

Sick Day Management Guidelines

Diabetes management when sick with an illness including a cold or flu

What happens with diabetes control when you are sick?

When your child is sick with the cold or flu or any other illness with or without fever, blood sugar levels might rise. Not only does your body need extra energy to fight off the germs, but stress hormones are produced that interfere with the action of insulin. Your cells may need more insulin to work. Eating, drinking, and **taking insulin** are extremely important when you are ill. If the cells do not get enough energy, or if there isn't enough insulin to help the glucose get into your cells, your body breaks down its own stores (fat and muscle) to provide this energy. This process produces waste products called ketones.

What are ketones?

Ketones are waste product that shows up in the blood and urine when body fat is being burned for energy. The blood glucose level is often high but the body cannot use it in the lack of insulin. Taking enough insulin, eating and drinking helps prevent ketones.

If high blood sugar levels are not treated, ketones will develop and your child could become very sick with diabetic ketoacidosis even without an identifiable illness.

Did You Know? Ketones can occur even if your blood sugar is in your target range.

Please follow these general guidelines during any illness or ongoing hyperglycemia:

- Check blood sugar every 2 to 3 hours.
- Check urine or blood ketones every 3 hours.
- Do not omit an insulin dose. Give basal insulin (Lantus or Levemir) even if you are vomiting or not eating normally. Doses may need to be decreased by around 20%, including NPH, but should not be skipped.
- Follow the steps for ketone management given in the table beginning on the next page.
- Please note that management of ketones will be different, depending on whether you can eat and drink or if you are vomiting. See table on next page.

- Refer to the section in the Pink Panther book on sick-day management for a refresher on managing diabetes during illness, in addition to using this sheet.

Follow these guidelines for managing an illness and/or vomiting:

Children often catch germs and get sick. Take care of your child's illness as you usually would. Call your primary care provider if your child's symptoms are significant.

Give small sips (1 tablespoon) of clear liquids containing sugar (like 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, it may be necessary to rest your child's stomach for another hour and then restart the small amounts of liquids. Continue to check blood sugar and blood or urine for ketones every 2 to 3 hours.

Go to the Emergency Department if your child is experiencing any of the following symptoms:

- Signs of diabetic ketoacidosis: moderate or large ketones, nausea, vomiting, stomach pain, "labored breathing," lethargy (very sleepy) or confusion. If these are present, take your child to the nearest emergency department.
- Your child has vomited more than 2 times and can't keep anything down.

When to ask for help or see a doctor:

Between 7 a.m. and 10 p.m. call 206-987-2000 or 866-987-2000 (toll-free) if:

- Moderate to large ketones are present and you are unfamiliar and/or uncomfortable utilizing the Sick Day Management Guidelines.

REMEMBER: Always check the blood sugar and ketones before calling. The healthcare providers will need this information.

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Ketones	If you are sick, but still able to eat and drink well	If you are unable to eat or drink and are vomiting
<p>Urine ketones: Negative/Trace or Blood ketones: <0.5</p>	<p>No additional insulin is needed. Encourage sugar-free liquids.</p>	<p>Encourage small sips of clear, sugar-containing liquid (1 tablespoon) every 15 minutes as tolerated.</p>
<p>Continue checking blood sugar and blood or urine ketones every 2 to 3 hours.</p>		
<p>Urine ketones: Moderate or Blood ketones: 0.5-1.5</p>	<p>Extra rapid-acting insulin is essential.</p> <p>If using a “basal/bolus” regimen with Lantus/Levemir and short-acting insulin of Humalog/Novolog or the insulin pump: Multiply your usual correction dose by 1.5. For example if your correction is 1 unit per 50 over a target blood sugar of 150 mg/dl and the blood sugar is 357 mg/dl, the correction is 4 units ($357 - 150 = 207 \div 50 = \text{about } 4$) So give 1.5 times the amount = 6 units of Humalog or Novolog ($4 \times 1.5 = 6$)</p> <p>If on a pump – give this correction by injection and change infusion set.</p> <p>If using NPH and Humalog/Novolog: Add up all insulin doses for a usual day and give 10% of the total daily dose as short-acting insulin Humalog or Novolog. (divide by 10 to get the 10% figure) For example: If your total units amount of insulin per day = 25 units, give 2.5 units of Humalog or Novolog ($25 \times 0.1 = 2.5$, i.e. 10% of 25)</p>	<p>← Follow directions on the left AND:</p> <p>Encourage small sips of clear, sugar-containing fluids (1 tablespoon) every 15 minutes as tolerated. If blood sugar is already over 200, alternate sips with water or sugar-free fluids. Maintain good hydration.</p>
<p>Continue checking blood sugar and blood or urine ketones every 2 to 3 hours, and give extra insulin for ketones every 3 hours as needed. Call if you need help between 7 a.m. and 10 p.m.</p> <p>REMEMBER: Always use rapid-acting insulin and check the blood sugar and ketones before calling. If blood sugar is below 200, maintain adequate hydration with sugar-containing liquids.</p>		

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Ketones	If you are sick, but still able to eat and drink well	If you are unable to eat or drink and are vomiting
<p>Urine ketones: Large or Blood ketones: >1.5</p>	<p>Extra rapid-acting insulin is essential.</p> <p>If using a “basal/bolus” regimen with Lantus/Levemir and Humalog/Novolog or the insulin pump: Multiply your usual correction dose by 2. For example if your correction is 1 unit per 50 over a target blood sugar of 150 mg/dl and the blood sugar is 357 mg/dl, the correction is 4 units ($357 - 150 = 207 \div 50 = \text{about } 4$) So give 2 times the amount = 8 units <u>Humalog or Novolog</u> ($4 \times 2 = 8$).</p> <p>If on a pump - give this correction by injection and change infusion set.</p> <p>If using NPH and Humalog/Novolog: Add up all insulin doses for a usual day and give 20% of the total daily dose as short-acting insulin Humalog or Novolog. (divide by 5 to get the 20% figure) For example: If your total units amount of insulin per day = 25 units, give 5 units of Humalog or Novolog ($25 \times 0.2 = 5$, i.e. 20% of 25).</p>	<p>← Follow directions on the left AND:</p> <p>Give small sips of clear, sugar-containing fluids (1 tablespoon) every 15 minutes as tolerated. If blood sugar is already over 200, alternate sips with water or sugar-free fluids. Maintain good hydration.</p> <ul style="list-style-type: none"> • Watch for signs of diabetic ketoacidosis: stomach pain, “labored breathing,” lethargy (very sleepy) or confusion. If these are present, take your child to the nearest emergency department.
	<p>Continue checking blood sugar and blood or urine ketones every 2 to 3 hours. Give extra insulin every 3 hours as needed for ketones. Call if you need help between 7 a.m. and 10 pm. After hours (10 p.m. to 7 a.m), please go to the Emergency Department.</p> <p>REMEMBER: Always use rapid-acting insulin and check the blood sugar and ketones before calling. If blood sugar is below 200, maintain adequate hydration with sugar-containing liquids.</p>	

Sick Day Management Guidelines

Sick day management record

Use this table to keep track of details for this illness. Record number and symptoms that your healthcare team will need to know. Refer back to it in the future to see what worked and what didn't.

Date	Time	Blood Sugar	Ketone	Units of Extra Insulin	Symptoms

Management of high blood sugars

- If your child has high blood sugars, check blood or urine ketones.
- If your child has high blood sugars and no or trace ketones, please give them their insulin correction doses as previously instructed by your diabetes team and call the Endocrinology Nurses before 11 a.m. the next business day at 206-987-2640, or email Endonurse@seattlechildrens.org
- If your child has high blood sugars and ketones are present, refer to the Sick Day Management Guidelines on pages 2 and 3.

Management of hypoglycemia (low blood sugar) and use of Mini-Dose Glucagon

- If your child has severe hypoglycemia (seizure, loss of consciousness), use the full dose of glucagon as instructed by your healthcare provider and call 911 for an ambulance.
- If your child has low blood sugars and is alert and able to eat or drink:
- Give 10 to 15 grams of simple carbohydrate and re-check their blood sugar in 15 minutes as previously instructed by your diabetes team. If needed, call the Endocrinology Nurses before 11 a.m. the next business day at 206-987-2640, or email Endonurse@seattlechildrens.org
- If your child has ongoing hypoglycemia, please follow the instructions below for Mini-Dose Glucagon. Low doses of glucagon can be used to raise the blood sugar before they become too low. The 1 mg glucagon emergency kit comes with a bottle containing a powdered tablet and a syringe containing diluting liquid.
- Mini-Dose Glucagon is NOT for use in cases of severe low blood sugar, as in a seizure or in the unconscious child.
- Mini-Dose Glucagon is NOT for use when ketones are present.
- To give the Mini-Dose Glucagon: Inject the Glucagon syringe containing the liquid into the bottle with the powdered tablet. Push all of the contents of the syringe into the bottle and swirl to form a clear liquid. Use your insulin syringe to give the following dose based on your child's age:
- If the child is 2 years or less, give 2 units.
- If your child is over 2 years, give one additional unit for each year of age over age 2. For example: at age 2 give 2 units, at age 5 give 5 units...up to age 15. Any child age 15 or older should receive a maximum of 15 units.
- At these small doses, you can expect the blood sugar to rise approximately 60-90 mg/dl and last about one hour. If the blood glucose does not rise sufficiently within 20-30 minutes the glucagon dose can be doubled and given again. These doses may be given every 1-2 hours as needed. Mixed glucagon can be stored in the refrigerator and used for up to 24 hours. Any unused glucagon should be discarded after 24 hours.
- Glucagon raises the blood sugar by stimulating the release of glycogen stores from the liver and muscles. If blood sugar has been low over a long period of time, glucagon may not be effective. If after two doses, the blood sugar does not rise and your child will not eat or drink or begins/continues to vomit, then go to the Emergency Department.
- Glucagon raises the blood sugar rapidly but does not keep it up over a long period of time. Food, in the form of carbohydrates and protein, are needed to sustain blood sugar.

Troubleshooting your pump

- Make sure infusion set is inserted correctly and there are no air bubbles.
- If you think your pump isn't working, call the 1-800 number from your pump company immediately and let them know that your pump is not working. They will work with you to resolve any of the problems affecting the function of your child's insulin pump.
- Give a basal dose of Lantus insulin (insulin glargine) that is equal to your total daily basal insulin delivery on the insulin pump. Look for this -in your pump settings report on your computer or in the pump itself under basal menu or settings (depending on brand of pump), or on your Lantus prescription label.
- At meals, dose with Humalog/Novolog based upon your insulin-to-carbohydrate ratio and your correction factor for high blood sugars.
- When you get your new pump, restart it 22 hours after last Lantus injection.

To Learn More

- Endocrinology
206-987-2640
- Your child's healthcare provider
- www.seattlechildrens.org

Free Interpreter Services

- In the hospital, ask your child's 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.

Seattle Children's offers interpreter services for Deaf, hard of hearing or non-English speaking patients, family members and legal representatives free of charge. Seattle Children's will make this information available in alternate formats upon request. Call the Family Resource Center at 206-987-2201.

This handout has been reviewed by clinical staff at Seattle Children's. However, your child's needs are unique. Before you act or rely upon this information, please talk with your child's healthcare provider.

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