

Patient information from BMJ

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Diabetes type 1: what treatments work?

Type 1 diabetes is a long-term condition that usually starts in childhood or young adulthood, but can also occur later in life. Taking insulin, eating healthily, and staying active can help you, or your child, live a long and healthy life with type 1 diabetes.

You can use our information to talk with your doctor and decide which treatments are right for you or your child.

What is it?

If you have diabetes, you have too much glucose in your blood. Glucose is a kind of sugar that your body uses for energy. But if it builds up in your blood it can make you ill.

There are two main types of diabetes: type 1 and type 2. This information is for adults with type 1 diabetes and parents of children with this condition. Type 1 diabetes usually starts in childhood, adolescence, or early adulthood, but it may also start later in adult life.

Everyone needs a hormone called insulin to keep their blood glucose at a healthy level. But when you have type 1 diabetes, your body stops making insulin or makes very little of it.

This kind of diabetes used to be called insulin-dependent diabetes, because it can be controlled by taking insulin.

Usually, type 1 diabetes is what's called an autoimmune disease. This means that the cells in your immune system, which normally fight infection, attack some of your own cells by mistake. In type 1 diabetes, the immune system attacks the cells that make insulin.

Doctors don't know why this happens. It may be triggered by viruses, or by your genes, or by a combination of things. Some people get type 1 diabetes without having an autoimmune problem, but this isn't common.

What treatments work?

There isn't a cure for type 1 diabetes. But treatment can help you, or your child, stay healthy by keeping the amount of glucose in your blood as close to normal as possible. This means taking insulin, probably several times a day.

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And you will need to check blood glucose levels regularly, to make sure that they are at a healthy level. It's also important to eat a healthy diet, and exercise regularly.

If your child has type 1 diabetes, staff members at their school will be trained to help them manage their diabetes, including their insulin. Your child should usually be able to do all the same activities as other children their age.

Insulin

Insulin is a hormone that helps move glucose from your blood into your body's cells. Your cells then use the glucose as energy. Insulin keeps the level of glucose in your blood steady.

The insulin used for diabetes is made in a laboratory. It is designed to be as much like natural human insulin as possible. It works in the same way to keep blood glucose under control.

There are different types of insulin. They vary in

- how quickly they work
- when they peak, and
- how long they last.

Your doctor will help you work out which are best for you or your child, and decide on a dosing schedule.

Ways to take insulin

You can't take insulin as tablets, because the digestive juices in your stomach would destroy the insulin. Most people take it as **injections**.

You might not like the idea of giving yourself or your child injections. But there are special devices made for people with diabetes that make giving injections much easier. The needles in these devices are very thin and you will probably find you soon get used to them.

Another way to take insulin is with an **insulin pump**. This is a device that gives the body a constant supply of insulin. The pump is about the same size and shape as a pack of cards.

Inside the pump is a store of insulin. It is pumped out through a long tube and into the body through a special kind of needle that stays in the skin. However, you can disconnect it for short periods (for example, while showering or bathing, going swimming, or getting dressed).

Dosing schedule

It might take some time to work out a dosing schedule that fits well with how you or your child lives. The amount of insulin people with type 1 diabetes need changes according to what they eat and drink, and how much exercise they take.

It can also change for other reasons, including if:

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- they have an infection
- they're stressed, or
- their body is having hormone changes from puberty or pregnancy.

You will need to be extra careful during these times.

If you are a woman and would like to become pregnant, talk to your doctor about steps you can take to prepare for a healthy pregnancy.

Checking blood glucose levels regularly is key to getting a good balance between your insulin dose and your eating and activity. This is true whether you are injecting insulin or using an insulin pump.

You check blood glucose levels with a device called a blood glucose meter. It uses a drop of blood, usually from a finger, to check glucose levels.

Your doctor can help you plan how often you should check your child's or your own glucose. This may be before each meal and at bedtime. You might also check it two hours after meals and when exercising.

Regularly monitoring blood glucose and carefully managing insulin doses can help you avoid two potentially serious problems: **hypoglycaemia** and **hyperglycaemia**.

- If people with type 1 diabetes take too much insulin, they can get hypoglycaemia. This happens because their blood glucose drops too low.

Symptoms include feeling very hungry, nervous, shaky, sweaty, dizzy, or confused. You should talk to your doctor about what you should do if you or your child gets these symptoms.

If the symptoms are mild, taking glucose tablets or gels, or drinking milk or juice, may be all the treatment that's needed. However, severe hypoglycaemia is an emergency and requires prompt medical treatment.

- If people don't take enough insulin, their blood glucose can get too high. This is called hyperglycaemia, and it also requires prompt treatment.

Hyperglycaemia can cause blurred vision, thirst, frequent urination, and tiredness.

It can also lead to a potentially serious problem called diabetic ketoacidosis (DKA), which is a build-up of acids in your blood. This can happen when your blood glucose is too high for too long.

Healthy living

If you or your child has type 1 diabetes, staying healthy doesn't just mean taking insulin. Eating healthily and being active can also help keep your blood glucose levels under control.

Also, if you smoke, one of the best things you can do is to stop. Your doctor can recommend treatments that can help.

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Diet

What people eat and drink plays an important role in how well they control their blood glucose level.

But there isn't a standard diet that you or your child should follow. Instead, doctors recommend meeting with a dietitian to work out a nutritional approach that suits you, based on your lifestyle and food preferences.

Eating regular meals is very important, as skipping meals can affect your glucose levels and insulin dose. Dietitians also often recommend that people with type 1 diabetes keep track of the carbohydrates they eat. You may hear this called 'carb counting'.

Carbohydrates supply the body with glucose. Foods high in carbohydrates include pastas, breads, potatoes, fruits, juice, milk, sweets, and snack foods like biscuits and crisps.

Your dietitian can give you advice on how to estimate the carbs you or your child eats at each meal. You can then adjust the insulin dose for that meal if necessary. This can help you better manage blood glucose levels and insulin.

Exercise

Taking regular exercise has many benefits for people with type 1 diabetes. Exercise uses up glucose, so it can help keep down the level of glucose in the blood. It can also help people maintain a healthy weight, and make them feel happier and more relaxed.

Regular activity is just as important for children with type 1 diabetes as for adults. You should encourage your child to be active every day. This could mean things like:

- walking to and from school
- making regular trips to the playground, and
- encouraging your child to take part in activities such as sport and dance.

For adults, getting regular exercise can sometimes be daunting, particularly if they haven't exercised much in the past. Getting started is sometimes the hardest part. Be sure to talk to your doctor before starting or changing an exercise programme.

Your doctor will be able to advise you on what kinds of exercise would be best for you. Doctors usually advise people with type 1 diabetes to do some kind of exercise most days.

This doesn't need to be strenuous. Walking for 30 minutes each day might be all you need to do. If you haven't been very active, you should build up your level of exercise slowly.

Both adults and children may need to take less insulin or eat a snack before exercising, and check their blood glucose before and after. You should discuss this with your doctor.

For more background information on diabetes see our leaflet *Diabetes type 1: what is it?*

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