



Field: Physics-electromagnetism

Context: what is the main cause of diabetes

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What is Diabetes?

Diabetes is when your blood **glucose***, also called blood sugar, is too high. Blood glucose is the main type of sugar found in your blood and your main source of energy.

Glucose comes from the food you eat and is also made in your liver and muscles. Your blood carries glucose to all of your body's cells to use for energy.

Your **pancreas**—an organ, located between your stomach and spine, that helps with digestion—releases a hormone it makes, called **insulin**, into your blood. Insulin helps your blood carry glucose to all your body's cells. Sometimes your body doesn't make enough insulin or the insulin doesn't work the way it should. Glucose then stays in your blood and doesn't reach your cells. Your blood glucose levels get too high and can cause diabetes or **prediabetes**.

Over time, having too much glucose in your blood can cause health problems.

Type of diabetes.

The three main types of diabetes are **type 1**, **type 2**, and **gestational** diabetes. People can develop diabetes at any age.

Type 1 Diabetes

Type 1 diabetes, which used to be called juvenile diabetes, develops most often in young people; however, type 1 diabetes can also develop in adults. In type 1 diabetes, your body no longer

makes insulin or enough insulin because

The body's **immune** system, which normally protects you from infection by getting rid of bacteria, viruses, and other harmful substances, has attacked and destroyed the cells that make insulin.

Type 2 Diabetes.

Type 2 diabetes, which used to be called adult-onset diabetes, can affect people at any age, even children. However, type 2 diabetes develops most often in middle- aged and older people. People who are overweight and inactive are also more likely to develop Type 2 diabetes.

Type 2 diabetes usually begins with insulin resistance—a condition that occurs when fat, muscle, and liver cells do not use insulin to carry glucose into the body's cells to use for energy.

Gestational Diabetes.

Gestational diabetes can develop when a woman is pregnant. Pregnant women make hormones that can lead to insulin resistance. All women have insulin resistance late in their pregnancy. If the pancreas doesn't make enough insulin during pregnancy, a woman develops gestational diabetes.

What causes type 1 diabetes?

Type 1 diabetes occurs when your immune system, the body's system for fighting infection, attacks and destroys the insulin-producing beta cells of the pancreas. Scientists think type 1 diabetes is caused by genes and environmental factors, such as viruses, that might trigger the disease. Studies such as [Trial Net External link](#) are working to pinpoint causes of type 1 diabetes and possible ways to prevent or slow the

disease.

What causes type 2 diabetes?

Type 2 diabetes—the most common form of diabetes—is caused by several factors, including lifestyle factors and genes.

Overweight, obesity, and physical inactivity.

You are more likely to develop type 2 diabetes if you are not physically active and are overweight or have obesity. Extra weight sometimes causes insulin resistance and is common in people with type 2 diabetes. The location of body fat also makes a difference. Extra belly fat is linked to insulin resistance, type 2 diabetes, and heart and blood vessel disease. To see if your weight puts you at risk for type 2 diabetes, check out these Body Mass Index (BMI) charts.

Insulin resistance

Type 2 diabetes usually begins with insulin resistance, a condition in which muscle, liver, and fat cells do not use insulin well.. At first, the pancreas makes more insulin to keep up with the added demand. Over time, the pancreas can't make enough insulin, and blood glucose levels rise.

What causes gestational diabetes?

Scientists believe gestational diabetes, a type of diabetes that develops during pregnancy, is caused by the hormonal changes of pregnancy along with genetic and lifestyle factors.

Insulin resistance

Hormones produced by the placenta [NIH external link](#) contribute to insulin resistance, which occurs in all women during late pregnancy. Most pregnant

women can produce enough insulin to overcome insulin resistance, but some cannot. Gestational diabetes occurs when the pancreas can't make enough insulin.

As with type 2 diabetes, extra weight is linked to gestational diabetes. Women who are overweight or have obesity may already have insulin resistance when they become pregnant. Gaining too much weight during pregnancy may also be a factor.

Genes and family history.

Having a family history of diabetes makes it more likely that a woman will develop gestational diabetes, which suggests that genes play a role. Genes may also explain why the disorder occurs more often in African Americans, American Indians, Asians, and Hispanics/Latinas.

What else can cause diabetes?

Genetic mutations, NIH external link, other diseases, damage to the pancreas, and certain medicines may also cause diabetes.

Genetic mutations.

Monogenic diabetes is caused by mutations, or changes, in a single gene. These changes are usually passed through families, but sometimes the gene mutation happens on its own. Most of these gene mutations cause diabetes by making the pancreas less able to make insulin. The most common types of monogenic diabetes are neonatal diabetes and maturity-onset diabetes of the young (MODY). Neonatal diabetes occurs in the first 6 months of life. Doctors usually diagnose MODY during adolescence or early adulthood, but sometimes the disease is not diagnosed until later in life.

Cystic fibrosis NIH external link produces thick mucus that causes scarring in the pancreas. This scarring can prevent the pancreas from making enough insulin.

Hemochromatosis causes the body to store too much iron. If the disease is not treated, iron can build up in and damage the pancreas and other organs.

Hormonal diseases.

Some hormonal diseases cause the body to produce too much of certain hormones, which sometimes cause insulin resistance and diabetes.

Cushing's syndrome occurs when the body produces too much cortisol—often called the “stress hormone.”

Acromegaly occurs when the body produces too much growth hormone.

Hyperthyroidism occurs when the thyroid gland produces too much thyroid hormone.

Damage to or removal of the pancreas.

Pancreatitis, pancreatic cancer, and trauma can all harm the beta cells or make them less able to produce insulin, resulting in diabetes. If the damaged pancreas is removed, diabetes will occur due to the loss of the beta cells.

Medicines.

Sometimes certain medicines can harm beta cells or disrupt the way insulin works. These include

- niacin, a type of vitamin B3.
- certain types of diuretics, also called water pills.
- anti-seizure drugs.

- psychiatric drugs.

drugs to treat human immunodeficiency virus (HIV [NIH external link](#))

pentamidine, a drug used to treat a type of pneumonia [External link](#)

glucocorticoids—medicines used to treat inflammatory illnesses such as rheumatoid arthritis [NIH external link](#), asthma [NIH external link](#), lupus [NIH external link](#), and ulcerative colitis anti-rejection medicines, used to help stop the body from rejecting a transplanted organ Statins, which are medicines to reduce LDL (“bad”) cholesterol levels, can slightly increase the chance that you’ll develop diabetes.

