Southport Hospital
Town Lane, Kew,
Southport, Merseyside,
PR8 6PN
Telephone: 0151 426 1600

Ormskirk Hospital
Dicconson Way, Wigan Road,
Ormskirk, Lancashire, L39 2AZ
Telephone: 01695 577 111

www.MerseyWestLancs.co.uk

NHS
Mersey and West Lancashire
Teaching Hospitals
NHS Trust

Carbohydrate counting

Patient information leaflet for Patients / Guardians

If you need this leaflet in a different language or accessible format please speak to a member of staff who can arrange it for you.

اگر به این بروشور به زبان دیگر یا در قالب دسترس‌پذیر نیاز دارید،
لطفاً با یکی از کارکنان صحبت کنید تا آن را برای شما تهیه کند.

Jeśli niniejsza ulotka ma być dostępna w innym języku lub formacie,
proszę skontaktować się z członkiem personelu, który ją dla Państwa przygotuje.

Dacă aveți nevoie de această broșură într-o altă limbă sau într-un format accesibil,
vă rog să discutați cu un membru al personalului să se ocupe
de acest lucru pentru dumneavoastră

如果您需要本传单的其他语言版本或无障碍格式，请联系工作人员为您安排。

إذا احتجت إلى هذه النشرة بلغة أخرى، أو بتنسيق
يسهل الوصول إليه، يرجى التحدث إلى أحد الموظفين لترتيب ذلك لك.

Author: Paediatric Diabetes Dietitians
Department: Paediatric Diabetes Team
Document Number: MWL2877
Version: 001
Review Date: 31/10/2028

What is Carbohydrate counting?

Being able to carbohydrate count means you can work out the carbohydrate content of all the meals and snacks you eat. We will show you how to work out the carbohydrate content of your meals and snacks by reading food labels, weighing foods and by using books and apps.

Why is Carbohydrate counting important?

During digestion all foods containing carbohydrate are broken down into glucose which is a form of sugar. Glucose is then absorbed into your blood stream and transported around your body. Insulin is needed to move the glucose from your blood into the body cells where it is used to provide energy. Insulin is sometimes described as the “key” to the “door” of the cells. Without insulin, the door to the cell remains shut, the body cannot use the glucose for energy and the blood glucose levels rise.

By calculating the carbohydrate content of your food you will be able to work out the amount of bolus insulin you need to give with that meal or snack. The more carbohydrate you eat the more bolus (or fast acting) insulin you will need to keep your blood glucose in target and to give you energy.

Notes

Team contact details

Paediatric Diabetes Dietitians
01695 656 867

Paediatric Diabetes Specialist Nurses
01695 656 766

Children's Ward
01695 656 912

How does carbohydrate counting help me?

Carbohydrate counting can help you to control your blood glucose levels and avoid low blood glucose levels (hypoglycaemia) and high blood glucose levels (hyperglycaemia).

Being able to carbohydrate count also gives you more flexibility about what, when and how much you choose to eat and you do not need to keep to rigid mealtimes or portion sizes.

However it does not mean total freedom to eat whatever you want in excess as this would be unhealthy for anyone, but carbohydrate counting allows special occasions and treats to be more easily incorporated and insulin adjusted accordingly.

Steps to follow to Carbohydrate count a meal or snack

- Identify which foods contain carbohydrate in the meal or snack.
- Calculate the carbohydrate in the meal or snack.
- Calculate the insulin bolus to cover this carbohydrate.

Blood glucose should always be checked before a meal to see if a correction dose of insulin is required. The diabetes team will discuss correction doses with you at a later time.

Which foods contain Carbohydrate?

Carbohydrate comes from starches, added sugars (for example sucrose, maltose and glucose) and natural sugars (fructose or fruit sugar and lactose or milk sugar). When these foods are eaten they will be digested and broken down into glucose or some form of sugar.

What foods should be counted?

- Starchy carbohydrates – all types of bread, potatoes, pasta, rice, chapattis, breakfast cereals, noodles, couscous, quinoa, bulgar wheat, bread products and all foods containing flour e.g. pastry, crackers, pancakes, chicken nuggets, fish fingers, fish or meat in batter/ breadcrumbs.

- Vegetables – all types of potatoes, yams, squashes, cassava, plantain, parsnips, pulse vegetables –sweetcorn, baked beans, other beans, peas, chickpeas, dahl and lentils.

- Fruit (contains fructose—a fruit sugar) - all fresh, frozen or tinned fruit, dried fruit, fruit juices and fruit smoothies.

- Milk (contains lactose—a milk sugar) - milk, yoghurt, fromage frais, drinking yoghurt, milkshake, custard, milk puddings e.g. rice pudding.

- Foods containing sucrose (sugar) and/or starch e.g. biscuits, cakes, muffins, cookies, brownies, doughnuts, sweets, chocolate, chocolate biscuits, ice cream, mousse, trifle, cheesecakes and other desserts, jams, honey, syrup, table sugar. Be cautious with portions of these foods.

The ICR is the number of grams of carbohydrate covered by 1 unit of fast acting insulin. The ICR varies from person to person and is affected by age, activity and weight, some people might have a different ICR for each meal. The diabetes team will advise on what your ICR is and explain how to check the ICR.

How is the fast acting insulin bolus calculated using the ICR?

- Add up the carbohydrate from all the foods in the meal or snack that you are having, to reach a total carbohydrate amount.

- Divide the total carbohydrate amount for the meal or snack by the weight of carbohydrate in the ICR for that meal to give the suggested dose of fast acting bolus insulin.

For example:

- If breakfast has 50g of carbohydrate and the ICR is 1 unit: 10g carbohydrate then the calculation is 50g÷ 10g = 5 units fast acting bolus insulin.

- If lunch has 60g carbohydrate and the ICR is 1 unit: 15g carbohydrate then the calculation is 60g ÷ 15g = 4 units fast acting bolus insulin.

When is Bolus Insulin given?

The bolus insulin should be given 15 minutes before the meal or snack. If the bolus is given after the meal the blood glucose will be rising before the insulin is working, and this can cause more erratic blood glucose levels.

Tips to help with Carbohydrate counting

- Keep digital scales and a calculator to hand in the kitchen.
- Once you have worked the carbohydrate out for a food make a note of it and the portion size in a notebook.
- When you have weighed a typical portion of food e.g. cooked pasta, put it into a cup or bowl so you know how much of the food they hold, or work out the number of spoonfuls so you will not need to weigh it every time.
- Try to become familiar with what portions of food look like on a plate at home as this will help you judge how much carbohydrates is in food when you are out.

How accurate do I need to be?

It is important to be as accurate as possible as this will help control your blood glucose levels. Try to weigh all of your portions when you are at home to ensure your carbohydrate counting is accurate. The more accurate you are at home, the easier it will be to estimate when you are out.

Working out how much Insulin to give with meals and snacks

Once the carbohydrate content of the meal has been calculated you can then work out how much insulin to give for the meal. This is called the bolus insulin. To work out the insulin bolus you also need to know your insulin to carbohydrate ratio (ICR).

Which foods do not need to be counted?

- Most vegetables if not on the previous list (depending on your portion).
- Fresh unprocessed protein foods e.g. meat, chicken, fish, eggs, soya and tofu.
- Cheese.
- Butter, margarine and cooking fats and oils.
- Water, sugar free squash and cordial and diet fizzy drinks.

Remember if carbohydrates are added during processing you need will need to count those foods e.g. breadcrumbs, batter, pastry, sausages.

How to count Carbohydrates

- Reading food labels.
- Weighing foods and calculating carbohydrates from their nutritional labels.
- Using nutritional books, apps and websites.

Reading food labels

All packaged food labels have nutrition information for the main nutrients including carbohydrate. The carbohydrate information is usually listed as per 100g of food and sometimes also per portion. The portion value is useful for foods like slices of bread, biscuits, yogurts where you tend to eat the suggested portion size.

However if you are going to eat a different amount to the suggested portion you will need to work out the amount of carbohydrate in your portion. See the section on Weighing foods and calculation of carbohydrates from nutrition labels.

When reading food labels:

- Use the ‘carbohydrate’ value not the ‘of which sugars’ or ‘of which starch’ values.
- Check what the portion size is e.g. If there are 2 biscuits in a pack the portion size may be 2 biscuits but you may only eat 1 biscuit.
- Use the ‘per portion’ figure where the suggested portion is the same as your portion, e.g.1 slice of bread,1 biscuit, 1 pot of yogurt.
- The traffic light labelling system often displayed on the front of food packaging cannot be used for carbohydrate counting as this only gives values for sugars.

Carbohydrate counting when eating out

Many of the large chain restaurants, cafes and fast-food outlets publish their nutritional information online and some also have printed information available in the restaurant.

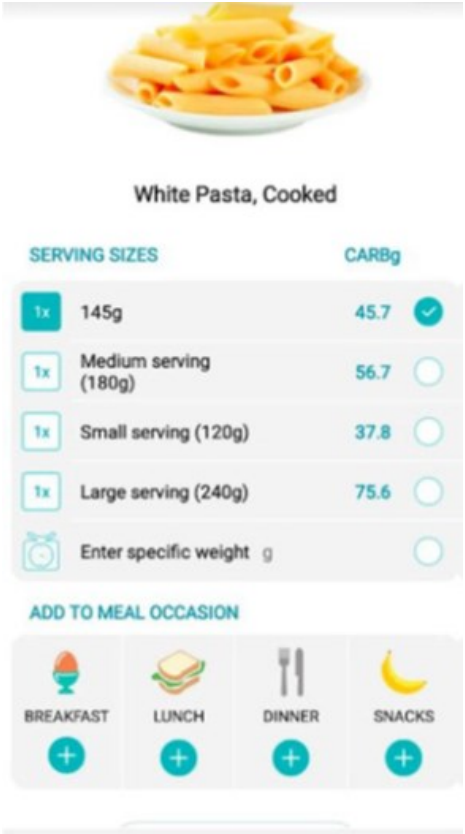
If this information is not available you will need to estimate the carbohydrate in you meal using other resources e.g. Carbs & Cals and Nutracheck or your own experience from carbohydrate counting at home.

Handy hints for food you eat regularly

- Bread - roughly half of the weight of bread, bread rolls or pizza base is carbohydrate. Weigh the bread and divide the weight by two to give the carbohydrate amount e.g. a 50g bread roll has 25g of carbohydrate.
- Cooked rice and pasta - Approximately a third of the weight of cooked rice and pasta is carbohydrate. Weigh the cooked rice or pasta and divide the weight by three to give the carbohydrate amount e.g. 30g cooked pasta or rice has 10g of carbohydrate.
- Cakes - One half of the weight of sponge cakes is carbohydrate. Weigh the cake and divide the weight by two to give the carbohydrate amount For example a 60g piece of cake has 30g carbohydrate.
- Mashed potato – one ice cream scoop of mash contains about 10g carbohydrate.
- Ice cream – one ice cream scoop of ice cream contains about 10g carbohydrate.

Nutracheck is another app that many people with diabetes use to help with carbohydrate counting. This app was initially aimed at supporting people with weight management therefore parental consent is needed to sign up to it, and it needs the nutrient shown to be changed from calories and fat to carbohydrates.

As part of the free version you can barcode scan and input the weight of the food you are eating and the app with calculate the carbohydrate for you. You also have the ability to build and carbohydrate count recipes.



Example of label reading

e.g. Wholemeal bread

	Per 100g	Per slice (40g)
Energy	221kcal	88kcal
Fat	1.8g	0.7g
Of which saturates	0.4g	0.2g
Carbohydrate	37.8g	15.1g
Of which sugars	4.1g	1.6g
Fibre	6.8g	2.7g
Protein	10.0g	4.0g
Salt	0.9g	0.26g

How much carbohydrate in 1 slice of bread?

- Read along the “Carbohydrate” line on the label.
- Use the per slice information.
- 1 slice of bread contains 15.1g of carbohydrates.

e.g. Fish fingers

	Per portion (3 fish fingers)	Per 100g
Energy	170kcal	183kcal
Carbohydrate	12.0g	13.0g
Of which sugars	0.6g	0.7g
Fat	7.6g	8.2g

How much carbohydrate in 2 fish fingers?

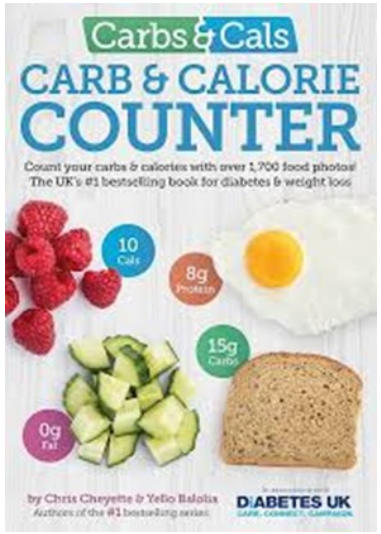
- Read along the “Carbohydrate” line on the label.
- If 3 fish fingers contain 12g of carbohydrates, we need to work out how much carbohydrate is in 1 fish finger first and then multiply this amount by the portion.
- 12g ÷ 3 = 4g carbohydrates in 1 fish finger.
- 4g x 2 = 8g of carbohydrate
- 2 fish fingers contain 8g of carbohydrate.

Carbs & Cals

Carbs & Cals products are a visual guide to carbohydrate counting, containing pictures of many different foods, in multiple portion sizes, alongside their carbohydrate counts.

It is recommended to continue to weigh portions of foods such as cereals, rice and pasta, as it is not easy to estimate the portion size of this food ‘by eye’. The book version has the “per 100g values” for many common foods e.g. fruit.

In the paid version of the app you can input the weight of your portion size and the app will calculate the carbohydrate content for you. It also has a barcode scanner and you can create personalised recipes of home cooked foods within the app.



Using cooked and uncooked weights

Always check if the carbohydrate values on food labels are for uncooked or cooked weights where appropriate. The weight of some foods changes significantly when they are cooked. This is particularly the case with pasta, rice, couscous, noodles, potatoes and pulses and is due to the amount of water they either absorb or lose in cooking. Pasta and rice absorbs water when it is cooked therefore a portion of cooked pasta or rice is heavier than its dry weight. Baked or roasted potatoes lose water when they are cooked as they dry out, therefore their weight decreases.

It is very important that the correct “carbohydrate per 100g” value is used for how the food is cooked as this can significantly affect the accuracy of your carbohydrate counting. When cooking for a family, it can be easier to weigh portions when they are cooked but be cautious, as some packages only label the carbohydrate in the uncooked (dry) weight.

Using books and apps

There are many books, apps and websites that can help to support you with carbohydrate counting. Listed below are two that other people with diabetes find helpful:

- Carb and Calorie Counter published by Carbs & Cals (book), but they also have an app version.
- Nutracheck app.

e.g. Pizza

	Per 1/2 pizza	Per 100g
Energy	445kcal	281kcal
Carbohydrate	50g	32g
Of which sugars	4.3g	2.7g
Fat	20.1g	12.7g

How much carbohydrate in ⅓ pizza?

- Read along the “Carbohydrate” line of the label.
- If half the pizza contains 50g of carbohydrate we need to work out how much carbohydrate in a whole pizza first and then divide this by 3 to calculate how much is in a 1/3.
- 1 pizza contains 50g x 2 = 100g carbohydrates in a whole pizza.
- 100g carbs ÷ 3 = 33.3g carbohydrates in 1/3 of a pizza.

Weighing foods and calculating Carbohydrate from food labels

This is the most accurate way to count carbohydrates in foods when the portion size varies e.g. pasta, rice, potatoes, noodles, couscous, breakfast cereals and homemade recipes. The weight of the food is not the same as the carbohydrate content because foods contain other nutrients. Therefore, some calculations are needed. The steps outlined below show you how to do this:

- Weigh your portion of food (ensuring your scales are on zero and set to grams not ounces and not including the weight of your plate or bowl).
- Look at the nutrition label and check the amount of carbohydrate per 100g of the food.
- Divide the amount of carbohydrate in 100g by 100 to tell you how much carbohydrate is in 1g of the food.
- Multiply this amount by the weight of your portion to tell you how much carbohydrate is in your portion of food.

The following example takes you through the stages involved in calculating carbohydrate from the weight of food eaten and using the per 100g information on the food label.

If you were having cornflakes for breakfast, how would you work out the carbohydrate in the cornflakes?

1. Weigh your cornflakes: Let us say they weigh 40g.

2. Read the nutrition label on the packet and check the amount of carbohydrate per 100g:

	Per 100g
Carbohydrate	75g
Of which sugars	12g

75g of carbohydrate per 100g of cornflakes

3. Work out how much carbohydrate is in 1g cornflakes:
75g ÷ 100 = 0.75g carbohydrate in 1g of cornflakes

4. Multiply the carbohydrate in 1g cornflakes by the weight of your portion:

0.75g x 40g = 30g carbohydrate in your portion of cornflakes