

Q&A

Type 2 diabetes remission

Professor Roy Taylor

Questions submitted by the *Diabetes & Primary Care* editorial board and readers

Part 1: Supporting remission

Q What is type 2 diabetes remission and how is it defined?

The ADA/EASD/DUK consensus definition of diabetes (Riddle et al, 2022) has three main criteria for remission:

- HbA_{1c} has to be in the non-diabetic range (<48 mmol/mol or <6.5%).
- Off all glucose-lowering drugs.
- At least 6 months after commencing a weight loss programme (and more than 3 months after stopping all glucose-lowering drugs).

Q What would be your top tips for encouraging people with type 2 diabetes to look at possible remission?

I find the following points persuasive to assist motivation to achieve potential remission of type 2 diabetes:

- Regain your health! Instead of a future of ever-increasing tablet taking, get back to normal.
- Do you really like taking those tablets? Successful weight loss guarantees at least a decrease in number of blood pressure tablets and, possibly, being able to stop all diabetes tablets.
- People who do this usually say, “I feel 10 years younger.”
- They also say that achieving 15 kg weight loss is simpler than they thought – it is a challenge but so worthwhile.
- Type 2 diabetes is not a nice condition. It causes premature heart attacks and threatens your eyes, kidneys and feet.
- Pay less for your holiday insurance!

Q If people are unable to participate in the NHS Type 2 Diabetes Path to Remission programme but still wish to try**to put their diabetes into remission, how can we best support them?**

The best resource is the new [Type 2 diabetes remission toolkit for General Practice](#), published in this issue of *Diabetes & Primary Care*.

For an explanation of the simple mechanisms behind type 2 diabetes and a fuller account of how to do it, read the book [Life Without Diabetes](#) by Roy Taylor (2nd Edition, 2025). This is written with a clear aim to inform healthcare professionals, even though it is primarily for people with diabetes to read themselves.

The [Newcastle University remission website](#), regularly updated, was created in 2011 when the first paper on dietary remission received widespread media coverage, and a deluge of emails from patients and doctors had to be handled.

Q Do you think the NHS Type 2 Diabetes Path to Remission programme should be extended to those with a BMI <27 kg/m² (<25 kg/m² in ethnic minorities)?

Yes, for several reasons. One is that it has now been formally demonstrated that people with BMI <27 kg/m² and type 2 diabetes have exactly the same underlying cause of their diabetes as do heavier people – more fat inside the vital organs than they personally can tolerate. In other words, they have exceeded their Personal Fat Threshold. People in the <27 kg/m² range may achieve remission with only ~10% weight loss (the median weight loss to achieve remission in the ReTUNE study was 6.5%; Taylor et al, 2023).

A second reason is that people in this BMI range usually find it much easier to avoid any subsequent weight regain; in health-economic terms, you get more bang for your buck. Thirdly, in ethnic minorities, type 2 diabetes occurs at lower BMIs, reflecting the relevant background

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Materials to support practice-based care aimed at the attainment of remission through total diet replacement in people who are ineligible for the NHS Path to Remission Programme.

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population; type 2 diabetes is commoner and its effect on bringing about premature cardiovascular disease is more severe. Note that cultural beliefs have to be recognised and approached as effectively and sensitively as possible.

Q NHS England has reduced the number of places available on remission programmes for people living with diabetes this year. How do we work with the Department of Health and Social Care going forward to make sure remission is higher up on the agenda? It's an important aligned pathway with the obesity workstreams.

Feeding back to DHSC about satisfaction of patients achieving remission is important, as is spreading widely the information published from NHS England's first-year report (Valabhji et al, 2024). However, it is the health-economic benefit that is likely to turn heads at the Department.

The 5-year report on the DiRECT study showed a halving of rates of hospitalisation for any serious medical problem and a major decrease in the incidence of cancers. That analysis fed into a recent independent report from the Association of Royal Medical Colleges and Wellcome Trust, which found that applying the low-calorie approach across the country would save over £1 billion annually (Frontier Economics, 2025).

Q The DiRECT study achieved impressive rates of type 2 diabetes remission at 1 year but remission rates fell steadily in subsequent years. Once remission is achieved, what guidance would you suggest for its maintenance?

This is a critical issue. Life happens, and sudden worries and stresses cause loss of focus on keeping food intake under control. Weight regain most commonly happens rapidly during some crisis – anything from illness in the family to problems at work, financial worries, etc.

It is vital to explain before commencing on the programme that weight regain may occur from time to time but must not be regarded as a failure; it is just something to be dealt with once the crisis has passed. Rescue using low-calorie liquid meals can be used when appropriate, and indeed was

needed at some point in half of all the DiRECT study participants.

If, on the other hand, weight regain is slow and steady, advise an appraisal of food/drinks and quantities consumed (not forgetting alcohol), and then recommend cutting down on the least favourite sources of extra calories.

There are also some tips to minimise any weight regain:

- Avoid ready-meals and takeaways, as they can result in overeating and early post-meal hunger.
- Avoid biscuits, confectionery and sugar-containing drinks such as fruit juices.
- Only eat at meal times.
- Eat slowly and focus on enjoying the food.
- Never do anything else whilst eating (e.g. watching TV), as this tends to result in too much food slipping down unnoticed.
- Keep a written record of weekly home weighing.
- Beware of social occasions when eating food may be expected. Plan how to cope in advance.
- Ideally, increase daily distance walked by building this into routine activities.

Q Given the evidence supporting the use of pioglitazone to benefit metabolic dysfunction-associated steatotic liver disease (MASLD), should we be using it more to counter insulin resistance, improve glycaemic control and facilitate the path to remission?

Pioglitazone achieves a distinct but moderate decrease in liver fat by increasing the capacity of subcutaneous fat, and hence moving fat out of the liver. Side effects of the drug have to be considered, however, including overall weight gain and osteoporosis. Successful dietary weight loss, on the other hand, brings about a complete reduction of liver fat levels to the normal range.

Instead of pioglitazone, use of the modern appetite-suppressant drugs (e.g. GLP-1 and dual incretin receptor agonists) is now far preferable – if an individual is unable or unwilling to try the rapid dietary weight loss method.

Finally, don't forget that real-life series of people taking these drugs show far lower average weight loss than in the tightly controlled clinical trials (Gasoyan et al, 2025).

Part 2: Assessing and coding remission

Q Would you prefer a diagnosis of “diabetes in remission” or to leave a person with HbA_{1c} <48 mmol/mol on cardioprotective medications like metformin or an SGLT2 inhibitor, rather than trying to wean them off with adequate monitoring to confirm whether remission has been achieved?

A person achieving weight loss-induced remission of diabetes also achieves complete normalisation of cardiovascular risk; QRISK3 on average returns to the normal score for people of the same age and sex without any diabetes (Melhem et al, 2021; Jesuthasan et al, 2022). It is important to remember that people who are in the pre-diabetes range, steadily moving towards type 2 diabetes, have abnormal lipid metabolism which puts them at high risk of cardiovascular disease. But after a weight loss-induced decrease in HbA_{1c} to the non-diabetic range, the lipid metabolism is corrected and risk decreases to levels that are non-significantly different from background risk.

And the evidence goes beyond just risk scores. By applying the modern remission criteria to data from the long-running weight loss study Look AHEAD, it has been demonstrated over 12 years of follow-up that achieving remission for 4 or more years brings about a 55% reduction in cardiovascular events, and that even if remission is only sustained for one year it brings about a 33% decrease (Gregg et al, 2024; [Brown, 2024](#)).

So the person sitting in front of you who has achieved sufficient weight loss to be in remission does not need extra medications; they have normal risk for their age. However, they do need to remain under observation, as weight regain may occur and other risk factors may change.

Remember that SGLT2 inhibitors **must not** be used during calorie restriction (i.e. the weight loss phase). There is a considerable risk of normoglycaemic ketoacidosis, as ketogenesis is accelerated by the lack of post-meal rise in plasma glucose.

Q If someone was started on an incretin therapy for obesity (not diabetes), and they remain off all other diabetes

medications after a remission programme but continue on their incretin therapy, would you still consider that person to be in remission?

They will have achieved all the health benefits of remission and can be reassured about this. However, by the strict letter of the Consensus definition of remission (Riddle et al, 2022), they cannot be coded as such.

As new data emerge, the remission criteria are likely to be clarified to permit use of incretin-based agents specifically, but there should be no rush to do this as the benefits of achieving a uniform consensus should be allowed to accumulate for some years yet.

Q In cases where HbA_{1c} is an unreliable guide to glycaemic control (e.g. haemolytic anaemia), how would you assess remission?

The remission consensus guideline recommends measuring fasting blood glucose if HbA_{1c} is likely to be unreliable, using 6.9 mmol/L or less as indicating remission (Riddle et al, 2022).

Clearly, some people may be misclassified whatever definition is used, but in practice this is far less variable than the myriad of differences between individuals. We do have to adopt clear criteria, but always considering them in the light of the individual in front of us.

Q Is there a consensus on how we should code people who have type 2 diabetes, then go into remission, then develop diabetes again, so that it is clear how long they have had diabetes and how long they were in remission?

This is a good question, as people who achieve remission but then put on weight and re-enter diabetes still have a major reduction in cardiovascular risk (Gregg et al, 2024).

As far as I know, there is no accepted method of coding for this, and carrying such uncertainties has to remain at the heart of personal medicine. Coding must reflect the ambient state of health, but knowledge should feed into management decisions that the person in front of you has diabetes but has already substantially modified their cardiovascular risk.



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Diabetes Distilled: Diabetes remission in the real world

Early data from the NHS Type 2 Diabetes Path to Remission programme show it is effective in achieving remission at scale outside of clinical trials.

Diabetes & Primary Care
26: 145–7

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33–55% lower rates of CKD
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achieved remission.

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Q Would a person who is classed as “in remission” from diabetes be able to receive medication via a Patient Group Direction (PGD) that was written for people with diabetes (example: presents with a foot infection, and PGD states diabetic foot infection)?

If a person develops a foot infection they may well have already lost remission – cue for an urgent plasma glucose test. People in remission are advised to remain under annual review, and this presumably would be in the practice diabetes clinic. In that regard, in the absence of any official decision about this, in the real world I would advocate that the PGD should apply.

Part 3: The remission evidence base

Q Are there any data on how complication risk reduces depending on time in remission?

Yes: the Look AHEAD data collected over 12 years following initial remission as mentioned above. For cardiovascular disease, there was a 34% decrease if remission was achieved for 1 year, a 41% decrease if achieved for 2–3 years, and a 49% decrease if for 4 years or more. For chronic kidney disease, there was a 24% decrease if in remission for 1 year, a 27% decrease with 2–3 years, and a 55% decrease with 4 years or more.

These risks are almost back to the levels present in people without diabetes of equivalent age, weight and sex. They are normalised completely if remission is maintained. It is thought that these time course data probably reflect the “metabolic memory” phenomenon seen in other circumstances.

Note that the central change brought about by weight loss is normalisation of hepatic lipid metabolism, and this achieves two parallel sets of changes: normalising glucose control and normalising lipoprotein output for the liver (hence the major cardiovascular benefit).

Q Do people who need to stay on an SGLT2 inhibitor for heart failure or chronic kidney disease, but who otherwise would be in remission (e.g. weight loss 15% and HbA_{1c} much lower than

48 mmol/mol, albeit on medication) get similar reductions in complications to those not on medication? Is there evidence for a differential impact on macrovascular or microvascular complications?

If a person has established chronic diabetic kidney disease and achieves remission, I would personally err on the side of continuing the SGLT2 inhibitor until resolution of the kidney disease (i.e. albuminuria) is confirmed. On the other hand, I most certainly would not recommend prescribing an SGLT2 inhibitor for most people who achieve weight loss-induced remission.

We simply won't have solid data on comparable risks, but the fact that risks are normalised with continuing remission is good news that should be passed on to our patients. With regard to microvascular disease, this is likely to regress with prolonged remission, as judged from other circumstances of normalising metabolic control (such as induction of long-term very tight control in type 1 diabetes).

Q There have been a few papers suggesting that remission from pre-diabetes/NDH, compared to just staying in the pre-diabetes range, reduces cardiovascular risk. Should we, thus, be aiming for an HbA_{1c} under 42 mmol/mol for added benefit?

People who are currently in the pre-diabetes range of HbA_{1c} are at raised risk of cardiovascular disease, and sufficient weight loss to normalise HbA_{1c} is highly likely to normalise QRISK as well. So yes, pre-diabetes should be treated by weight loss as this corrects the known pathophysiological processes which are driving the risk.

We can be clear that when HbA_{1c} remains under 48 mmol/mol following weight loss-induced remission of type 2 diabetes itself, evidence from the Counterbalance, DiRECT and Look AHEAD studies shows return of cardiovascular risk to background levels for the same age, weight and sex (Melhem et al, 2021; Jesuthasan et al, 2022; Gregg et al, 2024). So I would point out that pre-diabetes and “post-diabetes” are two distinct states, and that the latter is associated with lower cardiovascular

risk even though HbA_{1c} is 42–47 mmol/mol in both. The critical matter is that hepatic lipid metabolism has normalised following weight loss.

However, because the formal studies of remission have involved groups with diabetes duration of <6 years, there is less outcome information about microvascular disease.

For the person in the clinic in front of you, it is important to measure QRISK and to take appropriate action, as talking about group averages misses out on inevitable individual variation.

Q Is there any evidence of a differential benefit depending on how people lose weight and achieve remission? Will achieving remission with high-dose incretin drugs for obesity achieve the same benefits as losing weight and reducing HbA_{1c} using behaviour change?

The importance of the dietary weight loss method devised to test the Twin Cycle hypothesis is that it is a “pure” intervention uncomplicated by drug or other effects. It is the weight loss that is bringing about reductions in liver and pancreas fat, and the mechanism is identical following bariatric surgery. As healthcare professionals, we must understand the pathophysiology of disease.

The same is true for the new GLP-1 drugs, as the hard data show no direct long-term effect on the beta-cells but merely a dramatic decrease in appetite. The main snag with use of these drugs, however, is that weight regain after stopping is much more rapid than after the low-calorie diet programme because there has been no acquisition of the skill to judge the quantity of food consumed. ■

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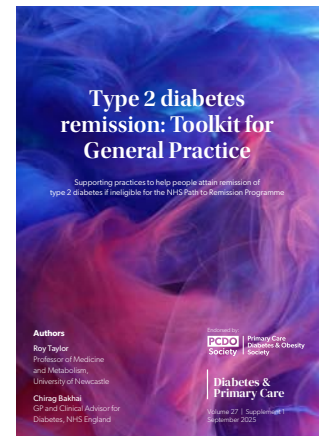
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Useful resources

Type 2 diabetes remission toolkit

Materials to support practice-based care aimed at the attainment of remission through total diet replacement in people who are ineligible for the NHS Path to Remission Programme.

[Access here](#)

Newcastle University diabetes remission site

Basic information on remission and the understanding behind it.

[Access here](#)

Life Without Diabetes (2nd edition) by Roy Taylor

A readable account of the discovery of the reversible nature of type 2 diabetes and detailed information on how to achieve this. Written primarily for people with diabetes, but with a clear underlying intention to provide information for doctors and medical students.

[Publisher's website](#)