

## Healthy Steps for Diabetes Prevention

About 17 million people in the United States have diabetes. Diabetes is widely recognized as one of the leading causes of death and disability in the United States. In 1999, about 450,000 deaths occurred among adults with diabetes.

Diabetes 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, strokes, kidney failure, amputations, and nerve damage. Uncontrolled diabetes can complicate pregnancy, and birth defects are more common in babies born to women with diabetes. People with diabetes are also two to four times more likely than people without diabetes to develop heart disease.

In 2002, diabetes cost the United States \$132 billion. Indirect costs, including disability payments, time lost from work, and premature death, totaled \$40.2 billion; direct medical costs for diabetes care, including hospitalizations, medical care, and treatment supplies, totaled \$91.8 billion.

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

Diabetes is a disorder of metabolism - the way our bodies use digested food for growth and energy. Most of the food we 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 must be present. Insulin is a hormone produced by the pancreas, a large gland behind the stomach.

When we eat, the pancreas is supposed to automatically produce the right amount of insulin to move glucose from blood into our cells. In people with diabetes, however, the pancreas either produces little or no insulin, or the cells do not respond appropriately to the insulin that is produced. Glucose builds up in the blood, overflows into the urine, and passes out of the body. Thus, the body loses its main source of fuel even though the blood contains large amounts of glucose.

The three main types of diabetes are:

- Type 1 diabetes
- Type 2 diabetes
- Gestational diabetes

Type 1 diabetes is an autoimmune disease. An autoimmune disease results when the body's system for fighting infection (the immune system) turns against a part of the body. In diabetes, the immune system attacks the insulin-producing beta cells in the pancreas and destroys them. The pancreas then produces little or no insulin. Someone with type 1 diabetes needs to take insulin daily to live.

At present, 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.

Type 1 diabetes develops most often in children and young adults, but the disorder can appear at any age. Symptoms of type 1 diabetes usually develop over a short period, although beta cell destruction can begin years earlier. Type 1 diabetes occurs equally among males and females, but is more common in whites than in nonwhites and is rare in African, American Indian, and Asian populations.

Symptoms include increased thirst and urination, constant hunger, weight loss, blurred vision, and extreme fatigue. If not diagnosed and treated with insulin, a person can lapse into a life-threatening diabetic coma, also known as diabetic ketoacidosis.

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 usually develops in adults age 40 and older and is most common in adults over age 55. About 80 percent of people with type 2 diabetes are overweight. Type 2 diabetes is often part of a metabolic syndrome that includes obesity, elevated blood pressure, and high levels of blood lipids. Unfortunately, as more children and adolescents become overweight, type 2 diabetes is becoming more common in young people.

The disease occurs more often in African Americans, American Indians, Asian and Pacific Islander Americans, and Hispanic Americans. On average, non-Hispanic African Americans are twice as likely to have diabetes as non-Hispanic whites of the same age. Hispanic Americans are nearly twice as likely to have diabetes as non-Hispanic whites. American Indians have the highest rates of diabetes in the world. Among the Pima Indians living in Arizona, for example, half of all adults have type 2 diabetes. On average, American Indians and Alaska Natives are 2.6 times as likely to have diabetes as non-Hispanic whites. Although prevalence data for diabetes among Asian Americans and Pacific Islanders is limited, some groups, such as Native Hawaiians, are 2.5 times more likely to have diabetes as white residents of Hawaii.

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. They are not as sudden in onset as in type 1 diabetes. Some people have no symptoms. Symptoms may include fatigue or nausea, frequent urination, unusual thirst, weight loss, blurred vision, frequent infections, and slow healing of wounds or sores.

Gestational diabetes develops only during pregnancy. Like type 2 diabetes, it occurs more often in African Americans, American Indians, Hispanic Americans, people with a family history of diabetes. Though it usually disappears after delivery, the mother is at increased risk of getting type 2 diabetes later in life.

The fasting plasma glucose test is the preferred test for diagnosing type 1 or type 2 diabetes. However, a diagnosis of diabetes is made for any one of three positive tests, with a second positive test on a different day:

- A random plasma glucose value (taken any time of day) of 200 mg/dL or more, along with the presence of diabetes symptoms.
- A plasma glucose value of 126 mg/dL or more, after a person has fasted for 8 hours.
- An oral glucose tolerance test (OGTT) plasma glucose value of 200 mg/dL or more in the blood sample, taken 2 hours after a person has consumed a drink containing 75 grams of glucose dissolved in water. The test, taken in a laboratory or the doctor's office, measures plasma glucose at timed intervals over a 3-hour period.

Gestational diabetes is diagnosed based on plasma glucose values measured during the OGTT. Glucose levels are normally lower during pregnancy, so the threshold values for diagnosis of diabetes in pregnancy are lower. If a woman has two plasma glucose values meeting or exceeding any of the following numbers, she has gestational diabetes: a fasting plasma glucose level of 95 mg/dL, a 1-hour level of 180 mg/dL, a 2-hour level of 155 mg/dL, or a 3-hour level of 140 mg/dL.

People with Pre-diabetes, a state between "normal" and "diabetes," are at risk for developing diabetes, heart attacks, and strokes. About 16 million people ages 40 to 74 in the United States have Pre-diabetes. Most of them are likely to develop type 2 diabetes within 10 years, unless they take steps to prevent or delay diabetes. There are two forms of Pre-diabetes.

A person has impaired fasting glucose (IFG) when fasting plasma glucose is 110 to 125 mg/dL. This level is higher than normal but less than the level indicating a diagnosis of diabetes.

Impaired glucose tolerance (IGT) means that blood glucose during the oral glucose tolerance test is higher than normal but not high enough for a diagnosis of diabetes. IGT is diagnosed when the glucose level is 141 to 199 mg/dL 2 hours after a person is given a drink containing 75 grams of glucose.

The prevalence of diabetes in the United States is likely to increase for several reasons. First, a large segment of the population is aging. Also, Hispanic Americans and other minority groups make up the fastest-growing segment of the U.S. population. Finally, Americans are increasingly overweight and sedentary. According to recent estimates, the prevalence of diabetes in the United States is predicted to be 8.9 percent of the population by 2025.

You are more likely to develop type 2 diabetes if

- you are overweight
- you are 45 years old or older
- you have a parent, brother, or sister with diabetes
- your family background is African American, American Indian, Asian American, Hispanic American/Latino, or Pacific Islander
- you have had gestational diabetes or gave birth to at least one baby weighing more than 9 pounds
- your blood pressure is 140/90 or higher, or you have been told that you have high blood pressure
- your HDL cholesterol is 35 or lower, or your triglyceride level is 250 or higher
- you are fairly inactive, or you exercise fewer than three times a week

Type 2 diabetes is a serious disease, but it can be delayed or prevented. If you have any of the above risk factors talk to your health care provider. It's important to find out early if you have diabetes or if you are at risk of developing it.

You can do a lot to lower your chances of getting diabetes. Exercising regularly, reducing fat and calorie intake, and losing weight can all help you reduce your risk of developing type 2 diabetes. Lowering blood pressure and cholesterol levels also help you stay healthy.

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