

patient education program

We know children 8200 Dodge Street Omaha, NE 68114-4113 402-955-3871 ChildrensOmaha.org

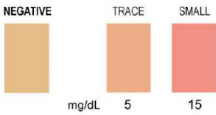

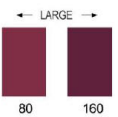
Ketone Treatment Guidelines

Positive ketones indicate the need for extra diabetes care. Extra insulin, fluids and carbohydrates are needed to clear ketones and prevent diabetic ketoacidosis (DKA).

STEP 1: Check for ketones anytime your child is sick and/or has blood sugars greater than 240 mg/dL. Also consider contacting your child’s primary care provider (PCP) for care of sick symptoms.

STEP 2: Insulin dosing

- **If ketones are negative, trace or small:** continue normal insulin dosing.
- **If ketones are moderate or large:** give short acting insulin (Humalog, Novolog or Apidra) every 2 to 3 hours to clear ketones *even if* your child is not eating normally. Use the table below to calculate the insulin dose.

Urine Ketones	Blood Ketones	Amount of Insulin to Give
Negative, trace, or small 	Less than 0.6	Usual insulin dosing
Moderate 	0.6-1.5	Multiply your insulin dose by 1.1
Large 	1.6-3.0	Multiply your insulin dose by 1.2
(Emergency!)	Greater than 3.0	MUST CALL CLINIC RIGHT AWAY

****Contact the clinic immediately** if your child has vomited or if ketones are not improving or are worsening after one extra insulin dose (2-3 hour window).

Check for ketones in the urine or blood. Use whichever method you have been taught.

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For example:

Correction dose is calculated to be 4 units and carbohydrate dose is calculated to be 2 units.
Total insulin dose is = 6 units → for large ketones, multiply this by 1.2:

$$6 \times 1.2 = 7.2 \text{ units} \rightarrow \text{Give 7 units for total dose}$$

STEP 3: Drink fluids

- **If your child is not able to drink fluids because of nausea/vomiting, then contact our clinic at 402-955-3871 for help.**
- **If blood sugar is greater than 200 and you/your child has positive ketones (any level above negative):**
 - Drink sugar-free liquids until ketones are cleared
 - [For example: water]
 - Aim for one ounce per hour for every year of age.
 - [For example: A 6 year old would drink 6 ounces per hour.]
- **If blood sugar is less than 200 and you/your child has positive ketones (any level above negative):**
 - Drink sugar-containing fluids (liquid carbohydrate) until blood sugar is over 200
 - [For example: Pedialyte, Gatorade, juice, Kool-Aid, regular soda pop, etc.].
 - Aim for one ounce per hour for every year of age.
 - [For example: A 6 year old would drink 6 ounces per hour.]
 - Once blood sugar is over 200, switch to sugar-free liquids.
 - If unable to raise blood sugar above 200 in 30 minutes, call our clinic.

STEP 4: Recheck your child's blood sugar and ketones every 2 to 3 hours. Drink fluids and give insulin every 2 to 3 hours until ketones are clear.

IMPORTANT:

- **NEVER** skip your child's long-acting insulin, **even if your child is not eating**. If your child is having low blood sugars or you are concerned lows may happen, please call our office at 402-955-3871.
- Even if your child is not eating meals normally try to use liquid carbohydrate as a substitute for regular meals and give insulin for carbohydrate and correction dosing.

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When to call the diabetes clinic, at 402-955-3871:

- Ketones are not improving or are worsening after one extra insulin dose (2-3 hour window), despite following the above guidelines.
- Your child is having low blood sugars with positive ketones
- Your child is less than 5 years old
- Your child is NOT peeing or drinking
- You don't know how much insulin to give
- **Contact the clinic immediately** if your child has vomited 2 or more times in the last 24 hours. *This could mean your child is in diabetic ketoacidosis (DKA).*

When to call 911:

- Your child has fruity/ acetone/medicinal smell in their breath and/or is breathing heavily.
- Your child is becoming very tired or is confused.

Rules for Pump Users

For someone wearing an insulin pump, the most common reason for ketones is a pump site failure. Therefore, if you use an insulin pump and ketones are POSITIVE (small, moderate or large) do the following:

1. Give insulin dose with a syringe or pen **immediately** following the rules above for insulin dosing and fluid intake.
2. Change your child's infusion set (tubing, reservoir, and site). This needs to be done even if you just changed the site as ketones may indicate a **failure of the newly inserted site.**
3. If ketones have not improved after the first insulin shot within 2-3 hours, call the clinic.

IMPORTANT:

- You **MUST** leave the basal rate on.
- Do not give insulin any more frequently than every 2 hours.

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Ketone Treatment Guidelines, FAQs

What are ketones?

- Ketones are made when your body breaks down fat for energy.
- Ketones indicate that your body needs more insulin.
- Ketones tend to cause an upset stomach, stomachache, and/or nausea/vomiting.

When should you check for ketones?

- When you have blood sugars 240 or above AND/OR
- Illness: not feeling well, fever, diarrhea, abdominal pain and/or nausea/vomiting.

Why is it important to treat ketones?

- To prevent Diabetic Ketoacidosis (DKA).
- Having moderate/large ketones means there is a high chance of developing DKA.

What is Diabetic Ketoacidosis (DKA)?

- DKA is a buildup of ketones and acid in the body.
- DKA is caused by lack of insulin.
- DKA is a very serious medical emergency and can cause death if it goes untreated.

What are other symptoms of Diabetic Ketoacidosis (DKA)?

- Stomachache
- Nausea
- Vomiting → this is a sign of severe illness and DKA.
- Not peeing → this means that you are dehydrated and need hospital care.
- Late symptoms of DKA include: fast and deep breathing, exhaustion, confusion → This is an **EMERGENCY!! Call 911 for transportation to the hospital.**