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Sick day rules for Type 1 diabetes

***Information for
patients and carers***

**Diabetes Centre
David Anderson Building
Foresterhill**

Key points

- Make sure you always have plenty of insulin and blood glucose and ketone monitoring equipment available.
- Make sure your ketone strips are still in date if you haven't used them in a while.
- **Never** stop your insulin
- Check for ketones if blood glucose is over 14mmols and if you are unwell
- Sip sugar free fluids
- If you start vomiting, can't keep fluids down or can't control your blood glucose or ketone levels, **you must seek urgent medical advice.**

How does illness affect my blood glucose levels?

When you're ill, your body is less responsive to the insulin you inject. Insulin is a hormone which controls your blood glucose level.

Being unwell, especially if you have an infection and high temperature, usually makes your blood glucose levels rise, even if you're eating less than usual.

You can also produce ketones when you're unwell. These are produced when your body can't use glucose for energy because your insulin injections aren't working properly. If ketones build up in your blood, this can quickly lead to a serious condition called diabetic ketoacidosis (DKA).

You can manage your diabetes effectively during illness, keep your blood glucose levels on or near target, and prevent the development of ketones by following the advice in this leaflet.

What should I look out for if I'm ill?



Diagram source: "Type 1 diabetes: What to do when you are ill" TREND-UK (February 2018)

Important things to do when you're unwell:

Always take your insulin.

Never stop taking your insulin.

- Tell someone you trust that you don't feel well – they can help you follow the rest of the rules.
- Keep well-hydrated by drinking water or other sugar-free fluids. Sip gently throughout the day (at least 2½ to 3½ litres or 4 to 6 pints in 24 hours).
- If you have diarrhoea or are feverish and sweating, you could still become dehydrated, so don't take the kind of blood pressure tablets that might affect your kidneys – ACE inhibitors (such as ramipril, perindopril, lisinopril) or angiotensin receptor blockers (such as valsartan, irbesartan, candesartan).
- Speak to a pharmacist for advice about appropriate over the counter medicines such as painkillers and cough syrups to treat high temperature and cough.

Continued on next page →

- Avoid strenuous activity. Get some rest.
- See your GP if you think you have an infection as you may need antibiotics.
- When you're unwell, your body uses a lot of energy even when you're resting. Try to eat as normal, but if you can't, replace your meals with light, easily-digested food such as soups and milky puddings (see next page for some examples).
- Monitor your blood glucose at least 4 times a day while you're unwell. If your blood glucose is over 14mmol/l, you will need extra fast-acting insulin (such as Novorapid, Humalog, Apidra, Humulin S and Actrapid).
- To calculate how much extra insulin to take, test for ketones in your blood.

Examples of light, easily-digested foods:

These portions contain approximately 10g carbohydrate.

	Fruit juice 100 ml
	Milk 200 ml
	Plain vanilla ice-cream 1 large scoop
	Tomato soup 200 gram (half a large tin)
	Low fat yoghurt 150 gram (1 small pot)
	2 Rich tea or malted milk biscuits

Diagram source: "Type 1 diabetes: What to do when you are ill" TREND-UK (February 2018)

Understanding your blood ketone levels:

- Less than 0.6 mmol/L is normal
- 0.6 to 1.4 mmol/L means you may be at risk of developing DKA so test again for ketones after 4 hours use additional quick-acting insulin to reduce glucose levels
- 1.5 to 2.9 mmol/L means you are at risk of DKA. **Contact your diabetes team or GP as soon as possible**
- 3 mmol/L or higher means you have a very high risk of DKA. **Get emergency help as soon as possible**

If blood glucose is more than 14mmol/l and blood ketones are less than 1.5mmol/l then take your usual correction dose or use the following example.

Blood glucose level	Insulin dose
14.0 - 17.0	Add 2 extra units to each dose
17.1 - 22.0	Add 4 extra units to each dose
More than 22.0	Add 6 extra units to each dose

Not everyone uses correction doses so if you don't know what your "correction dose" is, then:

1. Add up all the insulin you take in a typical day (each mealtime dose plus your background insulin dose)
2. This is your Total Daily Dose (TDD)].
3. Then test your blood ketones.

The chart on the next page tells you how many extra insulin units to take of your fast acting insulin (on top of your usual meal-time insulin dose), depending on your ketone level.

If you use an insulin pump, please read the insulin pump safety card for information about managing your ketones.

If you can only do a urine ketone test, a result of 2+ means you are likely to develop DKA.

Blood glucose more than 14mmol/L and blood ketones 1.5mmol/L or higher (+ or more of urine ketones).



Sip sugar-free fluids, at least 100ml each hour. Eat as normal, if possible. If not, see meal replacement suggestions on following pages. **You need food containing carbohydrate (carbs), insulin and fluids to avoid dehydration and prevent DKA.**



Blood ketones 1.5 to 3mmol/L (+ to ++ urine ketones).



Blood ketones more than 3mmol/L (+++ to ++++ urine ketones).



Give additional 10% of TDD as rapid-acting or mixed insulin every 2 hours	Total daily insulin dose (TDD)	Give additional 20% of TDD as rapid-acting or mixed insulin every 2 hours
1 unit	Up to 14 units	2 units
2 units	15 to 24 units	4 units
3 units	25 to 34 units	6 units
4 units	35 to 44 units	8 units
5 units	45 to 54 units	10 units
If you take more than 54 units or if you're unsure how to alter your dose, contact your specialist team or GP.		



Test blood glucose and blood ketones **every 2 hours**, including during the night.



Blood glucose more than **14 mmol/L** and ketones present?

YES – repeat process



NO

As your illness resolves, adjust your insulin dose back to normal.

When should I seek help?

Seek urgent medical help if your readings remain higher than usual, or you feel very unwell and you're not sure what to do.

Get to hospital urgently if any of these apply to you:

- If you are pregnant and have ketones
- If you vomit for the duration of 2 meals (i.e. 4 hours) and can't keep fluids down
- If you have persistent ketones despite increasing your insulin
- If you become drowsy and/or breathless
- If you have sudden abdominal pain
- If your condition worsens despite following the advice in this leaflet

Call 999 if your breathing becomes rapid and deep or if you feel drowsy. **These are signs of diabetic ketoacidosis - a life-threatening emergency.**


If you need to go to hospital, remember to take a list of all your medications and your insulin with you.

My personalised sick day insulin doses

<p>Blood ketones 1.5 to 3mmol/L</p> <p>(+ to ++ urine ketones)</p>	<p>Long Acting Insulin</p> <hr/> <p>+</p> <p>ALL Short Acting insulin</p> <hr/> <p>=</p>	<p>Blood ketones more than 3mmol/L</p> <p>(+++ to ++++ urine ketones)</p>
<p>Give additional 10% of your TDD as rapid acting insulin every 2 hours</p>	<p>Total Daily Dose Insulin (TDD)</p>	<p>Give additional 20% of your TDD as rapid acting insulin every 2 hours</p>

Useful contact details:

NHS 24

 111

**Diabetes Specialist Nurse Advice line
(Monday to Friday 9am to 1pm)**

 01224 559977

Your GP:



Website:

www.nhsgrampandiabetes.scot.nhs.uk

Other useful contacts:

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