

## Diabetes and stroke

Diabetes is a lifelong condition that occurs when your body cannot regulate the amount of sugar in your blood. If it's not treated or controlled well, diabetes can increase your risk of stroke. This guide explains the main symptoms of diabetes and the link between diabetes and stroke. It also describes how you can make changes to your lifestyle to reduce your risk of diabetes and stroke.

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### What is the link between diabetes and stroke?

Diabetes almost doubles your risk of having a stroke and is a contributing factor in 20% of strokes in England, Wales and Northern Ireland. This is because high levels of sugar in your blood can damage your blood vessels, making them harder and narrower and more likely to become blocked. If this happens in a blood vessel leading to your brain it could cause a stroke.

### What is diabetes?

Your pancreas produces a hormone called insulin, which controls the glucose (sugar) levels in your blood. It helps glucose to enter the cells in your body so it can be used as energy.

Diabetes develops when your body isn't able to produce insulin, or the insulin it does produce doesn't work properly. There are two main types of diabetes.

- Type 1 develops when your body stops producing insulin. This causes glucose to build up in your bloodstream. This type of diabetes usually begins in childhood or adolescence.

- Type 2 diabetes develops when your body does not produce enough insulin or when your body does not react to it in the right way. This type of diabetes is much more common: 90% of people with diabetes have type 2. It tends to develop gradually, usually in adulthood. It is a progressive condition, which means it will get worse over time if left untreated.

There is another type of diabetes known as gestational diabetes which can occur during pregnancy. It usually stops after the baby is born, although it can increase the mother's risk of developing type 2 diabetes in the future. It can recur, so in all future pregnancies you will be checked for diabetes.

### What are the symptoms of diabetes?

The main symptoms of both type 1 and type 2 diabetes are:

- feeling very thirsty
- urinating frequently – especially at night
- feeling very tired
- unexplained weight loss
- genital itching or regular episodes of thrush
- cuts or wounds that heal slowly
- blurred vision.

If you have type 2 diabetes, you may not notice the symptoms, as it tends to develop slowly over a number of years. Many people do not realise they have diabetes. It's estimated that there are over 3.6 million people diagnosed with diabetes in the UK, and around 850,000 people with undiagnosed diabetes. If you are experiencing any of the symptoms listed above, talk to your GP. If diabetes is not treated or controlled well, it can lead to serious health problems including loss of vision and kidney failure.

### Am I at risk of diabetes?

Although anyone can develop diabetes, there are some groups of people who are more likely to develop the condition. Some of the main risk factors for developing type 2 diabetes are:

- **a family history of diabetes**, particularly if a close relative such as a parent, brother or sister has the condition
- **your age**. All people over 40 are at a higher risk of developing diabetes
- **your ethnicity**. In the UK, type 2 diabetes is more common in people of South Asian, Chinese, African and Caribbean backgrounds, and their risk is increased from a younger age than the rest of the population. You can read more about ethnicity and stroke risk in our guides: F32, *Information for South Asian People* and F21, *Information for African and Caribbean people*
- **being overweight or obese**, especially if you carry your extra weight around your waist. Being overweight reduces your body's ability to respond to insulin. The upper limit of a healthy BMI for the general population is 25, but it's lower for people from African, Caribbean and South Asian backgrounds. If you are from these backgrounds and have a BMI of 23 or more you are at increased risk of diabetes, and if you have a BMI of 27.5 or more you are at high risk. If you think you're overweight, contact your GP to ask for a health check and find out what local weight loss help is available
- **gestational diabetes**. Having diabetes while pregnant makes you more likely to develop type 2 diabetes later in life.

## Diagnosis and treatment

### Diagnosis

Type 1 and type 2 diabetes can be diagnosed in a number of ways.

- Your doctor may test a sample of urine for glucose.
- An HbA1c blood test can show your blood glucose levels for the last two to three months. It is often used to measure blood glucose levels in diabetic patients, but can also be used as a diagnostic test.
- A glucose tolerance test (GTT) is done after fasting for 8–12 hours before a blood test. You then have a glucose drink and your blood is tested again two hours later.

Patients with type 1 are referred to a specialist care team. If you are diagnosed with type 2 diabetes, you should have help from a team of health professionals who will help you manage your condition. This will usually include your GP, and you will have advice on your diet, foot checks from a nurse or foot specialist, and eye checks by an opticians. You will have your blood sugar level checked at least once a year and your blood pressure should be monitored.

It's important that you receive support and information to help you manage your diabetes well. Everyone in the UK who has diabetes should be offered a free diabetes education course. If it is available in your area, your GP could recommend an educational programme such as DESMOND. These give you the chance to learn more about your condition and how to manage it, ask questions and meet other people with diabetes. Diabetes UK also

offers a free online education course, *Type 2 diabetes and me*.

If you haven't been offered a course, or if you think you'd benefit from a refresher, make sure you ask your GP or someone in your care team about courses that are available in your area.

### Treatment

Both type 1 and type 2 diabetes are lifetime conditions that currently have no cure. Patients diagnosed with type 1 manage their condition with regular injections of insulin. The rest of this section is about treatments for type 2 diabetes that can help to keep your blood glucose levels as normal as possible. They will help control any symptoms you are experiencing and prevent any long-term complications.

### Diet and exercise

Sometimes type 2 diabetes can be controlled through healthy eating and regular exercise, so you may not need to take medication. Your doctor or someone else in your care team should talk to you about the changes you need to make and how you can make them.

### Medication

In some cases diet and exercise alone aren't enough to manage diabetes. If your blood sugar levels are high, you may need medication to help control it, but it's still important that you eat a healthy diet and get enough exercise.

This guide can only give general information. You should always get individual advice about your own health and any treatment you may need from a medical professional such as a GP or pharmacist.

You should receive an individualised care plan that takes into account your own medical history and any other relevant factors. Metformin is the most commonly prescribed medication to manage blood glucose levels. If you are intolerant to metformin you will be offered a dipeptidyl peptidase 4 inhibitor (DPP-4), pioglitazone or a sulfonylurea. If the medication you are prescribed doesn't reduce your blood glucose levels sufficiently you may be offered a combination of two or three different medications.

As with all medication, some people may experience side-effects. Talk to your GP or someone in your care team if you are experiencing any side effects, as there may be a different medicine or combination of medicines that you could try.

- **Metformin**

This type of medicine helps to lower your blood sugar levels by reducing the amount of glucose that your liver produces. It also helps your body to respond better to the insulin that it produces. The dose is gradually increased over the first few weeks to minimise gastrointestinal side effects. It's not suitable for people with kidney damage.

- **Sulfonylureas**

This type of drug works by helping your pancreas to produce more insulin. You may be given this drug if you can't take metformin, or are overweight. It can lead to low blood sugar (hypoglycaemia) and side effects including nausea and weight gain. There are a number of different sulphonylureas including glibenclamide, glimepiride, gliclazide, gliquidone and glipizide.

- **Pioglitazone**

Pioglitazone is a type of thiazolidinedione medicine (TZD), which make your body's cells more sensitive to insulin so more glucose is taken from your blood. It's usually used in combination with other drugs. It can lead to weight gain and swollen ankles. You should not be prescribed this drug if you are at risk of heart failure, or fracturing your bones.

- **Gliptins (DPP-4 inhibitors)**

These drugs prevent the breakdown of a naturally occurring hormone called GLP-1 which helps the body produce insulin when blood sugar levels are high. Gliptins keep levels of GLP-1 higher in the blood to help reduce blood sugar, but without causing low blood sugar (hypoglycaemia). Examples include sitagliptin, linagliptin, vildagliptin and saxagliptin.

- **SGLT2 inhibitors (sodium–glucose cotransporter 2)**

This is a new type of drug for type 2 diabetes. It works by increasing the amount of glucose excreted through your urine to reduce the amount of glucose in your blood. Examples include dapagliflozin, canagliflozin and empagliflozin.

- **GLP-1 (glucagon like peptide 1)**

GLP-1 agonists act in a similar way to the natural hormone GLP-1 (see DPP-4 inhibitors, above). They're given by injection and boost insulin production when there are high blood glucose levels, reducing blood glucose without the risk of low blood sugar (hypoglycaemia).

- **Other medications**

Less commonly used medications include Acarbose, which slows down the rate at which your digestive system breaks carbohydrates down into glucose. It's not used as much because of common side effects like diarrhoea. Nateglinide and repaglinide are taken just before eating, and stimulate insulin production. They may help people with irregular mealtimes.

- **Insulin injections**

Insulin is used as a treatment for type 1 and type 2 diabetes. There are different types of insulin treatments available. Some are just injected once a day, others need to be injected several times a day before meals. Insulin pumps are available for some people with type 1 diabetes.

Your care team will talk to you about the type of insulin that they think is best for you. They will also teach you how to inject yourself and help you with any concerns you may have.

### Long-term care and support

If you have diabetes it is important to have regular check-ups to make sure that you're staying healthy and to avoid any complications.

Everyone with diabetes is supposed to have a full diabetes check at least once a year. This is known as your annual diabetes review. There are a number of checks that you should receive every year, to make sure that your condition is being managed well.

- **Blood glucose (HbA1c) test**

This test can show your blood sugar levels over the last few months. (You may also need to monitor your own glucose levels at home depending on your condition. Someone in your care team will show you how to do this).

- **Blood pressure check**

People with diabetes should have a blood pressure of 130/80mmHg or lower.

- **Cholesterol check**

Reducing your cholesterol levels will help to reduce your risk of stroke, as well as other conditions such as heart disease.

- **Kidney function blood and urine tests**

Looks for signs of kidney problems.

- **Weight and BMI checks**

Linked to a review of exercise levels and diet.

- **Eye check**

Looks for damage to the retina which affects your eyesight.

- **Feet and legs check**

Looks for poor circulation or nerve damage.

- **Emotional and psychological support**

You should be able to talk about any concerns you have.

- **Free diabetes education course**

Find out about group sessions in your local area.

- **Support to stop smoking**

If you have diabetes you are already at risk of developing heart disease and having a stroke. Smoking makes this risk even higher, so it's essential that you stop. Find local or online support through [nhs.uk/smokefree](https://www.nhs.uk/smokefree), or other regional Stop Smoking Services (see *Other sources of help and information* later in this guide). Your GP or nurse should also make sure you're getting all the advice and support you need to help you give up.

- **Flu jab**

Offered to all people with long-term conditions each autumn.

### Type 2 diabetes diagnosis after a stroke

Some people are only diagnosed with diabetes after they have had a stroke. For some people, diabetes may make very little difference to their day-to-day life, but for others it can have a big impact. You may find that you need to change your diet, take medication and monitor your blood glucose levels frequently. Coping with this as well as the effects of your stroke can be tough.

You may feel a range of different emotions about having diabetes. It can take time to adjust to the demands of managing your condition and it can be easy to feel overwhelmed. But just take it one step at a time. Speak to your GP about how you are feeling; don't wait for your annual check. Don't be afraid to ask questions – they are there to give you the information and support you need.

The organisations we've listed at the end of this guide can also provide help and support.

### How can I reduce my risk of stroke?

#### Stopping smoking

Smoking doubles your chance of having a stroke, so it's well worth getting advice on giving up. As soon as you stop smoking, your stroke risk starts to go down.

#### Eating healthily

Eat lots of vegetables and fruit, and have homemade food if you can, as it usually has less fat and salt than ready meals and snacks. Cutting salt can help with controlling blood pressure, and eating less fat can help with weight loss.

#### Moving around more

Move as much as you can. Try walking for half an hour a day, if you can. Walking for half an hour every day can halve the risk of a stroke. If you can, try to keep moving at home too. Just walking around the room every 20 minutes can lower your stroke risk. If you are taking insulin or have not exercised for some time, it's important that you speak to your GP before starting a new activity or exercise programme.

#### Drinking less alcohol

You can reduce your stroke risk by drinking less. In the UK, the Government advises that to keep health risks from alcohol low, it's best to have no more than 14 units a week, spread over at least three days. The limit is the same for men and women.

## Managing your weight

Staying a healthy weight cuts your risk of a stroke. Losing weight can also help you to control high blood pressure, and to manage your blood sugar level.

## Talk to other people

You may find that speaking to other people with diabetes is a good way of getting help and support. Diabetes UK runs local groups and care events that give you the chance to meet with other people and find out how they are coping with a similar situation. Contact Diabetes UK to find out more. See *Other sources of help and information* later in this guide.

## Where to get help and information

### From the Stroke Association

#### Talk to us

Our Stroke Helpline is for anyone affected by a stroke, including family, friends and carers. The Helpline can give you information and support on any aspect of stroke.

Call us on **0303 3033 100**, from a textphone **18001 0303 3033 100** or email **info@stroke.org.uk**.

#### Read our publications

We publish detailed information about a wide range of stroke topics including reducing your risk of a stroke and rehabilitation. Read online at **stroke.org.uk** or call the Helpline to ask for printed copies.

## My Stroke Guide

My Stroke Guide is the stroke support tool and online community from the Stroke Association. Log on at **mystrokeguide.com**.

Our Enquiry Line can support you with using My Stroke Guide: call **0300 222 5707** or email **mystrokeguide@stroke.org.uk**.

## Other sources of help and information

### Diabetes UK

**Website:** [www.diabetes.org.uk](http://www.diabetes.org.uk)

**Helpline:** 0345 123 2399

Provides information and support to people living with diabetes, including details of local support groups and how to lead a healthy lifestyle.

### Diabetes Research and Wellness Foundation

**Website:** [www.drwf.org.uk](http://www.drwf.org.uk)

**Tel:** 0239 263 7808

A charity that raises awareness of diabetes and provides support to people living with type 1 and type 2 diabetes.

### NHS Smokefree (England)

**Website:** [www.nhs.uk/smokefree](http://www.nhs.uk/smokefree)

**Smokefree National Helpline:**  
0300 123 1044

### Help me quit (Wales)

**Website:** [www.helpmequit.wales](http://www.helpmequit.wales)

**Helpline:** 0800 085 2219

### Want to stop! (Northern Ireland)

**Website:** [www.want2stop.info](http://www.want2stop.info)

**Tel:** 0808 812 8008

### NHS inform (Scotland)

**Website:** [www.nhsinform.scot/smoking](http://www.nhsinform.scot/smoking)

**Smokeline:** 0800 84 84 84

## About our information

We want to provide the best information for people affected by stroke. That's why we ask stroke survivors and their families, as well as medical experts, to help us put our publications together.

### How did we do?

To tell us what you think of this guide, or to request a list of the sources we used to create it, email us at [feedback@stroke.org.uk](mailto:feedback@stroke.org.uk).

### Accessible formats

Visit our website if you need this information in audio, large print or braille.

### Always get individual advice

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**Together we can conquer stroke.**

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