



DIABETES

WHAT IS DIABETES?

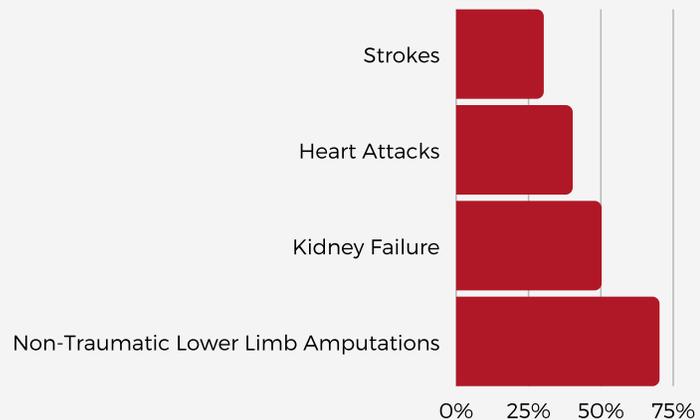
Diabetes is a disease that occurs when blood glucose, also called blood sugar, is too high. Normal blood glucose levels range from 4.0 to 7.0 prior to eating. Glucose is made through the consumption of bread, potatoes, rice, pasta, milk, and fruit. If left untreated or improperly managed, diabetes can result in a variety of complications including:

- Heart disease
- Kidney disease
- Eye disease
- Nerve damage

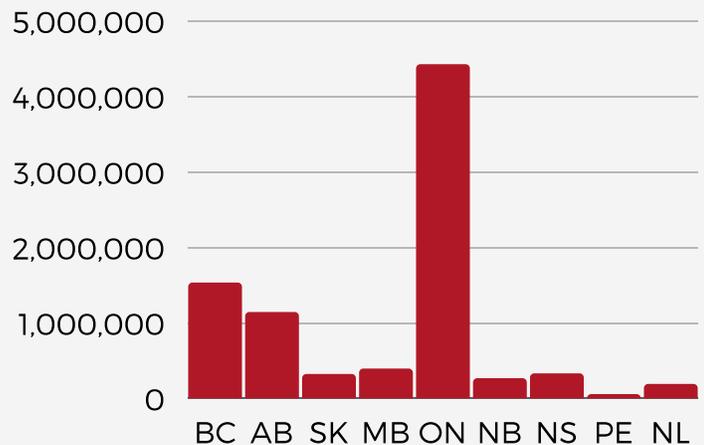
To help control the amount of glucose in the body, a hormone called insulin is produced. Insulin is created by the pancreas and it helps transport the glucose to blood cells to be used for energy. Sometimes, the body does not make enough -- or any -- insulin or does not use insulin well, which results to glucose staying in the blood and not reaching the cells. When this event occurs, this results to diabetes. There are 3 types of diabetes an individual can have: **Type 1 Diabetes, Type 2 Diabetes, and Gestational Diabetes.**

"CAUSES" OF DIABETES

Diabetes is not caused by eating too much sugar and people do not "give themselves" diabetes. There are several different reasons why someone may develop diabetes. This may depend on your genes, family history, ethnic background, environment, or your health. There is no common cause that fits every type of diabetes, rather, the disease is unique to the individual. The reason why someone will develop type 1 diabetes is very different from the reasons why another person will develop type 2 diabetes.



PERCENTAGE OF ISSUES IF DIABETES LEFT UNTREATED

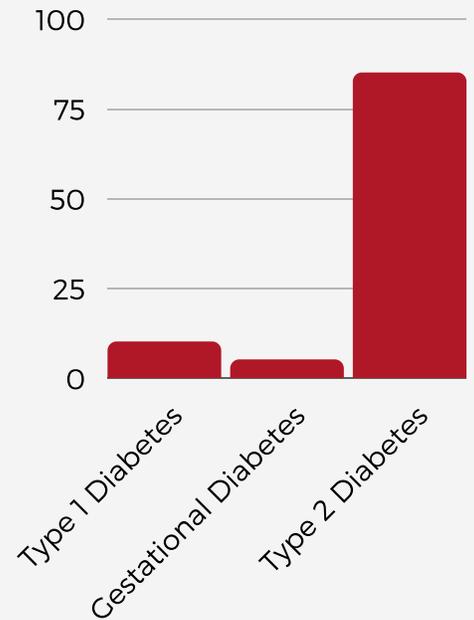


ESTIMATED NUMBER OF CANADIANS LIVING WITH DIABETES BY PROVINCE

TYPE 1 DIABETES

Type 1 diabetes is an autoimmune disease in which the pancreas does not produce enough insulin. Roughly 10% of people living with diabetes have type 1. The body's immune system attacks and destroys the cells in the pancreas that make insulin. Experts are unsure why this occurs. When a person eats foods such as bread, potatoes, rice, pasta, milk, or fruit, the body takes the sugar from it. Normally, the insulin hormone transports the sugar that was extracted to the cells so it can be used for energy. However, with not enough insulin, the sugar continues to build up in the blood instead of being used. There are some researchers that hypothesize that the individual's genes or the environment may be responsible for triggering type 1 diabetes. Furthermore, some people have a greater chance of getting type 1 because they have a parent, brother, or sister who has it. Another potential cause is having islet cell antibodies in the blood. The islet cell antibody is what the immune system produces to attack and destroy the islet cells as though they are foreign substances. Islet cells make hormones including insulin, glucagon, somatomammotropin, and pancreatic polypeptide.

This type of diabetes is treated by insulin therapy. The individual injects insulin by pen, syringe, or pump.



TYPE 2 DIABETES

Type 2 diabetes is much more common than type 1 diabetes. Roughly 90% of people living with diabetes have type 2 diabetes. It is most commonly developed in adulthood. However, it can happen in childhood as well.

This type of disease is where the pancreas does not produce enough insulin, or the body does not properly use the insulin it makes. The latter occurrence is called insulin resistance. When either event happens, sugar continues to build up in the blood instead of using it for energy. Several factors that cause type 2 diabetes include obesity, ethnic background, a family history of type 2 diabetes and other environmental factors. An individual is more likely to develop type 2 diabetes if they are not physically active and are overweight or obese. However, type 2 diabetes can be prevented or delayed with a healthy lifestyle, including staying at a healthy weight, making healthy food choices, and getting regular exercise.

GESTATIONAL DIABETES

Gestational diabetes occurs during the second or third trimester of pregnancy. Between 3-20% of pregnant women develop gestational diabetes. During this period, the body cannot produce enough insulin to handle the effects of a growing baby and the hormone changes. In most cases, when a woman did not have diabetes before the pregnancy, develops gestational diabetes, it will normally go away after giving birth.

If high blood sugar is left unchecked during pregnancy, it could result in problems for the mother and her baby:

- preeclampsia (high blood pressure that occurs during pregnancy)
- abnormal sugar level in baby
- the baby could grow too large, increasing the need of a caesarean section
- possible birth injury due to the baby's size and difficulties during delivery

The risk of developing gestational diabetes can be reduced by managing weight, eating healthy, and keeping active before and during pregnancy.

HOW IS DIABETES A RISK FACTOR FOR HEART DISEASE?

Symptoms of Diabetes



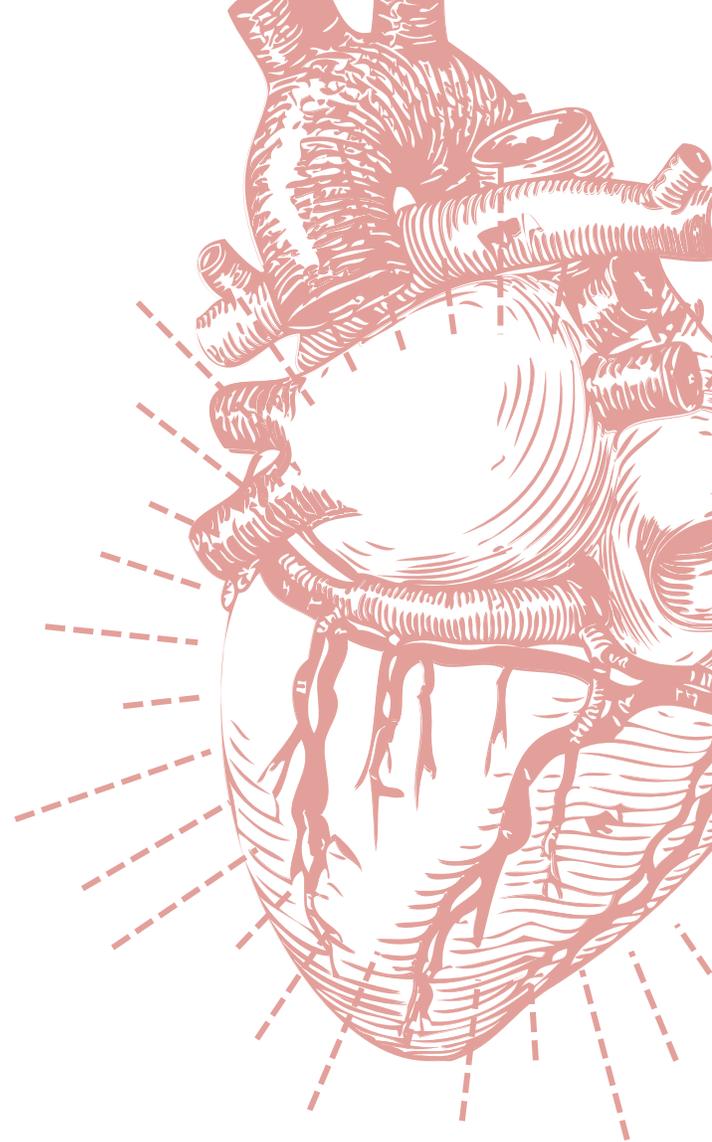
- Unusual thirst
- Frequent urination
- Weight change (gain or loss)
- Extreme fatigue or lack of energy
- Blurred vision
- Frequent or recurring infections
- Cuts and bruises that are slow to heal
- Tingling or numbness in the hands or feet

Overtime, high blood glucose from diabetes can damage the blood vessels and the nerves that control the heart and blood vessels. The longer an individual has diabetes, the higher the chances that they will develop heart disease. People with diabetes are twice as likely to experience cardiac events than other individuals.

The most common form of heart disease in diabetes is coronary artery disease. It develops when the arteries that supply the heart with blood become narrowed or blocked by fatty deposits. If the arteries that supply the brain become blocked, this may lead to a stroke. 65% of all deaths among diabetic patients are from cardiovascular disease. For this reason, the control on insulin is extremely important as it is directly related to blood glucose levels. Additionally, individuals who have diabetes along with other risk factors are much higher risk than nondiabetic individuals with the same number of risk factors. High blood glucose levels (hyperglycemia) are associated with damage to the smallest blood vessels (such as those in the retina of the eye) and enhanced atherosclerosis. High insulin levels also are associated with enhanced blood clotting.

In Canada alone, **3 million Canadians** (8.1%) were living with diagnosed diabetes in 2013-2014. This represents 1 in 300 children and youth (1-19), and 1 in 10 adults (20 years and older) who have a type of diabetes. This is a significant health problem in our country. This means that **every 24 hours:**

- more than 20 Canadians die of diabetes-related complications
- 480 more Canadians are diagnosed with this disease
- 14 Canadians have a lower limb amputation
- our health care system spends \$75 million treating diabetes



Meal Planning Tips



- Cook pasta "al dente" (firm)
- Make fruits and milk part of your meal plate
- Eat lower GI grains, such as barley and bulgur
- Swap half of your higher GI starch food with beans, lentils or chickpeas
- Cool red or white potatoes and make a potato salad

TREATING DIABETES & BLOOD GLUCOSE LEVELS

DIET

Managing your diet by eating healthy meals and snacks is one of the best ways to keep your blood glucose in check. There are a number of food groups that contribute to high glucose levels: carbohydrates, some dairy products, and some fruit. This is measured by the **glycemic index (GI)**; a scale that ranks a carbohydrate-containing food or drink by how much it raises blood glucose after it is eaten or drunk. There are 3 GI categories: **Low GI (55 or less), Medium GI (56-69), and High GI (70 or more)**. It is recommended by Diabetes Canada that individuals who have high blood glucose or has diabetes should choose foods with a low GI number. In general, when a food is highly processed or when a food is something that can be quickly digested, the higher the glycemic index. The boxes below showcase the desired glucose values an individual should aim for.

If you want to learn more about the glycemic index, visit www.diabetes.ca for more information.

Fasting blood glucose/blood sugar level before meals

4.0-7.0 mmol/L

Blood glucose/blood sugar level after eating

5.0-10.0 mmol/L

EXERCISE

Maintaining regular exercise carries a number of benefits that include weight loss, stronger bones, improved blood pressure control, lower rates of heart disease and cancer. Especially for individuals who have diabetes or high glucose levels, regular exercise is very advantageous as it improves the body's sensitivity to insulin and helps manage the blood sugar levels. When doing physical activity, active muscles use up sugar (glucose) as a source of energy, preventing sugar from building up in the blood.

MEDICATION

Depending on the type of diabetes you have, it is extremely important to maintain the medication prescribed to you. Especially with insulin, it may differ by how long they work, how quickly they start working, and when they are most effective. By understanding how your prescribed insulin works, you can time your meals, snacks, and activity levels. You might start on one or more injections each day. Your diabetes educator can work with you to find an insulin treatment that will work well with your lifestyle while helping you to achieve good blood sugar levels.

GLYCEMIC INDEX OF FOODS

<55 GI
units
Low GI

BREADS

Heavy mixed grain
Spelt
Sourdough bread
Tortilla (whole grain)

CEREAL

All Bran
Bran Buds with Psyllium
Oat Bran
Oats (steel cut)

GRAINS

Barley
Bulgur
Mung bean noodles
Pasta (al dente, firm)
Pulse flours
Quinoa
Rice (parboiled, converted)

OTHER STARCHES

Peas
Popcorn
Sweet Potato
Winter squash

FRUITS

Apple
Apricot (fresh, dried)
Banana (green, unripe)
Berries
Cantaloupe
Grapefruit

MILK, ALTERNATIVES & OTHER BEVERAGES

Milk (almond; cow - skim, 1% 2%, whole; soy; Greel)
Yogurt (skim, 1%, 2%, whole; Frozen)

MEAT & ALTERNATIVES

Baked beans
Chickpeas
Kidney
Mung
Romano beans; lentils,
soybeans/edamame, split peas

<55-69 GI
units
Medium GI

BREADS

Chapati, pita, roti (white, whole wheat)
Flax seed or linseed bread
Pumpernickel, rye, stone ground
whole wheat, whole grain wheat bread

CEREAL

Oats (instant, large flake, and quick)

GRAINS

Basmati, brown, short or long grain
white, wild rice
Cornmeal
Couscous

FRUITS

Banana (ripe, yellow)
Cherries
Cranberries
Figs (fresh, dried)
Grapes
Kiwi
Lychee
Pineapple
Raisins

MEAT & ALTERNATIVES

Lentil and split pea soup (ready made)

>70 GI
units
High GI

BREADS

White, whole wheat bread
Naan (white, whole wheat)

CEREAL

Corn Flakes
Cream of Wheat
Puffed wheat
Rice Krispies
Special K

GRAINS

Jasmine rice
Sticky rice
Instant white rice

OTHER STARCHES

Carrots
Potato (instant mashed; red, white, hot)
Pretzels
Rice cakes
Soda crackers

FRUITS

Banana (brown, overripe)
Watermelon

MILK, ALTERNATIVES & OTHER BEVERAGES

Rice milk



ABC'S IN TREATING DIABETES

A Taking the A1C test regularly

This is a blood glucose test that shows your average blood sugar level over the past 3 months. The higher the A1C number, the higher your blood glucose levels have been

D Developing a healthy body weight

Creating your own healthy lifestyle habits can help you manage your diabetes and prevent heart disease. Work with your healthcare provider to brainstorm a healthy eating plan and a physical activity regimen

B Control blood pressure

High blood pressure can lead to heart disease and stroke. So people with diabetes should try to maintain a blood pressure level below 130/80

E Education

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

C Control cholesterol levels

There are 2 kinds of cholesterol in the blood: LDL and HDL. LDL or "bad" cholesterol can build up and clog the blood vessels. HDL or "good" cholesterol help remove the "bad" cholesterol from your blood vessels. A diet that consists of vegetables, fruit, whole grains, plant proteins, low-fat milk products, and lean meats is an effective way to lower cholesterol

S Stop smoking

To not smoke is especially important for people with diabetes as smoking leads to the narrowing of blood vessels which in turn makes the heart work harder