Diabetes and stroke

Diabetes is a condition caused by too much glucose in the blood. It affects over two million people in the UK. If not treated or controlled well, diabetes can increase your risk of stroke. This factsheet 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.

What is diabetes?

Diabetes is a condition that occurs when the level of glucose (a type of sugar) in the blood is too high because the body is not processing it properly.

Glucose comes from the digestion of starchy and sugary foods (such as bread, biscuits, rice and pasta) and is also produced by the liver.

The hormone insulin is produced by the pancreas (a gland behind the stomach). Insulin helps glucose to enter the cells in your body so it can be used as energy. Insulin also controls the levels of glucose in the blood.

There are two main types of diabetes:

- **Type 1 diabetes** usually - but not always - begins in childhood or adolescence. It occurs when the body does not produce any insulin. This means glucose cannot enter your cells, but builds up in your bloodstream.

- **Type 2 diabetes** is much more common. Over 80 per cent of people with diabetes have this type. It develops gradually - usually occurring in adulthood. Type 2 diabetes occurs when the body does not produce enough insulin, or when the body’s cells do not react to insulin (called insulin resistance). It is a progressive condition which means it usually worsens with time.

Diabetes during pregnancy

Some pregnant women develop high levels of glucose in their blood and their body is unable to produce enough insulin to process it. This is known as gestational diabetes. This usually stops after giving birth. However it may increase the risk of both the mother and baby developing diabetes in the future.
future, and it also increases the risk of the mother developing gestational diabetes in subsequent pregnancies.

What are the symptoms of diabetes?

The main symptoms of diabetes are:
• feeling very thirsty
• frequently going to the toilet to pass urine – especially at night
• extreme tiredness
• weight loss
• genital itching or regular episodes of thrush
• blurred vision.

If you have type 2 diabetes, you may not notice these symptoms at all, or at least not when they first develop. Many people do not realise they have diabetes. In the UK it is estimated that there are up to one million people living 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 increases your risk of developing serious problems with your nerves, eyes, kidneys and blood vessels. Men may also experience impotence.

What is the link between diabetes and stroke?

Diabetes is a major risk factor for stroke. A stroke happens when the blood supply to the brain is interrupted. This could be due to a blockage (called an ischaemic stroke) or due to bleeding in or around the brain (called a haemorrhagic stroke).

Diabetes increases your risk of stroke because high levels of glucose in the blood can damage your arteries, making them harder and narrower (called atherosclerosis). Diabetes also increases the risk of the build-up of fatty deposits in your arteries, which increases the chances of these blood vessels becoming blocked. If this happens in an artery leading to the brain, it could cause a stroke.

People with diabetes are two to three times more likely to have a stroke caused by a blockage than people without the condition, according to research. However, the risk of having a stroke caused by a bleed is probably similar to that of people who do not have diabetes.

What are the risk factors for diabetes?

The main risk factors are:

• A family history of diabetes, particularly if a close relative such as a parent or sibling has the condition.

• Your ethnicity. In the UK, type 2 diabetes is up to six times more common in people of South Asian descent and up to three times more common in people of African or African–Caribbean descent, compared with the general population.

• Being overweight or obese. Type 2 diabetes is closely linked to excess weight. It is estimated that 80 per cent of people diagnosed with type 2 diabetes are overweight. Being overweight reduces the body’s ability to respond to insulin. In particular if you carry extra weight around your waist (called central obesity) you are at a higher risk of developing type 2 diabetes.
• **Age.** Your risk of developing diabetes increases with age. If you are white and aged over 40, or if you are over 25 and are of African, African–Caribbean or Asian descent, you are more likely to develop type 2 diabetes.

• **You have had diabetes during pregnancy.**

Measuring your waist is a quick way of assessing your risk of type 2 diabetes. You are at a higher risk if your waist measures more than:

- 31.5 inches (80cm) for all women
- 35 inches (90cm) for Asian men
- 37 inches (94cm) for white or black men.

**Diagnosis and treatment**

Diabetes cannot be cured, but treatment aims to keep your blood glucose levels as normal as possible, to control any symptoms you are experiencing and to prevent any longer-term complications.

Diabetes is usually diagnosed by urine and possibly blood tests. You will normally be told what your blood glucose level is, and what level it should be.

If you are diagnosed with diabetes, you will work with a diabetes care team – a group of health professionals. This team will normally include your GP, a diabetes specialist nurse and a dietitian. They will guide you in knowing and monitoring your own levels of blood glucose and will monitor other aspects of your health such as your blood pressure and cholesterol.

**Other specialists** you may see as needed include: an eye specialist, such as an ophthalmologist or optometrist, to check for any damage to your eyes because of your diabetes; a podiatrist (chiropodist) to check for any problems with your feet, or a consultant who specialises in diabetes.

**Diet and exercise**

Sometimes the early stages of type 2 diabetes may be controlled through healthy eating and regular exercise, and you may not need to take medication. Your diabetes care team will advise and support you in making any necessary changes to your lifestyle.

**Diabetes medicines**

If you have type 2 diabetes, depending on how high your blood glucose levels are, you may need medication to help control it. This will be in addition to following a healthy diet and taking regular exercise. There are many different types of medication available and your diabetes care team will work with you to find the most suitable one for you. The section below describes the different groups of medication available, although your tablets may have a different brand name depending on who manufactures them:

- **Biguanide.** This type of medicine helps the liver to stop producing new glucose and it helps insulin to carry glucose more efficiently into muscle cells. There is only one type of Biguanide medication, called metformin.

- **Sulphonylureas.** These work on the pancreas helping it to make more insulin and ensure that the body uses insulin efficiently. Examples include glibenclamide, gliclazide and glipizide.
• Alpha glucosidase inhibitors. These slow down the absorption of starchy foods from the intestine, which means blood glucose levels will rise more slowly after eating. There is only one medicine in this group, called acarbose.

• Prandial glucose regulators stimulate the pancreas into making more insulin. Examples include repaglinide and nateglinide.

• Thiazolidinediones (sometimes called glitazones) help the body to respond to its own insulin more efficiently. There is only one medicine in this group, called pioglitazone.

• Incretin mimetics. This type of medication is taken by injection, but it is not insulin. It works by increasing the levels of hormones called incretins. These hormones help the body to only produce glucose when it is needed. Examples include exenatide and liraglutide.

• DPP-4 inhibitors (gliptins) also increase the levels of incretins in the body. They do this by blocking an enzyme called DPP-4 which destroys them. Examples include sitagliptin, vildagliptin and saxagliptin.

Insulin injections
All people with type 1 diabetes, and some people with type 2 diabetes, require insulin injections every day to manage their blood glucose levels. There are different types of insulin preparations available. Some are just injected once a day, others need to be injected several times a day before meals. Your diabetes care team will advise you on what type of insulin is best for you. They will also teach you how to inject yourself and help you with any concerns you may have.

As with all medication, some people may experience side effects. Talk to your GP or diabetes care team if you are experiencing any side effects as there are many different medications you could try.

Reducing your risk of stroke
If you have diabetes, it is important to have regular check-ups with your GP or at a diabetes clinic to make sure your blood glucose and blood pressure stay at healthy levels. All people with diabetes will need to attend a diabetes clinic for a check up at least once a year.

Blood glucose
You will need to keep close control over your blood glucose levels. Check your blood or urine for glucose regularly to ensure it stays at a healthy level. Your diabetes care team will advise you on how often you need to do this. You may be given strips so you can test your urine at home, or a skin prick device so you can test your glucose levels with a tiny drop of blood instead.

Persistently high levels of blood glucose are a sign that your diabetes is not properly controlled and you may need to adjust your diet and/or medication or insulin. Your GP will tell you what to do if your blood glucose levels are above a certain amount.

Blood pressure
You should also aim to keep your blood pressure as low as possible. Doctors now recommend that people with diabetes should have a lower level of blood pressure than those without diabetes. Ideally, your blood pressure should be 130/80mmHg or lower. Your blood pressure can be controlled by following a healthy lifestyle, but you may also need to take medication. (For further...
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information on blood pressure, please see our factsheet F6, High blood pressure and stroke).

**Cholesterol**
Reducing your cholesterol levels can help reduce your risk of stroke, as well as other conditions such as heart disease. For some people, lowering cholesterol can be achieved through eating a diet that is low in saturated fat. However, some people may also need medication to lower their cholesterol levels.

See our factsheet F8, Healthy eating and stroke for more information on cholesterol and how to make your diet healthier.

**Being diagnosed with diabetes after a stroke**
Some people are only diagnosed with diabetes after they have had a stroke and this can be daunting. Some people may find that diabetes has very little impact on their day-to-day life, while others find it has a big impact.

You may find that you need to change your diet, take more medication, and monitor your blood glucose levels frequently, as well as coping with the after-effects of your stroke.

You may feel a range of different emotions about having diabetes. It can take time to adjust to the demands of managing the condition.Try not to feel overwhelmed and take one step at a time. **Speak to your diabetes care team** about how you are feeling and seek information. The organisations listed at the end of this factsheet can help.

**Helping yourself**

- **Eat a healthy, balanced diet.** A healthy diet is one that is low in salt, fat and sugar and includes plenty of fruit and vegetables. Your diabetes care team will be able to give you more information about following a healthy diet and managing your diabetes.

- **Get active.** As well as helping to reduce your blood pressure, regular physical activity can help to control your blood glucose levels, reduce cholesterol levels and maintain your overall fitness. If you are taking insulin, or have not exercised for some time, it is important that you speak to your GP before starting a new exercise regime. The Department of Health recommends that adults do at least 30 minutes of moderate exercise five days a week. See our resource sheet R6, Exercise and stroke for ideas to help you get started.

- **Control your weight.** Excess weight can raise your blood pressure, increase the strain on your heart and increase your risk of stroke, so it’s important to try to shed any excess pounds. If you have type 2 diabetes, losing weight also improves your body’s ability to respond to insulin and helps to control glucose levels.

- **Don’t smoke.** Smoking damages blood vessels that may already be damaged as a result of diabetes. Smoking is also linked to higher blood pressure. There is a lot of help and support available if you want to stop, see our factsheet F19, Smoking and stroke for further information.
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• **Drink alcohol in moderation.** Keep within the guidelines of two units a day for a woman or three units a day for a man.

• **Talk to other people.** Learning about other people’s experiences can be a valuable source of support. The organisations listed below can help.

**Useful organisations**

All organisations are UK wide unless otherwise stated.

**Stroke Association**

**Stroke Helpline:** 0303 3033 100  
**Website:** stroke.org.uk  
**Email:** info@stroke.org.uk  
Contact us for information about stroke, emotional support and details of local services and support groups.

**Diabetes UK**

**Diabetes Careline:** 0845 120 2960  
**Website:** www.diabetes.org.uk  
**Email:** careline@diabetes.org.uk  
Information and support about living with diabetes, including details of local support groups and healthy eating ideas.

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**Diabetes Research and Wellness Foundation**

**Tel:** 023 92637 808  
**Website:** www.drwf.org.uk  
**Email:** enquiries@drwf.org.uk  
Support and advice for people with diabetes.

Disclaimer: The Stroke Association provides the details of other organisations for information only. Inclusion in this factsheet does not constitute a recommendation or endorsement.

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