

When pumping, high blood glucose (BG) must be taken seriously as insulin pumps deliver only rapid-acting insulin. Without any long-acting insulin in your body, BG can rise quickly if the insulin flow is accidentally interrupted and a condition called diabetic ketoacidosis (DKA) can develop. DKA is a very serious condition which must be treated immediately. Understanding DKA will help you to prevent it. Read below for some basic facts about DKA.

DKA: Basic Facts

- Insulin is needed to move glucose out of the bloodstream and into the body's cells where it is used for energy. Without insulin, your body will begin to burn fat for energy. Ketones are an acidic byproduct of burning fat.
- Ketones (acids) can increase to toxic levels in the blood and urine when you don't have enough insulin. Urine ketones can be checked with a visual test strip purchased at your local pharmacy. Ketones in the blood can be detected more quickly than urine using a specific blood ketone testing system and strips. Ask your healthcare provider (HCP) when and how to test for ketones.
- DKA results when there is not enough insulin for your body to use glucose for energy.
- High BG combined with ketones is a serious medical problem that must be treated immediately.
- A serious illness or infection can also cause ketones.
- DKA is more common in persons with type 1 diabetes, although it can occur in those with type 2 under certain circumstances.
- If ketone strips detect moderate to large ketones and your BG is elevated, you must assume there is a problem with the insulin delivery from your pump. Usually the problem is related to the infusion set or site. If it is not an infusion set/site issue, it may be a problem such as: an error in programming, loss of delivery, bad insulin, or you may be ill or have another medical problem that needs medical attention.
- You will likely need extra insulin to correct high BG when ketones are present. Contact your HCP immediately for specific instructions.

Symptoms of DKA:

Common signs and symptoms of DKA include feeling unusually tired, stomach/abdominal pain, nausea/vomiting, dry mouth, thirst, fruity odor to breath, rapid or difficulty breathing. DKA can lead to dehydration, electrolyte imbalance, diabetic coma, or even death.

Prevention of DKA:

DKA is serious and scary, but it can be prevented! Check your BG regularly (at least 4 times each day) and follow the tips below to be prepared.

- Always carry a syringe and vial of insulin as part of your back up plan.
- Read through the questions below and on the next page to help you troubleshoot your infusion set/site and pump.
- If the high BG is still not explained, check for ketones
- Call your HCP immediately if your BG remains high and you have ketones or nausea after 2 correction doses.
- If you have ketones and begin vomiting, go to the nearest emergency room.

High BG? Questions to Help You Troubleshoot:

CAUTION! If you have moderate to large ketones, first take an injection of rapid-acting insulin, change your infusion set and cartridge and troubleshoot the situation.

The Infusion Set

- Is the tubing primed or filled with insulin?
- Is there air in the tubing?
- Did you remember to fill the cannula with insulin after inserting new set?
- Is the tubing connected to cartridge?
- Is the set connected to your body?
- Are there any leaks?
- Is the cannula dislodged or kinked?
- Has the infusion set been in longer than 2-3 days?
- Is there redness at the site?
- Is there discomfort at the site?
- Is there blood on/at the sit

The Insulin Pump

- Did you forget your last bolus? (Review bolus history)
- Have you received any recent alarms?
- Is your cartridge empty?
- Are the date and time on your pump screen correct?
- Are your basal rates programmed correctly?

The Insulin

- Is your insulin expired?
- Is it cloudy or clumped?
- How long has your insulin been at room temperature?
- Did you leave your insulin in a warm location or exposed to sunlight?
- How long has the insulin been in the cartridge and tubing?
- Was your insulin exposed to freezing temperatures?

Action Plan for High BG

- If your BG is higher than 250 mg/dL twice in a row, troubleshoot your pump, infusion set, and site.
- If you find a logical cause for the high BG, take your normal corrective action. Examples of a logical cause include: forgotten recent carb bolus or your infusion set came out. Your action plan for forgetting a carb bolus will include giving a BG bolus through your pump. Your action plan for a dislodged infusion set will include taking a BG bolus by syringe and changing your infusion set.
- If you cannot find a logical cause for the high BG, check for ketones.

Negative to Small Ketones		Moderate to Large Ketones	
<input type="checkbox"/> Give a BG bolus through your pump. <input type="checkbox"/> Drink at least 8 ounces of calorie-free fluids (or amount recommended by HCP) every hour until ketones are gone. <input type="checkbox"/> Recheck BG in 1-2 hours.		<input type="checkbox"/> Call your HCP. <input type="checkbox"/> Take your BG bolus by syringe immediately. You will likely need more insulin than usual for your correction. <input type="checkbox"/> Change your infusion set, cartridge, and tubing. <input type="checkbox"/> Drink at least 8 ounces of calorie-free fluids (or amount recommended by HCP) every hour until ketones are gone. <input type="checkbox"/> Recheck BG and ketones in 1-2 hours.	
<p>If BG is decreasing, that is a good sign, but monitor your BG and ketones more closely throughout the day.</p>	<p>If BG is NOT decreasing, check ketones and take another BG bolus by syringe. Change your infusion set, cartridge and tubing. Continue to monitor to be sure your BG decreases and ketones do not increase to moderate/large.</p>	<p>If BG is decreasing, continue to monitor to be sure your new infusion set is working and ketones resolve.</p>	<p>If BG is NOT decreasing:</p> <ul style="list-style-type: none"> • If ketones are still moderate to large call your HCP. • If ketones are decreasing, take another BG bolus as directed by your HCP and continue to monitor closely.