

Caring for Your Sick Child (Insulin Pump)

Ketones are more likely to develop no matter what the glucose levels are when your child is sick. Blood glucose levels may rise due to the stress response of illness. More insulin may be required to prevent or treat ketones.

When your child is ill, their body **continues to need insulin and carbohydrates to prevent formation of ketones.**

Follow these guidelines when your child is sick



Check glucose every **2** hours and give correction as needed until ketones are negative.



Give your child lots of liquids to stay hydrated.



Check urine ketones every **2-3** hours and follow the **Ketone Action Plan** for extra insulin until ketones are negative.



Continue insulin infusion through pump, even if your child is not eating.

Follow these guidelines when your child is vomiting



Take Zofran (Ondansetron) if prescribed by your doctor.



Give small sips (1 tablespoon) of clear sugared liquids (such as Gatorade) every 15 minutes.



If there is no vomiting after 30 minutes, increase the amount of liquids to 2 ounces ($\frac{1}{4}$ cup) every 15 minutes.



If vomiting restarts, don't offer liquids for another hour and then restart the small amounts of liquids.



Continue checking glucose and ketones every 2 hours and refer to the Ketone Action Plan for instructions. **If vomiting occurs more than 2 times, call your diabetes team.**

What are the warning signs to seek help?



Go to the emergency department if your child has large ketones and any of the following symptoms:

- ✓ Chest heaviness
- ✓ Rapid breathing or trouble breathing
- ✓ Confusion
- ✓ Severe abdominal pain
- ✓ Your child is too dehydrated to check for urine ketones (not urinating)
- ✓ Your child has vomited twice and can't keep liquids down



If you are uncertain about any of these instructions, please call Rady's diabetes team at: 858-966-4032, choose option for nurse - Monday through Friday from 8:30am to 4:30pm
Non-business hours, weekends, and holidays, call the hospital operator at 858-576-1700, press 0 and ask for the endocrinologist on call to be paged.

Checking for Ketones



What are ketones?

- ✓ When your body does not have enough insulin to move glucose into the cells to create energy, it breaks down fat for energy. The break-down of fat can result in ketones in your blood and urine.



Why check for ketones?

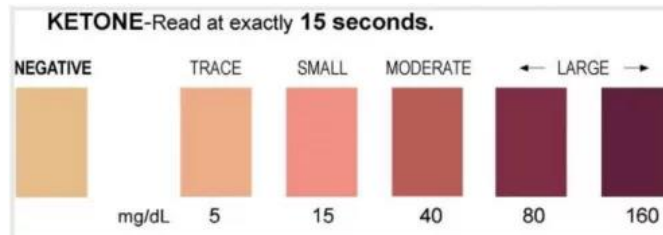
- ✓ Checking for ketones is very important. A high level of ketones in the body can lead to diabetic ketoacidosis (DKA), which can be serious and needs immediate treatment.



When do I check for ketones?

- ✓ When CGM shows glucose levels above 250 mg/dl for two hours or more or when blood glucose levels are above 250 mg/dl, twice in a row
- ✓ Anytime glucose levels are above 400 mg/dl
- ✓ When your child is sick, regardless of glucose levels
- ✓ When your child is vomiting

Urine ketones: to test, apply a drop of urine on the square of the ketone strip. Wait exactly 15 seconds, then compare the strip color with the color chart on the bottle.



Blood ketones: to test, put ketone strip into meter and apply a drop of blood. Compare the meter reading to the chart below.



How to interpret blood ketone levels	
< 0.6	Under 0.6 mmol/L – normal; consider rechecking blood ketone levels in 1-2 hours if blood glucose remains elevated above 250 mg/dL
0.6 – 1.5	0.6 – 1.5 mmol/L – indicates a need for extra insulin. It is important the patient follows the Ketone Action Plan provided by their diabetes health care team
> 1.5	Over 1.5 mmol/L – indicates risk of diabetic ketoacidosis. Patients should take IMMEDIATE ACTION and follow the Ketone Action Plan

When your child has moderate or large ketones, their body needs extra insulin.

Follow the Ketone Action Plan on the next page.

Ketone Action Plan when using an Insulin Pump (Omnipod, Tandem, Medtronic)

<p>Urine Ketones: Negative, Trace or Small or Blood ketones: 0.0 to 0.6 mmol/L</p>	<p>Give normal correction bolus through the insulin pump.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Recheck glucose levels and ketone levels in 2 hours. <input type="checkbox"/> After 2 hours, if glucose levels are below 250 mg/dl, you may continue to use your current infusion set. Give correction bolus every 2 hours until glucose is below 180 mg/dl. <input type="checkbox"/> After 2 hours, if glucose level is greater than 250 mg/dl and ketone levels are small or less: <ul style="list-style-type: none"> <input type="checkbox"/> Give your correction using syringe or pen (not through pump) <input type="checkbox"/> Change infusion set (including cartridge/reservoir and insulin) <input type="checkbox"/> Give correction bolus every 2 hours through pump until glucose is below 180 mg/dl <input type="checkbox"/> If ketones are moderate-large (above 0.6 mmol/L), follow plan below <input checked="" type="checkbox"/> Ok to exercise.
<p>Urine Ketones: Moderate or Blood ketones: 0.6 to 1.5 mmol/L</p>	<p>Give injection of insulin by syringe or pen NOW (not through pump)</p> <ul style="list-style-type: none"> <input type="checkbox"/> If correction factor (insulin sensitivity factor) is 50 or less, add 2 units of insulin to your usual correction. <input type="checkbox"/> If correction factor (insulin sensitivity factor) is 51-100, add 1 unit of insulin to your usual correction. <input type="checkbox"/> If correction factor (insulin sensitivity factor) is 100 or more, add 0.5 units of insulin to your usual correction. <input type="checkbox"/> Change infusion set (including cartridge/reservoir and insulin). <input type="checkbox"/> Drink water. <input type="checkbox"/> Recheck glucose and ketone levels every 2 hours; give correction bolus through new infusion set every 2 hours until ketones are negative, trace, or small (blood ketones below 0.6 mmol/L) and glucose is below 180 mg/dl. <input checked="" type="checkbox"/> No exercise until ketones are small, trace, or negative (blood ketones less than 0.6 mmol/L).
<p>Urine Ketones: Large or Blood ketones: above 1.5 mmol/L</p>	<p>Give injection of insulin by syringe or pen NOW (not through pump)</p> <ul style="list-style-type: none"> <input type="checkbox"/> If correction factor (insulin sensitivity factor) is 50 or less, add 3 units of insulin to your usual correction. <input type="checkbox"/> If correction factor (insulin sensitivity factor) is 51-100, add 2 units of insulin to your usual correction. <input type="checkbox"/> If correction factor (insulin sensitivity factor) is 100 or more, add 1 unit of insulin to your usual correction. <input type="checkbox"/> Change infusion set (including cartridge/reservoir and insulin).. <input type="checkbox"/> Drink water. <input type="checkbox"/> Recheck glucose and ketone levels every 2 hours; give correction bolus through new infusion set every 2 hours until ketones are small, trace, or negative (blood ketones below 0.6 mmol/L) and glucose is below 180 mg/dl. <input checked="" type="checkbox"/> No exercise until ketones are small, trace, or negative (blood ketones less than 0.6 mmol/L). <p>If feeling unwell or if ketones are large for 4 hours or more, call the on-call doctor.</p>



If you are uncertain about any of these instructions, please call Rady's diabetes team at: 858-966-4032, choose option for nurse - Monday through Friday from 8:30am to 4:30pm
Non-business hours, weekends, and holidays, call the hospital operator at 858-576-1700, press 0 and ask for the endocrinologist on call to be paged.