



Children and Young People's Diabetes Service

Insulin Pump Therapy Information
High blood glucose levels without ketones





Information for patients, parents and carers

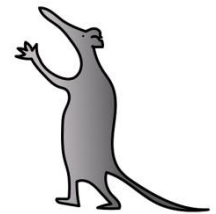
Why should you treat high blood glucose levels?

Correcting high blood glucose levels is needed to help achieve good diabetes control. Left untreated the blood glucose level may be high for hours, this can make you feel unwell and if high blood glucose levels happen often will cause a high HbA1c. A correction dose is an extra dose of fast acting insulin given to lower the blood glucose level back to target.

What should your blood glucose levels be?

It is recommended that your blood glucose levels should be

-  4-6mmol/L on waking
-  4-7mmol/l before meals
-  Below 9mmol/L 2 hours after meals
-  Below 7 mmol/L before bed



If the blood glucose level is 14mmol/L or more you need to check for ketones. If ketones are above 0.6mmol/l follow the advice in the information sheet about managing a high blood glucose level with ketones.



A correction dose should be given whenever blood glucose levels are above target. We recommend that you use the bolus advisor in your insulin pump to calculate correction doses. Bolus advisors also calculate active insulin or insulin on board which helps to reduce insulin stacking and hypos.

Calculating your insulin sensitivity factor

You need to calculate your insulin sensitivity factor to work out your correction doses. To do this you need to know how much insulin you usually take a day. You can look up your total daily dose in your pump history.

1. Calculate your average Total Daily Dose (TDD) of insulin over about 4 days
2. Divide 100 by your TDD
3. This is the amount 1 unit of insulin will lower your blood glucose level. This is your insulin sensitivity factor

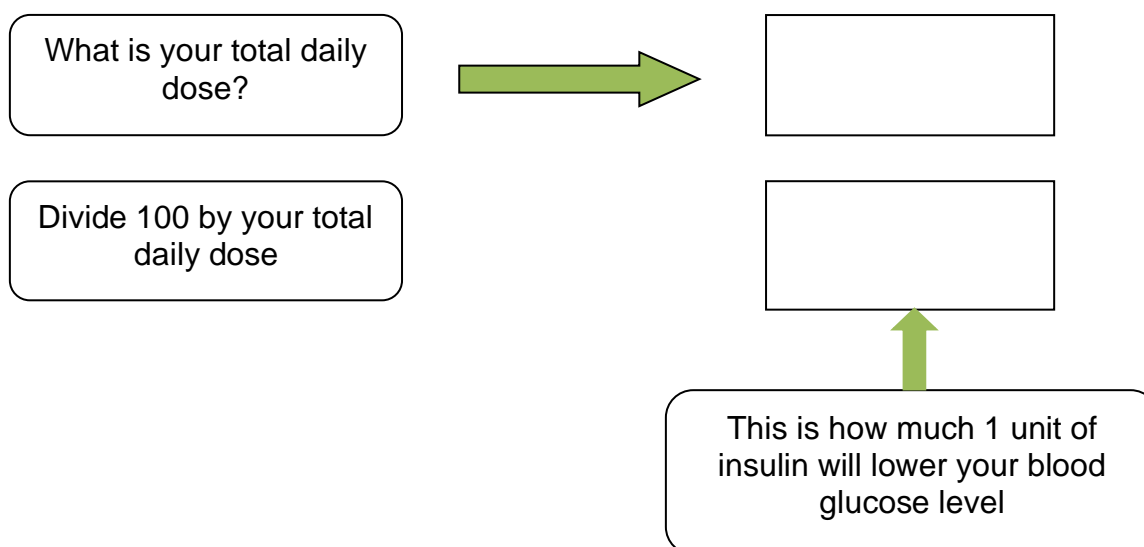
You will need to check your insulin sensitivity factor whenever the amount of insulin you take changes, for example

-  If your basal rate changes
-  If your insulin to carbohydrate ratio changes

Use this chart to help you calculate your total daily dose

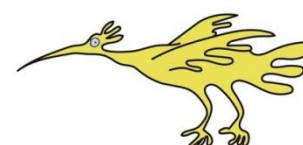
Insulin given	Day 1	Day 2	Day 3	Day 4	
Total basal rate					Keep a record in your blood glucose diary of the amount of insulin taken at different times of the day.
Total bolus insulin					
Total					Add the totals together
					Divide by 4 to find your average TDD

To calculate your insulin sensitivity factor



The amount of insulin you need to ‘correct’ your blood glucose level will depend on how sensitive you are to the insulin. Different things will affect your insulin sensitivity. These include;

- ✚ How well you are
- ✚ Whether you have ketones
- ✚ How stressed you are feeling
- ✚ How active you have been
- ✚ How much active insulin is in your body



What is active insulin?

This is insulin that is still working from a previous injection. It may also be called insulin on board. If you use a smart blood glucose meter this will take active insulin into account each time it calculates a correction dose.

If you do not use a bolus advisor you should not give a correction dose within **2hours** of a previous injection of fast acting insulin.

It is important to know how to an insulin sensitivity factor (ISF). Keep a record of all the settings in your bolus advisor on the pump or pump handset in case of pump failure or breakage.

Once you have managed the high blood glucose level it is important to think about why it may have happened. If you see a pattern of high blood glucose levels at the same time of day over a few days you will need to adjust your insulin.



You can contact the diabetes team for advice about adjusting basal rates, insulin to carbohydrate ratios and insulin sensitivity factors. More information is available in the insulin adjustment on pump therapy fact sheet.

High blood glucose levels may be caused by;

Insufficient Insulin Delivery

- Miscalculation of a bolus dose
- Omission of a bolus dose
- Excessive intake of carbohydrate for hypoglycaemia
- Insufficient basal rate (basal rate too low)
- Insufficient insulin to carbohydrate ratio
- Long periods of time spent off the pump
- Pump in stop mode
- Incorrect operation of pump
- Insulin not being changed regularly
- Out of date or incorrectly stored insulin

Problem with the Infusion set

- Air in the infusion line
- Blockage in the infusion set
- Leakage of insulin
- Infusion set has not been screwed securely to the adaptor or cartridge

Cannula

- Inflamed insertion site
- Blocked or kinked cannula
- Dislodged cannula
- Cannula in site for longer than recommended
- Lumpy site

Increased Insulin Demands

- Illness/ Infection
- Being less active than normal
- Stress
- Hormonal changes
- Growth
- Other medications



Who to contact for further help or advice

If you need urgent advice about diabetes management Monday – Friday 8am – 6pm, call 0151 252 5766.

For out of hours advice call the hospital switchboard on 0151 228 4811 and ask for ‘Diabetes on call’.

Always contact the insulin pump company in the event of pump failure.

For non-urgent advice contact your diabetes nurse on the usual numbers or email diabetes@alderhey.nhs.uk



Follow us on Twitter: @AlderHeyDiab

Website: <https://alderhey.nhs.uk/parents-and-patients/services/diabetes> – Meet the team, useful guidelines, research and publications, helpful advice and video guides.

Download the Digibete app, the video platform to share videos and educational resources about Type 1 Diabetes. The content is to support children, young people and their families to self manage their own diabetes by extending the reach of their clinical teams online using the clinic code - **AEBDR**



This leaflet only gives general information. You must always discuss the individual treatment of your child with the appropriate member of staff. Do not rely on this leaflet alone for information about your child’s treatment.

This information can be made available in other languages and formats if requested.

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