

## Oxfordshire Children's Diabetes Service

Extract from:

## Diabetes Handbook

# Ketone management and sick day rules for children and young people with Diabetes

When you are unwell, especially if you have a high temperature, the body releases chemical messengers (stress hormones) which can cause a rise in blood glucose levels. You may not feel like eating much when you are unwell, however, the body may still need the same amount, or even more, insulin than usual. You may need more insulin for several days, even once you feel better.

If the body does not get enough insulin, the body will start to break down fat for energy and, when this happens, ketones are produced.

### Ketones can be very dangerous

Ketones are acids which can quickly cause **nausea, loss of appetite, vomiting, tummy ache and fast breathing**. If the body does not get rid of the ketones, you can become more unwell very quickly and this could lead to **diabetic ketoacidosis (DKA)**, which would need urgent hospital treatment.

Giving insulin stops your body making ketones. It is important to give the extra insulin your body needs depending on the level of ketones (see chart overleaf).

Ketones are removed from the body in the urine, so it is important to drink lots of fluids (either sugar-free or with sugar, depending on the blood glucose level).



Sometimes blood glucose levels can fall with illnesses, especially tummy bugs. However, ketones can still be made and need to be treated with insulin, but this time the body needs carbohydrate as well as insulin. Occasionally, people with diabetes need to be admitted to hospital if their blood glucose level is low and ketones remain above 0.6 mmol/L.

**If you are vomiting, remember ketones can be caused by vomiting, but may also be the reason for the vomiting.**



**Background (basal) insulin must always be given (by pump or pen injection), even if not eating. If this is forgotten, ring for advice.**

### For insulin pump users:

**Check the pump and infusion site for occlusions (blockages), battery failure, accidental disconnection or leakage.**

Always check for ketones if blood glucose is above 14mmols for 2 hours or more.

**NEVER STOP  
BACKGROUND  
INSULIN WHEN  
UNWELL.**

# Sick day rules

Always check for ketones if you are unwell, regardless of the glucose level.

| STEP | Blood Ketones less than 0.6mmols/l (negative) AND Glucose Level over 14mmol/l for 2 hours                                                                                                                                                   | Blood Ketones 0.6 – 1.5mmols/l                                                                                                                                                                                 | Blood Ketones more than 1.5mmols/l                                                                                                                                                                                             |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Give correction dose if needed (with or without food dose)<br><b>If using a pump and the correction dose has no effect after one hour, assume infusion set not working and repeat the correction dose with a pen</b>                        | 1 unit/10kg of body weight (as additional rapid acting insulin by <b>pen</b> ) **                                                                                                                              | 2 units/10kg of body weight (as additional rapid acting insulin by <b>pen</b> ) **                                                                                                                                             |
|      | <b>AND</b><br>→ Change cannula, infusion set and insulin<br>→ Put pump into <b>manual mode</b> for 2 hours                                                                                                                                  |                                                                                                                                                                                                                |                                                                                                                                                                                                                                |
| 2    | Re-check glucose and ketone levels <b>after 2 hours</b> .<br>Keep well-hydrated, encourage additional fluids*<br>                                      |                                                                                                                                                                                                                |                                                                                                                                                                                                                                |
| 3    | <b>If glucose levels remain above 14mmols, repeat correction dose (BY PEN) every 2 hours until glucose within target range</b><br>If Ketones 0.6 – 1.5 follow <b>yellow</b> column<br>If ketones are more than 1.5 follow <b>red</b> column | If Ketones are less than 0.6mmol/l follow <b>green</b> column<br>If ketones remain 0.6- 1.5mmol/l repeat dose in <b>yellow</b> column step 1 (by pen)<br>If ketones are more than 1.5 follow <b>red</b> column | If Ketones are less than 0.6mmol/l follow <b>green</b> column<br>If ketones remain 0.6- 1.5mmol/l repeat dose in <b>yellow</b> column step 1 (by pen)<br>If ketones remain at more than 1.5 repeat step 1 in <b>red</b> column |

\*If glucose levels are **under 5.5mmols/l** give frequent **sugary** fluids.  
(Approximately 10mls every 5 minutes)

If glucose levels are **over 5.5 mmols/l** give **sugar free** fluids.

\*\*Continue usual insulin for FOOD doses in addition to ketone dose.  
**(Do NOT include correction insulin for high glucose level).**

## When to seek Advice?

- Ketones more than 3mmols OR need a **second** Ketone dose
- BG dropping below 4mmols/L
- Vomiting
- Increasingly unwell BG not returning to target range
- Worried?

CALL: **Nurses' office** - 01865 228737/ **Switchboard** - 0300 304 7777 (ask for Paediatric registrar)  
/ **Out of hours Mobile** - 07823 533466



## Your notes

You may wish to use this space to document your recent clinic weight and recommended ketone doses.

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[illegible]

## Further Information

If you would like an interpreter, please speak to the department where you are being seen. Please also tell them if you would like this information in another format, such as:

- Easy Read
- large print
- braille
- audio
- electronic
- another language.

We have tried to make the information in this leaflet meet your needs. If it does not meet your individual needs or situation, please speak to your healthcare team. They are happy to help.

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Oxford University Hospitals NHS Foundation Trust  
[www.ouh.nhs.uk/information](http://www.ouh.nhs.uk/information)



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Find us online:

**[www.ouh.nhs.uk/childrens-diabetes](http://www.ouh.nhs.uk/childrens-diabetes)**



Call: **01865 228737 / 01865 228736**