Diabetes Information & Resources

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What is Diabetes?

Diabetes mellitus is a group of diseases that affects how your body turns food into energy. When you eat, the body breaks down food into glucose (sugar), which enters your bloodstream. Insulin, a hormone made by the pancreas, helps move glucose into your cells for energy. In diabetes, the body either doesn't make enough insulin or can't use it properly. Over time, high blood sugar (hyperglycemia) can lead to serious health problems. There are primarily two types of diabetes: type 1 and type 2.

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Diabetes Vocabulary

A1C	A blood test that measures average blood glucose levels over the past 3 months.
Autoantibodies	Immune system proteins that mistakenly target and attack the body's own insulin-producing cells.
Blood glucose meter	A device that measures blood sugar using a drop of blood from a finger prick.
Blood sugar (Glucose)	The main type of sugar in the blood and the body's primary energy source.
Continuous Glucose Monitor (CGM)	A wearable device that tracks glucose levels in real time.
Diabetes insipidus	A rare condition causing frequent urination and thirst, unrelated to diabetes mellitus.
Diabetes mellitus	A group of diseases affecting how the body uses blood sugar.

Diabetic ketoacidosis (DKA)	A serious condition where the body produces excess ketones due to insulin deficiency.
Fasting blood glucose	Blood sugar level measured after not eating for at least 8 hours.
Focal laser treatment	Laser therapy targeting specific eye areas to stop fluid leakage caused by retinopathy.
Gestational diabetes	High blood sugar that develops during pregnancy in women without prior diabetes.
Glycemic targets	Recommended blood sugar level goals to manage diabetes.
Hyperglycemia	High blood sugar levels.
Hypoglycemia	Low blood sugar levels.
Insulin	A hormone that helps move glucose from the blood into the cells.
Insulin resistance	A condition where the body's cells do not respond effectively to insulin.

Juvenile diabetes	Another term for type 1 diabetes, often diagnosed in children.
Ketones	Acids produced when the body breaks down fat for energy due to lack of insulin.
Ketosis	A metabolic state where the body uses fat instead of glucose for energy.
Neuropathy	Nerve damage, often causing numbness or pain, commonly seen in diabetes.
Non-alcoholic fatty liver disease (NAFLD)	A liver condition linked to insulin resistance and obesity.
Pancreas	An organ that produces insulin and other important enzymes.
Polyuria	Excessive urination, often a symptom of high blood sugar.
Polydipsia	Excessive thirst, a common symptom of diabetes.

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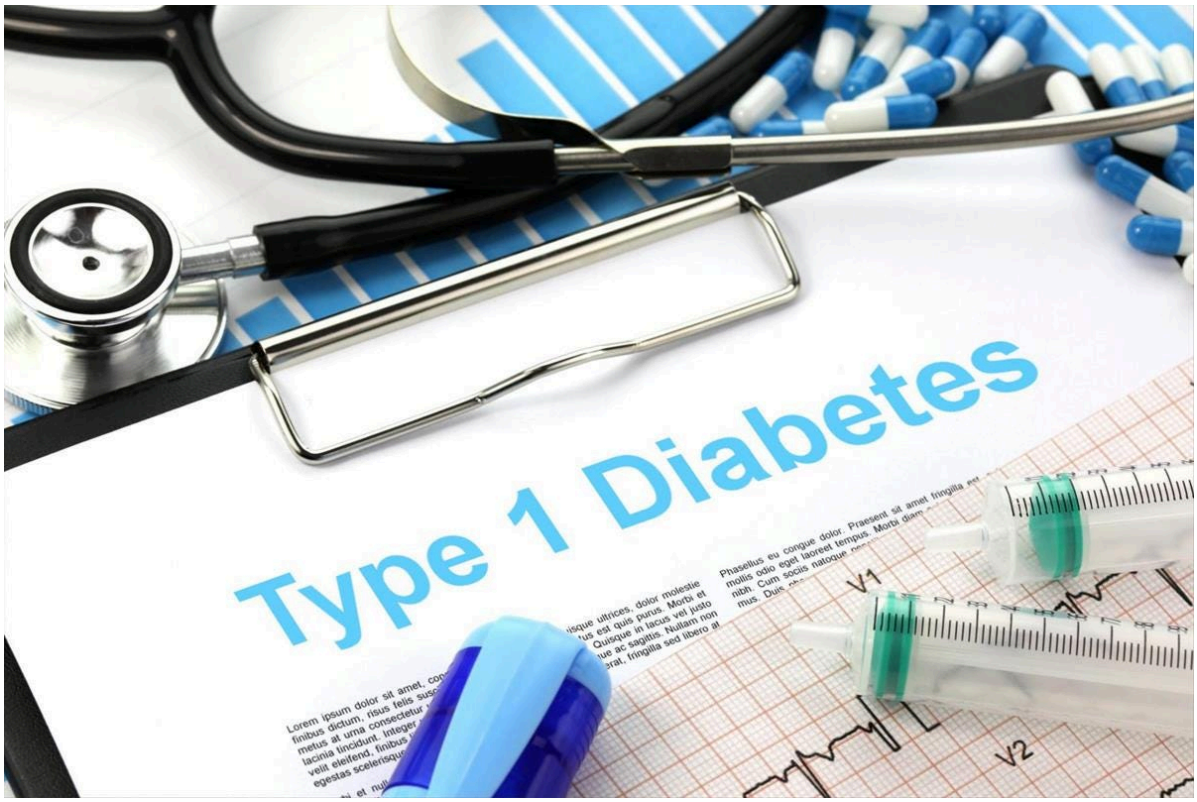
Prediabetes	A condition where blood sugar is higher than normal but not yet diabetic.
Retinopathy	Eye damage caused by high blood sugar affecting retinal blood vessels.
Scatter laser treatment	Laser therapy that shrinks abnormal blood vessels in the eye.
Target blood sugar range	The ideal blood glucose range individualized for people with diabetes.
Type 1 diabetes	An autoimmune condition where the body makes little or no insulin.
Type 2 diabetes	A condition where the body becomes resistant to insulin or doesn't produce enough.
Urine ketone testing	Testing urine for ketones to detect potential DKA.
Vitrectomy	A surgical procedure to remove blood and scar tissue from the eye's vitreous.

Type 1 Diabetes

Type 1 diabetes, sometimes known as juvenile diabetes or insulin-dependent diabetes, is when your pancreas makes little or no insulin. This happens because your immune system treats the cells that make insulin as foreign invaders and destroys them. When enough of these cells are destroyed, your pancreas makes so little insulin that you will need to take insulin to live. Type 1 diabetes is not preventable and has no cure. What triggers it is currently unknown. Type 1 diabetes most commonly develops in childhood, but can still occur in adults. Someone diagnosed with type 1 diabetes can live a long healthy life by having a strong support system and having a diabetes care team.



Risk factors and warning signs

Type 1 diabetes is not preventable, but we can identify persons with a higher risk of developing type 1 diabetes and potentially delay the onset of the disease. People with a family history of type 1 diabetes should be tested for diabetes immune system cells (autoantibodies). People with these autoantibodies have a higher risk of developing type 1 diabetes. However, not everyone who tests positive is guaranteed to become a diabetic. Type 1 diabetic parents should have their children regularly examined by a diabetes pediatrician.

Recognizing the symptoms of diabetes is crucial for early diagnosis and treatment. Common signs include:

- Frequent urination (polyuria): Excess glucose in the blood leads to increased urine production.
- Excessive thirst (polydipsia): Dehydration caused by frequent urination.
- Unexplained weight loss: The body breaks down muscle and fat for energy when it cannot use glucose effectively.
- Fatigue: Lack of glucose in cells leads to low energy levels.
- Blurred vision: High blood sugar can cause fluid to be pulled from the lenses of the eyes.
- Slow-healing wounds: Poor circulation and high blood sugar impair healing

Managing Type 1 Diabetes:

Managing type 1 diabetes is a lifelong commitment that involves careful monitoring, medication, lifestyle adjustments, and a strong support system. While it may seem overwhelming at first, with the right tools and knowledge, individuals with type 1 diabetes can lead healthy, fulfilling lives.

Regular blood sugar monitoring is essential for managing type 1 diabetes. It helps you understand how food, activity, stress, and medications affect your blood glucose levels. There are two ways to track your blood sugar at home: Blood glucose meters and continuous glucose monitors.

Blood Glucose Meters:

A small device that measures blood sugar levels using a drop of blood from a finger prick. Test strips are inserted into the meter, and results are displayed within seconds. It is recommended to check blood sugar multiple times a day (e.g., before meals, before bed, and during suspected highs or lows).

Continuous Glucose Monitors (CGMs):

A wearable device that measures glucose levels in real-time through a sensor placed under the skin. Provides trends and alerts for high or low blood sugar, reducing the need for frequent finger pricks. These are convenient solutions to manual blood glucose testing. If your insurance covers them, it is a great choice for monitoring your blood sugar.

Target Blood Sugar Ranges:

Usually these goals are personalized to the patient, but these are generally agreed upon “good” blood glucose levels.

- Fasting (before meals): 80–130 mg/dL.
- Post-meal (1–2 hours after eating): Less than 180 mg/dL.
- A1C Goal: Below 7%

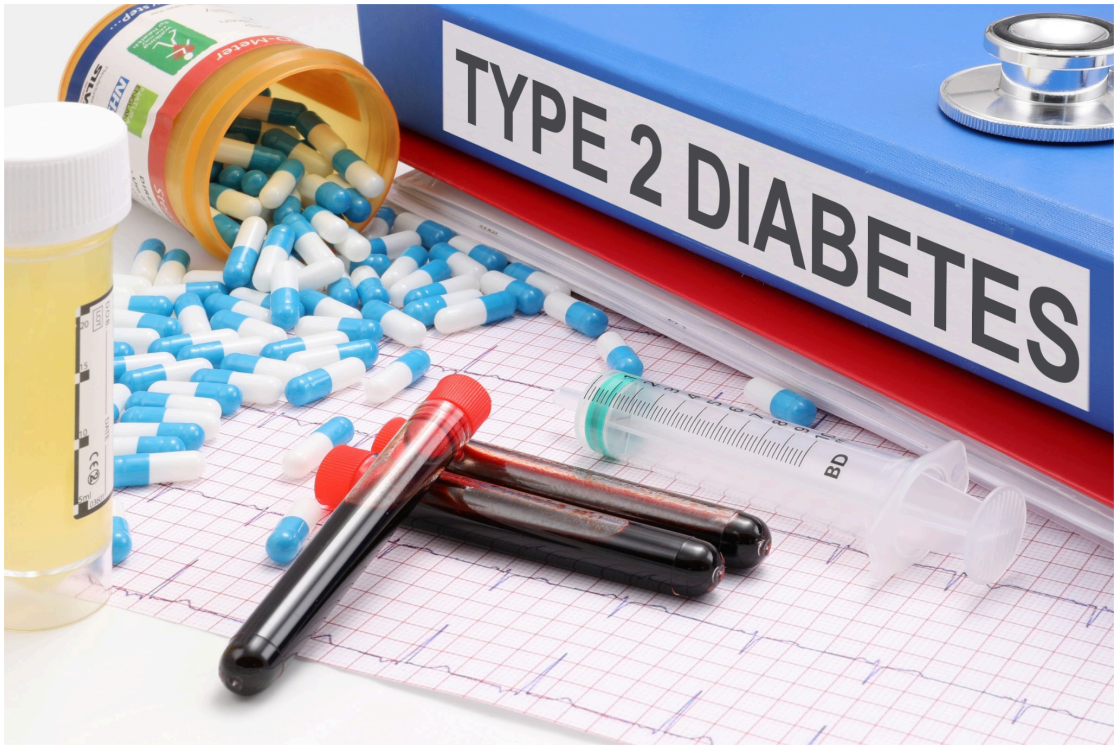
Everyone is different, and your goals will change throughout your life. For example, someone young and otherwise healthy will likely have an A1C goal of less than 7%, but someone old and with kidney disease may have a A1C goal of less than 8%. Diabetes medications can have side effects, and these side effects can affect people differently. If the older patient with kidney disease cannot reasonably handle these side effects, it is more important to prioritize their overall health rather than focus on their A1C.

Tips for Effective Monitoring:

- Keep a log of your blood sugar readings, meals, and activities to identify patterns.
- Work with your healthcare team to adjust insulin doses based on your readings.
- Use apps or digital tools to track and share data with your care team.

Type 2 Diabetes

Type 2 diabetes, previously known as adult onset diabetes, is when your body becomes resistant to the effects of insulin. At first, your pancreas compensates by making more insulin. Eventually, your pancreas cannot make enough insulin, and your blood sugar increases. Some professionals classify type 2 diabetes into two phases: prediabetes and type 2 diabetes, but they are both the same disease.



Currently it is unknown why the body becomes insulin resistant. There are ways to increase the body's sensitivity to insulin. These are medications that are used to manage diabetes.

Risk factors and warning signs

Type 2 diabetes is more easily delayed and prevented than type 1 diabetes. There are more ways to slow down insulin resistance than there are ways to prevent or delay type 1 diabetes. There are certain risk factors that put you more at risk for developing prediabetes and type 2 diabetes, such as:

- Being overweight or obese
- Being 45 years old or older
- Having a parent or sibling with type 2 diabetes
- Being physically active less than 3 times per week
- Having non-alcoholic fatty liver disease (NAFLD)
- Having had gestational diabetes (diabetes during pregnancy) or given birth to a baby who weighed over 9 pounds
- Being African American, Hispanic, or Latino, American Indian, or Alaska Native person. Some Pacific Islander people and Asian American people also have a higher risk.

Managing Type 2 Diabetes:

Type 1 and type 2 diabetes have similar tools to help manage them. Type 2 diabetes, once developed, is a lifelong disease that must be managed with

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Blood Glucose Meters:

A small device that measures blood sugar levels using a drop of blood from a finger prick. Test strips are inserted into the meter, and results are displayed within seconds. It is recommended to check blood sugar multiple times a day (e.g., before meals, before bed, and during suspected highs or lows).

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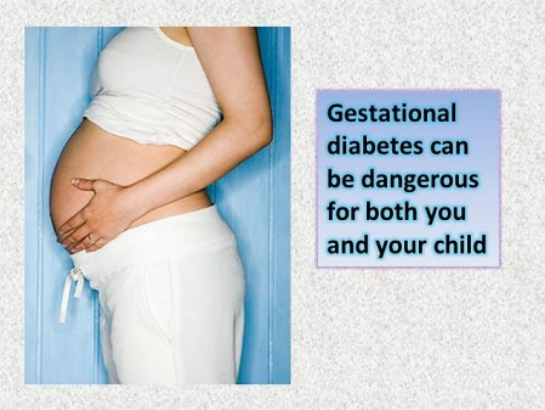
Other Types of Diabetes

Gestational Diabetes

Gestational diabetes is high blood sugar during pregnancy. It usually develops around the 24th week of pregnancy, and develops in women who don't already have diabetes. It may not cause symptoms, but can still affect the overall health of you and your baby. It is important to test for gestational diabetes between 24 and 28 weeks.



The good news is that after giving birth, your blood sugar will likely return to pre-pregnancy levels. People who have had gestational diabetes are at increased risk for developing type 2 diabetes.

It is unknown what causes gestational diabetes during pregnancy, but it is thankfully treatable with behavioral changes during pregnancy, such as light exercise and diet changes.

Diabetes Insipidus

Diabetes insipidus is a problem in which the body produces a large amount of urine, causing a fluid imbalance in the body. While the term diabetes is used, it is actually completely unrelated to diabetes mellitus, which is the disease type 1 and type 2 diabetes refer to.

When to see a Doctor

Recognizing when to seek medical care is crucial in managing diabetes effectively. You should see a doctor if you experience any of the following:

- Frequent high or low blood sugar readings despite medication and lifestyle adjustments.
- Unexplained weight loss or persistent fatigue.
- Slow-healing wounds or infections, especially on the feet.
- Blurred vision or other vision changes.
- Tingling, pain, or numbness in the hands and feet.
- Excessive thirst and urination that persists even with proper hydration.
- Signs of diabetic ketoacidosis (DKA), such as nausea, vomiting, fruity-smelling breath, or confusion.

Goals in Diabetes

Goals in diabetes matters on your age, overall health, and whether or not you are pregnant if you are a female. The ADA recommends the following for nonpregnant adults:

- An A1C goal of less than 7% without significant symptoms of low blood sugar
- If using a continuous blood sugar monitor, being in range more than 70% of the time and being below range less than 4% of the time and having low blood sugar (less than 54 mg/dL) less than 1% of the time.

The ADA recommends lower A1Cs (less than the goal of less than 7%) when the patient can get there without significant side effects. Your goal may be higher (such as less than 8%) if you are chronically ill, terminally ill, elderly, or the risks of treatment are greater than the benefits.

Diet and Exercise

Diet and exercise is essential to keeping your overall health well. Diabetes in all its forms can easily make your overall health deteriorate if you're not proactive. The American Diabetes Association has their own tips and guides for healthy eating and exercise. We recommend reading their guides and/or seeing a dietician for a more complete understanding, but we can provide a top down perspective.

Healthy eating plans all follow some basic guidelines. Here's what they have in common:

- Non-starchy vegetables as a foundation for the plate
- Lean proteins and plant-based sources of protein
- Quality carbohydrates like starchy vegetables, fruits, whole grains, and low-fat milk
- Less added sugar
- Healthy fats
- Less processed foods
- Water or zero-calorie beverages

Exercise is also important for managing diabetes and overall health. The Center for Disease Control (CDC) recommends that adults need at least 150 minutes of moderate-intensity physical activity a week, such as 30 minutes a day, 5 days a week. They also recommend 2 days of muscle-strengthening activity each week.

Foot Care and Eye Exams

Diabetes can lead to serious complications affecting the eyes and feet. In the most serious of cases, amputation of a leg can happen or blindness can occur. This can be avoided with proper care and regular doctors appointments.

People with diabetes are at risk for nerve damage (neuropathy) and poor blood circulation, which can lead to foot ulcers and/or infections. You may not notice sensations such as pain in your foot in serious cases where the nerve damage is great. To protect your feet, do the following:

- Check your feet daily for cuts, blisters, redness, or swelling.
- Keep feet clean and dry, and moisturize to prevent cracking.
- Wear comfortable, properly fitting shoes and avoid walking barefoot.
    - You can get specifically fitted shoes at certain clinics (such as a podiatrist clinic). These may or may not be covered by your insurance.
- Trim nails carefully to prevent ingrown toenails.
- Ask for a foot exam at your yearly primary care visit.
    - A foot exam is a test where a doctor will use a tool to test your sensation in your foot. They are testing whether or not you can feel them poking your foot, essentially.

Diabetes can cause diabetic retinopathy, which is the damage of the light-sensitive tissue at the back of the eye which is what we use to see (retina). Diabetes causes retinopathy by causing damage to the blood vessels supplying blood to the retina. Symptoms of retinopathy include

- Blurred vision
- A sudden shower of black “floaters” (black or grey specks or strings) in your vision
- Fluctuating vision
- Dark or empty areas of vision

You can check the health of your eye yearly at an optometrist. They may recommend treatments if you have symptoms of retinopathy. The treatments of retinopathy sound scary, but are quick and painless. They are injectable medications, laser therapy, and vitrectomy.

Injectable medications are injected in clinics where they numb your eye and a medication is injected into the middle of your eye to stop the growth of new blood vessels.

Laser therapy has two options: focal laser treatment and scatter laser treatment. Most of the time in the clinic is spent waiting for the numbing and dilation drops to take effect.

- Focal can stop or slow the blood and fluid leakage in the eye
- Scatter can shrink abnormal blood vessels in the eye.

A vitrectomy is a type of procedure done in a surgery center or hospital that involves making a tiny incision in your eye to remove blood from the vitreous, as well as scar tissue that's tugging on the retina. This is performed under local or general anesthesia.

Diabetic Ketoacidosis

Diabetic Ketoacidosis (DKA) is a serious condition that occurs when the body breaks down fat too quickly due to a lack of insulin. When your cells cannot take in glucose for energy, your body starts to break down the fat in your body. This fat breakdown releases ketones, which makes your blood more acidic. High levels of ketones can poison the body. It is more common for someone with type 1 diabetes to experience DKA, but it can happen to people with type 2.

DKA is very serious and can lead to death if not cared for properly. Contact your health provider or go to the emergency room IMMEDIATELY if you experience the following:

- Constantly feeling tired
- Dry or flushed skin
- Nausea, vomiting, or abdominal pain. Vomiting can be caused by many illnesses, not just ketoacidosis. If vomiting continues for more than two hours, contact your healthcare provider.
- Difficulty breathing
- Fruity odor on breath
- A hard time paying attention, or confusion

Luckily there are ways to test the levels of ketones in your blood. You can test your urine for ketones with strips like Ketostix. They dip into urine and tell you roughly how many ketones are in your body. You should test your urine for ketones in these situations:

- If your blood sugar tests are higher than 250 mg/dL for two or more tests in a row
- If you are feeling like your blood sugar is high
- If you think you have an infection
- If you are throwing up or feel sick to your stomach
- If you are ill or stressed

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