

## Diabetes

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### What Is Diabetes?

Diabetes and pre-diabetes are serious conditions in which people have high levels of sugar or glucose in their blood. The World Health Organization (WHO) reports that about 422 million people worldwide live with diabetes. In the US, according to the US Centers for Disease Control and Prevention (CDC), 37 million people have diabetes, and 96 million adults have pre-diabetes (blood sugar levels are higher than normal, but not high enough to be diagnosed with type 2 diabetes). Diabetes is a major cause of blindness, amputation, kidney failure, and cardiovascular disease.

Many people control their glucose levels by maintaining a healthy weight, changing their diet, and increasing exercise.

Glucose is a type of sugar that is used as fuel by the body. When you eat, your body converts food into glucose. The glucose then goes into your bloodstream and is carried throughout the body to provide energy to all of your cells. In order for glucose to move from your bloodstream into your cells, you need insulin. Insulin is a hormone made by the pancreas, an organ in the upper part of your abdomen (belly), and carries the glucose into your cells.

If your body has a problem making or using insulin, the glucose in your bloodstream cannot get into your cells. As a result, glucose stays in the blood (high blood sugar) and the cells do not get enough glucose. A diagnosis of pre-diabetes or diabetes is made when glucose stays at higher-than-normal levels (also called hyperglycemia).

There are several types of diabetes:

### **Type 1 Diabetes (Insulin Dependent)**

- The pancreas does not make any insulin
- You must take insulin every day to survive
- Usually begins in childhood or adolescence

### **Type 2 Diabetes (Non-insulin Dependent)**

- Your pancreas makes some insulin (but usually not enough), and/or the body does not respond normally to the insulin your body does make (sometimes referred to as 'insulin resistance')
- Some people with type 2 diabetes are able to control it with diet and exercise; many others need diabetes medication, and some need insulin
- Most common form of diabetes

### **Gestational Diabetes**

- Diabetes that starts during [pregnancy](#) due to hormones that prevent insulin from doing its job
- Most people with gestational diabetes are able to control their diabetes and prevent harm to themselves and their babies; people with gestational diabetes tend to have large babies
- Most often, blood sugar levels return to normal after delivery

### **Pre-diabetes**

- Blood glucose levels are higher than normal but not high enough for a diagnosis of diabetes
- Having pre-diabetes puts you at increased risk for developing type 2 diabetes
- Type 2 diabetes can often be prevented or delayed by making changes to your [diet](#), losing weight, and increasing [physical exercise](#)

### **Metabolic Syndrome**

Metabolic syndrome is not a type of diabetes, but a cluster, or group, of conditions usually associated

with being overweight or obese. Metabolic syndrome is also called Syndrome X, insulin resistance syndrome, and dysmetabolic syndrome. This group of characteristics, or traits, puts people at risk for heart disease and type 2 diabetes. A person has metabolic syndrome if they have three of the following five traits:

- High blood pressure (hypertension)
- High blood glucose (high blood sugar)
- High triglycerides (fats) in the blood
- High cholesterol
- Large waist (larger than 35 inches for women and larger than 40 inches for men)

## Symptoms of Diabetes

Symptoms of diabetes include:

- Extreme thirst
- Need to urinate frequently
- Unexplained weight loss
- Hunger
- Blurry vision
- Irritability
- Tingling or numbness in the hands or feet
- Difficulty healing
- Extreme fatigue

Symptoms typically occur when glucose levels have gotten very high. If you are diagnosed while diabetes is in its early stages, you may not have any symptoms.

## Glucose (Blood Sugar) Tests

Since diabetes does not always have obvious symptoms, it is important to have regular lab tests to check your blood sugar or glucose levels. The most common glucose tests are:

- Fasting glucose test: measures the glucose in a blood sample taken when you have not had anything to eat or drink (except water) for at least eight hours
- Hemoglobin A1C test: measures your average blood sugar or blood glucose over the last two to three months. This test does not require fasting. It is used to monitor diabetes control as well as to help diagnose it.

To find out if you have diabetes or pre-diabetes, you will usually have a fasting glucose test. A glucose tolerance test may be ordered to help diagnose diabetes and as a follow-up to a high fasting glucose level. A glucose tolerance test looks for abnormalities in the way your body handles glucose after eating.

A diagnosis of diabetes can be made based on either of the following test results, confirmed by retesting on a different day:

- A fasting blood glucose level of 126 milligrams per deciliter (mg/dL) or higher
- An A1C of 6.5 percent or more (an A1C of 5.7 - 6.4 suggests pre-diabetes)

## Who Is at Risk for Diabetes?

Anyone can get diabetes. However, certain factors may increase your risk:

Pregnant people who need to take PIs to prevent transmitting HIV to their babies should also have their glucose levels followed very closely.

- Being over 40 years old
- Being overweight or obese
- A family history of the disease
- A poor [diet](#) (high in cholesterol, fat and sugar, and low in fiber)
- Not being [physically active](#)
- [Smoking or using tobacco](#)
- A lot of fat around the belly (sometimes called 'central obesity;' having an apple-shaped body)
- [Hepatitis C](#) or liver damage
- High cholesterol level
- High blood pressure
- Having had gestational diabetes while pregnant
- Taking certain HIV drugs (see below)

## HIV and Diabetes

High glucose levels can be a [side effect](#) of some HIV drugs. Specifically, certain protease inhibitors (PIs), nucleoside reverse transcriptase inhibitors (NRTIs) and possibly integrase inhibitors (INSTIs) can make it difficult for insulin to get glucose into the cells. This is called insulin resistance. It can lead to pre-diabetes and diabetes.

If you need to take these drugs for your HIV treatment, your blood sugar should be checked frequently. Pregnant people who need to take PIs to prevent transmitting HIV to their babies should also have their glucose levels followed very closely.

Some people living with HIV experience changes in the location of their body fat ([lipodystrophy](#)). Lipodystrophy syndrome sometimes comes with high glucose levels, unwanted changes in body fat, and increases in [fat \(cholesterol and triglyceride\) levels](#) in the blood.

Regardless of the HIV drugs you take, there are things you can do to make diabetes less likely:

- Eat a healthy diet
- Get regular exercise
- Stop smoking
- Lose weight if you are overweight or obese
- Control your blood pressure and cholesterol levels – if necessary, with medications

## What Problems Can Diabetes Cause?

Diabetes can lead to serious illness and even death. It is a major cause of heart disease and stroke. Some of the serious complications of diabetes are:

- Blindness
- Kidney failure
- Blood vessel disease that requires an amputation
- Nerve damage ([neuropathy](#))
- Cardiovascular disease (damage to your [heart](#) and/or blood vessels) which increases the risk of heart attacks and stroke

## How Are Diabetes and Pre-Diabetes Treated?

Although diabetes can be a very serious disease, it can be treated. It is important to manage diabetes by checking your blood glucose regularly and keeping it under control. Many people control their glucose levels by maintaining a healthy weight, changing their diet, and increasing exercise.

A healthy diet for people with diabetes involves reducing sugar and starchy foods (simple carbohydrates), such as candy, pastries, chips, sugary drinks, bread, potatoes, rice, and corn. If possible, see a registered dietitian to help you plan your meals. Many AIDS service organizations have registered dietitians on staff who will see you free of charge.

Sometimes, despite eating well and being physically active, blood sugar levels cannot be controlled without the help of drugs and/or insulin. There are a number of medications available that lower blood glucose levels. Because these medications act in different ways, they may often be used together.

Some of the diabetes drugs may interact with HIV drugs. To reduce the chance of [drug interactions](#), make sure your all of your health care providers know about all medications you are taking.

## Pre-diabetes

People with pre-diabetes are likely to develop type 2 diabetes unless they take action. The good news is that if you have pre-diabetes, you can do a lot to prevent or delay diabetes.

Studies have shown that people can lower their risk of developing diabetes by losing weight through diet and increased physical activity. One study found that diet and exercise leading to five to seven percent weight loss (about ten to 14 pounds in a person who weighs 200 pounds) lowered the chances of getting type 2 diabetes by nearly 60 percent. Study participants lost weight by cutting fat and calories in their diet and by exercising (mostly walking) at least 30 minutes a day, five days a week.

## Taking Care of Yourself

While diabetes is a serious condition, people living with HIV and diabetes can make lifestyle changes and work with their health care providers to control their diabetes and prevent many of its complications.

Steps to staying healthy:

- Regular medical check-ups and lab work that includes glucose and hemoglobin A1C tests
- Control blood pressure and [fat levels in your blood](#) to lower the risk for [heart disease](#) and stroke
- Eat a healthy diet (see our fact sheet on [Nutrition](#))
- Get regular physical activity (see our fact sheet on [Exercise](#))
- Stop smoking (see our fact sheet on [Smoking](#))

Diabetes is a common disease. Many people with diabetes live full, active, healthy lives. There is also a lot of ongoing research about the best way to prevent diabetes. If you start by taking the steps above, you may be on your way to living well with diabetes.

## Additional Resources

Select the links below for additional materials related to diabetes.

- [American Diabetes Association](#)
- [Diabetes \(US National Institute of Diabetes and Digestive and Kidney Diseases\)](#)
- [Diabetes \(US Office on Women's Health\)](#)
- [Type 2 Diabetes and HIV \(aidsmap\)](#)

- [Insulin Resistance & Prediabetes \(US National Institute of Diabetes and Digesti...](#)
- [Metabolic Syndrome \(Cleveland Clinic\)](#)
- [Women & Diabetes \(DiabetesSisters\)](#)
- [Women and Diabetes \(US Food and Drug Administration\)](#)
- [Diabetes and Women \(US Centers for Disease Control and Prevention\)](#)
- [Diabetes \(Terrence Higgins Trust, United Kingdom\)](#)
- [Diabetes and Blood Sugar Problems \(CATIE, Canada\)](#)
- [HIV and Diabetes \(International Association of Providers of AIDS Care\)](#)
- [Women with HIV at Greater Risk of Diabetes Than Men \(aidsmap\)](#)



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