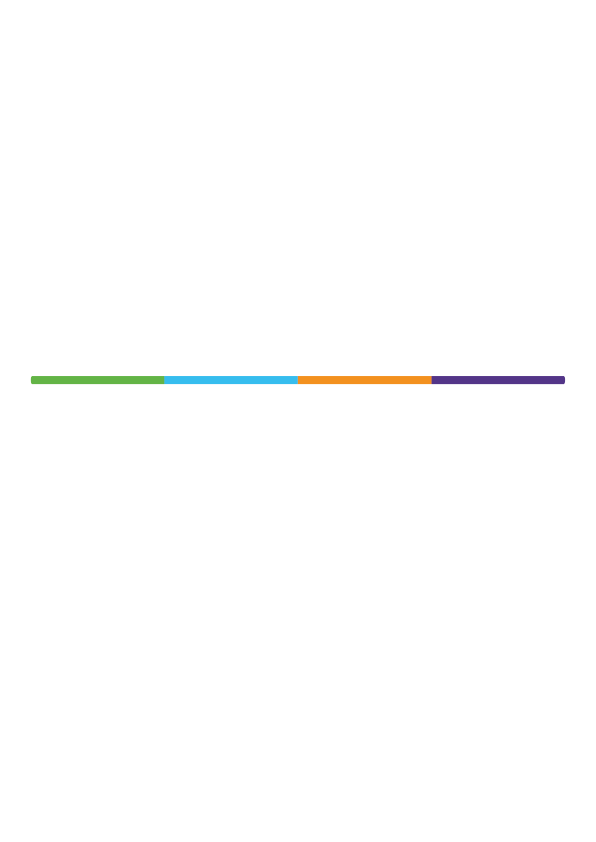
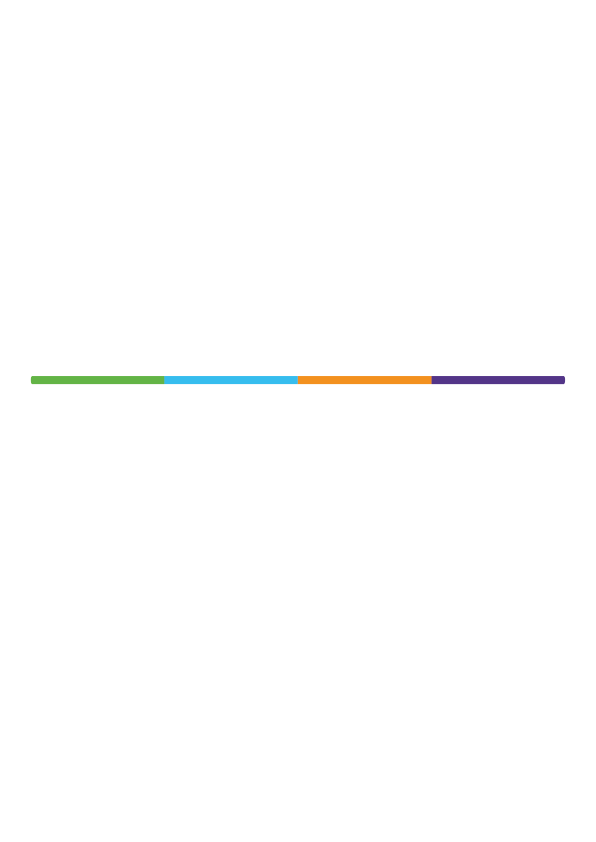
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Patient Information

Carbohydrate Counting

**What is a carbohydrate?**

Carbohydrate is the term used for any food or drink which is broken down into glucose in the body. The type and amount of carbohydrates you consume, can influence your blood glucose levels and overall diabetes management. They can be grouped into starches (such as bread, potato, rice, pasta, cereals etc) and sugars (such as fruits, yoghurts, milk, sweets, chocolate, sugary drinks etc).

**Why count carbohydrates?**

Carbohydrate counting can make it easier to control your diabetes and improve your HbA1c. With modern insulins, we can be much more precise in deciding on the right doses of quick acting insulin needed through the day. If you can work out how much carbohydrate there is in the meal you are about to eat, you can decide how much quick acting insulin you will need to cover it. It can also be helpful for those who want to lose weight. By reducing the amount of carbohydrate eaten and reducing the amount of insulin needed, you can avoid unnecessary weight gain.

**What foods are counted?**

|  |  |
| --- | --- |
| **Counted** | **Not counted** |
| * All types of bread, chapatti, naan * Cereals e.g. porridge, bran flakes * Grains e.g. rice, wheat * Pasta and Couscous * Potato, yam, sweet potato * Crisps and savoury biscuits * Fruit (fresh, dried, tinned) * Fruit juice, smoothies * Milk, yoghurt, ice cream * Biscuits and cereal bars * Cakes and pastries * Most thick soups and sauces * Syrup, honey, jam, chocolate * Sugar and sugary drinks * Beer, cider and liqueurs | * Plain meat, fish, and poultry * Eggs. cheese and butter * Vegetables and salad * Pulses and beans * Nuts and seeds * Wine and spirits * Stock and seasonings – salt and pepper * Tea and coffee * Diet drinks * Fats and oils * Herbs and spices * Sweeteners – aspartame (Candarel), sucralose (Splenda), saccharin and stevia |

Please note: Not all foods that are free from carbohydrate should be eaten freely:

* Fats and oils contain large amounts of calories and should be used sparingly.
* Too much salt could increase your blood pressure.

**Steps involved in carbohydrate counting:**

|  |  |  |
| --- | --- | --- |
|  |  | **Example:**  *Meal: Muesli with low fat milk and a banana* |
| **Step 1:** | Identify which foods do and do not contain carbohydrates | * Muesli * Milk * Banana |
| **Step 2:** | Measure the amount of food that you are going to eat – you can use food scale, cup measuring etc. | * Muesli – 40g * Milk – 250ml * Banana – 120g |
| **Step 3:** | Work out the carbohydrate content of the foods you have measured – you can use ‘Carbs&Cals’ book/app, Diabetes UK, ‘Carbs Count e-book’, food labels\* etc. | * Muesli – **29g** per 40g * Milk – **12g** per 250ml * Banana – **20.5g** per 100g |
| **Step 4:** | If the reference gives the amount of carbs for a 100g portion, and your portion is different, use the following formula to calculate the quantity of carbohydrates:  **Total weight(g)/100 x carbohydrate content of food per 100g.** | * Banana: 120g/100g x 20.5g= **24.6g** |
| **Step 5:** | Add the total amount of carbohydrates in grams. | **29 + 12 + 24.6**  **Total = 65.6g** |
| **Step 6:** | Calculate the insulin bolus needed for the meal according to your personal insulin to carbohydrate ratio. | |
| **Step 7:** | Keep a record of your blood glucose readings and insulin doses. Spend some time thinking about whether the insulin you have taken was right for the amount of carbohydrate you ate. | |

\*When checking food labels, look for ‘total carbohydrate’ not just ‘of which sugars’. The carbohydrate amount is usually per 100g or per serving. Be aware that the size of your serving may be different from the packet serving size, in which case use the calculation mentioned above.

**Your Ratio**

Insulin to carbohydrate ratios vary from person to person, so you will have your own personal ratio. Eventually, you may even have a different insulin to carbohydrate ratio for each meal.

Most people start with a ratio of 1unit of insulin for every 10g of carbohydrate. This can then be adjusted according to your blood glucose. Some people may need as much as 1unit of insulin to 5g carbohydrate or less, some may need as little as 1unit of insulin to 20g carbohydrate.

You can find out your ratio by keeping your carbohydrate, blood glucose and insulin diary. If you are unsure, please speak to your dietitian or diabetes specialist nurse.

If your blood glucose is dropping after a meal, this could indicate that you have not counted your carbohydrate properly, so recheck. It could also indicate that your ratio is too high i.e., you may be taking too much insulin for the carbohydrates consumed. If your ratio is 1unit to 10g carbohydrate, you could change it to 1unit to 15g carbohydrate and continue to record your blood glucose to see if this has worked.

If your blood glucose increases after a meal, you may have underestimated the carbohydrate in your meal, or your ratio is too low i.e., you may not be taking enough insulin to cover the carbohydrates consumed. If your ratio is 1 unit to 10g carbohydrate, you could change it to 1 unit to 5g carbohydrate and continue to record your blood glucose to see if this has worked.

**Checking background insulin**

It is important to remember when using your ratio that it will only be accurate if your long acting or background insulin is correct. If your background insulin is too little, your blood glucose will creep up gradually throughout the day, or if it is too much, your blood glucose will drop throughout the day.

You can check if your background insulin is correct by eating a carbohydrate free meal as follows:

1. Take your background insulin as normal.
2. Do not eat any carbohydrate with your meal, so you will not need any quick acting insulin.
3. Check your blood glucose once or twice before your next meal.

This way the background insulin will not have the influence of carbohydrate or fast acting insulin and you can assess whether your background dose is correct.

If your blood glucose reading has not changed by 2mmol/L by your next meal, then this indicates your background insulin is working well.

**Your Correction**

A correction dose is an additional amount of bolus insulin to bring down a one-off high blood glucose reading into the target range. A correction dose should always be given with caution and generally should only be given before a meal.

Most people find that taking 1u of insulin will decrease their blood glucose by 2-3 mmol/l. Or missing 1u of insulin may increase their blood glucose by 2-3mmol/l. It is useful to start with this calculation and adjust as you find out more. Some people may have a correction of 1u insulin 4mmol/l and others 1unit insulin to 1mmol/l.

For example, you may have a ratio of 1 unit to 10g carbohydrate and a correction of 1 unit to 3mmol/l and your blood glucose before your meal is 14mmol/l. Your meal contains 70g of carbohydrate, so you know you need 7 units of quick acting insulin for the meal. You may wish to reduce your blood glucose and make a ‘correction’ here so you would need to take an extra 2 units of quick acting insulin with your meal to reduce your blood glucose by 6 mmol/l, from 14mmol/l to 8mmol/l. So, you would take 9 units in total for the meal.

Likewise, if your blood glucose was 4 mmol/l before the meal, you might wish to reduce your mealtime dose of insulin by 1 unit to bring your blood glucose up by 3 mmol from 4mmol/l to 7 mmol/l. So, you would take 6 units for the meal. Recording your carbohydrate intake, blood glucose and insulin diary will help you work out what your correction is.

**Working out the ‘carbs’ in home cooking**

* Look at the recipe and decide which ingredients contain carbohydrate.
* Calculate the carbohydrate content of each ingredient.
* Add them all together and divide the total by the number of portions.
* You could also use an app like ‘Cook and count’ which contains the carbohydrate content of thousands of ingredients and calculates.

**Eating out**

* You can look up the nutrition information of the food in many restaurants online. Choose your meal and work out the carbohydrates beforehand. Some restaurants have standard menus and may be able to tell you the carbohydrate content of the food.
* Carbohydrate counting apps give the carbohydrate content with pictures of commonly eaten foods – it is quite easy to check and estimate the size of the portion.
* If you are eating take-away food, you can weigh it at home and use a carbohydrate counting book to find the most similar food.
* Learn by experience. If your guess was not quite right the first time, make a note and then you will be more accurate if you choose that dish again.
* Get used to what average portions of foods look like on your plate, and then you will be more able to guess accurately, if eating out.

**Helpful hints**

* Make a list of the carbohydrate values of the foods you eat most often.
* Learn to judge the carbohydrate content of your favourite foods by using the same bowl or plate.
* Every so often, weigh your foods to check your memory.

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