

Diabetes Overview

What is diabetes?

Diabetes is a disorder of the way the body uses food for growth and energy. Most of the food people eat is broken down into glucose, the form of sugar in the blood. Glucose is the main source of fuel for the body.

After digestion, glucose passes into the bloodstream, where it is used by cells for growth and energy. For glucose to get into cells, insulin - a hormone produced by the pancreas - must be present.

When we eat, the pancreas automatically produces the right amount of insulin to move glucose from blood into the cells. In people with diabetes the pancreas either does not produce insulin, or the cells do not respond to the insulin that is produced. Glucose builds up in the blood, overflows into the urine, and passes out of the body. So the body loses its main source of fuel even though the blood contains large amounts of glucose.

What are the types of diabetes?

The three main types of diabetes are

- type 1 diabetes
- type 2 diabetes
- gestational diabetes

Type 1 Diabetes

Type 1 diabetes is an autoimmune disease. In type 1 diabetes, the immune system attacks and destroys the insulin-producing beta cells in the pancreas. The pancreas then produces little or no insulin. A person who has type 1 diabetes must take insulin daily to live.

Scientists do not know exactly what causes the body's immune system to attack the beta cells, but they believe that autoimmune, genetic, and environmental factors - possibly viruses - are involved. Type 1 diabetes accounts for about 5 to 10 percent of diagnosed diabetes in the United States. It develops most often in children and young adults but can appear at any age.

Symptoms of type 1 diabetes usually develop over a short period. Symptoms may include increased thirst and urination, constant hunger, weight loss, blurred vision, and extreme fatigue. If not diagnosed and treated with insulin, a person with type 1 diabetes can lapse into a life-threatening diabetic coma, also known as diabetic ketoacidosis.

Type 2 Diabetes

The most common form of diabetes is type 2 diabetes. About 90 to 95 percent of people with diabetes have type 2. This form of diabetes is most often associated with older age, obesity, family history of diabetes, previous history of gestational diabetes, physical inactivity, and certain ethnicities. About 80 percent of people with type 2 diabetes are overweight or obese. More children and adolescents are being diagnosed with type 2 diabetes, especially African American, Mexican American, and Pacific Islander youth.

When type 2 diabetes is diagnosed, the pancreas is usually producing enough insulin, but for unknown reasons the body cannot use the insulin effectively, a condition called insulin resistance. After several years, insulin production decreases. The result is the same as for type 1 diabetes—glucose builds up in the blood and the body cannot make efficient use of its main source of fuel.

The symptoms of type 2 diabetes develop gradually. Their onset is not as sudden as in type 1 diabetes. Symptoms may include fatigue, frequent urination, increased thirst and hunger, weight loss, blurred vision, and slow healing of wounds or sores. Some people have no symptoms.

Gestational Diabetes

Some women develop gestational diabetes late in pregnancy. This form of diabetes usually disappears after the birth of the baby, but women who have had gestational diabetes have a 40 to 60 percent chance of developing type 2 diabetes within 5 to 10 years. Maintaining a reasonable body weight and being physically active may help prevent development of type 2 diabetes.

About 3 to 8 percent of pregnant women in the United States develop gestational diabetes. As with type 2 diabetes, gestational diabetes occurs more often in some ethnic groups and among women with a family history of diabetes. Gestational diabetes is caused by the hormones of pregnancy or a shortage of insulin. Women with gestational diabetes may not experience any symptoms.

Other less common types of diabetes may account for 1 to 2 percent of all diagnosed cases of diabetes and result from specific genetic syndromes, surgery, drugs, malnutrition, infections and other illnesses.

How is diabetes diagnosed?

The fasting blood glucose test is the preferred test for diagnosing diabetes in children and non-pregnant adults. The test is most reliable when done in the morning. However, a diagnosis of diabetes can be made based on any of the following test results, confirmed by retesting on a different day:

- A blood glucose level of 126 milligrams per deciliter (mg/dL) or higher after an 8-hour fast. This test is called the fasting blood glucose test.

- A blood glucose level of 200 mg/dL or higher 2 hours after drinking a beverage containing 75 grams of glucose dissolved in water. This test is called the oral glucose tolerance test (OGTT).
- A random blood glucose level of 200 mg/dL or higher, along with the presence of diabetes symptoms.

What is prediabetes?

People with pre-diabetes have blood glucose levels that are higher than normal but not high enough for a diagnosis of diabetes. This condition raises the risk of developing type 2 diabetes, heart disease, and stroke.

Pre-diabetes is also called impaired fasting glucose (IFG) or impaired glucose tolerance (IGT), depending on the test used to diagnose it. Some people have both IFG and IGT.

- IFG is a condition in which the blood glucose level is high—100 to 125 mg/dL—after an overnight fast, but is not high enough to be classified as diabetes. The former definition of IFG was 110 mg/dL to 125 mg/dL.
- IGT is a condition in which the blood glucose level is high—140 to 199 mg/dL—after a 2-hour OGTT, but is not high enough to be classified as diabetes.

Pre-diabetes is becoming more common in the United States. Those with pre-diabetes are likely to develop type 2 diabetes within 10 years, unless they take steps to prevent or delay diabetes.

The good news is that people with pre-diabetes can do a lot to prevent or delay diabetes. Studies have clearly shown that people can lower their risk of developing diabetes by losing 5 to 7 percent of their body weight through diet and increased physical activity.

A major study of more than 3,000 people with IGT found that diet and exercise resulting in a 5 to 7 percent weight lowered the incidence of type 2 diabetes by nearly 60 percent. Study participants lost weight by cutting fat and calories in their diet and by exercising—most chose walking—at least 30 minutes a day, 5 days a week.

What are the scope and impact of diabetes?

Diabetes is widely recognized as one of the leading causes of death and disability in the United States. It is associated with long-term complications that affect almost every part of the body. The disease often leads to blindness, heart and blood vessel disease, stroke, kidney failure, amputations, and nerve damage. Uncontrolled diabetes can complicate pregnancy, and birth defects are more common in babies born to women with diabetes.

Who gets diabetes?

Diabetes is not contagious. People cannot “catch” it from each other. However, certain factors can increase the risk of developing diabetes.

Type 1 diabetes occurs equally among males and females but is more common in whites than in nonwhites. Type 2 diabetes is more common in older people, especially in people who are overweight, and occurs more often in African Americans, American Indians, some Asian Americans, Native Hawaiians and other Pacific Islander Americans, and Hispanics/ Latinos.

Diabetes prevalence in the United States is likely to increase for several reasons. First, a large segment of the population is aging. Also, Hispanics/Latinos and other minority groups at increased risk make up the fastest-growing segment of the U.S. population. Finally, Americans are increasingly overweight and sedentary. According to recent estimates from the CDC, diabetes will affect one in three people born in 2000 in the United States.

How is diabetes managed?

Before the discovery of insulin in 1921, everyone with type 1 diabetes died within a few years after diagnosis. Although insulin is not considered a cure, its discovery was the first major breakthrough in diabetes treatment.

Today, healthy eating, physical activity, and taking insulin are the basic therapies for type 1 diabetes. The amount of insulin must be balanced with food intake and daily activities. Blood glucose levels must be closely monitored through frequent blood glucose checking. People with diabetes also monitor blood glucose levels several times a year with a laboratory test called the A1C. Results of the A1C test reflect average blood glucose over a 2- to 3-month period.

Healthy eating, physical activity, and blood glucose testing are the basic management tools for type 2 diabetes. In addition, many people with type 2 diabetes require one or more diabetes medicines—pills, insulin, and other injectable medicine—to control their blood glucose levels.

Adults with diabetes are at high risk for cardiovascular disease (CVD). In fact, at least 65 percent of those with diabetes die from heart disease or stroke. Managing diabetes is more than keeping blood glucose levels under control—it is also important to manage blood pressure and cholesterol levels through healthy eating, physical activity, and the use of medications, if needed. By doing so, those with diabetes can lower their risk. Aspirin therapy, if recommended by a person's health care team, and smoking cessation can also help lower risk.

People with diabetes must take responsibility for their day-to-day care. Much of the daily care involves keeping blood glucose levels from going too low or too high. When blood glucose levels drop too low—a condition known as hypoglycemia—a person can become nervous, shaky, and confused. Judgment can be impaired, and if blood glucose falls too low, fainting can occur. A person can also become ill if blood glucose levels rise too high.

People with diabetes should see a health care provider who will help them learn to manage their diabetes and who will monitor their diabetes control. Most people with diabetes get care from primary care physicians—internists, family practice doctors, or pediatricians. Often, having a team of providers can improve diabetes care. A team can include:

- a primary care provider such as an internist, a family practice doctor, or a pediatrician
- an endocrinologist—a specialist in diabetes care

- a dietitian, a nurse, and other health care providers who are certified diabetes educators—experts in providing information about managing diabetes
- a podiatrist—for foot care
- an ophthalmologist or an optometrist—for eye care

The team can also include other health care providers, such as cardiologists and other specialists. The team for a pregnant woman with type 1, type 2, or gestational diabetes should include an obstetrician who specializes in caring for women with diabetes. The team can also include a pediatrician or a neonatologist with experience taking care of babies born to women with diabetes.

The goal of diabetes management is to keep levels of blood glucose, blood pressure, and cholesterol as close to the normal range as safely possible. Studies with people with type 1 and type 2 diabetes have shown that keeping blood glucose levels close to normal reduces the risk of developing major complications.

Diabetes Care Plan

It is important that people diagnosed with diabetes receive good medical care from a diabetes care team. The diabetes health care team will work with the patient to design a diabetes care plan. A diabetes care plan should include:

- A list of goals
- A list of medications to help control diabetes
- A healthy meal plan developed by a registered dietitian
- A list of lifestyle changes
- A physical activity program
- Diabetes educational classes for the patient and the family
- A plan for seeing specialists – eye, foot, dental, others
- Instructions for follow-up visits to the doctor
- A birth control and pre-pregnancy plan, if appropriate

Setting goals

With the help of their health care team, people with diabetes should set goals for control of blood glucose levels as close to normal as is safely possible. There are two tests to measure your blood sugar levels:

- Hemoglobin A1c test is a simple lab test that measures the average amount of sugar that has been in the blood over the last 3 months. It is the best test for your health care provider to know if blood sugar is under control. The test is recommended at least twice a year, and more often if blood sugar stays too high. The hemoglobin A1c goal for people with diabetes is less than 7 percent. Research shows that maintaining hemoglobin A1c levels at less than 7 percent may reduce the risk of diabetes complications by 50 to 80 percent.

- Finger-stick test is a self-test the patient does using a blood glucose meter to measure blood sugar at the time of the test. Suggested goals for self-testing using a blood glucose meter are 90-130 mg/dl before meals and less than 180 two hours after starting a meal. Due to other factors, the doctor may set different goals for different individuals.

Diabetes is a serious disease, but you can successfully manage diabetes and avoid the serious health problems it can cause if you follow these steps:

- Know your diabetes “ABCs” – A1c, blood pressure and cholesterol numbers.
- Make healthy food choices and be physically active most days.
- Check your blood glucose as your doctor tells you to.
- If you are taking diabetes medications, take them even if you feel well.
- Be actively involved in your diabetes care.

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