



# Diabetes Research & Wellness Foundation

## What is diabetes?

By:  
Dr Mayank Patel  
Consultant Physician in Diabetes  
University Hospital Southampton  
NHS Foundation Trust



*Staying well until a cure is found...*

# What is diabetes?

In simple terms, diabetes prevents your body converting sugars and starches in your food into energy. This is due to a problem associated with insulin that is needed to do this. With diabetes, the body can either no longer produce insulin, an important hormone (chemical messenger), or the body is resistant to the effects of insulin it does produce.

When we eat food, some special cells in our pancreas should produce insulin. The insulin transports glucose, made from carbohydrates (e.g. complex bulky sugars, which the body breaks down) in the food, into the cells, where it can be used by the body to provide energy. Sugars and starches are the most efficient source of food energy and are carried in the blood as glucose.

If insulin is not produced, or does not work properly, the glucose builds up in the bloodstream instead of getting into the cells, causing the common symptoms of diabetes:

**Lethargy:** carbohydrates cannot be converted into energy.

**Passing water more frequently:** the body removes excess glucose in the urine.

**Thirst:** the body attempts to replace lost fluid.

**Recurrent infections:** bacteria and fungi are attracted to high glucose.

**Unplanned weight loss:** predominantly in type 1 diabetes due to glucose loss and uncontrolled breakdown of body fat.

**Visual changes:** due to temporary changes in lens shape caused by high glucose.

Symptoms happen more often in those with new or existing type 1 diabetes. People with type 2 diabetes may have no, or very few, symptoms, prior to diagnosis.



*Figure 1* Many people living with diabetes use wearable technology-enabled devices to monitor their blood glucose levels to help with self-management, with a reduced need for finger pricks



*Figure 2* Healthy eating plus physical activity are the cornerstones of good diabetes management.

# What are the different types of diabetes?

In **type 1 diabetes**, the insulin producing cells within the pancreas are unable to produce insulin. As a result, insulin has to be administered daily by injection through the skin, or infused via a personal pump device.

With **type 2 diabetes**, the body is more resistant to the usual actions of insulin using glucose as fuel by the body. The risk of developing type 2 diabetes is increased if overweight. In this case, the body is more resistant to the usual actions of insulin in promoting glucose uptake and use as fuel by the body. You may need tablets and/or insulin to help support this. Reducing your weight and being physically active will help to reduce your body's insulin resistance and risk of developing complications, and, in some cases, could lead to remission of type 2 diabetes.

There are also other types of diabetes, such as type 3 diabetes and gestational diabetes, which is related to pregnancy.

## Causes of diabetes

With type 1 diabetes, for reasons not fully understood, the body's immune system produces antibodies to the pancreas, damaging it and preventing it from producing insulin.

Type 1 diabetes accounts for around 10% of all people with diabetes globally and though it most commonly develops below the age of 40, this is not always the case.

Although type 2 diabetes is more likely to affect older people, it is increasingly being found in younger people and children – especially if they are overweight and not very physically active.

Type 2 diabetes is strongly linked to obesity and tends to run in families. It is more prevalent in people of South Asian and Afro-Caribbean descent. Many people with type 2 diabetes have high blood pressure and cholesterol. They may need medication to help control these, to help reduce the risk of damage to key blood vessels alongside glucose-lowering treatment.

Type 3 diabetes is caused by other medical conditions affecting the pancreas.

## Treatments

Type 1 diabetes is always treated with insulin, which has to be injected or infused daily. There are many different types of insulin delivery-mechanisms, and healthcare professionals can help to advise on these for individuals. Insulin injection sites should always be rotated, otherwise fatty pads may build up under the skin if insulin is injected repeatedly in the same area. This can affect insulin absorption and its action on glucose levels. Sharps, needles and lancets always need to be disposed of carefully, with sharps bins available on prescription.

The backbone of treating type 2 diabetes is mainly around encouraging healthy eating choices and physical activity. Type 2 diabetes is a progressive condition and often, over time, tablets and/or other forms of medication do become necessary and may even progress to a need for insulin.

Most people require medication to help manage diabetes, yet fewer than half remember to take them as prescribed. When taking medication, always make sure you know what each tablet or injection is for, any side effects to be expected and when to have a review. Medications are offered to help reduce the risk of longer term damage to the body that diabetes can cause. If you have a concern with your medication, please let your care team know.

## Blood glucose optimal levels

All those with diabetes taking insulin treatment and some of those treated with specific tablets are encouraged to monitor their glucose target levels regularly (**Figure 1**). Generally, the glucose range to aim for is around 4–10mmol before meals and up to 10mmol two hours after meals – although levels must be tailored to individual needs.

These levels should not be confused with a blood test usually performed at your GP surgery called an HbA1c. This gives a measure of the amount of glucose in the blood in the preceding three months – the aim for that is 48–58mmol/mol. However, as with daily glucose target levels, this range may also be personalised depending on the situation.

Insulin and some tablets can reduce blood glucose levels to very low levels making you feel unwell and confused, a condition referred to as a “hypo”; or hypoglycaemic episode. Your healthcare team should discuss this with you if you are at risk of these and how to reduce the risk of them happening. This is especially important if you drive or live alone.

In addition, people living with type 1 diabetes in the UK are also eligible for use of wearable diabetes technology (“sensors”) to help monitor glucose levels that can help reduce the amount of finger-prick glucose testing, though some will still be needed on occasion.

## Basic recommendations

With or without diabetes, as part of a healthy and active lifestyle, we should all try to eat a healthy balanced diet – there is no “diabetes diet”. Of course, occasional “naughty treats” are permitted! The size of the plate matters too. If food intake exceeds physical activity undertaken, weight is likely to increase (**Figure 2**).

## What care to expect

At diagnosis you should be given a full explanation of diabetes and a care plan. You should be involved in agreeing goals and targets achievable by you and offered the chance to attend a diabetes educational event. Take a note of what is agreed. It will come in useful as you see your progress over time. At the very least you should have annual reviews for your diabetes, including an explanation of blood test results. These should ideally be done a week or two prior to the consultation, to allow time for the results to be shared with you.

There is a national programme for eye screening for people with diabetes. You should also, as part of your annual health check, have your feet examined and your blood pressure reviewed. Most importantly, you should have an opportunity to discuss your care with your diabetes team and agree the next steps to support your health needs.

# Top tips to manage diabetes

## Diabetes is never mild, but it can be managed

- **Being as physically active as possible** improves insulin sensitivity.
- **Aiming to keep blood glucose levels at your recommended targets** can help protect the eyes, heart, kidneys and feet.
- **What is your cholesterol level?** If higher than recommended, cholesterol-lowering treatments (like statins) can help protect the heart.
- **Regular blood pressure checks are important**, as keeping at a recommended target level can help protect the heart and kidneys.
- **Smoking is not good for health for several reasons**, but adds risk when combined with diabetes. Both thicken the blood, encourage clot formation, and put a strain on the heart.
- **Aiming for a healthy weight**, even small amounts of weight loss, can contribute to improvements in both overall health and diabetes.

## More information

Your first point of call should be your diabetes healthcare professional. For more information on any aspect of diabetes, please call DRWF on **023 9263 7808**.

You may also contact NHS at the following links and telephone numbers:

### England

Freephone: **111**, 24-hour helpline. NHS 111 service website:

**[www.nhs.uk/using-the-nhs/nhs-services/urgent-and-emergency-care/nhs-111](http://www.nhs.uk/using-the-nhs/nhs-services/urgent-and-emergency-care/nhs-111)**

### Scotland

Freephone: **111**, 24-hour helpline.

NHS 24 website: **[www.nhs24.scot](http://www.nhs24.scot)**

### Wales

Freephone NHS Direct Wales on **0845 46 47**.

NHS Wales Direct website: **[111.wales.nhs.uk](http://111.wales.nhs.uk)**

### Northern Ireland

GP out-of-hours information service website:

**[www.nidirect.gov.uk/out-of-hours-service](http://www.nidirect.gov.uk/out-of-hours-service)**

Or you can visit the NHS Choices website: **[www.nhs.uk](http://www.nhs.uk)**





The Diabetes Research & Wellness Foundation works towards educating, informing and reminding you of the best and healthiest choices to make.

If you would like to become part of our Diabetes Wellness community, visit our website for more details.

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

DRWF, Building 1000, Langstone Park, Havant, Hampshire, PO9 1SA  
Tel: **023 9263 7808**  
Email: **[enquiries@drwf.org.uk](mailto:enquiries@drwf.org.uk)**

Registered Charity No. 1070607  
Registered in England, Company Number 03496304  
Company Limited by Guarantee

Trusted  
Information  
Creator



*Patient Information Forum*

PIFTICK is the only independently-assessed UK quality mark for trusted health information. It is operated by the Patient Information Forum.

Source references can be provided on request  
All details correct at time of print

**V1.0 published: September 2023**  
**Due to be reviewed within**  
**3 years of publication date**  
Printed by Holbrooks Printers Ltd.  
Portsmouth, Hampshire, UK