



Diabetes, Type 2

What is type 2 diabetes?

Type 2 diabetes is a disorder that happens when your body does not make enough insulin or is unable to use its own insulin properly. The inability to use insulin is called insulin resistance. These problems with insulin cause the level of sugar in your blood to get too high.

When you digest food, your body breaks down much of the food into sugar (glucose). Your blood carries the sugar to your cells for energy. Insulin made by the pancreas gland moves the sugar from the bloodstream into the cells.

When your body does not have enough insulin or cannot use insulin properly, sugar cannot get into your cells. Sugar then builds up in the blood. Too much sugar in the blood can cause many problems. These problems can be life threatening if they are not treated. However, proper treatment can control your blood-sugar level and prevent or delay the complications of diabetes.

Type 2 diabetes happens mostly in adults over age 40, especially overweight adults. Overweight children and adolescents can also have this type of diabetes. More people, including children and adolescents, are becoming diabetic as more people become overweight.

Many millions of people in the US have diabetes. Most of them have type 2 diabetes. Although type 2 diabetes occurs in all races, it occurs most often among Native Americans, Hispanics, African Americans, and Asian Americans.

How does it occur?

The exact cause of type 2 diabetes is not known. Age, weight, lack of exercise, and a high-calorie diet appear to be important factors. As people become older or overweight, they are more likely to have diabetes. Their cells become unable to use the insulin made by the pancreas.

Women who have given birth to large babies (for example, babies weighing 9 pounds or more), or who have had diabetes of pregnancy (called gestational diabetes), have a higher risk of developing type 2 diabetes later in life.

Also, if one or both of your parents have had type 2 diabetes, your chance of having type 2 diabetes is much higher.

What are the symptoms?

Type 2 diabetes may cause the following symptoms:

- increased urination
- increased thirst
- blurry vision
- unexpected weight gain or weight loss
- frequent infections – for example, of the skin, gums, or bladder
- frequent yeast infections of the vagina
- tiredness
- infections of the foreskin in uncircumcised men.

Most people, however, have no symptoms, often for months or even years. This is why it is so important to get your blood sugar checked every year or according to your healthcare provider's recommendation.

How is it diagnosed?

Your healthcare provider will ask about your medical history and your symptoms and examine you. He or she will test the level of sugar in your blood. Three blood tests may be done to diagnose diabetes: the fasting plasma glucose test (FPG), the oral glucose tolerance test (OGTT), or the A1C test.

- The FPG test is easier, faster, and less expensive to do. A sample of your blood is tested in the morning before you have eaten anything since the night before. If this test shows you have a fasting blood sugar of 126 milligrams per deciliter (mg/dL), or 7.0 millimoles per liter (mmol/L), or higher, you may have diabetes. Often a second fasting test will be done on a different morning to confirm the first result. If this second test confirms your high blood sugar, your provider will diagnose type 2 diabetes.
- For the oral glucose tolerance test, a sample of your blood is taken when you have not eaten anything since the night before. Then you drink a special sugar drink and your blood is tested again 2 hours later. If after 2 hours your blood sugar level is 200 mg/dL (11.1 mmol/L) or higher, you have diabetes.
- The A1C (hemoglobin A1C) test gives a measurement of your average blood sugar for 3 months. If your A1C is 6.5% or higher, you have diabetes.

How is it treated?

The goal of treatment is to control the level of sugar in your blood. You want to try to keep the sugar level in a normal range. This is done by:

- measuring your blood sugar regularly
- good nutrition and meal planning
- exercise
- medicine, including pills or insulin, if you are not able to control your blood
- sugar through diet and exercise.

Blood sugar tests

You will learn how to check your blood sugar at home. You will use a small machine called a blood glucose meter or glucometer to use to test your blood sugar. You will need some lancets (little blades or needles to prick your finger) and some test strips to put drops of blood on. Your healthcare provider will tell you when and how often you need to check your blood sugar.

When you are first diagnosed with diabetes you will need to check your blood sugar often. After you have your diabetes under control, your provider will tell you how you can decrease your sugar checks.

Keep a log of your blood sugar measurements. (Many glucometers can keep a record of your recent sugar readings inside the meter.) Your provider will check the log at your appointments to see how well your treatment is working.

A blood test called hemoglobin A1C (or just “A1C”) can show your average blood sugar control over the past 2 or 3 months. Your healthcare provider may do this test every 3 months to check your overall control of your blood sugar level. This is the best way to see if you are keeping your diabetes under control. However, it does not replace daily blood sugar measurements. Daily checks of your blood sugar show whether your daily treatment plan (diet, exercise and/or medicine) is working throughout the day.

Meal planning

Your healthcare provider or a dietitian will give you guidelines about which foods you should eat and how many calories you should eat each day. If you are overweight, losing weight will help you lower your blood sugar. Choosing healthy foods for your diet will help you lose weight as it improves your health. Sometimes losing just 7 to 10 pounds can reduce or eliminate your need to take medicine for diabetes.

Exercise

Physical activity is important in managing type 2 diabetes. Exercise is all some people need to control their blood sugar. Exercise improves blood flow, uses up more of the sugar in your blood, and helps your body use insulin better. Walking is one of the best exercises you can do. Ask your healthcare provider for exercise recommendations.

Medicine

If you can't control your blood sugar with diet and exercise, your healthcare provider will prescribe medicine to lower your blood sugar. You may need more than 1 type of medicine to keep your blood sugar in the normal range.

Common medicines taken by mouth to lower your blood sugar when you have type 2 diabetes are:

- Metformin (Glucophage), which helps the body use insulin better. This medicine is taken by mouth 2 to 3 times a day. It may be combined with another medicine.
- Sulfonylureas, which help your pancreas release more insulin. Examples of this type of medicine are glyburide (DiaBeta, Glynase, Micronase), glipizide (Glucotrol), and glimepiride (Amaryl). These medicines are taken by mouth 1 to 3 times a day.
- Repaglinide (Prandin) and nateglinide (Starlix), which also help release more insulin. They are taken by mouth before meals.
- Rosiglitazone (Avandia) and pioglitazone (Actos), which help the body use insulin better. They are taken by mouth once a day and may be combined with sulfonylureas, metformin, or insulin. If you are taking either of these medicines, you will have blood tests to check the effect on your liver.
- Acarbose (Precose) and miglitol (Glyset), which slow absorption of sugars from the digestive system.

Insulin is used when diet, exercise, and oral medicines are not keeping your blood sugar levels normal. Insulin is available in different forms. It may be short, intermediate, long, or fast acting. It is usually given as a shot. If you need insulin, your provider will teach you how to give shots to yourself. You may need a shot 1 to 4 times a day.

Two new medicines named Symlin and Byetta are now available to help people with type 2 diabetes. They may be prescribed if you are having trouble controlling your blood sugar. Both are given as shots. They help control your blood sugar with less risk of making your blood sugar too low. Ask your healthcare provider about them.

When you are using any type of diabetic medicine, you must carefully follow your provider's directions for checking your blood sugar. This will not only help you have

good blood sugar control, but it will help keep you from having blood sugar that is too low and life-threatening.

How long will the effects last?

Exercising more and not overeating can often help the body have a normal balance of sugar and insulin. Weight loss is the only treatment some people need. If you lose weight, you may not need diabetes medicine. Your improvement depends on following the diet and exercise plans prescribed by your healthcare provider to keep your blood sugar in the target range. Taking good care of yourself to avoid complications is especially important with diabetes. Possible diabetic complications include heart disease, stroke, blindness, kidney failure, and nerve damage, especially to your feet and legs.

Carefully controlling your blood sugar will prevent or delay these complications. Many people with type 2 diabetes have other conditions that increase their risk for heart disease even more. One of these conditions is called metabolic syndrome. You may be diagnosed with metabolic syndrome if you have 3 or more of the following health problems:

- excess weight around the waist (a waistline over 40 inches for men and over 35 inches for women)
- triglycerides blood level of 150 mg/dL or more
- HDL cholesterol levels lower than 40 mg/dL for men and below 50 mg/dL for women
- blood pressure of 130/85 mm HG or higher
- prediabetes (a fasting blood sugar between 100 and 125 mg/dL, or between 5.6 and 6.9 mmol/L) or diabetes (a fasting blood sugar level over 125 mg/dL, or over 6.9 mmol/L).

If you have metabolic syndrome, you are at very high risk for heart disease. For this reason it is very important to discuss these conditions with your healthcare provider. You will need to work with your provider to decrease your risk of heart disease.

How can I take care of myself?

Follow your diet plan.

- Learn how to make healthy choices when you eat out.
- Ask for diabetic meals when you travel (for instance, at hotels or on airplanes).
- Drink water or other calorie-free drinks when you feel the urge to eat between meals.
- Limit the amount of alcohol you drink.
- It can cause low blood sugar. It can also worsen nervous system problems caused by diabetes.
- Buy only foods in your diet plan.

- Eat on a regular schedule.
- Eat slowly and chew food thoroughly.

Follow your healthcare provider's advice for physical activity.

- Choose activities you like.
- Exercise with friends.

Do not smoke.

- Smoking speeds up the damage to the heart and blood vessels. Carefully follow the instructions your provider has given you for taking prescribed medicine.

Other things you can do are:

- Keep your follow-up appointments with your healthcare provider. Keep your blood pressure in the recommended range. Keep your blood lipids (cholesterol, HDL, LDL, and triglycerides) in the recommended ranges.
- Learn how to care for your feet every day.
- Have an eye exam by an eye doctor soon after you are diagnosed and every year after that. If you have eye problems from diabetes, you may need to be examined more often.
- Women with diabetes who become pregnant should have their eyes checked each trimester because diabetic eye problems can worsen quickly during pregnancy.
- Also make sure you get at least yearly tests to check your kidneys.
- Always carry identification that says you have diabetes, in case of an emergency.

Learn about diabetes and its complications so you can make the correct decisions to control your blood-sugar levels. Many hospitals have diabetes educators and dietitians who can help you. Ask your healthcare provider to refer you to these people.

You can get pamphlets and information about diabetes, including diabetic cookbooks, from:

The American Diabetes Association
Phone: 800-DIABETES (800-342-2383)
Web site: <http://www.diabetes.org>

How can I help prevent type 2 diabetes?

Even if there is a history of diabetes in your family, you may be able to avoid having the disease if you:

- Keep a healthy weight.
- Exercise regularly according to your healthcare provider's recommendations.
- Eat a healthy diet that includes fruits, vegetables, lean protein, and high-fiber grains. Limit sugars and foods made with white flour. If you have a family history of diabetes, you should get your blood sugar checked every year.

This advisory includes selected information only and may not include all side effects of this medicine or interactions with other medicines. Ask your healthcare provider or pharmacist for more information or if you have any questions.

Ask your pharmacist for the best way to dispose of outdated medicine or medicine you have not used. Do not throw medicines in the trash.

Keep all medicines out of the reach of children.

Do not share medicines with other people.

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