

Diabetes

Overview

Diabetes mellitus refers to a group of diseases that affect how the body uses blood sugar (glucose). Glucose is an important source of energy for the cells that make up the muscles and tissues. It's also the brain's main source of fuel.

The main cause of diabetes varies by type. But no matter what type of diabetes you have, it can lead to excess sugar in the blood. Too much sugar in the blood can lead to serious health problems.

Chronic diabetes conditions include type 1 diabetes and type 2 diabetes. Potentially reversible diabetes conditions include prediabetes and gestational diabetes. Prediabetes happens when blood sugar levels are higher than normal. But the blood sugar levels aren't high enough to be called diabetes. And prediabetes can lead to diabetes unless steps are taken to prevent it. Gestational diabetes happens during pregnancy. But it may go away after the baby is born.

Symptoms

Diabetes symptoms depend on how high your blood sugar is. Some people, especially if they have prediabetes, gestational diabetes or type 2 diabetes, may not have symptoms. In type 1 diabetes, symptoms tend to come on quickly and be more severe.

Some of the symptoms of type 1 diabetes and type 2 diabetes are:

- Feeling more thirsty than usual.
- Urinating often.
- Losing weight without trying.
- Presence of ketones in the urine. Ketones are a byproduct of the breakdown of muscle and fat that happens when there's not enough available insulin.
- Feeling tired and weak.
- Feeling irritable or having other mood changes.
- Having blurry vision.
- Having slow-healing sores.
- Getting a lot of infections, such as gum, skin and vaginal infections.

Type 1 diabetes can start at any age. But it often starts during childhood or teen years. Type 2 diabetes, the more common type, can develop at any age. Type 2 diabetes is more common in people older than 40. But type 2 diabetes in children is increasing.

When to see a doctor

- **If you think you or your child may have diabetes.** If you notice any possible diabetes symptoms, contact your health care provider. The earlier the condition is diagnosed, the sooner treatment can begin.
- **If you've already been diagnosed with diabetes.** After you receive your diagnosis, you'll need close medical follow-up until your blood sugar levels stabilize.

Causes

To understand diabetes, it's important to understand how the body normally uses glucose.

How insulin works

Insulin is a hormone that comes from a gland behind and below the stomach (pancreas).

- The pancreas releases insulin into the bloodstream.
- The insulin circulates, letting sugar enter the cells.
- Insulin lowers the amount of sugar in the bloodstream.
- As the blood sugar level drops, so does the secretion of insulin from the pancreas.

The role of glucose

Glucose — a sugar — is a source of energy for the cells that make up muscles and other tissues.

- Glucose comes from two major sources: food and the liver.
- Sugar is absorbed into the bloodstream, where it enters cells with the help of insulin.
- The liver stores and makes glucose.
- When glucose levels are low, such as when you haven't eaten in a while, the liver breaks down stored glycogen into glucose. This keeps your glucose level within a typical range.

The exact cause of most types of diabetes is unknown. In all cases, sugar builds up in the bloodstream. This is because the pancreas doesn't produce enough insulin. Both type 1 and type 2 diabetes may be caused by a combination of genetic or environmental factors. It is unclear what those factors may be.

Risk factors

Risk factors for diabetes depend on the type of diabetes. Family history may play a part in all types. Environmental factors and geography can add to the risk of type 1 diabetes.

Sometimes family members of people with type 1 diabetes are tested for the presence of diabetes immune system cells (autoantibodies). If you have these autoantibodies, you have an increased risk of developing type 1 diabetes. But not everyone who has these autoantibodies develops diabetes.

Race or ethnicity also may raise your risk of developing type 2 diabetes. Although it's unclear why, certain people — including Black, Hispanic, American Indian and Asian American people — are at higher risk.

Prediabetes, type 2 diabetes and gestational diabetes are more common in people who are overweight or obese.

Complications

Long-term complications of diabetes develop gradually. The longer you have diabetes — and the less controlled your blood sugar — the higher the risk of complications. Eventually, diabetes complications may be disabling or even life-threatening. In fact, prediabetes can lead to type 2 diabetes. Possible complications include:

- **Heart and blood vessel (cardiovascular) disease.** Diabetes majorly increases the risk of many heart problems. These can include coronary artery disease with chest pain (angina), heart attack, stroke and narrowing of arteries (atherosclerosis). If you have diabetes, you're more likely to have heart disease or stroke.
- **Nerve damage from diabetes (diabetic neuropathy).** Too much sugar can injure the walls of the tiny blood vessels (capillaries) that nourish the nerves, especially in the legs. This can cause tingling, numbness, burning or pain that usually begins at the tips of the toes or fingers and gradually spreads upward.

Damage to the nerves related to digestion can cause problems with nausea, vomiting, diarrhea or constipation. For men, it may lead to erectile dysfunction.

- **Kidney damage from diabetes (diabetic nephropathy).** The kidneys hold millions of tiny blood vessel clusters (glomeruli) that filter waste from the blood. Diabetes can damage this delicate filtering system.
- **Eye damage from diabetes (diabetic retinopathy).** Diabetes can damage the blood vessels of the eye. This could lead to blindness.
- **Foot damage.** Nerve damage in the feet or poor blood flow to the feet increases the risk of many foot complications.
- **Skin and mouth conditions.** Diabetes may leave you more prone to skin problems, including bacterial and fungal infections.
- **Hearing impairment.** Hearing problems are more common in people with diabetes.
- **Alzheimer's disease.** Type 2 diabetes may increase the risk of dementia, such as Alzheimer's disease.
- **Depression related to diabetes.** Depression symptoms are common in people with type 1 and type 2 diabetes.

Complications of gestational diabetes

Most women who have gestational diabetes deliver healthy babies. However, untreated or uncontrolled blood sugar levels can cause problems for you and your baby.

Complications in your baby can be caused by gestational diabetes, including:

- **Excess growth.** Extra glucose can cross the placenta. Extra glucose triggers the baby's pancreas to make extra insulin. This can cause your baby to grow too large. It can lead to a difficult birth and sometimes the need for a C-section.
- **Low blood sugar.** Sometimes babies of mothers with gestational diabetes develop low blood sugar (hypoglycemia) shortly after birth. This is because their own insulin production is high.
- **Type 2 diabetes later in life.** Babies of mothers who have gestational diabetes have a higher risk of developing obesity and type 2 diabetes later in life.
- **Death.** Untreated gestational diabetes can lead to a baby's death either before or shortly after birth.

Complications in the mother also can be caused by gestational diabetes, including:

- **Preeclampsia.** Symptoms of this condition include high blood pressure, too much protein in the urine, and swelling in the legs and feet.
- **Gestational diabetes.** If you had gestational diabetes in one pregnancy, you're more likely to have it again with the next pregnancy.

Prevention

Type 1 diabetes can't be prevented. But the healthy lifestyle choices that help treat prediabetes, type 2 diabetes and gestational diabetes can also help prevent them:

- **Eat healthy foods.** Choose foods lower in fat and calories and higher in fiber. Focus on fruits, vegetables and whole grains. Eat a variety to keep from feeling bored.
- **Get more physical activity.** Try to get about 30 minutes of moderate aerobic activity on most days of the week. Or aim to get at least 150 minutes of moderate aerobic activity a week. For example, take a brisk daily walk. If you can't fit in a long workout, break it up into smaller sessions throughout the day.
- **Lose excess pounds.** If you're overweight, losing even 7% of your body weight can lower the risk of diabetes. For example, if you weigh 200 pounds (90.7 kilograms), losing 14 pounds (6.4 kilograms) can lower the risk of diabetes.

But don't try to lose weight during pregnancy. Talk to your provider about how much weight is healthy for you to gain during pregnancy.

To keep your weight in a healthy range, work on long-term changes to your eating and exercise habits. Remember the benefits of losing weight, such as a healthier heart, more energy and higher self-esteem.

Sometimes drugs are an option. Oral diabetes drugs such as metformin (Glumetza, Fortamet, others) may lower the risk of type 2 diabetes. But healthy lifestyle choices are important. If you have prediabetes, have your blood sugar checked at least once a year to make sure you haven't developed type 2 diabetes.

By Mayo Clinic Staff

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