

A guide for insulin pump users

Food bolus options

Information for patients



Aim

The aim of this leaflet is to give you information on the different insulin pump bolus settings available, plus guidance on which bolus to use for the type of food you are eating.

Introduction

When using an insulin pump, you need to give insulin to cover the carbohydrate (CHO) in meals and snacks you eat. This is called a bolus dose.

Different food will have different effects on your blood glucose levels. Changing the type of bolus you give to match the carbohydrate in your meal or snack will help to keep your blood glucose levels in control. However, make sure that you count the CHO content of your meal correctly.

Before using the bolus options on your pump, make sure that you have turned on the bolus function (also known as the bolus calculator or bolus wizard). Please ask your dietitian or diabetes specialist nurse to support you with this if you are unsure.

Remember the importance of pre-bolusing at a time that reflects the onset of action of your insulin

Factors that affects the blood glucose response to meals include:

1. Glycaemic index (GI)

The GI is a guide to how carbohydrate foods affect your blood glucose levels. A high GI food increases the blood glucose levels quickly for a shorter amount of time, whereas a low GI food results in a slower and more prolonged rise in your blood glucose levels, therefore two meals with the same carbohydrate content can affect your blood glucose levels differently depending on their glycaemic index.

Carbohydrate	Lower GI	Medium GI	High GI
Bread	Multigrain, granary, rye, seeded, wholegrain, oat, pitta, chapatti	Crumpets, wholemeal	White bread, bagels, baguette, ciabatta
Rice	Basmati, long grain, brown rice	Risotto, wild rice	Instant white rice, glutinous rice
Potatoes	New potatoes with skins, sweet potato, yam	Boiled potato, french fries	Jacket potato
Pasta	All pasta cooked until al dente, noodles	Macaroni, egg noodles	Soft and over cooked pasta
Other grains	Bulgar wheat, barley, quinoa	Couscous, millet	Tapioca
Breakfast cereal	Jumbo porridge oats, unsweetened muesli, most oat/bran-base cereals	Wholewheat flakes mixed with a blend of dried fruits, toasted rice, wheat and barley flakes, puffed wheat, bran flakes, shredded wheat	Instant oats, cornflakes, puffed wheat, wheat biscuits, wholegrain wheat malts

For more information [BDAGlycaemic-Index.pdf](#)

2. Fat and protein

The presence of fat (fried food, butter, cream, cheese) and protein (meat, fish, eggs) as part of a meal will slow down the time of digestion which will cause the glucose to be released slower into the bloodstream.

3. Fibre

Food high in fibre such as granary breads, wholegrain or bran cereals, fruits, vegetables, beans, pulses and potato skins are digested and released more slowly.

4. Meal size

A large amount of carbohydrate will take longer to digest than a smaller amount.

5. Processing

Easy cook rice has a higher GI than basmati rice and rolled oats have a higher GI than whole jumbo oats. This is due to the processing methods.

6. Cooking method

Mashed potato has a higher GI than boiled new potato in the skin.

7. Ripeness

A riper banana will have a higher GI than an unripe banana as the starch naturally breaks down into sugar and is digested and absorbed more quickly.

How does the GI effect my choice of bolus?

When eaten in large quantities, foods with a lower GI may require you to split your bolus, therefore knowledge of GI and carbohydrate quantity of your foods will help you to decide the most suitable bolus option. Please discuss this with your Dietitian as some pumps may manage this without any issues in Hybrid Closed Loop (HCL). Please refer to the final page for more specific pump information.

Accounting for fats and proteins

Some people will find that they need to allow for fats and protein when giving their insulin bolus, particularly if the meal has more than 25g of fat, or 40g of protein. And as long as carbohydrate counting is as accurate as possible, if there is a recurring pattern of a certain meal causing a delayed rise (up to 5 hours later) consider trialling an increase in the bolus dose as mentioned below.

Rather than counting fats and proteins gram for gram, you may wish to trial a 20-30% increased bolus at the meal while ensuring that you split your insulin dose, again starting with a 50:50 to 70:30 split with a portion of the dose before the meal and the rest approximately an hour later. Based on your after meal tests you can increase your insulin in 5-10% increments if your blood glucose remains raised. If the trialled split does not work well, try a different split or extension duration, dependent on blood glucose trend.

Example

Using an additional dose for high fat and high protein meal, e.g. a pepperoni pizza contains 120g carbs with an extra 20% insulin and using a 1: 8 insulin to carb ratio. Normally this would require 15 units of insulin. To calculate an extra 20% take carbs for meal e.g 120g divide by 100 x 120 (to add 20%) = 144g total carbs. This can be entered into the pump as 72g carbs before the meal and 72g carbs approximately 1 hour later providing a 50:50% split dose. Only trial this option if there has been a recurring pattern of delayed hyperglycaemia despite accurate carb counting and already trialling a split dose.

It is essential to ensure that you monitor regularly when you are trialling this to ensure safety.

Please note these are starting suggestions, please discuss with your diabetes team before and during trying these additions.

Hybrid closed loop pumps and managing high fat, high protein meals (HFHP meals)

Omnipod 5	Try 100% of the carbs but if this causes a hypo for a specific meal (despite accurate carbohydrate counting) within 1 – 2 hours, consider entering a reduced amount of carbs next time e.g. 50 – 70%. An insulin action time of 2 hours will help the pump to correct more aggressively after 2 hours when a delayed rise occurs. If despite the above there is a delayed rise that the pump is unable to manage then consider 60% up front and 40% after an hour or as the BG starts to rise. As these pumps do not allow for entering a % of the bolus the carbohydrate split will need to be calculated, e.g. if 100g carbs is eaten from a pizza initially 60g and 40g later on.
Medtronic 780g	Only if finding a hypo occurs soon after a HFHP meal with accurate carb counting – next time trial entering only 50 – 75% (these would have to be entered as grams of carbs and not as a % of the total meal dose) before eating the meal and allow the pump to manage the delayed rise. A 2 hour active insulin time can be helpful to allow the pump to do this more easily. If despite trying this there is still delayed hyperglycaemia that the pump cannot manage appropriately consider adding the rest of the remaining bolus after the meal as the blood sugar starts to rise, this could be after the meal up to approximately 1 hour later.
Ypsompump My life CamAPS FX	Consider splitting the bolus and add the remaining (second) carbohydrate amount of carbohydrate in the Add meal function AND by choosing Slowly absorbed meal. Entering 40 – 60% of the usual meal bolus to start. And the rest through the add meal function as above.
T slim	Extended bolus option can be used in Control-IQ+ for up to 8 hours. Trial a 50/50 or 60/40 split and choose the duration of your choice

This information on managing HFHP with an HCL system will be individually tailored to your situation as everyone may be slightly different in terms of their rate of food digestion and what bolus type may work best.

Notes

Nutrition and Dietetics Department

Clinic 5, King's Treatment Centre, King's Mill Hospital
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01623 622515, extension **6570**

Further sources of information

NHS Choices: www.nhs.uk/conditions

Our website: www.sfh-tr.nhs.uk

Patient Experience Team (PET)

PET is available to help with any of your compliments, concerns or complaints, and will ensure a prompt and efficient service.

King's Mill Hospital: 01623 672222

Newark Hospital: 01636 685692

Email: sfh-tr.PET@nhs.net

If you would like this information in an alternative format, for example large print or easy read, or if you need help with communicating with us, for example because you use British Sign Language, please let us know.

You can call the Patient Experience Team on 01623 672222 or email sfh-tr.PET@nhs.net.

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