

What you need to know

# PREVENTING DIABETES

fueling the body



When we eat, food is broken down into small molecules in the digestive system (mouth, stomach and intestines). Carbohydrates are broken down into glucose (or “sugar”) molecules, which are small enough to be absorbed from the digestive system into the bloodstream. When glucose is absorbed into the bloodstream, it is referred to as “blood sugar.” Glucose is your body’s preferred source of fuel and provides energy for every cell in the body.

### What is prediabetes?

Prediabetes is a condition where blood glucose levels are higher than normal but not high enough to be diagnosed as diabetes. People who have been diagnosed with prediabetes often have higher than normal blood sugar levels because their body doesn’t respond well to insulin. Even though their pancreas is releasing the right amount of insulin, it just can’t “open the doors” to allow glucose out of the blood and into cells. This is called insulin resistance because the cells are “resistant” to insulin. When this happens, the pancreas releases more and more insulin to try to “help” the excess glucose get out of the bloodstream and into cells. People with prediabetes often have higher than normal blood sugar and insulin levels.

### How does your body use glucose or blood sugar?

When glucose enters the bloodstream, your body sends a signal to the pancreas – an organ located near your stomach – to release insulin into the bloodstream. You can think of insulin as the key that unlocks all the doors to your brain, muscles, organs, and cells, so that glucose can get in to provide fuel for your body. In most healthy people, the amount of insulin released is related to the amount of glucose in the blood. When you add more glucose (e.g., after eating), insulin causes blood sugar levels to fall gradually by telling cells to take in the glucose or sugar for energy.

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### Overweight: a risk factor for diabetes

Being overweight is a leading risk factor for type 2 diabetes. In fact, research shows that more than 85 percent of people with type 2 diabetes are overweight. No one really knows why being overweight increases the risk of developing type 2 diabetes, but some researchers think that being overweight makes it harder for cells to respond to insulin. When cells don’t respond to insulin, then glucose builds up in the blood.

In addition to making sure your body has a constant supply of energy from glucose, insulin also tells your fat cells to store lipids (or fat). This contributes to weight gain. Increased fat storage is triggered when the pancreas – the organ that produces insulin – pushes out more insulin to try to get the sugar out of the blood and into cells. More insulin leads to more fat storage, and more fat storage leads to more insulin resistance. At the same time, glucose, continues to increase in the bloodstream because it has no place to go. A vicious cycle begins unless steps are taken to reverse this process.

The good news? Often, losing as little as 5-10 lbs will help the body manage (and lower) blood sugar levels better.

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**GO YOU**<sup>SM</sup>



## The difference between type 1 and type 2 diabetes

Both type 1 and type 2 diabetes are conditions where blood sugar levels are above a normal range. With type 1 diabetes, the pancreas stops releasing insulin, and blood sugars rise. With type 2 diabetes, the pancreas initially is producing insulin, but it cannot get sugar out of the blood and into cells for energy. As a result, sugar builds up in the bloodstream with both type 1 and type 2 diabetes, which (if not treated) can severely damage organs, blood vessels and eventually lead to death.

### Type 1 diabetes

- Usually diagnosed in children and young adults
- Cells in the pancreas that produce insulin are destroyed (for reasons that aren't 100% known)
- Most with type 1 diabetes are not overweight and can be quite thin
- No insulin is produced by the pancreas, so insulin shots are required for life
- Not considered genetic

### Type 2 diabetes

- Diagnosed at any age, usually later in life
- Body becomes resistant to insulin
- 88% of people diagnosed are overweight or obese
- Over time, pancreas may stop functioning and the person may require insulin shots
- Oral medication is usually prescribed to control blood sugar levels

## Diagnosis

A diagnosis of prediabetes or diabetes may be made by your physician after you take one or both of the following tests:

Fasting Plasma Glucose Test (FPGT)	
<b>Fasting plasma glucose test (FPGT)</b> measures the amount of glucose in your plasma – or liquid portion of your blood – after at least 8 hours without eating.	<b>Diagnosis:</b> Impaired Fasting Glucose (IFG) - fasting blood glucose level is 100 to 125 milligrams per deciliter (mg/dL); higher than normal but not high enough to be classified as diabetes.  People with IFG are considered prediabetic.
Oral Glucose Tolerance Test (OGTT)	
<b>Oral glucose tolerance test (OGTT)</b> measures the amount of glucose in your blood after at least 8 hours without eating. Then, glucose is measured again two hours after you drink a sugary beverage called Glucola, which contains a specific amount of glucose. If the blood sugar is high after two hours, insulin may be having trouble getting the glucose out of your bloodstream.	<b>Diagnosis:</b> Impaired Glucose Tolerance (IGT) - fasting blood glucose level is between 140 to 199 mg/dL; higher than normal but not high enough to be classified as diabetes. People with IGT are considered prediabetic.

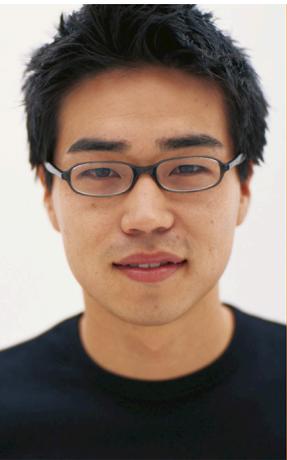
## HgA1C test

HgA1C stands for Hemoglobin A1C. Sugar is a sticky substance, and it sticks to proteins well. Because red blood cells (hemoglobin) have a lot of protein in them, glucose (or sugar) sticks to your blood cells. The glucose stays attached based on how much of it there is in your bloodstream during the lifespan of the red blood cell (120 days). The HgA1C test estimates your blood sugar levels on average for the past few months.

In contrast to the OGTT or FPGT, which measure your blood sugars at a specific place in time, HgA1C levels can help doctors know how stable (or unstable) your blood sugar levels have been over a longer period of time (months instead of hours). In short, HgA1C is a better indication of overall blood sugar control compared to the OGTT or FPGT.

## Complications associated with types 1 and 2 diabetes

- **Heart Disease** – Adults with diabetes are 2 to 4 times more likely to suffer a stroke or die of heart disease
- **Blindness** – Diabetes can lead to blindness by damaging the blood vessels in the eye
- **Kidney Failure** – Diabetes is the leading cause of chronic kidney disease, dialysis and kidney failure
- **Gum Disease** – Almost one-third of people with diabetes have severe periodontal disease with loss of attachment of the gums to the teeth
- **Nerve Damage** – About 60 to 70 percent of people with diabetes have mild to severe forms of nerve damage that cause pain, decreased sensation and muscle weakness
- **Amputations** – The rate of amputation for people with diabetes is 10 times higher than for those without diabetes
- **Weakened Immune System** – People with diabetes are more susceptible to other illnesses, and they often have worse prognoses once they acquire these illnesses.



“Progression to diabetes among those with prediabetes is not inevitable. Studies have shown that people with prediabetes who lose weight and increase their physical activity can prevent or delay diabetes and even return their blood glucose levels to normal.”

– *National Diabetes Information Clearinghouse*

## Complications associated with prediabetes

Studies show that people with prediabetes are twice as likely to suffer from heart disease. Why? Having excess sugar or glucose in the blood can damage the small blood vessels in your kidneys, heart, eyes, and throughout your body. The longer people have elevated blood sugar levels, the more damage it will do. Studies have shown that this damage increases the risk for heart attacks.

Studies also show that people with prediabetes may develop type 2 diabetes within ten years, or sooner, if they don't make healthy lifestyle changes. Fortunately, studies also show that almost 60 percent of people with prediabetes can avoid getting type 2 diabetes if they become more physically active, make better food choices, lose a moderate amount of weight, and adopt an overall healthier lifestyle.

### There is no timeline for diabetes

If you've been told that your blood sugars are high or that you have prediabetes, there is no rule that states you have 10 years before you need to make serious changes. Everybody is different. Some people may develop type 2 diabetes (and complications associated with diabetes) much sooner than others. The most important thing you can do right now is to learn how to make changes to your lifestyle to avoid any further damage to your body, and to avoid the progression from prediabetes to type 2 diabetes.

## Lowering your risks for diabetes

### Things you CAN'T change

- **Age** – Being 45 years old or older seems to increase one's risk of developing type 2 diabetes.
- **Genetics** – Having a parent, brother or sister with diabetes increases your risk of developing type 2 diabetes.
- **Family background** – People who are African American, American Indian, Asian American, Pacific Islander, or Hispanic American/Latino have a higher risk of developing type 2 diabetes.
- **Some pregnancies** – Having gestational diabetes or a large baby (greater than 9 lbs at birth) increases your risk of developing type 2 diabetes.

### Things you can change

- **Overweight** – Having a Body Mass Index greater than 25 (25-29 = overweight; 30-39 = obese; 40 and over = morbidly obese) increases your risk.
- **Blood pressure** – Having high blood pressure (140/90 or higher) increases your risk.
- **Cholesterol** – If your HDL cholesterol (“healthy” cholesterol) is 35 or lower, LDL cholesterol (“lousy” cholesterol) is above 100, and/or triglyceride level is 250 or higher, your risk increases.
- **Inactivity** – If you exercise fewer than three times a week, you are at greater risk.
- **Poor Diet** – An unhealthy diet increases your risk.
- **Smoking** – Smoking (any amount) increases your risk.

## How do I prevent the progression from prediabetes to type 2 diabetes?

### Make health a priority!

1. Learn how to lower and maintain stable blood sugar levels (and keep them stable throughout the day) – healthy eating, exercise and weight loss can help
2. Lose weight (even 10 lbs makes a difference) and maintain a healthy weight
3. Learn how to choose and/or make healthier food choices
4. Exercise regularly – 5 times per week; 30-45 minutes per day
5. Learn how to live a healthier lifestyle: Handle set-backs, manage stress, get more sleep, control emotions that affect your health, etc.



### Health eating at a glance

#### Choose healthier carbohydrates

- Increase intake of fiber and whole grains
- Avoid eating sweets
- Eat more fruits and vegetables
- Choose water or unsweetened tea

#### Choose lean protein

- Skinless chicken, fish, turkey, beans, eggs, soy & low-fat dairy
- Avoid high-fat meats and dairy

#### Choose healthy fats

- **Healthy Fats** – these should be the majority of your fat calories
  - Monounsaturated fats = almonds, olive oil
  - Polyunsaturated fats = walnuts, sunflower oil
  - Omega-3 fatty acids = fish, flaxseed
- **Unhealthy fats** – Keep under 10% of fat calories
  - Eliminate trans fats = fast food, packaged goods (partially hydrogenated oils)
  - Avoid saturated fats = fried foods, cookies



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