



Healthcare
Improvement
Scotland

SIGN
Evidence-based
clinical guidelines

Prevention and remission of type 2 diabetes

A booklet for adults, partners, friends, family members and carers



PLAIN
LANGUAGE
COMMISSION
CLEAR
ENGLISH
STANDARD

We would like to thank everyone who contributed to this booklet.

Parts of this booklet were generated using AI to summarise the clinical guideline. The draft was then reviewed and amended as necessary by guideline group members.

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Who is this booklet for?

This information is for people who:

- are at risk of developing type 2 diabetes because of things like age, ethnicity, weight or family history
- have already been diagnosed with prediabetes, impaired glucose tolerance, or high blood glucose when fasting, or
- had diabetes during a previous pregnancy.

This doesn't include children or people not at risk of type 2 diabetes.

Family members, friends and carers may also find the booklet helpful.

Blood glucose levels: Your blood glucose levels are a measurement that show how much glucose (sugar) you have in your blood. Glucose is the body's main source of energy, and maintaining stable blood glucose levels is crucial for overall health.



Prediabetes: This is when your blood glucose is higher than normal but not high enough for a diagnosis of type 2 diabetes.

Remission: This is when your blood glucose levels return to safe, non-diabetes levels in the long-term, and you don't need glucose-lowering medication.

What is this booklet about?

This booklet explains the recommendations in a guideline produced by the Scottish Intercollegiate Guidelines Network (SIGN), about preventing and delaying progression to type 2 diabetes.

Recommendations in the guideline are based on different types of evidence. Some of it comes from current research, some from the clinical experience and opinions of healthcare professionals, and some from people with lived experience.

The booklet will cover:	The booklet will not cover:
<ul style="list-style-type: none">• what type 2 diabetes is• how type 2 diabetes is identified• what you can do to prevent or delay getting type 2 diabetes• how medication can help prevent type 2 diabetes• how type 2 diabetes can be put into remission 	<ul style="list-style-type: none">• those not at risk or children• medication treatments for type 2 diabetes• issues related to type 1 diabetes 

There are two different types of recommendations in the booklet



**Recommendation
based on the research evidence**



**Recommendation
based on clinical experience**

What is type 2 diabetes?

Insulin is a hormone that helps glucose get into your cells. Type 2 diabetes happens when your body doesn't produce enough insulin to regulate your blood glucose, or when your body doesn't respond to the insulin it does produce.

Some people can prevent type 2 diabetes or put it into remission by changing how they live. This booklet explains ways of doing this. You should discuss them with your GP or healthcare team.

About 300,000 people live with type 2 diabetes in Scotland, and 20,000 new cases were diagnosed in 2022. About 500,000 adults are at high risk of developing it.

What are the symptoms of type 2 diabetes?

The main symptoms of type 2 diabetes are:

- peeing more often than usual, particularly at night
- feeling very thirsty
- feeling very tired
- unexplained weight loss
- itchiness around the genital area, or regular yeast infections
- cuts or wounds that heal slowly
- blurred vision (caused by the lens of your eye becoming dry).

What increases the risk of type 2 diabetes?

Conditions like heart disease, high blood pressure and obesity (too much body fat) can increase your risk. Your risk also increases with age. You're more at risk if you're over the age of 25 and your ethnicity is South Asian, Chinese, African-Caribbean or Black African. If you are white, your risk increases over the age of 40.

Weight, age, ethnicity and genetics all play a part. Even if you feel healthy, you might still be at risk if you're living with overweight or obesity.

How is type 2 diabetes identified?

How can I find out if I'm at risk of type 2 diabetes?

You can estimate your risk using tools like [Diabetes UK's Know Your Risk tool](#), which considers factors like age, body mass index (BMI) and family history. BMI is a number that shows if your weight is healthy for your height.

If your self-assessment test shows you are at high risk, make an appointment with your GP so you can discuss reducing your risk.



Because I had a family history of diabetes, I knew I was potentially at risk. So, I thought I'd better complete the survey and find out. When I found out I was potentially at risk, I wasn't shocked. Both of my parents have type 2 and, as they are first cousins, I guessed I would be at risk at some time in my life.

[Read Deborah's story](#)



Recommendation based on the research evidence

You should consider having a risk assessment if you're:

- aged 40 or older
- aged 25 to 39 and belong to high-risk ethnicity groups like South Asian, Chinese, African-Caribbean, and Black African.

Also, if you have conditions that increase the risk of type 2 diabetes, it's important to get assessed.



Recommendation based on the research evidence

If your assessment shows you are at high risk, your GP will offer you a blood test to check whether you have type 2 diabetes or prediabetes.



Recommendation based on the research evidence

If you do a self-assessment or take an assessment at places like a community pharmacy and score high risk, you should share your results with your GP. This helps you get the right follow-up and continuous care, but only with your permission.



Recommendation based on clinical experience

It may be more convenient for you to do a test at a community pharmacy or even at home. If so, it is helpful for your risk score to be shared with your GP so they can follow up with you if needed.

Your pharmacist will ask your permission before sending any information about you to your GP.

Home test kits are available at pharmacies. You can use them alongside advice and support from your healthcare professional.

What types of blood test are used to detect prediabetes?



Recommendation based on the research evidence

There are two types of blood test: the HbA1c test and the fasting plasma glucose (FPG) test.

HbA1c test: You don't need to fast before taking this test. It gives your average blood glucose over the past few months. An HbA1c level of 42 to 47 mmol/mol indicates prediabetes.

FPG test: The FPG test requires you to fast for 8-10 hours beforehand. It measures your blood glucose. An FPG of 6.1 to 6.9 mmol/l indicates high risk.

OGTT test: Another test that might be used is the 2-hour oral glucose tolerance test (OGTT). It assesses how your body processes glucose. After fasting for at least 8 hours, you drink a glucose solution, and your blood sugar is measured before and after.

mmol/mol: This stands for millimoles per mole. A mole is a scientific unit used to measure chemicals. It is a standard measurement for glucose levels.

mmol/L: This stands for millimoles per litre, which is a way of measuring the concentration of glucose in your blood. It shows how many glucose molecules are present in one litre of blood.



Recommendation based on the research evidence

How often you should be checked for prediabetes depends on your risk level. People at high risk but normal blood sugar levels should be reassessed every 3 years. For people at low or intermediate risk, it's every 5 years.



Information

If you have been told you are at increased risk of type 2 diabetes, your healthcare professionals will usually discuss the following things with you in person, on the phone or by video call:

- Any actions you can take that may prevent type 2 diabetes.
- The choices you have at an early stage to prevent type 2 diabetes.
- The seriousness of type 2 diabetes. How it increases the risk of other health issues. What you can do to reduce your risk.
- After discussing prevention options, what follow-up care and treatment you could get.
- Ways of putting type 2 diabetes into remission.
- Weight-loss injections as a preventive measure, if available.
- Where to get information on self-management.
- Support available if you decide not to take preventive action against type 2 diabetes.

There's a lot for you to think about and discuss. If you feel confused, ask for some information to take home and for a follow-up appointment.

It's OK to ask

When you go to your healthcare appointment(s), we encourage you to ask four key questions that will help you and your healthcare professionals make decisions together. This will make sure the care is right for you.

- 1 – What are the benefits of my treatment?
- 2 – What are the risks of my treatment?
- 3 – What alternative treatments can I try?
- 4 – What if I do nothing?

Learn more about [“It's OK to ask”](#)

Learn more about [realistic medicine](#)

After a diagnosis of prediabetes, how can I prevent or delay getting type 2 diabetes?

After getting a prediabetes diagnosis, you may be able to prevent or delay type 2 diabetes by tackling your risk factors.

First, it's crucial to get a personal assessment and advice that considers your needs, preferences and social circumstances. It will give you a plan to follow. But remember that because your circumstances can change, even a tailored plan may need to change after you start following it.



Recommendation based on the research evidence

If you have prediabetes, your risk factors should be reassessed each year. This is an opportunity to discuss how any changes in your lifestyle or social circumstances might affect your level of risk. It can also help motivate you to keep going with any changes you have made to improve your diet and physical activity.



Recommendation based on the research evidence

You can achieve a healthier weight through changes in diet, reducing calories, and taking physical activity supported by other life changes.

After a diagnosis of prediabetes, how can I prevent or delay getting type 2 diabetes? Continued



Recommendation based on the research evidence

If you have a diagnosis of prediabetes, your healthcare professional will do the following:

- Discuss your high risk level and what you can do to reduce it.
- Offer referral to evidence-based programmes supporting diet, physical activity and other personal changes.
- Encourage changes in diet, like eating more whole grains and vegetables while reducing fat intake.
- Encourage you to gradually lose weight by reducing your calorie intake and considering a structured weight-loss programme or referral to a dietitian.
- Discuss your level of physical activity and any barriers you face to taking more exercise.
- Provide access to a personal diabetes prevention programme that involves regular sessions over several months, offers intensive support at the start, and allows time for gradual personal changes.
- Consider online programmes and onward referral to support services if needed.
- Encourage self-management techniques like monitoring your physical activity, weight loss and overall health improvement.



It was quite a shock to find out I had prediabetes. I'd had a blood test at the GP and then got sent a text saying "you're prediabetic, you've been referred to the diabetes prevention programme". [Read Mala's story](#)

How can medication help prevent type 2 diabetes?

Treatment with medication can complement changes like a healthier diet and more physical activity to lower the risk of type 2 diabetes.

You can learn about the different medications on [Diabetes UK's website](#).

Incretin-based therapies

This type of medication works by increasing the level of hormones called incretins. These hormones help the body produce more insulin only when needed and reduce the amount of glucose being produced by the liver when it's not needed. They reduce the rate at which the stomach digests food and empties. They can also reduce appetite.

These treatments are meant to be used alongside eating fewer calories and exercising more. Research has found that these treatments work better when combined with lifestyle changes.

Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) are one type of treatment. They help increase insulin, decrease glucagon (a hormone that raises blood sugar), slow down how quickly your stomach empties, and make you feel full. This can help you lose weight. Liraglutide (Saxenda) and semaglutide (Wegovy) are two examples of this medication. Tirzepatide is a similar therapy.



Recommendation based on the research evidence

To help with weight loss, healthcare professionals can prescribe liraglutide or semaglutide or tirzepatide to adults with a high BMI and prediabetes or type 2 diabetes. This can be an extra support to a healthy diet and physical activity.

Metformin

Metformin improves how your body responds to insulin, which is important for controlling blood glucose in people with type 2 diabetes.

Recommendation based on the research evidence



If your HbA1c or fasting plasma glucose levels aren't getting back to normal even though you've been trying hard with lifestyle changes, metformin might be considered.

Recommendation based on clinical experience



Your kidney function should be checked before starting metformin and then every year. If you're older or there are concerns about your kidneys, your healthcare professional might check more often.

Recommendation based on the research evidence



If you can't tolerate regular metformin, you can try a version called modified-release metformin, which is gentler on your stomach.

Recommendation based on the research evidence



Long-term use of metformin might lead to vitamin B12 deficiency, so your healthcare professional might want to check your B12 levels every year, especially if you have anaemia (low red blood cells) or peripheral neuropathy (nerve damage in the hands and feet).

Orlistat

If you can't tolerate certain medications like incretin-based therapies (see page 12), your healthcare professional might consider prescribing orlistat instead. Orlistat helps people lose weight by blocking some of the fat they eat from being absorbed by their body. This means less fat is stored, helping with weight loss when combined with a healthy diet and physical activity.



Recommendation based on the research evidence

If you have a BMI of 28 or more, you might be considered for orlistat treatment as part of a plan to manage obesity. Your healthcare professional will consider your risk factors and how much weight you need to lose to lower those risks effectively.



How can I put my type 2 diabetes into remission?

Putting type 2 diabetes into remission means getting your blood glucose levels back to normal without needing medication.

You can work towards this by making changes like losing weight, eating better and exercising more. Remission doesn't mean you're cured, but it does mean you're managing your diabetes without medication. To keep it that way, you have to stick to these changes. You reach remission when your HbA1c stays below 6.5% for at least 3 months without medication.

“ You need to have the right mindset as it takes a lot of effort and control but the benefits at the end are so great and worth all the challenges.
[Read Peter's remission story](#)

Recommendation based on the research evidence

One way to reach remission is by following a low-calorie diet (around 800–850 calories each day), sometimes with meal-replacement products, to lose a lot of weight. Then, you slowly start eating regular food again and exercising more.

How can I help myself?



Recommendation based on clinical experience

Your primary care team (at your GP practice) will work with you to adjust your diabetes and blood pressure medications as needed during remission.

Recommendation based on clinical experience

Even though you're in remission, you'll need to stay on the diabetes register for yearly check-ups. These will include routine tests for eye health, HbA1c levels and other standard diabetes care. This ensures you continue to receive the necessary care for diabetes and any other conditions you might have.

Bariatric surgery

Bariatric surgery, also known as weight-loss surgery, helps people lose a lot of weight by making their stomach smaller and changing how it works. This makes you feel less hungry and full faster when you eat.



Recommendation based on the research evidence

If you have prediabetes or type 2 diabetes and have tried non-surgical weight-management treatments, you might be referred for an assessment to see if bariatric surgery is right for you. This is more likely if:

- your BMI is over 35, or over 32.5 if you are from a South Asian, Chinese, other Asian, Middle Eastern, Black African or African-Caribbean background, and
- you agree to the necessary long-term follow-up after surgery, such as lifelong annual reviews.



I had reached nearly 30 stone by the age of 30 and had developed several health conditions including Type 2 diabetes. My wife was pregnant with our first child and I knew that I had to do something to reduce my weight and become healthier so I could be a supportive father. [Read Jason's Bariatric surgery story](#)



Recommendation based on the research evidence

The team assessing you should include specialists in medical, nutritional, psychological and surgical assessments.



Recommendation based on clinical experience

You should be aware that long-term follow-up care is essential. This includes:

- annual checks to monitor diabetes status
- preventing complications after surgery
- education about life after surgery
- understanding the importance of lifelong dietary changes for good health.



Recommendation based on the research evidence

While waiting for surgery, you might get medicine to help manage your weight.

Where can I find more information?

The organisations we have listed below may be able to answer any questions you have and offer support.

SIGN accepts no responsibility for the information they give.



National organisations

Diabetes Scotland/Diabetes UK

www.diabetes.org.uk/in_your_area/scotland

Helpline: 0141 212 8710, Monday to Friday, 9am–6pm

Diabetes Scotland provides a wide range of information on diabetes including leaflets, fact sheets, details of support groups and advice on all aspects of diabetes. The Diabetes UK [Learning Zone](#) offers videos, quizzes and interactive tools for managing diabetes day-to-day which are tailored for each individual.

My Diabetes My Way

www.mydiabetesmyway.scot.nhs.uk

Gestational diabetes elearning site www.elearning.mydiabetesmyway.scot.nhs.uk/courses/gestational-diabetes-course/

My Diabetes My Way is NHSScotland's interactive diabetes website that helps to support people who have diabetes and their family and friends.

Other national organisations

NHS 24

Tel: 111

www.nhs24.scot

NHS 24 is an online and out-of-hours phone service providing the Scottish people with access to health advice and information 24 hours a day, 365 days a year.

Other national organisations continued

NHS Inform

Tel: 0800 224 488

www.nhsinform.scot

This is the national health and care information service for Scotland. It gives information and links to resources. It supports people with diabetes and health conditions that can develop during pregnancy.

Breathing Space

Tel: 0800 83 85 87 (Monday to Thursday, 6pm to 2am, Friday to Monday, 6pm to 6am)

www.breathingspace.scot

Breathing Space is a free and confidential phone and webchat service for anyone in Scotland over the age of 16 who may be feeling down or experiencing depression and need someone to talk to.

British Heart Foundation

Tel: 0300 330 3311

www.bhf.org.uk

The British Heart Foundation provides a telephone information service for people looking for information on health issues to do with the heart. Its website also provides a range of information.

Chest, Heart and Stroke Scotland (CHSS)

Tel: 0131 225 6963

www.chss.org.uk

CHSS aims to improve the quality of life of people affected by chest, heart and stroke illnesses by offering information, advice and support in the community. It produces leaflets on the links between diabetes, heart disease and stroke.

Other national organisations continued

Driver and Vehicle Licensing Agency (DVLA)

www.gov.uk/diabetes-driving

The DVLA is an executive agency of the UK Government Department for Transport. It is responsible for issuing driving licences and vehicle registration certificates. It also records driver endorsements, disqualifications and medical conditions. People who use insulin for more than 3 months to control their diabetes must inform the DVLA.



How are SIGN guidelines produced?

Our guidelines are based on the most up-to-date scientific evidence. We reviewed published evidence-based guidelines that met our high-quality requirements to produce this guideline for people in Scotland. We also asked healthcare professionals to use their clinical experience and judgement to suggest treatments.



1
Identify the questions



2
Search for high-quality guidelines



3
Professionals and people with lived experience agree the recommendations apply to NHSScotland



4
Ask people for feedback



5
Publish



6
Let everybody know about our guidelines

You can read more about us by visiting www.sign.ac.uk or you can phone 0131 623 4720 and ask for a copy of our booklet 'SIGN guidelines: information for patients, carers and the public'.

The Scottish Intercollegiate Guidelines Network (SIGN) writes guidelines which give advice for healthcare professionals, patients and carers about the best treatments that are available. We write these guidelines by working with healthcare professionals, other NHS staff, patients, carers and members of the public.

We are happy to consider requests for other languages or formats.

Please phone 0131 623 4720 or email sign@sign.ac.uk

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