Eating well with Type 1 diabetes
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Introduction

Balancing your diet when you have Type 1 diabetes can be challenging but it is important. Making sensible food choices and adapting your eating habits will help you manage your diabetes and protect your long-term health. The good news is that you should still be able to enjoy a wide variety of food.

In this booklet, you will find out about the importance of carbohydrate in your diet and how knowing how much carbohydrate you eat can be an effective way of managing your diabetes.

Taking steps to balance your diet is also good for your overall health so you’ll also find more general information about healthy eating too in this booklet.

You’re likely to have lots of questions about your diet and we’ve tried to answer the most common ones. A registered dietitian should be able to answer any further questions.

Diabetes UK recommends that everyone with diabetes should see a registered dietitian at diagnosis, and then have regular reviews for specific advice on their eating habits.
Your diet and diabetes

What is Type 1 diabetes?
Diabetes mellitus is a condition in which the amount of glucose (sugar) in the blood is too high because the body cannot use it properly. Glucose comes from the digestion of foods or drinks containing carbohydrate and from the liver which makes glucose.

Insulin is vital for life. It is a hormone produced by the pancreas, that helps glucose to enter the cells where it is used as fuel by the body. Type 1 diabetes develops when the insulin-producing cells (beta cells) in the pancreas have been destroyed and so no insulin can be produced. Nobody knows for sure why this happens but the most likely cause is the body's immune system developing an abnormal reaction to the cells (autoimmune). This may be triggered by a virus or other infection.

Good blood glucose control is important in the management of diabetes. Because of the link between eating carbohydrate and blood glucose levels, we have answered some of the most common questions about carbohydrate below.

What is carbohydrate?
Carbohydrate is a nutrient that is an important source of energy in the diet. All carbohydrates are broken down into glucose, which is used by the body's cells as fuel. Carbohydrate can be classified in a number of different ways, but essentially there are two main types, starchy carbohydrates and sugars.

Starchy carbohydrates include foods like bread, pasta, chapatis, potatoes, yam, noodles, rice and cereals.
Sugars include table sugar (caster, granulated etc), and can also be found in fruit (fructose), and some dairy foods (lactose). They can often be identified on food labels as those ingredients ending with -ose.
Another type of food that can affect blood glucose levels are nutritive sweeteners, including polyols. If you are unsure what these are, they tend to end in \(-\text{ol}\), e.g., sorbitol, maltitol, xylitol and mannitol.

**Why is carbohydrate important?**

Since all carbohydrate is converted into glucose, some people with diabetes wonder if it would be better not to have any carbohydrate in their diet to keep their blood glucose levels under control. This is not recommended as:

- glucose from carbohydrate is essential fuel for the body, especially the brain
- high fibre carbohydrates, such as wholegrain and fruit also play an important role in the health of the gut
- some carbohydrates may help you to feel fuller for longer after eating.

**How does carbohydrate affect my diabetes?**

All carbohydrate is converted into glucose. In someone without diabetes, the glucose level in the blood would be matched by insulin produced by the pancreas as shown below:

**Normal insulin release:**

![Insulin levels in blood graph](image)
In Type 1 diabetes the same principle applies but instead of the pancreas producing insulin, the carbohydrate is matched by insulin injections or an insulin pump. Most people follow twice daily or basal bolus insulin regimes as explained in the following section.

**Twice daily insulin:**

If you are taking two injections a day, knowing the amount of carbohydrate you are eating can help you balance it with your insulin so that your blood glucose levels stay under control. You should eat roughly the same amount of carbohydrate at similar times each day. For example, at your main meal try to fill about a third of your plate with starchy carbohydrate.

More carbohydrate than usual can cause blood glucose levels to go too high and less than usual can cause a hypo (low blood glucose levels).
Basal bolus insulin:

If you are using a basal bolus insulin regime or pump you can be much more flexible in adjusting the timings of and the amount of insulin you take with the amount of carbohydrate you eat and drink. This can be done by 'counting carbohydrates'. See 'What is carbohydrate counting?'— page 8. If you prefer fixed times and doses of insulin, it may be better to follow the principles for the twice daily insulin regime (left page).

How much do I need?
The actual amount of carbohydrate that the body needs varies depending on your age, weight and activity levels, but it should make up about half of what you eat and drink over the course of a week. For good health most of this should come from starchy carbohydrate, fruits and some dairy foods, with a small amount of your total carbohydrate to come from added sugar or table sugar. (see pages 15-17 for a clearer guide).
What is carbohydrate counting?

Carbohydrate counting is a method of matching your insulin requirements with the amount of carbohydrate you eat and drink. For many people with diabetes, it is an effective way of managing the condition that, once mastered, will lead to better blood glucose control, greater flexibility and freedom of lifestyle. It is an approach that requires a great deal of time and effort with guidance from a diabetes healthcare professional. To do it successfully you will need to learn all about carbohydrates, learn how to adjust your insulin and be dedicated to monitoring your blood glucose levels frequently.

How can I learn more about carbohydrate counting?

You will need the support of healthcare professionals either in the form of your diabetes healthcare team or through one of the structured carbohydrate-counting courses. Talk to your diabetes healthcare team about courses available in your area. It is important that the course you attend meets certain criteria. Although there is no formal accreditation scheme you can find courses that have met criteria set by the Diabetes Education Network by visiting: www.diabetes.nhs.uk/downloads>Type_1_Education_Network.pdf

Courses don’t suit everyone so, if this isn’t for you, talk to your nurse and dietitian about arranging some one-to-one education. Also see www.diabetes.org.uk/carb-counter
Ten steps to eating well

Although balancing carbohydrate and insulin is the most important task in managing your diabetes, eating a healthy balanced diet plays a vital role in benefiting your health by keeping your weight, blood fats and blood pressure under control.

1. Eat three meals a day. Avoid skipping meals and space out your breakfast, lunch and evening meal over the day. This will help control your appetite and your blood glucose levels especially if you are on twice daily insulin.

2. At each meal include starchy carbohydrate foods such as bread, pasta, chapatis, potatoes, yam, noodles, rice and cereals. The high fibre varieties of starchy foods will also help to maintain the health of your digestive system and prevent problems such as constipation. The amount of carbohydrate you eat is important in controlling your blood glucose levels.

3. Cut down on the fat you eat, particularly saturated fats, as a low fat diet benefits health. Choose unsaturated fats or oils, especially monounsaturated fat (e.g. olive oil and rapeseed oil) as these types of fats are better for your heart. As fat is the greatest source of calories, eating less fat will help you to lose weight if you need to. To cut down on the fat you eat, here are some tips:
   - Use less saturated fat by having less butter, margarine and cheese.
   - Choose chicken, turkey, lean meat and fish as low fat alternatives to fatty meats.
   - Choose lower fat dairy foods such as skimmed or semi-skimmed milk, low fat or diet yogurts, reduced fat cheese and lower fat spreads.