Diabetes Horizon Scan Bundle

Diabetes in Canada

An estimated 3.4 million Canadians are living with diabetes.[9] This number is expected to increase to 5 million by the year 2025.[9] In addition, about 20% of diabetes cases may be undiagnosed.[10] The direct costs of diabetes to the Canadian health care system were projected to reach C$8 billion in 2016[11] and nearly C$17 billion by 2020.[12]

Medications, equipment, and supplies to manage diabetes can be expensive, adding an additional out-of-pocket expense for people living with diabetes, and to their caregivers.[11-13] In Canada, coverage of treatment-related supplies varies from jurisdiction to jurisdiction and may include both public and, for some individuals with extended health insurance, private funding.[14]

New and emerging diabetes technologies

New technologies are emerging that may improve the diagnosis and management of diabetes and reduce the burden of this disease. The series of bulletins that follow summarizes the available evidence on six technologies that may have a positive impact on people with diabetes and on the Canadian health care system in future:

- **point-of-care hemoglobin A1C testing to diagnose type 2 diabetes**
- **artificial pancreas systems**
- **islet cell replacement therapy for type 1 and type 2 diabetes**
- **flash glucose monitoring for people with type 1 and type 2 diabetes**
- **transdermal glucagon to treat hypoglycemia**
- **shoe insoles to help prevent diabetic foot ulcers**.

Readers will also be interested in an upcoming CADTH horizon scan of type 2 diabetes medications for people living with type 1 diabetes, which is scheduled for publication in 2017.[1]

Types of diabetes

Diabetes mellitus is a serious chronic condition that occurs when the body does not produce enough insulin, or is unable to properly use insulin, a hormone needed to process glucose (sugar) as a source of energy.[2,3]

There are three types of diabetes.

Type 1 diabetes

In people with type 1 diabetes, the immune system attacks and kills the insulin-producing beta cells of the pancreas.[3] Because of this, the body has little or no insulin and sugar builds up in the blood instead of being turned into energy.[3] About 5% to 10% of people with diabetes have type 1 diabetes.[2] It is usually first diagnosed in childhood or adolescence and there is no known way to prevent it.[2] Everyone living with type 1 diabetes requires insulin injections (or insulin infusion using a pump) to manage the disease.[3] Managing diet and meal planning is also an important part of maintaining appropriate blood sugar levels.[3]

Type 2 diabetes

In people with type 2 diabetes, the body does not produce enough insulin, or does not properly use the insulin available, leading to a build-up of sugar in the blood.[2,3] About 90% to 95% of people with diabetes have type 2.[2,3] It is most common in people over the age of 40 but is being seen increasingly in children and teenagers.[2,3] Type 2 diabetes is often associated with obesity and can largely be prevented with a healthier diet and exercise.[2] Type 2 diabetes is managed with medications and some people with type 2 diabetes also require insulin injections.[3]

Gestational diabetes

The third type of diabetes, gestational diabetes, is a temporary condition that occurs in 2% to 4% of pregnancies.[2,3] In most cases, gestational diabetes can be managed through diet and exercise.[2,3] If a pregnant woman's blood sugar cannot be controlled, it may also be managed using insulin injections.[2,3]

Symptoms of diabetes

Although some people with type 2 diabetes may not show symptoms of the disease, common symptoms of diabetes include unusual thirst, frequent urination, weight loss or gain, lack of energy or fatigue, blurred vision, frequent infections or infections that repeatedly occur, slow healing of cuts and bruises, numbness or tingling in the hands or feet, and difficulty getting or maintaining an erection.[4,5]

Complications of diabetes

Living with diabetes increases the risk of serious and potentially life-threatening short- and long-term complications.[6]

Short-term complications

Short-term complications caused by high blood sugar (hyperglycemia) or low blood sugar (hypoglycemia caused by diabetes treatments) include:

- infections and slow healing wounds
- falls
- diabetic ketoacidosis (that is, a build-up of ketones, the chemicals produced when the body uses fat instead of sugar to make energy)
- hyperglycemic hyperosmolar nonketotic syndrome (severe dehydration caused when the body tries to rid itself of excess sugar by passing it in urine)
- loss of consciousness, coma, and death.[6]

Long-term complications

Long-term complications from chronic increased sugar levels in people with diabetes include:

- damage to blood vessels and nerves leading to eye conditions (for example, glaucoma, cataracts, and diabetic retinopathy) and vision loss
- kidney disease (diabetic nephropathy)
- nerve damage (neuropathy)
- infections and wounds that do not heal, sometimes leading to amputation.[6]

Diabetes significantly increases a person's risk of heart disease, stroke, and other cardiovascular conditions.[6] It has also been associated with mental health problems, such as anxiety and depression.[6-8]

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ABOUT CADTH

CADTH is an independent, not-for-profit organization responsible for providing Canada's health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs and medical devices in our health care system.

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