Sick Day Management

Sick Day Management:
Being sick is stressful. It can make it harder to keep blood sugars within a normal range. It can often cause blood sugars to be high. Please write down all blood glucose results and ketone results. The doctor will need this information to help your child. If sick, insulin requirements may change. If sugars are running high or ketones are present, begin sick day management. Remember, insulin is needed to stay healthy and strong, even when not eating. Do not skip long-acting insulin.

Ground Rules for Sick Day Management:

1. Don't panic.
2. Check blood sugar every 2 hours. Write these down.
3. Check for ketones if blood sugar is 300 or higher. Write these down.
4. Check for ketones if experiencing any abdominal pain, nausea/vomiting, diarrhea, or fever even if blood sugar is within normal range. Check every void while sick. Write these down.
5. Do not skip long-acting insulin.

- If blood glucose is running high, over 300, with or without ketones, extra rapid acting insulin may be needed. Please refer to sick day management and ketone protocol and call the student's pediatric endocrinologist office for assistance.
- Encourage to drink plenty of sugar-free fluids. However, if nausea/vomiting is present, this could be difficult. Please try to have student drink 4-6 ounces (½ cup) every 30 to 60 minutes. This will help prevent dehydration.
- If blood glucose is running low, less than 70, you might need to decrease insulin doses if experiencing nausea/vomiting/stomach virus. **Please do NOT skip long-acting insulin.** Have student try to drink 4-6 ounces (½ cup) of **regular** fluids like Gatorade, Coke, ginger-ale, Jell-O without added fruit, or ½ of a double-stick popsicle every 30-60 minutes.

Ketones:
Ketones are always the result of insufficient insulin. They are sort of like poison in the body. The body makes ketones when it burns fat for energy, when you lose weight, or if there is not enough insulin for the body to use sugar for energy. They can make you very sick.

Causes of Ketones:

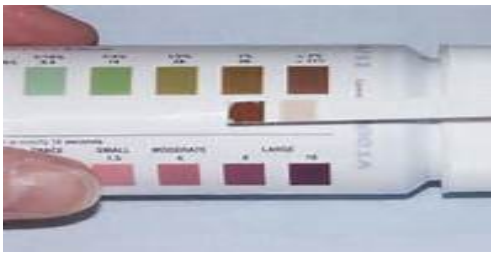
- Missed insulin injections
- Pump malfunction
- Sickness

Tips to PREVENT Ketones:

- Get into a routine; take insulin at the same time every day. Parents need to supervise insulin injections.
- Mark insulin vial or pen with the date opened with a permanent marker. Once opened, an insulin vial or pen, can be used for 30 days. Store unopened insulin in the refrigerator. Do not freeze insulin. Insulin that freezes or is exposed to excessive heat should be discarded. Check insulin for discoloration, clarity, clumps and crystals.
- Rotate injection sites/pump sites. Don't use the same site over and over. Injecting insulin into the same place over and over causes inflammation in the fatty tissue below the skin. The area will become firm and won't absorb insulin as efficiently. This is called hypertrophy or lipodystrophy.

Checking for Ketones:

- Ketones can be tested by blood or urine.
- There are two brands of urine ketone dipsticks: Ketostix and Chemstrip K. However, many big pharmacy chains have their own version of these. These may be a little cheaper if they are not covered by insurance. Ketones will turn the color of the pad on a urine dipstick a different color. Compare to the color scale on the container for results.



Testing for Ketones Using Urine:

1. Catch urine in a small cup, like a paper bathroom cup, or run the strip through the urine stream.
2. Dip urine ketone stick in urine.
3. Tap off excess urine.
4. Lay it flat across the rim of the cup or on the counter.
5. Read stick in 15 seconds.

- Make sure the urine ketone strips have not expired. Always write the date on the vial when you open the bottle. Once the bottle is opened, they are good for 6 months. However, if using strips in foil, check the expiration date on the individual foil package.
- To check for ketones with infants/toddlers wearing diapers, place a cotton ball in the front of the diaper. When they wet the diaper, squeeze urine from the cotton ball onto the ketone strip and follow instructions as above.

Testing for Ketones Using Blood:

- To test for blood ketones, you will need a meter capable of doing this. Use of a blood ketone meter tends to be more expensive than urine sticks. Currently, there are two: NovaMax Plus and Precision Xtra. Each meter is a little different. However, it is basically like using a glucometer. Blood ketones are measured in mmol/L.

Nova Max Plus:
< 0.6 = negative
> 1.5 = moderate to large
> 0.6 to 1.0 = small to moderate

Precision Xtra:
0.6 to 1.5 = small to moderate
1.5 to 3.0 = large

Diabetic Ketoacidosis (DKA):
If ketone production is not treated appropriately, ketones can build up to the point that you can become severely ill. This is called Diabetic Ketoacidosis, or DKA. It usually develops slowly, which is why it is important to check for ketones with unexplained high blood sugars and illness. However, with those using an insulin pump/bad pump site, DKA can occur more quickly if the infusion site gets blocked.

Signs/Symptoms of DKA:

- Nausea, vomiting, abdominal pain
- Fruity odor on breath
- Difficulty breathing
- Difficulty staying awake/extreme sleepiness
- REFER TO KETONE PROTOCOL IF KETONES ARE PRESENT.
- Call if you have any questions or concerns.

Sick Day Management for Fever, Abdominal Pain, Vomiting, or Diarrhea:

Check blood sugar and ketones.

- If ketones are MODERATE (40) or LARGE (80, 160) use ketone protocol.
- If ketones are SMALL (15) or LESS, the abdominal pain and vomiting are not from ketones and usual diabetes care should be used.
- Continue checking blood sugars more frequently while sick. Check ketones every void while sick. Write these down.
- Do NOT skip long-acting insulin.

Ketone Management:

To treat ketones, you must give extra insulin to shut off ketone production. Remember, ketones are the problem, not the high blood sugar.

1. Give shot of Apidra/Humalog/Novolog. Use correction factor to determine amount.
2. Give fluids based on age. Drink sugared fluids (regular soda and juice) to keep blood sugar from running low.
    - 2-4 years old: 10-12 ounces per hour
    - 5-12 years old: 14-16 ounces per hour
    - Teens: 24-36 ounces per hour
3. Check blood sugar and urine ketones 2 hours after giving insulin.
    - If ketones are small (15 or less), you are done. Go back to normal care but check ketones with every void while sick.
    - If ketones are moderate (40) or large (80-160), then repeat steps 1 and 2 until ketones are small or less.

If child experiences heavy breathing, chest pain, severe stomach pain, trouble staying awake, is unable to tolerate fluids, or develops hypoglycemia, call 911 immediately.

Fluids/Foods for Sick Day Management:

- Double stick popsicles,
- Ginger-ale
- Jell-O without added fruit
- Applesauce
- Regular soda
- Gatorade
- Plain crackers
- Chicken noodle/rice soup

Pump Site Management:

- Calculate correction on pump, but give correction by SHOT.
- Change your pump site.
- Recheck blood sugar in 2 hours. Check for ketones with every void while sick.

Please contact the student's pediatric endocrinologist or primary care physician with questions or concerns. Please have fingerstick and ketone results available. The correction scale is individualized for each patient and should be given to students at each follow-up visit with their doctor.