CONDITION

# Type 1 diabetes

Type 1 diabetes is an autoimmune condition in which the pancreas makes little or no insulin.

**WHAT IT IS**
Autoimmune condition causing little or no insulin production

**BODY SYSTEM**
Hormones and metabolism

**MAIN SYMPTOMS**
Thirst, frequent urination, weight loss, tiredness

**WHAT CAUSES IT**
Immune attack on insulin-making pancreatic cells

**HOW IT IS DIAGNOSED**
Blood glucose tests, A1C, and diabetes autoantibodies

**MAIN TREATMENT**
Lifelong insulin, glucose monitoring, food and activity planning

**CAN IT BE CURED?**
No - insulin-making cells remain damaged

**IS IT AN EMERGENCY?**
Sometimes - vomiting, deep breathing, confusion, or unconsciousness

**LONG-TERM OUTLOOK**
Usually full lives with daily treatment and monitoring

## Overview

Type 1 diabetes is a lifelong autoimmune condition. The immune system mistakenly attacks beta cells in the pancreas. These cells normally make insulin, a hormone that helps glucose move from the blood into the body's cells for energy.

Without enough insulin, glucose builds up in the blood. The body then begins breaking down fat for energy. This can produce acids called ketones. A dangerous buildup of ketones is known as diabetic ketoacidosis, or DKA.

Type 1 diabetes was once called juvenile diabetes because it often begins during childhood. However, it can develop at any age, including later adulthood. The older name can therefore be misleading.

Daily insulin replaces the insulin the pancreas can no longer make. Glucose monitoring, food planning, physical activity, and regular healthcare are also important. Treatment cannot currently remove the underlying autoimmune condition, but it can keep glucose in a safer range and reduce the risk of complications.

## Symptoms

Symptoms often develop over days or weeks, especially in children. They may appear more gradually in adults.

Common symptoms include:

These symptoms happen because glucose cannot enter cells normally and is lost through urine. The extra glucose draws water with it, leading to frequent urination and thirst. Weight loss can occur as the body uses fat and muscle for energy.

Some people are first diagnosed when they develop DKA. Signs include nausea, vomiting, stomach pain, dehydration, deep or rapid breathing, fruity-smelling breath, marked sleepiness, or confusion. DKA needs emergency treatment.

- Feeling very thirsty
- Urinating often, including new bed-wetting in a child
- Feeling unusually hungry
- Losing weight without trying
- Tiredness or weakness
- Blurred vision
- Irritability or difficulty concentrating
- Repeated skin, urinary, or yeast infections

## Causes and risk factors

Type 1 diabetes develops when the immune system destroys insulin-making beta cells. This process may begin months or years before symptoms appear.

The exact trigger is not fully understood. Certain genes increase susceptibility, and environmental factors may help start the immune reaction. Researchers have studied viral infections and other possible triggers, but there is usually no single event that explains why one person develops the condition.

Type 1 diabetes is not caused by eating sugar, having a higher body weight, or failing to exercise. Nothing you or your family did caused the immune attack.

Having a parent or sibling with type 1 diabetes raises the chance of developing it. Even so, many people diagnosed with the condition have no close relative who has it.

People with type 1 diabetes are also more likely to develop other autoimmune conditions. These include autoimmune thyroid conditions and coeliac disease, in which gluten triggers damage to the small intestine.

## Diagnosis

A healthcare professional diagnoses diabetes using blood tests that measure glucose. An A1C test may also be used. A1C estimates the average glucose level over roughly the previous two to three months, although some health conditions can make it less reliable.

If type 1 diabetes is suspected, additional tests may help distinguish it from other types of diabetes. Blood tests can look for diabetes autoantibodies, which are signs of an immune attack on beta cells. A C-peptide test can help show how much insulin the pancreas is still making.

Urine or blood may be tested for ketones if glucose is high or the person is unwell. High ketones, particularly with vomiting, dehydration, or abnormal breathing, can indicate DKA.

Adults can also develop type 1 diabetes. Because symptoms may progress more slowly, it can initially be mistaken for type 2 diabetes. Autoantibody and C-peptide tests can help clarify the diagnosis when the type is uncertain.

## Treatment and management

Everyone with type 1 diabetes needs insulin. Insulin is usually given by injections or an insulin pump. It cannot generally be taken as a standard pill because digestion would break it down.

Treatment often combines background insulin with insulin for meals and glucose corrections. An insulin pump gives insulin continuously through a small tube or patch. Some pumps can communicate with a continuous glucose monitor and automatically adjust insulin delivery within set limits. These are sometimes called automated insulin delivery or hybrid closed-loop systems.

A continuous glucose monitor, or CGM, measures glucose in the fluid just under the skin. It shows current readings, trends, and alerts. A finger-stick glucose meter may still be needed as

a backup or when readings do not match symptoms.

Food does not need to be "sugar-free." Learning how carbohydrates affect glucose helps with meal-time insulin planning. Protein, fat, meal timing, illness, stress, alcohol, and physical activity can also change glucose levels.

Exercise supports heart, bone, and emotional health. It can lower or sometimes raise glucose, depending on the activity and its intensity. People using insulin learn how to monitor around exercise and adjust food or insulin according to their agreed plan.

Management also includes:

Glucagon is an emergency medicine that raises glucose when severe hypoglycemia makes someone unable to safely eat or drink. Family members, friends, school staff, or coworkers may be taught how to use it.

- Knowing how to recognise and treat low glucose
- Having a sick-day and ketone-testing plan
- Keeping emergency glucagon available
- Caring for injection or pump sites
- Attending checks for eyes, kidneys, nerves, blood pressure, and cholesterol
- Getting support for stress, eating concerns, or diabetes burnout

## Complications

Hypoglycemia means glucose has fallen too low, often because insulin, food, and activity are out of balance. Early symptoms can include shaking, sweating, hunger, a fast heartbeat, dizziness, or irritability. Severe hypoglycemia can cause confusion, seizures, or unconsciousness.

DKA occurs when there is not enough insulin and ketones build up. Illness, missed insulin, or an interruption in pump delivery can contribute. DKA can develop quickly and needs urgent hospital treatment.

Over many years, higher glucose levels can damage small blood vessels and nerves. Possible complications include eye damage, kidney problems, loss of sensation in the feet, digestive or sexual difficulties, and slower healing. Type 1 diabetes also raises the risk of heart and blood vessel conditions.

These outcomes are not inevitable. Glucose management and regular screening can identify changes early. Blood pressure management, cholesterol care, avoiding smoking, and treating

related conditions also reduce long-term risk.

## Prevention

There is currently no proven way to prevent type 1 diabetes in the general population. Diet, exercise, and weight loss do not prevent the autoimmune process.

Relatives of someone with type 1 diabetes may be offered autoantibody screening through specialist services or research programs. Screening does not prevent the condition, but it may identify its early stages and reduce the chance that diagnosis first occurs during DKA.

For some people with an early, symptom-free stage of type 1 diabetes, specialist treatment may delay the onset of symptoms. It does not permanently prevent or cure the condition, and availability differs by country.

## Living with it and what to expect

Type 1 diabetes requires attention every day, but management usually becomes more familiar with experience. Technology can reduce some of the workload, although pumps and sensors still need supplies, maintenance, and decision-making.

Soon after diagnosis, some people enter a "honeymoon phase." The pancreas temporarily continues making a small amount of insulin, so insulin needs may fall. This phase can last for weeks or months and occasionally longer. It does not mean the condition has gone away.

Insulin needs change over time. Growth, puberty, menstrual cycles, pregnancy, illness, stress, sleep, exercise, and changes in routine can all affect glucose. These changes are expected and do not mean someone has failed.

Children can usually attend school, play sports, travel, and join in ordinary activities with suitable planning. Adults can work, drive, exercise, have relationships, and have children. Pregnancy needs planning and closer monitoring because glucose levels affect both the pregnant person and the developing baby.

Regular follow-up is used to review glucose patterns, insulin delivery, injection or pump sites, and emotional well-being. Screening may include eye photographs or examinations, urine and blood tests for kidney health, foot checks, thyroid tests, and coeliac disease testing.

Many people with type 1 diabetes live long, active lives. Long-term health is influenced by glucose levels, access to insulin and technology, severe low-glucose episodes, DKA, cardiovascular risk, and regular screening. No device or glucose result needs to be perfect at

all times.

## When to get medical help

Call emergency services if someone with diabetes is unconscious, having a seizure, cannot swallow safely, or has severe confusion. Use emergency glucagon if it is available and you have been shown how. Do not give food or drink to someone who cannot swallow safely.

Seek emergency care for possible DKA, particularly when high glucose or ketones occur with:

Contact your diabetes service promptly if ketones remain raised, glucose stays high despite following your correction plan, or illness is making insulin and fluid management difficult. Do not stop background insulin during illness unless a diabetes professional specifically directs you to do so.

Arrange routine follow-up if glucose is often outside your agreed range, low-glucose episodes are becoming more frequent, or injection and device sites are sore or damaged. Help is also appropriate if diabetes is causing distress, fear of hypoglycemia, disordered eating, or difficulty completing everyday care.

- Repeated vomiting or inability to keep fluids down
- Deep, rapid, or difficult breathing
- Severe stomach pain
- Fruity-smelling breath
- Marked drowsiness, confusion, or collapse
- Signs of severe dehydration

## Common questions

Can type 1 diabetes go away?

No. The honeymoon phase can make it seem as though the condition is improving, but the immune damage continues and insulin is still needed. There is currently no established cure.

Is type 1 diabetes caused by eating too much sugar?

No. It is caused by an immune attack on insulin-making cells. Eating sugar does not cause that attack. Food choices still matter after diagnosis because carbohydrates affect glucose and insulin needs.

What is the difference between type 1 and type 2 diabetes?

Type 1 diabetes involves autoimmune destruction of beta cells and requires insulin. Type 2 diabetes mainly involves resistance to insulin and a gradual loss of insulin production. Both cause high glucose, but their underlying processes and treatment options differ.

Can adults suddenly develop type 1 diabetes?

Yes. Type 1 diabetes can begin at any age. In adults, the loss of insulin production may be slower, so symptoms can be less obvious and the condition may initially resemble type 2 diabetes.

Can I exercise and eat ordinary food with type 1 diabetes?

Usually, yes. There is no single required "diabetes diet." Exercise and a wide range of foods can fit into management, but insulin, carbohydrates, glucose trends, and activity need to be planned together.

Will my child inherit type 1 diabetes?

Type 1 diabetes is not inherited in a simple, predictable way. Having a close relative with it raises the chance, but most children of parents with type 1 diabetes do not develop the condition.

## Sources

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