CG APPROVED

Introduction to Carbohydrate Counting

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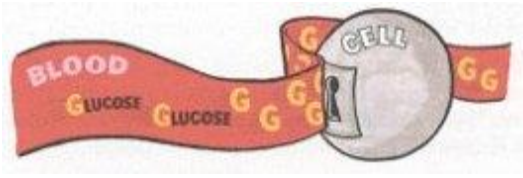
Introduction:

About Type 1 diabetes:

Type 1 diabetes is a condition that results in increased blood glucose (commonly called sugar) levels due to the lack of the hormone insulin.

Insulin acts like a key to get glucose from the blood to where it is needed to provide energy. With diabetes you need to give insulin by injections to achieve blood glucose control.

Insulin = Key



The glucose in the blood comes mainly from the food you eat.

Achiving better blood glucose control will give you a greater feeling of health and well being. In addition as you probably already know keeping your blood glucose level within the target range is essential in helping to prevent the long term complications of diabetes.

However, having diabetes and trying to keep your blood glucose range within target does not necessarily mean that you have to miss out on the food and activities that you enjoy. Research and experience suggests that learning carbohydrate counting will help you to control your diabetes rather than it controlling you.

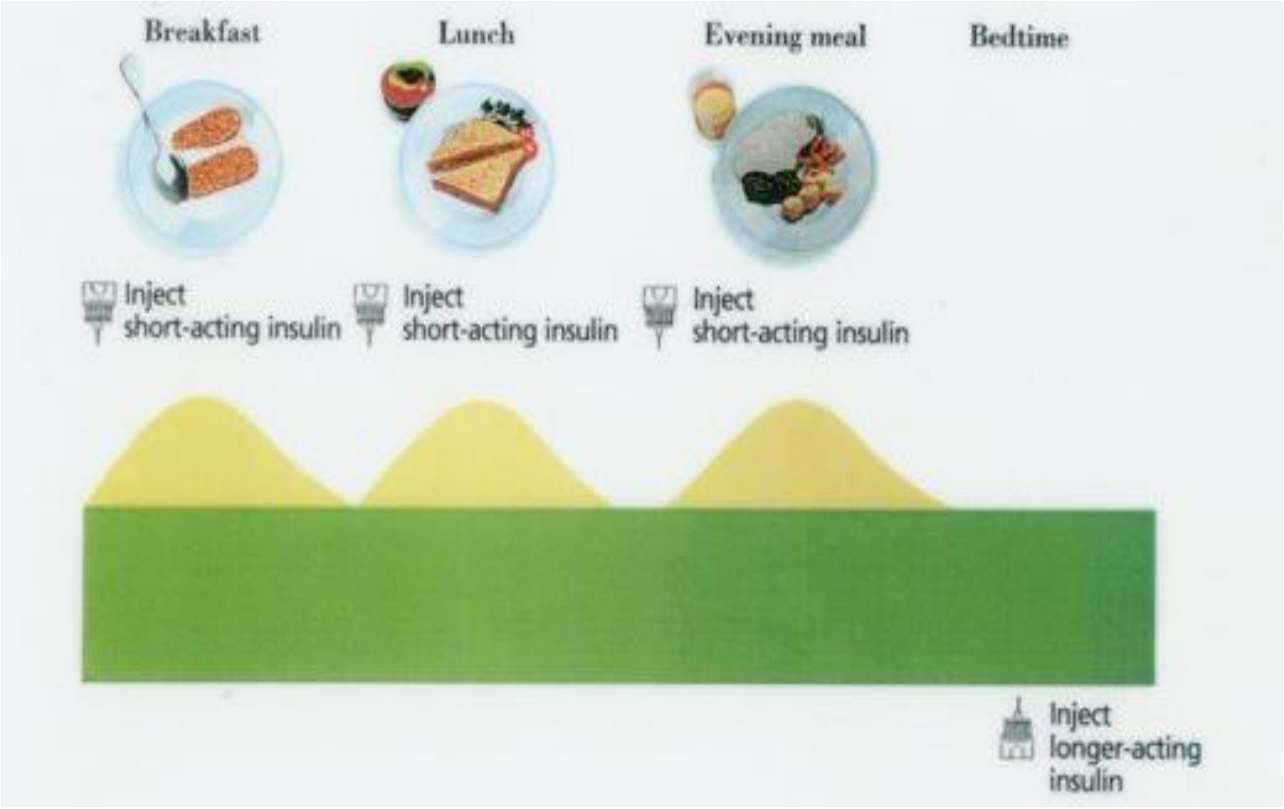
Is there a diet for diabetes?

We should all aim to have a well-balanced healthy diet, to reduce fat and sugars, eat plenty of fibre and keep a sensible body weight.

This is very important for the person with diabetes but you should also have the same freedom to eat a varied diet, to eat at different times and enjoy celebrations or eating out. You should also feel able to try different foods on holiday, skip meals occasionally and choose to snack or not.

Understanding your insulin:

Most people with Type 1 diabetes are prescribed a Basal Bolus insulin regimen. This means taking 1 or 2 injections of a long acting insulin at the same time each day. (Basal) and then a number of injections (Bolus) of quick acting insulin with meals/snacks.



The long acting insulins such as **Lantus (Glargine)** or **Detemir (Levemir)** act as a background.

The quick acting insulin such as **Humalog** or **Novorapid** work to control the blood glucose levels after eating carbohydrate. The number and timing of injections, and the amount needed depends on the number of meals/snacks you eat and how much carbohydrate these contain.

How much insulin do I need?

Basal

This insulin is given as a single injection or two injections at the same time of day, every day. This insulin will determine the blood glucose on waking. Look at these levels over 3-4 days to see a pattern in order to decide on any change in dose. You can adjust the dose by 2 units at a time.

The dose is then kept the same once a stable blood glucose is achieved.

Bolus

Always inject quick acting insulin when you have food with carbohydrate. This is called a Bolus. If you miss a meal, or delay a meal you can skip or delay the insulin injection.

The amount of insulin you need with food is worked out as a ratio, which is the amount of insulin per carbohydrate portion (CP).

A CP is approximately 10g of carbohydrate.

A commonly used ratio is 1 unit of quick acting insulin for every CP

What is carbohydrate?
Many foods are a mixture of protein, fat and carbohydrate and the main sources of each are shown in the table below:

Food Group	Example foods
Protein	Meat, poultry, fish, eggs, cheese, nuts
Fat	Butter, margarine, vegetable oils, cream,
Carbohydrate	Starchy foods, sugary foods, fruit & fruit juices, milk & milk products (e.g. yoghurts etc)

Carbohydrate

Carbohydrate foods are the main type of foods that affects your blood glucose levels. During digestion carbohydrate containing foods are broken down into glucose (sugar), which is absorbed into the blood stream causing a rise in your blood glucose level.

Foods containing mainly protein and fat have a minimal effect compared to carbohydrate containing foods. The actual affect on the blood glucose level depends on the amount and sometimes the type of carbohydrate eaten.

To manage diabetes well we need to know this effect and learn how to match it with the right amount of insulin. Different foods contain different amounts of carbohydrate.

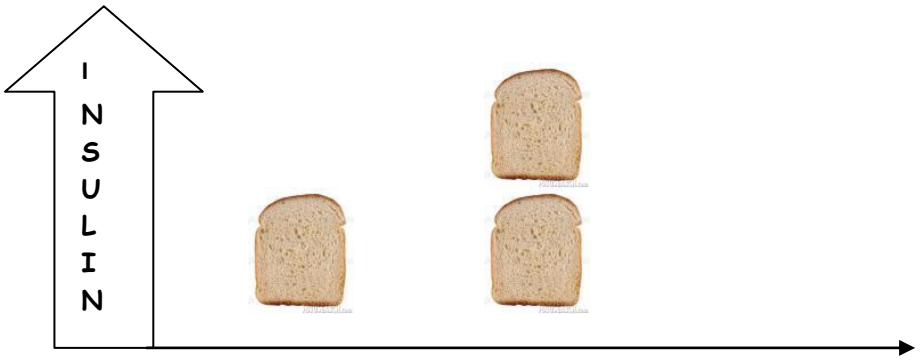
Which foods contain carbohydrate?

A Summary of Carbohydrate Sources

- **Starchy carbohydrates:** breakfast cereals, grains, bread, rice, pasta, couscous, flour-based products (pastry, biscuits, cakes), thickening agents (e.g. cornflour)
- **Vegetable based starchy foods:** potato, legumes (legumes, beans, peas)
- **Fruit based carbohydrate foods (fructose)**: fruit, fruit juice
- **Milk based carbohydrate foods (lactose):** milk, yoghurt, ice cream, custard
- **Sugar and sugary foods (sucrose):** table sugar, syrup, chocolate and other confectionary, ordinary soft drinks

It does not matter whether the carbohydrate comes in the form of a ‘starchy’ food such as bread or a ‘sugary food’ such as a fizzy drink; all carbohydrates end up as glucose in your blood stream, and will require insulin.

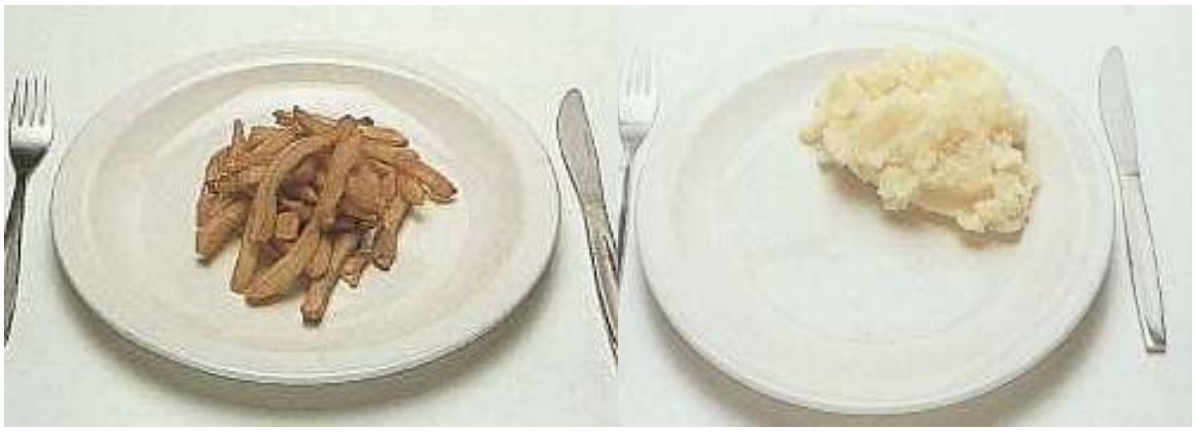
The amount of carbohydrate in your diet determines the amount of insulin you will need to move it into the cells- the more carbohydrate you eat the more insulin you will need



The body will need more insulin for two slices of bread than it will need for one.

How can I work out the carbohydrate of my meals?

Potato is a good example. Each of the pictures below show 40g of carbohydrate in 4 potato dishes – note how the quantity varies.



Tools for Counting Carbohydrate

Scales, Cups, Spoons

Food tables

Food labels

Food photographs

The CP (Carbohydrate Portion) System:

A CP contains approximately 10g carbohydrate (similar to ‘exchanges’ or ‘lines’ used in the past). Add up the CP portions in your meal, using the CP list. The insulin needed per CP is determined by the health care professional.

On average 1 CP (10g carbohydrate) could raise blood glucose by 2-3mmol/l but the effect is individual

The Carbohydrate Portion List

This lists types of carbohydrate foods with a typical serving size and how many CPs in a serving. Compare these with your serving size.

They also list the ‘reference value’, i.e. how much carbohydrate per 100g. This value is also listed on food labels.

You may find it useful to weigh your portion sizes to start with to get an accurate assessment of the carbohydrate content. You can then use “handy” measures such as scoops or cups to estimate the content of future meals.

Remember to divide the total amount of carbohydrate in your weighed portion by 10 to get the number of CPs.

Be aware of using the right value e.g. for either cooked or dry weight foods. Remember rice & pasta absorb water when cooked and the portion weighs more while a baked potato loses water and shrinks in size after cooking.

Food Labels

It is important to also look at food labels to determine the quantity found in different products. When read correctly, this information gives you a precise figure for the carbohydrate value.

It is the **total carbohydrate** you need to count, not the "of which sugars" value. Food composition will always change, so it's always helpful to check the label.

Pepperoni Pizza (300g)	**Per 100g**	**Per 150g Serving**
Energy	275kcals	412kcal
Carbohydrate	**25.3g**	**38g**
(of which sugars)		18.6g
Fat	**12.4g**	

Example Label
If the whole pizza is eaten, this is 2 servings **or 2x 38g = 76g total** carbohydrate (or 7 ½ CPs)

If the values listed are for cooked products, such as pasta, cook the product according to instructions on the packet, e.g. check the recommended time.

You can use food labels for information about dishes where there is no labelling such as a packaged Chinese meal from the supermarket to help you assess your takeaway meal.

If you require a special edition of this leaflet

This leaflet is available in large print, Braille, on audio tape or disk and in other languages on request. Please contact:

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