



# Diabetes

## What is diabetes?

Diabetes mellitus is a disease that prevents your body from properly using the energy from the food you eat. Diabetes occurs when either:

- The pancreas (an organ behind your stomach) produces little insulin or no insulin at all. (Insulin is a naturally occurring hormone produced by the beta cells of the pancreas that helps the body use sugar for energy.)

-Or-

- The pancreas makes insulin, but the insulin made does not work as it should. This condition is called insulin resistance.

## Understanding metabolism

To better understand diabetes, it helps to know more about how the body uses food for energy (a process called metabolism). Your body is made up of millions of cells. To make energy, the cells need food in a very simple form. When you eat or drink, much of your food is broken down into a simple sugar called glucose. Glucose provides the energy your body needs for daily activities.

The blood vessels and blood are the highways that transport sugar from where it is either taken in (the stomach) or manufactured (in the liver) to the cells where it is used (muscles) or where it is stored (fat). Sugar cannot go into the cells by itself. The pancreas releases insulin into the blood, which serves as the helper, or the "key," that lets sugar into the cells for use as energy.

When sugar leaves the bloodstream and enters the cells, the blood sugar level is lowered. Without insulin, or the "key," sugar cannot get into the body's cells for use as energy. This causes sugar to rise. Too much sugar in the blood is called "hyperglycemia" (high blood sugar) or diabetes.

Insulin is responsible for bringing the sugar (glucose) from your blood stream into your cells. Diabetes essentially prevents your body from properly using the energy from the food you eat.

## **There are two forms of DM:**

- **Type 1** – Caused when the body's autoimmune processes destroy islet beta cells, which are the cells in the pancreas that produce insulin. This lack of insulin production requires those who suffer from this form of diabetes to use insulin injections to control their blood sugar levels. Type 1 diabetes usually affects children and young adults.
- **Type 2** – Unlike people with type 1 diabetes, people with type 2 diabetes produce insulin. However, the insulin produced is either not enough or doesn't work properly in the body. Most commonly seen in adults, this type of diabetes has been linked with obesity, high blood pressure and kidney failure. Oral glucose-lowering medications are most commonly used, but insulin injections also may be needed if blood sugars are not adequately controlled.

For forms, appropriate diet and exercise is the mainstay of therapy.

## **What are the symptoms of diabetes?**

The symptoms of diabetes include:

- Increased thirst
- Increased hunger (especially after eating)
- Dry mouth
- Frequent urination
- Unexplained weight loss (even though you are eating and feel hungry)
- Weak, tired feeling
- Blurred vision
- Numbness or tingling of the hands or feet
- Slow healing sores or cuts
- Dry and itchy skin (usually in the vaginal or groin area)
- Frequent yeast infections

## **Diabetes risk factors**

- A family history of diabetes
- Race or ethnic background
- Being overweight
- History of hypertension (high blood pressure)
- Abnormal blood cholesterol or triglyceride levels
- Advancing age
- Certain drugs (These might increase blood sugar.)
- Years of heavy alcohol use
- Smoking
- History of gestational diabetes or delivery of a baby weighing more than 9 pounds.
- History of autoimmune disease
- Being at risk for diabetes

It is important to note that sugar itself does not cause diabetes. Eating a lot of sugar can lead to tooth decay, but it does not cause diabetes.

### How is diabetes diagnosed?

Diabetes is diagnosed with fasting sugar blood tests or with A1c blood tests, also known as glycated hemoglobin tests. A fasting blood sugar test is performed after you have had nothing by mouth (eating or drinking) for at least 8 hours. Normal fasting blood sugar is less than 100 mg/dl. You do not have to be fasting for an A1c blood test.

Diabetes is diagnosed by one of the following:

- Your blood sugar level is equal to or greater than 126 mg/dl.
- You have two random blood sugar tests over 200 mg/dl with symptoms.
- You have an oral glucose tolerance test with results over 200 mg/dl.
- Your A1c test is greater than 6.5% on two separate days.

An A1c test should be performed in a laboratory using a method that is certified by the National Glycohemoglobin Standardization Program (NGSP) and standardized to the Diabetes Control and Complications Trial (DCCT) assay.

|   | Normal         | Pre-diabetes | Diabetes       |
|---|----------------|--------------|----------------|
| <b>Source: American Diabetes Association 2010</b> |                |              |                |
| Fasting Glucose Test                              | Less than 100  | 100-125      | 126 or higher  |
| Random (anytime) Glucose Test                     | Less than 140  | 140-199      | 200 or higher  |
| A1c Test  | Less than 5.6% | 5.7 - 6.4%   | 6.5% or higher |

### Does diabetes mean poorer sports performance?

Poor glucose control may affect an athlete's performance, regardless of if it is low or high.

Athletes with diabetes need to have a glucose management plan that matches the intensity and duration of his or her exercise. Studies have shown that when blood glucose levels are controlled appropriately, exercise capacity is the same for diabetics and non-diabetics. Keep in mind: athletes with diabetes have won Olympic medals!

### **How do athletes know their glucose levels?**

“Just test it!” Diabetics involved in sports should have a thorough understanding of monitoring their blood sugar levels and medications. Because exercise can alter glucose levels significantly, diabetic athletes should measure their glucose level before, during (in 30 minutes intervals), immediately and hours after exercise.

### **What complications can arise from poor glucose control?**

Short-term complications of poor glucose control range from poor performance in school or work to increased risk of infection. Long-term complications are higher rates of heart attacks, strokes and peripheral nerve damage (called peripheral neuropathy).