



**The  
Emily  
Center**



# How to Care for Your Child with Diabetes

#422



# How to Care for Your Child with Diabetes

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# Introduction

When a child is diagnosed with a serious condition, parents often feel out of control because they don't understand everything that is happening. However, once they learn about the illness and master home care skills, parents get their sense of control back.

Perhaps you, too, are feeling out of control and overwhelmed because you need to learn about your child's diabetes. This information may seem like too much to handle right now, but don't give up. Like other families, you will also be able to take care of your child's diabetes.

We are here to help.

First, understand there is nothing you or your child did that gave him or her type 1 diabetes. You could not have done anything to prevent diabetes. There is nothing your child can't do because of his or her diabetes.

In the hospital, we will explain the basics about type 1 diabetes, and show you how to safely care for your child at home. The Journey Board shows you all the topics to discuss. This usually takes about 2 days. Your child's caregivers will need to be at the hospital every day to learn the basics.

While your child is in the hospital, we may not be able to get his or her blood sugars into target range. This is OK. After leaving the hospital, your family will continue to meet with our diabetes team. The second part of the Journey Board shows you the topics you will learn about in the clinic. We will teach you the skills to get your child's blood sugars into target range. We will help you become comfortable and confident in your ability to manage your child's diabetes.

# 1. I can tell you about diabetes

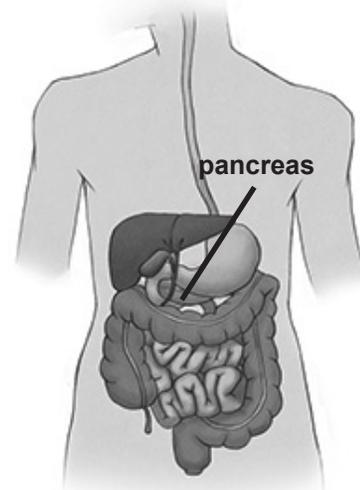
## What is diabetes?

In diabetes the blood has too much **sugar**. Another name for sugar is **glucose**.

## How does the body usually control blood sugar?

We eat food to get energy for our body. Most energy comes from one nutrient: **carbohydrate**. This is found in starchy or sugary foods. Carbohydrates (carbs) are measured in grams.

When we eat these foods, our body's digestive system breaks down the carbohydrate into sugar. The sugar moves from our digestive system into our blood, where it travels all around the body. The sugar needs to move from the blood to the inside of our cells. Inside the cells is where we can make sugar into energy. To do that, we need a hormone called **insulin**. Insulin acts like a key, unlocking the door to the cell so that the sugar can get inside. Insulin is made in the **pancreas**.



**Insulin is made in the pancreas.**

Sugar gets into your blood in two ways:

1. The carbohydrates you eat are turned into sugar by your digestive system.
2. Your liver stores some extra sugar. The liver releases sugar into the blood when you haven't eaten in a while.

Blood sugar levels naturally go up and down a little bit. They do not stay at the exact same level all the time. A healthy pancreas releases insulin only when it needs to, so that the blood sugar level stays fairly steady all day long.

## What is type 1 diabetes?

**Type 1 diabetes** used to be called **juvenile** or **insulin-dependent diabetes**. Type 1 diabetes is usually diagnosed in children and young adults, but it can be diagnosed at any age. About 3 million people in the United States have it.

In type 1 diabetes, the person's body attacks the part of the pancreas that makes insulin. This is called is an **autoimmune disorder**.

After this attack begins, less and less insulin is produced. This prevents sugar from going inside the body's cells, and causes blood sugar levels to go much higher than usual. Eventually, this completely destroys the body's ability to make insulin, leaving the body without any way to get energy out of food that is eaten. Insulin replacement is the only treatment for type 1 diabetes.

## What is type 2 diabetes?

**Type 2 diabetes**, which used to be called **adult-onset** or **non-insulin-dependent diabetes**, is the most common form of diabetes in the United States. It is usually diagnosed in adults, but is sometimes diagnosed in younger people, too.

Type 2 diabetes can happen to anyone, but it is more common in:

- African Americans
- Native Americans
- Hispanic Americans
- Asian Americans
- Pacific Islanders

It is also more common in people who are overweight, have family members with type 2 diabetes, and people who are older.

In type 2 diabetes, the body may not make enough insulin or the insulin that is made does not control the blood sugar levels very well. This is called **insulin resistance**, meaning the cells don't respond to the insulin as well as they usually do. This causes extra sugar to collect in the blood over time. Because type 2 diabetes can develop more slowly, people can have it for years before they know it.

The treatment for type 2 diabetes is different from person to person.

- Some people can control type 2 diabetes by changing their lifestyle. Eating healthy foods and being more active will help the body use its own insulin better.
- Some people have more success controlling type 2 diabetes with medicine.
- Some people who have type 2 diabetes need insulin to help control blood sugar levels. This may be when a person is first diagnosed, in the hospital, or after they have had diabetes for many years.

Some people who make lifestyle changes may be able to stop medicine, but that

does not mean the diabetes has been cured. Blood sugar levels will become high again if those healthy habits stop.

## What are the symptoms of diabetes?

The symptoms of diabetes are:

- Hunger
- Frequent urination
- Very thirsty
- Very tired
- Blurry vision
- Weight loss
- Fruity smelling breath
- Trouble breathing
- Infections

## How is diabetes diagnosed?

When someone shows symptoms of diabetes, blood tests can be done to determine the amount of sugar in the blood. If the blood sugar level is higher than normal, diabetes is diagnosed. A lab test called Hemoglobin A1c (or HbA1c) gives an average of your child's blood sugar over the past 3 months.

Sometimes, it is hard to tell which type of diabetes a person has. The doctor may order other blood tests to determine the type. The most common test looks for antibodies. High levels of antibodies show the body has attacked the pancreas.

## Does diabetes ever go away?

At this time, there is no cure for diabetes. Diabetes never goes away naturally. The best we can do is to try to keep blood sugar levels as close to normal as possible. Some people with type 1 diabetes will have a **honeymoon period** soon after they are diagnosed. During this time, it may look as if the diabetes has gone away, but it really has not.

When a person is first diagnosed with type 1 diabetes, the body begins to attack the pancreas, but it is not finished. That means the pancreas is usually still able to make a little bit of insulin.

Within a few days or weeks after beginning insulin treatment, the pancreas may start back up and release some of its own insulin. Because of this extra insulin, the blood sugar levels may start to go too low, and the doctor may say your child needs to take less insulin. Most people still take some insulin during the honeymoon period, but they may need fewer injections or less insulin.

Unfortunately, the attack on the pancreas cannot be stopped, and in time the body will not make any insulin at all. The honeymoon period can last from 1 week to 2 years. There is no way to tell how long the honeymoon period will last or whether there will be one at all.

Because every child is different, it is important to keep testing the blood sugar levels during the honeymoon period. This information helps the doctor know when to adjust the insulin amount.

**Now that you've read this:**

- Tell your nurse or doctor what diabetes is. (Check when done.)
- Tell your nurse or doctor what glucose means. (Check when done.)
- Tell your nurse or doctor what type of diabetes your child has. (Check when done.)

## 2. I can tell you about blood sugar target ranges

### What is the target range for blood sugars in a person with diabetes?

The **target range** gives the blood sugar levels which are safe and healthy for your child. Blood sugar is measured in **milligrams per deciliter** or **mg/dL**, although some people use the word points. Here are the target ranges for blood sugar levels before meals. Target range is based on age.

#### **Children under 6 years old**

100-180 mg/dL during the daytime

110-200 mg/dL before bedtime and overnight

#### **Children between 6 and 12 years old**

90-180 mg/dL during the daytime

100-180 mg/dL before bedtime and overnight

#### **Teens between 13 and 19 years old**

90-130 mg/dL during the daytime

90-150 mg/dL before bedtime and overnight

The target range may be personalized to better fit your child's needs. Because there are many things that may affect blood sugar levels, it is impossible for your child to stay within the target range all the time. There will be days that you and your child do everything right and still have a blood sugar that is not in target range. That is OK. Blood sugar levels do not have to be perfect. The goal is to do as much as you can to get blood sugar in the target range as much as possible.

How we talk to children about blood sugar levels is important. Talk about the blood sugar number using words like "above target range," "in target range," or "below target range." Do not use words like "good" or "bad" to describe your child's blood sugar levels. These words can make children feel like they are "good" or "bad." To avoid being "bad" some children may hide or change the real blood sugar readings.

## **How do I keep my child's blood sugar level in the target range?**

There are several things you can do to keep the blood sugar levels in the target range as often as possible. These are called self-management skills.

### **Giving the diabetes medicine.**

For type 1 diabetes, your child needs insulin injections several times each day.

**Testing the blood sugar level** at least 4 times a day and writing the results on your log.

**Eating healthy.** People with diabetes do not have to be on a special diet. The guidelines for healthy eating for children with diabetes are the same for children without diabetes.

**Being active.** Exercise keeps people healthy, whether they have diabetes or not. Being active helps to keep your child's blood sugar level in the target range.

**Managing high and low blood sugar levels.** Hyperglycemia means a high blood sugar level is above target. Hypoglycemia means a blood sugar level is below target. There are things we can do to get high and low blood sugar levels back into target range.

**Healthy Coping.** Diabetes can be stressful on every member of the family. Finding resources and support can keep your family emotionally healthy.

**Following up with your Diabetes Team.** It is important that your child see the Diabetes Team every 3 to 4 months. Members of your child's team will help you manage your child's diabetes. At these visits, your child will have physical exams and lab tests to make sure he or she is healthy. The team will also look at the blood sugar logs to see if any medication changes should be made.

## **Now that you've read this:**

- Tell your nurse or doctor about what the target range means.  
(Check when done.)
- Tell your nurse or doctor your child's blood sugar target range during the day.  
(Check when done.)
- Tell your nurse or doctor your child's blood sugar target range at bedtime and at night. (Check when done.)
- Tell your nurse or doctor 3 things you can do to help keep your child's blood sugars in the target range. (Check when done.)

### **3. I can tell you what bothers or worries me most about my child's diabetes**

Write down questions as you think of them. Ask your health care team all of your questions. Ask questions over again until you understand the answers. No question is stupid. When you don't get the answers you need, you may feel you won't be able to take care of your child. When you understand what to do, you can feel more in control over your situation.

When you have questions, ask your child's health care team. After you leave the hospital, your health care team can answer your questions during your follow-up office visits, or you can call them.

#### **Now that you've read this:**

- Tell your nurse or doctor what you are concerned about. (Check when done.)
- Tell your nurse or doctor how you can help your child with his or her feelings about this diagnosis. (Check when done.)

## 4. I can tell you about my child's insulin

### What is insulin?

The body makes **hormones** that send signals through the body. Insulin is a hormone made in the pancreas. It lowers the amount of sugar in the blood. It moves sugar out of the blood into the body's cells, where it is used for energy.



**A healthy pancreas drips insulin all day long.**

A healthy pancreas releases insulin in 2 ways. It can release small drips of insulin throughout the day, like a drippy faucet. It can also release large amounts of insulin very quickly when it needs to, like turning a faucet on all the way.



**A healthy pancreas can also release large amounts of insulin when needed.**

In type 1 diabetes, insulin is missing and we need to replace it. The different types of insulin act like the insulin that a healthy pancreas makes. Most people with type 1 diabetes take two types of insulin, long acting insulin and fast acting insulin. Insulin comes in a small bottle, called a **vial**.

### What is long acting insulin?

The body always needs energy. Even when we are sleeping or not moving much, our brain, heart, and lungs are still working. So the body needs a little bit of insulin all the time. Long acting insulin lasts the whole day.

Since long acting insulin lasts for a whole day, you take long acting insulin one time each day, around the same time (for example, at 7 pm every evening).

There are 2 brands of long acting insulin. They are:

- Lantus
- Levemir

They both work the same way. To save you money, we try to choose the brand your insurance company prefers.

**My child's long acting insulin is: \_\_\_\_\_**  
**It is given once a day and lasts all day and night.**

## What is fast acting insulin?

Sometimes the amount of sugar in the blood goes up very fast, like when we eat food with carbohydrates. To clear this extra sugar out of the blood quickly, there is a type of insulin that works quickly. It is called **fast acting insulin**.

Fast acting insulin lowers blood sugar for about 3 to 5 hours. People with type 1 diabetes take fast acting insulin with nearly every food they eat, to help bring down a spike in blood sugar levels that is caused by carbohydrates in food. We call this **covering carbohydrates** or **covering carbs**.

People with type 1 diabetes can also use fast acting insulin to bring high blood sugar levels back down quickly. We call this **correcting a high blood sugar** or **giving a correction**.

So, fast acting insulin can do 2 different jobs:

- Covering carbohydrates that are eaten
- Correcting high blood sugars

There are 3 brands of fast acting insulin. They are:

- Novolog
- Humalog
- Apidra

They all work the same way. To save you money, we try to choose the brand your insurance company prefers.

**My child's fast acting insulin is:** \_\_\_\_\_

**It is given for meals and to correct high blood sugar.**

## What else should I know about insulin?

- Insulin is measured in units.
- Insulin is a type of protein, like the protein found in meat, fish, or eggs. If we took insulin in a pill, it would be digested like other proteins and would not work. This is why insulin has to be given under the skin.
- Insulin will go bad in hot and cold temperatures. Insulin is stable only between 36° F and 86° F. If you are comfortable, the insulin is usually comfortable, too.
- Long acting insulin (Lantus or Levemir) should not be mixed with any other insulin.

- Fast acting insulin (Novolog, Humalog, or Apidra) should be given before eating the meal and snack. Fast acting insulin takes about 15 minutes to start working after you give the injection. If you have a good idea how much your child is going to eat, give your child insulin before eating. Insulin works best when given before a meal. Children under 5 years old may need to give insulin right after eating until you know how much they will eat.

Most people with type 1 diabetes have 4 to 6 insulin injections each day:

- Fast acting insulin at breakfast
- Fast acting insulin at lunch
- Fast acting insulin at snack time, if needed
- Fast acting insulin at dinner
- Fast acting insulin at bedtime, if needed
- Long acting insulin once a day

While that may sound scary, almost all people with type 1 diabetes get used to injections.

### **Now that you've read this:**

- Tell your nurse or doctor the name of your child's long acting insulin. (Check when done.)
- Tell your nurse or doctor the name of your child's fast acting insulin. (Check when done.)
- Tell your nurse or doctor when long acting insulin is given. (Check when done.)
- Tell your nurse or doctor when fast acting insulin is given. (Check when done.)
- Tell your nurse or doctor why insulin can't be given as a pill. (Check when done.)

## 5. I can tell you how to comfort my child during procedures

Insulin needles are small, thin, and smooth. They are not like the larger needles used to give immunizations. If you want to know what an injection feels like for your child, you can inject yourself with sterile salt water (**saline**) using an insulin syringe. Your nurse can get this sterile saline for you.

Room temperature insulin will help prevent stinging. Staying relaxed during injections will help with comfort. If your child is anxious about the injections, numb the area by placing something cold on it for several seconds before the injection.

Many children want to avoid injections, no matter how painless they may be. They may become emotional, upset, or have a tantrum, especially after a diagnosis when injections are new to them. In most cases, the emotional outbursts that children have is from anxiety about injections, not because the injections are painful. Although it can be difficult at times, caregivers of children with type 1 diabetes must be firm about giving injections. Every injection saves your child's life.

Here are some ways children are comforted during blood sugar checks and insulin injections:

- Stay relaxed while giving finger pokes and injections. If you are anxious, they may become anxious too.
- Use the sides of the fingertips for blood sugar checks. These hurt less because they have fewer nerve endings than fingertip pads.
- Use a new lancet and new syringe each time. Needles become dull with each use, which can cause pain.
- Don't use a bent lancet or a syringe needle.
- Cold insulin may sting. Room temperature insulin is usually more comfortable.
- Try a **comfort hold**. Hug your child on your lap during a finger poke or injection.
- During a finger poke or injection, have your child blow bubbles or breathe out instead of holding his or her breath.
- Numb the area where the injection will go by placing ice on the skin a few seconds before.

- Have your child squeeze your hand or a stress ball during pokes or injections.

Make it clear that blood sugar checks and injections are not a choice. Use phrases like “It’s time to check a blood sugar. Do you want to use your right hand or your left hand this time?”

After the injection, give your child praise or a hug. Let your child know he or she did well.

**Now that you’ve read this:**

- Tell your nurse or doctor how to comfort your child during blood testing.  
(Check when done.)
- Tell your nurse or doctor how to comfort your child during insulin shots.  
(Check when done.)

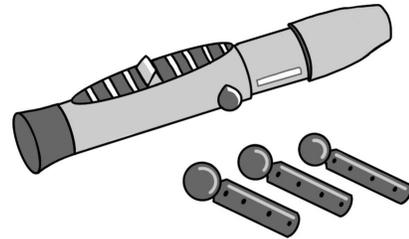
# 6. I can show you how to check my child's blood sugar

## Testing Blood Sugar

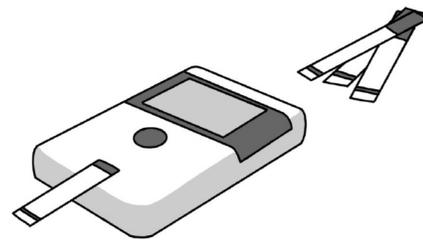
Blood sugar levels can be tested at home using a very small drop of blood and a special machine called a **blood sugar meter**, or **glucometer**. You will learn how to use a blood sugar meter before your child leaves the hospital.

You will learn to use:

- **Lancets** are tiny needles used to get one drop of blood. Some meter types have lancet drums that hold several lancets.
- **Lancing device or poker** holds the lancet. Most lancing devices can be adjusted to set how deep the lancet pokes.
- **Test strips** analyze the drop of blood.
- **Meter** reads the test strip to show the blood sugar level.



Lancing device and lancets



Meter and test strips

There are many types of blood sugar meters made by different companies. They each work the same way, but they may be different sizes, or take different amounts of time to get the results.

Meters must be accurate to be useful. However, if you test the same blood in different brands of meters, you may get slightly different readings. To get the best information, use the same brand of meter every time you test blood. To save you money, we try to choose the brand that your insurance company prefers.

## Why it's important to test blood sugar levels

**Safety:** It can be very dangerous to have a blood sugar level that is too high or too low. Testing blood sugar levels is an easy way to prevent a hospitalization or life-threatening situation.

**Insulin dose adjustments:** We need to know what the blood sugar levels are to

know if the insulin dose is right. The more blood sugar information we have, the better we can adjust the insulin doses. Over time, this means improved blood sugar control for your child.

**Helps you understand how different things affect the blood sugar:** Everyone's blood sugar responds differently to foods, exercise, sickness and stress. Regular testing can help you understand how your child's body responds.

## How to use the blood sugar meter

### What you need:

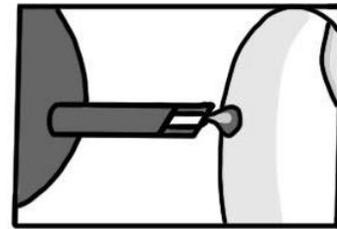
- Lancet
- Lancing device
- Test strip
- Meter
- Cotton ball or tissue

The **quick guide** for your meter will show you how to use it. Here are instructions that apply to all meters.

### What to do:

1. Place all supplies on a clean, flat surface.
2. Wash your child's hands with soap and warm water. If you cannot wash your child's hands, use a baby wipe, alcohol pad, or hand sanitizer. If hands are not clean, you will not get an accurate reading.
3. Dry the hands completely, or let the alcohol or sanitizer evaporate. If hands are still wet, you will not get an accurate reading.
4. When you start a new lancet or lancet drum, remove the cap from the lancet device, put a new lancet or lancet drum into the device, and replace the cap.
5. Set the depth of the lancing device. The low numbers do not go very deep. The high numbers go deeper. If you are not sure how deep the lancet should go, choose a number in the middle.
6. Set the spring on the lancing device.
7. Right before you need the meter, turn it on. To turn on the meter, put a test strip in and wait for the meter to show it is ready for the drop of blood. The meter will shut off if it is not used soon.
8. Place the tip of the lancing device firmly on the side of the fingertip. Press the button on the lancing device to release the lancet. Your child will feel a small prick.

9. Set the lancing device down and gently squeeze the finger until a drop of blood appears.
10. Hold the end of the test strip against the drop of blood. The test strip will suck up the blood. Make sure the blood fills the entire blood collection area. Each meter needs a different amount of blood, so make sure you have enough for your meter. If there is not enough blood in the test strip, you may not get an accurate reading.
11. Soon, the meter will show a number, which is the blood sugar result. If there was an error, the meter will show an error message.
12. Throw away the lancet in a safe container.



**Hold the end of the test strip against the drop of blood. Make sure the blood fills the entire blood collection area.**

### **More information**

- Use the sides of the fingertips, because these have fewer nerve endings and hurt less.
- More blood will flow to the finger tip if your child's hand is below the heart.
- Keep test strips in a cool, dry place. Keep the bottle tightly capped when not in use. Heat, light, and moisture can damage test strips.
- Check the expiration date on the side of the test strip bottle. Do not use strips that have expired.
- After changing the battery in your meter, make sure the time and date are correct. Before you use the meter, make sure the time and date are correct. If you need help to set or change the time and date, read the owner's manual or call the meter's customer service number.
- Most meters have a memory. They will show you past blood sugar levels and the time and date that they were done. This can help you find blood sugar readings that are not on the blood sugar log. It can also help parents supervise children who are testing their own blood sugar levels.
- Keep a backup meter for school, vacations, or if you lose or break your meter. Call our office if you need a backup meter.
- Your meter comes with a small bottle of test solution you can use to check the test strips. Instead of using a drop of blood on the test strip, use the test solution. Then, compare the meter result with the control solution range on the vial of test strips.
- If you have any questions or concerns about your meter, including the warranty, call the customer service number on the back of the meter.

## What does a meter reading of HI mean?

When the meter shows **HI** instead of a number, means the blood sugar level is too high for the meter to read. This usually this means the blood sugar is over 600 mg/dL.

If the meter reading is HI, wash the hands well with warm, soapy water and check the blood sugar again. If the meter reading still says HI:

- Check the urine for ketones. If ketones are moderate or large, call the diabetes team or on-call endocrinologist right away.
- If it is time to give a correction injection, use 600 mg/dL as the current blood sugar level. You will learn more about this later.
- Check the blood sugar level again in 3 hours.

## How do I record blood sugar levels?

Keeping a written record of blood sugar readings and insulin doses is an important part of your child's diabetes care. This information is used to adjust your child's insulin doses safely. While you are in the hospital, you will be given a paper for writing this information, called a **log sheet** or **blood sugar log**. You will learn how to use the log sheets before you go home.

### Log Sheet

— **Date:** Write the date that the information is from.

— **Blood sugar:** Write the blood sugar result from the meter.

Here is an example:

<b>Date</b> 6/29	<b>12PM</b>	<b>1PM</b>	<b>2PM</b>	<b>3PM</b>	<b>4PM</b>	<b>5PM</b>	<b>6PM</b>	<b>7PM</b>	<b>8PM</b>
<b>Blood Sugar</b>	244					136			219

Your diabetes team needs to see blood sugar information at every visit. Bring your log sheets and meter to every appointment.

## **Now that you've read this:**

- Show your nurse or doctor how you check your child's blood sugar.  
(Check when done.)
- Tell your nurse or doctor what a meter reading of HI means, and what to do if you see it. (Check when done.)
- Tell your nurse or doctor why keeping a log is important. (Check when done.)
- Show your nurse or doctor what and where you write on the diabetes log.  
(Check when done.)
- Tell your nurse or doctor when you should share the log with your Diabetes Team. (Check when done.)

## 7. I can tell you how much insulin to give and when

### How much insulin does my child need?

Your child needs enough long acting insulin and fast acting insulin to keep blood sugar levels within target range. The Diabetes Team will decide what the starting doses should be. They look at your child's age, weight, and blood sugar readings. The doses of insulin will change over time as your child grows and as your child changes activity levels. Before you leave the hospital you will know how much insulin your child needs.

### What is the dose of long acting insulin?

The amount of long acting insulin will stay the same every day. The diabetes team will let you know if the amount of long acting insulin should be changed.

### What is the dose of fast acting insulin?

The amount of fast acting insulin may be different each time it is given. This is because the fast acting insulin does two different jobs, covering carbs and correcting high blood sugars. Most people eat different amounts of carbohydrates at each meal. The blood sugar level will also be different each time it is checked. We use math to tell us how much fast acting insulin to give.

### Step 1: Covering Carbs

Two things help us figure out how much fast acting insulin is needed to cover carbs.

1. **The amount of carbohydrates, or grams of carb,** your child eats in the meal.

This number could be different at each meal. It depends on how hungry your child is and what sorts of food your child likes. Counting carbohydrates in food, called **carb counting**, is a skill you will learn.

2. **The carbohydrate ratio, or carb ratio** for short. The carb ratio tells us how many grams of carbohydrates that 1 unit of fast acting insulin can cover. For example, if your carb ratio is 1 to 10, that means 1 unit of fast acting insulin covers 10 grams of carbohydrates. Your doctor will determine the carb ratio to use in the hospital. The carb ratio number may change as your child gets older.

Use these two numbers to figure out the amount of fast acting insulin your child needs to cover carbs.

$$\text{Total Amount of Carbs} \div \text{Carb Ratio} = \text{Units of Fast acting Insulin to Cover Carbs}$$

Here is how we do the math:

60 grams of carbohydrate  $\div$  Carb Ratio of 10 = 6 units of fast acting insulin

## Step 2: Correcting High Blood Sugars

Three things help us figure out how much fast acting insulin is needed to correct high blood sugars.

1. **Your child's blood sugar (BG)** before the meal. You will learn how to check blood sugar levels so you can find this number.
2. **The top of the target range**, or top of target (**ToT**). Your child's target range is based on his or her age and weight. There may be different ranges for day and night, and these will change as your child gets older. The diabetes team will tell you what the starting numbers are.
3. **The Insulin Sensitivity Factor (ISF)**. The Insulin Sensitivity Factor tells us how sensitive a person is to insulin. This number is a measure of how much the blood sugar level will go down from 1 unit of fast acting insulin. If your Insulin Sensitivity Factor is 50, that means 1 unit of fast acting insulin will lower your blood sugar by about 50 mg/dL. Your doctor will determine the Insulin Sensitivity Factor to use in the hospital.

Use these three numbers to figure out the amount of fast acting insulin your child needs to bring a high blood sugar number back into a normal range.

$$\text{Blood Sugar Before the Meal} - \text{Top of Target Range} \div \text{Insulin Sensitivity Factor} = \text{Units of Fast acting Insulin to Correct High Blood Sugar}$$

You may also see **corrections** written like this:

$$\frac{\text{BG} - \text{ToT}}{\text{ISF}} = \text{units of fast acting insulin}$$

Here is an example of how we do the math:

BG is 300 – ToT of 150 = 3 units of fast acting insulin

ISF is 50

Correction doses work to lower blood sugar for 3 hours.

**Only give one correction dose in a 3 hour period.**

### Step 3: Add Carb Coverage and Correction Amounts

You add the units of insulin you need to cover the carbs and the units of insulin you need to correct for a high blood sugar. This will tell you the total dose of fast acting insulin you need.

**Carb coverage dose + High blood sugar correction dose =  
Total dose of fast acting insulin**

Here is an example of adding the carb coverage dose and the high blood sugar correction dose together:

6 units for carb coverage + 3 units for high blood sugar correction =  
9 units of fast acting insulin

The answer can be rounded up or down so we can give the amount of insulin that is closest to what your child's body actually needs.

<b>If the calculated dose ends in...</b>	<b>Then round...</b>	<b>Example</b>
0.1-0.2 units	↓ Down to nearest whole unit	If the calculated dose is 2.2 units, you would round down and give 2.0 units.
0.3-0.7 units	To the nearest half unit	If the calculated dose is 2.7 units, you would round to the half unit and give 2.5 units.
0.8-0.9 units	↑ Up to the nearest whole unit	If the calculated dose is 2.8 units, you would round up and give 3.0 units.

This may seem confusing, but it will get easier as you practice on Insulin Math Worksheets and keep records on the log sheets.

**Because fast acting insulin works for three hours, we have to be careful about when we give it. To be safe:**

- Count and cover the carbohydrates in all meals and snacks that your child eats. This prevents blood sugar from going too high.
- Check your child's blood sugar before each meal. Give a correction if it is needed and if it has been at least three hours since the last fast acting insulin was given. This will help bring down a high blood sugar without causing it to go too low.

## How do I record the insulin given?

Date 6/29	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM
<b>Blood Sugar</b>	244					136			219
<b>Carb Intake</b>	73					32			-
<b>Carb Dose</b>	2.4					1.0			-
<b>High Blood Sugar Dose</b>	.6					-			.4
<b>Total Dose</b>	3.0					1.0			.5
<b>Levemir or Lantus Dose</b>									3.0

## Log Sheet

- **Date:** Write the date that the information is from.
- **Blood sugar:** Write the blood sugar result from the meter.
- **Carb Intake:** Write the total amount of carbohydrate that your child will have at a meal or snack.
- **Carb Dose:** Write the amount of fast acting insulin that you calculated to cover carbohydrates.
- **High Blood Sugar Dose:** Write the amount of fast acting insulin that you calculated to correct a high blood sugar.
- **Total Dose:** Write the total dose of fast acting insulin that was given.
- **Levemir or Lantus Dose:** Write the dose of long acting insulin that was given. This is usually only one time each day.

Your diabetes team needs to see blood sugar information at every visit. Bring your log sheets and meter to every appointment.

## **Now that you've read this:**

- Tell your nurse or doctor when to give your child long acting insulin.  
(Check when done.)
- Tell your nurse or doctor how much long acting insulin to give.  
(Check when done.)
- Tell your nurse or doctor two things fast acting insulin does.  
(Check when done.)
- Tell your nurse or doctor when to give your child fast acting insulin.  
(Check when done.)
- Tell your nurse or doctor how to know how much fast acting insulin to give.  
(Check when done.)
- Tell your nurse or doctor your child's carb ratio. (Check when done.)
- Tell your nurse or doctor your child's Insulin Sensitivity Factor or ISF number.  
(Check when done.)
- Tell your nurse or doctor the top of the target range to use during the day.  
(Check when done.)
- Tell your nurse or doctor the top of the target range to use at night.  
(Check when done.)
- Show your nurse or doctor how to decide the dose of fast acting insulin to give.  
(Check when done.)
- Tell your nurse or doctor when to cover carbs with fast acting insulin.  
(Check when done.)
- Tell your nurse or doctor when to correct high blood sugars with fast acting insulin. (Check when done.)
- Show your nurse or doctor what and where you write on the diabetes log.  
(Check when done.)
- Tell your nurse or doctor when you should share the log with your Diabetes Team. (Check when done.)

# 8. I can show you how I give my child insulin

## What should I know about insulin syringes?

Insulin must be given with a special syringe. They come in different brands and sizes.

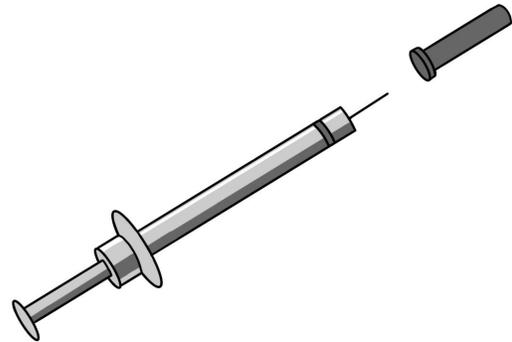
### Parts of the syringe:

#### Cap

The orange cap protects the needle until we are ready to use the syringe.

#### Needle

This goes under the skin. Most people feel the 6 millimeter (6mm) needle is most comfortable.



Point to the cap, needle, barrel, and plunger.

#### Barrel

This measures the insulin dose. An insulin syringe will have lines showing insulin units. The lines on the syringe are called increments.

#### Plunger

The plunger moves insulin in and out of the syringe.

## Size of insulin syringe

There are different sizes of insulin syringes. The Diabetes Team will tell you which size is right for your child.

The size of my child's syringe is: \_\_\_\_\_

## How to draw up insulin

Drawing up insulin means getting insulin from the vial into the syringe.

### What you need

- Vial of the right insulin
- 1 syringe
- 1 alcohol pad

### What to do

1. Place the supplies on a clean, flat surface.
2. Wash your hands with soap and water.
3. **Make sure the name of the insulin on the vial is the medicine you want to give.**
4. Check your math, and make sure the amount of insulin you will give is right.
5. Look at the insulin vial. Is it expired? Is the medicine cloudy or does it have crystals? If the medicine is past the expiration date, cloudy, or has crystals, use another vial.
6. Clean off the top of the insulin vial with alcohol. Let the alcohol dry before drawing up the insulin.
7. Carefully remove the plunger cap and the needle cap. Do not let the needle touch anything.
8. Draw air into the syringe, using the same number of units as the dose of insulin. For example, if your child's dose is 2 units, draw up 2 units of air.
9. Push the syringe needle into the top of the insulin vial. Press the plunger to put the air into the vial.
10. Turn the insulin vial upside down. Make sure the tip of the needle is in the insulin. Pull back on the plunger to fill the syringe with the right amount of insulin.
11. If there are large air bubbles in the syringe, push them back into the vial. Pull back on the plunger to fill the syringe with the right amount of insulin. Repeat until the large air bubbles are gone.
12. Make sure the syringe has the right amount of insulin and no large air bubbles.

### What else should I know about drawing up insulin?

- If the needle is bent, do not use it.
- Use a new syringe every time your child needs an injection. Using the same syringe more than once will dull the needle. This will make injections more painful.

## Where to give insulin injections

Insulin needs to be absorbed into fatty tissue to work right. Insulin is given in areas that have fatty tissue right below the skin. This is called a **subcutaneous injection**. Insulin will not work well if it is injected into muscle or scar tissue.

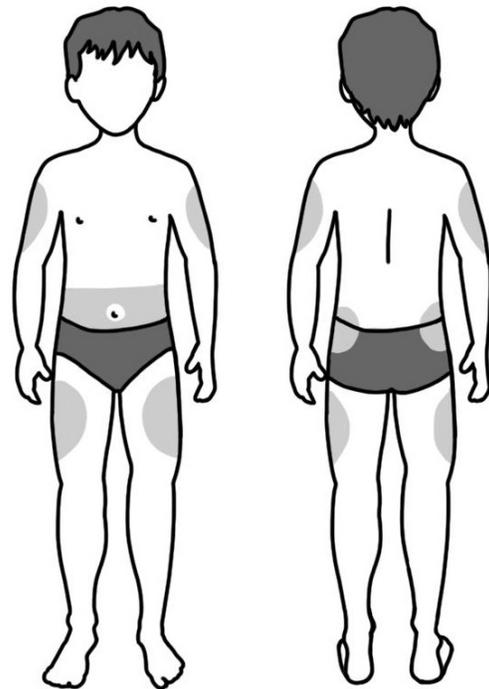
### Here are the places we can inject insulin:

- **Arms** The outside of the arm, between the elbow and shoulder.
- **Stomach** The belly, below the rib cage, with the exception of the belly button area. The sides of the belly can also be used.
- **Buttocks** The upper part of the buttocks and the upper hips.
- **Legs** The outside of the thighs.

## Why is it important to move the injection sites?

If the injections are given in the same place too often the skin in that area will become lumpy. Insulin does not work well if it is injected into lumps, and this can cause high blood sugar levels. When skin gets lumpy from injecting in the same spot too often, it is called **lipohypertrophy**.

Wait at least one week before you use the same injection spot again.



Wait at least one week before you use the same injection spot again.

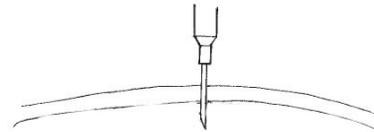
# How to give an insulin injection

## What you need:

- 1 alcohol pad
- 1 syringe filled with the right amount of the right insulin
- 1 container to throw out sharps (a coffee can or thick plastic bottle)

## What to do:

1. Choose the place on the body where you will give the insulin.
2. Clean the skin with alcohol on that spot. Let it air dry. Do not blow on it to make it dry faster.
3. If your child is very thin, gently pinch up the top layer of skin with one hand. This is to make sure the insulin goes into the fatty tissue right below the skin, not into the muscle.
4. Hold the syringe straight up and down (at a 90° angle) and push the needle through the skin. Make sure the entire needle is pushed through the skin.
5. If the skin is pinched, release the pinch. Push in the plunger of the syringe at a steady speed until the syringe is empty.
6. Wait 10 seconds and quickly remove the needle. Waiting 10 seconds keeps the insulin from leaking out. Do not rub the area after you take out the needle.
7. Carefully throw out the syringe in the sharps container.
8. Write the time, insulin type, and amount of insulin you gave on the log sheet.



**Hold the syringe straight up and down and push the needle through the skin.**

## How to safely get rid of sharps

In Arizona, it is legal to dispose of syringes in a sealed container in the trash. Use a thick plastic bottle (like a detergent bottle) to collect used insulin syringes. When the bottle is almost full, tighten and tape the lid, and throw the bottle in the regular garbage. You could buy a sharps container at a drug store. Sharps containers can be emptied at a drop-off collection site.

## How do I record the dose of insulin given?

### Log Sheet

- **Date:** Write the date that the information is from.
- **Blood sugar:** Write the blood sugar result from the meter.
- **Carb Intake:** Write the total amount of carbohydrate that your child will have at a meal or snack.
- **Carb Dose:** Write the amount of fast acting insulin that you calculated to cover carbohydrates.
- **High Blood Sugar Dose:** Write the amount of fast acting insulin that you calculated to correct a high blood sugar.
- **Total Dose:** Write the total dose of fast acting insulin that was given.
- **Levemir or Lantus Dose:** Write the dose of long acting insulin that was given.  
This is usually only one time each day.

Date 6/29	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM
<b>Blood Sugar</b>	244					136			219
<b>Carb Intake</b>	73					32			-
<b>Carb Dose</b>	2.4					1.0			-
<b>High Blood Sugar Dose</b>	.6					-			.4
<b>Total Dose</b>	3.0					1.0			.5
<b>Levemir or Lantus Dose</b>									3.0

Bring your log sheets and meter to every appointment.

### Now that you've read this:

- Tell your nurse or doctor why it is important to check the name of the insulin.  
(Check when done.)
- Show your nurse or doctor how to draw up the right amount of insulin.  
(Check when done.)
- Show your nurse or doctor how to decide where to give the insulin.  
(Check when done.)
- Show your nurse or doctor how to give your child insulin. (Check when done.)
- Tell your nurse or doctor why it is important to change the injection sites.  
(Check when done.)
- Show your nurse or doctor how to safely get rid of sharps. (Check when done.)

- Show your nurse or doctor what and where you write on the diabetes log.  
(Check when done.)
- Tell your nurse or doctor when you should share the log with your Diabetes Team. (Check when done.)

## **9. I can tell you when to check my child's blood sugar**

### **Test blood sugar levels:**

- Before each meal
- Before bedtime
- Whenever there are symptoms of either high or low blood sugar levels
- During illness, every 2 to 3 hours
- Before physical activity
- Each hour during physical activity
- In the middle of the night if there has been a dose change

### **Now that you've read this:**

- Tell your nurse or doctor why it is important to test blood sugar levels.  
(Check when done.)
- Tell your nurse or doctor when to check your child's blood sugar.  
(Check when done.)

## 10. I can tell you about carbohydrates

Children with diabetes should eat the same healthy foods as other children. They do not have to be on a special diet. However, children with type 1 diabetes need to match the amount of insulin to the carbohydrate they will eat.

All food is made of different combinations of 3 nutrients: **carbohydrates**, **proteins**, and **fats**. The body uses each of these for different things and digests them in different ways.

**Carbohydrates** (or **carbs**) are the sugars and starches in food. When eaten, they break down into sugar. Carbohydrates make blood sugar levels go up, whether you have diabetes or not. Insulin lowers the blood sugar levels.

In a person who does not have diabetes, the pancreas releases just the right amount of insulin each time food is eaten. This insulin moves the sugar from the blood into the body's cells, where it is used for energy. In type 1 diabetes, the pancreas no longer makes insulin to take care of the sugar from these foods, so we need to take insulin. In other words, we are doing what the pancreas would have done. The goal is to match the carbs to the insulin as best as we can.

Children need carbohydrates to grow and develop. Children with diabetes need carbohydrates, just like they did before getting diabetes. Having type 1 diabetes does not mean your child needs fewer carbs or more carbs. It just means they need the insulin to cover those carbs. A balanced diet is the best way to keep your child healthy.

With type 1 diabetes, we count all the carbohydrates in each meal and snack to find out how much insulin to take. This is called **carbohydrate counting**, or **carb counting**. While your child is in the hospital, you will learn how to count carbohydrates.

Some foods will have many carbs, and will need a higher dose of insulin than others. For example, a pasta meal will require a higher dose of insulin than steak and a salad, because pasta has more carbs. Pasta can still be a healthy choice.

## How do I know how many carbohydrates are in a food?

Many foods come with a label that shows the carbohydrate amount. Look for the **Nutrition Facts** label. You will need to read it carefully to know how many carbohydrates are in the amount of food your child eats. To figure out the carb amount from the food label, find the serving size and the total carbohydrate.

### The label tells you:

**Serving size:** Everything on the label is based on this serving size. Your child may eat more or less than one serving.

**Total carbohydrate:** The grams of total carbohydrate include the grams of dietary fiber, sugar, and other carbohydrates. The grams of sugar do not need to be counted separately.

Then ask: **How many servings will your child eat?**

If it is more or less than one serving, find the amount of carbohydrates in what your child will eat.

<b>Nutrition Facts</b>	
Serving Size 1 cup (228g)	
Servings per Container 2	
Amount Per Serving	
<b>Calories</b> 280	<b>Calories from Fat</b> 120
<b>% Daily Value*</b>	
<b>Total Fat</b> 13g	20%
<b>Saturated Fat</b> 5g	25%
<b>Trans Fat</b> 2g	
<b>Cholesterol</b> 2mg	10%
<b>Sodium</b> 660mg	28%
<b>Total Carbohydrate</b> 31g	10%
<b>Dietary Fiber</b> 3g	0%
<b>Sugars</b> 5g	
<b>Protein</b> 5g	
<b>Vitamin A</b> 4%	<b>Vitamin C</b> 2%
<b>Calcium</b> 15%	<b>Iron</b> 4%
<small>*Percent Daily Values are based on a 2,000-calorie diet. Your daily values may be higher or lower depending on your calorie needs.</small>	
	<b>Calories:</b> 2,000    2,500
<b>Total Fat</b>	Less than 65g    80g
<b>Sat Fat</b>	Less than 20g    25g
<b>Cholesterol</b>	Less than 300mg    300mg
<b>Sodium</b>	Less than 2,400mg    2,400mg
<b>Total Carbohydrate</b>	300g    375g
<b>Fiber</b>	25g    30g
<b>Calories per gram:</b>	
<b>Fat</b> 9	<b>Carbohydrate</b> 4 <b>Protein</b> 4

A nutrition label

For example, let's say a 1 cup serving of this food has 31 grams of carbohydrate. If your child eats 2 cups, that will be 62 grams of carbohydrate.

**How do you know how many carbohydrates are in fruits or vegetables in a store? Or how many carbohydrates are in food from a restaurant?** Your diabetes team will show you how to find out how many carbohydrates are in foods that don't come with labels. This information is in books, on websites, and on apps, such as:

- The website for the restaurant
- The National Nutrient Database at <http://ndb.nal.usda.gov/ndb/foods>
- Calorie King book or smartphone app

Many schools have carbohydrate information on the breakfast and lunch menus. If you pack a lunch for your child, write the grams of carbohydrate on each item that doesn't have a Nutrition Facts label.

## Choose healthy foods

Everyone, with or without diabetes, should choose foods that have lots of nutrition. These are whole grains, fruits, vegetables, lean meats, and low-fat dairy products. It is not healthy for anyone to eat sugar often or in large amounts. For example, regular soda has a lot of sugar but very little nutrition.

A person with type 1 diabetes can still eat foods that have sugar. Your child does not need **sugar-free foods** because of type 1 diabetes. Still, some families want to consider sugar-free foods, especially for **free snacks**.

Keep in mind sugar-free does not always mean carbohydrate-free. Foods that say they are sugar-free or have no sugar added may have as many grams of carbohydrate as the foods they are meant to replace. For example, ½ cup of no sugar added ice cream has about 15 grams of carbohydrates. Regular ice cream may have the same number of carbohydrates. So it may not be helpful to use the sugar-free food.

Sometimes there is a big difference in carbohydrates between the regular and the sugar-free types of a food. For example, sugar-free sodas, jelly, and Jell-O have fewer carbohydrates than regular sodas, jelly, and Jell-O.

Some no sugar added products may use sugar alcohols (Mannitol, Sorbitol, Xylitol) in place of sugar. If sugar alcohols are eaten often or in large amounts, they may cause stomach pain, bloating, gas, or diarrhea. However, many people with diabetes include some sugar alcohols in their diet without any problems. To find what works best, try different sugar alcohols without limiting carbohydrates.

## How do protein and fat affect blood sugar?

**Protein** and **fat** affect blood sugars in a different way than carbohydrates. It takes the body longer to digest protein and fat than it does carbohydrates. Also, fat and protein slow down the absorption of carbohydrate. So when they are eaten with carbohydrate, fat and protein prevent the blood sugar levels from rising too quickly. Ask your nurse to see the graph that shows how carbohydrate, protein, and fat affect blood sugar levels in different ways.

## What is a free snack?

**Free snacks** are snacks that are low enough in carbohydrates to not require an insulin injection. Many kids, especially younger ones, need a small snack to avoid hunger between meals. Free snacks are a great way to provide food between meals, without needing an extra insulin injection.

### **To find number of carbohydrate grams your child can eat without requiring an insulin injection:**

- Take your child's carb ratio number (the number of carbohydrate grams covered by 1 unit of fast-acting insulin).
- Divide that number by 4. This is because we cannot draw up  $\frac{1}{4}$  of a unit of insulin to cover that amount of carbohydrate.

**Your child can only have one free snack between meals.** If the child has several free snacks, the carbohydrate grams will start adding up and will require insulin.

Some parents find it helpful to have a free snack basket and let the child choose a free snack.

### **These common low-carbohydrate snacks which are often free:**

Hard boiled egg  
Veggies with dressing or hummus  
Raw vegetables  
Sliced turkey or ham  
Tuna or chicken salad  
Celery with 1 Tablespoon of peanut butter  
Nuts  
String cheese  
Sugar free gelatin  
Sugar free popsicles

Carbohydrate free does not mean calorie free. Some low carb foods are high in calories and should only be eaten in small amounts.

## How do I record the amount of carbs eaten?

### Log Sheet

- **Date:** Write the date that the information is from.
- **Blood sugar:** Write the blood sugar result from the meter.
- **Carb Intake:** Write the total amount of carbohydrate that your child had at a meal or snack.
- **Carb Dose:** Write the amount of fast acting insulin that you calculated to cover carbohydrates.
- **High Blood Sugar Dose:** Write the amount of fast acting insulin that you calculated to correct a high blood sugar.
- **Total Dose:** Write the total dose of fast acting insulin that was given.
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This is usually only one time each day.

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<b>Total Dose</b>	3.0					1.0			.5
<b>Levemir or Lantus Dose</b>									3.0

Bring your log sheets and meter to every appointment.

### Now that you've read this:

- Tell your nurse, doctor, or dietitian which foods have carbohydrates or carbs.  
(Check when done.)
- Tell your nurse, doctor, or dietitian how you find the amount of carbohydrates or carbs in a food with a Nutrition Facts label. (Check when done.)
- Tell your nurse, doctor, or dietitian how you find the amount of carbohydrates or carbs in a food without a label. (Check when done.)
- Show your nurse or doctor what and where you write on the diabetes log.  
(Check when done.)
- Tell your nurse or doctor when you should share the log with your Diabetes Team. (Check when done.)

## **Foods with Carbohydrates**

### **Grains**

Bread, pita bread, tortillas  
Hamburger buns and hotdog buns  
Rolls, croissants, bagels, biscuits, cornbread  
Pancakes, waffles, muffins  
Cereal, oatmeal, cream of wheat, grits  
Pasta, noodles, rice, grains, barley, bulgur  
Flour, cornstarch, breadings, crusts, croutons  
Crackers, popcorn, pretzels, granola

### **Fruits**

Apples, applesauce, oranges, bananas  
Watermelons, melons, cantaloupe, honeydew  
Pineapple, pears, apricots, peaches, plums  
Grapes, dates  
Berries, cherries  
Papaya, mango, kiwi  
Dried fruit, fruit juice

### **Dairy**

Milk (all types)  
Buttermilk  
Yogurt

### **Starchy Vegetables**

Beans and lentils (most types)  
Green peas, corn, parsnips  
Potatoes, sweet potatoes  
Winter squash

### **Condiments**

Many sauces, such as BBQ, teriyaki, ketchup  
Honey, jam, jelly  
Less Healthy Foods  
Chips, fries, Cheetos  
Sodas, sports drinks  
Energy drinks, Kool-Aid  
Cookies, candies, cakes, pies  
Donuts, cinnamon rolls  
Chocolate, icing, frosting  
Ice cream, regular Jell-O  
Table sugar, brown sugar  
High fructose corn syrup

## **Foods with no Carbohydrates**

or very low in carbohydrates

### **Non-Starchy Vegetables**

Salad, lettuce, spinach, cabbage, kale, greens  
Tomato, onion, green onions, avocado  
Mushrooms, olives, cucumbers, pickles  
Carrots, beets, radishes, turnips, sprouts  
Celery, leeks, cabbage, sauerkraut  
Baby corn, bamboo shoots, water chestnuts  
Green beans, Italian beans, wax beans  
Asparagus, artichoke, eggplant  
Zucchini, summer squash  
Broccoli, cauliflower, brussels sprouts  
Okra, peppers

### **Fruits**

Lemons, limes

### **Proteins**

Eggs, egg substitutes  
Fish, tuna, shellfish, seafood  
Chicken, poultry, turkey  
Pork chops, ham  
Beef, hamburger, steak  
Lamb, venison, bison  
Nuts, nut butters, cashews, seeds  
Tofu, soy protein

### **Dairy**

Cheese, string cheese, cottage cheese

### **Condiments and Oils**

Garlic, herbs, spices, and seasonings  
Vinegar, mustard  
Vegetable oils, canola oil, olive oil

### **Less Healthy Foods**

Mayonnaise  
Salad dressings, creamy sauces, gravies  
Heavy cream, whipped cream topping  
Cream cheese, sour cream  
Butter, margarine, lard, shortening  
Hydrogenated oil, trans fats, coconut oil  
Hot dogs, bacon, sausage, organ meats

# 11. I can tell you about high blood sugar and how to treat it

## What is high blood sugar?

High blood sugar is any blood sugar reading that is above your child's target range. This is also called **hyperglycemia**. Hyperglycemia is a medical term that means too much sugar in the blood.

### Here are the target blood sugar levels based on age:

#### Children under 6 years old

100-180 mg/dL during the daytime

110-200 mg/dL before bedtime and overnight

#### Children between 6 and 12 years old

90-180 mg/dL during the daytime

100-180 mg/dL before bedtime and overnight

#### Teens between 13 and 19 years old

90-130 mg/dL during the daytime

90-150 mg/dL before bedtime and overnight

There are many things we can do to help blood sugar levels stay in target range as much as possible. However, sometimes blood sugar levels will go high no matter how careful we are. The goal is to bring the high blood sugar down soon after it goes up. The more often blood sugar levels stay within target range, the lower the risk of diabetes complications.

One high blood sugar reading will not cause damage to the body.

## What are the symptoms of a high blood sugar?

The symptoms of high blood sugar are the same as the signs of diabetes before it is diagnosed.

**Hunger:** The body's cells can't get the energy they need from food. Since the cells believe they are starving, they continue to send signals to the brain that increase hunger.



Hunger

**Frequent urination:** The body tries to lower the level of sugar in the blood by getting rid of extra sugar in the urine. The person with high blood sugar levels will go to the bathroom a lot more than usual.



frequent urination

**Very thirsty:** Urinating a lot causes dehydration, and the body sends signals that increase thirst.

**Very tired:** When the body is not able to burn sugar for energy, the cells don't have enough fuel so the body can get tired easily.



Very thirsty

**Blurry vision:** Extra sugar can build up in the liquid of the eyes, causing changes in vision. It may be hard to focus.

**Weight loss:** When the body cannot burn sugar for energy, it begins to burn to body fat. This can lead to weight loss.

**Fruity smelling breath:** Body fat does not burn cleanly. It creates an acid called a ketone, and too many ketones can make a person very sick. Ketones can be detected on the breath and have a fruity smell. Fruity smelling breath is not usually seen in type 2 diabetes.



Very tired

**Trouble breathing:** The body will try to get rid of extra acids by breathing harder and faster. Trouble breathing is not usually seen in type 2 diabetes.



Blurry vision

**Infections:** Germs use sugar for energy too. If there is a lot of sugar in our bodies, it is easier to get infections and harder to get rid of infections.

Not everyone has the same symptoms of high blood sugar levels. Some people do not have any symptoms at all when their blood sugar level is high. Regular blood sugar checks can help catch a high blood sugar level that has no symptoms. Even if there are no symptoms, it is important to bring down high blood sugar level.

## **Possible causes of high blood sugar**

- Problems with the insulin:
  - A missed insulin injection
  - Not taking enough insulin
  - Bubbles in the syringe
  - An error in drawing up or giving the injection
  - Insulin that may have gone bad
  - Expired insulin
- The insulin may have been given in the same place too many times. This causes a lump to form, and lumps do not absorb insulin well.
- Extra carbohydrates that were not covered by the insulin
- Testing too soon after eating carbohydrates
- Hormones, such as the hormones in puberty or menstruation
- Illness
- Certain medicines
- Stress
- Dehydration
- Less activity than usual

## How to treat high blood sugar

If your child has one high blood sugar reading, the regular correction dose should help bring it down by the time of the next check.

If the blood sugar is over 300 mg/dL twice in a row (for example, if it is 315 mg/dL before breakfast and it is 330 mg/dL before lunch):

- Check for ketones (page 33). **If ketones are moderate or large, call the diabetes team.** A high blood sugar without ketones is not an emergency.
- Drink water, or sugar free and caffeine free fluids.
- Give insulin as directed.
- Write the blood sugar level, ketone level, and the amount of insulin given on your log sheet.

## What should I do if high blood sugars happen regularly?

If high blood sugars continue for a long time, this can cause damage to many parts of the body. If your child has high blood sugars regularly, it may be time for a change in the dose of insulin. Send your blood sugar log to the diabetes team. They will review the numbers and let you know if changes need to be made. Later, you will learn how to make dose changes, too.

### Now that you've read this:

- Tell your nurse or doctor the signs of a high blood sugar level.  
(Check when done.)
- Tell your nurse or doctor how to treat a high blood sugar level.  
(Check when done.)
- Tell your nurse or doctor what you would do if high blood sugars happen regularly. (Check when done.)
- Show your nurse or doctor what and where you write on the diabetes log.  
(Check when done.)
- Tell your nurse or doctor when you should share the log with your Diabetes Team. (Check when done.)

# 12. I can tell you about ketones

## What are ketones?

The body prefers to get its energy from sugar, but sometimes it can't. If there is not enough insulin, sugar cannot get into the body's cells. When the body cannot use sugar for energy, it uses body fat for energy. When body fat is used for energy, it releases an acid called a **ketone**. Ketones can build up in the blood and the urine, and cause damage to the body. This is called **diabetic ketoacidosis**, or **DKA** for short.

You can test the urine for ketones. Ketones that are moderate or large (the darker colors) are urgent. Ketones that are not treated can cause a hospital admission, coma, or death. Call the diabetes team or on-call endocrinologist right away.

Ketones that are trace or small (tan or light pink) can usually be treated at home and are not considered an emergency. Call the diabetes team if you are not sure how to fix trace or small ketones.

### To get rid of ketones:

- Regular insulin injections will help prevent more ketones from forming.
- Water or sugar-free, caffeine-free fluids will help flush out the ketones.

### Ketones may happen

- When insulin injections are missed
  - Missed injections are the most common reason ketones occur after the child is diagnosed with diabetes. This can be avoided if an adult is involved in care.
- With undiagnosed diabetes, before insulin is started
- When not enough insulin is taken
- When the person is ill
- When the person has emotional stress
- If the insulin has gone bad

## **What are symptoms of ketones?**

When ketones build to dangerous levels, they can cause symptoms including:

- Upset stomach
- Throwing up
- Very tired or hard to move
- Trouble breathing
- Breath that smells fruity

## **When should I test for ketones?**

In the hospital, your diabetes team will test for ketones anytime the blood sugar is over 300mg/dL. When you go home, test ketones:

- If the blood sugar is over 300mg/dL twice in a row (for example, 315mg/dL before breakfast and 330mg/dL before lunch).
- If there are any symptoms of ketones.

When the child is sick or stressed, test once each day, no matter what the blood sugar level is.

## **How to check for ketones in the urine**

1. Check the expiration date on the side of the bottle. Do not use expired strips.
2. Once a bottle has been opened, it is only good for 90 days. When you open a bottle, write the date on it.
3. Wet the pad at the end of the strip with urine.
  - For those in diaper, place cotton ball in the diaper to collect the urine.
  - With young children, collect the urine in a cup.
  - Older children can place the strip in the stream of urine.
4. Wait the right time. The bottle will say how long to wait.
5. Compare the color on the pad to the chart on the side of the bottle.
6. Write the ketone level on your log sheet.

Ask your nurse to show you the picture of the ketone color chart.

### **Now that you've read this:**

- Tell your nurse or doctor what ketones are. (Check when done.)
- Tell your nurse or doctor what you can do to avoid ketones.  
(Check when done.)
- Tell your nurse or doctor when you need to test for ketones.  
(Check when done.)
- Show your nurse or doctor how you test for ketones. (Check when done.)
- Tell your nurse or doctor what you would do if there are ketones.  
(Check when done.)
- Show your nurse or doctor what and where you write ketones on the diabetes  
log. (Check when done.)

# 13. I can tell you about low blood sugar and how to treat it

**Low blood sugar** is when the blood sugar level goes too far below your child's target range. This means there is not enough energy to fuel the body. Treat this right away. This is called **hypoglycemia**.

We need enough sugar in the blood to fuel the body at all times. If our blood sugar level drops too low, the body can run out of energy quickly. It is a bit like gasoline in a car. To keep the car going, we need enough gasoline in the tank. Without enough gasoline, the car will stop.

## **When is a blood sugar level too low?**

### **For children 0 to 2 years old:**

Daytime Blood sugar of 100 mg/dL or less

Nighttime Blood sugar of 100 mg/dL or less

### **For children 3 years old and older:**

Daytime Blood sugar of 80 mg/dL or less

Nighttime Blood sugar of 100 mg/dL or less

We treat low blood sugar levels with 15 grams of quick sugar with no insulin. Do not give insulin when trying to raise blood sugar. Quick sugars are things that are very sugary, like soda, juice, or candy. Quick sugar gets into the blood quickly and raises the blood sugar level. Giving only 15 grams of quick sugar will help prevent the blood sugar level from going too high above target range.

## **Remember, the target ranges for blood sugar levels are:**

### **For children under 6 years old:**

100-180 mg/dL during the daytime

110-200 mg/dL before bedtime and overnight

### **For children between 6 and 12 years old:**

90-180 mg/dL during the daytime

100-180 mg/dL before bedtime and overnight

### **For teens between 13 and 19 years old:**

90-130 mg/dL during the daytime

90-150 mg/dL before bedtime and overnight

The levels for blood sugars at night are slightly higher because it can be hard to feel and respond to symptoms of low blood sugar when we are sleeping. A low blood sugar level while sleeping increases the chances that the low will be more dangerous.

**Treat a low blood sugar right away.** A low blood sugar that is not treated can lead to seizure, loss of consciousness, coma, or death. Everyone who cares for your child must know how to find and treat a low blood sugar.

### Common signs of low blood sugar



**Shaky**



**Sweaty**



**Confused**



**Headache**



**Tired or sleepy**



**Hungry**

### Other signs of a low blood sugar

- Pale
- Cranky or whiny
- Weak
- Tingling lips or fingertips
- Nightmares
- Stomach ache or sick to the stomach

Not everyone has the same symptoms of low blood sugar. Some people do not have any symptoms at all when their blood sugar is low. Regular blood sugar checks can help catch a low blood sugar that has no symptoms. Small children may not be able to tell us when they feel different, so those who care for small children will need to watch for these symptoms.

## **Possible causes of low blood sugar**

- Exercise
- Too much insulin
  - Correcting a high blood sugar more often than every 3 hours
  - Not counting the carbohydrates in the food correctly
  - Not eating all the carbohydrates that were served
  - Giving insulin too late after food
  - Math errors
- Drawing up too much insulin
- Honeymoon phase of diabetes

## **What are examples of 15 grams of quick sugar?**

**Always carry a quick sugar with you.** Here are examples of some quick sugars:

- 3 to 4 glucose tabs
- a half cup of regular soda (4 ounces)
- a half cup of juice (4 ounces)
- 17 Skittles
- 4 Starbursts
- 6 jelly beans
- 1 Tablespoon of sugar
- a half tube of glucose gel

This can be rubbed on the gums if your child can't swallow.

Foods with a lot of protein, fat, or fiber (like milk, yogurt, chocolate, sandwiches) take longer to enter the blood stream. Do not use these to treat a low blood sugar quickly.

## How to treat low blood sugar

We want to treat low blood sugar so it comes back to the target range but doesn't go too high. This treatment is called **The Rule of 15**.

### **When the blood sugar is below target range:**

1. Give 15 grams of quick sugar without insulin.
2. Wait 15 minutes, then check the blood sugar to see if it worked.
3. If the blood sugar is not within target range, give 15 more grams of quick sugar, wait another 15 minutes, then check the blood sugar again.
4. If it's still not within target range, call the clinic or the on-call doctor.

For low blood sugar levels at bedtime or overnight, give a little bit of protein or fat after using The Rule of 15. This may help keep blood sugar levels steady. If the blood sugar was low at bedtime, check the blood sugar again in the middle of the night.

For example:

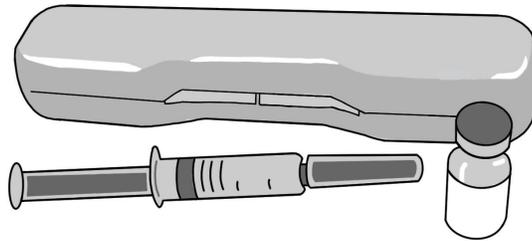
Your child's blood sugar is 93 mg/dL before bedtime. You give 15 grams of quick sugar, wait 15 minutes and test again. The blood sugar level went up to 118 mg/dL, which is in target range for nighttime. However, you are concerned it may go back down overnight, so you give your child a string cheese to help keep the blood sugar level steady.

If it is unsafe for your child to swallow a quick sugar, or if your child passes out or has a seizure from a low blood sugar, you will need to give your child an emergency injection of glucagon and call 911.

## What is glucagon?

**Glucagon** is a hormone in the body that works opposite of insulin. While insulin works to get sugar from the blood into the cells, glucagon works to put stored sugar from the liver into the blood. Glucagon can raise blood sugar levels without having to use food. In type 1 diabetes, sometimes we need to replace glucagon just like we replace insulin.

A **glucagon kit** for people with diabetes is similar to an Epi-Pen for people who have severe allergies. It is very rarely used, but it can be lifesaving in an emergency. Keep a glucagon kit with you at all times. Check often to make sure the glucagon kit has not expired.



**Keep a glucagon kit with you at all times.**

Glucagon comes in either a red or orange case. There are two things inside the case:

1. A special syringe that contains a liquid
2. A vial that contains a powder of glucagon

The liquid and the powder are separate so your glucagon kit will have a long shelf life. When a glucagon injection is needed, mix the liquid and the powder well together before injecting.

There are 2 different doses of glucagon, a half dose and a full dose. Children who weigh less than 50 pounds need a half dose. Children who weigh more than 50 pounds need the full dose.

## How to give glucagon

If it is unsafe for your child to swallow a quick sugar, or if your child passes out or has a seizure from a low blood sugar, do this right away:

1. Send someone to call 9-1-1 if possible.  
If no one is able to call, first give glucagon and then call 911.
2. Turn your child onto the side so he or she doesn't choke on vomit. Do not put any food, fluid, or hard objects into the mouth.
3. Inject all the liquid from the syringe into the vial of powder.

4. Swirl or shake the bottle well.
5. Draw up the right dose as directed.
6. Give the glucagon into a big muscle, like the top of the thigh or the buttock.
7. Check the blood sugar level in 15 minutes.

**Call the clinic if:**

- There are 2 low blood sugars within 24 hours.
- A child wakes up two days in a row with a morning blood sugar under 100 mg/dL.
- Blood sugars are under 80 mg/dL after treating twice with the Rule of 15.
- You have had to give glucagon. We want to prevent a serious low blood sugar from happening again, and we may need to give you a new glucagon prescription.

**Now that you've read this:**

- Tell your nurse or doctor what blood sugar level in my child is too low.  
(Check when done.)
- Tell your nurse or doctor what very low blood sugar feels like.  
(Check when done.)
- Tell your nurse or doctor how to treat blood sugar that is too low.  
(Check when done.)
- Tell your nurse or doctor when to give your child glucagon.  
(Check when done.)
- Tell your nurse or doctor your child's dose of glucagon.  
(Check when done.)
- Show your nurse or doctor how you would give your child glucagon.  
(Check when done.)
- Show your nurse or doctor what and where you write on the diabetes log.  
(Check when done.)
- Tell your nurse or doctor when you should share the log with your Diabetes Team. (Check when done.)

# 14. I can tell you how my child can safely be active

## How does activity affect blood sugar levels?

Activity is very good for your child's blood sugar control and general health.

- Activity usually makes people more sensitive to insulin. In other words, 1 unit of insulin will lower your child's blood sugar more. This may cause your child to have lows.
- Activity may cause lows for up to 24 hours after activity, even if your child's blood sugars went up during the exercise.
- The excitement that comes with activity may cause the body to release more sugar into the blood, which can make blood sugar levels go up.
- If your child already has ketones, activity will make the cells burn fat for energy and release even more ketones.
- Activity may cause dehydration, which can raise blood sugar levels.

Every child is different. Learn how your child's blood sugars change with activity by checking the blood sugar before, during, and after he or she is active.

## How do I manage blood sugar levels before, during, and after activity?

This is general information about how children can be safely active. Your diabetes team will tell you what works best for your child.

### Before activity:

Check blood sugar before activity.

- If blood sugar is less than 100, have a 15 to 30 gram carbohydrate snack without insulin.
- If blood sugar is less than 150, have a 15 gram carbohydrate snack without insulin.
- **If blood sugar is between 150 and 300, it is OK to exercise.**
- If blood sugar is greater than 300, check for ketones.
  - If ketones are positive (moderate to large), do not exercise. Treat the ketones instead.

- If ketones are negative (trace or small), it is OK to exercise.
- Consider giving an insulin correction using 200 as the target.

**During activity:**

- Check blood sugar every hour. If blood sugar goes below 150, give 15 grams of carbohydrate without insulin.
- Drink plenty of water to stay hydrated.

**After activity:**

- Check blood sugar soon after activity to learn how it responds to activity.
- Drink plenty of water to stay hydrated.
- Do not correct for high blood sugar until 2 hours after activity, but you can cover for carbs as usual.

**At bedtime:**

- If your child had a lot of exercise that day, adjust bedtime and nighttime target blood sugar range to 130-180 mg/dl.
- If blood sugar is less than 130, give a 15 gram carbohydrate snack with protein, without insulin.
- If blood sugar is more than 180, correct with insulin using a target of 180.
- Consider a blood sugar check at 2 a.m.
- Consider decreasing long-acting insulin (Lantus or Levemir) if using vials or pens. Consider a temporary basal decrease for an insulin pump.

**Now that you've read this:**

- Tell your nurse or doctor what exercise does to blood sugar. (Check when done.)
- Tell your nurse or doctor when to check your child's blood sugar when active. (Check when done.)
- Tell your nurse or doctor what to do before your child exercises. (Check when done.)
- Tell your nurse or doctor what to do while your child is exercising. (Check when done.)
- Tell your nurse or doctor what to do after exercise. (Check when done.)
- Tell your nurse or doctor what to do at bedtime, if your child has had a lot of exercise that day. (Check when done.)

## 15. I can tell you what supplies I need and where to get them

You need a system for keeping track of your child's medical supplies, and a way to remind you when to order more, so you never run out.

- Make a list of all the supplies you need.

### **To keep your child safe always have with you**

- Blood glucose meter
- Test strips and lancets (at least 10 of each)
- Fast acting insulin
- Syringes or pen needles (at least 10)
- Quick sugar items
- Snack of 15 grams carbohydrate and 5 grams of protein
- Emergency Glucagon or Gluca-Gen

- Put the contact information for the place where you get your supplies and your health insurance company in the memory of your cell phone.

- When you have only two weeks of supplies left, it is time to order more. You need this much time, because sometimes you will have to wait for the order to be approved by your insurance company. This is called **prior authorization**.

- Make a note of when your child's Glucagon Kit expires.

- Order a medic alert bracelet or necklace for your child. These websites offer many different styles:

#### **Medical ID**

[www.laurenshope.com](http://www.laurenshope.com)

[www.hopepaige.com](http://www.hopepaige.com)

[www.americanmedical-id.com](http://www.americanmedical-id.com)

[www.coolmedid.com](http://www.coolmedid.com)

[www.vitalid.com](http://www.vitalid.com)

### **Now that you've read this:**

- Tell your nurse or doctor what supplies you need for your child at home.  
(Check when done.)
- Tell your nurse or doctor where you will get those supplies, and how.  
(Check when done.)
- Tell your nurse or doctor when you need to order supplies. (Check when done.)
- Tell your nurse or doctor who you will call if you have questions about the supplies. (Check when done.)
- Tell your nurse or doctor if your child needs a medic alert bracelet or necklace, and where to get it. (Check when done.)

## 16. I can tell you how I store insulin

Insulin comes in a small bottle, called a **vial**. Insulin is very sensitive to light and heat, so it needs to be stored carefully.

Store all medicine where children cannot reach it. Unopened vials of insulin should be stored in the refrigerator and are good until the expiration date on the box.

Opened vials of insulin can be kept in the refrigerator or at room temperature. Use a marker to write the date opened on the bottle of insulin or insulin pen. Insulin is good for only 1 month after it has been opened, except for Levemir, which is good for 42 days.

Insulin will go bad at 86° F or higher.

Insulin will go bad at 36° F or lower.

If you are comfortable, the insulin is usually comfortable.

Insulin that has been frozen or has gotten too hot may not work and may cause the blood sugar levels to run high. An insulated lunch box or cooler can be used to carry vials of insulin safely outside the home. This is especially important in the summer.

### **Now that you've read this:**

- Tell your nurse or doctor where you will keep your child's insulin.  
(Check when done.)
- Tell your nurse or doctor what you will do when you open a new vial of insulin or insulin pen. (Check when done.)
- Tell your nurse or doctor how long to keep insulin after it is open.  
(Check when done.)
- Tell your nurse or doctor how I will store insulin away from home.  
(Check when done.)

## 17. I can tell you when my child can return to school

Your health care team will tell you when your child can return to school. They will also give you a copy of your child's treatment plan to give to the nurse or teacher at school.

If you want to learn more about how you can help your child at school, ask your nurse for the booklet: **How to Get the Best Education for Your Child With Special Needs: Section 504 The Rehabilitation Act of 1973 #843**

### **Now that you've read this:**

- Tell your nurse or doctor what you will tell the school nurse and the teacher about your child's condition. (Check when done.)
- Give your child's school a copy of the treatment plan. (Check when done.)

# 18. I can tell you who I can call with questions or concerns, and when I should call

## When to Call Your Diabetes Team

### Urgent Calls

During office hours Monday to Friday, 8:30 am to 4:00 pm:

Call **602-933-0618** to speak with the diabetes educator. If you get a voice mail message, please leave a message and the diabetes team will call you back as soon as possible.

Before and after office hours, on weekends, and during holidays:

Call **602-933-1000** and request to speak with the endocrinologist on-call immediately.

Examples of urgent calls:

- Child has recently been in the hospital and you need help.
- **Child has moderate to large ketones.**
- Child is throwing up or has dry mouth, dry tongue, or sunken eyes (appears to be dehydrated).
- **Child has had 2 low blood sugars within 24 hours.**
- Child received glucagon for a serious low blood sugar level.
- Child's blood sugar level is still equal to or less than 80 mg/dL after treating twice.

### When to go to the emergency room or call 911:

- Your child is unconscious and you are not able to give glucagon by injection.
- If your child has signs and symptoms of diabetic ketoacidosis (DKA) and you need help.
- Signs of DKA:
  - Moderate or large ketones
  - Dry mouth, dry tongue, sunken eyes (dehydration)
  - Throws up several times
  - Unable to keep fluids down
  - Has trouble breathing
  - Breath smells fruity

## **Routine and Non-Urgent Calls**

Blood sugar logs

For a routine blood sugar review, send the readings to:

- Phone: **602-933-0618**
- Fax: **602-933-2471**, attention Diabetes Educators
- E-mail: [diabeteslog@phoenixchildrens.com](mailto:diabeteslog@phoenixchildrens.com)

We will respond by the end of the next business day. If you do not receive a response by that time, please send us your blood sugar log again.

## **Forms**

Requests for forms to be filled out by our office, such as school packets, travel letters, FMLA forms, procedure preparation instructions, or lab slips, may take up to 5 business days to complete. Please fax or mail the forms to be filled out early enough so we can get them to you by the time you need them.

## **Prescription Refills**

For prescription refills, please call your pharmacy. Be ready to give your pharmacy the following information:

- Patient's name
- Patient's date of birth
- Specific medicine or supplies needed
- Amount needed
- Phone number where you can be reached

## **Prior Authorizations**

Prior authorizations required by insurance for certain medicines and supplies can take up to 7-10 working days to be processed. Call our office as soon as possible so you don't have to go without in medicine or supplies.

Prescriptions are usually good for only for 1 year from the day they were written. If your child has not been seen in the Diabetes Clinic in the past year, prescriptions cannot be refilled until the child is seen by a doctor.

## **Making or Changing an Appointment**

To make or change an appointment call **602-933-0935** and select the option for appointments. You will speak to an endocrinology department scheduler who can give you an appointment.

Put these telephone numbers in the memory of your cell phone, so you will have them when you need them.

## **Now that you've read the list:**

- Tell your nurse or doctor the name and telephone number of your child's doctor. (Check when done.)
- Tell your nurse or doctor the names and telephone numbers of your child's diabetes team members, and when you should call them. (Check when done.)
- Tell your nurse or doctor who you should call if you have questions about how to care for your child at home. (Check when done.)
- Tell your nurse or doctor who you would call if you have a question about your child's health. (Check when done.)
- Tell your nurse or doctor who you would call if you need transportation to get home. (Check when done.)
- Tell your nurse or doctor when you should share the log with your Diabetes Team. (Check when done.)

# 19. I can tell you where I can find support resources for diabetes

## **Coaching**

— Phoenix Children’s Hospital’s Diabetes Program staff offers one-on-one coaching for the first few weeks after a diabetes diagnosis.

## **Classes At Phoenix Children’s Hospital**

To attend, call 602-933-0618

- Parenting a Child with Diabetes
- Pre-Pump
- Post-Pump
- Advanced Pumping
- Pattern Management
- Nutrition in Diabetes
- Transitioning to Teenage Years
- Transitioning to Adulthood

## **National Organizations for People with Diabetes**

— American Diabetes Association (ADA)

[www.diabetes.org](http://www.diabetes.org)

1-800-DIABETES or 1-800-342-2383

Phoenix Chapter: 602-861-4731

— JDRF (formerly the Juvenile Diabetes Research Foundation)

[www.jdrf.org](http://www.jdrf.org)

1-800-533-CURE or 1-800-533-2873

Phoenix Chapter: 602-224-1800 or [www.jdrfdsw.org](http://www.jdrfdsw.org)

## **Websites for support and information**

Phoenix Children’s Hospital Diabetes Program Facebook Group

[www.facebook.com/groups/PCHdiabetes](http://www.facebook.com/groups/PCHdiabetes)

Children with Diabetes - The online community for kids, families, and adults with diabetes

[www.childrenwithdiabetes.com](http://www.childrenwithdiabetes.com)

Type One Nation - Social network for people with type 1 diabetes  
[www.typeonenation.org](http://www.typeonenation.org)

Diabetes Hands Foundation - A community of people touched by diabetes  
[www.tudiabetes.org](http://www.tudiabetes.org)

Diatribe - Making Sense of Diabetes  
[www.diatribe.org](http://www.diatribe.org)

Diabetes Mine - a gold mine of straight talk and encouragement  
[www.diabetesmine.com](http://www.diabetesmine.com)

dLife - It's Your Diabetes Life  
[www.dlife.com](http://www.dlife.com)

Diabetic Connect  
[www.diabeticconnect.com](http://www.diabeticconnect.com)

College Diabetic Network  
[www.collegediabetesnetwork.org](http://www.collegediabetesnetwork.org)  
Diabetes Mall  
[www.diabetesnet.com](http://www.diabetesnet.com)

### Food and Nutrition Information

[www.calorieking.com](http://www.calorieking.com)  
[www.nutritiondata.com](http://www.nutritiondata.com)  
[www.myfitnesspal.com](http://www.myfitnesspal.com)

### Smartphone and tablet apps



BlueLoop 4+  
BlueLoop, LLC. >



mySugr Junior  
mySugr GmbH >



CalorieKing Food 12+  
Search  
CalorieKing >



Calorie Counter &  
Diet Tracker by...  
MyFitnessPal.com >



GoMeals 4+  
sanofi-aventis U.S. L... >



Diabetes Personal 4+  
Calculator  
iTenuto Soft >

**Do not use the  
Diabetes Personal Calculator  
when blood sugar is low.**

**Books for young children:**

Coco and Goofy's Goofy Day by Disney, 2013

Coco Goes Back to School by Disney, 2013

Coco's First Sleepover by Disney, 2012

I have Diabetes: A Children's Book about Juvenile Diabetes by Karri Andersen, 2015

**Books for School-Aged Children:**

Lara Takes Charge by Rocky Lang and Sally Huss, 2012

Taking Diabetes to School, Kim Gosselin, 2004

A Magic Ride in Fozzball-Land by Jean Betschart-Roemer, 1995

The Bravest Girl in School by Kate Gaynor, 2015

The Great Katie Kate by M. Maitland DeLand, 2010

**Books for Teens and Young Adults:**

Young Adult Type 1 Diabetes Realities by Nicole Johnson, 2014

Not Dead Yet: My Race Against Disease: From Diagnosis to Dominance by Phil Southerland, 2012

**Books for Caregivers:**

Kids First, Diabetes Second by Leighann Calentine, 2012

Raising Teens with Diabetes: A Survival Guide for Parents by Moira McCarthy, 2013

Typecast: Amazing People Overcoming the Chronic Disease of Type 1 Diabetes by Deutscher, 2013

Balancing Diabetes: Conversations about finding happiness and living well by Kerri Sparling, 2014

Everything Parent's Guide to Children with Juvenile Diabetes: Reassuring advice for Managing Symptoms and raising a healthy, happy child by Moira McCarthy, 2007

**Mentorship Programs (ask your Diabetes Team for more information)**

— JDRF Mentorship Program

**School and Daycare Resources: (ask your Diabetes Team for more information)**

— ADA Safe at School handout

— ADA Safe at School Workshop offered at Phoenix Children's Hospital throughout the year

— ADA Safe Sitter Workshop offered at Phoenix Children’s Hospital throughout the year

— JDRF School Advisory Toolkit

### **Now that you’ve read this:**

- Tell your nurse or doctor what The Emily Center is and how you can contact the nurses there. (Check when done.)
- Tell your nurse or doctor which agencies and other resources can help you. (Check when done.)
- Tell your nurse or doctor who you would call if you need transportation to get home. (Check when done.)
- Tell your nurse or doctor when you should share the log with your Diabetes Team. (Check when done.)
- Tell your nurse or doctor how this diagnosis impacts your family (siblings, marriage, extended family). (Check when done.)
- Tell your nurse or doctor how this diagnosis changes how your family lives, and how you can cope with that. (Check when done.)

## 20. I can tell you about my child's follow-up appointments

### Now that you've read this:

- Tell your nurse or doctor the name and telephone number of the doctor in charge of your child's care. (Check when done.)
- Tell your nurse or doctor the date, time, and place of your child's next doctor's appointment. (Check when done.)
- Tell your nurse or doctor the names and telephone numbers of your child's specialists. (Check when done.)
- Tell your nurse or doctor the date, time, and place of your child's next appointment with each specialist. (Check when done.)
- Tell your nurse or doctor how you will get to each doctor's appointment. (Check when done.)
- Tell your nurse or doctor why it is important to keep your child's doctor's appointments. (Check when done.)

## Diabetes Team Members

The professionals on your child's health care team can help your family cope with diabetes. As you get to know the members of your Diabetes Team, you will learn who to talk to when an issue comes up.

### **Pediatric Endocrinologist:**

A pediatric endocrinologist is a doctor who specializes in treating children and adolescents who have problems with their endocrine system. Diabetes is an endocrine disorder. There is always an endocrinologist on call for problems and emergencies. You should see your endocrinologist every 3 to 4 months.

### **Pediatric Endocrinology Fellows:**

Phoenix Children's Hospital is a teaching facility that trains pediatric endocrinologists. If you choose to see, or are scheduled to see a fellow, you will also be seen by one of the endocrinologists.

### **Certified Diabetic Educator (CDE):**

These team members have taken a test to become certified to care for people with diabetes and provide diabetes education. Certain professionals are eligible to become a CDE including registered nurses, registered dietitians, and pharmacists.

### **Diabetes Coach:**

The families of children newly diagnosed with diabetes will be assigned a diabetes coach. The coach will maintain close contact with the family during the first few weeks after diagnosis. The coach will help with insulin dose adjustments, and be a resource for additional information.

### **Nurse:**

The diabetes nurse is a nurse who specializes in educating patients about diabetes. The nurses at the Diabetes Clinic can help you deal with many aspects of your diabetes care.

### **Registered Dietitian:**

The diabetes dietitian can help you with carbohydrate counting, meal planning, special diets, healthy eating, and any questions about supplements.

### **Medical Assistant:**

The medical assistant will check you in each time you visit the clinic. They will take your child's blood pressure, pulse, height, weight, and do a finger poke for the hemoglobin A1c. The medical assistant will also help you with any prescriptions and getting items authorized by your insurance company.



If you have any questions or concerns,  
 call your child's doctor or  call \_\_\_\_\_

If you want to know more about child health and illness,  
visit our library at The Emily Center at Phoenix Children's Hospital  
1919 East Thomas Road  
Phoenix, AZ 85016  
602-933-1400  
866-933-6459  
[www.phoenixchildrens.org](http://www.phoenixchildrens.org)  
[www.theemilycenter.org](http://www.theemilycenter.org)  
Facebook: [facebook.com/theemilycenter](https://www.facebook.com/theemilycenter)  
Twitter: @emilycenter

**Disclaimer**

The information provided at this site is intended to be general information, and is provided for educational purposes only. It is not intended to take the place of examination, treatment, or consultation with a physician. Phoenix Children's Hospital urges you to contact your physician with any questions you may have about a medical condition.

July 31, 2017  
#422 • Written by The Phoenix Children's Hospital Diabetes Team  
Illustrated by Irene Takamizu, Christine Rimmel, Alyssa Talent



**MDI BLOOD GLUCOSE RECORD**

Apply Patient Label

Office Phone: (602) 933-0618 Fax: (602) 933-2471  
 Email: [diabeteslog@phoenixchildrens.com](mailto:diabeteslog@phoenixchildrens.com)

**E= exercise** (please indicate duration of activity i.e. E- 30 min)      **K= ketones checked** (please indicate result: N- negative, T-trace, S-small, M-moderate, L-large)

Date	12AM	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM
Blood Sugar																								
Carb Intake																								
Carb Dose																								
High Blood Sugar Dose																								
Total Dose																								
Levemir or Lantus Dose																								

Date	12AM	1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM
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Blood Sugar																								
Carb Intake																								
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High Blood Sugar Dose																								
Total Dose																								
Levemir or Lantus Dose																								

Patient Name: \_\_\_\_\_ DOB: \_\_\_\_\_ MR# \_\_\_\_\_ Date: \_\_\_\_\_

Contact person: \_\_\_\_\_ Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

# Insulin Math Worksheet

Here is a worksheet to practice using the Insulin Sensitivity Factor (ISF) and Carb Ratio (CR) together in real life situations.

**Current Insulin Sensitivity Factor** \_\_\_\_\_ **Current Carb Ratio** \_\_\_\_\_

## **1** Part One: Correcting High Blood Sugars

Current blood sugar (**use only if above target**): \_\_\_\_\_ mg/dL  
Top of Target blood sugar this time of the day: - \_\_\_\_\_ mg/dL  
Difference between the two: = \_\_\_\_\_ mg/dL  
My **Insulin Sensitivity Factor** number: ÷ \_\_\_\_\_ (point drop)  
Units of fast acting insulin to correct a high: = \_\_\_\_\_ **units**

## **2** Part Two: Covering Carbs

Total carb amount in meal or snack: \_\_\_\_\_ grams of carb  
My **Carb Ratio** number: ÷ \_\_\_\_\_ (carb coverage)  
Units of fast acting insulin to cover the carbs: = \_\_\_\_\_ **units**

## **3** Part Three: Add Both Insulin Amounts Together

Units of fast acting insulin to correct for a high: \_\_\_\_\_ units  
Units of fast acting insulin to cover the carbs: + \_\_\_\_\_ units  
Fast acting insulin for correcting and covering: = \_\_\_\_\_ **units**

## **4** Part Four: Round to the nearest half or whole unit

If the number ends with .0 to .2 → Round down to a whole number  
For example, **1.2** becomes **1.0**

If the number ends with .3 to .7 → Round to the middle  
For example, **1.6** becomes **1.5**

If the number ends with .8 to .9 → Round up to a whole number  
For example, **1.8** becomes **2.0**

**Fast acting insulin to take in 1 injection:** = \_\_\_\_\_ **units**