropriate for blood glucose management (1). Mindful eating has been suggested as a complementary counselling strategy implemented after initial education to assist individuals in achieving optimal glycemic control (2). This strategy builds on introductory education about what to eat by understanding how much to eat and why we are eating. This article serves as a reference for research to date, and further learning around how to incorporate mindful eating into practice.

Mindful eating is a relatively new counselling approach with limited research. A recent literature review of mindfulness interventions with individuals living with diabetes showed mixed results in the reduction of glycated hemoglobin (A1C) (2). Two of the four studies in this review showed improvement in A1C, as well as other significant benefits, including a reduction in dietary intake of transfat, sugar, and an increase in total fibre at three-month follow up (3). A reduction in rates of depression, anxiety and general psychological distress were also observed (4). The improvement in psychological symptoms is further supported in a systematic review concluding that mindful eating could provide a significant reduction in depressive symptoms, anxiety and distress (5). Interestingly, the other two studies in the literature review showed no significant change in A1C, but found significant benefit in the intervention group when measuring quality of life (6,7).

Research in other patient populations provides similarly promising results. A recent review of the role of mindfulness, mindful eating and intuitive eating concluded that these interventions can reduce emotional eating and eating in response to external cues (8). Mindfulness intervention is also a key component to binge-eating therapy and in reducing the frequency of binge eating, increasing positive attitudes toward eating and helping individuals who are struggling to control sudden urges to eat (9,10).

Although research is still exploratory (short-term studies relying on small sample sizes and diverse delivery methods), the results encourage the incorporation of mindful eating as a positive message and counselling strategy (2,5,8).

The Phases of Mindful Eating Counselling

Phase One: Awareness of Our Eating Experience will Uncover Poor Eating Habits

Awareness building is the first step in mindful eating. Slowing down helps observe unhealthy eating patterns, which we can eventually replace with healthier behaviours. Before we replace these behaviours, we need to identify them. Mindful eating helps focus one's attention on eating by exploring our five senses – seeing, tasting, hearing, smelling, feeling. It is more difficult than it sounds because our thoughts naturally wander, instead of focusing on the present moment. Typically, we react to these thoughts, but with mindful eating, we want to notice them without reaction, and then bring our attention back to

the present moment by exploring the aroma and texture of the food we are about to eat.

To incorporate the approach into diabetes self-management, start small by choosing one meal a week to eat mindfully. Counselling strategies that facilitate staying in the present are important. These techniques include slowing down the meal by putting the fork down between bites or using one's nondominant hand (11). Focusing on the five senses will help facilitate the curiosity of our food choices.

Phase Two: Listen to Our Body and its Natural Cues

Mindless eating is eating without awareness, and typically involves eating in response to external cues, like the aroma of food, or situational distractions, such as social events or schedules (12). We make over 220 eating-related decisions per day, but we are only consciously aware of approximately 14 of these decisions and, even more surprising, we are unaware of how our environment influences these decisions (12). This supports the need to slow down, build insight and shift our focus from external cues to internal cues (such as our physical hunger) when making decisions to eat.

Hunger provides immediate feedback, and individuals can use these physiological cues to help self-regulate consumption (8). The literature explains that improved awareness and acceptance of internal physical signals, such as hunger and fullness, improves decision-making around the timing and volume of consumption (8,10).

When incorporating mindfulness into diabetes self-management, patients should be coached to tune into the hunger levels throughout the entire experience of eating. They must become aware of how hunger changes during a meal by consciously observing hunger before the meal and the shifting sensations that occur as the meal progresses.

Phase Three: Interrupt Automatic Responses

Now that we are aware of our internal environment and our external environment, we must build insight around our patterns and our triggers for mindless eating. This provides the opportunity to break the cycle of automated responses and start making conscious food choices.

Meditation can be used to facilitate this conscious choice, decreasing both emotional and physiological impulsiveness and slowing down the racing mind to help recognize physiological signals, such as satiety cues. The goal is to interrupt habitual, automatic, reactive eating behaviours and provide individuals with the choice to make a change.

To incorporate mindfulness into diabetes self-management, practise mini meditation by connecting to your breath and becoming aware of bodily sensations before a meal. This pause provides an opportunity to make a choice to eat, allowing one to shift out of autopilot and break the cycle of fulfilling certain patterns.

To start the discussion of mindful and intuitive eating with your clients, check out the following short five-minute video. Choose the "Develop a Healthy Relationship with Food" icon at www.healtheuniversity.ca/en/DiabetesCollege/THRIVE/ (13).

Summary

Mindfulness conditions the brain to increase awareness and become more conscious of habits. After initial insight building, incorporation of positive internal triggers can help break unhealthy habits, build better habits and meet goals. The more clients practise these techniques, the more in charge they can feel about their diabetes care. Mindful eating is another instrument we can add to our toolkit and help individuals bring enjoyment back into eating.

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TECH WATCH

Most-Recommended Nutrition Apps

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At the 2017 Diabetes Canada/ Canadian Society of Endocrinology and Metabolism conference in Edmonton, I polled about 25 educators on what nutrition apps they usually recommend.

The top two answers were MyFitnessPal and MyPlate. Both appear on the 2017 best diabetes apps list on healthline.com (1), and they are available for both iPhone and Android platforms in free and premium/gold versions at $9.99 per month or $49.99 per year. These apps make it easier to track food and exercise to help reach health and fitness goals. The information below is from the apps themselves, the App Store and Google Play.

What is Similar?

Both apps are easy to use and set daily calorie goals for you. You search their databases or scan bar codes for food entry, and you can create your own recipes and food entries. Both apps track and display calories, carbohydrate, protein, fat, water intake and exercise. Blogs, community support groups and recipes are available for both of them.

What is Different?

MyFitnessPal has six million plus foods listed in its database; MyPlate has two million plus. In MyFitnessPal you can track micronutrients, such as cholesterol, sodium and some vitamins; this app can also sync with 55 or more apps and devices (everything from exercise trackers, fitness programs, scales, body composition and fertility programs). You can connect with friends and support each other on MyFitnessPal.

MyPlate syncs to Apple's HealthKit and Android's Google Fit apps; future versions will include new devices that will sync with the app. MyPlate has five exercise videos in the free version; more are available if you upgrade to the gold version. MyPlate has eight-week meal plans for those who want help in deciding what to eat. The meal plans are available in four dietary preferences: omnivore, vegetarian, vegan and gluten free; you also get daily motivational messages, a 30-minute workout plan, a weekly grocery list and recipes.

Tracking what you eat can increase and help maintain weight loss (2). Using an app for tracking is easier than pen and paper. The above information can help you decide between these two very popular apps.

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Professional Section Executive Nominations Are Now Open!

Want to make a professional difference as a volunteer? You can get involved!

We are currently seeking nominations for the following positions:

- Chair, Quality (Educator)
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Each portfolio is represented by both a clinician/scientist and an educator member. Nominations are available online at **www.diabetes.ca/professional-section.** The deadline is **June 1, 2018**.

For more information, contact **professional.membership@diabetes.ca**.

Reflections on 30 Years of Life and Work with Diabetes

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Diabetes treatment in the pre-insulin era was renowned for severe dietary restrictions, including Dr. Frederick Allen's infamous 1915 "Starvation Treatment for Diabetes":

"For forty-eight hours after admission…the patient is kept on an ordinary diet, to determine the severity of his diabetes. Then he is starved, and no food allowed save [one ounce of] whiskey [in] black coffee… every two hours, from 7am until 7pm. The whiskey is not an essential part of treatment; it merely furnishes a few calories and keeps the patient more comfortable while he is being starved…(1)."

Carbohydrate intake was then titrated to the maximum amount not resulting in glycosuria. The typical discharge diet contained eight per cent of carbohydrates and 70 per cent of fat (2). Despite the discovery of insulin in 1921, severe carbohydrate restriction and undernutrition remained the recommended dietary treatment for decades (3).

The Canadian Diabetes Association (CDA; now, Diabetes Canada) and the American Diabetes Association (ADA) introduced the first "exchange diets" in the 1950s. Designed for people with type 2 diabetes, this heralded the first attempt to improve dietary adherence and flexibility. Despite revision over the years, dietary recommendations remained low carbohydrate and calorie based.

In 1987, I was 20 weeks pregnant when glycosuria found during my routine prenatal visit prompted a glucose tolerance test. I received my gestational diabetes diagnosis over the phone on a Friday as I was preparing my daughter's birthday cake. My first concern was, "What should I do until my diabetes clinic appointment on Monday?" The advice was to "eat normally, but avoid sugar," which offered little comfort as I held the mixing bowl containing cake icing.

I received a full day of diabetes education, and was taught a 1,800-calorie meal plan, with three meals and three snacks using the CDA Good Health Eating Guide (GHEG). Neither sugar, nor artificial sweeteners were permitted during pregnancy.

Despite diligently following the meal plan, my glucose levels kept rising. By 32 weeks, I was losing weight on 3,000 calories/day. My three meals and six snacks included a large 2 a.m. snack! My endocrinologist insisted that I was cheating, but thanks to the insistence of my diabetes educators, I began insulin injections. As it turned out, I had type 1 diabetes.

My postnatal meal plan had 1,800 calories, with meal and snack times dictated by the pharmacodynamics of my two insulin injections. Delayed meals were possible if I ate my snack at mealtime and my meal at snack time. Occasional small amounts of sweets were permitted: a half-cup of ice cream could replace two servings of milk or one serving of fruits and vegetables plus a fat and oil choice. I was assured that this was not cheating. "Extras" filled the void when my meal plan did not satisfy my appetite. Lists of permitted/banned foods still existed, but low fat and higher carbohydrates were gaining ground.

My decision to pursue a career in nutrition and diabetes education was influenced by my respect for my own diabetes educators, and by the release of the Diabetes Control and Complications Trial (DCCT). At the same time, I transitioned from two to four injections per day.

My graduation in 1998 coincided with two major developments that heralded a seismic shift in both the nutritional and the medical management of diabetes. The first was the release of new diabetes nutrition recommendations in both Canada and the United States permitting up to 10 per cent of daily energy from sucrose, as was recommended for the general population. The new "sugars choice" contained 10 grams of carbohydrates and was symbolized by a snowflake. Meal plans were adapted to include the number of sugar choices permitted. The second development was the release of the first rapid-acting insulin analogue. Humalog could be given immediately before or after meals. Snacks became optional, except at bedtime and to prevent exercise-induced hypoglycemia. Multiple-dose injections with rapid insulin and permitting sucrose consumption signalled the beginning of personalized treatment and normalizing nutrition recommendations.

Filled with enthusiasm, I began working in a pediatric diabetes clinic. I was determined to teach inclusion; sugar was now permitted! Surprisingly, my efforts were often met with resistance and skepticism, rather than the relief I anticipated. I forged ahead and banished "cheating" and the "no added sugar" diet sheet from my office. Despite these changes, I was still adapting meal plans (and life) to two injections a day.

I began converting GHEG meal plans to carbohydrate grams. A serving of lasagna became 25 grams of carbohydrates with protein and fat, rather than one starch, one fruits and vegetables, two proteins plus two fats and oils choices! Supported by mounting evidence following the release of the DCCT, I began teaching insulin-to-carbohydrate ratios.

Despite these changes, the difficulties of titrating minute insulin doses meant that diabetes management in pediatrics was still restrictive and inflexible. In 1999, our clinic received

its first request for an insulin pump. The possibility of truly adapting treatment to lifestyle and appetite was appealing, but we lacked pump experience. A few months later, I switched to a pump, becoming the clinic "guinea pig." I have never looked back.

In 2005, the CDA released *Beyond the Basics*, the first major nutrition overhaul since the introduction of sugars. There were still food groups, but the new 15-gram carbohydrate choices used portion sizes that were harmonized with Canada's food guide and the ADA exchanges. This was NAFTA for diabetes! Nutrition recommendations shifted from calorie quantity to carbohydrate quantity. Diet quality was addressed by the glycemic index and increasing dietary fats with monounsaturated fats. My patients were mostly interested in carbohydrates.

By 2010, basal-bolus insulin therapy for type 1 diabetes was the norm. New basal insulin provided an option for those unable to afford (or unwilling to wear) a pump. All foods were now permitted provided you knew how much insulin to inject. Meals could be delayed or even skipped if one was not hungry!

Diabetes technologies and patient demands altered my practice. Increasingly reliable continuous glucose monitoring (CGM) revealed the glycemic effects of different foods, emotions and activities. Newer pumps capable of microdosing and extending bolus delivery provided options to improve control particularly when combined with CGM. The tables had turned: I was now teaching how to adapt insulin delivery to food intake and lifestyle, rather than the reverse. People no longer dreaded entering my office, but now arrived with a plethora of diabetes cures and miracle foods found on the internet. Safe surfing was added to the curriculum!

Carbohydrate counting has simplified diabetes management. But an unanticipated consequence has been the trend to ignore nutritional quality and noncarbohydrate foods. Evidence now shows that protein and fat do impact blood glucose levels, and that the relationship between carbohydrate quantity and insulin dose is not linear. Carbohydrate counting is now a complicated liberator with a burdensome potential!

The face of diabetes now includes a growing number of adolescents with type 2 diabetes. Technological advances have enabled diabetes management to be inclusive, rather than restrictive. At the same time, increased poverty, decreased physical activity and fewer family meal times have ensured that healthy lifestyle education remains an important part of diabetes education that technology can never replace.

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EDITORIAL...CONTINUED FROM PAGE 1

to afford healthy food, and point out the need to screen for food insecurity and tailor care plans for these patients.

Frequently, medications used to treat complex mental illness have unintended consequences on metabolism, appetite and nutritional status. Kelly Matheson explains the side effects of second-generation antipsychotics that clinicians should be aware of, and offers strategies to help control them for balancing mental and physical health.

Dietitian Debbie Stiles answers the question, "How Do I Help My Clients with Gastroparesis?" in our Ask the Expert article, offering recommendations for dietary changes, which may improve symptoms of gastroparesis.

With the growing number of individuals with type 2 diabetes and obesity who undergo bariatric surgery, it is crucial that health-care providers understand how the resulting lowered appetite, increased satiety and decreased intestinal absorption affect nutritional status. Jennifer Brown provides a detailed overview of the behavioural recommendations and supplements required to prevent nutritional deficiencies in this group of patients.

In addition to carbohydrates, vitamins D and B_{12}, zinc and docosahexaenoic acid also have important effects on promoting healthy fetal growth and development. Gwyneth Xagoraris provides a review of these macro- and micronutrients of concern during pregnancy for women with pre-existing and gestational diabetes.

Veronica Rouse explores the benefits of mindful eating, which has shown mixed results in lowering glycated hemoglobin, but significant improvements in psychological symptoms, such as anxiety, depression and distress. This article outlines the phases of mindful eating, and offers tips on how patients with diabetes can incorporate this approach in order to promote a healthy relationship with the food on their plates.

With the release of the 2018 clinical practice guidelines, be sure to take a look at the article by Robyn Houlden. She provides a synopsis of guideline changes and key highlights, along with information on the rigorous methodological review process for literature that formed the recommendations. Hope you enjoy this issue!

Calling for Award Nominations 2018

Professional section members of Diabetes Canada: consider nominating a member or putting your own name forward for an award. Deadline for nominations is **June 1, 2018.** Visit the website for available awards: **www.diabetes.ca/awards.**

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The *Canadian Journal of Diabetes* promotes the sharing and enhancement of knowledge to advance the prevention, management and cure of diabetes and related diseases. The journal publishes original research articles and expert reviews ranging from basic sciences to clinical applications, education, public and population health, and health policy.

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To apply or for more information, visit **www.diabetes.ca/publications-newsletters/canadian-journal-of-diabetes.**

The Canadian Diabetes Educator Certification Board: Search Engine

In 2017, the Canadian Diabetes Educator Certification Board (CDECB) launched a search engine enabling the public to verify which health-care professionals hold the certified diabetes educator (CDE)® designation.

This year, the CDECB will launch a search engine available for the public to locate a CDE who could be contacted for consultation without a referral. Note that this portion of the search engine is intended for the CDE who wishes to participate in this program. It is not mandatory. If you wish to participate, and you hold a current CDE designation, please log into your CDECB account and complete the necessary fields.

For further information, visit **www.cdecb.ca/.**

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