

## Your Diabetes Team

Ask your diabetes team members to print their names and phone numbers on the list below.  
Keep the chart in a handy place, such as on your refrigerator door.

**Children’s Healthcare of Atlanta at Egleston: 404-785-6000**

**Children’s Healthcare of Atlanta at Hughes Spalding: 404-785-9500**

**Children’s Healthcare of Atlanta at Scottish Rite: 404-785-5252**

Endocrinologist (diabetes doctor): \_\_\_\_\_

Diabetes Educator: \_\_\_\_\_

Dietitian: \_\_\_\_\_

Physical Therapist: \_\_\_\_\_

Social Worker: \_\_\_\_\_

Other: \_\_\_\_\_

**Call 911 or go to the nearest Emergency department right away in case of an urgent concern or emergency.**

This is general information and not specific medical advice for your child. Always consult your doctor or other healthcare provider if you have any questions or concerns.

## Caring for Diabetes

This handbook contains general guidelines about diabetes care. It is not meant to be a complete source of information, but hopefully it will answer some of your questions about caring for your diabetes. Your doctor is the best source of information about your treatment and care.

The handbook can help you learn:

- How to measure your blood sugar.
- How to manage your medicines.
- How to eat well, be active and stay healthy.
- What to do for certain problems.

Having diabetes can be scary at first, but you are not alone. The Children’s Healthcare of Atlanta diabetes team can help you and your family learn how to take care of your diabetes. It is a lifelong condition that can be managed.

Diabetes will change some things about the way you live. Having diabetes can seem like a lot to handle. You will learn to do many new things, like testing your blood sugar and taking medicines. Before long, these new skills will become part of your everyday life.

This handbook was written for you, but your family also will be using it as they learn about diabetes. For easy reading, it was written using the generic terms “he” or “him.” Words in italics are found in the Glossary on page 91.

- If you are a teenager, you can learn to do most your care yourself, but your parents will still stay involved to support you.
- If you are younger, your parents will do most of your care until you are old enough.

You, your family and our diabetes team will work together to make sure you have the knowledge and skills needed to stay as healthy as possible.

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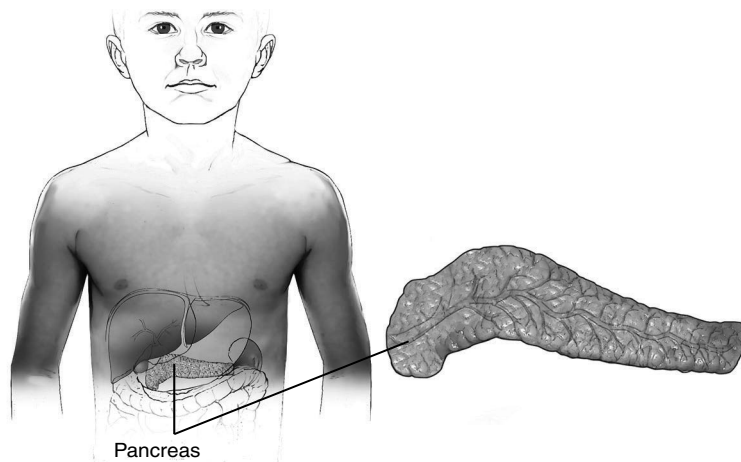
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## What is Diabetes?

Your body gets energy from the food you eat. Sugar—also called *glucose*—is your body’s main source of energy. After your stomach digests food, sugar travels to your body’s cells through the blood. Your cells change sugar to energy. Having *diabetes* means your body cannot use sugar like it should.

- For your body to use sugar the right way, it needs a hormone called *insulin*.
- Insulin is a hormone made in your *pancreas* by special cells called *beta cells*. The pancreas is an organ near the stomach.

### Where Insulin is Made



- Insulin acts like a key. It opens your body’s cells to allow sugar from the food you eat to be used as energy.
- Without enough insulin, sugar stays in your blood instead of moving into the cells. This causes high blood sugar, also called *hyperglycemia*. Hyper means “high” and glycemia means “glucose in the blood.”

Diabetes can occur when the body does not make insulin. Or, it can occur when your body makes insulin, but cannot use the insulin the way it should.

Doctors do not know exactly what causes diabetes. It is not contagious. This means you cannot catch it from someone else. It also means no one can catch it from you. What doctors do know is that there are 2 main types of diabetes—Type 1 and Type 2.

### TYPE 1 DIABETES

This type of diabetes happens when your body does not make insulin. This means you have to take insulin through shots or an insulin pump.

- About 1 in 10 (10 percent) of all people with diabetes have Type 1.
- This type of diabetes usually occurs in children and young adults.
- There often is no family history of diabetes.
- It is caused by an *autoimmune* (self-allergy) reaction to the beta cells that make insulin.

## TYPE 2 DIABETES

This type of diabetes happens when your body cannot use the insulin it makes or when your body does not make enough insulin. You may have to take insulin or another type of medicine.

Some of the medicines used to treat diabetes help your body use insulin better. Other medicines help your body make more insulin.

- About 9 in 10 (90 percent) of all people with diabetes have Type 2.
- This type of diabetes occurs in people of all ages.
- Things that can put someone at risk for Type 2 diabetes include:
  - Having a family history of diabetes.
  - Being overweight and physically inactive.
  - Certain race and ethnic backgrounds.
  - If your mother had diabetes when she was pregnant with you.
  - Being insulin resistant. One sign of this can be if you have thick, darkened skin on the neck or armpit area, called *acanthosis nigricans*.

## SIGNS OF DIABETES

Signs of diabetes occur because the body lacks insulin. This causes blood sugar to build up in the blood, leading to these signs:

- **Passing extra urine:** When your body does not have enough insulin to move sugar into your cells, it stays in your blood. This causes high blood sugar. Your body gets rid of the extra blood sugar by passing it out of the body through urine.
- **Drinking a lot:** When your body loses fluid through urine, you may get dehydrated (dried out) and be thirsty.
- **Eating a lot:** When sugar cannot get into the cells, your body does not get energy. Your body asks for more food to make energy. This might cause you to be more hungry than usual.
- **Energy loss:** Less sugar in your body's cells means less energy. This may cause you to feel tired all the time and not want to run and play like usual.
- **Weight loss:** Without enough insulin, your body looks for other sources of energy. As your body uses fat for energy, you lose fat and you can lose weight too. When you get dehydrated from passing extra urine, you also can lose weight from fluid loss.

# Managing Diabetes

There is no cure for diabetes, but you can learn to manage and control it, instead of it controlling you. Managing your diabetes can help you stay healthy and feel well.

**The key to managing diabetes is learning to keep your blood sugar at a certain level, called your target blood sugar range.** Your doctor will decide on a range that is safe and healthy for you. Your target blood sugar range may be different from someone else you know with diabetes.

You will find that many things affect your blood sugar:

Food—raises blood sugar level
Exercise—lowers blood sugar level
Insulin and diabetes medicines—lower blood sugar level
Hormones and stress—raise blood sugar level

Your doctor and diabetes team will help you learn to balance these things by teaching you to:

## Check your blood sugar

- You will learn to check your blood sugar with a home monitor (called monitoring).
- You will learn how often and when to check your blood sugar.
- You also will learn what to do if your blood sugar is below or above your target range.

## Test for *ketones*

- You will learn how and when to test your urine or blood for ketones. Ketones can make someone with diabetes very sick.

## Take medicine

- This may mean taking insulin injections (shots) or diabetes medicines by mouth (pills).

## Manage the food that you eat

- Eating the right foods— You will learn to balance the food you eat with either insulin or other diabetes medicines. Since food raises your blood sugar level, the more food you eat, the more insulin you need.

## Manage your body

- Exercising—Regular exercise each day helps your body use sugar and can lower your blood sugar level.
- Managing stress—Stress can raise your blood sugar level. Learning to deal with and accept stress in a healthy way can help. Exercising and talking to your family or a counselor can help you control stress.
- Getting plenty of sleep—Sleep refreshes your body and mind. You need a certain amount of rest and sleep to be healthy.

**Manage your appointments**

- Visit your *endocrinologist* and work with your diabetes team —Regular diabetes checkups are important. Your doctor can also help you when you are ill.

If you just found out that you have Type 1 diabetes and you take insulin, there is a chance that you have some beta cells that still work. These cells might start making more insulin, which can make your blood sugar levels normal for awhile. You may need to reduce the amount of insulin you take during this time.

This common phase is called the *honeymoon phase* because it only lasts for a short time. After awhile, the beta cells will stop making insulin and you will need to take all of your insulin through injections again.



# Home Monitoring

## BLOOD SUGAR MONITORING

Measuring your blood sugar with a home monitor—also called a meter—is key to managing your diabetes. Blood sugar levels change during the day and night. Your levels depend on what you eat, how much insulin or medicine you have, and other things such as exercise, stress, illness and growth.

- Each time you test your blood sugar level, the meter tells you how your body reacted to those things.
- Your blood sugar level guides your treatment, like how much insulin you should take.
- The level lets you know what you need to do next.
- You will learn to use your blood sugar level to adjust your insulin or medicine and your diet and activity. This helps you to meet your blood sugar target range.

There are many different types of blood sugar meters. Your diabetes team will help you pick one that meets your needs. They also will train you how to use it. If you go to school, you will need 2 meters—one for home and one for school. Your doctor and diabetes team can make plans to get you both.

Using a blood sugar meter involves testing a drop of blood from your finger. To do this, follow the guidelines below.

### Get ready

- Wash your hands with soap and warm water. Dry your hands well. Damp hands can affect your blood sugar reading.
- To help increase the blood flow to your fingers and make it easier to get a drop of blood:
  - Warm your hands by rubbing them together.
  - Hang your hand down at your side for 1-2 minutes.
- Avoid using rubbing alcohol to clean your fingers. It can dry out the skin on your fingertips.

### Check the meter

Turn the meter on and place a test strip in it. Check the code on the screen. It needs to match the code on the bottle of strips. If it does not match, you will get an error in the reading.

### Test your blood

- Use a lancet to prick your finger and draw a drop of blood. Sometimes it hurts less if you use the side of your finger.
  - How you use the test strips depends on the type of meter and strips that you have. The test strip will “sip” the blood up when you touch the edge of the strip to the drop of blood.
  - Be sure you get the right amount. Not putting enough blood on a strip can cause an incorrect reading.
- Read the results.

### When you are done

- Record your blood sugar level in your log book.
- Check with your city or trash removal company about how to dispose of your syringes and needles. You also might call your local health department.
- Do not recycle syringes and needles.
- Put the lancets you use for finger pricking in the same kind of plastic container as syringes.
- Check with your school about how to dispose of syringes and needles while there.

**Tips to help you get correct results:**

- Keep your meter and strips in a clean, dry place. Keep the strips tightly closed and away from heat, steam and light.
- Test a strip with control solution each time you open a new box. This makes sure the strips are good to use. Test your strips or meter any time you need to make sure they are correct.
- Match the code number on the meter with the code number on the test strip bottle if needed.
- Check the date and time in your meter to be sure it is correct. This allows you to record your blood sugar readings using the memory function.
- Get enough blood on the test strip.
- Wash your hands and dry well before checking your blood sugar.
- Keep a record of your blood sugar levels for you and your doctor to check.

## KETONE TESTING

When there is not enough insulin to move sugar into the cells, your body looks for other forms of fuel to use as energy. It uses fat as a fuel source.

- As fats break down, acids called ketones build up in your blood and urine.
- Ketones in the blood and urine are a sign that diabetes is out of balance.
- This can happen if you are sick or if you do not get enough insulin.
- It often happens when someone first finds out he has diabetes.

Signs that you might have ketones include:

- Dry mouth and skin
- Increased thirst
- Passing extra urine
- Nausea and vomiting
- Stomach cramps or pain
- Sweet, fruity odor on the breath
- Feeling weak or sleepy
- Breathing hard and deep

Ketones can make someone with diabetes very sick. Excess ketones can lead to a condition called *ketoacidosis*. It is important to test for ketones when:

- Your blood sugar level is more than 300 *mg/dL* or as advised by your doctor.
- You feel sick, especially if you vomit or have an upset stomach.
- Your blood sugar levels have been high for 2 - 3 days and do not come down after taking insulin.

There are 2 ways to test for ketones—either a urine test using a ketone test strip or a blood test.

To check for urine ketones:

1. Dip a ketone test strip in a urine sample. Cover the colored test pad on the end of the strip.
2. Wait 15 seconds after dipping the strip or as the label on the bottle directs. Be sure to wait the right amount of time to get a correct reading.
3. Compare the color on the test pad to the color guide on the label.
4. Ketone levels can be trace, small, moderate or large. **Always call your doctor if you have moderate or large ketone levels.**
5. Wash your hands well when you are done.

To check for blood ketones:

Some blood sugar meters measure both blood sugar and blood ketones. However the blood sugar test strips cannot be used to test for blood ketones. A special type of ketone test strip needs to be purchased.

To use it:

- Put a drop of blood on a blood ketone strip.
- While the strip is in the meter, read the results.

Your diabetes team can tell you how to read the results on this meter.

You can find more information about ketone testing and ketoacidosis in the resource section of this book on page 3.

### **Hemoglobin A1C Test**

*A Hemoglobin A1C test* is a blood test that is part of your regular checkup at the doctor's office. It tells what your average daily blood sugar level has been during the past 2 to 3 months.

- An A1C gives you the “big picture” of your blood sugar control. Your home blood sugar tests give you a snapshot of a single moment.
- Your A1C helps you, your doctor and your diabetes team know how well your diabetes is managed. It also tells them if they need to adjust your treatment.
- Research has shown that keeping your hemoglobin A1C at healthy levels can help prevent or delay the long-term problems of diabetes.
  - Your doctor will tell you what A1C test range is right for you.
  - You can learn more about A1C and preventing complications later in the section labeled “Health Concerns” on page 61.

# Taking Insulin

Millions of people with diabetes take insulin each day, either by shots or through an insulin pump. You cannot take insulin by mouth. This is because insulin is a type of protein that it is destroyed during digestion.

There are many types of insulin. The chart below lists some common types. It is only a general guide.

- Many things affect how insulin works and how long it lasts.
- This includes your own body’s response, the time of day, exercise, stress, illness and what you eat.
- Your doctor will tell you what kind of insulin to take and when to take it.
- The type of insulin you use may change as you grow older and your body changes.

Type of insulin	When it starts working	When it works the hardest	How long it lasts	When to take it
<b>Rapid-acting</b>				
Humalog, Novolog and Apidra	5 to 15 minutes	1 to 2 hours	2 to 5 hours	Right before eating
<b>Short-acting</b>				
Regular	30 to 60 minutes	2 to 4 hours	6 to 8 hours	30 minutes before eating
<b>Intermediate-acting</b>				
NPH	1 to 2 hours	4 to 8 hours	10 to 20 hours	Varies. Take it at the same time each day
<b>Mixed insulin (Intermediate- and Rapid-acting)</b>				
Novolog 70/30 Humalog 75/25	5 to 15 minutes	1-6 hours	10 to 20 hours	Right before eating. Take it at the same time each day
<b>Long-acting</b>				
Lantus, Levemir	1 to 2 hours	No peak	Up to 24 hours	Varies. Take it at the same time each day

**Rapid-acting insulin (Novolog, Humalog, Apidra)** is taken with meals and some snacks.

- This type of insulin works best if you take it right before eating. You can take up to 10 minutes before a meal or with the first bite of food.
- Small children and picky eaters might have to take this insulin within 15-30 minutes of the first bite of food. They can also take it right after the meal.
- If you are carbohydrate counting or using an insulin pump, your doctor may refer to this insulin as your *bolus* insulin.

**Short-acting insulin (Regular)** is taken 30 minutes before you eat.

**Intermediate-acting and long-acting insulins (NPH, Levemir, Lantus)** work between meals. Take these types of insulin at the same time each day. You may notice your doctor refer to Lantus and Levemir as your *basal* insulin.

**Mixed insulin** contains both rapid-acting and long-acting insulin. Because it contains rapid-acting insulin, you need to eat right away.

- You usually take this insulin 2 times a day.
- This type of insulin is cloudy. You must gently roll the bottle between your hands to mix the insulin before you take it.

These guidelines can change if **your blood sugar is too low**.

- If it is too low, you may need to eat some fast-acting carbohydrates first.
- Once you are sure your blood sugar level is high enough, take your insulin.

#### **STORING INSULIN**

Insulin will not work if it is not stored properly. It is usually good for 28 to 30 days after you open the bottle as long as it is stored properly. (42 days for Levemir)

- Always check the expiration date on the vial before you use it. Throw it away if it is expired.
- Write the date that you open it on the bottle. Use it to remind you of when to throw it away.
- Store the insulin the way the manufacturer's instructions tell you to or as advised by your doctor.

Ask your diabetes team about the storage rules for insulin pumps and pens.

Here are some other tips for properly storing insulin:

- Insulin will spoil if it gets too hot or too cold. Keep it between 36°F to 86°F.
- Keep insulin in the refrigerator until you are ready to open it. For best results, keep it in an area where it will not freeze or have big changes in temperatures.
- Keep opened bottles of insulin at room temperature. This will feel better when you inject it.
- Keep it away from an area that gets very hot like a kitchen stove or humid like the bathroom.
- Never leave insulin in a car, especially in the summer. It can get too warm and spoil.
- Store your insulin in a cooler or a travel case with a cool pack in it if you plan on being in a hot place like the beach for several hours.

Always make sure your insulin is not spoiled before you use it.

- Mixed insulin or cloudy insulin like NPH clumps and sticks to the bottle when it goes bad.
- Clear insulin is cloudy or discolored when spoiled.
- Throw away any spoiled or outdated insulin.

### **ABOUT SYRINGES**

Insulin is measured in units. The most common type of insulin made in the United States is U-100. This means there are 100 units of insulin per milliliter (mL). Milliliters are units of measurement.

The type of syringe you use should match your insulin. For example, give U-100 insulin with a U-100 syringe.

Tips for using a syringe:

- Use a syringe 1 time only. Using a syringe again can cause infection. A needle also becomes dull after using it more than 1 time.
- Never share used syringes with another person.

## **DRAWING UP INSULIN**

Learning to draw up insulin takes practice. Your nurse will help you learn how. Ask questions and ask for help when you need it. Follow the steps below to prepare your injection.

### **How to Draw up Insulin**

#### **Getting ready**

1. Place your insulin and supplies on a clean, flat surface.
2. Wash your hands well with soap and water.
3. Check the label to make sure the insulin has not spoiled, expired or been opened longer than 30 days.

#### **Draw up the insulin**

4. Clean the top of the insulin bottle with an alcohol swab. Let it dry. Do not touch the clean top while you get ready to give a shot. This helps prevent germs from getting on the needle or from being pushed down into the insulin.
5. Remove the cap from the needle. Pull back the syringe plunger to the number of units of insulin you need to take. You will pull air back into the syringe as you do this.
6. Push the needle through the rubber top of the insulin bottle while it sits on the flat surface. Push the plunger all the way down to push the air in the syringe into the bottle. This step makes it easier to draw out the insulin.
7. Keep the needle in the bottle of insulin and turn the bottle upside down. Draw up the dose of insulin you need.
8. To remove air bubbles:
  - Push all the insulin back into the bottle and draw up the dose again.
  - Or try tapping the top of the syringe to make the bubbles rise to the top. Then push the bubbles back into the bottle. If needed, pull back on the plunger until you have the correct amount of insulin in the syringe.
9. Remove the needle from the bottle once you have the dose of insulin you need. Put the cap on the needle if you do not give yourself the insulin right away.

#### **A note about air bubbles**

If you have a lot of air bubbles in your syringe, they take the place of insulin. This means that you will not get all the insulin you need. Other than being short on your insulin dose, having air bubbles in the syringe will not harm you.



### How to Draw Up and Mix Clear and Cloudy Insulin

Only mix 2 types of insulin together if your doctor tells you to do this. An example of 2 insulins that can be mixed together are NPH insulin with Humalog or NovoLog. **Note: Never mix Lantus or Levemir with another kind of insulin.**

1. Place your insulin and supplies on a clean, flat surface.
2. Wash your hands well with soap and water.
3. Check the label to make sure the insulin has not spoiled, expired or been opened longer than 30 days.

#### First, add air to the cloudy insulin vial

4. Gently roll the bottle of **cloudy** insulin between your hands. The insulin is mixed when it looks cloudy all the way through the bottle. Do not shake the bottle to mix it as this will make air bubbles.
5. Clean the tops of both the **cloudy** and clear insulin bottles with alcohol. Let them dry.
6. Remove the cap from the needle. Pull back the syringe plunger to the number of units of **cloudy** insulin you need to take. You will pull air back into the syringe as you do this.
7. Push the needle through the rubber top of the **cloudy** insulin bottle while it is sitting on the flat surface. Push the plunger all the way down. This pushes the air in the syringe into the bottle. This step makes it easier to draw out the insulin.
8. Pull the needle out of the **cloudy** insulin bottle without any insulin in it.

#### Next, draw up the clear insulin

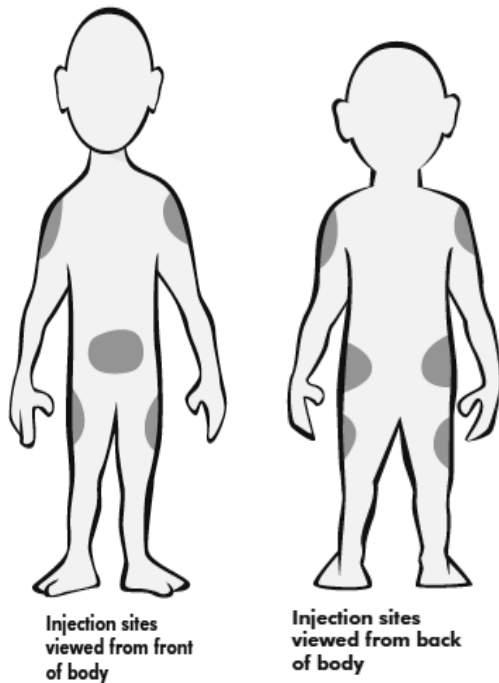
9. With the **clear** insulin bottle, repeat Steps 6 and 7. Draw up air equal to the amount of **clear** insulin you need. Do not pull the needle out of the bottle.
10. Keep the needle in the bottle of **clear** insulin and turn the bottle upside down. Draw up the dose of insulin you need.
11. To remove air bubbles:
  - Push all the insulin back into the bottle and draw up the dose again.
  - Or try tapping the top of the syringe to make the bubbles rise to the top. Then push the bubbles back into the bottle. Pull back on the plunger until you have the correct amount of insulin in the syringe, if needed. Remove the syringe from the clear insulin bottle.

#### Now, draw up the cloudy insulin

12. Push the needle back through the rubber top of the **cloudy** insulin bottle while it sits on a flat surface.
13. Keep the needle in the bottle of **cloudy** insulin and turn the bottle upside down. Draw up the dose of insulin you need. For example: your insulin dose is 5 units of rapid acting (clear) insulin, and your cloudy dose is 20 units. When you are finished, your syringe will have 25 units of insulin ( $5 + 20 = 25$ ). At this point, if you pull up too much **cloudy** insulin into the syringe, throw the syringe and insulin away and start over.
14. Remove the needle from the bottle once you have the dose of **cloudy** insulin you need.
15. Put the cap back on the needle if you do not give yourself the insulin right away.

## HOW TO INJECT INSULIN

Give yourself your insulin shot in a place where you have at least a half inch of fat under the skin. The main areas are the stomach, buttocks, outer thigh and the back of the upper arm. (See pictures below.)



A few tips to help protect your skin include:

- Inject insulin at least 2 inches away from your belly button.
- Do not give shots near moles or scars.
- Do not give a shot in the stomach to small and very thin children who do not have a half inch layer of fat.
- Choose 2 different places for each shot when taking 2 shots at one time.
- Change the site where you give the shots each time. Rotate places within each site. If not, your body might make scar tissue, or lumps, under the skin. The scarring can keep insulin from being absorbed well.
- Make up a chart or a simple system to keep track of the different places you use. For instance, you may want to use your right arm for breakfast insulin, your left arm for lunch insulin, stomach for dinner and buttock for bedtime.

Just like drawing up insulin, injecting insulin takes practice. If you are afraid of this step, ask your doctor or nurse for help.

**Note to Parents:** Never force a young child or a child who is afraid to give themselves shots. An adult—like a parent—needs to help until the child is old enough and emotionally ready. Even an independent teen needs help giving a shot sometimes.

To give an insulin shot:

1. Clean your skin with an alcohol swab. Let it dry before giving the shot. This helps prevent stinging.
2. Pick up the syringe like you would hold a pencil. Take off the needle cap.
3. Use your other hand to gently pinch the cleaned area into a 3-inch fold. Do not squeeze the skin hard or you might squeeze out the insulin.
  - Insert the needle into your skin at a 90-degree angle if you are using a **short needle**.
  - Insert the needle into your skin at a 45-degree angle if you are using a **long needle**. This makes sure that you inject the insulin into fat instead of muscle. Going into muscle will hurt and can cause insulin to be absorbed more quickly. This can lead to low blood sugar.
4. Push the plunger down until all of the insulin is gone from the syringe. **Wait 10 seconds**, then pull needle out.
  - Holding the needle in keeps the insulin from leaking out when you remove the needle.
  - Do not take any more insulin if any of it leaks out. Just make a note in your insulin and blood sugar log. Leaked insulin can cause higher blood sugar readings. If this continues to happen, tell your doctor.
  - **Do not rub the injection site. This can cause the insulin to be absorbed too fast.**
5. If you bleed, it may be because you broke a small blood vessel with the needle. Use a tissue to gently press down on your skin.

### Injecting insulin into fat tissue



## Sharp Disposal Tips

1. Do not put the cap back on a used needle—this can cause you to stick yourself.

**If you accidentally stick yourself with another person’s needle, you will need to have a blood test. Let your doctor know right away if this happens. This helps to keep you safe.**

2. Put the used syringe and needle in a hard plastic container that has a screw-on lid, like a bleach bottle.
  - Check with your city or trash removal company about how to dispose of your syringes and needles. You also might call your local health department.
  - Do not recycle syringes and needles.
  - Put the lancets you use for finger pricking in the same kind of plastic container as syringes.
  - Check with your school about how to dispose of syringes and needles while there.

## HOW THE BODY ABSORBS INSULIN

How fast the body absorbs insulin depends on where you inject it. It is absorbed more quickly from the stomach area than any other spot. Some things can increase how fast insulin is absorbed. This is due to the increased blood flow to the area. They include:

- Taking a hot bath or shower.
- Rubbing an injection site.
- Exercising the body part where you just injected the insulin. This could happen if you gave yourself insulin shot in the upper arm or in the leg and then played tennis right away.

## SOME TOOLS TO HELP YOU

There are tools that can help you inject insulin. Always check with your diabetes team before using them.

- **Magnifying tool**—This can help if you cannot see the lines on a syringe when you draw up insulin.
- **Insulin pen**—This looks like a big writing pen. The pen combines an insulin bottle and a needle into one tool. When you are on the go, an insulin pen can be faster and easier than using a bottle and syringe.
- **Insulin pump**—A pump is a small battery-operated tool about the size of a cell phone. It has a pump reservoir (like a regular syringe) to hold insulin and a computer chip. The chip allows you to control exactly how much insulin the pump gives you.
- **Automatic injectors**—This tool helps push a needle through the skin. People who are afraid of needles can use them.

## Other Diabetes Medications

Medicines are normally used to manage type 2 diabetes in adults. Most of these medicines do not work for people with type 1 diabetes. Like insulin, your doctor must order these medicines.

Each diabetes medicine lowers blood sugar in a different way.

- When you take your medicine, take it the same way each day.
- Some medicines work well for one person but not for someone else.
- You may take only one of these medicines or you may take more than one.
- Some people may take these medicines with insulin and some do not.

Below are some of the medicines your doctor might order for you:

Brand Name	Generic Name	How it works	How to take it	Special notes
Glucophage Glucophage XR	Metformin Metformin	<ul style="list-style-type: none"> <li>• Slows down the release of sugar from the liver.</li> <li>• Helps muscles use insulin better.</li> <li>• Often used for children who are resistant to insulin. This means that their body cannot use insulin in the right way.</li> </ul>	By mouth (oral)	<ul style="list-style-type: none"> <li>• Does not cause low blood sugar unless you skip meals.</li> <li>• Take with food to avoid stomach pain or diarrhea.</li> <li>• Stop taking it if you vomit and call your doctor.</li> <li>• Do not take if you are scheduled for a medical test and were told not to eat.</li> </ul>
Micronase Diabeta Glucotrol Amaryl	Glyburide Glyburide Glipizide Glimepiride	<ul style="list-style-type: none"> <li>• Increases the release of insulin from the pancreas.</li> </ul>	Oral	<ul style="list-style-type: none"> <li>• May cause low blood sugar.</li> </ul>
Prandin Starlix	Repaglinide Nateglinide	<ul style="list-style-type: none"> <li>• Increases the release of insulin from the pancreas.</li> </ul>	Oral	<ul style="list-style-type: none"> <li>• May cause low blood sugar.</li> </ul>
Precose Glyset	Acarbose Miglitol	<ul style="list-style-type: none"> <li>• Slows the digestion of carbs after a meal.</li> <li>• Slows down how quickly glucose is absorbed.</li> </ul>	Oral	<ul style="list-style-type: none"> <li>• Does not cause low blood sugar.</li> </ul>
Avandia Actos	Rosiglitazone Pioglitazone	<ul style="list-style-type: none"> <li>• Makes the body more sensitive to insulin.</li> <li>• Decreases the release of sugar from the liver.</li> </ul>	Oral	<ul style="list-style-type: none"> <li>• Does not cause low blood sugar.</li> </ul>
Januvia	Sitagliptin	<ul style="list-style-type: none"> <li>• Helps the pancreas continue to make insulin by blocking an enzyme.</li> </ul>	Oral	<ul style="list-style-type: none"> <li>• May cause low blood sugar.</li> </ul>
Byetta Victoza	Exenatide Liraglutide	<ul style="list-style-type: none"> <li>• Helps the pancreas make insulin.</li> <li>• Slows digestion.</li> </ul>	Injection	<ul style="list-style-type: none"> <li>• May cause low blood sugar.</li> </ul>
Symlin	Pramlintide	<ul style="list-style-type: none"> <li>• Slows digestion.</li> <li>• Slows down the release of sugar from the liver.</li> <li>• Helps control appetite.</li> </ul>	Injection	<ul style="list-style-type: none"> <li>• May cause low blood sugar.</li> <li>• Your doctor may need to lower your insulin dose before you take it.</li> </ul>

**SIDE EFFECTS**

Like most medicines, these drugs can cause side effects. Side effects are the unwanted effects of medicines. Some common side effects of diabetes medicines include:

- Upset stomach
- Vomiting
- Diarrhea
- Loss of appetite
- Weight gain
- Headache
- Muscle aches
- Flu or cold symptoms

Tell your doctor if you have any of these side effects.

# Nutrition and Diabetes

When you have diabetes, you need a healthy diet. This means that you must eat foods that contain many kinds of nutrients. Nutrients are the parts of food that nourish the body. Nutrients can help:

- Your body to grow strong and stay healthy
- Provide fuel for exercise
- Prevent heart disease, high blood pressure and obesity

The current guidelines for a healthy diet include eating foods from all of the groups listed below each day:

- Breads and grains
- Vegetables
- Fruits
- Milk
- Meats and beans



Healthy eating also means that you eat a balance of foods and nutrients. When you eat, balance your plate with:

- 1 part starch or grain
- 1 part lean meat, poultry or fish
- 1 part non-starchy vegetables or salad
- 1 part fruit
- 1 part dairy

A balanced plate will provide:

- Carbohydrates
- Protein
- Fats
- Fiber
- Vitamins
- Minerals

Three nutrients give us calories – the fuel our body needs to run on - carbohydrates, protein, and fat. Let's learn more about them.

Study this table and learn about the nutrients in your favorite foods. This will help make it easier to follow your diabetes plan.

### Energy Nutrients and Food Lists

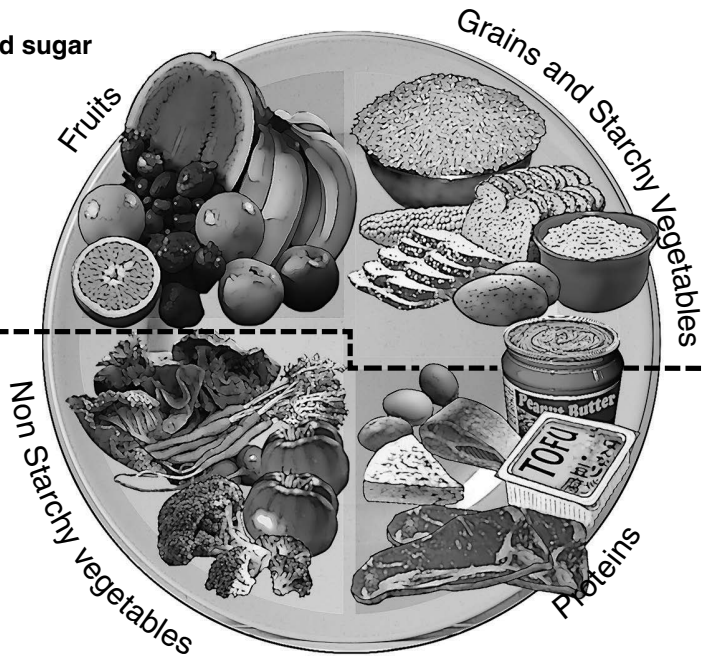
<u>Carbohydrate Group</u>	<u>Protein Group (Meat and Meat Substitutes)</u>	<u>Fat Group</u>
<b><u>Starch</u></b>	Chicken	Avocado
Bread, Tortilla	Turkey	Bacon
Pasta, Pancake, Biscuit	Beef	Butter
Cereals (hot and cold)	Pork	Coconut, Coconut Milk
Grains (rice, wheat, oats, corn barley, rye)	Hot dogs	Cream (heavy, light, whipped, half and half)
Beans (pinto, black, lima)	Fish	Cream cheese
Peas, Lentils	Shellfish	Lard
<b><u>Starchy vegetables</u></b>	Game	Margarine
Potatoes, sweet green peas	Eggs	Mayonnaise
Winter squash	Cheese	Nuts
<b><u>Crackers and snacks</u></b>	Peanut Butter (2 tablespoons)	Oil
Chips, popcorn		Salad dressing
Pretzels, Crackers		Seeds
<b><u>Fruits</u></b>		Shortening
Fresh or canned		Sour cream
Fruit juice		Salt pork
<b><u>Milk</u></b>		Peanut butter (1 ½ teaspoons)
Fat free, 1% Low-fat		
2% Reduced-fat, Whole		
Yogurt, Ice cream		
Combination Foods		
Soup, Chicken nuggets		
Frozen dinners		
Pizza, Lasagna		
Macaroni and cheese		
Casseroles, Burrito		
Pocket sandwich		
<b><u>Sweets and Desserts</u></b>		
Candy		
Cakes, Cookies, Pies		
Doughnuts		
<b><u>Other Carbohydrates</u></b>		
Sugar, Honey,		
Pancake syrup		
Sports drinks		
Soft drinks		
Peanut butter (3 or more tablespoons)		
<b><u>Nonstarchy Vegetables: see Food List</u></b>		



## How different foods affect blood sugar

### Foods that raise blood sugar

Fruits  
Starch and grains  
Milk and yogurt  
Sweets



Lowfat milk and yogurt

### Foods that do not raise blood sugar

Non-starchy vegetables  
Meats and proteins (cheese, soy, eggs)  
Fats and oils



Oils and Fats

## **CARBOHYDRATES**

### **What are carbohydrates?**

Carbohydrates are also called carbs, starch and sugar. Carbs help your body because they:

- Help you grow.
- Give you energy.
- Contain other nutrients your body needs like vitamins, minerals and fiber.

### **High Carb Foods**

- Starches – bread, cereal, crackers, grains, rice, pasta
- Starchy vegetables – potatoes, corn, peas, beans
- All fruits and fruit juices
- Milk and yogurt
- Sugary foods – candy, regular sodas, jelly, syrup
- Sweets – cakes, cookies, pies, ice cream

### **How Carbs Affect Blood Sugar**

Carbs raise your blood sugar more than any other nutrient. When your body digests carbs, they turn into glucose or blood sugar. Your body needs insulin to use the carbs you eat. Your carb goals depend on:

- The insulin you use
- Your body weight
- How active you are

Your diabetes team will work with you to create a meal plan that works best for you.

To control your diabetes and stay healthy, you will need to limit how often you eat high-sugar foods or drinks.

Sugary foods are:

- Low in other nutrients
- High in calories due to the high carb grams
- May cause you to gain weight from the extra calories

## **SWEETENERS**

You do not have to eat special dietetic or sugar-free foods. Sugar-free does not always mean carb-free. Many of these foods:

- Cost more than the regular versions.
- Contain carbs from natural sugars, sugar alcohols or both.

### **Sweeteners with Calories and Carbs**

#### **Natural Sweeteners**

- Contain carb grams and calories.
- Provide the same amount of calories as table sugar.
- Can raise your blood sugar like table sugar.
- A few natural sweeteners include:
  - Sucrose - table sugar, brown sugar, raw sugar, cane juice (Found in sugar cane, corn and beets)
  - Fructose - fruits, fruit juice concentrate
    - Found in fruits and honey
  - Honey
  - Lactose
    - Found in cow's milk, human milk
  - Agave nectar
  - Maple syrup, pancake syrup
  - Molasses
  - Corn syrup, high fructose corn syrup
  - Brown rice syrup
  - Dextrose, maltose

#### **Sugar Alcohols (Polyols)**

- Usual names - erythriol, isomalt, lactitol, maltitol, mannitol, sorbitol, xylitol.
- Lower in calories than sugar
- Found in sugar-free gum, candy, cookies and ice cream.
- Used in many foods advertised as “no sugar added” or “sugar free.” They may also be called “natural sweeteners”. They contain carbs.
- Eating too much of these sweeteners may cause diarrhea and stomach cramps.

#### **Blended products:**

- **Sun Crystals** – rebaudiana (Stevia) and sucrose
- **Skooz** - erythriol, xylitol, maltitol, rebaudiana (Stevia), maltodextrin
- **Truvia** - Erythriol, rebiana (Stevia)  
**Ideal** - Xylitol, dextrose, Sucralose

### **Sweeteners with Little or No Calories and Carbohydrates - Artificial Sweeteners and Sugar Substitutes**

Sugar substitutes

- Do not raise blood sugar in normal serving sizes.
- Contain little to no calories and carbs.
- Do not cause tooth decay.
- Found in thousands of food and drink products.
- Are 200 to 7,000 times sweeter than sugar.
- Limit children to no more than 2 sugar-free drinks a day, such as 1 Crystal Lite packet and 1 can diet soda.

<b>Name</b>	<b>Brand names</b>	<b>Heat stable for cooking and baking</b>	<b>Benefits</b>
Aspartame (Blue Packet)	Equal NutraSweet	No – loses sweetness	Long lasting flavor  Only 1 calorie per packet
Sucralose (Yellow Packet)	Splenda	Yes	Does not add calories or raise blood sugar
Saccharin (Pink Packet)	Sweet N’ Low Weight Watchers Sugar Twin	Yes	Does not add calories or raise blood sugar
Stevia (Green or Green and White Packet)	Stevia Truvia* (a blend) PureVia Sweetleaf	Yes	Does not add calories or raise blood sugar  Made from a plant
Acesulfame Potassium (Acesulfame K or Ace -K)	Sunett Sweet One	Yes	Does not add calories or raise blood sugar  Clean taste
Neotame	None	Yes	Does not add calories or raise blood sugar  Sweet long lasting taste

## PROTEIN

### What are proteins?

The body uses protein to grow and repair cells. It is sometimes used for energy.

### High Protein Foods Include Meats and Meat Substitutes

- Beef, pork, veal, lamb, sausage, hot dogs
- Chicken and turkey
- Fish and seafood
- Eggs
- Cheese
- Nuts, seeds and peanut butter

Eat mostly lean protein food such as chicken, turkey and fish.

- Many protein foods such as beef, bacon and sausage are also high in saturated fat.
- Eating too much saturated fat can cause weight gain or other health problems.

### How Protein Affects Your Blood Sugar

Protein foods do not have a large affect on your blood sugar. If protein foods are breaded, you have to count the carb grams.

See the list below to guide you:

Lean	Medium fat	High fat
Poultry: white meat Shellfish Cottage cheese Beef: round, loin, ground round Egg white / substitute	Poultry: dark meat w/skin Pork: top loin, chop, cutlet Fried fish Beef: ground beef, prime rib Egg	Peanut butter Pork-ribs, sausage Cheese: cheddar, American, Swiss Hot dog, bacon, bologna, salami

## FAT

### What is fat?

Fat is used for energy and other purposes. The 4 types of fat include:

- Monounsaturated
- Polyunsaturated
- Saturated
- Trans fats

### High Fat Foods

- Oils
- Butter, margarine, shortening, lard
- Salad dressing such as Ranch and Italian
- Nuts, seeds
- Mayonnaise
- Sour cream, cream cheese
- Bacon, sausage, bologna and some other meats
- Olives, avocados

### How Fat Affects Blood Sugar

Fat does not raise your blood sugar, but it can keep it high for a longer time.

- Fats have 2 times as many calories as carbohydrates and protein.
- Eating too much fat may lead to weight gain and other health problems such as heart disease and high blood pressure.

For better health, eat more “heart healthy” fats. These include monounsaturated and polyunsaturated fats.

Unhealthy fats include saturated and trans fats:

- Limit saturated fats
- Avoid trans fats

See the table below for a list of fats.

<b>MONO</b>	<b>POLY</b>	<b>SATURATED</b>	<b>TRANS</b>
Canola oil	Corn oil	Skin of poultry	Hydrogenated shortening
Olive oil	Soybean oil	Marbling in red meat	Baked desserts
Nuts	Sunflower oil	Fat in dairy foods	Hard margarines
Avocado	Omega-3 (fish)		Palm oil

## **FIBER**

### **What is fiber?**

Fiber is a carbohydrate in plant foods. Our body does not completely digest fiber. Foods that contain fiber provide volume and bulk and help keep you full. They also help to keep your intestines (the lower part of your digestive tract) healthy.

### **High Fiber Foods**

- Seeds and skins of fruits and vegetables
- Beans, peas
- Whole grains, breads and cereals made with whole grains
- Nuts and seeds

### **How Fiber Affects Blood Sugar**

Fiber affects blood sugar by slowing digestion. This slows the release of sugar into the blood. Fiber can help you better control your diabetes, cholesterol and weight.

### **Vitamins and Minerals**

Vitamins and minerals are found in foods that contain carbohydrates, proteins and fat. They help your body use food for better health. Vitamins and minerals are an important part of diabetes management. The best sources are unprocessed, whole foods such as whole grain cereals and breads, vegetables and fruits.





# Carbohydrate Counting

## COUNTING CARBOHYDRATE GRAMS

The amount of carbs you eat at meals and snacks will affect how high your blood sugar rises. You can help your blood sugar stay within your target range when you:

- Know the number of carb grams in food and drinks
- Manage the size of your portions

Carb counting will help you decide:

- What to eat
- How much to eat
- When to eat
- How much insulin to use

## Carbohydrate Counting Methods

To count carbs, you must know how much food you eat. The way to know this is to measure carb foods before eating. Use one of these methods to measure your food:

- Measuring cup
- Measuring spoon
- Food scale
- Helping Hand method

When you first start counting carbs, always use one of these methods to check your portion size.

- The portion you eat may be different from the serving size listed on the food package.
- The amount of insulin you use is based on the amount of carbs in the portion you eat.

With practice, you will learn how many carbs a food has without measuring.

### ½ cup size

- ½ cup is about the size of one cupped hand. This is the size of the palm of your hand without using the fingers.
- Use this portion size for fruit, potatoes, corn, peas and beans.

### 1 cup size

- 1 cup is about the size of your fist or 2 hands cupped together.
- Use this portion size for breakfast cereal, soup, salad, mixed dishes or 3 servings of cooked rice or pasta.

### Other sizes

- 1 snack serving is a cupped handful that is not too full.
- 1 bread choice is about the size of your open palm and half of your fingers.
- 1 serving of meat, fish and poultry is equal to the open palm of your hand.
- 1 tablespoon is about the size of two thumb tips together.

### There are two ways to count carb grams:

- The Food Label
- Carbohydrate/Food serving lists

## The Helping Hand method

Use this method to figure your serving sizes when eating out.

# PORTION SIZES

## WHEN YOU CAN'T MEASURE YOUR FOOD

### Your Helpful Hands...

The best way to find out how much of a food you are eating, or your portion size, is to use measuring cups, spoons or a scale. Sometimes, such as when you eat out, you can't do this. Here are a number of ways you can use your hands to help you find out about how much you are eating.\* The portion sizes in each food group use an adult *woman's* hand as a guide.



One fist clenched = 8 fluid ounces

- Cold and hot beverages



Two hands, cupped = 1 cup

- Breakfast cereal
- Soup
- Green salads (lettuce or spinach)
- Mixed dishes (chili, stew, macaroni and cheese)
- Chinese food



One hand, cupped = 1/2 cup

- Pasta, rice
- Hot cereal (oatmeal, farina)
- Fruit salad, berries, applesauce
- Tomato or spaghetti sauce
- Beans (cooked or canned)
- Cole slaw or potato salad
- Mashed potatoes
- Cottage cheese
- Pudding, gelatin



Palm of hand = 3 ounces

- Cooked meats (hamburger patty, chicken breast, fish fillet, pork loin)
- Canned fish (tuna, salmon)



Two thumbs together = 1 tablespoon

- Peanut butter
- Salad dressing
- Sour cream
- Dips
- Whipped topping
- Dessert sauces
- Margarine
- Cream cheese
- Mayonnaise

\*Adapted from MyPyramid.gov. This handout is only a guide. The amounts of foods in your meal plan may be different.

Provided as a FREE educational service on [www.learningaboutdiabetes.org](http://www.learningaboutdiabetes.org).  
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## READING FOOD LABELS

Carb counting is easier when you can use a food label. The label allows you to see how many carbohydrates and other nutrients are in a serving size of food. For carb counting, the 3 most important areas on a food label are **servicing size, total carbohydrate grams, and serving per container.**

1. Look at the **servicing size.**
  - All the information on the label is for the serving size listed.
  - When eating a larger or smaller serving, you will need to figure out how many grams of carbs it contains.
2. Look at the **total carbohydrate grams.**
  - Total carbohydrate includes sugar, starch, sugar alcohols and fiber.
  - If a food has *6 or more grams of fiber*, subtract half the grams of fiber from the total carbohydrate grams to get the new total carbohydrate grams.
  - If a food has *6 grams or more of sugar alcohols*, subtract half the grams of sugar alcohol from the total carbohydrate grams to get the new total carbohydrate grams.
  -
3. Look at the **servicing per container.**

There are often several servings in one container.

<b>Nutrition Facts</b>	
Serving Size 1 cup (228g)	
Servings Per Container 2	
<b>Amount Per Serving</b>	
<b>Calories 260</b>	<b>Calories from Fat 120</b>
<b>% Daily Value*</b>	
<b>Total Fat 13g</b>	<b>20%</b>
Saturated Fat 5g	<b>25%</b>
Trans Fat 2g	
<b>Cholesterol 30mg</b>	<b>10%</b>
<b>Sodium 660mg</b>	<b>28%</b>
<b>Total Carbohydrate 31g</b>	<b>10%</b>
Dietary Fiber 0g	<b>0%</b>
Sugars 5g	
<b>Protein 5g</b>	
Vitamin A 4%	• Vitamin C 2%
Calcium 15%	• Iron 4%
* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs:	
	Calories: 2,000    2,500
Total Fat	Less than 65g    80g
Sat Fat	Less than 20g    25g
Cholesterol	Less than 300mg    300mg
Sodium	Less than 2,400mg    2,400mg
Total Carbohydrate	300g    375g
Dietary Fiber	25g    30g
Calories per gram:	
Fat 9	* Carbohydrate 4    * Protein 4

## Using Carbohydrate/Food Serving Lists

At the end of this chapter you will find a food list to help you figure out the amount of carbs in food. Use this list as a guide when you eat out or have something that does not have a label on it.

## **STAY IN CONTROL**

Eating the same types of meals and snacks can help you have better blood sugar control. Plan to eat healthy meals and snacks and exercise each day. This includes making sure that half your plate is fruits and vegetables and drinking plenty of water.

Choose to eat:

- Colorful vegetables at least 2-3 times each day
- Fresh fruits 2-3 times a day
- Whole grains such as breads, cereals, pasta and rice
- Fat-free or low-fat (1%) milk
- Foods that contain calcium 3 times a day, such as milk, cheese and yogurt
- Low fat or lean meats, and fish, beans, nuts and peas
- Low-sugar foods

Limit these foods:

- Solid fats such as butter, stick margarine, shortening and lard
- High-sugar and fat foods such as desserts and fried foods
- Sugary drinks
- Large portions and super-size meals

More wellness tips for good health include:

- Balance food and fun activities. Activity and exercise make your whole body work better and help prevent weight gain.
- Get at least 1 hour of activity each day.
- Limit screen time to no more than 2 hours a day. This includes TV, computers and video games.

Wellness tips for parents:

- Be a healthy eating and exercise role model. Your children will learn best by watching you.
- Cook and eat meals together as a family. Mealtime can also be family time. Avoid or limit eating “on the run.”
- Let your children serve themselves at mealtime. Start with a small amount. Let them go back for more if they are still hungry.
- Teach them to eat new foods. This often takes time and repeated attempts.
- Children are more likely to eat a food if they help choose and prepare it.
- Serve your children all kinds of foods. Do not restrict certain kinds.

## DINE OUT or TAKE OUT

When eating out or ordering take-out foods, choose meals that are within your meal plan. You can get nutrition information from restaurants, the internet, cell phone apps and many food guides.

When eating out, take your insulin when the food arrives. Other things to think about when eating out include:

### Portion size

- Learn what a portion looks like by practicing with measuring cups or spoons at home. This helps you to give the correct insulin dose.
- Use the Helping Hand method to figure portion size. (see page 34)
- Portion sizes are often large. Eat only half of a large portion and take the rest home.

### Food choices:

- Foods are often high in fat and sodium (salt).
- Look for baked, broiled, grilled or roasted foods without sauces and gravies.
- Choose a salad instead of French fries.
- Choose fruit for dessert.
- Choose sugar-free drinks.

## How Many Carbohydrates Should I Have?

The chart below gives you a sample range of carbohydrate intake for each day. This is a general guideline based on age. Your diabetes team will let you know your exact amount based on your needs.

Age	B'FAST carbs (in grams)	LUNCH carbs (in grams)	DINNER carbs (in grams)
5-6	30 - 45	30 - 45	30 - 45
7-9	45 - 60	45 - 60	45 - 60
10 -13	45 - 60	60 - 75	60 - 75
14 - 16	60 - 75	60 - 75	75 - 90
17 - 18	75 - 90	75 - 90	75 - 90

## MATCHING INSULIN TO CARBOHYDRATE GRAMS IN FOOD

There are two approaches that are described here. Your doctor and you will decide what works best for you: Advanced Carb counting or Set Carb Grams.

### Set Carbohydrate Grams and Servings

- We will give you a certain number of carb grams or carb servings to eat for each meal and snack. You will take a certain dose of insulin to manage the number of carb grams you eat.

### Advanced Carbohydrate Counting

Your doctor will give you an **insulin to carbohydrate ratio**. You will use this ratio to decide how much rapid acting insulin (Humalog, Novolog or Apidra) you need for the amount of carbohydrates you eat.

**Example** - a 1:15 insulin to carbohydrate ratio means 1 unit of insulin will help your body use 15 grams of carbohydrate.

Insulin for Food using an insulin to carb ratio

Using the example ratio 1: **15** (1 unit of rapid acting insulin is needed for every **15** grams of carbs)

A. Add Up Your Carbohydrates

2 slices of Wheat Bread = 30 grams

Turkey = 0 grams

Crystal Light = 0 grams

banana = 30 grams

Total carbs (grams) = 60 grams

B. Divide the Total Carbs by the Insulin : Carbohydrate ratio (1:**15**)

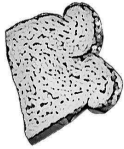
If your meal has 60 grams of carb then divide by 15

$60 \div 15 = 4$  units of fast acting insulin

- NOTE: You may need to take extra insulin if your blood sugar is higher than your target range. If so, you will use a **blood glucose correction factor** or a **sliding scale formula** to decide how much extra insulin you need. See the “High Blood Sugar: Hyperglycemia” - Adjusting your Insulin Dose for High Blood Sugars section on pages 56-57 for more detailed information. You also can find instructions on the sheet titled “Insulin Dosing Worksheet” in the resource section of this book .

## Measuring Carbohydrates

1 serving equals 15 grams of carbohydrates



1 slice of bread

or



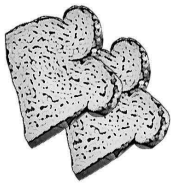
1/3 cup of rice

or



2 hard shell tacos

2 servings equals 30 grams of carbohydrates



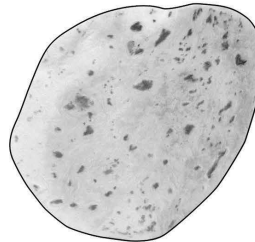
2 slices of bread

or



2/3 cup of rice

or



one 12 inch tortilla

3 servings equals 45 grams of carbohydrates



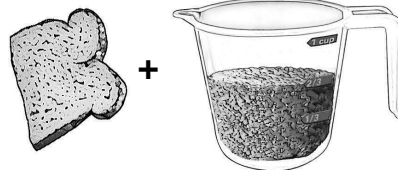
1 cup of pasta

or



1 cup of rice

or



1 slice of bread + 2/3 cup of rice

# Food Lists

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## Starches

### 1 Serving = 15 grams carbohydrate

#### Breads

##### 1 serving = 15 grams carb

Bagel, large 4 ounce size	¼ (1 ounce)
Biscuit, 2 ½ inches across	1
Bread – whole wheat, white	1 slice
Bread, reduced-calorie	2 slices
Chapatti, small, 6 inches across	1
Corn bread, 2 inch square	1
English Muffin	½
Hot dog bun	½
Muffin, plain, small 1 ounce size	1
Pancake, 4 inches across, ¼ inch thick (like a CD)	1
Pita, 6 inches across	½
Roll, small	1
Taco shell, hard	2
Tortilla – flour or corn, 6 inches across	1

#### Cereals and Grains

##### 1 serving = 15 grams carb

Barley, cooked	1/3 cup
Cereal, bran, oatmeal	½ cup
Cereal, sugar-frosted	½ cup
Cereal, puffed, unsweetened	1 ½ cups
Cereal, unsweetened	¾ cup
Granola – low fat or regular	¼ cup
Grits, cooked	½ cup
Tabbouleh, prepared	½ cup
Wheat germ, dry	3 Tablespoons
<b>Pasta, Rice, Noodles – cooked</b>	
<b>1 serving = 15 grams carb</b>	
Pasta, cooked, noodles, spaghetti and macaroni	1/3 cup
Rice, cooked – white, brown	1/3 cup
** Pasta and rice in multiple serving portions: ½ cup = 22 grams carb 1 cup = 45 grams carb	
Macaroni and cheese	1 cup = 48 gra
Penne – tube or spiral pasta	½ cup
Wild rice, cooked	½ cup



**Beans, Peas and Lentils**  
**1 serving = 15 grams carb**

Baked beans	1/3 cup
Beans, cooked – black, garbanzo, lima, kidney, navy, pinto and white	½ cup
Lentils, cooked	½ cup
Peas, cooked – black-eyed, green	½ cup
Refried beans	½ cup

**Starchy Vegetables**  
**1 serving = 15 grams carb**

Corn	½ cup
Corn on the cob, large	½ cob
French Fries	10-15
Plantain, ripe	1/3 cup
Potato, large, baked with skin	¼ (3 ounces)
Potato, small, baked	½
Potato, mashed	½ cup
Pumpkin	1 cup
Squash – acorn, butternut	1 cup
Sweet potato or yam, plain	½ cup

**Crackers and Snacks**  
**1 serving = 15 grams carb**

Animal crackers	8
Crackers, round	7
Crackers, saltine	6
Graham crackers (2 ½ inch squares)	3
Oyster crackers	20
Popcorn, low fat	4 cups
Potato chips (1 ounce) (snack bag size)	12 – 18
Pretzels, stick (¾ ounce)	30
Rice cakes (4 inches across)	2
Tortilla chips (1 ounce)	6 -12

# Fruits

**1 serving = 15 grams of carbohydrate**

**Sizes and weights of whole fruits listed include skin, core, seeds and rind.**

## Fresh Fruit

**1 serving = 15 grams carb**

Apple, small (2 inches across)	1 (4 ounces)
Apricots, fresh	4
Banana, medium	½ (4 ounces)
Blackberries, blueberries	1 cup
Cantaloupe, honeydew, papaya, cubed	1
Cherries	12
Dates	3
Grapefruit, large	½
Grapes, small	15-17 (12 cup)
Kiwi	1
Mango, cubed	½ cup
Nectarine, small	1 (5 ounces)
Orange, small	1
Pear, large	½ (4 ounces)
Pineapple, cubed	¾ cup
Plums, small	2
Raspberries	1 cup
Strawberries	1 ¼ cup
Tangerines, clementines	2
Watermelon, cubed	1 ¼ cup

## Dried fruit

Raisins, cranberries 2 Tablespoons

Canned Fruit, unsweetened  
1 serving = 15 grams  
Applesauce, fruit cocktail,  
Mandarin oranges, grapefruit  
sections, peaches, pears, ½ cup  
pineapple

### Health Tips:

Select canned fruit and juices without added sugar  
Look for “no added sugar,” “unsweetened extra  
light syrup” or “packed in own juice” on the label.

Drain fruits canned in their own juice.

## Fruit Juice, unsweetened

**1 serving = 15 grams**

Juice – apple, grapefruit, orange ½ cup (4 ounces)  
pineapple  
Juice – grape, fruit juice blends 1/3 cup  
prune

# Milk and Yogurt

## Health Tips:

Milk and yogurt are good sources of calcium and protein.

Give children over the age of 2 fat-free and low-fat milk and yogurt products.

The higher the fat content of milk and yogurt, the more saturated fat and cholesterol it has.

## Milk

### 1 serving = 12 grams carb

Skim milk, non fat	1 cup
1% fat milk, low fat	1 cup
2% fat milk	1 cup
Whole milk, full fat	1 cup

## Other Milks

Chocolate milk	1 cup = 24 grams
Kefir, plain	1 cup = 15 grams
Kefir, flavored	1 cup = 25 grams
Rice milk, plain	1 cup = 23 grams
Soy milk, unsweetened	1 cup = 4 grams
Soy milk, sweetened	1 cup = 10-25 grams

## Yogurts

Yogurt, regular	6 ounces = 28 grams
Yogurt, light	6 ounces = 15 grams
Yogurt, low carb (less than 6 grams of carb)	6 ounces = 5 grams

# Sweets and Desserts

## Health Tips:

Eat sweets and desserts only occasionally, and as part of your meal. This allows your blood sugar to rise more slowly.

Many of the foods listed in this section contain more than 15 grams of carbohydrate in a serving. Please read carefully.

### Brownies, cake, cookies and donuts

Banana nut bread, 1 inch slice	30 grams
Brownie, small, 1 ¼ inch square	15 grams
Cake, unfrosted, 2 inch square	15 grams
Cake, frosted, 2 inch square	30 grams
Chocolate chip cookies, 2 small	15 grams
Donut, glazed	30 grams
Sweet roll (small)	30 grams
Vanilla wafers, 5	15 grams

### Ice cream and other frozen desserts

Frozen ice pop, 1	10 grams
Fruit juice bar, 100% juice	15 grams
Frozen yogurt, low fat	½ cup = 15 grams
Ice cream, regular	½ cup = 15 grams
Ice cream, no sugar added	½ cup = 15 grams
Sherbet, sorbet	½ cup = 30 grams

### Pie and pudding

Fruit pie, 2 crusts, 1/6 of 8 inch pie	45 grams
Pumpkin pie, 1/6 of 8 inch pie	30 grams
Jell-O, regular	½ cup = 15 grams
Pudding, regular	½ cup = 30 grams
Pudding, sugar free	½ cup = 15 grams

### Candy

Candy bar, 1 fun size	10 – 12 grams
Chocolate kisses, 5 pieces	15 grams
Marshmallows, 4 piece	22 grams

# Sauces, Condiments and Drinks

## Spreads and syrups

Chocolate syrup, 2 Tablespoons	24 grams
Fruit spreads, 100% fruit, 1 Tablespoon	10 grams
Honey, 1 Tablespoon	15 grams
Jam or Jelly, regular, 1 Tablespoon	15 grams
Pancake syrup, light 2 Tablespoons	15 grams
Pancake syrup, regular, 1 Tablespoons	15 grams
Sugar, white, brown, 1 Tablespoon	15 grams

## Drinks

Hot chocolate, regular	1 cup = 24 grams
Hot chocolate, sugar free	1 cup = 15 grams
Lemonade or fruit drink	1 cup = 30 grams
Sports drink	1 cup = 15 grams

## Sauces and Condiments

Barbecue sauce, 2 Tablespoons	10 – 15 grams
Honey mustard, Two Tablespoons	13 grams
Ketchup, 1 Tablespoon, 2 packets	5 grams
Spaghetti Sauce, ½ cup	10-15 grams
Sweet 'N Sour, 2 Tablespoons	13 grams

# Combination Foods

## Chicken nuggets, pizza and soups

Chicken nuggets, 6 pieces	16 grams
Breaded chicken, fish and pork cho with 3 Tablespoons flour	15 grams
Chili with beans	1 cup = 15 grams
Casserole type, Lasagna	1 cup = 30grams
Pizza, cheese or pepperoni, regular crust, medium cut into 8 pieces	1 slice = 30 grams
Chicken noodle soup	1 cup = 10 grams
Vegetable beef soup, Or other broth-type	1 cup = 15 grams
Stews (Beef/other meats and vegetables)	1 cup = 15 grams

## Salads

Coleslaw	½ cup = 15 grams
Macaroni	½ cup = 26 grams
Potato	½ cup = 18 grams

## Non-starchy Vegetables

If your ratio is 1:5 – ½ cup cooked or 1 cup raw = 5 grams carb.

If your ratio is NOT 1:5 – these foods count as a “free” vegetable.

### Health Tip:

Non-starchy vegetables contain only small amounts of carbohydrate and calories. They are also very healthy to eat.

- Artichokes
- Asparagus
- Bamboo shoots
- Beans: green, Italian, wax
- Bean sprouts
- Beets
- Broccoli
- Brussels sprouts
- Cabbage: Bok Choy, Chinese, green
- Carrots
- Cauliflower
- Celery
- Chayote
- Cucumber
- Eggplant,
- Greens: collard, kale, mustard, turnip
- Jicama
- Mushrooms
- Okra
- Onions
- Pea pods
- Peppers, all colors and varieties
- Radishes
- Salad greens: endive, lettuce, romaine
- Spinach
- Summer squash
- Tomato: raw, canned, sauce, juice
- Turnips
- Water chestnuts
- Zucchini

# Proteins: Meats and Meat Substitutes

## Meal planning Tips:

- Choose lean meats, chicken, turkey, fish, beans, eggs and nuts.
- Bake, broil, boil, roast or grill meat, fish and poultry

## Healthy Foods:

Chicken or turkey breast, without skin

Ground turkey breast or chicken without skin

Low fat cheese, skim milk

Eggs or egg whites

Fish

Hot dogs, low fat or light

Lunch meats, low fat

Meats, lean cuts - at least 90% lean ground beef, sirloin and tenderloin

Pork, lean cuts - loin, center pork chop

Nuts

Peanut butter, nut butters

Soy-based vegetarian sausage, meats or tofu. These foods may contain carbohydrates. Check label for detail.

## Unhealthy Foods:

- These foods are higher in unhealthy fats. Do not eat them every day. Eat them only in small amounts.

Bologna

Beef, regular ground (80 – 85% lean) or ground chuck

Cheese, regular

Chicken or turkey wings

Hot dogs, regular

Pork and beef ribs

Pepperoni, salami

Sausage, breakfast and dinner, Slim Jims



# Fats and Oils

## Health Tips:

- Choose heart-healthy fats from the list below, such as olive and canola oils.
- A serving of fat is about:      1 teaspoon of regular margarine, oil or butter  
   1 Tablespoon of regular salad dressing or mayonnaise

## Healthy Foods

Avocado

Canola, olive or peanut oil

Light, tub margarines or spreads (trans fat-free)

Light or low-fat salad dressings

Light mayonnaise, light cream cheese or light sour cream

Nuts (1/4 cup) and seeds (2 Tablespoons)

Olives, green or black

## Unhealthy Fat Foods (Saturated and Trans Fat)

- Do not eat these foods every day. Eat only in small amounts.

Bacon (serving size = 1 slice)

Butter

Cream

Cream cheese

Hydrogenated oils

Lard, shortening

Palm or coconut oil

Regular, creamy salad dressings

Sour cream

Stick margarine

## Free Foods

The foods on the list below contain 5 grams of carbohydrate or less per serving.

- If your ratio is 1:5 – follow your doctor’s advice about how much you can eat.
- If your ratio is NOT 1:5 – the foods on the list below are “free” foods unless your doctor tells you otherwise.

### Drinks

Bouillon, broth and consommé  
Club soda  
Coffee, unsweetened or with sugar substitute  
Diet soda, sugar free  
Drink mixes, Crystal Light, sugar free  
Flavored waters, carbohydrate-free, such as Powerade Zero, Propel Zero  
Tea, unsweetened or with sugar substitute  
Water: plain, carbonated, mineral

### Condiments and Seasonings

Hot pepper and Tabasco sauces  
Garlic, herbs, spices and seasoning salts  
Lemon or lime juice  
Mustard  
Mayonnaise, regular light (1 Tablespoon)  
Salad dressings, Ranch, Italian 2 Tablespoons (regular or light)  
Soy sauce, regular, light  
Vinegar

### Other

Gelatin, sugar-free (Jell-O type)  
Gum, sugar-free

### These foods are “free” in the amounts listed below.

Candy, hard, sugar-free	1 candy
Jam or jelly, sugar-free	1 Tablespoon
Syrups, sugar-free (pancake, chocolate)	2 Tablespoons
Salsa	¼ cup
Sweet pickles, gherkin	1 pickle or 2 slices
Whipped Topping (Cool Whip type)	2 Tablespoons

# Snacks

One Serving = 15 grams

## Crackers

7 animal crackers  
23 Cheese Nips (1/2 cup)  
45 Goldfish (1/2 cup)  
3 graham cracker squares  
3 gingersnaps  
12 Ritz Bitz  
6 Ritz crackers  
6 saltine crackers  
16 Teddy Grahams  
5 Triscuts  
12 Wheat Thins  
2 Oreos, small chocolate chip  
5 vanilla wafers  
4 cups light popcorn  
15 potato chips (snack bag)  
30 thin stick pretzels  
1/2 sandwich  
1 cup soup

## Free Snacks – 5 Grams Carb or Less

Raw veggies and Ranch dressing  
Dill pickles  
Small salad  
Cheese, string or cubed  
Chicken or tuna salad  
Grilled chicken strips  
Egg, hard boiled

## Fruits

1/2 medium banana  
15 – 17 small grapes (1/2 cup)  
1 small fresh apple or orange  
1 cup fresh fruit, berries  
1/2 cup unsweetened applesauce  
1/2 cup canned fruit (light syrup)  
2 Tablespoons raisins

## Breads and Cereals

1 slice toast  
1/2 English muffin  
1/2 small bagel (1 ounce)  
1 pancake, 4 inches across  
1 frozen waffle  
3/4 cup unsweetened cereal  
1/2 cup sweetened cereal

## Yogurt and Dairy

1 Gogurt  
6 oz. light fruit yogurt  
1/2 cup sugar free pudding  
1/2 cup plain ice cream

Lunch meats  
Omelet, scrambled egg  
Nuts, peanuts, almonds, 1 ounce (1/2 cup)  
Sunflower seeds, 2 Tablespoons  
Sugar-free gelatin  
Sugar-free Popsicle



# Exercise and Diabetes

Regular exercise can help you stay healthy and lower your blood sugar level. Exercise also can:

- Help control your weight
- Improve the way you look and feel
- Keep your bones strong
- Tone and strengthen your muscles
- Raise your energy level
- Reduce stress
- Help you to have a positive attitude

Exercise is a special help for people with diabetes because it:

- Helps insulin work better by making it easier for blood sugar to get inside the cells
- May reduce insulin dose needs
- Helps protect against many health problems such as heart disease

Ask your diabetes team what type of exercise is right for you.

- Health experts advise 30 - 60 minutes of aerobic exercise at least 5 times a week for all people.
- Aerobic exercise makes your heart work harder and makes you breathe deeper and faster.
- Non-aerobic exercise does not cause your heart to work as hard but it does help keep muscle and joints strong and active.

Below is a chart listing some examples of aerobic and non-aerobic exercises. Both kinds of activities are fun and good for your health.

<b>These are aerobic activities:</b>	<b>These are non-aerobic activities:</b>
Aerobic dancing Step aerobics Stair climbing Bicycling Dancing Hiking or backpacking Basketball Jumping rope Soccer Singles tennis Swimming Running or jogging Video fitness programs (Wii, Xbox etc.) Continuous free-play	Softball* Bowling Golfing Football* Doubles tennis Sit-ups and push-ups Weight-lifting** Walking

\*Team practice may be aerobic

\*\* Moderate to intense resistive exercise may also lower blood sugar levels particularly in type 2 diabetes

### **If you do not exercise now**

Even if you do not like to exercise, there are activities you can do that are fun, cheap and good for you. Being active can be fun, especially when you are with family or friends. Here are a few that you and your family or friends can do together:

- Go for a walk after dinner
- Play at a park
- Clean the yard or plant a garden
- Ride bikes
- Go for a swim
- Take a trip to the zoo or a farm
- Go hiking
- Sign up to do a walk for charity
- Buy pedometers and have a contest to see who can walk the furthest

There are a lot of other things that aren't listed here that you can do – just use your imagination.

If you have not been exercising, start with walking or riding a bike. Gradually increase the distance and how fast you walk or ride. “Overdoing” when starting to exercise can cause pain, sore muscles or injury, and you are more likely to give up.

Rain or bad weather should not keep you from being active. Below is a list of activities you can do inside:

- Go walking at a mall
- Join a gym and exercise indoors
- Work out to exercise videos, DVDs or games
- Help around the house by doing active chores like vacuuming and mopping
- Buy a stationary bike or treadmill and have contests to see who rides or walks the most miles

### **A message to parents**

You have the power to promote good health habits in your children by being a role model and being active yourself.

- Limit screen time such as TV, computer games, computers and video games to no more than 2 hours each day. This goes for both you and your child.
- For every 30 minutes you and your child spend in front of the TV, match that with the same amount of time doing some physical activity.

## PARTS OF AN EXERCISE PROGRAM

A good aerobic exercise program has 3 parts:

1. Warm-up and stretching
2. Aerobic activity
3. Cool down and stretching

Warming up your muscles before you begin to exercise is important. This helps the muscles get ready for exercise. For example:

- Before walking or running, warm up by marching in place, doing jumping jacks, and stretching your front and back thigh and calf muscles.
- Before tennis, do arm circles, shoulder shrugs and stretch your chest and upper back muscles.

Cooling down is important, too. It helps your muscles unwind after exercise. You can do the same kinds of things to cool down as you did to warm up.

## YOUR TARGET HEART RATE

Your heart rate is the number of times your heart beats during 1 minute.

- Check your heart rate before, during and after exercise. This will help you exercise at the right pace.
- For best results, keep your heart beating at your target rate for **at least 20 minutes**.

A math formula is used to decide your target heart rate. It is based on 60 to 85 percent of your upper heart rate. See the chart below to find out what your target heart rate is.

You measure your heart rate by taking your pulse. To take your pulse:

1. Use 2 fingers to feel your pulse. Do not use your thumb. Your thumb has its own pulse. You will find your pulse:
  - On the radial artery. This spot is on the underside of your wrist, just below the base of your thumb.
  - On the carotid artery. This spot is on either side of your neck.
2. Count the number of beats you feel in 10 seconds.
  - Time it by using a watch with a second hand.
  - Multiply this by 6 to get the number of beats per minute. (See the “Target Heart Rates for Ages 5 to 18” chart.)

## Target Heart Rates for Ages 5 to 18

Age	60% to 85% training heart rate	Number of heart beats in 10 seconds
5	129 to 183	22 to 31
6	128 to 182	21 to 30
7	128 to 181	21 to 30
8	127 to 180	21 to 30
9	127 to 180	21 to 30
10	129 to 179	21 to 30
11	125 to 178	21 to 30
12	125 to 177	21 to 30
13	124 to 176	21 to 29
14	123 to 175	21 to 29
15	122 to 174	21 to 29
16	122 to 173	20 to 29
17	122 to 173	20 to 29
18	121 to 172	20 to 29

### Staying hydrated

Dehydration means your body is too dried out. Dehydration can happen when you sweat a lot and you do not drink enough fluid to replace what you have lost.

- The simplest way to know you are drinking enough is to check the color of your urine (pee). It should be the same color as straw or hay.
- Another way is to weigh yourself before and after an activity. You will know if you have had enough to drink if your body weight does not change a lot after an event.

If your blood sugar has been running high, you may start off dehydrated because you are losing water through your urine. Dehydration makes your blood become “thicker.” This can make your blood sugar level appear higher.

Do not force yourself to drink more than the amount of fluid that satisfies your thirst. Drinking too much fluid can cause a condition called water intoxication. This happens when your blood becomes dilute (watery) and can cause changes in your blood sodium (salt) levels.

### What to drink:

- Water - plain, cool water is best for less strenuous activities. If you like flavored drinks, try flavored seltzer water, sports drinks with no added carbs or Crystal Lite.
- Drinks with carbs - for longer or more strenuous activities, drink sports drinks or diluted juices. Start with a drink that contains 15 carbs for each 30 - 60 minutes of strenuous exercise.
- Check your blood sugar before and after every 45 - 60 minutes during an activity to tell you which drink you need - water or drinks with carbs. Be sure to have both on hand.



**Adrenaline effect:**

Some people have high blood sugar levels right before a big activity.

- When you get excited about something, your body may release a hormone called adrenaline. This raises your blood sugar.
- The high blood sugar level usually lasts just a short time. **Do not give yourself insulin.** As your excitement wears off and you complete the activity, your blood sugar will come down.
- Keep a log of what happens to your blood sugar before, during and after activities. This can help you find out if this happens to you.

**TYPE 1 DIABETES EXERCISE GUIDELINES**

If you take insulin, the most common problem you may have when you are active is low blood sugar (*hypoglycemia*). There are things you can do to help prevent low blood sugar on days that you exercise. The choice depends on your exercise goals and plans. Your diabetes team will work with you to decide on a method for you to use.

**Extra carbs for exercise**

Many people raise their target blood sugar level to allow for exercise. To reach your target level before you exercise:

- Test your blood sugar before you start.
- Eat some carbs to raise your blood sugar to that level.

For example, let's say your target blood sugar range before you exercise is 150-200 mg/dL.

- When you check your blood sugar, you find it is 120 mg/dL.
- This means you may need to eat a snack that contains 15 or 30 grams of carbohydrate to raise your level before you start.

To give yourself staying power, take a snack with you that has fiber, protein or fat. Have a fast-acting carb, such as juice when you:

- Need to raise a low blood sugar quickly before exercise OR
- Are in target range and you are going to exercise right away for 30 minutes or less.

If you use a fast-acting carb, be sure to follow it with a snack that contains fiber, protein or fat.

The amount you eat will depend on:

- How the exercise usually affects you
- How long you do it
- How hard you will work at it

### Extra Food to Cover Moderate Exercise

Do not take insulin for food meant to raise blood sugar.

Expected length of exercise	Blood sugar level before exercise mg/dL	Grams of Carbohydrates to eat	Examples
Short (15 – 30 minutes)	<120	15 – long-acting carbohydrate	4 peanut butter crackers or piece of fruit
	120-150	15 – long-acting carbohydrate	1 slice bread with peanut butter
	>150	0	none
Longer (30 – 120 minutes)	<120	30 – 15 gm short + 15 gm long-acting	8 oz. milk and ½ granola bar
	120-150	30 – 15 gm short + 15 gm long-acting	8 oz. sports drink and ½ sandwich
	>150	15 – 15 gm long-acting	1 piece fruit
Longest (2-4 hours)	<120	45 -15 gm short-acting + 30 gm long	1 energy bar and 4 oz. juice
	120-150	45 –15 gm short-acting + 30 gm long	8 oz. milk and 1 ½ cup unsweetened cereal
	>150	30 – 30 gm long-acting	Whole sandwich

#### Write down your blood sugar levels during exercise

No matter what method you use to adjust your blood sugar, you will need to check your blood sugar levels before and after exercise initially in order to identify a pattern. You may also need to check it during exercise if you are exercising more than 60 minutes at a time. Write your blood sugar levels down on the Exercise Log at the end of this section. Also, record what you eat or drink before or during exercise.

- Do this several times when you start a new exercise until you find out what works best. It usually takes 7-10 exercise sessions of the same intensity and duration.
- This will help you and your diabetes team notice patterns of how an exercise affects your blood sugar.
- As you do this you may need to adjust food intake. Compare the results to find out what works best for you.

### **Adjust insulin for exercise**

Another way to avoid low blood sugar with exercise is to work with your doctor to adjust your insulin dose. Your dose may need to be lower on days you exercise. This method is more involved and you will need your doctor's help to make sure your insulin dose is correct. Consult with your doctor when you have developed a pattern and are ready to adjust the insulin dose prior to exercise.

Choose your insulin site carefully to avoid the area that would be used the most during upcoming exercise session because the insulin may be absorbed faster than desired. For example, to avoid your legs, you may choose to inject your abdomen before running.

### **Exercise tips**

- Always carry some carbs with you when you plan to exercise.
- Eat extra carbs if your blood sugar level is less than what your target level should be before exercise. If your blood sugar was less than 100, check your blood sugar again after you eat to make sure it is in your target range prior to exercising.
- Exercise each day and avoid big swings in your activity levels. This can make it harder to adjust insulin doses.
- The type of insulin, timing and type of carb taken can affect blood glucose level.
- If the duration and intensity of the exercise are consistent, the influence on the blood glucose levels can be predicted.
- If your blood sugar is less than 100 after exercise, you may need to eat a 15 gram snack to prevent low blood sugar.
- On days when you do a lot of strenuous activity, eat extra carbs (without insulin) to raise your bedtime blood sugar above 160. You may want to set your alarm for 2 a.m. to check that your level does not drop while you sleep.

### **Check your blood sugar**

- Check blood sugar 30 minutes before exercise. Recheck your blood sugar if you were below 100 initially and every 45-60 minutes until you finish.
- Stop the exercise and check your blood sugar **right away** if you become light-headed, dizzy or have other signs of low blood sugar. Begin treatment if it is low.
- Check your blood sugar more often after exercise. Exercise can cause low blood sugar levels for up to 12 to 24 hours afterward.

### **Insulin**

- **Do not** take insulin when you eat a snack meant to raise your blood sugar before exercise.

## **TYPE 2 DIABETES EXERCISE GUIDELINES**

If you have Type 2 diabetes, your body may still make insulin but just not use it well.

- The good news is that exercise makes your body more sensitive to insulin, so it uses it better.
- This means that if you exercise on a regular basis, you can reduce or stop your need for insulin shots.

People with Type 2 diabetes often need to maintain or lose weight. Exercise can help you meet this goal. If you need to maintain or lose weight and do not take insulin, do **not** eat extra carbs when you exercise unless you have signs of low blood sugar.

If you have low blood sugar during or after exercise, talk with your doctor about reducing your insulin or medicine dose.

## **WHEN NOT TO EXERCISE**

There are certain times when you should not exercise. This includes when you:

- **Are positive for ketones.** Positive ketones mean your body is using fat or muscle for energy. Check for ketones anytime your blood sugar is over 300. If you exercise when you have ketones, you can make your blood sugar and ketones go even higher.
- **Feel shaky, weak or dizzy or have a headache.** You might have low blood sugar. Stop and check your blood sugar **right away**. If it is low, begin treatment for low blood sugar. See page 50.
- **Are sick.** If you have a fever, you may have an infection. Rest and start exercise slowly when you are well. Check your blood sugar closely when you start again. See the Sick Days section on page 69 for more information.

**Exercise with caution** if your blood sugar is over 300 and you do not have ketones. Be sure to drink enough to avoid being dehydrated when your blood sugar is high.

## **Tell Your Coaches**

Tell your coaches and physical education (PE) teachers about your diabetes. This helps them to learn about how to help if you should ever need it. Have your parent or guardian fill in the form letter for coaches at the end of this section or, they can use it as a guide to write their own letter.

# How to Avoid Low Blood Sugar during Exercise



**Children's**<sup>SM</sup>  
Healthcare of Atlanta

<b>Extra Food to Cover Moderate Exercise</b>			
<b>How long you expect exercise to last</b>	<b>Blood sugar level right before exercise - mg/dL</b>	<b>Grams of carbohydrate to eat right before you start exercise</b>	<b>Examples</b>
Short - 15-30 minutes	Less than 120	15 gm	4 peanut butter crackers or 1 piece of fruit
	120-150	15 gm	1 slice bread with peanut butter
	Over 150	0	none
Longer - 30-120 minutes	Less than 120	30 gm	8 oz. milk and ½ granola bar
	120-150	30 gm	8 oz. sports drink and ½ sandwich
	Over 150	15 gm	1 piece fruit
Longest - 2-4 hours	Less than 120	45 gm	1 energy bar and 4 oz. juice
	120-150	45 gm	8 oz. milk and 1½ cup unsweetened cereal
	Over 150	30 gm	Whole sandwich

- If blood sugar is in the 200-300 mg/dL range, check for ketones. If negative, exercise with caution. You do not need extra carbohydrates before exercise. Check blood sugar again in one hour.
- Adrenaline can raise blood sugar temporarily if you get excited at a sporting event you are in. Eventually blood sugar will come back down. Keep records of how your blood sugar responds so you can determine patterns. This will help you determine the best way to handle that activity.
- Check for ketones whenever blood sugar is over 300 mg/dL. If positive for ketones, call your doctor and do not exercise.
- Exercise with caution or delay exercise if blood sugar is more than 300 mg/dL.

Table adapted from ***Understanding Diabetes*** by Peter Chase 11<sup>th</sup> edition 2006  
Barbara Davis Center for Childhood Diabetes.

# My Exercise Log

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**Children's**<sup>SM</sup>  
Healthcare of Atlanta

Plan to get 30 – 60 minutes of exercise each day.

<b>Date Time</b>	<b>Activity</b>	<b>Last Insulin dose Amount and time taken</b>	<b>Time Start/end</b>	<b>Blood sugar before</b>	<b>Blood sugar after</b>	<b>Snacks eaten and time</b>	<b>Other notes (ex:last meal)</b>

# Especially for Coaches

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Dear Coach,

This letter is about \_\_\_\_\_, who has diabetes. His/her diabetes should not interfere with his/her ability to play \_\_\_\_\_. In fact, many people with diabetes are good athletes and are able to perform the same as any other player.

Exercise is very important for people with diabetes because it lowers blood sugar levels. The amount of insulin and food must be adjusted for exercise. People with diabetes learn how to manage exercise, food and insulin by testing their blood sugar and talking with their diabetes educator or doctor.

At times, the blood sugar can become too low and he/she may need your help. You should be familiar with the signs of low blood sugar and how to treat it.

- Signs of low blood sugar include:
- Shakiness
- Extreme hunger
- Tiredness
- Paleness
- Dizziness
- Sweating
- Double vision
- Headaches
- Sudden drop in performance or an irritable mood

If signs of low blood sugar occur, he/she needs to stop immediately and check his/her blood sugar. If it is low, he/she will need to eat or drink something to raise it. He/she should carry testing supplies and food for this purpose. Some of the ways to raise blood sugar are to:

- Drink a 4-ounce can of fruit juice or take three to four glucose tablets or 4 teaspoons of sugar. Follow any of the above with a solid food such as cheese and crackers or a sandwich.
- Test blood sugar to make sure it is back in the target range. Physical activity can be resumed once blood sugar increases.

Quickly responding to the first signs of low blood sugar can help avoid a severe reaction, such as loss of consciousness or seizures. Your understanding and support will help ensure continued athletic success.

Thank you,

# Low Blood Sugar: Hypoglycemia

Low blood sugar is also called hypoglycemia. Almost every person using insulin needs treatment for low blood sugar at some time. Low blood sugar happens quickly and needs to be treated right away.

You need to know the signs of low blood sugar so you can treat it quickly. Your family, friends, teachers and sitters need to know the signs of low blood sugar too. When they know what to look for, they may notice the signs before you do. They also need to know what to do in case you need help.

In general, a blood sugar level below 70 is considered low. For you, a blood sugar level below your target range might be considered low. Ask your diabetes team what a low blood sugar level is for you.

## CAUSES OF LOW BLOOD SUGAR

Some things that cause low blood sugar include:

- Too much insulin or medicine
- Exercise
- Not eating enough food to cover a dose of insulin
- Skipping meals and snacks if you are on insulin that peaks several hours after you take it

## SIGNS OF LOW BLOOD SUGAR

Mild signs of low blood sugar include:

- Shakiness
- Fast heartbeat
- Sweating
- Blurred or double vision
- Headache
- Confusion, slow thinking or trouble doing simple things
- Slurred speech
- Hunger
- Feeling moody or cranky
- Numbness
- Feeling weak or sleepy
- Having a pale, gray color to your skin
- Crying or feeling nervous
- Not being able to move right (poor coordination)

Low blood sugar needs to be treated **right away**. If you do not treat the early signs, you may have more severe problems like:

- Passing out
- *Seizures*



## TREATING LOW BLOOD SUGAR

### Treatment when you are alert (Conscious)

1. Always check your blood sugar level first. Do not assume it is low just by the way you feel.
2. If you have signs of low blood sugar and find out it is below your target range or slightly above it, use the “Rule of 15” to treat yourself. This means that you eat or drink 15 grams of carbohydrates such as:
  - 3 or 4 glucose tablets
  - 4 ounces of juice
  - 1 tablespoon of sugar
  - 5 ounces of regular soda—not diet
  - 8 ounces of low-fat milk or yogurt
  - Glucose gel—get it over-the-counter at most drug stores
3. Wait 15 minutes and test your blood sugar level again.
4. If blood sugar is still below 70 or below your target range, eat another 15 grams of carbohydrates.
5. Wait 15 minutes after eating and test your blood sugar level again.
5. If your blood sugar level is above 70, resume your regular routine.
6. If after 3 checks, your blood sugar level is still below 70, call your doctor.

### Hypoglycemia



You can find a handout about treating your low blood sugar in the resource section of this book on page 1.

**Avoid these foods when you treat low blood sugar:**

- Chocolate has a lot of fat and takes a long time to digest.
- Other foods that contain cornstarch, fat or protein may take longer to work too.
- Hard candy, like mints or Lifesavers, takes a long time to dissolve.

**Treatment if you become confused**

Low blood sugar can sometimes cause you to be confused. If this happens, your parent or another adult can squirt glucose gel into the side of your mouth.

- They should squirt it between the gum and cheek and rub it in.
- This will help raise your blood sugar level.
- Your diabetes team will show you how to do this.
- You can buy glucose gels at your local drug store.

**Treatment if you are not alert (unconscious) or have a seizure**

If you ever have a very low blood sugar level and pass out, someone will need to give you medicine called *glucagon*. Make sure that you, your family and any caregivers, such as teachers and sitters, know how to use glucagon. You need a doctor's prescription for this medicine.

Glucagon is a natural hormone made by the pancreas.

- It has the opposite effect of insulin
- It raises blood sugar
- If you ever have a seizure or are not alert, someone will need to give it to you by injection (shot) under your skin or into the muscle

Glucagon comes in a Red Emergency Kit in 2 parts: a powder and a liquid. Someone needs to mix it just before giving it. The package has instructions for mixing and giving it.

If you often have low blood sugar levels, have a kit handy **at all times**. You will need a new glucagon prescription from your doctor every 12 months.

### **For parents or other adults**

You will only give glucagon to your child if he is not conscious or is having a seizure. If this happens, never give him food or drinks. It could cause him to choke.

You should:

1. Get the glucagon ready to inject. Follow the package instructions.
2. Give the proper dose as advised by your child's doctor.
3. Glucagon may cause vomiting. Place your child on his side to prevent choking.
4. Wait several minutes for the glucagon to work. Check his blood sugar after 10 minutes.
  - If your child does not respond in 10 minutes, call the doctor. He may advise giving another dose.
  - **Call 911 or your local emergency service if there is no response to the glucagon or if your child begins to seize or has trouble breathing.**
5. When your child wakes up, give him sips of a regular soft drink, juice or sweetened drink even if he has an upset stomach.
  - He may not want to drink but give sips of fluids with carbohydrates anyway.
  - This helps to prevent another low blood sugar reaction.
6. After 10 minutes, if your child is able to keep the drink down, have him eat something solid. You may use a sandwich or crackers with peanut butter.
7. Check his blood sugar often.
8. If he vomits, check for ketones.
9. Always call his doctor for further instructions after using glucagon. His next insulin dose may need to be changed.

You also can find these instructions on the sheet titled "Care for low blood sugar" in the resource section of this book on page 1. You may want to make extra copies for teachers, school nurses, babysitters, grandparents or anyone else who may need it.

### **HOW TO HELP PREVENT LOW BLOOD SUGAR**

- Talk with your diabetes team any time you have low blood sugar levels for no known reason. You may need a change in your insulin or medicine dose.
- Learn to offset the effect exercise has on blood sugar by adjusting your insulin or eating extra carbs.
- Check your blood sugar level before any physical activity. Carry extra snacks and sports drinks if your blood sugar is near the low end of your target range.
- Recording your blood sugar level is the best way to find out how activity affects your blood sugar.
  - Record the times, intensity and length of exercise.
  - Record your blood sugar levels before, during and after the activity. This can help your diabetes team decide what you can do to help prevent low blood sugar levels when you exercise.
- Talk with your doctor or diabetes team about how to adjust your insulin if you have low blood sugar levels during the night. They may suggest changes in your insulin.

### **How to help prevent low blood sugar at night**

- Always measure your blood sugar level before you go to bed.
- If your bedtime blood sugar level is less than 100 mg/dL, eat a carbohydrate snack. Do not take insulin to cover the snack.
- If you were extra active during the day, make sure your blood sugar level is at least 160 mg/dL before you go to bed.
- After a day of extra activity, measure your blood sugar level at 2 a.m.
- One time a month, check your blood sugar level at 2 a.m.

**SAFETY TIPS**

You cannot completely prevent low blood sugar levels. Being prepared for it is the most important thing you can do. Be sure to:

- Wear identification (ID) saying you have diabetes.
- Carry some form of carbohydrate with you at all times.
- Check your blood sugar levels before driving any type of vehicle.
- Check your blood sugar levels at the first sign of low blood sugar.
- Keep glucagon in a handy place so your family can find it in a hurry.
- Get a new glucagon prescription every 12 months when it expires.



# High Blood Sugar: Hyperglycemia

Your blood sugar level is not always the same. It will not stay in your target range all the time. There are many natural things that can affect your blood sugar levels. You will learn what changes to make to your treatment plan to adjust for these things.

## Things that affect blood sugar levels

**Growing up**—As you grow and develop, insulin needs often increase. This is due to chemicals in the body called hormones.

- Hormones, like those you make as you change into an adult, can make your body less sensitive to insulin.
- Insulin needs increase when hormone levels are high, like during the teen years.

**How active you are**—Your activity level changes during the year. You may play a sport in the spring and fall but not during the winter. This affects how much energy you burn and changes how much insulin you need.

- When you are more active, you usually need less insulin.
- When you are less active, you usually need more insulin.

**When you are ill**—You will learn in a later chapter what to do when you are ill.

**When you go through times of high stress**—Your body makes stress hormones that can increase your blood sugar level the same way that growth hormones do.

## CAUSES OF HIGH BLOOD SUGAR

High blood sugar is also called hyperglycemia. It happens when your blood sugar level rises above your target range. Some things that can cause high blood sugar include:

- Not taking enough insulin
- Less exercise than normal
- Eating or drinking too many carbohydrates
- Stress
- Being sick
- Emotions, such as excitement or anger
- Growth and hormones

## SIGNS OF HIGH BLOOD SUGAR

Some signs you might have if your blood sugar is high include:

- Drinking a lot
- Going to the bathroom often
- Headache
- Feeling tired or irritable
- Blurred vision
- Hunger
- Dry skin
- Weight loss
- Upset stomach
- Vomiting

## **TREATING HIGH BLOOD SUGAR**

You cannot always tell your blood sugar is high just by the way you feel. Some of the signs of high blood sugar and low blood sugar are alike, such as headache, irritability and blurry vision.

Always check your blood sugar before you take any action. Once you test your blood sugar, you will know what steps to take next.

If you have signs of high blood sugar, take these steps:

1. Check your blood sugar level.
2. Check for ketones:
  - If your blood sugar level is more than 300 mg/dL.
  - If you have an insulin pump and your blood sugar level is more than 250 mg/dL.
3. Call your doctor if you have ketones.

If you do **NOT** have ketones and your blood sugar level is:

1. 240 mg/dL or higher 3 times in one day – call your doctor. The doctor may need to change your insulin dose.
2. High – use your correction formula or sliding scale the next time you need to take rapid-acting insulin. This should help bring your blood sugar reading down.

## **ADJUST YOUR INSULIN DOSE FOR HIGH BLOOD SUGARS**

You will learn how to adjust your insulin dose to help correct high blood sugars. The insulin dose that you will adjust is your mealtime rapid-acting insulin dose.

### **Example:**

- Your target blood sugar range is 70 to 150.
- You check your blood sugar level before a meal and it is 200.
- You will need to take extra insulin PLUS your mealtime insulin to help lower your blood sugar.
- Your doctor will let you know which formula you should use—a correction factor or a sliding scale formula.
- Your diabetes team will teach you how to use these formulas.

## THE CORRECTION FACTOR

Your doctor will give you a number called your “correction factor.” It is usually a number such as 20, 25, 30, 50 or 100.

When using the correction factor, you will:

- Subtract a number your doctor gives you (usually 100) from your current blood sugar level
- Divide that number by your correction factor

### Example:

Your blood sugar is 200 and your correction factor is 20. This means you would take an extra 5 units of insulin.

### To do the math:

200 minus 100 = 100

Divide 100 by 20 = 5 extra units of rapid-acting insulin

NOTE: This is just an example. Do not use this formula to adjust your insulin dose. Always follow your doctor’s orders.

## The Sliding Scale Formula

The sliding scale formula is based on blood sugar ranges. Based on this chart, if your blood sugar level is 200 before a meal, you would take an extra 2 units of rapid-acting insulin.

If your blood sugar level is between	Take this many <b>extra</b> units of rapid-acting insulin
200 to 299	2 extra units
300 to 399	4 extra units
More than 400	6 extra units

NOTE: This is just an example. Do not use this formula to adjust your insulin dose. Always follow your doctor’s orders.

## What are ketones?

As fats break down, acids called ketones build up in the blood and urine. This can happen when someone with diabetes:

- Has an illness like a fever, stomach virus or the flu – called illness ketones.
- Does not eat enough carbohydrates – called starvation ketones.
- Does not get enough insulin or misses insulin doses – called insulin-deficiency ketones.

When ketone levels are high, it leads to a serious condition called diabetic ketoacidosis or DKA.



## WHAT IS DIABETIC KETOACIDOSIS (DKA)?

Diabetic ketoacidosis(DKA) means that there is too much acid in the body caused by a build-up of ketones. If not treated, it can cause confusion, coma and death.

Finding ketones in the blood or urine **EARLY** is the best way to treat it.

## What are the main causes of DKA?

The 2 main reasons ketones show up in the blood or urine are:

1. Illness – the stress of illness causes the body to make stress hormones. These hormones can raise blood glucose and blood ketone levels.
  - DKA happens more quickly if you vomit or have diarrhea. This is because you can become dehydrated (dried out) and this raises blood ketone levels.
  - Be sure to take insulin during times of illness, even if you do not eat.
2. Forgetting to take insulin or not getting enough insulin.
  - Missing shots or under-dosing insulin often can cause DKA.
  - If you have an insulin pump and the tubing gets kinked or the pump stops working, you will not get enough insulin. When this happens, you will quickly start making ketones.

## What are the warning signs of DKA?

Warning signs include:

- Dry mouth and skin
- Increased thirst and urination (passing water)
- Upset stomach and vomiting
- Stomach cramps or pain
- Sweet, fruity odor on the breath
- Extreme weakness and tiredness
- Deep, heavy breathing
- Pain in the back or side

## How to prevent DKA

If you ever have a blood sugar level more than 300 mg/dL, have an upset stomach or are sick, tell your parents or another adult **right away**.

- Someone may need to help you.
- You will need to test yourself for ketones and you may need to take extra insulin if you have them.
- Make sure that you and your family know what to do to help prevent and treat DKA.

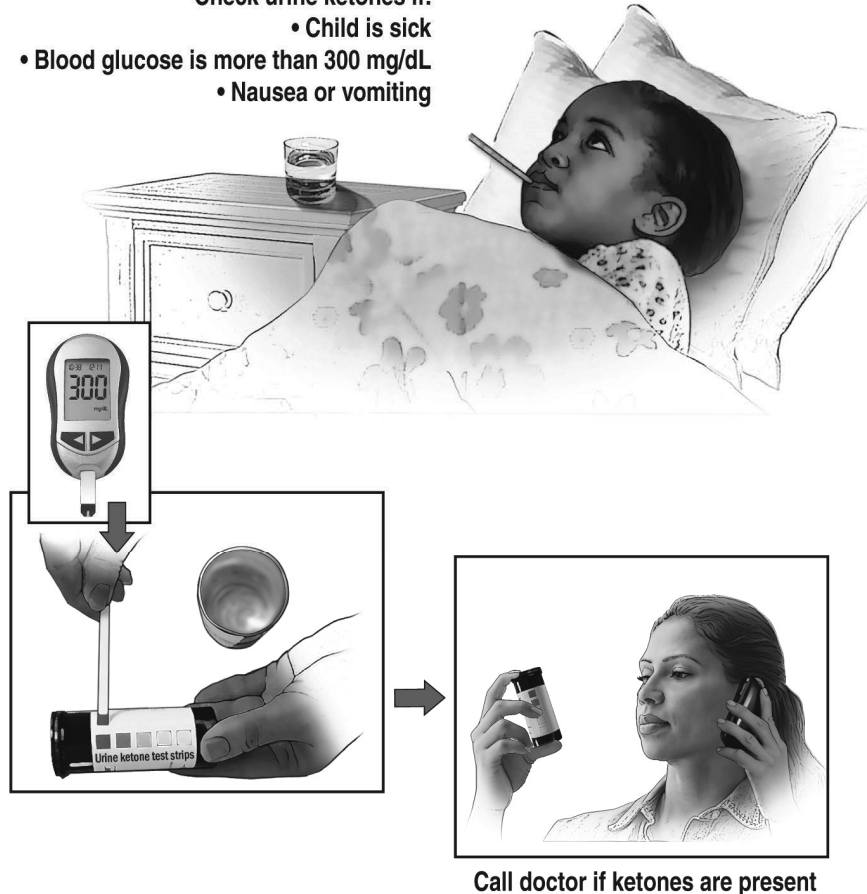
## For parents

Be sure to stay involved and review your child's blood sugar meter readings often. Even a teen that is very responsible can miss early signs of DKA. Test your child's ketones anytime your child:

- Has a blood sugar over 300 mg/dL
- Is ill
- Is sick, nauseous or throwing up, even if blood sugar levels are not high
- Has blood sugar levels that have been running high often
- Shows signs of DKA

## Hyperglycemia and Ketones

- Check urine ketones if:
- Child is sick
  - Blood glucose is more than 300 mg/dL
  - Nausea or vomiting



### How do I test for ketones?

There are 2 ways to check for ketones - a urine test and a blood test.

1. A ketone urine test is easy to do and does not cost much. It uses a “dip-and-read” urine test strip. Your nurse or diabetes team will show you how to use it. Be sure to also read instructions on the package.
2. Basic guidelines include:
  - Dip the test strip into a sample of fresh urine.
  - Begin timing and wait a certain number of seconds.
  - Compare the color of the strip to a chart on the container.
  - If the color changes, there are ketones in the urine.
3. Some home blood glucose monitors also test for ketones. If you would like to learn more about this method, talk with your child’s diabetes team or doctor.

## What should I do if my child has ketones in his urine or blood test?

### Moderate or large ketones

- If you find moderate or large ketones, call your child's doctor **right away**.
- Follow your doctor's advice about what to do. This may include:
  - Have your child rest and drink a glass of water or other calorie-free fluid.
  - Check your child's blood sugar and ketones often, such as every 2-4 hours.
  - Give your child extra insulin if his doctor tells you to.
- Your child may need to go to the hospital for more treatment.
- **Never leave your child alone if he has ketones or is vomiting.**

### Trace or small ketones

If your child has trace or small ketones, check them again in 2 hours.

## HYPEROSMOLAR HYPERGLYCEMIC NONKETOTIC SYNDROME

Hyperosmolar hyperglycemic nonketotic syndrome (HHNS) is very serious. It can happen to someone with Type 2 diabetes who is ill or stressed.

### Causes of HHNS include:

- Infection
- Illness
- Kidney failure
- Medicines like steroids or diuretics (water pills)
- Uncontrolled high blood sugar
- Bleeding stomach ulcer

### Signs of HHNS include:

- Drinking a lot
- Going to the bathroom often
- Weakness on 1 side of the body
- Confusion
- Dehydration including increased thirst, dry or sticky mouth, dry skin– Blurry vision
- Hallucinations
- Shock
- Coma, if untreated

### How to prevent HHNS

The best way to avoid HHNS is to check your child's blood sugar levels often.

- If his blood sugar is high and he does not respond to his usual insulin or medicine dose, call your child's doctor.
- If your child is sick, the doctor will want you to check his blood sugar levels more often. Also have him drink plenty of fluids.
- Your child may need to take more diabetes medicines. Only change the medicine dose if your child's doctor tells you to.

## Health Concerns

You will feel much better if you keep your blood sugar as close to normal as possible. You will also be better able to do all the things you enjoy.

- If you have high blood sugars often, you are at risk for having other health problems.
- Research shows that good blood sugar control helps to delay or prevent these problems. Good blood sugar control means that your average blood sugar level stays near a level that someone without diabetes would have.
- Learning good health habits now can help stop many health problems later.

There are different ways to measure blood sugar control. Since you cannot test your blood sugar each minute of the day, your doctor relies on a test called *Hemoglobin A1C* (HgbA1C).

### **Hemoglobin A1C Test (Hgb A1C)**

- This test shows what your average blood sugar level has been during the past 2 to 3 months.
- The number is reported as a percent (%).
- Research has shown that keeping your HgbA1C at 7 percent or lower helps prevent or delay other health problems.
- A HgbA1C of 7 may not be your goal. Talk with your doctor about what your goal is.

### **Comparing your A1C with your blood sugar levels**

You can use a formula to change your Hgb A1C percent to the same units your blood glucose meter uses. This allows you to compare these 2 levels. The formula changes your A1C to an “estimated Average Glucose” or eAG.

Here’s how the formula works:

- Multiply your Hgb A1C by 28.7.
- Then subtract 46.7 and round up
- This gives you your eAG

**Example:**

Your doctor tells you your Hgb A1C is 8.

$$8 \times 28.7 = 229.6$$

229.6 minus 46.7 = 182.9. Round up to 183.

So, if your Hgb A1C is 8, that means your average blood sugar has been 183. You can also use the chart below instead of doing the math.

A1C %	eAG (mg/dL)
6%	126
6.5%	140
7%	154
7.5%	169
8%	183
8.5%	197
9%	212
9.5%	226
10%	240

**SHORT-TERM PROBLEMS**

If your blood sugar level is high too often, you can be prone to certain infections. Infections usually raise your blood sugar level, which means your insulin needs will go up too.

**Skin infections**

Your skin helps to protect you from infections, so you must take good care of it. You can help prevent skin problems such as excess dryness, rashes, boils and other infections when you keep your blood sugar level within your target range.

When you have a cut, keep it clean and dry. Cover it with a bandage if needed. Watch for signs of infection such as fever (temperature over 100.3°F) or these signs around the cut:

- Redness
- Pus
- Swelling
- Excess warmth

Call your doctor if you see any signs of infection. Get treatment as soon as possible.

## Flu

The flu is an infection of the nose, throat and lungs. It is contagious, which means you can catch it from another person.

- All people with diabetes need a flu shot each year.
- Get your flu shot early in the fall so it will be working when the flu season begins.
- Preventing the flu can help prevent diabetic ketoacidosis.

## Pneumonia

Pneumonia is an infection of the lungs. A virus or germ can cause it. Like the flu, pneumonia can be serious for someone who has diabetes. Talk to your doctor about getting a pneumonia vaccine.

## Problems with your teeth

When blood sugar levels are high, the saliva in your mouth has more sugar in it. The extra sugar invites germs to grow, which can cause cavities and gum problems. Some tips to help prevent gum infections and teeth problems include:

- Keep your blood sugar level within your target range.
- Brush your teeth at least 2 times a day with a soft-bristle brush.
- Floss your teeth at least 1 time a day.
- Use mouthwash after brushing your teeth.
- Go to the dentist every 6 months. Make sure your dentist knows you have diabetes.

## LONG-TERM PROBLEMS

Diabetes can put you at risk for long-term problems. Most long-term problems are due to high blood sugar levels day after day, sometimes for years. You can reduce these risks when you manage your diabetes well.

### Eye problems

Diabetes can affect your vision. If you have diabetes, you are at risk for certain eye problems such as:

- **Cataract** – this occurs when the lens of the eye gets cloudy and you cannot see through it. The treatment for a cataract is surgery.
- **Glaucoma** –this happens when the fluid pressure inside the eyes gets too high. The increased pressure can damage the nerves in the eye. If not treated, it can cause blindness. Treatment for glaucoma is medicines or surgery.
- **Retinopathy** –diabetes can damage the tiny blood vessels inside your retina.
  - The retina is the tissue that lines the back of the eye. It acts like film in a camera to capture images that we see.
  - Retinopathy can cause the blood vessels in the eye to leak, and can cause blindness.
  - Treatment for retinopathy is laser surgery.
  - Glasses do not help restore eyesight lost from retinopathy.

### You can reduce the risk of serious eye problems when you:

- Keep your blood sugar in your target range.
- Get a good eye exam each year. Go to an eye doctor (ophthalmologist) or optometrist who specializes in diabetes care.
- Keep your blood pressure within normal limits.

## Heart disease

Diabetes can increase the risk for heart disease.

- High blood sugar can damage your blood vessels, including those that carry blood to your heart and brain.
- High blood sugar makes it easier for fat deposits to form in your vessels. These deposits can affect blood flow and lead to what is called coronary heart disease.
- High blood sugar also puts you at risk for high blood pressure, which can cause both heart disease and stroke.

### You can reduce the risk of heart disease when you:

- Keep your blood sugar level in your target range.
- Eat a healthy diet low in fat and high in fiber.
- Exercise each day.
- Keep within your target body weight.
- Do not smoke.
- Keep your blood pressure within a normal range.
- Keep your blood fats (lipids) such as cholesterol, LDL and HDL within a normal range.

## Kidney disease

Diabetes can cause kidney disease, also known as **nephropathy**. Kidney failure can occur if kidney disease is not treated. This means your kidneys no longer remove waste from your body. Kidney failure can cause waste products and toxins to build up in your blood.

### You can reduce the risk of kidney disease when you:

- Keep your blood sugar level in your target range.
- Keep your blood pressure within a normal range.
- Have a yearly urine test for a protein called albumin.
- This **urine test** is used to check for signs of early kidney problems. If the kidneys are working well, the albumin stays in the blood. If the kidneys are damaged, albumin will start spilling into the urine. This condition is called *microalbuminuria*. (“micro” means small and uria” means urine-small amounts of albumin in the urine). It is important to detect kidney problems early because people with this will likely progress to later stages of kidney disease if not treated.

Your doctor may order a medicine called an ACE inhibitor. It may help to slow the course of kidney disease.

See a doctor **right away** if you think you have a urinary tract infection. Signs of urinary tract infection include:

- Pain or burning when you pass urine.
- Feeling an urge to pass urine often.
- Pain in your bladder area even when you do not pass urine. The bladder is below your belly button and between your hip bones.
- Cloudy urine that may contain blood.
- Fever (temperature over 100.3°F) with no other signs of illness.
- Sometimes you can just feel bad all over—tired, shaky and ill.

### **Nerve damage**

Over time, high blood sugar levels can damage the nerves in your legs, feet, stomach, intestines and sex organs.

Signs of nerve damage include:

- Pain
- Burning
- Tingling or loss of feeling in your feet and hands
- Trouble swallowing
- Trouble going to the bathroom

### **You can reduce the risk of nerve disease when you:**

- Keep your blood sugar level in your target range.
- Have regular foot checks by a doctor.
- Take care of your feet.

### **Foot Problems**

People with diabetes can have problems with their feet if they do not take care of them. High blood sugar levels make your feet more at risk for dry skin and fungus infections.

High blood sugar also can harm the blood vessels and nerves in your body. This includes the ones in your feet. The loss of feeling in your feet makes it hard for you to tell if they are injured. If you do not treat foot injuries, they can get infected and cause serious health problems.

To help prevent problems, check your feet each day. Look for these things:

- Cuts
- Cracks
- Sores
- Red spots
- Swelling
- Ingrown toenails
- Splinters
- Blisters
- Calluses



## Taking care of your feet

### Protect your feet

- Always wear shoes and socks to keep your feet from getting hurt.
- Wear aqua shoes in the water to protect your feet while swimming and playing at the beach or pool. Take them off when you are done in the water, dry your feet, and put on dry shoes and socks.
- Do not wear shoes that hurt your feet and cause blisters.
- Break in new shoes slowly by wearing them 1 or 2 hours each day for a few weeks.

### Keep your feet clean

- Wash your feet in warm—not hot—water and dry them well. Dry between your toes to reduce the chance of fungus.
- Once a week and as needed, cut your toenails to the curve of the toe. Cut them even with the end of the toe. Do not cut them too short. Cut toenails when they are soft from washing.
- Rub lotion on the top and bottom of your feet to help prevent cracking and drying. Do not rub it between your toes.
- Be careful when getting a pedicure since cuts on your foot can get infected. Infections of the foot are often hard to treat. You may want to bring your own tools or just do pedicures at home.

### See a doctor if needed

- See a podiatrist (foot doctor) for any foot problems such as fungus infections and ingrown nails.
- Call your doctor if any foot problems do not heal after 3 days.

### Autoimmune diseases

There appears to be a link between Type 1 diabetes and other *autoimmune* diseases. Having Type 1 diabetes can put you more at risk for having one or more of these other problems. Ask your doctor or diabetes team for more information or if you have questions.

### Celiac disease

Celiac disease is an allergy to a protein called gluten. Gluten is found in grains such as wheat, rye and barley.

- Celiac disease can cause problems with keeping your blood sugar level within your target range.
- It is treated by eating a gluten-free diet. Your dietitian can tell you what the diet includes.

Signs of celiac disease include:

- Excess gas and bloating
- Stomach pain
- Diarrhea
- Short height for age
- Weight loss or unable to gain weight

If you have any of these signs, talk to your doctor.

## Thyroid problems

Your **thyroid** is a small gland in the lower part of your neck. It makes hormones that control how fast your body uses energy. These hormones also help you grow.

Thyroid disease is common in people with type 1 diabetes. Your doctor will check the size of your thyroid gland for signs of problems at office visits. You also may need a blood test to check your thyroid level.

Some thyroid problems are thought to be caused by *antibodies* in the blood. These antibodies can cause an allergic reaction that can damage the thyroid. This is like the autoimmune process that happens with type 1 diabetes when antibodies harm the beta cells in the pancreas.

If your thyroid does not work correctly, it can affect your:

- Weight
- Energy level
- Muscle strength
- Memory
- Heart rate
- Cholesterol level

There are two types of thyroid problems:

- **Hyperthyroidism** or overactive (too much) thyroid. Your body has more energy than normal. Your metabolism speeds up and you often lose weight.
- **Hypothyroidism** or underactive (too little) thyroid. Your body has less energy than normal. Your metabolism slows down and you often gain weight.

Medicines are used to treat thyroid problems. The type of medicine depends on whether your thyroid is overactive or underactive.



## Sick Days

Having diabetes means you need to take special care of yourself when you get sick. Just the stress of being sick can raise your blood sugar level.

- Colds, fever, vomiting and diarrhea can cause your blood sugar to rise.
- Low blood sugar can happen if you vomit or have diarrhea and cannot eat.

See the **Tips for Sick Days** handout in the Resources section on page 8.

### SPECIAL NOTE FOR PARENTS

**When your child is sick, he will need your help and he will need extra care. The rest of this chapter is written for you, so you will know what to do when your child is ill.**

Caring for your child when he is sick:

- Check your child's blood sugar level every 2 to 4 hours when he is sick.
- Check for ketones every 4 hours. When your child is sick, ketones can show up even if his blood sugar levels are low.
- Illness and infection cause the body to make stress hormones. Hormones cause the liver to release extra sugar. This can lead to diabetic ketoacidosis (DKA).
- **Nausea and vomiting are the first signs of DKA. Anytime your child has them, test for ketones.**

Call your child's diabetes doctor if he:

- Vomits or has diarrhea more than 1 time in 24 hours (a single day).
- Has a blood sugar level of more than 240 mg/dL for 3 times in 24 hours (a single day).
- Has moderate to large ketones.
- Has a temperature higher than 101.5°F.
- Does not respond to his usual dose of insulin and you do not know how much insulin to give.
- Cannot eat or drink.
- Has low blood sugar and you cannot get it to come up by giving him carbs to eat.

When you call the doctor, he will want to know your child's:

- Blood sugar levels for the last 24 to 48 hours
- Ketone levels for the last 24 to 48 hours
- Current temperature
- Symptoms such as sore throat, earache, nausea, diarrhea or vomiting
- Last insulin or diabetes medicine dose

Also, tell the doctor these things about your child:

- What other medicines he takes
- What and how much food and drink he had in the past 24 hours
- The last time he urinated (passed water)

**Call 911 right away if your child:**

- Is less alert
- Has trouble breathing such as:
  - Is working **very** hard to breathe or finds it hard to take a breath
  - Grunts when he breathes
  - Has chest retractions (skin pulling in around the ribs and chest when breathing)
  - Has a blue or dark purple color to the nail beds, lips or gums.
  - Stops breathing for more than 10 seconds
  - Cannot speak while trying to breathe

**Insulin**

**Your child should not stop taking his insulin or diabetes medicine when he gets sick unless the doctor tells you to stop.** But your child's dose may need to change on sick days.

- Your child may need more insulin to help keep his blood sugar in his target range.
- Or he may need less insulin if he cannot eat.
- If your child takes glucophage and he is vomiting, do not give it. Call his doctor.

Your diabetes doctor or a member of your diabetes team will help you decide how much insulin your child should have when he is sick.

**Food**

When your child is sick:

- He may not feel like eating, even though his body needs more energy to fight illness.
- If he is too sick to eat, his body will get energy from sugar stored in the liver.
- This can make his blood sugar level rise.

You can better manage your child's blood sugar level when he is sick by making sure that he takes his insulin or diabetes medicine. This is true even if he does not eat or does not eat as much.

- Check his blood sugar and call the doctor to see how much insulin he needs to take and when to take it.
- As soon as he feels like it, offer him soft foods in small amounts.
- For more help, see the table on page 72.

**Liquids**

People who are sick can get dehydrated (dried out), especially with fever, vomiting and diarrhea. When the body does not have enough water, blood sugar levels can rise.

- Have your child drink plenty of liquids so he stays hydrated.
- Try to get him to drink ½ to 1 cup an hour, based on his size.

### General guidelines for vomiting:

- **Call the diabetes doctor if your child vomits more than 1 time in 24 hours.** Call the diabetes doctor if he throws up a second time.
- Allow your child's stomach to rest 15 to 30 minutes after he vomits the first time.
- After this, start with a 1 teaspoon of clear liquid every 5 minutes.
- Offer 1 teaspoon of liquid or a few ice chips every 5 minutes for 20 to 30 minutes if he can keep it down.
- Increase the amount to 1 ounce (5 – 6 teaspoons) every 10 to 15 minutes if he can keep it down.
- Slowly increase the amount until your child can drink as much as he wants.

### Types of liquids to use

- If your child's blood sugar is within his target blood sugar range or higher, give him sugar-free clear liquids.
- If your child's blood sugar level is lower than his target range and he has had insulin, call his diabetes doctor. The doctor may tell you to use liquids with sugar.

### Medicines

Medicines can also affect blood sugar levels. Ask your child's diabetes doctor or pharmacist how the medicine he takes can affect his blood sugar level. This includes any medicines, herbs or supplements that are sold over-the-counter without a prescription.

- Prescription medicines, such as steroids for treating asthma and poison ivy, can raise blood sugar levels. This increases your child's insulin needs.
- You do not need to buy sugar-free cough syrups and liquid over-the-counter medicines. The small amount of sugar added is not enough to affect blood sugar levels when taken in the dose advised by your child's doctor.
- Your doctor may prescribe Zofran (Ondansetron) for nausea and vomiting. **Zofran** is usually prescribed as a tablet that dissolves on the tongue. The tablet usually dissolves in a few seconds and can be swallowed with saliva. Talk with your doctor before you give this medicine.
- If your child is older than 2 years, your doctor may prescribe suppositories for nausea and vomiting.
  - A suppository is a medicine that you give into the rectum (your child's bottom).
  - Store them in the refrigerator. Insert them with the rounded end first.
  - Most of these medicines can cause your child to feel sleepy.
  - Talk with your doctor before you give these medicines.

**Carbs can help**

If your child cannot eat regular meals, try giving him soft foods or drinks that equal 15 grams of carbs each hour. The table below gives you some examples of food and drinks that equal 15 grams of carbs. Be sure to write down what your child eats so you can tell the doctor.

<b>Food</b>	<b>Amounts</b>
Regular soda made with sugar, such as ginger ale and cola	¾ cup (6 ounces)
Juice	½ cup (4 ounces)
Gatorade	1 cup (8 ounces)
Milk	1 cup
Corn syrup	1 tablespoon
Tapioca pudding	1/3 cup
Custard	½ cup
Fruit-flavored yogurt	½ to 1/3 cup
Regular Jell-O	½ cup
Steamed rice	1/3 cup
Toast	1 slice
Saltine crackers	4 to 6 crackers
Vanilla wafers	5 wafers
Graham crackers	3 square crackers
Soup	1 cup

# Managing Diabetes at School

You will need help taking care of your diabetes at school, just like you do at home. Your doctor and diabetes team will make a plan for your school to follow. The plan can help keep you safe while you go to class and take part in activities you like, such as gym, field trips and after-school programs. Look in the resource section for an example of a diabetes management plan for school. Your doctor will need to complete and sign one before you go back to school.

The plan will tell the staff at your school what they need to do to help you manage your diabetes. The plan will:

- Include a list of your medicines, including your dose and when you should take them.
- Tell when you should check your blood sugar and ketones.
- Describe your meal plan and when you should have snacks.
- Include guidelines for exercise.
- Tell how to deal with high or low blood sugar levels.
- Include phone numbers for your parents and your doctor.
- Describe where your diabetes supplies will be kept.

Your parents need to share the plan at a yearly meeting with all of the people involved in your classes and activities, such as your:

- Teachers
- Principal
- School nurse
- Counselor
- Coach
- Bus driver
- Cafeteria manager

## TEACHING THE TEACHERS

Your parents need to train school staff about how to care for your diabetes. Your care at school will be a combined effort between the school and your parents. Things that school staff may need help with include:

- Learning the signs of low blood sugar and what action to take.
- How to use your blood glucose meter.
- How to give glucagon.
- How to prevent low blood sugar during gym class or sports activities.
- How to count carbs so you can eat in the school cafeteria and at parties.
- Permitting you to take extra trips to the bathroom or water fountain if needed.

The **Tips for Teachers** handout in the Resources section on page 5, can help school staff learn how to better manage your needs.



Other ways your parents can help:

- Update your school health plan to note changes to your diabetes care.
- Tell your school if you are having out-of-range blood sugar levels.
- Sign paperwork giving permission for trained staff to give you insulin and medicines.
- Talk regularly with the nurse about your blood sugar levels.
- Provide your diabetes supplies to your school.
- Let your school know when you will be absent for appointments with your diabetes doctors.

### **Keep these diabetes supplies at school**

- Insulin, syringes and alcohol swabs
- Blood sugar meter, test strips, lancet holder and lancets
- Ketone strips
- Fast-acting and slow-acting emergency carbohydrate snacks for treatment of low blood sugar. Make sure they are nonperishable.
- Glucose tablets
- Glucose gel
- Glucagon kit with directions for use
- Glucose logs

### **Ways your school can help**

Your school can help you and also abide by federal laws by training staff members. The school needs to be sure they have staff trained in:

- Knowing the signs and treating the symptoms of low blood sugar
- Testing blood sugar levels
- Giving insulin and glucagon
- Testing ketones
- Counting carbohydrates

This includes having a system in place to tell substitute teachers and bus drivers that you have diabetes.

They can also help by allowing you to:

- Have extra bathroom breaks—The school staff needs to know that you may need to use the restroom more often when your blood sugar level is high. You also may need to have a bottle of water in class.
- Treat low blood sugar levels promptly—This may mean that you keep your blood sugar meter with you so you can limit the amount of class time you miss to treat it. If your supplies are kept in another part of the school, you will need an adult to go with you so you are sure to get there safely.
- Be absent as needed—You may need to be absent now and then for medical appointments and diabetes classes.
- Eat meals or snacks whenever and wherever needed—This includes eating lunch at the correct time. It also means having enough time to check your blood sugar, take insulin and finish your meal.
- Make special arrangements for taking tests—If you have signs of a high or low blood sugar level while taking a test, the school needs to give you extra time to check your blood sugar and treat it. If the test is a standardized test given by someone other than the local school system, your school must tell them about your special needs.
- Make up missed days of school—The school needs to work with you to make a plan for making up missed class work and tests when you are absent due to diabetes appointments or classes.
- Take part in all school sports, physical education and field trips—The school needs to provide trained staff that can help with your diabetes care as needed.
- Have nutrition and carbohydrate information of items on the school menu—Each school district has a school nutrition director who oversees this.

## LAWS AND DIABETES

There are federal laws that protect children with diabetes from discrimination in schools. They include:

- Section 504—Rehabilitation Act of 1973
- Individuals with Disabilities Education Act
- Americans with Disabilities Act
- Safe at School – HB 879

These laws state that any school receiving federal funds must provide for the special needs of a child with diabetes. These laws also assure that you have an equal chance for all of the activities and opportunities in school. This means that the school should:

- Provide as little disruption to your usual routine as possible.
- Plan for you to safely and fully take part in all school activities.
- Create a written plan stating how they will help you, such as a diabetes health care plan, a 504 plan or an IEP.
- HB 879 – Safe at School states that additional school personnel, who have completed training coordinated by the school nurse and who provides care under the supervision of the school nurse or other health care professional, needs to be prepared to perform diabetes care tasks at school when a school nurse or other health care professional is not available.

**For more information on diabetes in the school setting see the resources below:**

Resource	Web address
American Diabetes Association	<a href="http://www.diabetes.org/for-parents-and-kids.jsp">http://www.diabetes.org/for-parents-and-kids.jsp</a>
Children with Diabetes	<a href="http://www.childrenwithdiabetes.com/d_0q_000.htm">http://www.childrenwithdiabetes.com/d_0q_000.htm</a>
Juvenile Diabetes Research Foundation	<a href="http://www.jdrf.org/index.cfm?page_id=102709">http://www.jdrf.org/index.cfm?page_id=102709</a>
National Institute of Health	<a href="http://www.ndep.nih.gov/diabetes/pubs/Youth_SchoolGuide.pdf">http://www.ndep.nih.gov/diabetes/pubs/Youth_SchoolGuide.pdf</a>
College Board	<a href="http://www.collegeboard.com/ssd/student/eligible.html">http://www.collegeboard.com/ssd/student/eligible.html</a>
JDRF School Advisory Toolkit	<a href="http://www.jdrf.org">www.jdrf.org</a> Select "Life with Diabetes" Then a drop down list will appear- select "Type 1 Diabetes in school" and complete the request to receive a downloadable copy.

# Traveling When You Have Diabetes

If you and your family plan ahead, there is no reason for diabetes to get in the way of your vacation plans.

## TALK TO YOUR DOCTOR

See your doctor for a checkup before you go on a trip to make sure your diabetes is in good control. Tell your doctor how you will travel and where you will go. If you go through different time zones, you may need to adjust your insulin dose or timing.

Your doctor also can:

- Decide how and where you can get emergency medical help.
- Write a letter that says you have diabetes and tells about your care needs. You may need to give this letter to airport security before boarding an airplane.
- Write a prescription for insulin, syringes and other diabetes supplies.

## Things you can do to make your trip easier and more enjoyable:

- Make a checklist of the supplies you will need on your trip. You can find a checklist of supplies in the Resources section on page 6 to help you pack.
- Pack more of each item than you really need. It is better to have more supplies than not enough.
- Divide the supplies in 2 separate bags.
  - One bag will be a backup in case one gets lost.
  - Have someone else carry 1 of the bags and keep 1 bag with you. Do not check them with your other bags at the airport.

## Traveling

If you travel outside the United States, know that other countries might not have the type of insulin you use.

- Insulin used in the United States is U-100 strength. This means there are 100 units of insulin per milliliter (mL).
- Other countries do not always have U-100 insulin. Insulin may come in U-40 or U-80 strength in other countries.
- If you must use their insulin, you will need to buy new syringes to match the new insulin. Plan for this change before you go and ask your doctor about it.

Other things to keep in mind if you are out of the country:

- Plan to get any vaccines you need well in advance. If the shots make you sick, you will have plenty of time to get better.
- Learn how to say “I have diabetes” and “sugar or orange juice please” in the language of the country you visit.
- Wear a medical identification alert (ID necklace or bracelet).

If you get sick or need help while away, know that prescription laws may be different in other countries. There are some groups that can help:

- Diabetes Federation Group: [www.idf.org](http://www.idf.org)
- International Association for Medical Assistance to Travelers: [www.iamat.org](http://www.iamat.org)
- U.S. Consulate in the country you are visiting

### **FOOD AND DRINKS**

Here is a list of foods and drinks you can take with you:

- Sugar substitutes
- Things that you can quickly eat or drink in case meals are delayed or your blood sugar drops:
  - Bags or sliced bread
  - Pretzels
  - Low-fat crackers
  - Small jar of peanut butter
  - Nuts
  - Tuna or chicken packed in water
  - Juice or fruit (single servings)
  - Soup
  - Fresh fruit
  - Dried fruit
  - Dry soup mixes
  - Dry cereal, granola bars or trail mix
  - Shelf-stable milk
  - Microwave popcorn
  - Bottled water
  - Diet soft drinks

In some foreign countries, you need to be careful about the quality of the water. You can get sick by drinking it.

- You can drink bottled water or boil local water for 5 minutes before you drink it.
- Use the bottled or boiled water to brush your teeth.
- Be careful not to get water inside your mouth when you shower or wash your face.

## **TRAVEL BY PLANE**

Check with the airline you will be flying with to find out their rules about taking medical supplies such as syringes and insulin. Also, refer to the Transportation and Security Administration website at [www.tsa.gov](http://www.tsa.gov) for more information.

When you arrive at the airport, tell airport security that you have diabetes and that you have your supplies with you. These diabetes supplies are allowed through the checkpoint once they are screened:

- Insulin and insulin-loaded dispensers (vials or box of individual vials) jet injectors, biojectors, epinephrine pens, infusers and preloaded syringes.
- Unlimited number of unused syringes or pen needles as long as you have insulin or other injectable medicine as well.
- Lancets
- Blood sugar meters, strips, meter test solutions
- Alcohol swabs
- Insulin pump and supplies such as cleaning agents, batteries, reservoir, plastic tubing, infusion kit and insertion device. You must have insulin to go with them.
- Glucagon emergency kit. You must label it clearly and keep it in the original box.
- Ketone test strips
- Used syringes that are inside a disposal container.
- Insulin in any form or in a dispenser must be clearly identified.

## **IF YOU WEAR A PUMP**

Tell the security guard that you have an insulin pump and that you cannot remove it. Tell him that it is connected to a catheter that goes under your skin.

- If you are concerned about going through metal detector with your pump, tell the security guard about it.
- Let him know that you want a visual check instead. The check may involve a “pat-down.”
- You must have insulin with you to go with the pump.

Please refer to the transportation and security administration website at [www.tsa.gov](http://www.tsa.gov) for more information.



## Diabetes and Feelings

You may have many different feelings when you find out you have diabetes. You may feel shocked, scared, angry or sad. You may be thinking:

- **Why me?** I cannot believe this is happening to me.
- **I am afraid.** Shots scare me. I am afraid of being sick.
- **I do not want to learn all this stuff.** I do not care about diabetes. Maybe it will go away if I ignore it.
- **I am really mad that I have diabetes.** I am angry with my friends and family—they just do not understand.
- **What did I do wrong?** What did I do to cause this?
- **I feel so sad and alone.** No one else I know has diabetes. No one knows how I feel.

All of these feelings are normal. Many other people with diabetes have felt them too. Know that in time, you will learn to accept and manage it.

- You may not be the only one who has these feelings. Your family may be upset too.
- Diabetes affects the whole family. Each person in your family might feel differently about it. They may need time to figure out what helps them cope with it.

Talk with your family and friends about your feelings. Listen to each other and help one another. It is easier when you have help and support from those around you, especially your family.

Here are some ways your family members can help each other adjust:

- Support one another by eating the same foods.
- Exercise together.
- Thank and praise each other when someone makes a change to adjust to diabetes.
- Allow everyone to express his feelings. Listen to what they have to say and ask how you can help.
- Be flexible and willing to change.

You can also talk with other families and children who live with diabetes. There are support groups and Web sites where you can meet other parents and children living with it. Ask your diabetes team and see the resource list in the back of the handbook on page 96 for more information.

Most people with diabetes do not let it limit their lives. Managing diabetes will become a part of your daily routine. You and your family may still have days when you wish there was no such thing as diabetes. But you also will find that you have the strength and the know-how to handle it.

Even though you cannot change the reality of having diabetes, you can always choose to change the way you feel about it and how you cope with it. Knowing this can help you to feel strong and empowered.



## FEELINGS ABOUT DIABETES

Having diabetes may cause extra stress for you and your family. But stress can be both good and bad for you.

- The good kind of stress makes you get something done. This is the kind of stress you might feel when you have to give a report in front of your class or play in a soccer game.
- The bad kind of stress can overload your body and mind.

You can make yourself sick by feeling stressed-out about having diabetes all the time. That is because stress raises your blood sugar level. Stress can also make you feel like not taking care of yourself.

Everyone responds to stress differently. The way you respond to stress is called coping. You can find ways to make stress work **for** you instead of **against** you.

To cope with stress, you have to know how your body reacts to stress. Some signs to look for include:

- Headaches
- Tight muscles
- Changes in how much you eat or sleep
- Feeling angry or tense

You cannot remove stress from your life. But there are things you can do to help prevent or manage it. Make a list of things you like to do to help ease stress when you feel it. Here are some ideas to start with:

- **Exercise:** Exercise is a great way to reduce stress. Walking, swimming, dancing, biking and playing basketball are great ways to “blow off steam.”
- **Talk about it:** Talking with someone can help you decide what to do. Knowing when to ask for help can head off problems. Join a support group or talk to a family member, friend or counselor.
- **Know your limits:** Sometimes you may feel overwhelmed by stress. Learn to accept things the way they are. Do not take on more than you can handle.
- **Take care of yourself:** Get enough rest and eat well to stay strong and healthy. This can be a big help during stressful times.
- **Relax:** Do some deep breathing and stretch your muscles. Picture yourself in a place that is beautiful, peaceful and carefree. Give your mind time to relax every day. It can relax your body and help improve your diabetes control.
- **Do less:** Cut the number of demands on your time. Do fewer things and do them better.
- **Have fun:** Do things that are fun and make you forget about stressful things. Do something you enjoy, like listening to music, reading a book or working on a hobby.
- **Reflect:** Think about how you’ve handled stress in the past. That can help you find ways to deal with it now.
- **Pat yourself on the back for all you do. You are your own “best friend.” Think positive thoughts.**

## PEOPLE JUST LIKE YOU

You are not alone. Sometimes it is helpful to meet or know other people who have diabetes, too. There are more than 20 million children and adults with diabetes in the United States. The disease affects all kinds of people, even singers, movie stars, athletes and historical figures like:

- **Arthur Ashe**, first African-American to be ranked No. 1 in the world in tennis (Type 2 diabetes)
- **Nicole Johnson Baker**, winner of the 1999 Miss America pageant, who found out she had diabetes the same year she won her title (Type 1 diabetes)
- **Halle Berry**, actress who played Storm in the X-men movies (Type 2 diabetes)
- **Crystal Bowersox**, 2010 American Idol semi-finalist (Type 1 diabetes)
- **Nick Boynton**, plays defense for the Boston Bruins hockey team (Type 1 diabetes)
- **Will Cross**, high school principal and the first person with diabetes to reach the top of Mount Everest (Type 1 diabetes)
- **Chris Dudley**, former NBA player for the Phoenix Suns and New York Knicks (Type 1 diabetes)
- **Thomas Edison**, inventor who created many things during his life, including the first successful electric light bulb (Type 2 diabetes)
- **Gary Hall**, Olympic swimmer (Type 1 diabetes)
- **Nick Jonas**, teen idol and band member of the Jonas Brothers (Type 1 diabetes)
- **Zippora Karz**, professional ballerina for the New York City Ballet (Type 1 diabetes)
- **Charlie Kimball**, drives the No. 83 car for Novo Nordisk Chip Ganassi Racing in the IZOD IndyCar Series and is the first licensed driver with diabetes in the history of INDYCAR (Type 1 diabetes)
- **Patti LaBelle**, jazz singer (Type 2 diabetes)
- **George Lucas**, writer and director who created the Star Wars movies (Type 2 diabetes)
- **Mary Tyler Moore**, actress who has been active with the Juvenile Diabetes Research Foundation (Type 1 diabetes)
- **Jackie Robinson**, first African-American baseball star in the Major Leagues (Type 1 diabetes)
- **Ron Santo**, Chicago Cubs broadcaster and former All-Star third baseman (Type 1 diabetes)
- **Sonia Sotomayor**, first Latino Supreme Court Justice, who has had Type 1 diabetes since age 8.
- **Elliott Yamin**, a singing contestant on the fifth season of American Idol (Type 1 diabetes)



# A Message to Parents

Managing diabetes is a team effort. It requires support from the whole family and the diabetes care provider. Even if your child is a teenager, he still needs your constant support and guidance to help manage his diabetes.

Children mature and develop at different ages. Some children are ready to be involved in their own diabetes care at an early age, others when they are much older. Talk with your child's doctor, dietitian, diabetes educator or *social worker* for more advice. You also can talk with another family who has a child with diabetes. Ask your diabetes team how you could meet another family.

Below are some examples of the things children might do at different ages.

## **YOUNGER THAN AGE 3**

### **Child's behavior**

When it is time for a blood test or shot:

- Runs away.
- Throws a temper tantrum and acts out.
- Cries and acts afraid.

### **What you can do to help**

- Stay calm and ignore tantrums and poor behavior when you can. Let it run its course and then begin.
- Prepare supplies away from your child's view.
- Tell your child right before you are going to do something. Do not tell a young child ahead of time.
- Have a certain place in your home for diabetes care.
- Keep your child's bedroom or play area a "safe place."
- Give hugs, kisses and praise when your child cooperates with his diabetes care.
- Allow your child to "act out" his care with a favorite doll or stuffed animal.
- Give small rewards such as stickers and sticker charts after care is done. See the sticker chart in the resources section.

## **AGES 3 to 7**

### **Child's behavior**

- Wants to help with his care, but is not able to do certain things yet.
- Will not always eat food you prepare.
- Resists care.

### **What you can do to help**

- Explain things in simple terms. Tell your child several minutes before you are going to do something.
- Allow your child to help gather supplies, clean a finger or choose the site for the insulin shot.
- Offer two or three food choices when you can—let your child pick one.
- Allow your child to set the table or help prepare part of the meal to make him feel included.
- Help your child meet other children who have diabetes through school, the Juvenile Diabetes Research Foundation and diabetes day camps.

## **AGES 8 to 11**

### **Child's behavior**

- Children at this age are usually eager to help and learn.
- Hand and eye coordination is good enough to begin doing some self-care.

### **What you can do to help**

- Even though your child wants to do things, **be sure to watch or supervise him with blood sugar levels, insulin shots or taking medicines.** He is not yet ready to be on his own.
- A child younger than age 11 should not inject insulin alone.
- Allow your child to begin doing some things, such as lancing his finger, gathering supplies, keeping a journal or helping plan or prepare meals.
- Teach your child about how food and exercise affect blood sugar levels.
- Praise your child's efforts to learn diabetes care—do not praise blood sugar results. It is best to call a reading "low," "high" or "okay" rather than to say "good" or "bad."
- Send your child to a diabetes summer camp.

## **AGES 12 to 18**

### **Child's behavior**

- Teens usually are ready to begin caring for themselves.
- Teens want to be independent, but may not be responsible. They may not check their blood sugar levels or take their medicine the way they should.
- Teens are going through a time of rapid growth, increased thinking ability and self-discovery.
- Friends and peers are very important to them.
- They may rebel or take risks with alcohol, tobacco or drugs. These activities are more of a problem to someone with diabetes. They can raise or lower blood sugar levels and increase the risk of heart and kidney problems.

### **What you can do to help**

- Your teen can check his own blood sugar level and take his own insulin shots or medicines, but he still needs your help and guidance. You will still need to be involved with his care.
- Make an agreement with your teen about what you will continue to check. For instance, you could allow him to check his own blood sugar levels each day. But you could agree to have him leave his monitor on the table each night so you can check his levels for that day.
- Praise your teen for being responsible and for managing his diabetes.
- Tell your teen as much ahead of time as possible about doctor's appointments and changes in his treatment plan.
- Arrange for your teen to speak with another teenager with diabetes. Support groups such as the Juvenile Diabetes Research Fund (JDRF) at [www.jdrfgeorgia.org](http://www.jdrfgeorgia.org) can help. They allow your teen to meet and share with others who may be going through the same type of issues.
- Teens are tuned into online social networking. Refer your teen to these reputable sites to learn about and meet others just like them who live with Type 1 diabetes.

## Teen Resources

1. <http://wdd.quickcompliance.net/>- this website shows a bunch of different videos produced by kids with Type for World Diabetes Day.
2. [www.juvenation.org](http://www.juvenation.org) – a social networking web site run by JDRF geared toward teens living with Type 1
3. [www.tudiabetes.org](http://www.tudiabetes.org) - a website to share personal experiences and information about living with diabetes.
4. [www.childrenwithdiabetes.com](http://www.childrenwithdiabetes.com) – excellent website with chat rooms
5. [http://www.joslin.org/phs/parent\\_discussion\\_board.html](http://www.joslin.org/phs/parent_discussion_board.html) - there is also a teen discussion board
6. [www.medtronicdiabetes.com/lenny-carb-app](http://www.medtronicdiabetes.com/lenny-carb-app). - Medtronics carb counting app for iphone
7. <http://www.dlife.com/dlifeTv/c987206439rn-Kids-Teens.html> - check out videos from Nick Jonas and other teens – like professional snowboarders living with Type 1



# Research

Diabetes Research is the key to better diabetes treatment and improved monitoring. It is a path toward a cure.

**Participation** in research is not for everyone and not every child with diabetes will be eligible. But all patients and families should be aware that diabetes research studies are taking place in the U.S. and around the world. We encourage you to be your child's advocate and seek out information.

## What are some of the Diabetes Research focus areas?

1. Stop or slow the progression of type 1 diabetes by protecting or preserving the remaining beta cells in people who are newly diagnosed. (Halting the autoimmune destruction)
2. Prevent or reverse complications in those who have been living with diabetes for years.
3. Prevent diabetes and identify those at risk.
4. Improve the treatment of type 1 and type 2 diabetes. (Develop new insulins and new medications.)
5. Provide better tools to achieve tight glucose control. (Develop new innovative technologies-insulin pumps, continuous glucose sensors, and artificial pancreas)
6. Develop therapies for islet cell replacement and regeneration.
7. Prevent obesity in children.

## What is a clinical trial?

It is a health related research study that determines the effectiveness of a medication or medical device in treating or preventing a condition in a large group of people. Usually volunteers are recruited.

## Why should newly diagnosed diabetes patients and families learn about this complex subject of clinical trials?

The answer is simple. Clinical trials are the only road toward improving diabetes treatment. It is a path toward prevention and even a cure. When diabetes researchers come up with a new treatment, they must prove to their colleagues and to patients that the new treatment is better or at least equal to existing treatments. The only way to prove it is to run a clinical trial to demonstrate how the new treatment fares when compared to the standard treatment. Participants in clinical studies may gain access to new research treatments before they are available.

## Is there a time factor?

If you think you may wish to join a study, call as soon as possible because many studies need to start soon after diagnosis.



### **Where do I start?**

Choosing to participate in a clinical trial is an important personal decision and can be overwhelming. So begin by speaking to your child's endocrinologist about the different trials. Your pediatric endocrinologist office may have a research department. Then we would suggest contacting the trial research staff directly to ask specific questions.

### **Ways to stay informed:**

Children's Healthcare of Atlanta has a type 1 diabetes research team. Feel free to email [Type1diabetes@emory.edu](mailto:Type1diabetes@emory.edu) or call 404-785-T1DM (8136) to contact the type 1 research team directly.

<http://www.pedsresearch.org> Emory Children's Pediatric Research Center

<http://www.choa.org/Pediatric-Research> Children's Healthcare of Atlanta Research Department

<http://www.trials.jdrf.org> The JDRF Type 1 Diabetes Clinical Trials Connection

<http://www.clinicaltrials.gov> US National Institute of Health

<http://www.clinicaltrials.gov/ct2/info/understand>

### **Questions to Ask Before Participating in a Clinical Trial**

From **CISCRP**(Center for Information and Study on Clinical Research Participation)

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

1. What is the main purpose of this study?
2. Does the study involve a placebo or a treatment that is already on the market?
3. How will the treatment be given to me?
4. How long is the study going to last and what will I be asked to do as a participant?
5. What has been learned about the study treatment and are any study results published?
6. Do I have to pay for any part of the study? Will my insurance cover these costs?
7. Is there any reimbursement for travel costs or childcare?
8. Will I be able to see my own doctor?
9. If the treatment works for me, can I keep using it after the study?
10. Can anyone find out whether I am participating in the clinical trial?
11. Will I receive any follow-up care after the study has ended?
12. What will happen to my medical care if I stop participating in the study?
13. Does the physician/investigator have any financial or special interest in the clinical study?
14. What are the credentials and research experience of the physician and study staff?

## Glossary

***Acanthosis nigricans:*** A skin condition characterized by darkened skin patches in the neck and groin area. Common in people with Type 2 diabetes with insulin resistance.

***Acesulfame K:*** An artificial sweetener that is 200 times sweeter than sugar. This sweetener has no calories. Brand names include Sunett and Sweet One.

***Aerobic exercise:*** Any activity that keeps the heart beating at its target rate.

***Antibody:*** A protein the body makes to protect itself from “foreign” substances like bacteria or a virus. People who get Type 1 diabetes make antibodies that destroy the insulin-making cells in the pancreas, called beta cells.

***Aspartame:*** An artificial sweetener that is 200 times sweeter than sugar. Brand names include Equal and NutraSweet.

***Autoimmune:*** Occurs when the body’s immune system mistakenly attacks and destroys body tissue that it believes to be foreign.

***Basal insulin:*** The “background” insulin taken to sustain energy between meals (Lantus and NPH).

***Beta cell:*** A cell that makes insulin. Beta cells are located in the islets of the pancreas.

***Bolus insulin:*** The extra amount of quick-acting insulin taken to cover the expected rise in blood sugar after a meal or snack. This insulin also is used to correct a high blood sugar reading (NovoLog, Humalog, Apidra).

***Carbohydrates:*** One of the three nutrients in food that provides calories, changes to sugar in the blood and gives your body energy.

***Cataracts:*** A clouding of the eye lens that can cause decreased vision.

***Cholesterol:*** A kind of fat made by the body that is in some foods we eat. It is found in foods that come from animals, including eggs, dairy products, meat and poultry.

***Clinical trial:*** A research study that involves human volunteers and answers questions about how well a medicine or medical device works.

***Diabetes:*** A disease that occurs when the body does not produce insulin or when the body does not use insulin the way it should, causing blood sugar to rise.

***Diabetes educator:*** A healthcare worker who teaches people how to manage their diabetes. Some are certified diabetes educators (CDE). They work in hospitals and doctors’ offices, and for managed care companies.

***Diabetic ketoacidosis (DKA):*** A life-threatening condition that happens when there is extreme high blood sugar and severe lack of insulin, causing the body to break down fat for energy. Signs of DKA are nausea, vomiting, stomach pain, rapid breathing and fruity odor to the breath. If untreated, DKA can lead to coma and death.

***Dietitian:*** A healthcare worker who specializes in nutrition and meal planning.

**Endocrinologist:** A doctor who cares for people with endocrine gland problems, such as diabetes.

**Fat:** One of the three main nutrients that provides calories in foods such as oils, butter, margarine and nuts. Fat has little to no effect on blood sugar levels.

**Fiber:** A part of food that cannot be digested. It helps clean out the intestines. Fiber is found in fruits, vegetables, whole grains, breads and cereal.

**Fructose:** A natural sugar found in fruit.

**Glucagon:** A hormone made in the pancreas. It raises blood sugar by causing stored sugar (glucose) to be released from the liver.

**Glucose:** The medical word for sugar. The body uses glucose (sugar) from the food you eat for energy.

**Hemoglobin A1c test:** A blood test that measures the average blood sugar level over two to three months. Also called a glycosolated hemoglobin test.

**Hyperglycemia:** A high blood sugar (glucose) level.

**Hyperosmolar hyperglycemic nonketotic state (HHNS):** A serious condition that happens in people with Type 2 diabetes. Warning signs include high blood sugars above 600, dehydration, fever, weakness, sleepiness or confusion and seizures.

**Hypoglycemia:** A low blood sugar (glucose) level.

**Honeymoon phase:** When some insulin secretion occurs for a short time after someone is newly diagnosed with Type 1 diabetes. It causes normal blood sugar with very little to no outside source of insulin.

**Insulin:** A hormone made in the pancreas that helps the body use sugar for energy.

**Ketoacidosis:** An emergency condition when blood sugar levels are high from not enough insulin. The body uses fat for energy and causes ketones to build up in the blood.

**Ketone:** A product made when there is a shortage of insulin, causing the body to use fat for energy.

**Kussmaul breathing:** Rapid or deep breathing that can happen with diabetic ketoacidosis.

**Ketostix®:** Strips used to check urine for ketones.

**Mannitol:** A sugar alcohol that is half as sweet as sugar and has 4 calories per gram.

**mg/dL:** Milligrams per deciliter. A unit of measure that is used to show the concentration of sugar in the blood. Other countries use millimoles per liter (mmol/L). To convert mmol/L to mg/dL, multiply mmol/L by 18. For example: a glucose reading of 18 mmol/L = 324 mg/dL.

**Microalbumin :** small proteins called “albumin” that escape through the kidneys filtering system and passes into the urine – having higher than average microalbumin in the urine is an early sign of kidney disease. A urine test is used to detect this.

**Nephropathy:** Kidney disease caused by diabetes. This happens when diabetes damages the small blood vessels in the kidneys, allowing protein to leak out of the kidneys and into the urine.

**Nutrient:** A substance in food that is needed for life. Nutrients include carbohydrates, proteins, fats, vitamins and minerals.

**Pancreas:** The organ in the body that makes insulin.

**Physical therapist:** A healthcare worker who specializes in movement and exercise.

**Protein:** A nutrient that helps the body grow and heal. Many foods contain protein, but the best sources are beef, poultry, fish, eggs, dairy products, nuts, seeds and legumes (peas, beans).

**Retinopathy:** A condition caused when diabetes damages the blood vessels inside the retina of the eye.

**Saccharin:** An artificial sweetener that is 300 to 500 times sweeter than sugar.

**Social worker:** A healthcare worker who cares for the social and emotional needs of people.

**Seizure:** Involuntary jerking of the muscles that can occur with a low blood sugar level.

**Sorbitol:** A sugar alcohol half as sweet as sugar with 4 calories per gram.

**Sucrose:** Table sugar.

**Sucralose:** An artificial sweetener that is 600 times sweeter than sugar. The brand name is Splenda.

**Thyroid:** A gland at the base of the neck that makes hormones. The hormones control how much energy the body uses.

**Triglycerides:** Fat found in the blood.

**Xylitol:** A sugar alcohol used as a sugar substitute that has 4 calories per gram. It is often found in mints and chewing gum.



## Resources

### **The Egleston Family Resource Library at Children’s Healthcare of Atlanta at Egleston**

The library has books and videos about diabetes for patients and their families. 404-785-1611

### **The Children’s Healthcare of Atlanta Max Brown Family Resource Library**

The library has books and videos about diabetes for patients and their families. 404-785-2192

## **Other Resources**

### **American Diabetes Association (ADA)**

This nonprofit organization works to prevent and cure diabetes and to improve the lives of all people affected by the disease. The ADA has an information hotline, advocacy assistance, local activities, educational programs and summer camps. Annual membership includes a monthly magazine and a network of diabetes support and information.

404-320-7100 (Georgia affiliate) or 800-342-2383

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

### **Camp Kudzu**

This summer camp is open to children with Type 1 diabetes. Other activities for children and families are available throughout the year.

404-250-1811

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

### **Children’s Medical Services (CMS)**

A statewide public health program that provides supplemental funds for medical care to children with chronic diseases like diabetes.

404-463-3478

<http://health.state.ga.us/programs/cms>

### **Diabetes Association of Atlanta (DAA)**

Provides early detection, screening and education for at-risk and low-income populations in metro Atlanta.

404-527-7150

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

### **Diabetes Exercise and Sports Association**

A nonprofit service organization that helps people with diabetes improve their quality of life through exercise and physical fitness.

800-898-4322

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

## **Juvenile Diabetes Research Foundation (JDRF)**

Parents of children with diabetes created this foundation to raise money for diabetes research.

404-420-5990 or 800-925-5533

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

## **National Diabetes Information Clearinghouse**

<http://diabetes.niddk.nih.gov>

## **Support Groups**

Go to the Georgia chapter Juvenile Diabetes Research Foundation Web site at [www.jdrfgeorgia.org](http://www.jdrfgeorgia.org). Select the Family Network link to locate a support group in your area.

### **Additional Online Resources:**

- <http://wdd.quickcompliance.net/> - This website shows different videos produced by kids for World Diabetes Day.
- [www.juvenation.org](http://www.juvenation.org) – This site is a social networking website run by JDRF and geared toward teens living with Type 1 diabetes.
- [www.childrenwithdiabetes.com](http://www.childrenwithdiabetes.com) – This site provides chat rooms for children with diabetes.
- [http://www.joslin.org/phs/parent\\_discussion\\_board.html](http://www.joslin.org/phs/parent_discussion_board.html) - This site provides a discussion board for parents.
- [www.medtronicdiabetes.com/lenny-carb-app](http://www.medtronicdiabetes.com/lenny-carb-app). - Medtronics carb counting app for iphone.
- <http://www.dlife.com/dlifeTv/c987206439rn-Kids-Teens.html> - See videos from Nick Jonas and other teens – like professional snowboarders - living with Type 1

*Children's Healthcare of Atlanta has not reviewed all of the sites listed as resources and does not make any representations regarding their content or accuracy.*

# Resources: Table of Contents

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1. **Care for Low Blood Sugar**—quick reference on how to treat low blood sugar. May be helpful to school personnel and family members.
2. **Emergency Care**—quick reference on causes, signs and treatment of high and low blood sugars. May be useful to school personnel, family members and babysitters.
3. **Ketone Testing**— review of where ketones come from, the warning signs of diabetic ketoacidosis and how to prevent it.
4. **School Health Plan**—required document for nurses to help with giving insulin in the schools.
5. **Tips for Teachers**—tips for teachers that will help the child adjust and be safe in school.
6. **Diabetes Supply List**—list of supplies parents will need to provide the child's school.
7. **Caring for a Child with Diabetes**—a quick one page reference that can be filled out and used by babysitters and other caregivers.
8. **Tips for Sick Days**—basic things for parents to do when their child becomes sick.
9. **Be Prepared for Travel**—supplies to pack when traveling.
10. **Jumpstart Healthy Habits at Home** – Some suggested healthy habits that partents should adopt for the whole family.
11. **Sticker Chart** – use for positive reinforcement for children when they cooperate with their diabetes care or learn a new skill.
12. **Insulin Calculation Worksheet** – describes how to figure out pre-meal rapid acting insulin dose.
13. **Insulin Calculation Weekly Worksheet** – a good resource for writing down calculations for insulin dose.



# Care for Low Blood Sugar



**Children's**<sup>SM</sup>  
Healthcare of Atlanta

Treatment for a child who is conscious	Treatment for a child who is unconscious or having a seizure
<p><b>Child should use the 15:15 rule:</b></p> <p>1. Eat or drink 10 to 15 grams of carbohydrates. Examples include:</p> <ul style="list-style-type: none"> <li>• 3 - 4 glucose tablets</li> <li>• 4 ounces of juice</li> <li>• 1 tablespoon of sugar</li> <li>• 5 ounces of regular soda—not diet soda</li> <li>• 1 tablespoon of honey or maple syrup. Do not give honey to children under the age of 2.</li> <li>• 8 ounces of low-fat milk or yogurt</li> <li>• Glucose gel - available over the counter at most drug stores</li> </ul> <p>Avoid these foods:</p> <ul style="list-style-type: none"> <li>• Chocolate, which has a lot of fat and takes a long time to digest</li> <li>• Hard candy like mints or Lifesavers®, which take a long time to dissolve</li> <li>• Foods that contain cornstarch, fat or protein, which may take longer to work</li> </ul> <p>2. Wait 15 minutes before testing your blood sugar again.</p> <ul style="list-style-type: none"> <li>• If it is still below 70 or your target range, eat another 15 grams of carbohydrates. Wait 15 minutes after eating and test your blood sugar again.</li> <li>• If blood sugar is above 70, continue your regular routine.</li> <li>• If after 3 tries, your blood sugar is not above 70, call your doctor.</li> </ul>	<p><b>An adult should:</b></p> <ol style="list-style-type: none"> <li>1. Never give food or fluids to an unconscious child, as it may cause choking.</li> <li>2. Prepare glucagon injection (Red Emergency Kit) according to how you were trained and in-line with the package instructions. This is a hormone that raises blood sugar level.</li> <li>3. Give the injection in the amount advised by the doctor.</li> <li>4. Place the child on their side to prevent choking, as glucagon may cause vomiting.</li> <li>5. Wait several minutes for the glucagon to work. Check blood sugar after 10 minutes.             <ul style="list-style-type: none"> <li>• If child does not respond to the glucagon in 10 minutes, call the doctor. He may advise another dose.</li> <li>• Call 911 or the local emergency medical service if there is no response to glucagon or if the child has trouble breathing.</li> </ul> </li> <li>6. As soon as child wakes up, give sips of a regular soft drink, juice or sweetened beverage.             <ul style="list-style-type: none"> <li>• Child may have an upset stomach and not want to drink. Give the fluid anyway in small sips to prevent another low blood sugar reaction.</li> </ul> </li> <li>7. After 10 minutes, if child can drink without problem, give him something solid to eat like a sandwich or crackers with peanut butter.</li> <li>8. Check blood sugar often.</li> <li>9. If child vomits, check for ketones.</li> <li>10. Always call the child's doctor after giving an injection of glucagon for more instructions. The next insulin dose may need changed.</li> </ol>

# Emergency Care

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	<b>Low blood sugar (Hypoglycemia)</b>	<b>High blood sugar (Hyperglycemia)</b>
<b>Causes</b>	<ul style="list-style-type: none"> <li>• Too much insulin</li> <li>• Not enough food</li> <li>• Increased physical activity</li> <li>• Late or skipped meals (if on NPH)</li> </ul>	<ul style="list-style-type: none"> <li>• Not enough insulin</li> <li>• Missed doses</li> <li>• Too much carbohydrate</li> <li>• Infection, fever, illness</li> <li>• Emotional stress</li> <li>• Hormonal changes</li> </ul>
<b>Signs</b>	<ul style="list-style-type: none"> <li>• Sweating</li> <li>• Pale, clammy skin</li> <li>• Shaking</li> <li>• Headache</li> <li>• Hunger</li> <li>• Irritability and nervousness</li> <li>• Fast heartbeat</li> <li>• Weakness</li> <li>• Blurred vision</li> <li>• Mouth numbness</li> <li>• Change in behavior or confusion</li> <li>• Seizure</li> </ul>	<ul style="list-style-type: none"> <li>• Increased urinating</li> <li>• Increased thirst</li> <li>• Tiredness</li> <li>• Blurry vision</li> <li>• Increased hunger</li> <li>• Poor concentration</li> </ul>
<b>Treatments</b>	<ul style="list-style-type: none"> <li>• Do not leave child alone.</li> <li>• Check blood sugar level - treat if below 70 or if child has symptoms of low blood sugar.</li> <li>• Give foods with 15 grams fast-acting carbohydrates such as 3-4 glucose tablets, 4 oz. fruit juice or 5 oz. regular (not diet) soda.</li> <li>• Recheck blood sugar in 10-15 minutes. If it is not above 70, give another 15 grams carbohydrate.</li> <li>• Repeat this 3 times.</li> </ul> <p>If on NPH insulin, follow the above treatment with a snack like cheese and crackers or half a sandwich. Call doctor if blood sugar is not above 70 after 3 tries.</p>	<ul style="list-style-type: none"> <li>• Check blood sugar level.</li> <li>• If sugar is more than 300, check for ketones.</li> <li>• If ketones are present, call the parents - the child needs medical care. Call the doctor if parents cannot be reached.</li> <li>• When blood sugar is high, child may need more frequent bathroom breaks and sugar-free fluids.</li> <li>• Extra insulin may be needed. Follow instructions on healthcare plan for insulin.</li> </ul>

# Ketones

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Healthcare of Atlanta

## What are ketones?

When there is not enough insulin to move sugar into the cells, your body looks for other forms of fuel to use as energy. It uses fat as a fuel source.

- As fats break down, acids called ketones build up in your blood and urine.
- Ketones in the blood and urine are a sign that diabetes is out of balance.
- It often happens when someone first finds out he has diabetes.
- It can also happen when someone with diabetes:
  - Has an illness like a fever, stomach virus or the flu - called illness ketones
  - Does not eat enough carbohydrates - called starvation ketones
  - Does not get enough insulin, such as by missing insulin doses - called insulin-deficiency ketones

## When should I check my child for ketones?

Ketones can make someone with diabetes very sick. Excess ketones can lead to a condition called *ketoacidosis*. It is important to test for ketones when:

- Your blood sugar level is more than 300 *mg/dL* or as advised by your doctor.
- You feel sick, especially if you vomit or have an upset stomach.
- Your blood sugar levels have been high for 2 - 3 days and do not come down after taking insulin.
- If your child is sick in any way.
- If your child wears an insulin pump, anytime his blood glucose level is more than 250 *mg/dL*.

## What are the warning signs of diabetes ketoacidosis (DKA)?

Signs of excess ketones in the blood include:

- Dry mouth and skin
- Increased thirst
- Passing extra urine
- Nausea and vomiting
- Stomach cramps or pain
- Sweet, fruity odor on the breath
- Feeling weak or sleepy
- Breathing hard and deep
- Pain in the back and side

## How do I test for ketones?

There are 2 ways to test for ketones—either a urine test using a ketone test strip or a blood test.

### To check for urine ketones:

1. Remove 1 test strip from the bottle. Replace the cap tightly.
2. To collect a urine sample:

- Boys can usually urinate (pee) directly on the strip. Cover the colored test pad on the end of the strip.
  - Girls usually need to urinate (pee) into a clean, dry container. Dip the ketone test strip in the urine sample. Cover the colored test pad on the end of the strip.
  - If you have a baby, put a cotton ball in the diaper. Squeeze urine from the cotton ball directly onto the test pad. Always use fresh urine.
3. Touch the edge of the strip to a tissue or paper towel to remove excess urine.
  4. Lay the strip on a flat surface and start timing. Wait 15 seconds or as your bottle label directs. Be sure to wait the right amount of time to get a correct reading.
  5. Hold the strip close to the color chart on the bottle. Compare the color on the test pad to the color guide on the label.
    - Ketone levels can be small, moderate or large.
    - **Always call your doctor if you have moderate or large ketone levels.**
  6. Wash your hands well when you are done.
  7. Write the results in your log book.

### **To check for blood ketones:**

There are a couple of blood sugar meters that come with test strips to measure blood ketone levels. To use them:

- Put a drop of blood on a blood ketone strip.
- While the strip is in the meter, read the results.

Blood ketones are measured in mmol/L.

- Normal blood ketones measure at 0.6 mmol/L or below.
- If your child's blood ketone measures above 0.6 mmol/L, call his endocrinologist.
- Your diabetes team can give you more information if you would like to use this meter.

### **When should I call the doctor?**

Call your child's **doctor right** away if:

- The urine ketone results show a moderate or large amount of ketones
- The blood ketone result is higher than 0.6 mmol/L
- If your child vomits more than once.
- If your child has any signs of DKA such as increased thirst, passing extra urine, nausea, vomiting, stomach cramps or pain, sweet fruity odor on the breath, Feeling weak or sleepy, dry mouth and skin or breathing hard and deep.

# DIABETES MELLITUS MEDICAL MANAGEMENT PLAN

School Year: 20\_\_ to \_\_\_\_\_

Student's Name: \_\_\_\_\_ Date of Birth: \_\_\_\_\_

**BLOOD GLUCOSE (BG) MONITORING:** (Treat BG below \_\_\_\_mg/dl or above \_\_\_\_mg/dl as outlined below.)

- Before meals
- as needed for suspected low/high BG
- 2 hours after correction
- Midmorning
- Mid-afternoon

**INSULIN ADMINISTRATION:** Dose determined by:  Student  Parent  School nurse or Trained Diabetes Personnel

Insulin delivery system:  Syringe  Pen  Pump

MEAL INSULIN: (It is best if given right **before eating**. For small children, can give within 15-30 minutes of the first bite of food-or right after meal)

Insulin Type: Humalog Novolog Apidra

- Insulin to Carbohydrate Ratio: \_\_\_\_ unit per \_\_\_\_\_ grams carbohydrate
- Set Doses: Give \_\_\_\_ units (Eat \_\_\_\_\_ grams of carbohydrates)

**CORRECTION INSULIN:** (For high blood sugar. Add before meal insulin to correction/ sliding scale insulin for total meal time insulin dose.)

- Use the following correction formula ( for pre lunch blood sugar over \_\_\_\_ ):  
 $( BG - \underline{\quad} ) \div \underline{\quad} = \text{extra units insulin to provide}$
- Sliding Scale:  
BG from \_\_\_\_\_ to \_\_\_\_\_ = \_\_\_\_\_ u  
BG from \_\_\_\_\_ to \_\_\_\_\_ = \_\_\_\_\_ u  
BG from \_\_\_\_\_ to \_\_\_\_\_ = \_\_\_\_\_ u  
BG from \_\_\_\_\_ to \_\_\_\_\_ = \_\_\_\_\_ u

## MILD low sugar: Alert and cooperative student (BG below 70 )

- Never leave student alone
- Give 15 grams glucose; recheck in 15 minutes
- If BG remains below 70, retreat and recheck in 15 minutes
- Notify parent if not resolved
- If no meal is scheduled in the next hour, provide an additional snack with carbohydrate, fat, protein.

## SEVERE low sugar: Loss of consciousness or seizure

- Call 911. Open airway. Turn to side.
- Glucagon injection  0.25 mg  0.50 mg  1.0 mg IM/SQ
- Notify parent.
- For students using insulin pump, stop pump by placing in "suspend" or stop mode, disconnecting at pigtail or clip, and/or removing an attached pump. If pump was removed, send with EMS to hospital.

## MANAGEMENT OF HIGH BLOOD GLUCOSE (above 200 mg/dl)

- Sugar-free fluids/frequent bathroom privileges.
- If BG is greater than 300, and it's been 2 hours since last dose, give  HALF  FULL correction formula noted above.
- If BG is greater than 300, and it's been 4 hours since last dose, give FULL correction formula noted above.
- If BG is greater than 300 check for ketones. Notify parent if ketones are present.
- Note and document changes in status.
- Child should be allowed to stay in school unless vomiting and moderate or large ketones are present.

## MANAGEMENT DURING PHYSICAL ACTIVITY:

Student shall have easy access to fast-acting carbohydrates, snacks, and blood glucose monitoring equipment during activities. Child should NOT exercise if blood glucose levels are below 70 mg/dl or above 300 mg/dl and urine contains moderate or large ketones.

- Check blood sugar right before physical education to determine need for additional snack.
- If BG is less than 70 mg/dl, eat 15-45 grams carbohydrate before, depending on intensity and length of exercise.
- Student may disconnect insulin pump for 1 hour or decrease basal rate by \_\_\_\_\_.
- At the beginning of a new activity check blood sugar before and after exercise only until a pattern for management is established.
- A snack is required prior to participation in physical education.

## MEAL PLAN:

- A snack will be provided each day at: \_\_\_\_\_
- If regularly scheduled meal plan is disrupted: call parent for care instructions

## SPECIAL MANAGEMENT OF INSULIN PUMP:

- Contact Parent in event of:
  - pump alarms or malfunctions
  - detachment of dressing / infusion set out of place
  - Leakage of insulin
  - Student must give insulin injection
  - Student has to change site
  - Soreness or redness at site
  - Corrective measures do not return blood glucose to target range within \_\_\_\_ hrs.
- Parents will provide extra supplies including infusion sets, reservoirs, batteries, pump insulin, and syringes.

**DIABETES MELLITUS MEDICAL MANAGEMENT PLAN**

School Year: **2012-2013**

**This student requires assistance by the School Nurse or Trained Diabetes Personnel with the following aspects of diabetes management:**

- Monitor and record blood glucose levels
- Respond to elevated or low blood glucose levels
- Administer glucagon when required
- Administer insulin or oral medication
- Monitor blood or urine ketones
- Follow instructions regarding meals and snacks
- Follow instructions as related to physical activity
- Insulin pump management: administer insulin, inspect infusion site, contact parent for problems
- Provide other specified assistance: \_\_\_\_\_

**This student may independently perform the following aspects of diabetes management:**

- Monitor blood glucose:
- in the classroom
  - in the designated clinic office
  - in any area of the school and at any school related activity
- Monitor urine or blood ketones
  - Administer insulin
  - Treat hypoglycemia (low blood sugar)
  - Treat hyperglycemia (elevated blood sugar)
  - Carry supplies for blood glucose monitoring
  - Carry supplies for insulin administration
  - Determine own snack/meal content
  - Manage insulin pump
  - Replace insulin pump infusion set

**LOCATION OF SUPPLIES/EQUIPMENT:** (To be completed by school personnel and parent. Parent to provide and restock snacks and low blood sugar supplies box.)

	Clinic room	With student		Clinic room	With student
Blood glucose equipment	<input type="checkbox"/>	<input type="checkbox"/>	Glucagon kit	<input type="checkbox"/>	<input type="checkbox"/>
Insulin administration supplies	<input type="checkbox"/>	<input type="checkbox"/>	Glucose gel	<input type="checkbox"/>	<input type="checkbox"/>
Ketone supplies	<input type="checkbox"/>	<input type="checkbox"/>	Juice / low blood glucose snacks	<input type="checkbox"/>	<input type="checkbox"/>

**EMERGENCY NOTIFICATION: Notify parents of the following conditions:**

- a. Loss of consciousness or seizure (convulsion) immediately after calling 911 and administering glucagon.
- b. Blood sugars in excess of 300 mg/dl, when ketones present.
- c. Abdominal pain, nausea/vomiting, fever, diarrhea, altered breathing, altered level of consciousness.

Parent/Guardian: \_\_\_\_\_ Phone at Home: \_\_\_\_\_ Work: \_\_\_\_\_ Cell/Pager: \_\_\_\_\_

Parent/Guardian: \_\_\_\_\_ Phone at Home: \_\_\_\_\_ Work: \_\_\_\_\_ Cell/Pager: \_\_\_\_\_

Other emergency contact: \_\_\_\_\_ Phone #: \_\_\_\_\_ Relationship: \_\_\_\_\_

Insurance Carrier: \_\_\_\_\_ Preferred Hospital: \_\_\_\_\_

**SIGNATURES:** I understand that all treatments and procedures may be performed by the student and/or Trained Diabetes Personnel within the school, or by EMS in the event of loss of consciousness or seizure. I also understand that the school is not responsible for damage, loss of equipment, or expenses utilized in these treatments and procedures. I give permission for school personnel to contact my child's diabetes provider for guidance and recommendations. I have reviewed this information form and agree with the indicated information. This document serves as the Diabetes Medical Management Plan as specified by Georgia state law.

PARENT SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

SCHOOL NURSE SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

*My signature provides authorization for the above Diabetes Mellitus Medical Management Plan. I understand that all procedures must be implemented within state laws and regulations. This authorization is valid for one year.*

- Dose/treatment changes may be relayed through parent.
- Student is due for medical appointment for review of diabetes management plan.

HEALTHCARE PROVIDER SIGNATURE: \_\_\_\_\_ Date: \_\_\_\_\_

Diabetes Care Provider: \_\_\_\_\_ Phone #: \_\_\_\_\_  
Address: \_\_\_\_\_

# Tips for Teachers

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**Children's**<sup>SM</sup>  
Healthcare of Atlanta

Used with permission from the American Diabetes Association

## **1. EVERY CHILD WITH DIABETES IS DIFFERENT.**

Each and every child with diabetes may have different symptoms of low blood sugar. Although many of the symptoms may be similar, they will not always be the same. Situations that can affect your student's blood sugar are: insulin, food intake, exercise, illness, stress and/or any changes in routine. Soon you will get to know your own student's unique individuality and their typical reactions to low blood sugar.

## **2. DON'T DRAW UNNECESSARY ATTENTION TO YOUR STUDENT'S CONDITION.**

Your student with diabetes may have to eat snacks periodically in the classroom. In addition to your student's designated snack time, remember that he or she **MUST** eat whenever they feel low. This is imperative, especially if the student is unable to have his or her blood sugar level checked first. This is **NOT** a choice for the child with diabetes, but a necessity!

## **3. PROVIDE INCONSPICUOUS AND GENTLE REMINDERS.**

Pay close attention to your student's regular snack time. Not all children (especially the very young) can tell time, or are going to remember their snack time. If you haven't noticed them eating, pass them a note or work out a special "password" between the two of you that reminds them of their snack time.

## **4. DO NOT PUT A "LABEL" ON THE STUDENT WITH DIABETES.**

Never single a child with diabetes out as the "diabetic" kid. First and foremost, the child with diabetes needs and wants to feel unique and special, just like every other student in your class.

## **5. DO NOT SYMPATHIZE: EMPATHIZE.**

A child with diabetes does not want or need your sympathy. These children need understanding, acceptance and support. Educate yourself in every way possible about diabetes. Learn how it may affect them and have compassion for how they must live their lives each and every day.

## **6. ALWAYS BE PREPARED.**

Always carry a quick and portable snack **WHENEVER** you and your student with diabetes leave the classroom or the school grounds. This is especially important during fire drills, earthquake drills, field trips, special presentations and/or assemblies. A small can of juice together with crackers may work best.

## **7. USE THE BUDDY SYSTEM.**

If your student with diabetes tells you he or she feels low, then give the student a quick-acting carbohydrate snack such as fruit juice, regular soda, or glucose tabs. If your student needs to see the nurse, **ALWAYS** send a "buddy" (someone who won't object) with them. **Never leave a child alone or sent anywhere alone when experiencing low blood sugar.**

## **8. ALLOW UNRESTRICTED BATHROOM BREAKS.**

When given the opportunity, let the child with diabetes know that it's okay to go to the bathroom **WHENEVER** necessary and have a water bottle when blood sugar is high. If their blood sugar is running high, their body's natural response is to eliminate the extra glucose by using the bathroom. Don't make them feel embarrassed by having to ask you for permission.

## **9. BE PATIENT.**

Be patient if the student with diabetes has minor problems with organization. High and/or low blood sugar levels may make it difficult for them to concentrate at times. You may have to repeat some things, especially if they've been to the nurse's office during class time.

## **10. KEEP THE LINES OF COMMUNICATIONS OPEN.**

Always work as a team with the student, caregivers, school nurse and other educators. If there is a special school party or occasion where "treats" are to be served, let the family know in advance, if possible. This allows the family to discuss the options with the child so that he or she can make responsible choices. Often, many treats can be worked into the child's meal plan.

## **11. KNOWLEDGE IS POWER.**

Learn as much as you can about diabetes in children. Consider completing a training to enable you to perform essential key diabetes care tasks such as blood glucose monitoring and insulin and glucagon administration. Your willingness to learn about diabetes and being prepared to perform care tasks or provide supervision as necessary will ensure a safe classroom environment and enable your student to attain optimal academic performance.

# Diabetes Supply List

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**Children's**<sup>SM</sup>  
Healthcare of Atlanta

Here is a list of supplies you will use to take care of your diabetes. This list may be useful when you first have diabetes to help remind you of supplies you will need to bring to school, overnight stays and for traveling.

A √ means that your diabetes doctor (endocrinologist) needs to prescribe these items:

## **For shots:**

- Insulin √
- Syringes √
- Alcohol swabs
- Safe container to dispose of syringes and needles

## **For blood sugar monitoring:**

- Monitor √
- Blood glucose strips √
- Control solution
- Lancet (finger stick) device √
- Lancets √
- Monitoring log

## **For ketone monitoring:**

- Ketostix® √

## **For low blood sugar (hypoglycemia):**

- Glucagon kit √
- Carbohydrate source: glucose tablets, 4 oz. juice box
- Glucose gel
- Snacks

## **Other important supplies:**

- Medical ID bracelet or necklace
- Suppositories to use to stop vomiting √



# Caring for a Child with Diabetes



Child: \_\_\_\_\_ Alternate contact: \_\_\_\_\_  
Home address: \_\_\_\_\_ Phone number: \_\_\_\_\_  
Parents/guardians: \_\_\_\_\_ Doctor's name: \_\_\_\_\_  
Will be at: \_\_\_\_\_ Phone number: \_\_\_\_\_  
Will be home by: \_\_\_\_\_ a.m. / p.m. Emergency number: \_\_\_\_\_  
Cell phone number: \_\_\_\_\_

Meals & snacks	Insulin dose	Time given
_____	_____	_____ a.m./p.m.
_____	_____	_____ a.m./p.m.
_____	_____	_____ a.m./p.m.
_____	_____	_____ a.m./p.m.
_____	_____	_____ a.m./p.m.

**Anything eaten that was not on the usual meal plan:**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Activities: \_\_\_\_\_  
Bedtime at: \_\_\_\_\_ a.m. / p.m.  
Other instructions: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**My child's blood sugar level before I left was:**  
\_\_\_\_\_ at \_\_\_\_\_ a.m. / p.m.

**Check blood sugar levels at the following times:**  
\_\_\_\_\_ a.m./p.m. Result: \_\_\_\_\_  
\_\_\_\_\_ a.m./p.m. Result: \_\_\_\_\_  
\_\_\_\_\_ a.m./p.m. Result: \_\_\_\_\_

Blood sugar level should not go below: \_\_\_\_\_  
*See below for emergency instructions if blood sugar level goes too low.*

Check my child's blood sugar level and give \_\_\_\_\_ immediately if you notice any of these symptoms:

- Feels weak, shaky or light-headed
- Sweats or feels clammy
- Acts crabby or confused
- Has a fast heartbeat
- Has numbness or tingling
- \_\_\_\_\_

Checked at: \_\_\_\_\_ a.m./p.m. Result: \_\_\_\_\_  
Checked again at: \_\_\_\_\_ a.m./p.m. Result: \_\_\_\_\_

## Treating Low Blood Sugar

It is normal for blood sugar levels to go up and down throughout the day. If blood sugar level goes below 70 mg/dl, my child has low blood sugar.

### The symptoms of low blood sugar include:

- Feels weak, shaky or light-headed
- Sweats or feels clammy
- Acts crabby or confused
- Has a fast heartbeat
- Has numbness or tingling
- \_\_\_\_\_

### If you think my child has low blood sugar, immediately do the following:

1. Check blood sugar level.
2. If the level is too low, have my child eat or drink 15 grams of carbohydrates. This could be:
  - Three glucose tablets
  - ½ cup or orange juice or apple juice
  - Five or six pieces of hard candy\_\_\_\_\_
3. Wait 15 to 20 minutes. Then check blood sugar level again.
4. If the level is still low, have my child eat or drink another 15 grams of carbohydrates.

**Once blood sugar level is back in its normal range,** my child needs to eat or drink a snack with carbohydrates and protein, such as:

- Crackers with cheese or peanut butter
- Cup of milk

Be sure to keep me informed.

### Call 911 if:

- My child's blood sugar level is low after two treatments and you cannot reach me.
- My child is lethargic, unresponsive or unconscious.

Tell the 911 operator that my child has diabetes and takes insulin. Give this sheet to the emergency workers when they arrive.

# Tips for Sick Days

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**Children with diabetes need special care when they are sick. Here are some tips to help parents manage their child's diabetes when they are ill.**

- Check their blood sugar level every two to four hours.
- Check for ketones every four hours. Remember, ketones can show up even if their blood sugar level is low when they are sick.
- Illnesses and infections can cause the body to make stress hormones which raise your blood sugars.
- Nausea and vomiting are sometimes the first signs of DKA (diabetic ketoacidosis), a life threatening condition. Anytime your child has these symptoms be sure to check for ketones.
- If vomiting is present or your child cannot eat, their blood sugar may go low and they may need an insulin adjustment.
- Never omit insulin unless instructed by your doctor
- Close parental supervision is needed when a child with diabetes is sick

Call your doctor if:

- Child vomits more than once.
- Child cannot eat.
- Child has three blood sugar readings over 240 on the same day.
- Child has moderate to large ketones.
- You are not sure how much insulin to give child.
- A shot of insulin was missed or not given.
- Child's blood sugar does not increase to 70 mg/dL after he or she eats 15 grams carbohydrate for the third time.
- You had to give child glucagon due to unconsciousness or seizure.
- Call 911 if your child has trouble breathing.

# Be prepared for travel

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**Make a checklist of the supplies you will need on your trip. Be sure to pack more of each item than you actually need.**

- Insulin or diabetes pills
- Syringes
- Container for getting rid of lancets and needles
- Prescriptions for insulin, syringes and diabetes supplies
- Medicine for motion sickness, nausea and diarrhea
- Blood glucose monitor and all tools you need for testing
- Extra batteries for your blood glucose monitor
- Foil-wrapped strips for ketone testing
- Glucagon emergency kit
- Comfortable walking shoes that are already broken-in
- Beach shoes (if you are going to the beach or a pool)
- Sunscreen (SPF 15 or higher) and a hat
- Insect repellent
- Hydrocortisone cream for insect bites
- Gauze dressing, paper tape and antibiotic ointment
- Insurance card
- Medical identification - MedicAlert is known around the world
- Emergency phone numbers and addresses
- Glucose tablets or other items to treat low blood sugar
- Supply of prepackaged snacks and food in case meals are delayed
- Sugar substitutes
- Telephone calling cards

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Bring a 2 day supply of insulin and insulin syringes on board the plane with you.

- Divide your supplies into 2 separate bags. This will give you a backup in case one gets lost.
- Have someone else carry 1 of the bags and keep 1 bag with you.
- Do not check these bags with other baggage at the airport.

Be prepared to take extra time when passing through airport security.

# JUMPSTART HEALTHY HABITS AT HOME



- **Get the Entire Family On Board** – No matter what health goal you set with your family, keep in mind positive changes benefit all family members. It takes the support of all family members to be successful.
- **Take One Positive Step at a Time** – The most effective way to incorporate a lifestyle change with your family is to focus your efforts on one positive step at a time, instead of trying to tackle everything at once.
- **Be a Role Model for Health at Home** – Make healthy habits a priority in your family. Nobody's perfect, but try to make healthy choices when you can.
- **Ask for Help** – Many resources are available to help you make positive steps in the right direction. Start by visiting [strong4life.com](http://strong4life.com), where you'll find tips to use right away.
- **Ready, Set, Go!** – Ready to set your first goal? Talk about goals with your family. Choose a goal that works for all family members—then, go for it! Post a reminder of the goal on the refrigerator.

## USE THESE SUGGESTIONS FOR LIVING A HEALTHIER LIFESTYLE.



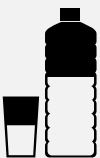
### Fill half your plate with veggies and fruits

- Try to include a variety of colors
- Make breakfast a priority
- Eat meals as a family



### Limit screen time to one hour

- After 30 minutes of screen time, get 30 minutes of activity
- Once a week: Turn TV and video games off and do something active



### Drink more water and limit sugary drinks

- Carry a water bottle with you
- Drink water or 1% milk at meal and snack time
- Choose water at sports activities and playtime



### Be active for 60 minutes

- Aim for 60 minutes of activity throughout the day
- Take the stairs, play sports, dance, play tag...the choice is yours, just have fun!
- Take a family walk around the neighborhood

# HEALTHY CHOICES FOR HEALTHY KIDS



**MAKE 1/2**  
YOUR PLATE WITH  
VEGGIES AND FRUITS



**BE**  
**ACTIVE FOR**  
**60 MINS**



**DRINK**  
**MORE WATER**  
**AND**  
**LIMIT SUGARY**  
**DRINKS**



**LIMIT**  
**SCREEN TIME**  
**TO ONE HOUR**



# My Sticker Chart

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**Children's**<sup>SM</sup>  
Healthcare of Atlanta

Week of \_\_\_\_\_

For toddlers and young children - use this as a sticker chart to reward your child for cooperating with his or her diabetes care.

For older children - use this as a reward system as your child develops skills and gradually take on some of his or her own diabetes care.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
<b>Blood Sugar Monitoring</b>							
<b>Insulin Shots</b>							
<b>Counting Carbohydrates</b>							
<b>Exercise</b>							
<b>Other</b>							

# Insulin Dosing Worksheet

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Insulin: Carbohydrate ratio 1 unit: \_\_\_\_\_ grams carb  
Correction Formula: (Blood Sugar - 100) ÷ \_\_\_\_\_

## 1. Insulin for Food

Add up all the carbohydrates in your meal

Total Carbs \_\_\_\_\_

Divide the total carbs by the insulin: carb ratio

÷ \_\_\_\_\_

Insulin needed to cover the carbs

Units of Insulin =

## 2. Insulin to Correct a High Blood Sugar

If pre-meal blood sugar (BS) is greater than 150, take the BS reading and subtract 100

(BS \_\_\_\_\_ - 100) = \_\_\_\_\_

Divide what's left by the correction factor

÷ \_\_\_\_\_

Insulin needed to correct the high BS

Units of Insulin = \_\_\_\_\_

## 3. Total Insulin

Add the number of units needed for FOOD plus CORRECTION to get your total dose of Insulin (Humalog/Novolog/Apidra).

Food Insulin +  Correction Insulin =  Total Insulin

\_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_

**Note: Your doctor may give you different correction instructions for pre-bedtime**

# Figuring Out Your Pre-meal Rapid Acting Insulin Dose

## 1. Insulin for Food

### A. Add Up Your Carbohydrates

- Look at your food labels and your Nutrient Count Table to find Carbohydrate Information
- Example: 1 Wheat Bagel = 38 grams  
2 Tbsp. Cream cheese = 0 grams

**Crystal Light = 0 grams**

4 oz. Apple = 15 grams

Total carbs (grams) = 53 grams

- ### B. Use your Insulin to Carbohydrate Ratio to figure out how much insulin you need. This is a number determined by your doctor.

- Example:

Insulin: Carbohydrate ratio = 1:10 (1 unit per 10 grams)

If your meal has 53 grams of carb then  $53 \div 10 = 5.3$  units of Humalog, Novolog or Apidra

## 2. Insulin to Correct a High Blood Sugar

- ### A. Your Correction Factor is a formula used to normalize high blood sugars greater than the high end of your target range (example: 150 mg/dl). This formula will decrease your blood sugar to a mid-point of your target range (example: 100 mg/dL).

- If your blood sugar is **NOT** greater than 150 mg/dL skip this part.

$$\frac{\text{BG (blood glucose)} - 100}{X}$$

- Your doctor will tell you the X number.

- Example: X = 50 and your BG is 270.

$$270 - 100 = 170$$

$$170 \div 50(X) = 3.4$$

- ### 3. The **total insulin dose** is what is needed to cover food with the insulin needed for the high blood sugar:

$$5.3 + 3.4 = 8.7 \text{ or } 9 \text{ units Humalog/Novolog or Apidra}$$



