

## **Low carb diets and type 1 diabetes**

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Low carbohydrate diets are increasingly being suggested as an option for people with type 1 and type 2 diabetes. Some people with type 1 have been exploring whether low carbohydrate diets can improve their blood glucose control, their health outcomes and quality of life with type 1.

There is very little research evidence on the health outcomes for people with type 1, but here we review what we do know at the moment, including possible risks.

### **Adults with type 1**

At the moment, there is simply not enough evidence to say whether or not low carb diets have an overall positive or negative long term impact on health outcomes for adults with type 1 diabetes. Very small studies (10 participants or less) have indicated that:

- Restricted carbs may lead to reduced weight, lower insulin doses, and improved HbA1c,
- Indications are mixed about whether there is improvement in glucose level variation, one trial finds an improvement, one found no improvement as measured with continuous glucose monitoring
- Low carb diets may make people less sensitive to glucose taken to treat a mild hypo
- 'Low carb' may cause ketone bodies and free fatty acid levels to be higher, as the body breaking down fat for energy instead of using carbohydrates, some advocates suggest these can be adapted to provide energy for the brain – SEE 'What is Not Known'

A further Swedish study retrospectively tracked 48 people with type 1 who had decided to adopt a low carb diet, and had attended a course to do so. 23 people stuck to the diet over four years. They appeared to have reduced risk of complications and better HbA1c, but the study also indicates that eating low carb can be tough to stick to over a prolonged period of time.

What is not known:

The effect of reducing carb intake to very low levels and following a ketogenic diet may result in lower blood glucose levels. Although the brain can use ketones for a fuel in place of glucose the implications from a legal perspective in relation to driving and DVLA recommendations is not known.

The effect of exposure to ketones on unborn babies is unknown, there has been an association between high levels of ketones and adverse pregnancy outcomes. It is not clear if this is an effect of poor diabetes control or the ketones.

### **Children with type 1**

Growing clinical evidence in this area shows that low carbs may have a significantly detrimental effect on children with type 1 diabetes, as both carbohydrates and insulin are essential for growth. Standard dietitian advice is that low carb diets are not appropriate for children and young adults who are still growing.

A review of six cases of children on low carb, high protein diets showed that the children experienced low energy levels, very high blood pressure for their age, high cholesterol, weight loss or gain that was slow for their age and increased hypoglycaemia. The authors conclude that these cases support the current clinical guidelines that children with type 1 diabetes should be eating a diet that balances proteins, fats, carbohydrates and is high in fruit and vegetables.

**What next?**

If adults are considering a low carb diet it is very important that they discuss it, and all of the potential health consequences, with their diabetes team first. This is so that their wider nutritional and health needs can be considered in order to support them in developing a sustainable way to manage their diabetes.