



Prediabetes

Symptoms and causes

By Mayo Clinic Staff

Symptoms

Prediabetes generally has no signs or symptoms.

One possible sign that you may be at risk of type 2 diabetes is darkened skin on certain parts of the body. Affected areas can include the neck, armpits, elbows, knees and knuckles.

Classic signs and symptoms that suggest you've moved from prediabetes to type 2 diabetes include:

- Increased thirst
- Frequent urination
- Fatigue
- Blurred vision

When to see a doctor

See your doctor if you're concerned about diabetes or if you notice any type 2 diabetes signs or symptoms. Ask your doctor about blood glucose screening if you have any risk factors for prediabetes.

Causes

The exact cause of prediabetes is unknown. But family history and genetics appear to play an important role. Inactivity and excess fat — especially abdominal fat — also seem to be important factors.

What is clear is that people with prediabetes don't process sugar (glucose) properly anymore. As a result, sugar accumulates in the bloodstream instead of doing its normal job of fueling the cells that make up muscles and other tissues.

Most of the glucose in your body comes from the food you eat. When food is digested, sugar enters your bloodstream. Moving sugar from your bloodstream to your body's cells requires a

hormone (insulin).

Insulin comes from a gland located behind the stomach (pancreas). Your pancreas secretes insulin into your bloodstream when you eat.

As insulin circulates, it allows sugar to enter your cells — and lowers the amount of sugar in your bloodstream. As your blood sugar level drops, so does the secretion of insulin from your pancreas.

When you have prediabetes, this process begins to work improperly. Instead of fueling your cells, sugar builds up in your bloodstream. High blood sugar occurs when your pancreas doesn't make enough insulin or your cells become resistant to the action of insulin, or both.

Risk factors

The same factors that increase the risk of developing type 2 diabetes increase the risk of developing prediabetes. These factors include:

- **Weight.** Being overweight is a primary risk factor for prediabetes. The more fatty tissue you have — especially inside and between the muscle and skin around your abdomen — the more resistant your cells become to insulin.
- **Waist size.** A large waist size can indicate insulin resistance. The risk of insulin resistance goes up for men with waists larger than 40 inches and for women with waists larger than 35 inches.
- **Dietary patterns.** Eating red meat and processed meat, and drinking sugar-sweetened beverages, is associated with a higher risk of prediabetes. A diet high in fruits, vegetables, nuts, whole grains and olive oil is associated with a lower risk of prediabetes.
- **Inactivity.** The less active you are, the greater your risk of prediabetes. Physical activity helps you control your weight, uses up glucose as energy and makes your cells more sensitive to insulin.
- **Age.** Although diabetes can develop at any age, the risk of prediabetes increases after age 45. This may be because people tend to exercise less, lose muscle mass and gain weight as they age.
- **Family history.** Your risk of prediabetes increases if you have a parent or sibling with type 2 diabetes.
- **Race.** Although it's unclear why, people of certain races — including African-Americans, Hispanics, Native Americans, Asian-Americans and Pacific Islanders — are more likely to develop prediabetes.
- **Gestational diabetes.** If you developed gestational diabetes while pregnant, you and your child are at higher risk of developing prediabetes. If you gave birth to a baby who weighed more than 9 pounds (4.1 kilograms), you're also at increased risk of prediabetes.
- **Polycystic ovary syndrome.** This common condition — characterized by irregular menstrual periods, excess hair growth and obesity — increases women's risk of prediabetes.

- **Sleep.** People with a certain sleep disorder (obstructive sleep apnea) have an increased risk of insulin resistance. People who work changing shifts or night shifts, possibly causing sleep problems, also may have an increased risk of prediabetes or type 2 diabetes.

Other conditions associated with prediabetes include:

- High blood pressure
- Low levels of high-density lipoprotein (HDL) cholesterol, the "good" cholesterol
- High levels of triglycerides — a type of fat in your blood

When these conditions occur with obesity, they are associated with insulin resistance. The combination of three or more of these conditions is often called metabolic syndrome.

Complications

The most serious consequence of prediabetes is progression to type 2 diabetes. That's because type 2 diabetes can lead to:

- High blood pressure
- High cholesterol
- Heart disease
- Stroke
- Kidney disease
- Blindness
- Amputations

Research indicates that prediabetes is often associated with unrecognized heart attacks and can damage your kidneys, even if you haven't progressed to type 2 diabetes.

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