

2023 Sick Day Guidelines

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Written and clinically reviewed by Marissa Town, RN, BSN, CDCES

Now that we have all emerged from the COVID-19 pandemic, many of us are rebuilding our immune system. This means we are catching all the germs our kids are bringing home from school, our coworkers are bringing into work, and whatever else our body catches. Since we were all isolated for so long, a lot of our body's antibodies aren't as effective as they once were. Here are the latest guidelines for sick-day management for people with diabetes. *Note – if you are a caregiver/parent, replace “you” with “your child.”

Monitoring Glucose and Ketones

For sick days, monitoring blood glucose levels more often is very important. Illness can cause blood sugar levels to rise due to the added stress on the body. However, there is also a risk of low blood sugar if unable to keep down food. The current recommendations from the International Society for Pediatric and Adolescent Diabetes (ISPAD) are to either utilize CGM (continuous glucose monitoring) or do finger sticks every 1-2 hours and to monitor ketone levels every 1-2 hours as well.

Targets for Sick Days are:

- Glucose levels 70-180 mg/dL (3.9 -10 mmol/L)
- Target Ketone levels <0.6 mmol/L or small/trace ketones on urine dipstick
- Small sips of liquid every 5-10 minutes to maintain hydration (Goal 100 ml per hour which is about 3.5 oz)
- Remember that urine ketones may be less accurate data due to the amount of time the urine has been in the body. Assume that the urine is 6-8 hours old and that the level of ketones could be greater than measured. Unfortunately, not everyone has access to a blood ketone meter, but if you can get one, it is a more accurate tool.

Keep Taking Insulin

If you do not keep taking insulin, you could get very sick, and increase the risk for diabetic ketoacidosis (DKA). Also, when your blood sugars stay higher, it can make the infection worse. The bacteria or virus feeds off the extra sugar and become stronger. You may have to take less insulin if you are having severe vomiting, drink fluids that have carbohydrates in them, or utilize mini-glucagon to keep blood sugars in the target range. (Mini-glucagon is getting more challenging due to the discontinuation of the old glucagon kits, but there are studies going on now for mini-dose pens of glucagon, so more to come!) If unable to keep fluids down or blood sugars up, you can go to an emergency room to get intravenous (IV) dextrose fluids (sugar fluids).

When to Call the Diabetes Team

There are many reasons to call the diabetes team, and you shouldn't hesitate if you are concerned! Here are some reasons you may want to call:

- If you are worried and need guidance on what to do
- You are getting worse and feel concerned
- You are unable to keep blood sugars above 70 mg/dL (3.9 mmol/L)
- Vomiting has gone on for longer than 2 hours
- You are unable to keep down fluids

- Blood sugars stay elevated despite extra insulin doses
- Your ketones are moderate and you are not sure how to manage them

Managing Ketones

When ketones are present, the risks are elevated and you need to stay hydrated and have plenty of insulin on board. Depending on how high your ketones are, you may have to add extra insulin doses than you usually would to treat the ketones. Here are some tips for the various levels of ketones.

Trace/Small Ketones (0 – 0.9 mmol/L)

- You're not in the danger zone yet, but you want to keep an eye on things
- Refresh insulin – a new pen or insulin pump cartridge, tubing, and infusion set
- Hydrate – fluids with sugar if BG <90 mg/dL (<5 mmol/L), sugar free fluids if higher
- Consider eating extra carbohydrates and bolusing normally to help avoid starvation ketones
- Consider reducing total daily insulin if blood sugars are running less than 90 mg/dL (<5 mmol/L)

Small/Moderate Ketones (1-1.4 mmol/L)

- Refresh insulin – a new pen or insulin pump cartridge, tubing, and infusion set
- Hydrate fluids with sugar – bolus for them!
- Bolus for foods that are eaten, you need to have more insulin in your system, even if your blood sugar is low or normal
- Give corrections if above 90-100 mg/dL (5-6 mmol/L)

Moderate/Large Ketones (1.5 – 2.9 mmol/L)

- Do not reduce total daily insulin
- Refresh insulin – a new pen or insulin pump cartridge, tubing, and infusion set
- Hydrate with fluids with sugar – bolus for them and add an extra 5% of your Total Daily Dose (See below on Calculating Total Daily Dose) to the bolus
- Bolus for foods that are eaten; you need to have more insulin in your system, even if your blood sugar is low or normal
- Give corrections above 90-100 mg/dL (5-6 mmol/L)
- Watch for signs/symptoms of DKA – nausea/vomiting, change in level of consciousness, short, rapid breathing, fruity smelling breath (if present, go to the Emergency Room)

Large Ketones (>3 mmol/L)

- Contact your Diabetes Team and consider going to the Emergency Room
- If Nausea/Vomiting present, drowsy, breathing rapidly, go to ER right away or call 911, if needed

Calculating Total Daily Dose

To calculate the total daily insulin dose, you will add up all the insulin given in a typical day. This includes both basal and bolus insulin – so the long-acting nighttime/morning dose and all of the doses you take throughout the day. Insulin pumps will have the Total Daily Dose in the history menu, typically.

When to Go to the Emergency Room

Sometimes you may need help from medical professionals, and that's okay. It happens, and this is what they are here for! Here are the key times to go to the closest Emergency Room:

1. Vomiting longer than 2 hours – especially in young children
2. Unable to keep glucose levels above 70 mg/dL (3.9 mmol/L)
3. Change in neurological status – confusion, loss of consciousness, seizure, etc.
4. Severe lethargy/drowsiness
5. Ketones stay elevated even with added insulin + hydration
6. Unable to get glucose levels down despite extra insulin doses
7. Dehydration symptoms – sunken eyes, infrequent urination, very dark urine, etc.
8. Short, rapid-breathing or hyperventilating (Kussmaul breathing²)
9. Severe pain that is not controlled
10. If you cannot care for yourself or your child at home safely
11. Don't Be Afraid to Ask for Help

We all need help sometimes and, speaking as a certified diabetes care and education specialist, and a nurse, I would MUCH rather someone call in to ask questions if they are worried than have something bad happen to them. Hopefully, your clinic or diabetes team will work with you and provide information about what they recommend for sick-days, and they will give you guidelines on when to call them for assistance. When in doubt, reach out to someone for help.

References:

1. [Sick day management in children and adolescents with diabetes \(ISPAD Guidelines 2022\)](#)
2. [Kussmaul Breathing \(Cleveland Clinic\)](#)