

Coping with illness (Sick day rules) – Insulin Pump –



Children whose diabetes is well controlled should not experience more illness or infections than children without diabetes. However those with poor diabetes control will be more at risk of a variety of different infections. Any illness may upset the control of your/your child's diabetes and it is important to know how to manage 'Sick Days':

- Most illnesses will cause high blood glucose levels. Fever tends to raise blood glucose levels. Some illnesses, especially vomiting illnesses, can cause low blood glucose levels.
- If high blood glucose levels are not treated, ketones will develop due to a shortage of insulin, and you/your child could become very unwell with diabetic ketoacidosis (DKA).

Never omit the basal (background) insulin.

Generally extra fast acting insulin is required.

What do I do if I am/my child is unwell?

- Check BG before meals, before bed and every 3-4 hours overnight.
- Check blood ketone levels every 4-6 hours.

How do I work out the insulin dose to give if I am/my child is unwell?

Refer to the flowchart titled “High Blood Glucose – Pump” for advice on how to manage blood glucose and blood ketone levels when unwell.

- Check your total daily dose (TDD) of insulin by either checking your pump or your most recent clinic sheet.
- If you are using a pump, a “sick day dose” of additional insulin will be required if your blood ketone reading is above 0.6 mmol/L.
- If a “sick day dose” is needed, **you must give Novorapid via insulin pen device.**
- Remember the ‘Sick Day dose’ is given **in addition** to the insulin required to cover carbohydrate intake.
- Expect the blood ketone levels to fall within two hours after the sick day dose. This sick day dose can be repeated four hourly as required.

Troubleshooting pump and equipment

If you think a pump or equipment malfunction is the reason for high blood glucose and ketone reading, **you must still give your sick day correction dose by insulin pen first.**

Once this is done, you have time to troubleshoot. It is important to check:

- There is no leakage from the infusion set or cannula.
- The cannula has not become dislodged.
- The cannula and insertion set has not been worn for more than 72 hours.
- There are no large air bubbles in the infusion set.
- The correct basal rate is set.
- The correct bolus dose has been given (check bolus history).
- The cannula is not inserted into a lumpy site.
- The pump is working properly (do a ‘self test’ if available on your pump]
- Any alarm messages
- Contact the pump company’s technical support for advice

Dealing with Hypoglycaemia due to illness such as vomiting and diarrhoea

What should I/my child eat and/or drink when unwell?

High blood glucose readings lead to dehydration so it is important to drink more fluids.

If you are/your child is not managing to eat, aim to replace the mealtime carbohydrate with fluid containing carbohydrate. Cover this CHO with bolus insulin (Novorapid).

There may be occasions where additional carbohydrate-containing fluids are required to maintain BG levels (and therefore energy supplies) without covering with bolus insulin – These fluids can be sipped/drunk over a few hours.

Fluids containing 10g carbohydrate

Carbohydrate containing fluids	10g equivalents
Glucose powders	2 teaspoons in 20mls water/sugar-free juice
Original lucozade	50 - 55mls
Original coca-cola	90mls
Milk	200mls
Apple juice	100mls

When to contact the Diabetes Team or Children's ward

- Continued vomiting and/or unable to tolerate CHO-containing drinks.
- Unable to keep BG level above 4mmol/L.
- BG is more than 14mmol/L and/or blood ketones are more than 0.6 mmol/L after sick day doses.
- You are worried or exhausted or don't know what to do next.

Diabetes Team 01324 567177 (Mon – Fri 9am-5pm)

Children's ward 01324 567203 (After 5pm and weekends/holidays)

High blood ketones and DKA

What are ketones?

Ketones are produced when fat is broken down in the body.

Ketones are acid chemicals. If these ketones are **allowed** to build up in the body, they can make you/your child very unwell.

The normal reading on the blood ketone meter is '**less than 0.6 mmol/L**'.

Why do ketones appear in the blood?

Anyone can produce ketones, even if they do not have diabetes. However, in people with diabetes, a lack of insulin in the body causes a high level of glucose in the blood. The body is not able to use this glucose for energy. Instead the body uses fat as an alternative energy source: fat is broken down producing ketones.

This can occur:

- At diagnosis of type 1 diabetes.
- If a person with type 1 diabetes forgets to take insulin.
- If there is an issue with a cannula, giving set or insulin pump leading to an interruption in insulin delivery
- During 'Sick Days' - when the body has an increased requirement for insulin.

High ketone level is an unwanted complication of not having enough insulin in the body.

If this gets out of control, the condition called **diabetic ketoacidosis** can develop (DKA).

Management of DKA requires hospital admission.

What is DKA and what are the symptoms?

- DKA is a serious and potentially life-threatening condition.
- Ketones build up in the body due to a lack of insulin and there is a great loss of fluids and salts from the body. DKA requires urgent treatment.
- The build up of the ketone acids in the blood stream affects the breathing pattern making it faster as the body tries to get rid of the acid.
- General abdominal/tummy pain and tenderness are also caused by the ketoacidosis.

What is the urgent treatment?

- Replacement of fluids and salts at a carefully calculated rate and administered via a 'drip' (infusion) directly into a vein.
- Insulin administered via an infusion directly into the vein. This will allow the body to use glucose appropriately and importantly will 'switch off' the production of ketones, which will clear from the body.
- Drinks and food are not allowed until the ketones clear from the blood. This is because the high blood ketones and the high blood glucose levels stop the stomach and gut from 'moving'/contracting as usual. Therefore any fluids or food entering the stomach will pool in the stomach and make the person vomit: vomiting can worsen the DKA and it can take longer to recover

What to expect on Children's ward.

- Very close attention from the nursing and medical staff.
- Hourly finger prick blood testing to monitor the blood glucose levels and the blood ketone levels.
- 4 hourly blood samples from a vein to measure the ketone acids in the blood and the salts and fluids in the blood.
- Monitors will be attached to you/your child to check heart rate, blood pressure and the amount of oxygen circulating in the blood.
- Fluids and insulin will be administered into a vein until the ketones clear. Thereafter you/your child will return to your normal insulin regimen.