

# Why I adopted a reduced carbohydrate approach

**Ron Raab**

Having lived with diabetes for many years, Ron Raab noticed that when he reduced the amount of carbohydrate in his diet, his blood glucose levels improved. His experience of the shortcomings of high-carbohydrate dietary recommendations in regulating his blood glucose led him to adopt an alternative approach. In this article, the author outlines his choice of a much reduced carbohydrate dietary intake as a key element of his diabetes management. He also highlights the logic of this approach and some of its supporting evidence, and describes the major contradictions inherent in the high-carbohydrate recommendations that constitute mainstream advice.

I was diagnosed with type 1 diabetes in 1957, at 6 years old. After 40 years, I had developed some complications: eye damage (retinopathy) and nerve damage (neuropathy), including delayed stomach emptying (gastroparesis). Over the years, I tried hard to keep good blood glucose levels and applied the standard high-

carbohydrate, low-glycaemic advice. But I could not achieve consistently near-normal blood glucose. As I tried harder to achieve better blood glucose outcomes I was having severe 'hypos', and my diabetes complications were worsening. I had to conclude that the high carbohydrate advice did not work.

In 1998, I became aware of an alternative approach consisting of a low-carbohydrate, low-glycaemic-index food plan, with a moderate intake of protein and a variable intake of unsaturated fat, which also results in reduced insulin doses. After much experimentation, I have reduced my total daily intake of carbohydrate from over 250 g to around 80 g.

## Some results

Since adopting the low-carbohydrate approach, my insulin requirements have fallen by 50% – to 25 units daily. My HbA<sub>1c</sub> has greatly improved. Variations in my daily blood glucose levels are reduced; episodes of hypoglycaemia are less severe. As noted by my ophthalmologist, my retinopathy has stabilized. My blood pressure remains normal, and lipids have remained in the normal/acceptable range throughout most of the period since I started this regime.



Calories can be obtained from healthy unsaturated fat by adding olive oil to a salad.

Very importantly, hunger has decreased (insulin is an appetite stimulant, and this regime has resulted in much less insulin). I am more motivated, feel less frustrated, and my subjective quality of life and outlook have improved enormously.

I do not regard this food plan as 'radical' or a 'fad'. It should not be confused with the extreme nutritional plans, which are periodically given

publicity. This is not a 'high-protein diet'; protein content is chosen and adjusted in part based on what gives a feeling of satiety.

#### **Rationale**

In *Diabetes Voice* in 2002, the Secretary-General of the International Society for Paediatric and Adolescent Diabetes commented that: 'Nutritional management is commonly described as one of the cornerstones of diabetes

care (...); unfortunately, it is the cornerstone which may be least understood, most under-researched, and to which there is the poorest adherence.'

Why are people with diabetes advised to eat so much carbohydrate? It should be born in mind that this is a food type that is the root cause of blood glucose instability and which increases the need for insulin – in turn creating further problems. *Lowering*

daily carbohydrate intake makes sense for many reasons. The greater the intake of carbohydrate, the more unpredictable is the timing and size of the resultant increase in blood glucose. This is exacerbated by the variability of insulin absorption (the impact and timing of the action of insulin in lowering blood glucose). This variability increases as the quantity of injected insulin increases.

**A high intake of carbohydrates results in more erratic and unpredictable blood glucose profiles.**

All of which means that a regimen consisting of a high intake of carbohydrates – even complex, slowly absorbed carbohydrates – results in erratic and unpredictable blood glucose profiles, compared to a low-carbohydrate, low-insulin regimen.

#### *Gastroparesis and other complications*

Gastroparesis, provoked by diabetes-related nerve damage, further adds to variable and unpredictable blood glucose levels. This condition, which is very common in people with long-standing diabetes, can be very unpleasant, with symptoms ranging from mild discomfort to acute pain. Gastroparesis highlights many of the wrong things with the high-carbohydrate advice. In people with gastroparesis, large amounts of carbohydrate can remain in the stomach for variable periods of time. Then, unpredictably, and possibly very suddenly, these are ‘processed’ or ‘emptied’ with the resultant blood glucose varying greatly.

The large amounts of insulin that are injected by people with gastroparesis on a high-carbohydrate diet continue acting, contributing to highly variable blood glucose levels and the possibility of major hypos. The risk of hyperglycaemia is increased, as at some point, the carbohydrate is digested, resulting in a rapid and drastic rise in blood glucose.

Clearly, recommendations to consume high levels of carbohydrates are a formula for very variable blood glucose levels and hypos. Indeed, this is the experience of many people with diabetes.

There are other implications of high-carbohydrate recommendations. A possible relationship exists between high insulin doses and the development of vascular disease, including heart disease, independent of any other factor.

**‘Dead-in-bed’ syndrome may be caused by large amounts of insulin taken to match a high carbohydrate intake.**

A growing body of evidence describes the role of even brief increases in post-meal blood glucose levels in the development of disabling and potentially life-threatening diabetes complications. It is speculated that ‘dead-in-bed’ syndrome may also be caused by the large amounts of insulin taken by people trying to match their high carbohydrate intake – in many cases tragically resulting in a life-ending hypo.

#### **What to eat?**

This is a simple and practical regime; a wealth of satisfying and tasty low-carbohydrate snacks and meals are readily available or can be easily prepared. Here is one example of a satisfying meal that contains 10 g to 15 g of carbohydrate and 120 g of protein:

- soup made from stock
- garden salad with olive oil
- a medium-sized serving of fish or vegetable protein
- cooked vegetables (no potatoes or similar)
- coffee with a small amount of milk.

Such a meal requires very few units of insulin – in my case 3 to 4. Compare this to the effects of a meal with 100 g or more of carbohydrate: more insulin is required in response, resulting in considerably greater variability and unpredictably in blood glucose levels, and worse outcomes.

Importantly, in a high-carbohydrate system it becomes extremely difficult to estimate accurately the intake of carbohydrates. Food labelling provides only an approximation of carbohydrate content. In a meal consisting of 100 g of carbohydrates, a 20% error in estimating translates into 20 g of carbohydrate either over or under-compensated (by the action of a dose of insulin). This compounds unpredictability in blood glucose levels. The degree of error described above can be very significant; the treatment for a hypo is about 20 g of glucose.

As an aside, the glucose tolerance test, which is widely used in the

diagnosis of diabetes, uses 75 g or 100 g of carbohydrate to test the body's mechanism for regulating blood glucose. 'Standard' dietary advice in effect obliges people with diabetes to metabolize the equivalent (the type of carbohydrate might differ, but the volume is the same) of three glucose-tolerance-test loads every day! What is the sense in recommending that a person who has major problems metabolizing carbohydrate consume such a huge carbohydrate load every day?

### Why recommend so much carbohydrate?

One of the historical reasons for the traditional dietary recommendations for people with diabetes – and indeed, the general population – relates to heart disease and other vascular disorders, which have been attributed to an increased intake of fat.

In order to reduce the amount of fat consumed while meeting the target intake of calories, a decision was taken to recommend increasing the amount of carbohydrate in people's diet. However, this was done without examining the contribution of carbohydrate itself to heart disease and obesity, the implications for people with diabetes of higher carbohydrate intake in terms of varying blood glucose levels, or the negative effects from the large amounts of insulin that are required to attempt to control blood glucose.

It is not difficult to have a food regime that is low in carbohydrate, low in saturated fat and higher in unsaturated fat – thus helping to provide the

required energy. A simple example of the calories that can be obtained from healthy unsaturated fat is adding olive oil to a salad. Two tablespoons of olive oil yield 360 calories – a significant amount in terms of daily needs – and this can be quite easily augmented in other ways with other unsaturated fats. The premise that a high carbohydrate intake is essential to meet calorific needs of people with diabetes, because of the risk of heart disease, is clearly not the case.

**We will see a reduction in the diabetes epidemic when there is a major change in dietary recommendations.**

### Conclusion

The current recommendations overlook a fundamental reality: blood glucose levels in people with diabetes vary with increasing unpredictability as the consumption of carbohydrate increases. A reduced intake of carbohydrates requires smaller amounts of insulin, resulting in increased predictability and smaller variation in blood glucose levels.

The tools exist to maintain continuously near-normal blood glucose levels. This approach has improved my life enormously. Yet only small numbers of people benefit from this because high-carbohydrate recommendations continue to be the standard advice. A more detailed description of my experience can be found on a website which was established in order to introduce this approach to more people (see address below).

A final comment relating to the prevention of type 2 diabetes: a high intake of carbohydrates contributes to the development of diabetes and impaired glucose tolerance in people who are susceptible (see 'Further reading' below). This has enormous implications. We will see a reduction in the current diabetes epidemic only when there is a major change in dietary recommendations. No amount of new medications or other approaches will achieve this for the simple reason that they do not address one of the major underlying causes: the amount of carbohydrate in the diet.

#### Ron Raab

Ron Raab is President of Insulin for Life and a Past Vice-President of the International Diabetes Federation.

To learn more about the low-carbohydrate approach, visit [www.diabetes-low-carb.org](http://www.diabetes-low-carb.org)

#### Further reading

- 1 Westman EC, Feinman RD, Mavropoulos JC, et al. Low-carbohydrate nutrition and metabolism. *Am J Clin Nutr* 2007; 86: 276-84.
- 2 Arora SK, McFarlane SI. The case for low carbohydrate diets in diabetes management. *Nutr Metab (Lond)* 2005; 2: 16.
- 3 Volek JS, Feinman RD. Carbohydrate restriction improves the features of Metabolic Syndrome. Metabolic Syndrome may be defined by the response to carbohydrate restriction. *Nutr Metab (Lond)* 2005; 2: 31.