



The Basics of Type 1 Diabetes

**A guide for parents who have just learned that
their child has diabetes**

From the Pediatric Diabetes Team at McMaster Children's Hospital
2008

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A guide for parents who have just learned that their child has diabetes

When you first find out that your child has diabetes you may feel many emotions. You may feel shocked, anxious, sad or angry. All of these feelings are normal. As you learn more about diabetes and how to care for your child, you will begin to feel more comfortable and confident. Your child's health care team will help by giving you lots of information and support.

The first step is learning how to take care of your child over the next few days. The health care team will teach you the "basics" and this booklet can help you remember this information. Because of the way you are feeling, it may be hard to take in a lot of new information. Please let the team know if you would like something explained again or if you have questions.

We know that it is upsetting for your child to be in hospital. Our goal is to help your family return home as soon as possible. If you have questions at home, you can call a Diabetes Nurse Educator at McMaster Children's Hospital during the day, Monday to Friday, from 8 am to 4 pm.

As soon as possible you will return to the hospital to meet the Pediatric Diabetes Team at the 2Q Clinic. During your clinic visits, this special team of health professionals will continue to teach you about your child's diabetes and how to manage it. You and the team will work closely together to help your child live well with diabetes.

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What causes Type 1 diabetes?

Type 1 diabetes is an autoimmune disease. This means that the immune system, which normally fights germs, has attacked and destroyed the insulin-making cells in the pancreas by mistake. We do not know exactly why this happens.

It is possible that your child has genes that made him or her more likely to get diabetes and something in the environment triggered the immune system to damage the pancreas.

There is nothing you could have done to prevent your child's diabetes.

How is diabetes treated?

Diabetes is a life-long condition. Keeping your child's blood glucose levels within a "target range" (not too high or too low) is the best way to help your child grow and develop, and prevent complications.

Keeping your child's blood glucose level within the target range involves:

- healthy eating
- physical activity
- following a meal plan
- injections of insulin

Your child will always need insulin, even when his or her blood glucose level is in the target range.

How do I manage my child's diabetes?

Managing your child's diabetes includes:

- checking your child's blood glucose levels
- knowing the target range for blood glucose levels
- giving your child shots of insulin (called injections)
- helping your child follow guidelines for healthy eating and activity
- knowing the signs of low and high blood glucose, what to do and how to get help if needed
- knowing what to do when your child is sick
- taking your child for regular visits with the family doctor or pediatrician, and seeing the Diabetes Health Care Team every 3 months

You will learn how food, activity and insulin affect your child's blood glucose. After that, you will learn how to make adjustments to meet your child's needs and manage illnesses.

If possible, share the responsibility for managing your child's diabetes with your partner or others who care for your child. We welcome these people at all teaching sessions.

As your child gets older, he or she will learn how to live with diabetes. This is called "self-management". The Pediatric Diabetes Team will continue to care for your family until your child is 18 years old.

How do I test my child's blood glucose?

Your child's blood glucose level will change with eating, activity and insulin. Stress and illness can also affect blood glucose.

Checking the blood glucose will tell you if your child's meal plan, activity and insulin are working well to control the diabetes. Blood glucose testing is one of the most important parts of your child's care.

Always test when your child's stomach is empty.

**There must always be at least 2 hours
between eating and a blood glucose reading.**

The best times to test your child's blood glucose are:

- before breakfast
- before lunch
- before dinner
- before bedtime snack
- at 3 am (until further instructions from your Diabetes Team)

Test more often if your child:

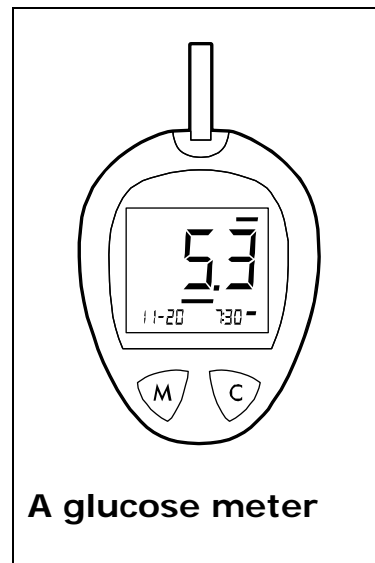
- is more active than usual (because the blood glucose may drop)
- is under stress (because the blood glucose may rise)
- feels sick (because the blood glucose may rise or drop)
- shows signs of high blood glucose (see Hyperglycemia on page 7)
or low blood glucose (see Hypoglycemia on page 11)

Using the glucose meter

The nurse will show you how to take a tiny drop of your child's blood from a finger and test it with a glucose meter. Then, you can practice doing this with the nurse's help. While you are in the hospital, the nurse will use the hospital's glucometer as well as yours. This requires cleaning with an alcohol swab, which you will not have to do when you go home.

When you go home, you should feel comfortable checking the blood glucose by yourself. If you have questions about your glucose meter, check the instructions or talk to your pharmacist.

1. Wash your hands and your child's hands.
2. Massage or warm the child's chosen finger.
3. Prick the skin at the side of the fingertip with a lancing device.
4. Put the first tiny drop of blood on the test strip.
5. Use the glucose meter to show the result.
6. Write down the result in your log book.



The target range for your child's blood glucose is:

- Less than 5 years: 6 to 12 mmol/L
- 5 to 12 years: 4 to 10 mmol/L
- 13 years and older: 4 to 7 mmol/L

The goal is to have as many readings as possible within the target range.

Blood glucose should not be less than 7.0 mmol/L before bedtime.

What are the signs of high blood glucose?

High blood glucose is also called:

Hyperglycemia

Hyperglycemia is when your child's blood glucose level is higher than the target range.

Your child may have high blood glucose or hyperglycemia if you notice **one or more** of these signs:

- feeling very tired or drowsy
- an urge to pass urine (pee) often
- wetting the bed often
- feeling very thirsty
- a dry mouth
- blurred vision

If you notice any of these signs, test your child's blood glucose.

What causes high blood glucose?

The main reasons why your child's blood glucose may be high are:

- eating more food (carbohydrates) than usual
- getting less activity or exercise than usual
- too little insulin or an injection is late or missed
- infection, illness or stress

These pictures can help your child learn and remember the signs of high blood glucose.

HYPERGLYCEMIA

High Blood Sugar

SIGNS AND SYMPTOMS



Drowsiness



*Frequent Urge
to Urinate*



Extreme Thirst



Dry Mouth



Frequent Bed Wetting



Blurred Vision

NovolinCare
Diabetes services from Novo Nordisk

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What can happen with high blood glucose?

It is important to recognize the signs of hyperglycemia early. If hyperglycemia goes unnoticed, ketones may develop in the blood. Ketones are poisonous waste products that come from the breakdown of fat for energy. The kidneys filter the blood and try to get rid of the ketones in the urine.

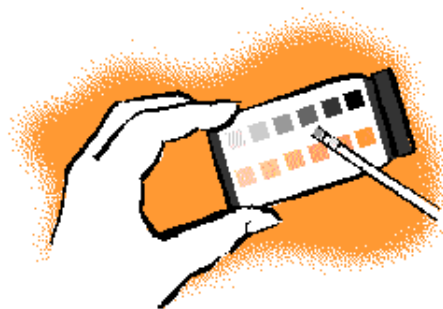
**Ketones are made when the body uses fat for energy.
Ketones mean there is not enough insulin.**

Test your child's urine for ketones:

- if your child's blood glucose is higher than 13 mmol/L **two times in a row**
- if your child is sick (because illness can raise or drop the blood glucose)

How do I test for ketones in the urine?

1. Collect some of your child's urine in a cup (or he or she can pee on the test strip).
2. Dip a test strip in the urine. Shake off any extra drops of urine.
3. Wait ___ seconds.
(follow directions on the test kit)
4. Match the colour on the strip pad to the colour on the bottle.
The reading will be negative, trace, small, moderate or large.
5. Record the results in the log book.



What do I do when there are urine ketones?

If your child's urine has **small to large** ketones, contact the doctor you have been speaking with at the hospital. If you are not able to contact the doctor, go to the nearest hospital emergency room.

It is important to manage ketones quickly to prevent ketoacidosis.

What is ketoacidosis?

Ketones are made when your child's body is breaking down fat for energy. The kidneys try to remove ketones from the blood and get rid of them in the urine. However, the kidneys can't remove the ketones as fast as they are being made. When ketones build up in the blood, the blood becomes more acidic. This is a serious condition called ketoacidosis that can lead to unconsciousness and even death.

Call the doctor or go to the nearest hospital emergency room, if your child has one or more of these signs of ketoacidosis:

- stomach ache
- severe nausea
- vomiting
- rapid breathing
- breath smells fruity or like acetone
- headache
- loss of consciousness

Recognizing the signs of hyperglycemia early can prevent ketones and ketoacidosis.

What are the signs of low blood glucose?

Low blood glucose is also called:

Hypoglycemia

Hypoglycemia is when your child's blood glucose level is lower than the target range.

Your child may have low blood glucose or hypoglycemia if you notice **one or more** of these signs:

- trembling or feeling shaky
- sweating
- trouble concentrating or thinking
- feeling hungry
- feeling weak
- feeling nervous or irritable
- dizziness
- feeling unsteady
- upset stomach or stomachache
- headaches
- slurred speech
- blurred vision
- numbness or tingling of the lips, tongue, fingers or feet

If your child has any of these signs, test his or her blood glucose.

If the blood glucose is less than 4mmol/L, your child has hypoglycemia and needs treatment right away.


If you are not able to test the blood glucose, you still need to treat the symptoms right away.

These pictures can help your child learn and remember the signs of low blood glucose.

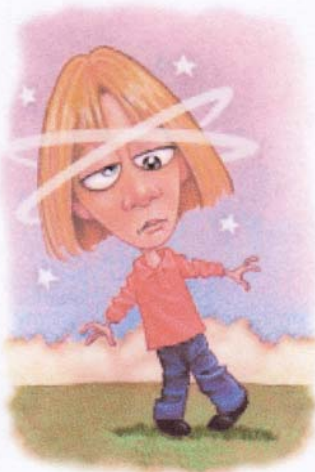
HYPOGLYCEMIA

Low Blood Sugar


SIGNS AND SYMPTOMS




Trembling




Dizziness




Blurred Vision




Mood Changes




Extreme Tiredness and Paleness



Headaches



Hunger



Sweating

NovolinCare
Diabetes services from Novo Nordisk

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What causes low blood glucose?

The main reasons why your child's blood glucose level may be low are:

- not eating enough food (carbohydrates)
- a meal or snack is missed or late
- getting more activity or exercise than usual
- too much insulin
- some illnesses

How do I treat low blood glucose?

Hypoglycemia can happen quickly and must be treated right away.

Step 1
<p>Have your child stop what he or she is doing.</p> <p>If your child is awake and able to swallow, give your child one of the following to eat or drink: (each has 15 grams of fast-acting carbohydrate)</p> <ul style="list-style-type: none">• chew 3 or 4 B-D[®] or 5 to 7 Dextrosol[®] glucose tablets• 3 to 4 teaspoons or 3 to 4 cubes or 3 to 4 packets of table sugar (may be dissolved in water)• 3 to 4 teaspoons of honey or corn syrup• ¾ cup to 1 cup of regular pop (not diet or sugar-free pop)• ¾ cup to 1 cup fruit juice• 6 to 8 Lifesaver[®] hard candies
Step 2
<p>Have your child sit down and rest for 10 to 15 minutes.</p> <p>Then recheck his or her blood glucose level.</p> <p>If the blood glucose level is still less than 4 mmol/L or if the symptoms of low blood glucose have not gone away, repeat Step 1.</p>

If your child has low blood glucose **just before a meal or snack**, treat it with Steps 1 and 2. Then give your child his meal or snack and insulin as planned.

If your child has low blood glucose **and his or her next meal or snack is more than an hour away**, treat it with Steps 1 and 2. Then give your child a snack with a starch (slow-acting carbohydrate) and protein such as:

- ½ cup of milk with 2 plain cookies
- ½ cup of milk with ½ cup of cereal
- 6 crackers with 1 oz of cheese
- 1 slice of bread with 1 tablespoon peanut butter or 1 oz meat or cheese

Make sure you or your child always carry a source of sugar, protein and carbohydrate to treat hypoglycemia.

What do I do if my child has a seizure or passes out?

Your child may have a very low blood glucose (severe hypoglycemia) if:

- your child has a seizure (convulsion)
- your child passes out (becomes unconscious)
- you are unable to wake your child

If this happens, you should:

1. Place your child on his or her right side.
2. Call 911. Do not try to take your child to the hospital.
3. Stay with your child until help arrives.

Never give your child anything by mouth when he or she is not awake enough to swallow.

What do I do if my child gets sick?

When your child is sick, his or her blood glucose levels may go up or down. Test your child's blood glucose level as often as every 2 hours. Give your child small drinks of water and sugar-free fluids often. Continue to give your child insulin. Encourage your child to eat as usual. If your child is not able to eat as usual, replace meals with sugar containing foods.

Take your child to the family doctor or pediatrician to treat the illness, if needed. Ask the doctor or pharmacist about medications to relieve symptoms such as fever or headache.

If your child is vomiting or has diarrhea he or she may develop:

- low blood glucose
- dehydration
- ketoacidosis

If your child vomits more than 2 times in 4 hours or refuses fluids that contain sugar, your child may need medical help.

- **Weekdays until 4 pm** - call the Pediatric Diabetes Team at 905-521-5093 and the Business Clerk will direct your call.
- **After 4 pm or on weekends** - take your child to the nearest hospital emergency room. Bring your child's glucose meter and test strips, lancets and lancing device, and log book.

If you go to the hospital the health care team in the Emergency Room will check your child's blood glucose and give him or her intravenous (IV) fluids and glucose. When your child can keep down fluids containing sugar, the intravenous can be taken out and your child can go home.

What should I know about insulin?

Your child needs injections of insulin to help his or her body use the glucose in food for energy. Insulin lowers blood glucose. The amount and type of insulin your child requires depends on his or her diet, activity and other needs.

The doctor will tell you the correct doses of insulin until the blood glucose level is stable. This will be done over the telephone. Eventually you will learn to adjust the insulin yourself.

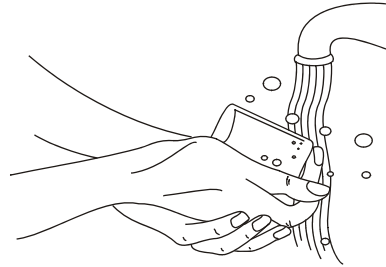
Store insulin away from heat and strong light. Unopened, it must be stored in the refrigerator, but not frozen. Once opened, it may be stored at room temperature for 30 days.

Keep insulin and syringes out of the reach of children.

How do I give an insulin injection?

The nurses will help you with the first few injections. Here are the steps to follow:

1. Wash your hands.



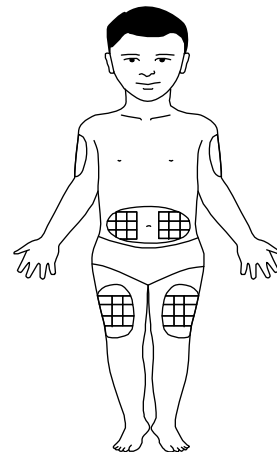
2. Check the bottle of insulin. Make sure it is the right type of insulin. Check the expiry date on the bottle.

3. Roll the bottle of cloudy insulin to mix, if needed.

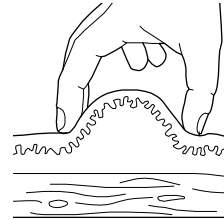
4. Draw up the required amount of insulin(s) into the syringe. If you are using two types of insulin, draw up the cloudy insulin first.

5. Choose an injection site. The tummy or abdomen is best. Rotate the sites. Move around to all available areas of the abdomen.

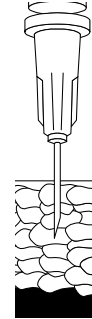
Keep injection sites at least 3 cm (1.5 inches) apart. Use the picture on page 18 to record where you give each injection.



6. Pinch 1 inch of skin.



7. Insert the needle straight into the skin.
You are aiming for the layer of fat below the skin, but above the muscle.



8. Push the plunger all the way down to inject the insulin.

9. Let go of the skin and then remove the needle.

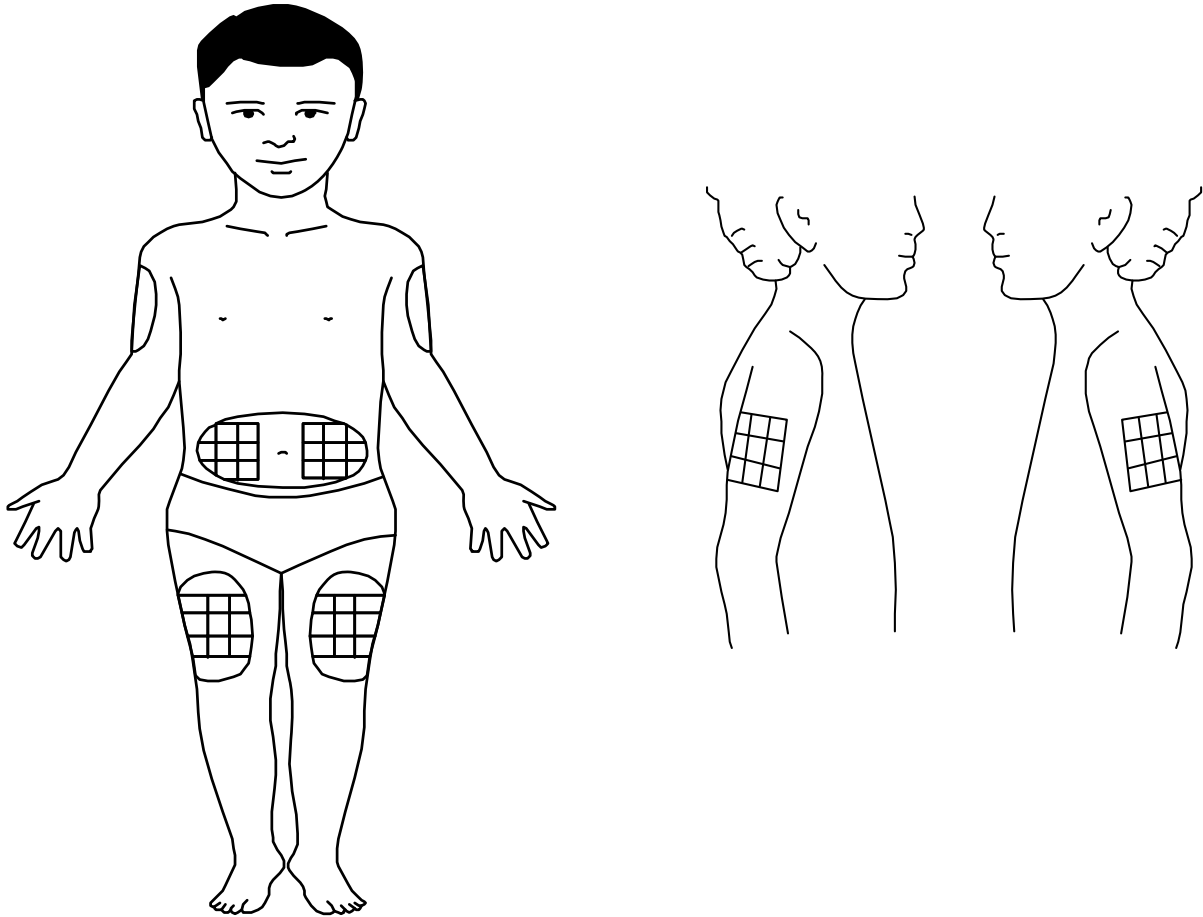
10. Discard the needle and syringe into the sharps container. When the sharps container is full take it to your pharmacy to be replaced.



11. Store insulin away from heat and strong light. Opened bottles of insulin can be stored for 30 days at room temperature.

Injection sites

Use this picture to record where each injection is given. The tummy (abdomen) is best. Remember to rotate the sites.



What can my child eat?

Use these guidelines to help you plan your child's meals and snacks until you meet with the dietitian.

The main nutrients in food are protein, fat and carbohydrate. Your child needs to eat a mixture of foods that have these nutrients each day to stay healthy.

Nutrient	Where it is found and how it is used
Protein	<ul style="list-style-type: none">• found mainly in foods like meat, eggs, cheese, poultry, fish, and legumes• helps to build muscles and supports growth
Fat	<ul style="list-style-type: none">• found mainly in foods like butter, margarine, oil and mayonnaise• helps brain development and supports growth
Carbohydrate	<ul style="list-style-type: none">• found mainly in foods like breads, cereals, potatoes, fruits, milk, sweets and some vegetables• provides most of the energy in our diets

Why are carbohydrates important?

Carbohydrates turn into sugar in the blood so the sugar can be used for energy. Carbohydrates give your child the energy to help him or her think, walk, work and play. Carbohydrates are also needed to keep your child's heart beating and lungs breathing.

We all need insulin to convert carbohydrates in our food into energy. Now that your child has diabetes, his or her pancreas cannot make enough insulin to use the carbohydrates properly. In order to keep your child's blood sugar at a desirable level, he or she now has to take insulin every day and become aware of the amount of carbohydrate eaten.

What are concentrated carbohydrates?

Some foods contain a lot of carbohydrates in a small portion. These foods are called concentrated carbohydrates, and often have sugar as the main ingredient. They will cause a quick rise in your child's blood sugar level. He or she will need to avoid eating concentrated carbohydrates until you have met with the dietitian. At that time you will learn about a meal plan.

Examples of concentrated carbohydrates include:

- candies
- honey, sugar and jam
- syrup
- chocolate
- regular pop
- fruit drinks and punches

What foods should my child have for meals and snacks?

- Make sure your child has 3 meals and a morning, afternoon and bedtime snack at roughly the same time everyday. You can continue to keep your usual family mealtimes. This will help to keep the blood sugar level steady.
- Avoid fruit juices between meals. Limit juice at meals to a 125 ml or ½ cup serving. If your child is thirsty between meals, offer water.
- At each meal, feed your child a variety of foods from the food groups in Eating Well with Canada's Food Guide:
 - **Grain Products** - breads, cereals, pasta, potatoes and rice.
 - **Vegetables and Fruits**
 - **Milk and Alternatives** - milk and yogourt.
 - **Meat and Alternatives** - beef, fish, poultry, peanut butter, eggs, legumes and tofu.
- Do not add sugar to foods.

Here is a list of foods your child can choose to eat and the foods to avoid.

Choose ...	Foods to Avoid....
Breads & cereals, pasta, rice, plain cookies, crackers, waffles, pancakes, muffins	Pies, cakes, pastries, iced cookies, doughnuts, and sweetened cereals
Fresh fruit and vegetables, including unsweetened juices	Sweetened canned fruit
Milk and milk products, including yogourt and cheese	Milkshakes, ice cream, chocolate milk, eggnog
Meat and alternatives	Sweet & sour, and honey sauces
Diet pop, diet drink crystals such as Crystal Light™ and diet iced tea	Regular pop, sweetened fruit drinks, punches, and iced tea
No sugar added jams and spreads	Regular jam, jelly, marmalade, honey
Artificially-sweetened puddings, Jell-O™, Popsicles™, Freezies™	Regular puddings, Jell-O™, Popsicles™, Freezies™
Artificially-sweetened or Calorie-reduced syrups	Corn or maple syrup, molasses
Sugar-free gum	Candy, chocolate, regular gum
Artificial sweeteners	White, brown, and icing sugars

Here are some examples of meals and snacks for your child to eat:

Breakfast:

- toast or bagel or cereal or waffles
- milk or ½ cup unsweetened fruit juice
- a piece of fruit, if desired
- peanut butter or eggs or bacon, if desired

Lunch:

- a sandwich or pasta or soup with crackers
- milk or ½ cup unsweetened fruit juice
- a vegetable, if desired
- a piece of fruit, if desired
- cookies or granola bar or yogourt, if desired

Supper:

- meat or legumes
- pasta or rice or potato or corn or bread
- a vegetable
- milk or ½ cup unsweetened fruit juice
- a piece of fruit or plain cookies, if desired

Snacks:

- | | | |
|-----------------|---------------|--------------|
| • bread | • crackers | • popcorn |
| • cereal | • fruit | • ½ sandwich |
| • plain cookies | • granola bar | • yogourt |
| • chips | • milk | |

Add any of these foods as desired:

- | | | |
|------------------|-----------------------|-------------------|
| • cheese | • peanut butter | • cucumbers, |
| • cheese spreads | • butter or margarine | peppers, celery, |
| • sliced meats | | tomatoes, lettuce |

When should I get medical help?

You should get medical help right away if:

- your child has a seizure, passes out or cannot be woken up
- your child has difficulty breathing
- your child has severe stomach pain
- your child's blood glucose is too high and there are ketones in the urine
- your child vomits more than 2 times in 4 hours or can't take fluids with sugar
- you are unsure of what to do



Patient Education

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