

Can type 2 diabetes be reversed?

The short answer is in many cases.

This whole article covers the longer answer(s), but first I'd like to say a few words about your diabetes care team, assuming you have one. These are likely to be intelligent, hard working, well educated men and women who care about you, and about their professional reputation. They are likely to follow national/professional guidelines, and have probably been taught that type 2 diabetes is chronic and progressive. That's also what their experience with the majority of their patients has reinforced.

They may or may not be immediately supportive of any attempts by you to reverse your type 2 diabetes. They are important to involve in the process as they allow you to keep an eye on how well anything you do is or isn't working for you.

If you are on insulin or any other treatment that can lead to hypoglycaemia (excessively low blood glucose), you must proceed cautiously.

If you decide to take steps to reverse your diabetes by following this site, and/or working with me one-on-one, please print the copy of this report [here](#), and take one to each of your immediate care team, e.g. your doctor, nurse, dietician etc. Please also get the go ahead from your doctor before taking up any vigorous exercise.

When is type 2 diabetes considered reversed or in remission?

The short answer is that it's when you no longer meet the criteria for type 2 diabetes as shown in the table below.

USA and UK Criteria for the Diagnosis of Impaired Fasting Glucose, Impaired Glucose Tolerance, and Type 2 Diabetes

	Impaired Fasting Glucose	Impaired Glucose Tolerance	Type 2 Diabetes
	'pre-diabetes'		
Fasting plasma glucose (mmol/L / mg/dL)	6-7 / 100-125		7.8 / 126 or above
2-hour plasma glucose* (mmol/L / mg/dL)		7.9-11.0 / 140-199	11.1 / 200 or above
HbA1c (% / mmol/mol)	5.7-6.4% / 42-47		6.5% / 48 or above

* The glucose 2 hours after an oral glucose tolerance test using 75 g of glucose.

Values taken from the National Diabetes Clearing House (USA) and National Health Service (UK). Most countries will have very similar criteria.

Different criteria for reversal or remission exist ¹, and the studies cited in this article have used different criteria. For practical purposes, reversal or remission would mean normal fasting glucose and normal HbA1c. Stricter criteria have been used in some studies that

measured insulin production and insulin resistance more directly, but such measurements are usually only done in studies and not widely available.

How can type 2 diabetes be reversed?

A few approaches to reverse type 2 diabetes have been documented in peer-reviewed studies. To date, the major focus has been on bariatric surgery which basically forces people to eat considerably less than they otherwise would ²⁻⁴

Because of the relative success of gastric surgery, especially gastric bypass, many have speculated that it is something about the procedure that makes it so beneficial ^{5,6}.

However, studies have shown that very low calorie diets (400-800 kcal/day) on their own have similar effects in terms of both weight reduction and reversing type 2 diabetes when calorie reduction is similar to that immediately following bariatric surgery ⁷⁻¹².

Less extreme diets, and diet and exercise combinations have also been studied ¹³⁻¹⁷. There is some research suggesting that it is carbohydrate reduction not exclusively calorie reduction that is responsible for the positive effects ¹⁸⁻²⁰. Very low calorie diets are by their nature low carbohydrate in absolute terms, meaning they contain less than 100 g of carbohydrate a day. More on that in future posts.

How quickly can type 2 diabetes be reversed?

Fasting, especially when this is continued past 24 hours can have a dramatic effect in terms of reducing blood glucose ²¹. Unsurprisingly then, the bulk of improvement in glucose control following calorie restriction with ²²⁻²⁴, and without bariatric surgery are commonly observed within a week ^{9,11,25}.

Who can and who can't reverse their type 2 diabetes?

There is no definitive answer. Duration and severity of diabetes in terms of drug and/or insulin treatment, as well as weight reduction following low calorie intake with and without bariatric surgery appear important ²⁶⁻³⁰.

In practical terms, it's quicker and easier to reverse type 2 diabetes if you've been diagnosed more recently, and/or are on minimal or no medication, and not on insulin.

What are the benefits of reversing type 2 diabetes?

Everyone will have different reasons for wanting to try and reverse their diabetes, so the perceived benefits are also going to be individual. Eliminating the need for medication eliminates any related costs and side-effects, including hypoglycaemia, especially for those previously taking insulin. There is limited research showing what happens long-term after bariatric surgery, what there is shows that the risk of heart attacks goes down ³¹. The same would be expected for other diabetes related complications, but without large studies lasting decades, it's not possible to say by what degree.

Improvements with lifestyle changes without surgery are likely to be even greater, although more difficult to sustain. The reason is that the more changes you make to improve your health, the more benefits you would expect. Surgery just forces people to eat smaller amounts, it doesn't require people to eat a more health promoting diet, exercise regularly, or otherwise live a more health promoting life.

Can reversal of type 2 diabetes be sustained?

The thing to understand is that if you do reverse your diabetes, you aren't 'cured' (please see previous article). If the underlying drivers of diabetes return, so will the condition. Barring other conditions that affect the pancreas, diabetes remission is likely to last as long as dietary, exercise, and other aspects of lifestyle support it.

If you can't sustain reversal of type 2 diabetes indefinitely, are there benefits?

Even if type 2 diabetes eventually returns, you still get extra years of better health, quality of life and financial savings. There is even work showing that heart health and related aspects of health stays improved for many months, maybe years following weight regain

31-34.

Conclusion

There is now substantial reputable evidence published in peer reviewed scientific journals that type 2 diabetes can be reversed in a large proportion of people.

Reversal can be complete, in that normal insulin and glucose metabolism is restored without medication, or partial, which includes reduction to complete removal of medication and/or insulin therapy.

Reversal of type 2 diabetes has been achieved using different forms of bariatric surgery, very low calorie diets, and lifestyle related weight reduction.

Given this evidence, it is incorrect to describe type 2 diabetes as either irreversible or inevitably progressive. Even if reversal is not fully achieved or not sustained indefinitely, there is considerable benefit to aiming for reversal.

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