

Low and very low carbohydrate diets in Type 1 diabetes

Dietetics

Patient information

What is this information about?

This information is for adults with Type 1 Diabetes who want to follow a low or very low carbohydrate diet.

Why have I been given this information?

You have been given this information because, if you decide you would like to follow this diet, you will need to read the advice below to make sure that you stay well.

There are some important things to be aware of like adjusting your insulin dose, and possible side effects. It is also really important that you speak to your dietitian before you start this diet.

Keep this information in a safe place so that you can refer to it, for example, when you are preparing meals.

What is a low or very low carbohydrate diet?

At the minute, there is no agreed definition of what a low or very low carbohydrate diet is.

Some research suggests that:

- Under 130 grams of carbohydrate per day is a low carbohydrate diet.
- 20 to 50 grams of carbohydrate per day is a very low carbohydrate diet. This is also called a ketogenic diet.

How might a low carbohydrate diet help me to control my diabetes?

A low carbohydrate diet is not recommended in type 1 diabetes.

However, eating fewer carbohydrates, particularly those that are refined, processed, or have low fibre, could be good for your overall health and help stabilise your blood sugars. This may result in weight loss and improved insulin sensitivity.

This could be beneficial if you are overweight or have insulin resistance and will help you to have better control over your diabetes.

What are carbohydrates?

Carbohydrates are a macronutrient found in food. The other macronutrients are fat and protein. Most foods contain a mix of carbohydrates, fats and proteins.

Carbohydrates break down to glucose in the blood. They are the body's best source of energy. If your body does not have carbohydrates, it will use protein and fat for energy instead.

Some carbohydrate foods contain essential vitamins, minerals and fibre. These form an important part of a healthy diet.

Carbohydrates can be categorised into the following groups:

- **Starchy:** bread, pasta, potatoes, breakfast cereals, yams and cous cous. Starchy carbohydrates that are high in fibre release glucose into the blood slower than sugary foods and drinks.
- **Naturally occurring sugars:** whole fruits, milk and yoghurt.
- **Free sugars:** sweets, chocolate, sugary drinks, syrups and honey.

What is fibre?

Fibre is a type of carbohydrate found in the cell walls of foods that come from plants. It is not digested so it does not increase blood glucose.

There are two types of fibre:

- **Insoluble fibre:** this helps to keep the digestive system healthy and is found in wholegrains like brown rice, granary bread and wholegrain cereal

- **Soluble fibre:** this improves digestion and reduces blood cholesterol slightly. It is found in fruit, vegetables, pulses, linseeds, oats and barley.

Evidence suggests that 30 grams of fibre per day lowers the risk of heart disease, stroke and bowel cancer.

What should I do if I want to reduce how much carbohydrate I eat?

If you have type 1 diabetes and you want to reduce how much carbohydrate you eat, it is really important that you are supervised by a dietitian before you make this change, and while you are following this diet.

We do not recommend that people follow a very low carbohydrate diet, because at the moment there is no strong evidence that it is helpful for people with type 1 diabetes. But if you do want to try a very low carbohydrate diet (also called a ketogenic diet), we will support you with this.

Will cutting down on carbohydrates help me to lose weight?

If an adult with type 1 diabetes is overweight and trying to lose weight, then reducing overall intake including calories from carbohydrates, fats, proteins and alcohol can help.

Cutting out carbohydrates does not necessarily mean cutting down on calories if it is being replaced with other foods that contain the same amount of calories.

How can I follow a low or very low carbohydrate safely?

If you do decide to follow a low carbohydrate diet or a very low carbohydrate (ketogenic) diet, here is some important information to be aware of:

Insulin

- Speak to your healthcare team so they can help you adjust your insulin to reduce your risk of hypos.
- Testing your blood glucose levels regularly, including between meals, is important to see how your blood levels are responding. Be aware that if you spend long periods of time with low blood glucose levels, you may lose your hypo awareness.
- Adjust your insulin doses according to the carbohydrate in each meal by using your usual insulin to carbohydrate ratio (ICR). If you regularly experience glucose levels below 4mmol/L, you may need to reduce your ICR or reduce your basal insulin.
- If you are doing planned physical activity, remember to reduce your insulin.
- If you are doing unplanned physical activity you may need to take extra carbohydrate.
- It is important to note that protein can also raise blood glucose, although not as much as carbohydrate. You may need to take a small dose of insulin to counteract the slower rise in blood glucose from protein.

Fats

- Choose oils or fats that are high in heart healthy polyunsaturated and monounsaturated fats. For example, avocado, nuts, seeds, oily fish and olive, rapeseed and vegetable oil.
- Try to limit saturated fats such as butter, cheese, ghee, meat fat and coconut oil.

Dairy

- Choose low saturated fat (less than 1.5 grams in every 100 grams) and low sugar (less than 5 grams in every 100 grams) dairy products. For example, Greek or natural yoghurt, skimmed or semi skimmed milk or fortified soya milk (containing calcium, vitamin B12 and iodine). These products are an excellent source of protein and micronutrients.
- Cheese should be eaten in moderation. Lower fat cheeses include cottage cheese, soft cheese, ricotta, quark and reduced fat cheddar.

Protein

- Aim to include a lean source two to three times daily. For example, poultry, fish, other seafood, eggs, soya, tofu and Quorn.
- Pulses are also a good source of protein and fibre. Replacing potato, rice and pasta with pulses will reduce your carbohydrate intake.
- Limit your intake of red and processed meat to maximum of 70 grams per day. This is the equivalent of two thin slices of roast meat.
- Aim to include two portions of fish per week, including one source of oily fish, for example salmon, mackerel, trout, herring, pilchards and sardines.

Vegetables, salad, pulses and fruits

- The fibre in vegetables, salad, pulses and fruit all go towards the recommended minimum of 30 grams of fibre per day. Eating a variety of these is good for your gut health and will add flavour, taste and texture to your meals. Your meals should include a minimum of two portions of vegetables or salad items.

Starches

- Choose higher fibre or lower glycaemic index (low GI) options. Low GI means that foods are digested more slowly and cause a lower rise in blood sugar. This includes oats, sweet potato, brown basmati rice, new potatoes, quinoa and wholegrain pasta instead of white refined carbohydrates such as white bread, rice and pasta. Wholegrains contain more fibre and essential vitamins and minerals.

How much should I drink?

Typically, the average adult needs between 1.5 to 2 litres of fluid every day. This is the same as about six to eight mugs.

Keeping hydrated (drinking enough) is important for good health and to prevent constipation. Checking the colour of your urine (wee) is an easy way to check if you are drinking enough.

Your urine should be clear or pale straw in colour. If your urine is dark yellow or orange this is a sign of severe dehydration (you have not had enough to drink) and you need to drink more.

Sugar-sweetened drinks should be avoided unless they are being used to treat hypoglycaemia.

Can I drink alcohol on a low carbohydrate diet?

Alcoholic drinks are high in calories. This can make losing weight hard.

Drinking lots of alcohol can over time make it harder for your body to absorb nutrients from food. This means it will use up essential vitamins and minerals.

Try to keep within the recommended weekly amount of 14 units of alcohol per week for both men and women. Choosing diet mixers, spirits or dry wine will reduce your carbohydrate intake.

What are the possible side effects of a low carbohydrate diet?

Depending on the approach, a low or very low carbohydrate diet could lead to unpleasant side effects such as constipation (hard or difficult poo) and bad breath. These side effects are often temporary but speak to your healthcare team if you are concerned.

Who can I contact for further information and advice?

For further information or to provide feedback please contact:

St Richard's Hospital

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