

Information leaflet on

How to be successful with advanced bolusing & managing exercise

KISS - Keep it Simple and Safe

For insulin pumps



Name:

Write down the three meals that always cause your glucose levels to stay high more than 4 hours after eating

1. -----

2. -----

3. -----

When Carbohydrate Counting works well

- When you weigh foods regularly.
- When you convert weighed portions into household measures – Saves time!
- When you give insulin 15 minutes before eating.
- When you plan ahead before eating out.
- **When you eat your usual well-balanced meals.**

When Carbohydrate Counting is not effective

- When you eat meals that are **high in fat and protein**, much higher than your usual well-balanced meals.

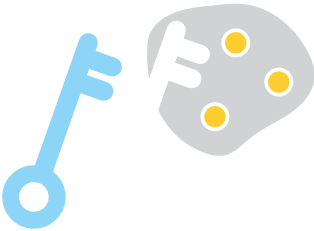
Your insulin to carbohydrate ratio will calculate an accurate insulin dose to cover your usual well-balanced meals. But it will not calculate enough insulin if your meal is very high in fat and protein.

Why?

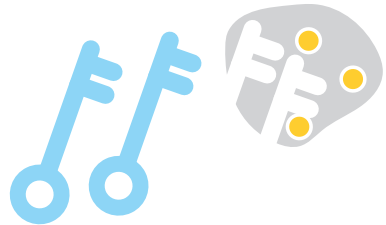
When you have a meal that contains a high amount fat and protein, way above your usual meal, your body needs more insulin to process the carbohydrate. The high fat and protein intake prevents the insulin from working effectively, the technical term, insulin resistance.

If you consider insulin works like a key, opening the cell doors to allow glucose in. Just think a meal high fat and protein puts another lock on the cell, so two insulin keys are needed instead of one.

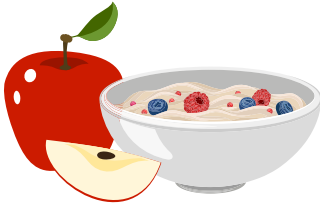
Normal meal



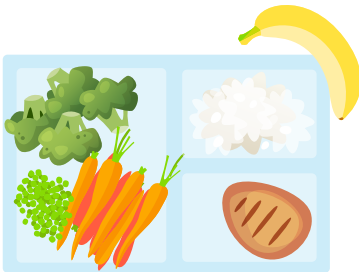
High Fat and Protein Meal



**When Carbohydrate
Counting Works**
Well-balanced breakfast



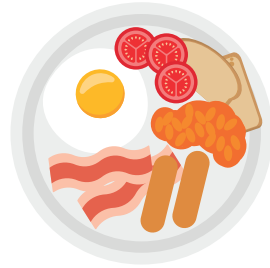
Well-balanced lunch



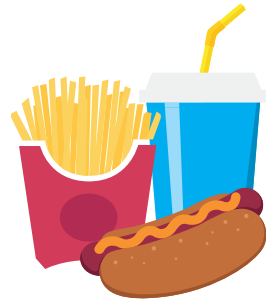
Well-balanced evening meal



When more insulin is needed
High fat and protein
breakfast



High fat and protein lunch



High fat and protein
evening meal



Meal	Extra Insulin	Multiwave Dualwave Extended
Fish and Chips	25% Health Event +25% Carbohydrate x 1.25	50% now 50% over 2.5 hours
Indian Takeaway	25% Health Event +25% Carbohydrate x 1.25	50% now 50% over 2.5 hours
Pizza	25% Health Event +25% Carbohydrate x 1.25	50% now 50% over 2.5 hours
Chinese Takeaway	25% Health Event +25% Carbohydrate x 1.25	50% now 50% over 2.5 hours
Pasta with creamy sauce e.g. Macaroni cheese	25% Health Event +25% Carbohydrate x 1.25	50% now 50% over 2.5 hours
Fast food meals e.g. McDonalds, KFC, Dixy's	25% Health Event +25% Carbohydrate x 1.25	50% now 50% over 2.5 hours

How do I do this on my pump?

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Guidance on adapting Dualwave / Multiwave / Extended bolus's

Monitoring:

- Test blood glucose before meal
- Test blood glucose two and half hour after
- Test blood glucose six hours after

Two half hour test - does the first percentage need adjusting?

- If blood glucose at 2.5 hours is **more than 4mmol.l** higher than pre meal:

Increase initial percentage by 20% next time to:

- 70% (multiply total insulin by 0.7) & 30% multiply total insulin by 0.3)
- E.g. $10 \times 0.7 = 7\text{units}$ & $10\text{units} \times 0.3\text{units} = 3\text{units}$

- If blood glucose at 2.5 hours is **lower** than pre meal:

Reduce initial percentage by 20% next time to:

- 30% (multiply total insulin by 0.3) & 70% multiply total insulin by 0.7)
- E.g. $10 \times 0.3 = 3\text{units}$ & $10\text{units} \times 0.7\text{units} = 7\text{units}$

Six hour test - do you need more insulin?

Guidance on adapting extra insulin:

- If blood glucose at six hours is **2 - 6mmol.l higher** than pre meal:

Increase the percentage by 10%, from 25% extra to 35% extra by

- Carbohydrate to be eaten x 1.35,
E.g. $100 \times 1.35 = 135\text{g}$ multiwave

OR

- **Health Event= +35%**

- If blood glucose at six hours is **more than 6mmol.l higher** than pre meal:

Increase the percentage by 20%, from 25% extra to 45% extra by

- Carbohydrate to be eaten x 1.45
E.g. $100 \times 1.45 = 145\text{g}$ multiwave

OR

- **Health Event= + 45%**

First time experiment

Meal: _____ Meal carbohydrate: _____

Calculation for 25% extra insulin to cover high fat high protein meal

Meal carbohydrate x 1.25 (Health Event +25%)=

50% now & 50% over 2.5 hours

Time to test Blood Glucose	Blood Glucose
Pre meal	
2.5 hours after meal	
6 hours after meal	

Does the percentage up-front need adjusting based on the 2.5 hours test?

Does the total amount of insulin need increasing above 25% based on the 6 hours test?

Second time experiment

Meal: _____ Meal carbohydrate: _____

Calculation for 25% extra insulin to cover high fat high protein meal

Meal carbohydrate x 1.25 (Health Event +25%)=

50% now & 50% over 2.5 hours

Time to test Blood Glucose	Blood Glucose
Pre meal	
2.5 hours after meal	
6 hours after meal	

Does the percentage up-front need adjusting based on the 2.5 hours test?

Does the total amount of insulin need increasing above 25% based on the 6 hours test?

Your Personal List

As you work out the extra insulin and Dual/Extended bolus splits for different meals note them down in your own personal list below.

Meal	Extra Insulin	Dual/Extended Split	
Fish and Chips		% now	% over 2.5 hours
Indian Takeaway		% now	% over 2.5 hours
Pizza		% now	% over 2.5 hours
Chinese Takeaway		% now	% over 2.5 hours
Pasta with creamy sauce e.g. Macaroni cheese		% now	% over 2.5 hours
		% now	% over 2.5 hours
		% now	% over 2.5 hours
		% now	% over 2.5 hours
		% now	% over 2.5 hours
		% now	% over 2.5 hours
		% now	% over 2.5 hours
		% now	% over 2.5 hours
		% now	% over 2.5 hours

<p>Number of minutes the activity is after insulin bolus for meal</p>	<p>Before Activity Meal before activity</p>	<p>During Activity Check BG before and during 30minute intervals if possible</p>	<p>After activity If more than 30 minutes</p>
<p>0 - 1 1/2 hours Peak insulin action</p>	<p>Activity up to 30 minutes: -25% off the bolus insulin Activity 30+ minutes: -50% off the bolus insulin</p>	<p>Check Blood Glucose before and every 30minutes: 4-8mmol/l = 0.5g/kg/hr carbohydrate 8-14mmol/l = 0g carbohydrate >14mmol/l & ketones <0.6mmol/l = Consider 50% correction, ok to exercise >14mmol/l & ketones >0.6mmol/l = 10% TDD correction and no activity</p>	<p>Only give half of the usual correction dose Option 1: -25% off the bolus insulin after activity meal Option 2: if not eating have 10-20g carbohydrate with no insulin Option 3: reduce basal by -25% for 2-6 hours</p>
<p>More than 1 1/2 hours Moderate insulin action</p>	<p>Full amount of bolus insulin</p>	<p>Check Blood Glucose before and every 30minutes: 4-8mmol/l = 1g/kg/hr carbohydrate 8-14mmol/l = 0g carbohydrate >14mmol/l & ketones <0.6mmol/l = Consider 50% correction, ok to exercise >14mmol/l & ketones >0.6mmol/l = 10% TDD correction and no activity</p>	<p>Only give half of the usual correction dose Option 1: -25% off the bolus insulin after activity meal Option 2: if not eating have 10-20g carbohydrate with no insulin Option 3: reduce basal by -25% for 2-6 hours</p>

Activity	Before Activity Meal before activity	During Activity Check BG before and during 30 minute intervals if possible	After activity If more than 30 minutes

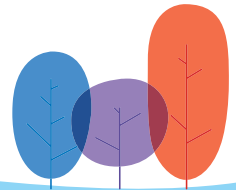
Notes

Looking after and sharing information about you

We have a duty of care to help patients and families understand how information about them is kept and shared and we include the following information in all our patient leaflets:

Information is collected about you relevant to your diagnosis, treatment and care. We store it in written records and electronically on computer. As a necessary part of that care and treatment we may have to share some of your information with other people and organisations who are either responsible or directly involved in your care. This may involve taking your information off site. We may also have to share some of your information for other purposes; such as research etc. Any information that is shared in this way will not identify your child unless we have your consent.

If you have any questions and/or do not want us to share that information with others, please talk to the people looking after your child or contact PALS (Patient Advice and Liaison Service) on 0121 333 8403.



Birmingham Children's Hospital NHS Foundation Trust
Steelhouse Lane Birmingham B4 6NH
Telephone 0121 333 9999
Fax: 0121 333 9998
Website: www.bwc.nhs.uk

Author: John Pemberton - Paediatric Diabetes Dietitian
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