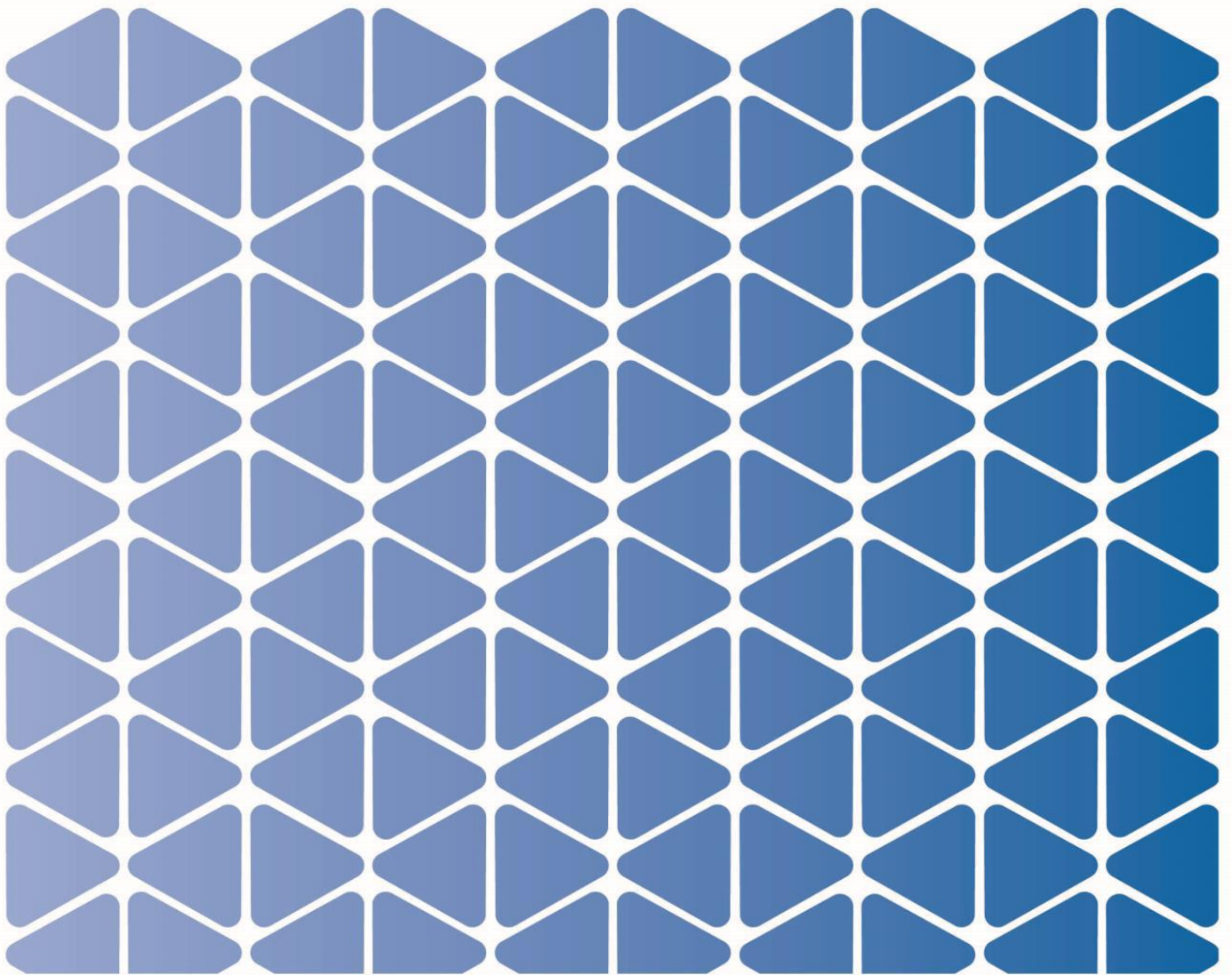


PATIENT INFORMATION

DIETARY ADVICE FOR CHILDREN AND YOUNG PEOPLE WITH DIABETES

CARBOHYDRATE ESTIMATION



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Your Dietitian: Dorota Amador Bueno

How much carbs should you eat each day?

Here are approximate daily requirements for carbohydrate for children of different ages:

Age	Daily carbohydrate
4-6	200-230 gram
7-10	230-250 gram
11-14	250-300 gram
15-18	280-370 gram

You require adequate amount of carbohydrate foods daily to give you energy to promote growth and supply you with energy for all your activities. The amount of carbohydrate needed varies from person to person and will depend on the age and physical activity. Your dietitian will explain this to you further.

Insulin is needed when carbohydrate foods are eaten!

Carbohydrates should be eaten at 3 or 4 regular meals per day!

Snacks should either contain very small amount of carbohydrate, usually less than 15 g, otherwise they will require insulin. Some children and young persons will require insulin with all snacks containing carbohydrates to achieve good blood glucose control.

As you are growing you may need more carbohydrate and your insulin doses need to be adjusted accordingly.

What is carbohydrate counting?

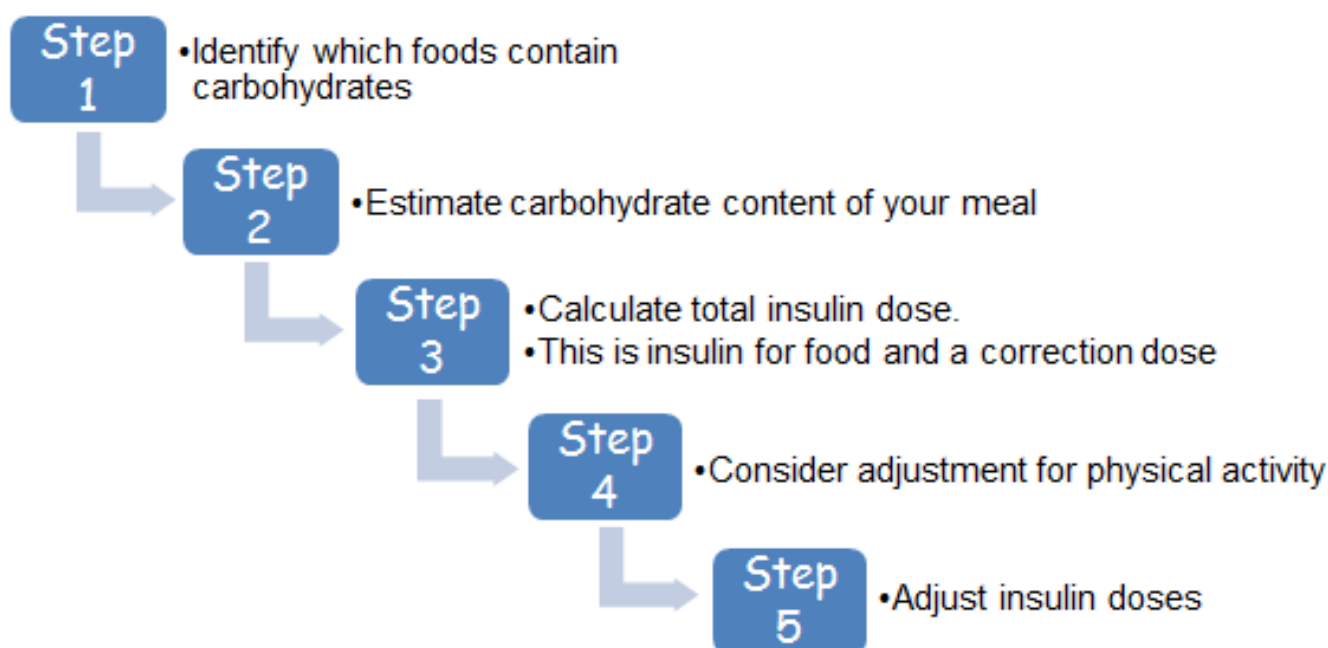
The **total amount of carbohydrate** in a meal or a snack has a direct effect on how much your blood glucose goes up.

Each 10g of carbohydrate produces on average 2 to 3 mmol/l of glucose in the blood.

So if you know the amount of carbohydrate that you have at different meals you can work out your insulin doses to cover the carbohydrate eaten.

Steps of carbohydrate counting:

To adjust your dose of insulin accurately you will need to follow these steps:



Step 1

Identify which foods contain carbohydrates

The first step to carb counting is to identify foods that contain carbohydrates. Make can make a list of the carbohydrates you normally have at your meals using the table provided at the back of this leaflet, called 'Carbohydrate content of my usual meals'. For now only fill in the left hand column of that table and complete the rest of the table when you learn to estimate the carbs in these foods as explained in the Step 2.

Step 2

Estimate carbohydrate content of your meal

The key to accurate carbohydrate counting is firstly to learn to estimate the portions of carbohydrate rich foods. Once you know the portion size of the carbohydrate foods, you can calculate the carbohydrate content.

There are different methods of estimating the amount of carbohydrates in your meals:

- food label

- a kitchen scale
- measuring cups
- serving spoons
- Carbs and Cals book
- Carbohydrate Reference Tables

Using food labels to find the carb content of food:

Food labels usually provide information on carbohydrate content per 100g and sometimes also per portion or serving size. Food labels may be confusing and learning to read them is an important skill to effectively estimate carbohydrate content of your meals and snacks.

When you are counting carbohydrate always use the **total carbohydrate** amount stated on the food label, as this figure includes both the sugars and starchy foods.

Food labels information per portion or serving

Information on the food label per portion or serving size is helpful if you know exactly what your portion is or how many servings you are having. This works well when you eat a suggested amount of foods that are packaged according to the serving size, such as biscuits or crackers, pots of yoghurt or ready meals.

How much carbohydrate is in 3 crackers?

Cracker Bread		
Typical values	Per 1 cracker (33g)	Per 100g
Energy	75kcal	227kcal
Protein	0.6g	1.9g
Total Carbohydrate	11.7g	35.5g
	0.4g	1.2g

Find out the serving size and the total carbohydrate per serving.
1 cracker contains 11.7g carbohydrate.
If you have 3 crackers, multiply the total carbohydrate content by 3. **11.7 x 3 = 35.1g**
Round it down and you now know that 3 crackers have about 35g of carbohydrate.

How much carbohydrate is your portion of pizza?

Pizza		
Typical values	Per 1/2 pizza	Per 100g
Energy	380kcal	165kcal
Protein	17.1g	7.5g
Total Carbohydrate	54.4g	23.9g
of which sugars	5.5g	2.4g

Find out the portion size and the total carbohydrate per portion.
The serving size is 1/2 pizza and contains 54.4g of carbohydrate.

- If you eat the whole pizza, you need to multiply the total carbohydrate by 2.

$$54.4\text{g} \times 2 = 108.8\text{g}$$

- If you eat a third of the pizza, first find out the total carbohydrate content of the whole pizza and then divide it by 3.

$$54.4\text{g} \times 2 = 108.8\text{g} \text{ (the whole pizza), then } 108.8\text{g} \div 3 = 36\text{g} \text{ (a third of a pizza)}$$

How much carbohydrate in 5 fish fingers?

Fish fingers

<i>Typical values</i>	<i>Per portion (3 fish fingers)</i>	<i>Per 100g</i>
<i>Energy</i>	<i>170kcal</i>	<i>183kcal</i>
<i>Protein</i>	<i>10.2g</i>	<i>11.3g</i>
<i>Total Carbohydrate</i>	<i>14.0g</i>	<i>15.1g</i>
<i>of which sugars</i>	<i>0.6g</i>	<i>0.7g</i>

This label tells you that 3 fish fingers contain 14g of carbohydrate in total.

- Divide the carbs per given per 3 fish fingers by 3 you to find out the carbs in 1 fish finger. $14 \div 3 = 4.6\text{g}$
- Then multiply it by the number of fish fingers that you have.
For example if you having 5 fish fingers: $4.6\text{g} \times 5 = 23\text{g}$

ONCE YOU ADDED UP ALL THE SMALL ITEMS, DROP THE DECIMAL PLACES, ROUND UP OR DOWN THE ANSWER!

Calculate carbohydrate content of a third of the chocolate cake:

Chocolate cake

<i>Typical values</i>	<i>Per 1/8th cake</i>	<i>Per 100g</i>
<i>Energy</i>	<i>224kcal</i>	<i>439kcal</i>
<i>Protein</i>	<i>2.1g</i>	<i>4.1g</i>
<i>Total Carbohydrate of which sugars</i>	<i>25.9g 21.1g</i>	<i>50.7g 41.3g</i>

Calculate carbohydrate content of your portion

If you eat a different amount of food than the suggested serving size on the food label, then you need to weigh out your portion and calculate the amount of carbohydrate in your portion using the reference of the total carbohydrate content for that product given per 100 g.

You will find the carbohydrate content per 100 g on:

- nutritional labels
- Carbohydrate Reference Tables
- websites and apps

It is a good idea to weigh some of the food you usually have to familiarise yourself with the sizes of your portions, especially for food such as potatoes, pasta, rice and breakfast cereals.



Alternatively you can use a food atlas, like '*Carbs and Cals*' book to look at a picture of carbohydrate content of cooked pasta and compare it with your portion. Using food pictures may be an easy option, but it is not as accurate as weighing out your portions and using household measures.

HOW TO CALCULATE CARB CONTENT OF FOOD BY WEIGHING YOUR PORTION:

- Weigh your portion of starchy foods.
- Look up carbohydrate content of the food per 100g on the food label or in the carbohydrate reference table.
- Divide the given value by a 100 to get carbohydrate content in 1g.
- Then multiply it by the weight of your portion in grams to get the carbohydrate content of your portion.

$$\begin{array}{|c|} \hline \text{Carbohydrate} \\ \text{content per} \\ \text{100g} \\ \hline \end{array} \div \boxed{100} = \begin{array}{|c|} \hline \text{Weight of your} \\ \text{portion in} \\ \hline \end{array} \begin{array}{|c|} \hline \text{Carbohydrate} \\ \text{content of your} \\ \text{portion} \\ \hline \end{array}$$

Example:

Cooked rice has 30 g carbohydrate per 100g, so divide 30 by 100, which is 0.3 (carbs in 1 gram) and multiply it by the weight of your portion in grams.

Cooked and uncooked Carbohydrate Reference Value per 100g

The weight of starchy foods changes when it is cooked. Make sure that when you use a food label or a Carbohydrate Reference Table you do not confuse the cooked and uncooked weights when calculating the carbohydrate content.

Most starchy carbohydrate, such as pasta, rice and potatoes are heavier when they are cooked, as they absorb water, therefore will have significantly less carbohydrate per 100 g when cooked, as compared to the dry product.

When potatoes are baked they lose water, therefore they are lighter and have more carbohydrate per 100 g than raw potatoes.

In order to avoid any confusion, we recommend using the carbohydrate values given for cooked starchy foods.

Example of how to calculate carb content of 1 cup of pasta:

Pasta

Typical values	Per serving (75g uncooked pasta weighs approximately 170g when cooked)	Per 100g (cooked)
Energy	265kcal	350kcal
Carbohydrate	54g	31g

- Carbohydrate content of 100g of cooked pasta is 31g.
- Weigh out one cup (250ml) of cooked pasta, which is 140g.

Then calculate the carbohydrate content of your portion using the calculation given:

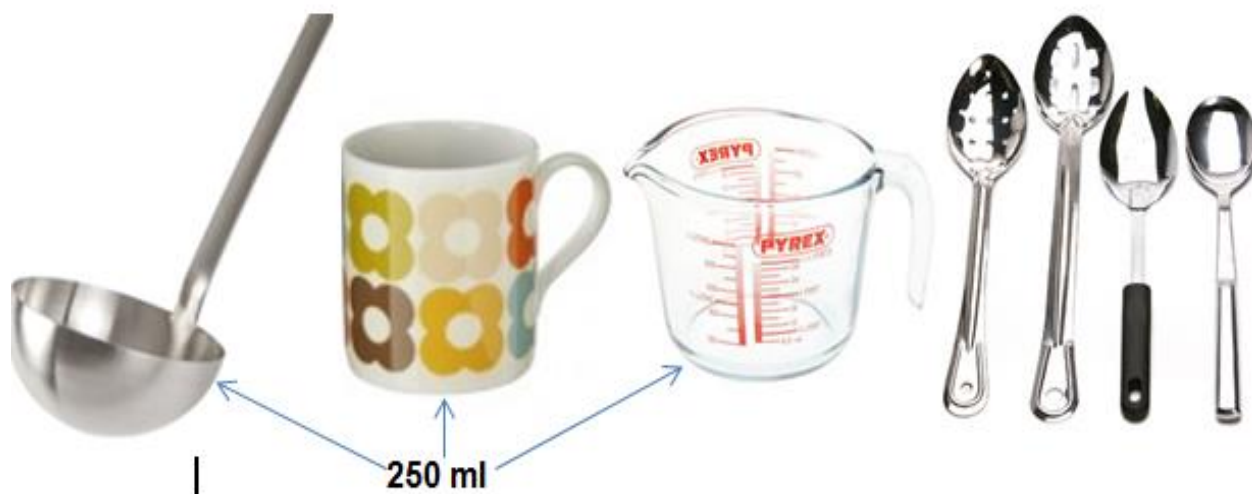
$$\begin{array}{c}
 \text{Carbohydrate content per 100g} \\
 \downarrow \\
 31\text{g}
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 \div
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 100
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 \text{Weight of your portion in grams} \\
 \downarrow \\
 140\text{g}
 \end{array}
 =
 \begin{array}{c}
 \text{Carbohydrate content of your portion} \\
 \\
 43\text{g}
 \end{array}$$

Carb content of cooked pasta	
1 cup	40g carbohydrate
$\frac{3}{4}$ cup	30g carbohydrate
$\frac{1}{2}$ cup	20g carbohydrate
$\frac{1}{4}$ cup	10g carbohydrate



Using household measures

You can use household measures to estimate the carbohydrate content of your meals, then you do not need to weigh out the starchy foods every time you have them.



What the volume
of your ladle?

Different scoops and serving spoons have different volumes!

Think of how you normally dish out different starchy foods, for example using as a ladle, serving spoon, a cup, a mug or a measuring jug. Weigh out a portion of food that fits into a specific household measure and calculate the carb content of that serving.

You can then use that household measure to carb count while you dish out your meal.

Carb counting using an ice cream scoop: You can use an ice cream scoop to serve mash potatoes or rice and at the same time count the carbs.

Calculate the carbs in 1 scoop of mash:



- Mash potatoes have 18g carbs per 100g of mash
- 1 scoop of mash weighs 60g
- $18 \div 100 \times 60 = 10.8$
- Round down to 10g of carbs in 1 scoop.



A standard size scoop of mash potato or rice has about 10g of carbs.

A scoop of plain ice cream also has about 10g of carbs!

Carb counting cereals using a cup:

Calculate the carb content of a cup of breakfast cereal. You can use that same cup to measure your portion of cereal and estimate the carbs in it at the same time.

Different cereals have different carb content and weight, so will have a different amount of carbs per cup.

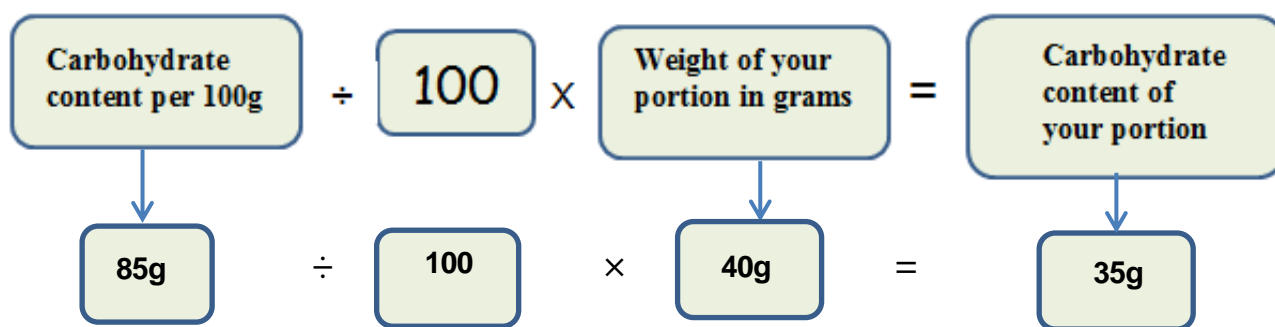
You would need to calculate the carbs per cup for each type of cereal you usually have.

How to work out the carb content of 1 cup of Rice Krispies:

Rice Krispies

<i>Typical values</i>	<i>Per 30g serving*</i>	<i>Per 100g</i>
Energy	174kcal	383kcal
Protein	6g	6g
Total Carbohydrate	32g	85g
of which sugars	9g	10g

*30g serving with 125ml of semi-skimmed milk



There is 35 g of carbohydrate in 1 cup of Rice Krispies

Tip: If you like different cereals make a list of the carb content of 1 cup (250ml) of different cereals and you can use your list to carb count as you dish out your cereal

Remember: You need to add the carbs for the milk with your cereal

Semi-skimmed milk

<i>Typical values</i>	<i>Per 100ml</i>
Energy	48kcal
Protein	3.4g
Total Carbohydrate	5g
of which sugars	5g

Measure the volume of your portion of milk: _____ ml

5g \div 100 \times _____ ml = _____ g of carbohydrate in your portion of milk

For example: 200ml of milk has about 10g of carbs (5 ÷ 100 × 200 = 10)

CARBOHYDRATE REFERENCE TABLE PER 100g AND PER FOR SOME FOODS PER CUP / LADDLE (250ml)

Food	Carbs per 100g of cooked food	Weight in grams of 1 cup (250ml) of the cooked food	Carbs in 1 cup (250ml) of cooked food
Shreddies	73 g	70 g	51 g
Rice Krispies	85 g	40 g	34 g
Porridge	14 g	240 g	34 g
Rice	28 g	160 g	44 g
Pasta	30 g	140 g	42 g
Noodles	30 g	160 g	40 g
Couscous	23 g	175 g	45 g
Mashed potatoes	18 g	250 g	40 g
Chips	25-30 g	-	-
Jacket/roast potatoes	25 g	-	-
Sweet potato	20 g	-	-
White bread	50 g	-	-
Wholemeal bread	42 g	-	-
Bagel / baguette	60 g	-	-

$$\begin{array}{c}
 \swarrow \quad \quad \quad \downarrow \quad \quad \quad \downarrow \\
 \boxed{\text{Carbohydrate content per 100g}} \div \boxed{100} \times \boxed{\text{Weight of your portion in grams}} = \boxed{\text{Carbohydrate content of your portion}}
 \end{array}$$

Handy' measures to estimate carbs

Mashed potato	<ul style="list-style-type: none"> • 1 ice cream scoop = 10g carbohydrate • 1 laddle (250 ml) = 45g carbohydrate
Boiled potato	<ul style="list-style-type: none"> • 1 egg size potato = 10g carbohydrate
Chips	<ul style="list-style-type: none"> • 5 thick chips = 10g carbohydrate • 10 thin chips = 10g carbohydrate
Cooked rice	<ul style="list-style-type: none"> • 1 cup (250ml) = 43g carbohydrate • 1 serving spoon = 10g carbohydrate
Cooked pasta	<ul style="list-style-type: none"> • 1 cup (250ml) = 40g carbohydrate
Pizza	<ul style="list-style-type: none"> • Adult's size hand (closed fingers) = 30g carbohydrate

Work out the carbohydrate content of a recipe?

You can use this guide to work out carbs in your favourite recipes.

Step 1

- Decide which ingredients in the recipe contain carbohydrate

Step 2

- Use your Carbohydrate Reference Table and the following calculation to work out the amount of carbohydrate in **each ingredient**:

$$\begin{array}{|c|} \hline \text{Carbohydrate} \\ \text{content per 100g} \\ \hline \end{array} \div \begin{array}{|c|} \hline 100 \\ \hline \end{array} \times \begin{array}{|c|} \hline \text{Weight of your} \\ \text{portion in grams} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Carbohydrate} \\ \text{content of} \\ \text{your portion} \\ \hline \end{array}$$

Example: Wholemeal flour has 76g carbs per 100g. The recipe needs 225g of flour.

$$76 \div 100 \times 225 \text{ g} = 171 \text{ g carbohydrate}$$

Step 3

- Repeat the above for each ingredient containing carbohydrate

Example: Sugar has 100g carbs per 100g! Add 125g of sugar, which is 125g of carbs.

Step 4

- Add up the total amount of carbohydrate in the whole recipe

Example: Carbs in flour + carbs in sugar: $171 + 125 = 296\text{g}$ carbs in total

Step 5

- Divide the total carbohydrate in the recipe by the number of servings the recipe makes, to give you the carbohydrate in 1 serving

Example: The recipe makes 6 portions: Total carbs in the whole recipe $296\text{g} \div 6 = 49.3\text{g}$

Round up to 50g carbs in 1 portion.

Carbohydrate content of my usual meals

Use this table to create your own list of carbohydrate foods.

Think how normally serve different foods and estimate the carbs in that serving, so you can dish out your food and carb count at the same time!

Food	Total Carb per 100g or 100ml	My usual portion in grams or ml	Carbs in my portion (g)	Carbs using a household measure
Rice Krispies	87g	60g	53g	1 cup = 34g
Milk	5ml	250ml	12g	1 cup = 12g

Favourite lunch and dinner foods

Food	Total Carb per 100g or 100ml	My usual portion in grams or ml	Carbs in my portion (g)	Carbs using a household measure

Other Foods and Drinks

Food	Total Carb per 100g or 100ml	My usual portion in grams or ml	Carbs in my portion (g)	Carbs using a household measure

If your symptoms or condition worsens, or if you are concerned about anything, please call your GP, 111, or 999.

Patient Experience

We know that being admitted to hospital can be a difficult and unsettling time for you and your loved ones. If you have any questions or concerns, please do speak with a member of staff on the ward or in the relevant department who will do their best to answer your questions and reassure you.

Feedback

Feedback is really important and useful to us – it can tell us where we are working well and where improvements can be made. There are lots of ways you can share your experience with us including completing our Friends and Family Test – cards are available and can be posted on all wards, departments and clinics at our hospitals. We value your comments and feedback and thank you for taking the time to share this with us.

Patient Advice and Liaison Service (PALS)

If you have any concerns or questions about your care, we advise you to talk with the nurse in charge or the department manager in the first instance as they are best placed to answer any questions or resolve concerns quickly. If the relevant member of staff is unable to help resolve your concern, you can contact the PALS Team. We offer informal help, advice or support about any aspect of hospital services & experiences.

Our PALS team will liaise with the various departments in our hospitals on your behalf, if you feel unable to do so, to resolve your problems and where appropriate refer to outside help.

If you are still unhappy you can contact the Complaints Department, who can investigate your concerns. You can make a complaint orally, electronically or in writing and we can advise and guide you through the complaints procedure.

How to contact PALS:

Telephone Patient Services: 0300 123 1732 or via email at: wah-tr.PET@nhs.net

Opening times:

The PALS telephone lines are open Monday to Thursday from 8.30am to 4.30pm and Friday: 8.30am to 4.00pm. Please be aware that a voicemail service is in use at busy times, but messages will be returned as quickly as possible.

If you are unable to understand this leaflet, please communicate with a member of staff.