

Sick Days/Ketone Management

What are ketones?

Ketones are a waste product of fat breakdown. When your body does not have enough insulin to move glucose into the cells for energy, the cells are hungry. The body responds by breaking down fat for energy, which can result in ketones in your blood and urine.

Why check for ketones?

Checking ketones is **very** important!
A high level of ketones in the body can lead to **diabetic ketoacidosis (DKA)**, which can be serious.

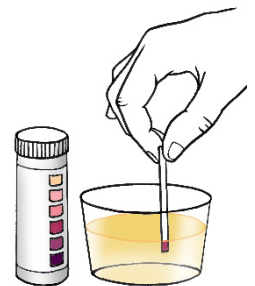
When to check for ketones?

- When the blood glucose is over 250 mg/dL twice in a row
- When your child is sick, regardless of the blood glucose numbers
- When your child is vomiting

How to check for ketones in urine or blood

Urine ketone check

1. Apply a drop of urine onto the square tip of the ketone strip
2. Compare the strip color with the color chart on the bottle **in exactly 15 seconds**



When you open a new bottle of ketone strips write today's date on the bottle. Once opened, they are good for 2 to 6 months depending upon manufacturer.

Blood ketone check

1. Put ketone strip into meter and apply a drop of blood
2. Compare the meter reading to the chart below

Negative, trace or small	Below 0.6 mmol/L
Moderate	0.6 to 1.5 mmol/L
Large	Above 1.5 mmol/L



Blood ketone meter

To Learn More

- Endocrinology
206-987-2640
- Ask your child's healthcare provider
- seattlechildrens.org/patient-education

Free Interpreter Services

- In the hospital, ask your nurse.
- From outside the hospital, call the toll-free Family Interpreting Line, 1-866-583-1527. Tell the interpreter the name or extension you need.



Ketone Insulin Dosing

When your child has **moderate or large ketones**, they will need extra insulin to clear the ketones. Regardless of if using injections or on an insulin pump. Please refer to the table below for dosing guidelines.

Check for ketones when:

- Blood glucose is over 250 mg/dL twice in a row, or if over 300 mg/dL for more than 3 hours.
- Child is sick, regardless of blood glucose numbers
- Child is vomiting

Ketone Dosing Table

Ketone level	Action to take
Negative, Trace or Small	<p>If blood glucose is above range:</p> <ul style="list-style-type: none"> • Give usual correction dose for high blood glucose • Drink extra water • Check blood glucose and ketones every 3 hours until ketones are negative
Moderate	<p>If blood glucose is above 200 mg/dL:</p> <ul style="list-style-type: none"> • Give usual correction dose x 1.5 = insulin dose to give • Drink extra water • Check blood glucose and ketones every 3 hour and give corrections until ketones are negative <p>If blood glucose is under 200 mg/dL:</p> <ul style="list-style-type: none"> • Give sugary liquids like Gatorade (do not cover with insulin) • Recheck blood glucose every 15 minutes until blood glucose is above 200, and then give extra insulin for moderate ketones.
Large	<p>If blood glucose is above 200 mg/mL:</p> <ul style="list-style-type: none"> • Give usual correction dose x 2 = insulin dose to give • Drink extra water • Check blood glucose and ketones every 3 hours and give corrections until ketones are negative <p>If blood glucose is under 200 mg/mL:</p> <ul style="list-style-type: none"> • Give sugary liquids like Gatorade (do not cover with insulin) • Recheck blood glucose every 15 minutes until blood glucose is above 200, and then give extra insulin for large ketones.

If child wants to eat, make sure it is at the same time you are giving corrections and not in-between.

If ketones continue to be large after 6 hours, call the diabetes urgent pager at 206-987-2000.

Actions for Ketone Management on Insulin Pumps

- If blood sugars are more than 250 mg/mL for ____ hours, change the injection site regardless of when last site was inserted. A bad site is the main cause of ketones on pumps.
- If blood sugar does not come down within 90 minutes of changing site remove the pump, **check for ketones** and give a manual injection following the steps on the chart above.
- You can continue with pump therapy 90 minutes after injection. if on an automated system, wait until the next dose of insulin would be due (3 hours).
- Some pumps offer different profiles. If yours does program a sick day profile to use when your child is ill or has ketones, this will be **discussed during your pump start class**.
- Automated systems will need to be taken out of automated mode or stopped completely while clearing ketones.
- If your pump has failed or is broken, contact your manufacturer right away.
- Know where to find your most recent dosing information in case of pump failure, this is either in your last **After Visit Summary** found in **MyChart**, or in the report section of the phone application that supports your pump.

Important: These guidelines are designed to work with any insulin pump system. Each individual system manages ketones and sick days differently. This is discussed in your pump start class. If you call, it is important to let the person you talk to know what pump your child is on and what actions you have already taken to reduce ketones.

Provider Signature: _____

Date: _____

When Your Child with Diabetes is Sick

When your child is sick with a cold or flu:

- Ketones are more likely to develop no matter what the blood glucose numbers are. Blood glucose levels may rise due to the stress response of illness.
 - More insulin may be required to prevent or treat ketones
 - You will need to keep enough insulin and carbohydrates in the body to help fight the infection
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Follow these guidelines when your child is sick:

- **Check blood glucose every 3 hours** until your child has negative ketones for 24 hours
- **Check ketones every 3 hours** until your child has negative ketones for 24 hours
- **Stay hydrated.** Give your child lots of liquids.
- Always give long-acting insulin (Lantus, Basaglar, Tresiba), even if your child is not eating
- Refer to the Ketone Dosing Table on page 2 of this handout for instructions on dosing insulin

When your child is vomiting:

- Give small sips (1 tablespoon) of clear sugar-containing liquids (like Ginger Ale or Gatorade) every 15 minutes
- If there is no vomiting after 30 minutes, increase the amount of liquids to 2 ounces (1/4 cup) every 15 minutes
- If vomiting restarts, rest your child's stomach for another hour and then restart the small amount of liquids
- Continue checking blood glucose and ketones every 3 hours and refer to the Ketone Dosing Table on page 2 of this handout for instructions on insulin dosing

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
- Trouble breathing
- Change in mental status
- Severe stomach pain
- Your child is too dehydrated to check for urine ketones
- Your child has vomited twice and can't keep anything down

If uncertain about any of these instructions, please call 206-987-2000 and ask the Children's operator to page the diabetes team for you.