

# Understanding diabetes

*Your essential guide*



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# How this booklet can help you

**This booklet is an introduction to diabetes for adults who:**

- have been diagnosed with Type 1 or Type 2 diabetes
- are caring for or are family/friends of someone who has diabetes.



**It provides you with information about:**

- the two main types of diabetes
- how to live a healthy, active life with diabetes
- managing the condition
- the short-term and long-term complications associated with having diabetes
- frequently asked questions.

We hope that this booklet will help you learn more about diabetes and to understand that, if properly managed, having diabetes should not stop you from leading a full and active life.

**It is important that** the information in this booklet is used together with advice from your diabetes healthcare team.

# What is diabetes?

Diabetes is a common life-long health condition. There are 2.8 million people diagnosed with diabetes in the UK and an estimated 850,000 people who have the condition but don't know it.

Diabetes is when the amount of glucose in your blood is too high because the body cannot use it properly. This is because the pancreas does not produce any or enough insulin, or the insulin that is produced does not work properly (known as insulin resistance).

**Insulin** is vital for life. It is a hormone produced by the pancreas that helps glucose enter the cells where it is used as fuel by the body.

**Glucose** comes from digesting carbohydrate and is also produced by the liver. **Carbohydrate** comes from different kinds of foods and drink, including starchy foods such as bread, potatoes and chapatis, fruit, some dairy products, sugar and other sweet foods.

If you have diabetes, your body cannot make proper use of this glucose so it builds up in the blood and isn't able to be used as fuel.

**Symptoms** of diabetes include passing urine frequently (especially at night), increased thirst, extreme tiredness, unexplained weight loss, genital itching or regular episodes of thrush, slow healing of cuts and wounds, blurred vision. Symptoms are quickly relieved once diabetes is treated and under control.

**There are two main types of diabetes: Type 1 and Type 2.**

## Type 1 diabetes

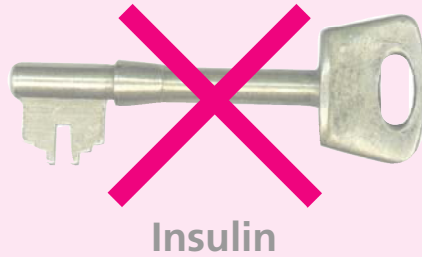
Type 1 diabetes develops when the insulin-producing cells in the body have been destroyed and the body is unable to produce any insulin.

Insulin is the key that unlocks the door to the body's cells. Once the door is unlocked, glucose can enter the cells where it is used as fuel. In Type 1 diabetes the body is unable to produce any insulin so there is no key to unlock the door and the glucose builds up in the blood.

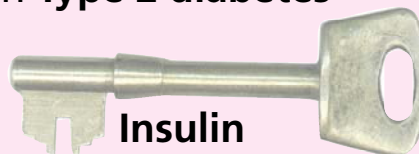
**Diabetes develops when glucose can't enter the body's cells to be used as fuel. This happens because either...**



...there is no key (insulin) to unlock the door to the cells... as in **Type 1 diabetes**



...or the key (insulin) is unable to unlock the door properly and/or  
...the key (insulin) is there, but the lock doesn't work properly... as in **Type 2 diabetes**



Nobody knows for sure why these insulin-producing cells have been destroyed but the most likely cause is the body having an abnormal reaction to the cells. This may be triggered by a virus or other infection. Type 1 diabetes can develop at any age but usually appears before the age of 40, and especially in childhood.

Type 1 diabetes accounts for approximately 10 per cent of all people with diabetes, and is treated by taking insulin daily by injection or pump, a healthy diet and regular physical activity.

## **Type 2 diabetes**

Type 2 diabetes develops when the body can still make some insulin, but not enough, or when the insulin that is produced does not work properly (known as insulin resistance).

Insulin acts as a key unlocking the cells, so if there is not enough insulin, or it is not working properly, the cells are only partially unlocked (or not at all) and glucose builds up in the blood.

Type 2 diabetes usually appears in people over the age of 40, though in South Asian and black people, who are at greater risk, it often appears from the age of 25. It is also becoming more common in children, adolescents and young people of all ethnicities.

Type 2 diabetes accounts for approximately 90 per cent of all people with diabetes and is treated with a healthy diet and increased physical activity. In addition to this, medication and/or insulin is often required.



# Diagnosis

## Coming to term with diagnosis

Diabetes does not wait for a convenient time in life to be diagnosed. Often people are already experiencing other stresses and complications in life (work, home relationships or other illnesses for instance) at the time of diagnosis, which can make diagnosis even harder to deal with.

It is not unusual for people to experience some of the following thoughts and feelings:

- I was healthy and now I'm 'ill' – it feels unfair and I'm angry/depressed.
- What I eat may be risky and that makes me anxious.
- I have to change my whole life. What if I can't manage?
- It's all my fault.
- If I change my lifestyle perhaps my diabetes will go away.
- Complications are inevitable.
- My body is out of control, I feel helpless.

These feelings are very common and part of the process of adapting to having diabetes. Having thoughts like these does not mean that the person is not coping but may be that they need more information or support. This anxiety should lessen once more is learnt about the condition.

## Lifestyle changes and choices

Diabetes is serious and should be treated properly. To achieve the best possible diabetes care, it is essential for you to work with your diabetes healthcare team and use your combined experience and expertise to agree what care and support you need.

Although diabetes cannot yet be cured it can be managed very successfully. This is likely to involve lifestyle changes that will have enormous health benefits and allow you to continue your normal day-to-day life. You will read more about how to make lifestyle changes in the following pages.

# Managing diabetes

The aim of managing your diabetes is to keep your blood glucose, blood pressure and blood fat levels as close to target as possible. This will also help reduce the risk of long-term complications (see page 14). Good control can be achieved through a combination of taking insulin and/or medication as prescribed, eating well and being physically active.

## Blood glucose levels

The table below is a general guide to the target blood glucose levels before and after meals:

### **Type 1 diabetes**

Glucose levels before meals **4–7mmol/l**

Glucose levels 2 hours after meals less than **9mmol/l**

### **Type 2 diabetes**

Glucose levels before meals **4–7mmol/l**

Glucose levels 2 hours after meals less than **8.5mmol/l**

At least once a year your diabetes healthcare team should check your long-term blood glucose control. The most common test is HbA1c, which indicates your blood glucose levels over the previous 2–3 months. The general target is 48 mmol/mol (6.5 per cent) or below.

Each individual's clinical needs will vary, so it is important to discuss with your diabetes healthcare team your individual blood glucose and HbA1c target levels, and whether home blood glucose monitoring is appropriate for you.

### **Controlling Type 1 diabetes**

To help control blood glucose levels in Type 1 diabetes it is necessary to take insulin. Insulin can be administered in different ways, including via a pen, syringe or pump. There are six main types of insulin, which all work for varying lengths of time. Your diabetes healthcare team will discuss the option most suitable for you.



## Controlling Type 2 diabetes

Type 2 diabetes is a progressive condition and over time it may be that following a healthy eating plan and being physically active is not enough to control blood glucose levels. If this happens, your diabetes healthcare team may advise you to start or change medication. Some people with Type 2 diabetes will also need to take insulin to help control their blood glucose levels.

## Blood pressure and blood fats

The table below is a guide to blood pressure and blood fat targets. For your individual target levels speak to your diabetes healthcare team.

<b>Type 1 and Type 2 diabetes</b>	
Blood pressure	<b>130/80mmHg, or 125/75 if you have kidney problems</b>
Total cholesterol	<b>less than 4mmol/l</b>
LDL cholesterol	<b>less than 2mmol/l</b>
HDL cholesterol	<b>1mmol/l or above for men 1.2mmol/l or above for women</b>
Triglycerides	<b>less than 1.7mmol/l</b>

Diet and lifestyle changes may not be enough to achieve these targets and medication may also be needed.

## Medication

If medication is needed to achieve good diabetes control your diabetes healthcare team will discuss the best choice of treatment.

Increasing or changing diabetes medication is not a sign that your diabetes is becoming more severe, but that your diabetes healthcare team are working with you to improve your diabetes management.

If you are taking diabetes medication and/or insulin you are exempt from prescription costs. Ask at your doctor's surgery for a FP92A form.

## Eating well

Food choices and eating habits are important to help manage diabetes, but it should be possible to continue to enjoy a wide variety of foods as part of healthy eating.

### Healthy eating tip

It is better to make small changes that can be maintained, rather than extreme changes that can't.

### Ten steps to eating well

1. Eat three meals a day
2. At each meal include starchy carbohydrate foods
3. Cut down on the fat you eat
4. Eat more fruit and vegetables
5. Include more beans and lentils in your diet
6. Aim for at least two portions of oily fish a week
7. Limit sugar and sugary foods
8. Reduce salt in your diet to 6g or less a day
9. Drink alcohol in moderation only
10. Avoid diabetic foods or drinks



**For more information visit:** [www.diabetes.org.uk/food-and-recipes](http://www.diabetes.org.uk/food-and-recipes)

**Diabetes UK recommends** that everyone with diabetes should see a registered dietitian at diagnosis, and then have regular reviews for specific advice on their eating habits. Ask your doctor to refer you.

## Quit smoking

If you have diabetes, it is particularly important that you don't smoke. Smoking increases your risks of developing complications of diabetes and it may affect blood glucose control and increase insulin resistance. Contact the NHS free smoking helpline: 0800 022 4332

## Keeping active

Physical activity, combined with healthy eating and any diabetes medication that a person with diabetes might be taking, will help manage the condition. Being active is good for all of us, but is especially important for people with diabetes to manage their condition.



Being more active often conjures up thoughts of expensive gym memberships, running on a treadmill and aerobics in a leotard – but this need not be the case. People can become more active by making small lifestyle changes, such as parking the car in the furthest spot in the car park or going for a walk during lunch breaks.



Every form of physical activity counts. The recommended minimum amount of activity for adults is 30 minutes on at least five days of the week. It is recommended that this activity is at moderate intensity, which means an increase in breathing rate, an increase in heart rate to the level where the pulse can be felt, and a feeling of increased warmth.

Activity can be spread out throughout the day into bite-size chunks that may help achieve personal goals and should be at a pace where you feel slightly out of breath to gain the full benefits.

**Remember** it is advisable to talk to your doctor/diabetes healthcare team before you start any new activity and once you are active on a regular basis. If you are on medication and/or insulin, this may need to be adjusted.

**For more information visit:** [www.diabetes.org.uk/keeping-active](http://www.diabetes.org.uk/keeping-active)

# Short-term complications

## Hypoglycaemia

Hypoglycaemia (hypo) means low blood glucose levels – that is, less than 4mmol/l. Hypos can happen when diabetes is treated with insulin and/or with some diabetes medication. Hypos should be treated immediately. If hypos are not treated, symptoms can become worse and a person can become unconscious.

Reasons for a hypo include:

- too much insulin
- too much diabetes medication
- delayed or missed meal or snack
- insufficient carbohydrate
- unplanned or strenuous activity
- too much alcohol or drinking alcohol without food.

Sometimes there is no obvious cause.

Warning signs can include, among others:

- hunger
- trembling
- sweating
- mood change
- paleness.



### What to do

- Immediately take/give a short-acting carbohydrate, eg glass of Lucozade, three or more glucose tablets, five sweets eg jelly babies, glass of fruit juice – quantities will vary for each person and on the circumstances.
- Follow this with a longer-acting carbohydrate, eg half a sandwich, small bowl of cereal, fruit, biscuits and milk or the next meal if it is due.
- If someone is unconscious, dial 999. Never try to give food or drink to someone who is unconscious.

## Hyperglycaemia

Hyperglycaemia (hyper) means having high blood glucose levels. Consistently high blood glucose levels, if left untreated, can lead to a dangerous condition called diabetic ketoacidosis in people with Type 1 diabetes.

The initial symptoms of raised blood glucose levels include passing more urine and feeling thirsty, which can cause you to become dehydrated.

If left untreated symptoms will progress, and include among others nausea and vomiting, drowsiness and eventual unconsciousness.

### What to do

With Type 1 diabetes, if blood glucose levels are 15mmol/l or more, test blood and urine for ketones. If ketones are found call your general practice or go to the nearest Accident and Emergency.

In Type 2 diabetes, diabetic ketoacidosis is very rare, but severe dehydration and very high blood glucose levels can mean emergency treatment in hospital is needed.

Some people who have persistently raised blood glucose levels can mistakenly think they are having a hypo when their blood glucose levels start lowering. If you are able, check your level and **only treat if below 4mmol/l**.

# Long-term complications

Diabetes is serious and, if not well managed, can lead to long-term health complications affecting many areas of the body including your eyes, heart, kidneys, nerves and feet.

By keeping blood glucose, blood pressure and blood fat levels as near to normal as possible, together with following a healthy lifestyle, the risks of developing long-term complications can be reduced. These complications include:

## Cardiovascular disease (CVD)

This includes heart disease, stroke and all other diseases of the heart and circulation. Compared to people without diabetes, people with the condition have about twice the risk of developing a range of vascular diseases.



Poorly controlled blood glucose, blood pressure and blood fat levels increase the likelihood of narrowing and blocking of the arteries. This is known as atherosclerosis. Atherosclerosis can lead to certain areas of the body being starved of essential oxygen and nutrients. If an artery leading to the heart becomes blocked, it can cause a heart attack. If this happens to an artery leading to the brain, it can cause a stroke.

## Eyes (retinopathy)

People with diabetes are at risk of developing retinopathy. Retinopathy is caused when the blood vessels in the retina become blocked, leaky or grow haphazardly. This damage gets in the way of the light passing through to the retina (the 'seeing' part of the eye) and, if left untreated, can damage your vision.





It is recommended that people with diabetes have their eyes screened annually with a specialised digital camera, which can identify retinopathy. Retinopathy can be treated by laser therapy but this will not restore any vision that has already been lost. Research shows that if retinopathy is identified early, through retinal screening, and treated appropriately, blindness can be prevented in the majority of people at risk.

Diabetes is the leading cause of blindness in people of working age in the UK.

Annual retinal screening using a digital camera can help prevent blindness.

### **Kidney disease (nephropathy)**

Kidney disease occurs when the kidneys start to fail. It develops very slowly, over many years. Kidney disease can be a very serious condition, which is why it is very important to detect it at its earliest stage. It is most common in people who have had diabetes for over 20 years. About one in three people with diabetes might go on to develop kidney disease but as treatments improve the condition is managed much more effectively.

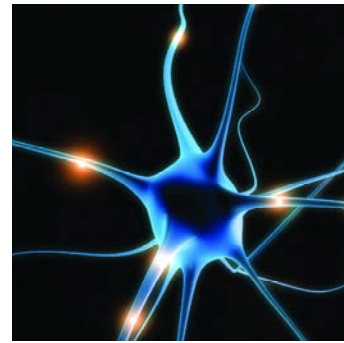


### **Nerves (neuropathy)**

Neuropathy is damage to the nerves. High blood glucose levels can damage the body's nerves, weakening their ability to transmit signals. Raised blood glucose levels can also harm the blood vessels that carry oxygen and nutrients to the nerves.

There are different types of neuropathy:

- **Sensory neuropathy** affects the nerves that carry messages from the skin, bones and muscles to the brain. It is the most common form of neuropathy and mainly occurs in the feet and legs, but can also occur in the arms and hands. It can lead to a loss of feeling and a failure to sense pain. Symptoms include numbness, tingling and extreme sensitivity to touch.
- **Autonomic neuropathy** affects the nerves that control the automatic workings of the body. These include the sexual organs in both men and women (causing erectile dysfunction and vaginal dryness), stomach, intestine, sweat glands and sometimes the heart. Symptoms vary depending on the part of the body affected.
- **Motor neuropathy**, which is very rare, involves the eyes and muscles of the legs and feet. Sometimes painful, it causes muscle weakness and, in areas like the thigh, muscle wasting can occur. If the nerves that supply the muscles in the foot are affected it can lead to the development of foot deformities.



Your diabetes healthcare team will be able to advise on the various treatments available for neuropathy.

**Remember,** if you have diabetes, it is important that you have access to regular health checks with your diabetes healthcare team to identify any problems early, so you can be treated effectively and be supported in achieving good diabetes control.

# Coping with diabetes when ill

For people with diabetes, illness and infections, like other forms of stress, will raise blood glucose levels. This is because part of the body's defence mechanism for fighting illness and infection puts more glucose into the bloodstream and prevents insulin working properly.

Blood glucose levels rise even when a person is off their food or eating less than usual.

## **Important steps to follow when ill include:**

- Test blood glucose levels more often – at least four times a day and four times at night.
- With Type 1 diabetes, if blood glucose levels are 15mmol/l or more, test blood or urine for ketones.
- Continue to take insulin or diabetes medication and adjust the dose in response to test results. For advice on how to do this contact your doctor or diabetes healthcare team.
- Drink plenty of sugar-free drinks.
- If being sick, take carbohydrate containing drinks such as milk and other milky drinks, fruit juice or sugary drinks such as Lucozade, ordinary cola or lemonade.
- If able to eat but have no appetite, eat little and often, taking carbohydrate containing drinks, as above, and snacks such as toast, biscuits and cereal.
- Contact your doctor or diabetes healthcare team if any of the following apply: blood glucose levels are continuously high, ketones in blood or urine, vomiting or diarrhoea or if you are unsure what to do.

It is a good idea to carry some form of medical ID so people will know you have diabetes if you are unwell. Some people carry a card or wear jewellery that has the international symbol of medicine. Ask your diabetes healthcare team or call Diabetes UK Careline (details on back) for further information.

# Frequently asked questions

## **Will having diabetes affect my job or stop me from getting the job that I want?**

Diabetes can be covered by the Equality Act 2010. As a result of this act, it is illegal for employers to refuse someone a job simply because of their disability. Instead their fitness to do the job must be individually assessed. The only employer exempt from the Equality Act is the Armed Forces, where a blanket ban on recruiting people with diabetes still applies. If you feel you have been refused a job because of your diabetes, or have been dismissed from a job for the same reason, it may be worth appealing the situation. For advice contact Diabetes UK's Advocacy Service (020 7424 1840), your local Citizens Advice Bureau, or the Equality and Human Rights Commission ([www.equalityhumanrights.com](http://www.equalityhumanrights.com)).



## **Can I still travel if I have diabetes?**

You do not need to choose special holidays or curb your wanderlust. The key is making the right preparations to minimise any potential problems and have an enjoyable safe trip.

For information visit our website:  
[www.diabetes.org.uk/travel](http://www.diabetes.org.uk/travel)



## **Am I allowed to drive?**

Having diabetes does not mean you need to give up driving but there are important points you need to consider. For further information please visit our website: [www.diabetes.org.uk](http://www.diabetes.org.uk). You may also need to contact the Driving and Vehicle Licensing Agency (Driver and Vehicle Agency in Northern Ireland) – [www.dft.gov.uk/dvla](http://www.dft.gov.uk/dvla)



## **Will I be able to get insurance?**

Having diabetes can affect both existing policies and many new policies that you might choose. Tell your insurance company that you have diabetes – if you don't, it may make your insurance invalid. Shop around for the best deal. Diabetes UK Insurance Services has been set up as a result of the many enquiries we receive from people with diabetes who have trouble getting some insurance products. These policies are also available for people without diabetes. For every policy sold an amount is donated to Diabetes UK. For more information call: 0800 731 7431 or email: [diabetes@heathlambert.com](mailto:diabetes@heathlambert.com)



### **Will I need extra support and where can I get it?**

Support and encouragement can be really beneficial. Support should ideally come from someone you have regular contact with, maybe your partner, a friend, or someone from your diabetes healthcare team. For information on support groups in your area call Diabetes UK on 020 7424 1000 or visit [www.diabetes.org.uk/support-groups](http://www.diabetes.org.uk/support-groups)



### **What education is available?**

NHS guidelines now recommend that people with diabetes be offered patient education programmes, known as structured education. Talk to your diabetes healthcare team about suitable courses available in your area.



### **Where can I get more information on diabetes?**

For support and information contact Diabetes UK Careline on 0845 120 2960, Monday–Friday, 9am–5pm or email: [careline@diabetes.org.uk](mailto:careline@diabetes.org.uk).

For a printed catalogue listing our range of information call Diabetes UK Distribution on 0800 585 088. Or visit Diabetes UK's website at [www.diabetes.org.uk](http://www.diabetes.org.uk)



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