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## Can you reverse type 2 diabetes?

Type 2 diabetes is a disease which can be carefully managed through diet and exercise but its risks have led researchers to explore ways to reduce the harm it causes. One method is putting diabetes into remission.

[Type 2 diabetes](#) is a common chronic illness that affects millions of people in the UK, increasingly young people as well as old. It can affect patients' feet, sight, nervous system, kidneys and blood vessels. It also increases the risk of events like [strokes](#) and [heart attacks](#).

Whilst type 2 diabetes can be carefully managed, new techniques have emerged which can put diabetes into remission. While it is not a cure or reversal, remission means that your blood sugar levels are in the same range as someone who doesn't have diabetes, even though you're not on medication to lower it.

Putting your diabetes into remission doesn't reverse any damage which has already been done to your organs. But it does prevent future damage, and can dramatically reduce the risk of problems with your [kidneys](#), [eyes](#) and [nervous system](#), as well as your risk of heart attack and stroke.

## How is diabetes defined?

In the past, diabetes was diagnosed on the basis of your blood glucose – the level of sugar in your bloodstream at a given time. The two main measurements were your fasting blood glucose and the results of an 'oral glucose tolerance test', which compared your blood sugar before and after drinking a standard dose of a sugary drink.

These days, the blood test most often used to determine whether you have diabetes is called the [HbA1c](#). This measures the average level of your blood sugar over about the previous three months. HbA1c used to be measured in percentages: it's now measured in the UK in mmol/mol.

The [World Health Organization](#) advises that:

- A 'normal' HbA1c is below 42 mmol/mol (6%).
- An HbA1c between 'pre-diabetes' is 42-47 mmol/mol (6.0-6.5%).
- An HbA1c over 48 mmol/mol (6.5%) means you have diabetes.

Diabetes in pregnancy is still diagnosed using an oral glucose tolerance test.

## DiRECT study

The [DiRECT study](#), run by Professors Roy Taylor and Mike Lean, has been the biggest experiment to date into achieving remission through low-calorie diets. People on the DiRECT study exclusively ate shakes and soups containing all their recommended daily nutrients for about 12 weeks - this worked out at around 850 calories per day. The big emphasis in DiRECT was on long-term weight loss maintenance.

In the study, researchers defined 'remission' as having an HbA1c level of less than 6.5% (<48 mmol/mol) after at least two months off all antidiabetes medications for a year after the study.

In a [new paper](#) published this year, the study found that 68 (46%) of 149 study participants put their diabetes into remission. Of the 149 participants, 36 lost at least 15 kg.

The DiRECT trial now has funding to continue to five years, and will look at how people with diabetes might be better supported to maintain the [weight loss](#) and remission. In studies outside the UK, Professor Lean will also look at the link between diabetes, weight and BMI in South Asian, Arab and Black cohorts with diabetes to explore how genetics might affect remission.

## "This is for my health"

Sandra, 68, from East Kilbride, was diagnosed with [diabetes](#) five years ago after a health scare and began the DiRECT trial the year afterwards. She lost 11 kg and her diabetes went into remission.

Life without meals felt isolating at times, she admits: one or two people warned her she'd lost too much weight, and colleagues asked if she wanted to be left alone while they ate lunch. She credits her husband's support for pushing through. "At first, he felt guilty and I had to say to him: 'Look, this is for my health.' And then he was fine," she says.

It took willpower, but surprisingly, she adds, she didn't really feel hungry.

"When I read back my diary, I wrote, 'I'm a bit fed up today and I really want something to eat', but I can't honestly ever say I was hungry. What I missed was the eating, actual chewing of something to eat," explains Sandra.

"When I wanted some tea, I would say to myself, 'Just wait another hour, wait another hour' ... Then, 'Oh, it's 9pm, it's not worth it now.' It's been a success for me, but I think you've got to want to do it."

## Managing remission

Dr Rebecca Haines, a GP in Gateshead and the diabetes lead for Newcastle and Gateshead CCG, has seen a couple of her patients go through the DiRECT trial in her area. She's also seen patients achieve remission through other approaches.

Once on the diet, she explains, it's obvious that most people will at points feel hungry, tired and low on energy. She adds that these diets can sometimes also cause a bit of constipation. The main hurdle, however, comes later.

"On the very low-calorie part of the plan, weight loss is usually rapid which can help to motivate people to continue," she says. "However, the food reintroduction and weight loss maintenance stages can be more difficult - it is important not to fall back to previous eating habits.

"People in the DiRECT trial had intense support from dietitians or practice nurses, and people who are trying to follow this approach on their own may find it hard to access this level of support."

Those living with their families might find it particularly hard to eat low-calorie diets and maintain weight loss, while the rest of their family eats differently, she adds.

Unfortunately, Dr Haines points out, achieving remission is still something people will need to pursue through private means at the moment: "Very low-calorie diets are not currently part of routine NHS diabetes care. There are private companies who provide support and dietary products for this approach, but the cost is a challenge or barrier for many people.

"If people are taking this approach privately, it is really important to discuss with their diabetes team, especially if they are on medication for type 2 diabetes or hypertension, as this will need to be reviewed and probably stopped, with monitoring of blood glucose and blood pressure."

## The future of diabetes remission

Douglas Twenefour, a dietician and deputy head of care at [Diabetes UK](#), says that although the DiRECT or very low-calorie diets would not be hard to incorporate on the NHS, at the moment few people can access them this way.

"Remission is achieved primarily through weight loss management," he explains. "You can see that we have existing infrastructure, but that infrastructure is not specific to delivering what was delivered in DiRECT."

But for Professor Lean, sharing trial results could not be more urgent.

"Type 2 diabetes is only there because people are gaining weight, weight that in some cases goes into their pancreas and their liver," says Lean. "This is a horrible, horrible disease - your 10-year survival rate is worse with type 2 diabetes than with [non-Hodgkin's lymphoma](#). Why aren't we treating it equally vigorously? We should be going for remission."

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