Illness
Illness

Control of diabetes is upset easily by an illness. Two very different situations can arise when a person with diabetes is ill.

1. **Blood Sugar Rises** because an illness or infection produces a resistance to insulin. This situation often occurs along with a fever. Examples of illnesses which can cause increased blood sugars are colds, flu, chicken pox, ear infection, strep throat, tooth abscess, etc.

   ... Or ...

2. **Blood Sugar Falls** because diarrhea or vomiting or poor appetite are not allowing the body to absorb enough glucose.

Your child may need his insulin adjusted on these days. The insulin may need to go up or down. You must know what happens to diabetes control during illness and why, so you can manage periods of illness safely.

**Illness With a Rise in Blood Sugar 🆆...**

**Why does blood sugar rise during illness?**

An illness or an infection produces a resistance to the action of insulin. When insulin action is weak, there is an increased release of glucose from the liver into the blood. This raises the blood sugar level.

Even if your child cannot eat all the food on his meal plan, the increased release of glucose from the liver into the blood can cause a large increase in blood sugar.

I’ve heard “KETONES” can appear during illness ... What are they?
During illness, the cells do not receive enough glucose due to the lack of insulin action. Without the help of insulin, the cells cannot use glucose to produce energy. The body burns fat for energy instead of glucose. When this occurs, acid waste products called ketones appear in large amounts in the blood and spill over into the urine. High levels of ketones in the blood and urine are a sign of a serious lack of insulin action. 

**Ketones are serious and should never be ignored.**

**Why are ketones serious?**

Large amounts of ketones in the blood can cause severe changes in the body’s acid balance. This condition is called ketoacidosis. Ketoacidosis is serious and shows up as high levels of sugar and ketones in both blood and urine.

**Signs of ketoacidosis are:**

- Very thirsty – drinking large amounts of water.
- Voiding frequently – large volume of urine.
- Possible rapid weight loss.
- Abdominal pain – feeling nauseated; possibly vomiting.
- Feeling drowsy and weak.
- Flushed cheeks, dry warm skin.
- Rapid breathing.
- Fruity odour to breath.
- High blood sugars and ketones present in urine.

This requires immediate treatment and possibly hospitalization.

**Adjusting Insulin During an Illness**
Use these guidelines every day of illness.
If you think your child is sick, begin the following routine:

1. Check the blood sugar and urine ketones before each meal, bedtime and during the middle of the night. You may also want to check between meals as well. After you have each blood sugar and urine ketone information, go to the chart below to decide which situation you are in.

2. Eating or drinking - After you have each blood sugar and urine ketone information, go to the chart below, section titled “What to eat or drink.”. What action you take will depend on where the blood sugar and ketones are. Avoid milk and milk products.

3. Treat the underlying illness. Your child may need to see a doctor for a treatable infection (example: strep throat so that the length of the illness is shortened. You can use Tylenol in the recommended doses for age. Check with your pharmacist about over-the-counter cough syrups and cough lozenges.

<table>
<thead>
<tr>
<th>Situation A</th>
<th>Situation B</th>
<th>Situation C</th>
<th>Situation D</th>
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</thead>
<tbody>
<tr>
<td>Blood Sugar</td>
<td>4-13</td>
<td>14-20</td>
<td>Above 20</td>
</tr>
<tr>
<td>Urine Ketones</td>
<td>Small or less</td>
<td>Small or less</td>
<td>Small or less (less than 8)</td>
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</table>

**What to do with the insulin dose**

- Wait. Monitor at frequency in #1 above. *See rules below for blood sugars under 7.*
- Can give extra short or rapid-acting insulin every 3 - 4 hours, about 10%-20% of the total daily dose until blood sugar is below 20 and ketones are less than moderate (less than 8). See bottom box “Calculating total daily dose of insulin.”

**What to eat or drink**

- Try to use usual meal plan.
- If not able, switch to a fluid meal plan. This means drinking/eating 15 gms of carbohydrate each hour plus “extra fluids” (no carbohydrate)
- When blood sugars are above 20, use lots of “extra” fluids (until blood sugars fall below 20. At that time, resume use of fluid meal plan with fluids containing carbohydrate.

* * If blood sugar is less than 7; child is nauseated or vomiting; ketones are absent or small only - reduce the intermediate insulin dose you will be giving at that time by 20%. Do not give any short-/rapid-acting insulin. If ketones are moderate (8) or more, give usual insulin dose and bring child to hospital at once. If illness continues, increase intermediate insulin by 10%

**Important:** When illness is over, return to original intermediate-acting dose, immediately.

**Calculating total daily dose of insulin:**

- Name of short or rapid-acting insulin used _______________________________
- Total amount of insulin used in the day (add together intermediate and short or rapid-acting insulin doses) __________
- 10% of total amount of insulin used in a day __________
- 15% of total amount of insulin used in a day __________
- 20% of total amount of insulin used in a day __________

**Does your child need to take insulin if all the food on the meal plan is not eaten?**

✔️
Yes! During illness, your child may require more than the usual amount of insulin due to the body’s resistance to its action. You may think that because he/she eats less food during illness, less insulin is needed. But … remember … Even though your child may not be eating all the food, there is often an increased release of glucose from the liver. This can raise the blood sugar to very high levels no matter how little he/she eats.

Can I learn to change the insulin during illness?

Yes! With experience, most parents can learn to change the insulin amounts during an illness. This prevents the blood sugar and ketones from going too high. Use the chart on page 69 as a guide. When diabetes is new, it is expected that you will call your Diabetes Team or own doctor for guidance with insulin adjustments for insulin. It takes awhile to learn how to manage an illness!

Until you gain confidence through experience, always get in touch with your Diabetes Team to make sure what you are doing is correct.
ILLNESS WITH A FALL IN BLOOD SUGAR ↓...

Some illnesses cause blood sugars to fall instead of rise. These include vomiting and diarrhea without fever and loss of appetite due to teething pain, etc. When your child has these symptoms, less insulin may be needed. Contact your Diabetes Team or Doctor.

What to do if your child is sick and can’t eat.

Try to get him/her to eat or drink the carbohydrate foods on the meal plan. Aim for 15 gms of carbohydrate each hour. These include the foods in the Starchy, Milk, Fruit & Vegetable groups. Since protein and fat do not immediately affect blood sugar levels, you may temporarily omit them during illness. If your child finds it difficult to take solid foods, you can switch the carbohydrate choices to fluid form. It is important to avoid dehydration.

If he/she cannot take fluids, or if vomiting (as an example, more than twice in 1 hour) occurs, he/she may need temporary intravenous fluids and glucose, with insulin. Contact your doctor if your child cannot take fluids or if he begins to vomit. If you cannot reach your doctor, go to the hospital, Emergency Department; tell them who your doctor is. Take your record book, meal plan and meter with you..

DON’T DELAY IN THE HOPE THAT THINGS WILL GET BETTER ON THEIR OWN. SEVERE LOW BLOOD SUGAR CAN HAPPEN IF YOUR CHILD IS UNABLE TO EAT OR DRINK. See page 69 for ‘Insulin Adjustments’.
Fluid Meal Plan for Illness Days Only

Each Hour Take: 15 gm carbohydrate-containing food/fluids

(See fluid examples for these listed below.)

“Extra” fluids are water, broth, sugar-free pop or sugar-free Jello. These do not contain carbohydrate and help to keep the body hydrated.

<table>
<thead>
<tr>
<th>Carbohydrate Fluid Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 grams carbohydrate = ½ cup vanilla ice cream</td>
</tr>
<tr>
<td>= 1 cup soup</td>
</tr>
<tr>
<td>= ¾ cup regular gingerale</td>
</tr>
<tr>
<td>= 1 regular popsicle (1 whole)</td>
</tr>
<tr>
<td>= ½ cup regular Jello</td>
</tr>
<tr>
<td>= 6 LifeSavers</td>
</tr>
</tbody>
</table>

When Do I Request Help?

These situations require help – either by phone or by going to your doctor or Emergency Department.

1. Your child continues to vomit – more than two times in an hour would be an example.
2. You have given extra short or rapid-acting insulin to correct high blood sugars or ketones, but the high ketones are not disappearing.
3. Blood sugars are low, but ketones are moderate/large.
4. You are not sure how to adjust the insulin.
6. Your child can’t eat or drink anything.
7. The illness is lasting longer than 24 hours. Your child has a fever.
8. You are not sure what to do.
PAUSE TO REFLECT

Read each question and choose the best answer.

1. With an illness or an infection, the blood sugar will probably:
   a) increase
   b) decrease
   c) stay the same

2. Always consider illness:
   a) not too important
   b) serious and needs to be closely watched
   c) an emergency which requires phoning a member of your health care team

3. During illness, if your child is nauseated or cannot eat or drink, you should:
   a) send your child to bed and to try to sleep it off
   b) decrease the insulin since your child is not eating
   c) phone your health care team for advice

4. If your child has a bad cold or a flu, you should seek help if:
   a) your child is showing moderate or large ketones in the urine (more than 8)
   b) the blood sugar is over 20
   c) you are not sure about some cold remedies you want to give your child
   d) all of the above

5. If your child cannot tolerate solid foods when ill, you should:
   a) monitor the blood sugar and urine ketones
   b) provide 15 gms of carbohydrate fluids or food every hour
   c) give your child plenty of “extra” fluids (i.e. broth, sugar-free soft drinks, tea)
   d) all of the above

6. What might you do in this situation?
   Your child has had diabetes for three months. One morning s/he wakes up, throws up and then can’t eat breakfast. Her/his blood sugar is 5 with no ketones. What should you do?