

High Blood Glucose and Type 1 Diabetes

When your blood glucose levels are high (over 8mmol/L before meals, over 10mmol/L after meals or HbA1c over 7%:

- You may not experience symptoms even if blood glucose (BG) levels are higher than normal unless they are persistently above 15mmol/L. However, even levels above 8mmol/L can cause damage silently.
- An occasional high blood glucose level may occur and this is not usually a problem. Your risk of developing complications depends on your average blood glucose, as shown by your HbA1c level (test of your average blood glucose over the past 2-3 months).

Blood glucose levels above 15mmol/L (hyperglycaemia) may cause:

- thirst
- tiredness
- passing large amounts of urine or more frequent urination
- blurred vision
- weight loss
- persistent infections, eg. 'thrush' (rash, itching).

What causes high blood glucose levels?

Blood glucose levels usually rise during illness, infection or times of stress. Weight gain and cortisone treatment are other causes of higher blood glucose levels. During stress and illness, increased levels of the hormones adrenaline and cortisol are produced, which raise the level of glucose in your blood. Forgetting to take insulin or not taking enough will also result in high BG levels.

Balancing your blood glucose levels

- Check your blood glucose levels frequently – up to 4 times per day. Check before meals and if on rapid acting insulin (Humalog or Novorapid), check 2 hours after meals. Record tests in your diary to discuss with your health professional.
- Review your tests to look for patterns of high or low levels that occur about the same time each day or night. Talk to your doctor or diabetes educator about changes to your insulin dose if test results are too high or low.
- Take your insulin regularly at the same time each day. If you have difficulty remembering to take it, try setting a reminder on your mobile phone or watch, and carry a spare insulin pen with you.
- Learn about adjusting your insulin doses for exercise or illness. Ask your doctor to complete the insulin dose guide on your sick day action plan.
- Learn about the effect of different foods and carbohydrate serves on your blood glucose levels to estimate the insulin dose you need for each meal.

Sick days and type 1 diabetes

Illnesses such as colds, flu, infections, vomiting or diarrhoea may create special problems for people with diabetes as illness tends to worsen diabetes control.

When you feel sick you may not feel like worrying about your diabetes, but this is just the time to take special care, to prevent more serious problems developing.

If you are not well enough to follow your sick day plan, ask someone to help you or call your doctor or go to a hospital emergency department.

Ketones and Ketoacidosis

Ketones are a chemical in the bloodstream that may be produced when blood glucose levels become very high, if not enough insulin is taken or an insulin dose is missed, during illness or infection. High ketone levels in the blood or urine is a warning that ketoacidosis could be developing and extra insulin is urgently required. Ketoacidosis is a medical emergency because if not detected and treated, it can be life threatening.

Ketoacidosis can occur if you are ill and your blood glucose levels are high. The signs of ketoacidosis are:

- Nausea and vomiting
- Stomach pains
- Drowsiness
- Shortness of breath
- Sweet 'fruity' odour on breath

It is not necessary to test for ketones on a routine basis, however, people with type 1 diabetes should test for ketones when they:

- are vomiting
- have a fever, infection or illness
- have persistently high blood sugars (15 or above on 2 consecutive tests)
- during pregnancy (before eating each morning).

Follow your sick day action plan when you feel unwell or become ill, if your blood glucose levels are very high (over 15) for more than 24 hours or you have ketones in your blood or urine. Ask your doctor to complete the insulin dose guide for you to follow.

Sick day action plan and type 1 diabetes

What to do when you feel unwell or become ill, if your blood glucose levels are very high (over 15) for more than 24 hours or you have ketones in your blood or urine:

Keep taking your insulin

- Take at least your usual dose, even if not eating. Your body needs at least your usual insulin dose when you are sick.
- You may need an extra dose of quick acting or a larger dose of insulin than usual. Ask your doctor for advice and refer to the guide below.

Check your blood glucose levels

- Check every 4 hours (2-4 hours if on rapid acting insulin).
- If your blood glucose is over 15mmol/L, extra insulin is needed.

Check your blood or urine for ketones

- If you have more than a trace of ketones in your urine or blood ketones are 1.0 – 1.5mmol/L, you may need an extra short acting insulin. Refer to the dose guide below.
- Contact your doctor urgently if urine ketones are increasing, are ++ or more or blood ketones are 1.5mmol/L or higher.

Drink plenty of sugar free fluids

- Drink about a glass each hour. Dehydration can develop quickly, especially if you have diarrhoea and vomiting.
- Continue eating if possible. Light meals may be preferred, such as toast, fruit or juice.
- If you cannot eat food, drink fluids containing sugars, such as fruit juice or lemonade
to prevent your blood glucose becoming too low (less than 3.5mmol/L).
- If your blood glucose level is < 15mmol/L, drink fluids containing sugar.
- If your blood glucose level is > 15mmol/L drink sugar free fluids.

Contact your doctor or go to hospital if

- You vomit 2 or 3 times or continue vomiting for more than 4 hours
- Your blood glucose level or ketones continue to rise despite extra insulin
- You are hypoglycaemic and cannot keep your blood glucose level above 4mmol/L
- You develop stomach pains, difficulty breathing or drowsiness
- You are concerned about your diabetes control or are unable to care for yourself

Insulin dose guide

Discuss extra insulin doses required during periods of illness with your Doctor.

Blood glucose	Ketones	Take extra units of fast acting insulin
4 – 15 mmol/L	No ketones	units
	+ ketones	units
15 – 20 mmol/L	No ketones	units
	+ ketones	units
Over 20 mmol/L	No ketones	units
	+ ketones	units



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