

# Ketone and Sick Day Management

## How to calculate rapid acting insulin (Novorapid/Apidra/Humalog)



**Never stop Basal/Background insulin**

Lantus, Levemir, Protophane or NPH

\***Extra** insulin, as highlighted, means **in addition** to insulin dose for carbohydrate

Blood Ketones	Urine Ketones	Blood Glucose Level < 4mmol/l	Blood Glucose Level 4-8 mmol/l	Blood Glucose Level 8.1-15 mmol/l	Blood Glucose Level > 15 mmol/l
< 1.0 mmol/l	Negative or trace/small  +	<p><b>Blood Ketones &lt; 1.0 mmol/L</b></p> <ul style="list-style-type: none"> <li>Risk of hypoglycaemia with rapid insulin</li> <li>Offer carb &amp; sweetened fluid</li> <li>Consider minidose glucagon if &lt; 4 mmol</li> </ul> <p><b>Test for glucose &amp; ketones repeat 30 mins until BGL &gt; 4 mmols</b></p>	<p><b>Blood Ketones &lt; 1.0 mmol/L</b></p> <ul style="list-style-type: none"> <li>Normal insulin</li> <li>Carb &amp; sweetened fluid</li> </ul> <p><b>Test for glucose &amp; ketones 2 hourly</b></p>	<p><b>Blood Ketones &lt; 1.0 mmol/L</b></p> <ul style="list-style-type: none"> <li>Give <b>extra*</b> 5% of TDD.</li> <li>Encourage sugar free fluid</li> </ul> <p><b>Test for glucose &amp; ketones 2 hourly</b></p>	<p><b>Blood Ketones &lt; 1.0 mmol/L</b></p> <ul style="list-style-type: none"> <li>Give <b>extra*</b> 10% of TDD.</li> <li>Repeat dose after 2 hours depending on levels</li> <li>Encourage sugar free fluid</li> </ul> <p><b>Test for glucose &amp; ketones 2 hourly</b></p>
1.0 - 1.4 mmol/l	Small / moderate  ++	<p><b>Blood Ketones 1.0 - 1.4 mmol/L</b></p> <ul style="list-style-type: none"> <li>Risk of hypoglycaemia with rapid insulin</li> <li>Offer carb &amp; sweetened fluid</li> <li>Consider minidose glucagon if &lt; 4 mmol</li> </ul> <p><b>Test for glucose &amp; ketones repeat 30 mins until BGL &gt; 4 mmols</b> <b>Ring Hospital for advice</b></p>	<p><b>Blood Ketones 1.0 - 1.4 mmol/L</b></p> <ul style="list-style-type: none"> <li>Give <b>extra*</b> 5% of TDD.</li> <li>Repeat dose after 2 hours if ketones not reduced</li> <li>Carb and sweetened fluid</li> </ul> <p><b>Test for glucose &amp; ketones 2 hourly</b></p>	<p><b>Blood Ketones 1.0 - 1.4 mmol/L</b></p> <ul style="list-style-type: none"> <li>Give <b>extra*</b> 10% of TDD.</li> <li>Repeat dose after 2 hours if ketones not reduced</li> <li>Encourage sugar free fluid</li> </ul> <p><b>Test for glucose &amp; ketones 2 hourly</b></p>	<p><b>Blood Ketones 1.0 - 1.4 mmol/L</b></p> <ul style="list-style-type: none"> <li>Give <b>extra*</b> 10% of TDD.</li> <li>Repeat dose after 2 hours if ketones not reduced</li> <li>Encourage sugar free fluid</li> </ul> <p><b>Test for glucose &amp; ketones 1 hourly</b></p>
> 1.5	Large  ++++	<p><b>Blood Ketones &gt; 1.5</b></p> <ul style="list-style-type: none"> <li>Risk of hypoglycaemia with rapid insulin</li> <li>Offer carb &amp; sweetened fluid</li> <li>Consider minidose glucagon if &lt; 4 mmol</li> <li>Prepare to come to hospital</li> </ul> <p><b>Ring Hospital for advice</b></p>	<p><b>Blood Ketones &gt; 1.5</b></p> <ul style="list-style-type: none"> <li>Give <b>extra*</b> 5% of TDD.</li> <li>Repeat dose after 2 hours if ketones not reduced</li> <li>Carb and sweetened fluid</li> <li>Go to hospital if vomiting</li> </ul> <p><b>Test for glucose &amp; ketones 2 hourly</b> <b>Ring Hospital for advice</b></p>	<p><b>Blood Ketones &gt; 1.5</b></p> <ul style="list-style-type: none"> <li>Give <b>extra*</b> 10% of TDD.</li> <li>Repeat dose after 2 hours if ketones not reduced</li> <li>encourage sugar free fluid</li> <li>Go to hospital if vomiting</li> </ul> <p><b>Test for glucose &amp; ketones 1 hourly</b> <b>Ring Hospital for advice</b></p>	<p><b>Blood Ketones &gt; 1.5</b></p> <ul style="list-style-type: none"> <li>Give <b>extra*</b> 20% of TDD.</li> <li>Repeat dose after 2 hours if ketones not reduced</li> <li>encourage sugar free fluid</li> <li>Go to hospital if vomiting</li> </ul> <p><b>Test for glucose &amp; ketones 1 hourly</b> <b>Ring Hospital for advice</b></p>

**Immediate risk of diabetic ketoacidosis (DKA) if the blood ketone is > 3.0 mmol/l. Insulin treatment is needed urgently. Go to closest emergency department.**

To calculate total daily dose (TDD) add up all insulin given on a usual day. (E.g.: TDD is 50 units, 5% = 2.5 units; 10% = 5 units, 20% = 10 units). Do not include correction doses for unexpected hyperglycaemia.

Adapted from ISPAD guidelines 2009 & APEG draft guidelines 2011.

## You need to speak to your doctor or diabetes educator urgently or go to hospital if:

- Vomiting persists / you're unable to keep fluids down
- Ketones are not coming down or are 1.5 mmols/l or more after two supplemental doses of insulin
- Blood glucose does not improve or remains over 15 mmol despite two supplemental doses of insulin
- You become more unwell, drowsy or confused
- You have fast or unusual breathing
- You have abdominal pain
- You are not sure what is wrong with you
- The people who are caring for you are not sure what to do or are exhausted.

% of Total Daily Dose Ready Reckoner			
Total Daily Dose (TDD) ↓	5%	10%	20%
15	1	2	3
20	2	2	4
25	1.5	3	5
30	1.5	3	6
35	2	4	7
40	2	4	8
45	2.5	5	9
50	2.5	5	10
55	3	6	11
60	3	6	12
65	3.5	7	13
70	3.5	7	14
75	4	8	15
80	4	8	16
85	4.5	9	17