

Your Simple Guide to Carbohydrate Counting



Welcome to Carbohydrate Counting

This information booklet will help you to learn how to count the carbohydrates in your meals and snacks.

Your Insulin Regime

Patients on Multiple Daily Injections (MDI) will be managed on both long acting insulin and short acting insulin.

Your long acting BASAL insulin is called _____ and is taken once a day as directed by your team.

Your short acting BOLUS insulin is called _____ and should be taken with every meal and snack you eat that contains carbohydrates.

Carbohydrate counting is recommended when patients are on MDI insulin regimens or on insulin pumps.

You need to count the carbohydrate in every meal and snack that you eat to be able to adjust the bolus insulin dose.

What are carbohydrates?

There are different types of carbohydrates in our diets, see table 1. Your body will digest and break down all of these carbohydrates and change them in to sugar (glucose). This sugar is what you are testing when you do a blood sugar check.

Insulin allows sugar to move from the blood into the cells in your body where it can be used for energy. This is especially important for your liver, brain and muscles.

Matching insulin with carbohydrate at each meal and snack can help keep blood sugar levels in a target range.

Starchy foods	Bread, potato, rice, pasta, breakfast cereals, flour, baked beans, some vegetables
Fruit (contain fructose)	All fruit, whether fresh, tinned, frozen or juice
Dairy (contain lactose)	All milk, yoghurt, Fromage Frais, custard, ice cream, milk based sauces
Sugar foods	Sugar, jams, honey, soft drinks, sweets, chocolate, cake, biscuits and puddings

There are several foods that do not contain carbohydrate. These are made up of the nutrients protein and fat which we do not count.

Protein	Fat
Meat Fish Chicken Eggs	Butter Cream Cheese

Remember if any of these foods have batter or breadcrumbs in or on them they should be counted e.g. chicken nuggets, scotch eggs or battered fish etc.

Also some foods have 'hidden' carbohydrate i.e. sausages, burgers – so unless they are 100% meat we need to count them too.

Steps to Carbohydrate Counting

All carbohydrates are counted in 'grams'.

In order to carbohydrate count you will need to:

1. Identify which foods contain carbohydrate
2. Calculate or estimate the carbohydrate in your meal
3. Give your bolus insulin dose

It is important to remember that the carbohydrate content (in grams) of a food is not the same as the total weight in grams of the food item.

Carbohydrate Counting Tools

Useful tools used for carbohydrate counting:

- 1) Food labels
- 2) Food photographs e.g. Carbs and Cals book/app
- 3) Scales to weigh the food
- 4) Handy household measures: cups and spoons
- 5) Calculator

Food Labels

When read correctly, food labels can give a precise figure for the carbohydrate value of a brand specific food item. It is the '*Total Carbohydrate*' you need to count. A label will give you information 'per 100g, and/or 'per serving'.

It is important to use the right value e.g. for either cooked or dry weight foods.

Make sure you cook foods according to instructions on the packet.

Have a go at working out the following examples.

Example #1: Rich Tea Biscuits

	<i>Per Biscuit (8.4g)</i>	<i>Per 100g</i>
Energy	36kcal	453kcal
Total Carbohydrate	5.7g	71.2g
Protein	0.6g	7.1g
Fat	1.2g	15.5g
Fibre	0.2g	2.9g



If you plan to eat more than one biscuit you would need to multiply the carbohydrate by how many you are going to eat.

How much carbohydrate would there be in:

2 biscuits

3 biscuits

5 biscuits

Example #2: Pepperoni Pizza

	Per 100g	Per 150g serving
Energy	275kcal	412kcal
Total Carbohydrate	25.3g	38g
of which sugars	3.4g	5.1g
Fat	12.4g	18.6g



How much carbohydrate would there be in:

1 whole pizza

1/3 of the pizza

Example #3: Weetabix

	Per 2 Biscuits	Per 100g
Energy	127kcal	338kcal
Total Carbohydrate	25.7g	71.2g
Protein	4.3g	11.5g
Fat	0.8g	2.0g
Fibre	3.8g	10.0g



How much carbohydrate would there be in:

1 Weetabix

Look at some more example labels and find the carbohydrate per portion.

Using the 100g Column

Some labels will only tell you carbohydrate per 100g, but your food item might not weigh 100g. You will need to find the weight of your portion by either looking at the label for the weight, or weighing the food using your scales.

N.B. There are copies of this worksheet at the end of the pack

Example #1: Cornflakes

Weight of food item on scales: **65g**

	Per 100g
Energy	378kcal
Total Carbohydrate	84g
Of which sugars	8g



1. Amount of carbohydrate per 100g

84

2. Divide this number by 100

0.84

This will give you the carbs in 1g of Cornflakes

3. Weight of your food item

65

4. Times (multiply) step **2** by step **3**

54.6

5. Total amount of carbohydrate per portion

55g total

Example #2: Black Cherry Yoghurt (125g)

	Per 100g
Energy	95kcal
Total Carbohydrate	15.1g
of which sugars	11.9g



1. Amount of carbohydrate per 100g

2. Divide this number by 100

This will give you the carbs in 1g of food

3. Weight of your food item

4. Times (multiply) step **2** by step **3**

5. Total amount of carbohydrate per portion

Example #3: Cooked Oven Chips (170g)

	Per 100g frozen	Per 100g baked
Energy	144kcal	208kcal
Total Carbohydrate	23g	31g
of which sugars	0.3g	0.7g



1. Amount of carbohydrate per 100g

2. Divide this number by 100

This will give you the carbs in 1g of food

3. Weight of your food item

4. Times (multiply) step **2** by step **3**

5. Total amount of carbohydrate per portion

Carbohydrate Counting using the 'Carbs & Cals' book

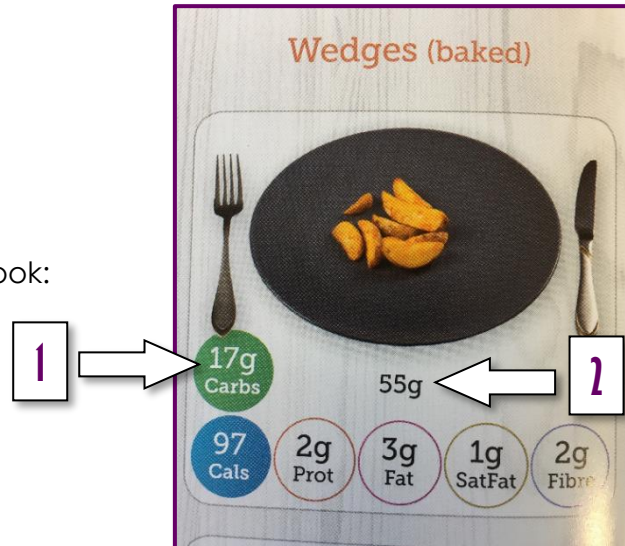
The Carbs & Cals book is particularly useful for calculating carbs of foods that do not have useful labels, or have no labels at all, such as fruit, potatoes, rice and pasta (these are often given in uncooked values). It is also useful for individual items such as bakery goods.

For the insulin dose to be accurate, where possible weigh the food on your scales.

Example: Baked Potato Wedges

Your portion weighs **140g after cooking**

This is the picture in the Carbs & Cals book:



1. Look for the carbs in **green circle** →

17g
- ÷
2. Divide by weight under picture →

55g
- x
3. Multiply this number by your weight on scales →

140g
- =
- Total carbs in **YOUR** portion:

43g

Calculate the following using the Carbs & Cals book:

Example #1: Spaghetti

You have measured a portion of white cooked spaghetti and it weighs 180g.

1. Look for the carbs in **green circle** $\longrightarrow$
 $\div$
 2. Divide by weight under picture $\longrightarrow$
 $\times$
 3. Multiply this number by your weight on scales $\longrightarrow$
 $=$
- Total carbs in your portion:

Example #2: Banana (with skin on)

You have weighed a banana with the skin on and it weighs 112g.

1. Look for the carbs in **green circle** $\longrightarrow$
 $\div$
 2. Divide by weight under picture $\longrightarrow$
 $\times$
 3. Multiply this number by your weight on scales $\longrightarrow$
 $=$
- Total carbs in your portion:

Example #3: Egg Noodles

You have weighed a portion of cooked noodles and it weighs 145g.

1. Look for the carbs in **green circle** $\longrightarrow$
 $\div$
 2. Divide by weight under picture $\longrightarrow$
 $\times$
 3. Multiply this number by your weight on scales $\longrightarrow$
 $=$
- Total carbs in your portion:

Example #4: Homemade Pancake

You have weighed a homemade pancake and it weighs 60g.

1. Look for the carbs in **green circle** $\longrightarrow$
- $\div$
2. Divide by weight under picture $\longrightarrow$
- $\times$
3. Multiply this number by your weight on scales $\longrightarrow$
- $=$
- Total carbs in your portion:



The Carbs and Cals book also comes as an App for your mobile phone. If able to, download the App. With the app, you don't need to do any sums – it does it all for you!

Additional Information Sheets

The following information and worksheets are to be used as a reference point and to help you continue working out the carbs of your meals and snacks.

They are all available by email if you want more copies of them.

The pack includes:

- Carb free snack list
- Carb counting chart
- 100g column worksheets
- Using the Carbs & Cals worksheet
- Carbohydrate sum sheet
- Frequently asked questions

Carbohydrate Free Snack List

This guide shows suitable snacks to have between meals, and appropriate portion sizes. If your child is young, choose the smaller recommended portion. Please remember that you do not have to snack, these are just options if snacks are needed. We have to be careful that we do not always choose high calorie snacks, so ideally choose those that have no limits. One snack is sufficient between meals. *Some of the snacks have up to 3g carbohydrate in each one.

Snack idea	Portion size (between meal)	Number of times per week
Mixed salad / lettuce / rocket / spinach / courgette / cauliflower / broccoli / cabbage / bean sprouts	No limit	No limit
*Tomatoes	5 cherry tomatoes 1 standard tomato	No limit
*Carrots	1 standard carrot	No limit
Pepper / Cucumber / Celery sticks/radish/mushrooms	No limit	No limit
Celery sticks with peanut butter	1 tablespoon peanut butter	No limit
Beetroot	2 small baby 3-4 slices	No limit
Pickled onions / gherkins in vinegar	4	No limit
Olives	8	4-5
Asparagus	No limit	No limit
Roast vegetables (courgette / aubergine / pepper – not potato)	No limit	No limit
Eggs	1 poached, boiled, scrambled (no milk)	4-5
Fried egg	1	1
Omelette (can add cheese, meat, vegetables)	1-2 egg	3-4
Standard hard cheese	25g (1 matchbox size piece)	3-4
Soft cheese	2-3 tablespoons	2 -3
Plain cottage cheese	2-3 tablespoons	2-3
Processed cheese – strings / discs / triangles	1 item	2-4
Cooked chicken breast / meat	80g ½ breast	3-4
Chicken wings / drumsticks(no sauce/breadcrumbs)	1-2 drumsticks 2-4 wings	1-2
Prawns or seafood	100g	2-3
Sardines / tuna / mackerel – in spring water/brine	1 tin	4-5
Salmon	80g smoked ½ tin	4-5
Ham / turkey / roast beef slices	3-4 slices 4-6 slices wafer thin	3-4
Tofu / quorn	50g	3-4
Tzatziki dip / guacamole / salsa	¼ pot	2-3
Houmous	1/6 pot	2-3
Mayonnaise	1 tablespoon	With meat/fish/salad
Whole nuts not recommended for children under 5 years of age		
Walnuts / Brazils / Pecans / Macadamias	20g	3-4
Cashews / Peanuts / Pistachios / Almonds	20g	3-4
Pumpkin seeds / sunflower seeds / mixed seeds	20g	No limit
Sesame seeds	10g	No limit
Coconut flakes	30g	3-4
Sugar free jelly	1 pot	2-3
Sugar free ice-pops	1-2	1-2
Hot chocolate made with water (Options/Highlights)	½ small sachet	2-3
Cocoa powder hot drink made with water	1 level tablespoon with sweetener not sugar	3-4

Carbohydrate Counting Chart

Breakfast ratio:

Lunch ratio:

Dinner ratio:

Supper ratio:

[illegible]

Worksheet for 'Using the 100g Column'

Place plate on scales. Press 'Zero'. Put your food on the plate to get the weight of the food.

Food item: _____ **Weight of food item on scales:** _____

6. Amount of carbohydrate per 100g
7. Divide this number by 100
8. Weight of your food item
9. Times (Multiply) step **2** by step **3**
10. Total amount of carbohydrate per portion

Food item: _____ **Weight of food item on scales:** _____

1. Amount of carbohydrate per 100g
2. Divide this number by 100
3. Weight of your food item
4. Times (Multiply) step **2** by step **3**
5. Total amount of carbohydrate per portion

Food item: _____ **Weight of food item on scales:** _____

1. Amount of carbohydrate per 100g
2. Divide this number by 100
3. Weight of your food item
4. Times (Multiply) step **2** by step **3**
5. Total amount of carbohydrate per portion

Using the Carbs & Cals book to calculate your carbs

Food item: _____ **Weight of food item on scales:** _____

1. Look for the carbs in **green circle** $\longrightarrow$

$\div$
 2. Divide by weight under picture $\longrightarrow$

x
 3. Multiply this number by your weight on scales $\longrightarrow$

=
- Total carbs in your portion:

Food item: _____ **Weight of food item on scales:** _____

1. Look for the carbs in **green circle** $\longrightarrow$

$\div$
 2. Divide by weight under picture $\longrightarrow$

x
 3. Multiply this number by your weight on scales $\longrightarrow$

=
- Total carbs in your portion:

Food item: _____ **Weight of food item on scales:** _____

1. Look for the carbs in **green circle** $\longrightarrow$

$\div$
 2. Divide by weight under picture $\longrightarrow$

x
 3. Multiply this number by your weight on scales $\longrightarrow$

=
- Total carbs in your portion:

Carbohydrate Meal Sums

Once you have worked out the individual carbs in each food item, use this sheet to add up the carbs of each item to get your total amount of carbs per meal

Meal #1:

Food	Carbs
	+
	+
	+
	+
Total carbs in meal =	

Meal #2:

Food	Carbs
	+
	+
	+
	+
Total carbs in meal =	

Meal #3:

Food	Carbs
	+
	+
	+
	+
Total carbs in meal =	

Frequently Asked Questions

Why does food play a part in diabetes management?

In order for you to have energy and carry out everyday tasks, you need to eat food. Every time you eat food with carbohydrate, insulin is needed so that you can use this energy, otherwise the sugars stay in the bloodstream and cannot be used. We need you to be knowledgeable about food and its impact on diabetes in order for you to manage your diabetes safely and effectively.

What is Carbohydrate?

Carbohydrate is one of three food groups; carbohydrate, fat and protein. Carbohydrate is the only food group that affects blood sugars. Most foods contain a mixture of each food group but it is the carbohydrate in the food that causes blood sugars to rise. There are very few foods that are solely carbohydrate.

When does my child have to eat carbohydrate?

Your child will need to eat some carbohydrate after each fast-acting insulin injection. At diagnosis this will be three times; at breakfast, lunch and evening meal. In time, your child may have four or five injections of fast acting insulin per day if they eat carbohydrate more frequently than this. If your child does not like breakfast, or another meal, discuss with the dietitians ways of ensuring that some carbohydrate is eaten. If fast acting insulin has been given, carbohydrate must be eaten.

Will my child be able to eat family meals?

Your child will be able to eat all family meals as normal. The timing of some meals may need to be altered slightly to fit in with insulin injections but with time, your child will be able to follow a flexible eating pattern.

My child has many meals away from the home with grandparents, carers or at afterschool clubs. Can they still do this?

Yes. The diabetes team will offer training to everyone who is involved in caring for your child. The meal provision can be discussed and agreed in advance and advice can be sought from the dietitians by these carers at any time.

Will we be able to eat out?

You will be able to eat out as often as you would have pre diagnosis. We can discuss insulin adjustment for bigger or smaller meals with you to ensure you can still enjoy eating out.

Will my child be able to eat sweets?

Every child is allowed some sweets in moderation as part of a healthy diet. This is no different to children without diabetes. By incorporating occasional treat days into a week/fortnight then your child will know that sweets are not banned, but can be allowed on occasion. This principle applies to cake, biscuits and chocolate as well. We encourage this approach for siblings too.

My child often refuses to eat their meals, what do I do if I have already given their insulin?

Don't panic. Encourage your child to eat the carbohydrate portion of the meal first. Do not give something sweet to tempt them to eat such as puddings. This will encourage them to refuse in the future as they know this is a worry for you. You could offer a glass of milk or a small piece of fruit. Otherwise, you will need to check blood sugars regularly following the meal and treat a hypo if it arises.

My child grazes throughout the day, what can we do?

Grazing can be difficult to manage with diabetes, especially for the younger children. Ideally they should have three standard meals per day. Children don't need to snack but we know this is a habit many get in to, and they are often hungry in between meals. Your child can be offered healthy carbohydrate free foods to snack on.

Why do the snacks have to be carbohydrate free?

Carbohydrate causes blood sugar levels to rise if no insulin is given. Snacking on carbohydrate between meals without insulin will cause elevated blood sugars by the next meal. Long-term it is not good to have persistent elevated blood sugars.

I always used to allow fruit between meals, when can they have fruit now? Is fruit bad for my child?

Fruit is an excellent source of fibre, vitamins and minerals and needs to be included in daily meal planning to help children achieve their '5-A-day'. It does contain natural sugars called *fructose* which can cause elevated blood sugars so fruit needs to be eaten after you have had some insulin. We suggest fruit is eaten as part of a meal or as a pudding.

Can I give my child their fast-acting insulin after they have eaten?

No. We recommend all fast acting insulin is given pre-meal. Sugar from food can be absorbed quite fast so we need the insulin to be administered pre-meal so that it is ready to move sugar from the bloodstream into the cells. Occasionally this advice may vary for toddlers/babies.

Can my child have snacks once they have had their long-acting insulin?

No. Glargine or Detemir are the long acting insulins that your child will need to have once every 24 hours. This dose of long-acting insulin must be given at the same time each day. *Food does not need to be given with this insulin.* Long-acting insulins tend to be given in the evening. If your child usually has a supper, discuss with the team if extra fast acting insulin can be given.

If you intend to use this booklet, or parts of this booklet, please acknowledge 'Derby Children's Hospital, 2020'. To contact the team please email dhft.diabetesdietitians@nhs.net