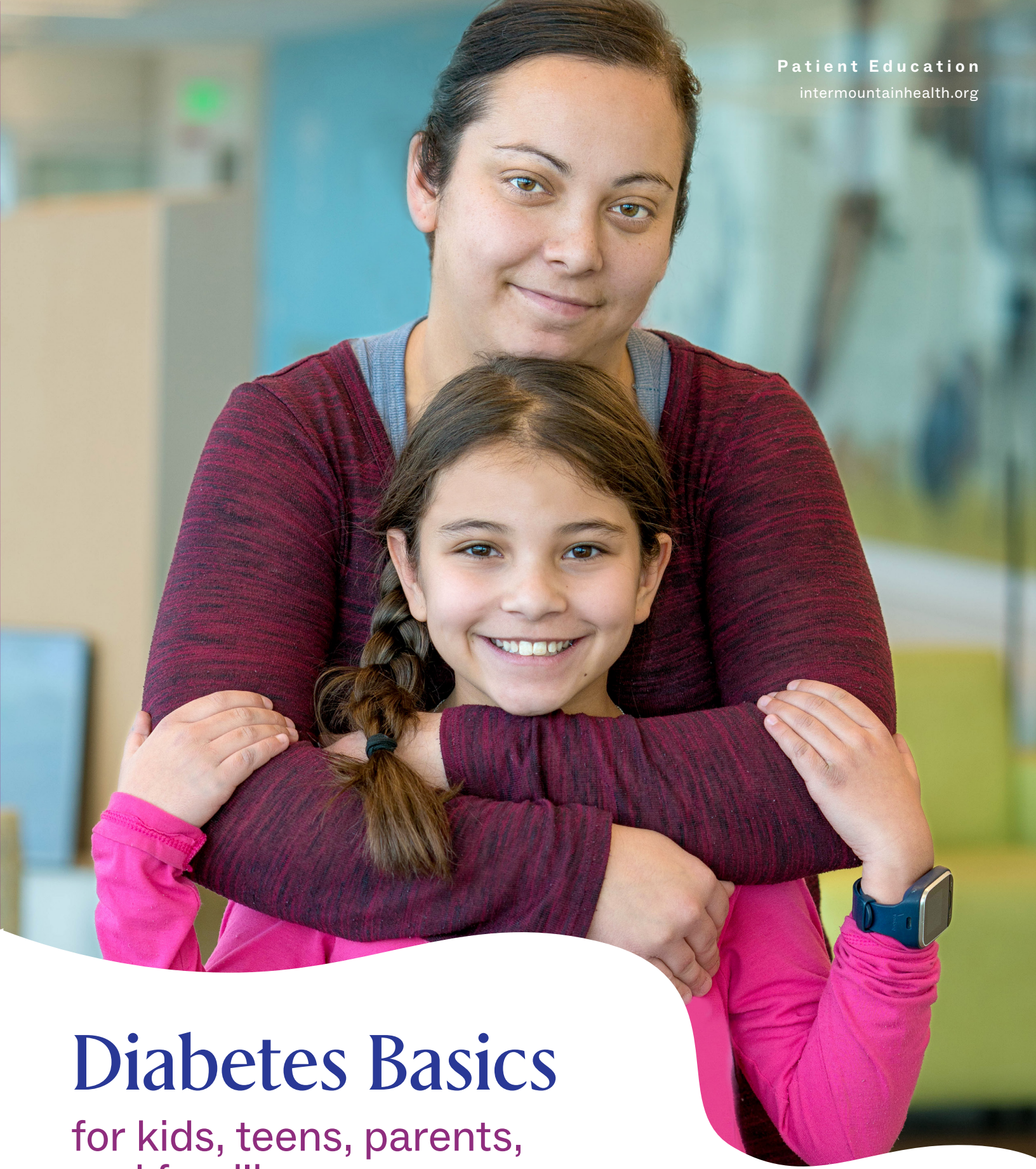

Patient Education
intermountainhealth.org

Diabetes Basics

for kids, teens, parents, and families

Intermountain Children's Health

Diabetes Basics

for kids, teens, parents, and families

This book is for beginners

When you first learn you have diabetes, it's easy to feel confused and scared. But although diabetes is a challenge, it's not a disaster. You're still you, even with diabetes. You can still be healthy, active, and strong. You just need to work a bit harder to take care of yourself.

This book can help you get a good start.

As you go over these pages with your diabetes care team, we encourage you to make notes at the end of each section. Draw pictures. Ask questions. And if your care team's instructions differ from what you read here, always follow your team's instructions.

DB037-06/25 (Last reviewed-07/23)

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What You Need To Know Right Now

Diabetes is a life-long disease that cannot be cured. But it can be managed. The first section of this handbook explains the basics: What you need to learn in the first couple of days after diagnosis.

Understanding Diabetes

What is diabetes?

Diabetes is a metabolic disorder that changes how the body uses food for energy and growth. It is important to remember that getting **type 1 diabetes is nobody's fault.** Parents do not give it to their children, and there is nothing anyone can do to prevent it.

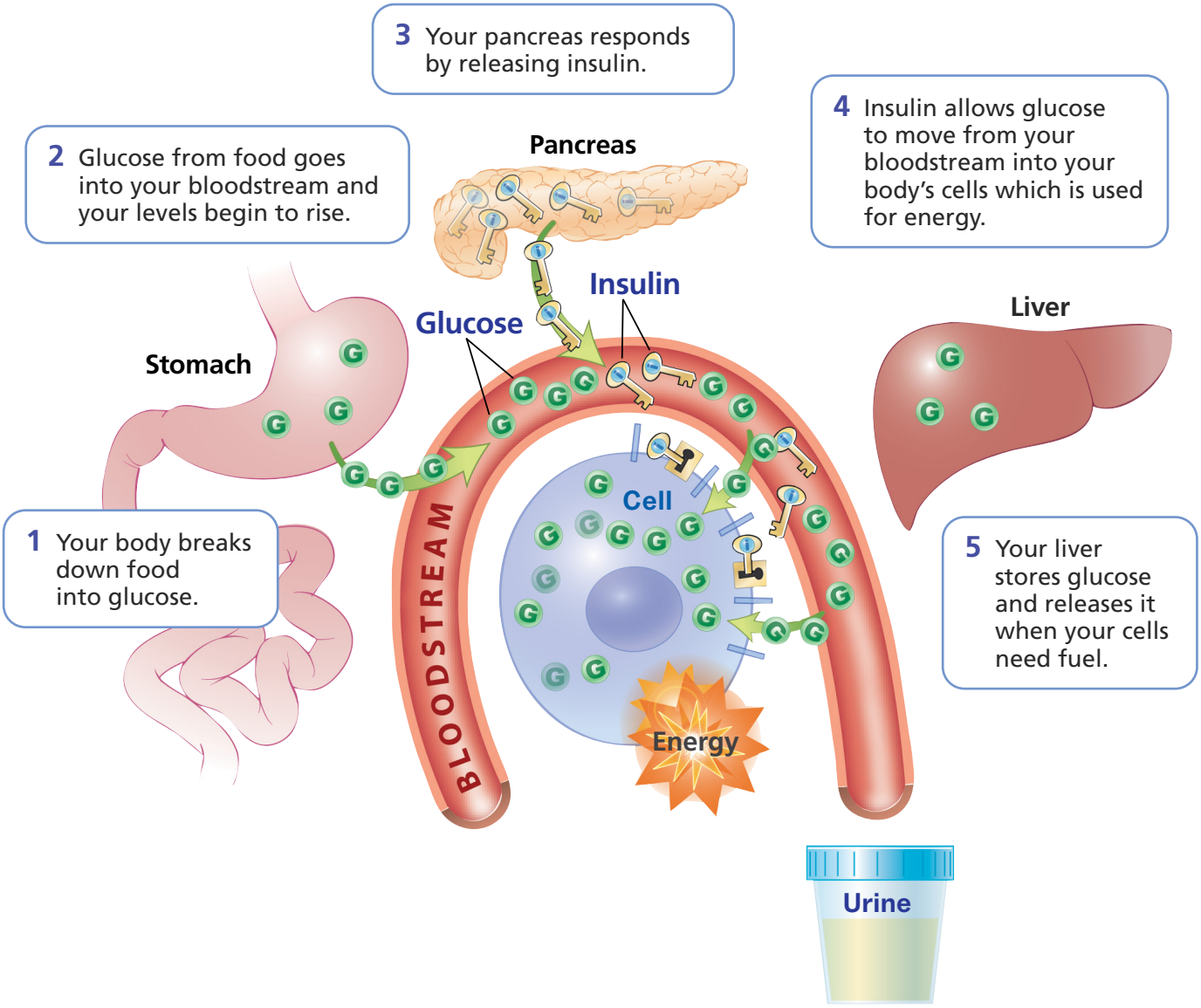
Diabetes requires life-long treatment

Type 1 diabetes requires multiple daily insulin injections and fingersticks for blood glucose (or blood sugar) to keep the body in balance. Parents should not feel guilty about doing this or making sure their child does. Injections and fingersticks are necessary to stay healthy.

Getting fuel from food

To understand more about what diabetes is, it helps to know how the body uses food when you do not have diabetes:

1. When you eat, your body breaks food down into glucose. Glucose is a type of sugar that is the body's main source of energy.
2. Glucose from food goes into your bloodstream. Your blood glucose (the amount of sugar in your blood) begins to rise.
3. As your blood glucose rises, your pancreas responds by releasing a hormone called insulin.
4. Insulin allows glucose to move from your bloodstream into your body's cells. Insulin is like a key that "unlocks" the cells. Once in your cells, glucose is used for energy.
5. Your liver stores glucose and releases it when your cells need fuel (for example, when you have not eaten for a while). When you have eaten, however, insulin blocks this release of glucose from your liver.



Getting fuel from food with diabetes

When you have diabetes, it is more difficult to get energy from food. Here is why:

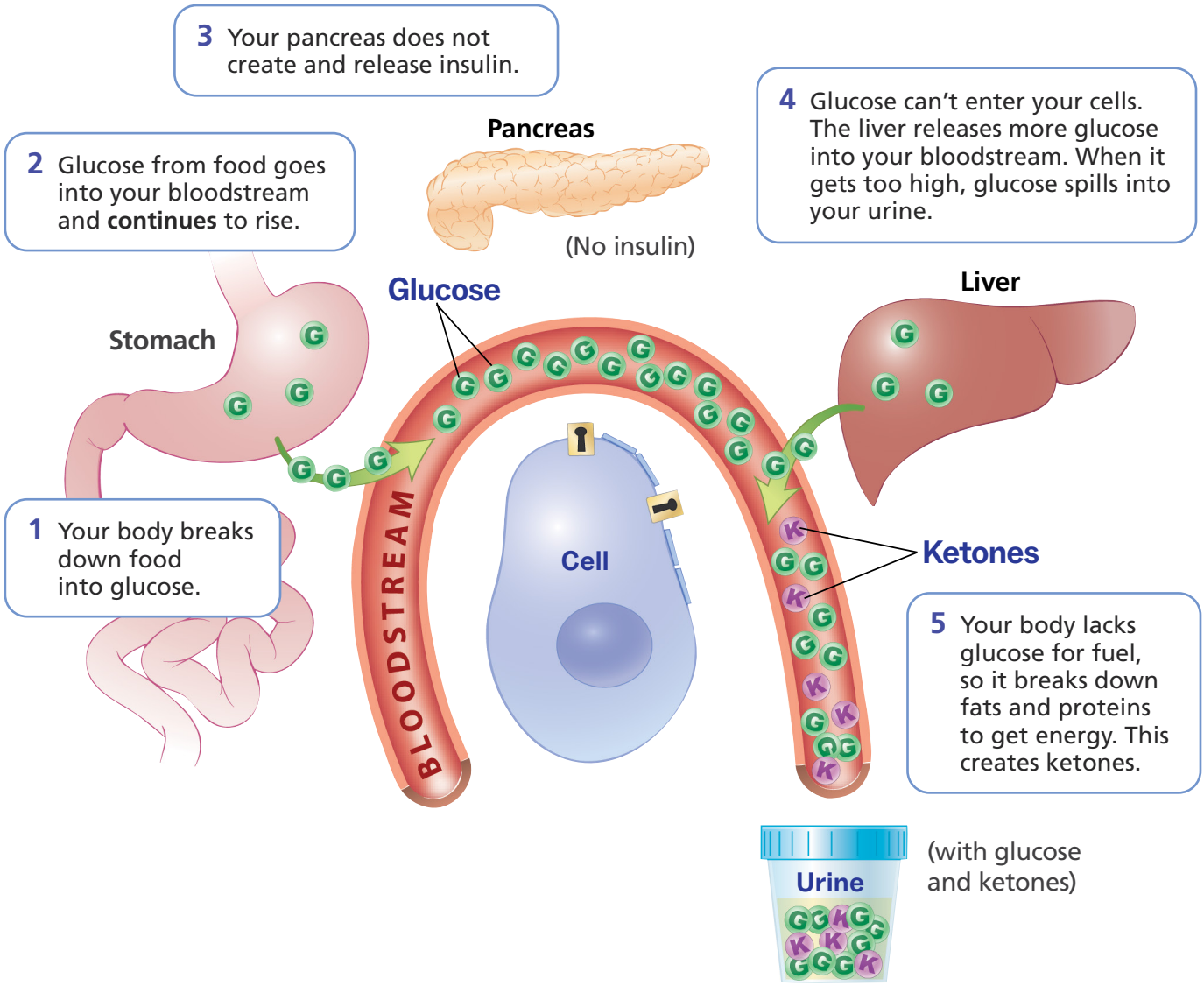
1. Your body still breaks down food into glucose, but your cells cannot use it for energy because your body does not have enough insulin to move glucose into your cells.
2. Glucose levels continue to increase in your bloodstream.
3. Your pancreas does not create insulin.
4. Because your cells don't have glucose, the liver reacts by releasing even more glucose into your bloodstream. When your blood glucose gets high enough, it begins to "spill" into your urine.
5. Due to a lack of glucose for fuel, the body breaks down fats and proteins to get energy, creating ketones. High levels of ketones can harm your body and make you really sick.

As a result of not having enough insulin, you will feel:

- Thirsty
- Hungry
- Weak and tired
- The need to urinate (pee) all the time

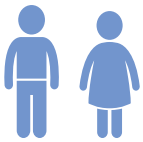
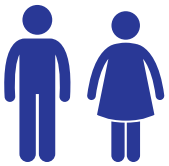
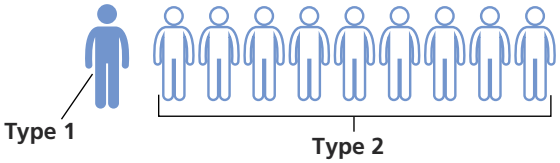
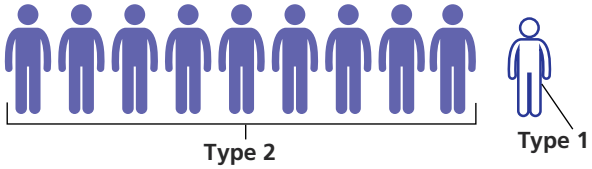
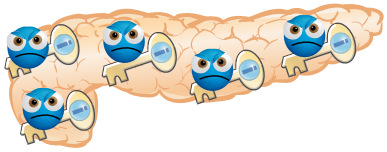
You might also experience:

- Weight loss
- Blurry vision
- Fast, deep breathing
- Slow or confused thinking



Understanding the types of diabetes

There are 2 types of diabetes: Type 1 and type 2. You probably already know which type you have. Since the 2 types can behave differently and have different treatments, it is important to know what the differences are.

Type 1	Type 2
Usually happens to kids but can occur at any age 	Usually happens to adults but can also happen to teens 
1 in **10** people of all ages who have diabetes have **type 1** 	**9** in **10** of all people who have diabetes have **type 2** 
Is caused by an autoimmune disorder* *This means the immune system (your body's defense system) begins to attack the pancreas for some unknown reason. As a result, the insulin-making beta cells in the pancreas are destroyed. 	The exact cause is not known, but it tends to run in families 
Not related to being overweight or lack of exercise 	Often happens in people who are overweight or do not exercise much 
Body stops making insulin 	Body still makes insulin, but cannot use it very well 
Treated with injections (shots) of insulin 	Treated with diet, exercise, pills, and sometimes injections of insulin 

What causes type 1 diabetes?

Scientists still are not sure. Right now, studies focus on 2 factors that seem to play a role in determining who gets type 1 diabetes:

- **Genetics.** People with diabetes are more likely to have certain genes that make them more likely to get the disease.
- **Environment.** Something sets off, or "triggers," the autoimmune process in a person with a genetic tendency toward diabetes. The trigger is thought to be something like a virus, stress, a chemical, or something else the person encounters in daily life.

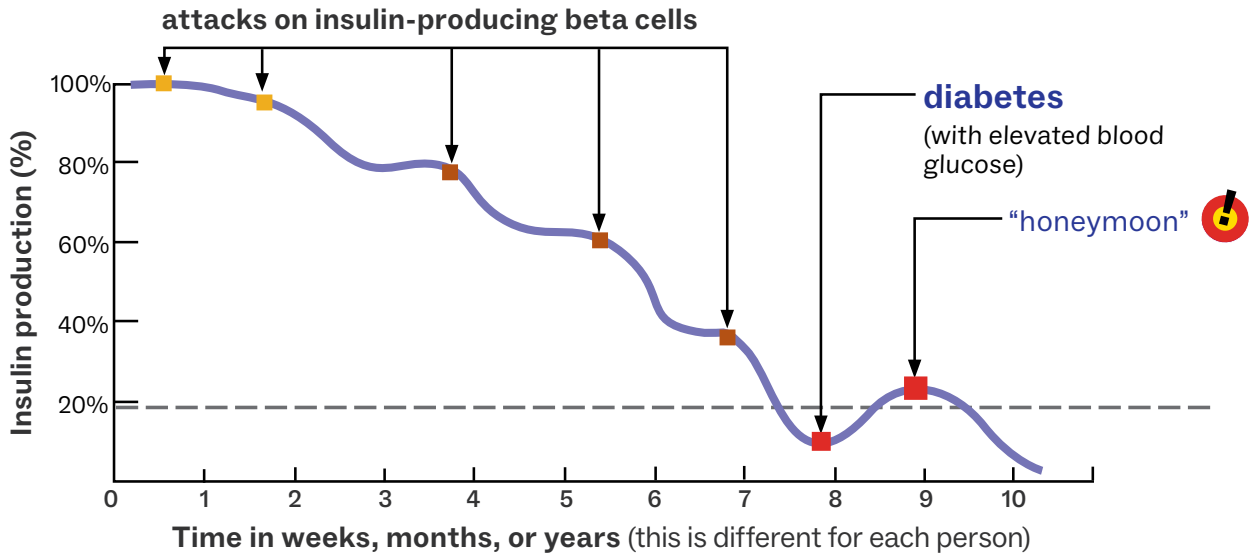
At this point in time, there is not a cure, but it can be treated and managed very effectively. This means kids with type 1 are able to live a long and healthy life and take part in all their regular activities.

Although it might seem like your diabetes happened suddenly, it has probably been developing gradually over the last few months or years. The graph below shows how scientists think type 1 diabetes starts.

What is a type 1 honeymoon?

After you develop diabetes, you will likely have a "honeymoon" phase. This is a time when your body's last few beta cells are working overtime to keep your blood glucose in control. You might need less insulin during this time. The honeymoon phase is only temporary. You still have diabetes, and eventually, your insulin production will start to go down again.

Damage to the insulin-producing beta cells in your pancreas occurs in separate "attacks" that gradually lower insulin production. This can happen over weeks, months, or years.



When insulin production drops enough that your body cannot control your blood glucose levels, you have type 1 diabetes. You need treatment with insulin.

Talking to friends and family about diabetes

People who know and care about you might have a lot of questions about type 1 diabetes. Here are some things you can tell them:

What is type 1 diabetes?

Your body needs insulin to turn glucose (sugar) into energy. Insulin is made by the pancreas and is released when you eat.

With type 1 diabetes, the pancreas doesn't make enough insulin. Glucose stays in the blood instead of moving into the cells to provide energy for the body. This is what makes you sick. Once you start taking insulin, you begin to feel better.

What is the treatment?

People with type 1 diabetes MUST have insulin injections with every meal, and sometimes with snacks, to stay healthy. Their blood glucose must be checked before every meal, and with snacks. This is to make sure they get the correct dose of insulin to keep their blood glucose in a healthy range.

What is the difference between type 1 and type 2 diabetes?

Type 1 diabetes is NOT the same as type 2 diabetes. Type 1 diabetes is an autoimmune disease and is the most common type of diabetes in children and teens. People who have type 1 diabetes didn't do anything to cause it. It just happens. People with type 1 diabetes don't need a special diet. They can eat all the same foods that you do. Type 2 diabetes is more common in adults. It often runs in families and can be related to food and activity choices.

Quick Quiz: Understanding diabetes

True or False?

Diabetes is a life-long disease that cannot be cured.

true **false**

Your body needs insulin to help move glucose into your cells.

true **false**

Untreated diabetes causes high blood glucose.

true **false**

Type 1 diabetes is caused by an autoimmune process that attacks the pancreas.

true **false**

High levels of ketones are good for your body.

true **false**

Diabetes comes on suddenly — but if you have a "honeymoon" phase where you need less insulin, you probably don't have diabetes anymore.

true **false**

Circle the correct answer:

1. What do your cells use for fuel?
   A. Insulin
   B. Glucose
   C. Ketones
   D. Immunities

2. What hormone acts like a key to unlock your cells and move glucose from your bloodstream?
   A. Thyroid
   B. Glucose
   C. Ketones
   D. Insulin

3. Which organ in your body normally produces insulin?
   A. Liver
   B. Stomach
   C. Pancreas
   D. Kidneys

4. Which factors seem to play a role in the development of type 1 diabetes? (Circle all that apply.)
   A. Eating habits, particularly how much sugar you eat
   B. Environmental triggers such as a virus
   C. Body weight
   D. Genetics (inherited genes)

5. As a treatment for type 1 diabetes, how is insulin usually taken?
   A. As a pill
   B. In a patch
   C. As a liquid that you swallow
   D. In an injection (shot)

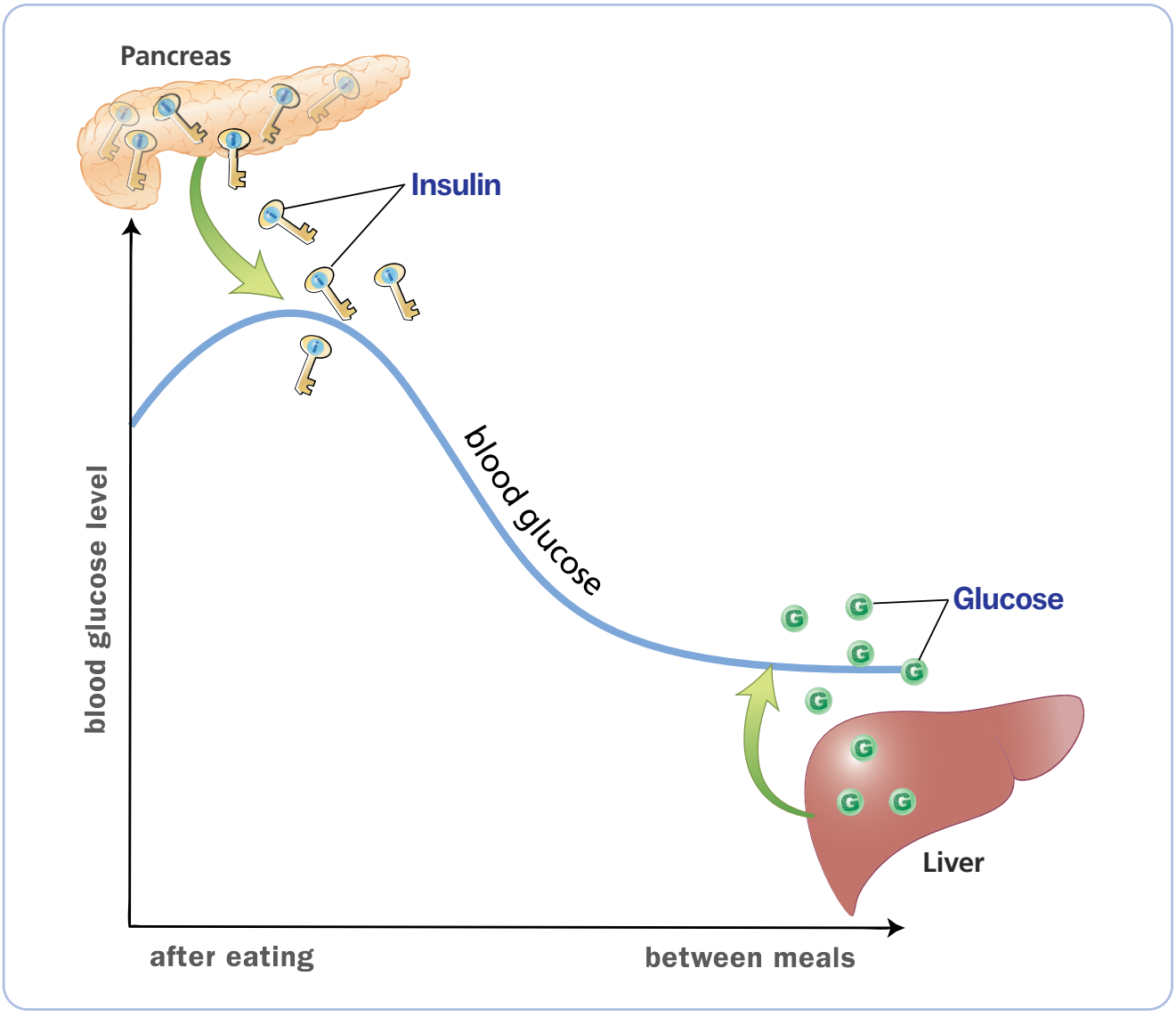
answers: true; true; true; true; false; false; 1. B; 2. D; 3. C; 4. B and D; 5. D.

Notes

How Does the Body Regulate Blood Glucose?

Blood glucose levels vary naturally. They rise after a meal, then go down as the body uses up the glucose provided by the food. Here is how it normally works:

- As your blood glucose starts to increase after a meal, the pancreas responds by releasing insulin. The insulin moves the glucose out of the bloodstream and into the cells to be used for energy. This prevents blood glucose from getting too high.
- After eating, glucose is also moved into the muscles and liver where it is stored for later use.
- When your blood glucose starts to decrease — as can happen when you do not eat for a while — the liver responds by releasing stored glucose into your bloodstream. With insulin helping glucose get into the cells after eating, the release of stored glucose from the liver prevents blood glucose from dropping too low, keeping your levels within a healthy range.



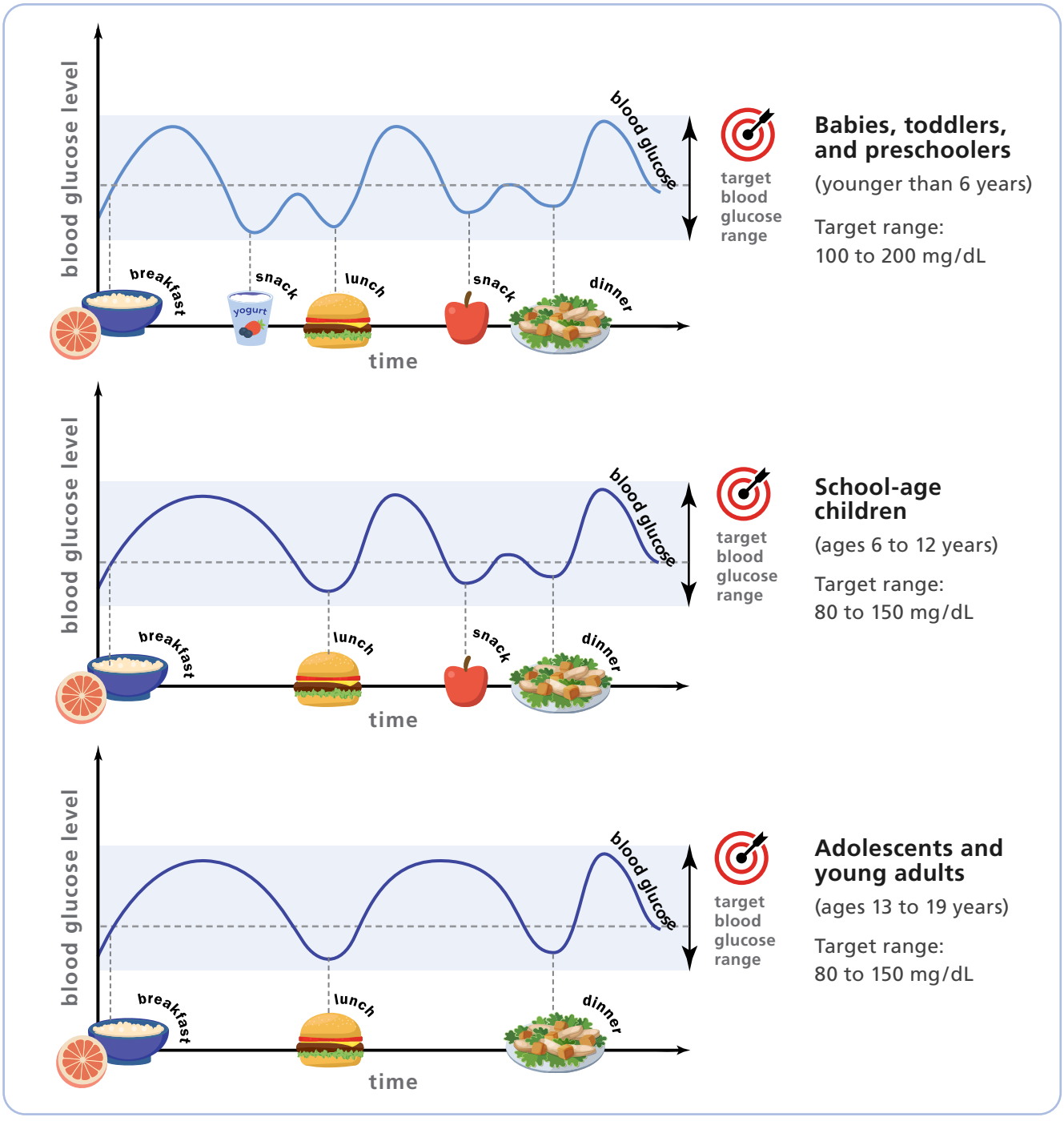
Blood glucose regulation with diabetes: *Your target range*

If your pancreas is not producing any insulin, you have to rely on insulin shots to help you maintain healthy blood glucose levels.

You will still have ups and downs throughout the day, but they should stay within your **target range**.

You and your healthcare provider will adjust your target range based on your specific needs.

Blood glucose is measured in milligrams per deciliter, or **mg/dL**. Find your target range for blood glucose levels below.



Checking your blood glucose

People with type 1 diabetes need to check their blood glucose several times every day. This is the only way to know how much insulin or food your body needs.

How do I check my blood glucose?

To check your blood glucose, first, wash your hands to make sure there is no sugar on them. Then, prick your finger to get a tiny sample of blood and use a small machine called a **glucose meter** to read the sample and display your blood glucose level.

There are many different meters to choose from. Your doctor or diabetes educator will help you get a meter and show you how to use it. It may take some practice. Follow the directions that come with your meter.

Understanding your glucose meter

Use a strip to test the accuracy of your meter.

Check the date and time on your glucose meter regularly to make sure they are accurate.

Most glucose meters store at least 100 readings.

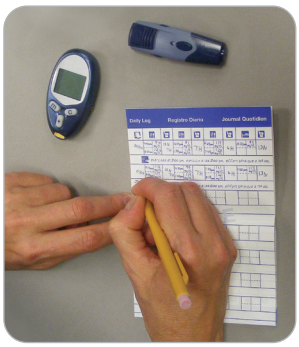
How often do I check my blood glucose?

Your diabetes care provider or educator will tell you when and how often to check your blood glucose. In general, it's a minimum of 4 times each day. You may need to check more often now, right after your diagnosis, than you will once you have been treated for a few weeks.

Here are some common times to check:

- Before every main meal (breakfast, lunch, and dinner)
- At bedtime
- In the middle of the night (for the first few days or so, as your doctor suggests)
- Before exercise
- When you aren't feeling well

Your doctor may ask you to check at other times as well, for example before snacks or after meals. Write down your blood glucose level each time you check. Use the log sheets that your nurse gives to you.



Checking for ketones

If your blood glucose is over 300 mg/dL twice in a row, or if you are sick, you should also check your urine for ketones.

To do this, use the ketone test strips from the pharmacy. Follow the instructions exactly. Collect urine in the sample cup, then dip the strip in the urine. Follow the directions on the urine test strip packaging for how long to wait, then match the test strip with the color chart to see if you have ketones.

To learn more about ketones and high blood sugar (hyperglycemia), see **page 1.34** in this section.

Quick Quiz: Monitoring blood glucose

True or False?

People with diabetes need to check their blood glucose levels to make sure they stay in a safe, target range.

true **false**

It is normal for blood glucose levels to go up and down throughout the day.

true **false**

Normally, blood glucose drops after a meal.

true **false**

The liver releases stored glucose to prevent blood glucose from dropping too low.

true **false**

Circle the correct answer:

What device allows you to check your blood glucose at home?

A. Thermometer
B. Syringe
C. Glucose meter
D. Insulin pen

Based on your age, what is the target range for your blood glucose levels?

A. 100 to 200 mg/dL
B. 80 to 150 mg/dL
C. 70 to 150 mg/dL
D. 200 to 300 mg/dL

What are some common times for a person to check blood glucose?

A. Before every main meal (breakfast, lunch, and dinner)
B. At bedtime
C. In the middle of the night
D. All of the above

answers: true; true; false; true; C; correct answer varies; D.

Notes

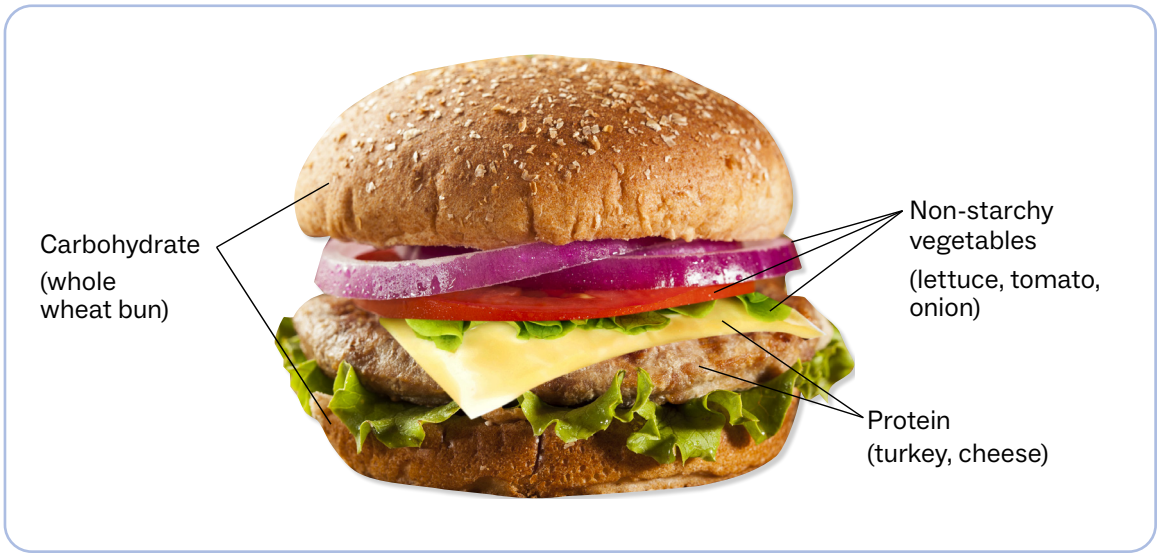
Eating Well, Being Active

Diabetes will not necessarily change how you eat, play, or exercise. But you might need to pay a bit more attention to these activities since food and physical activity affect your blood glucose. This section tells you what you need to know to eat well and stay active with diabetes.

The basics of eating well with diabetes

In years past, diabetes treatment meant strict control over your daily diet. But that is no longer the case. Thanks to newer insulin types, you and other kids with diabetes can be flexible in your eating habits. You can eat as much or as little as you need to satisfy your hunger. For you, meal planning is more about these basic principles:

- **Eat a variety of foods.** This is the best way to make sure you're getting the energy, vitamins, and minerals you need to grow, play, work, and stay healthy. About half of your plate should be fruits and non-starchy vegetables. The other half should include starchy vegetables, grains, and protein.
- **Allow yourself treats once in a while—but do not overdo it.** There are no "bad foods" or "good foods" in your meal plan. But just like everybody else, you need to make healthy choices.
- **Try to stick to a schedule.** Eat regular meals; don't skip meals. Structure meals and snacks so that you are not eating more often than every 2 hours during the day (to minimize grazing or nibbling between meals). Be sure to include a source of protein in each snack.
- **Pay attention to carbohydrates in your meals and snacks.** Food is made up of three main nutrients: Fat, protein, and carbohydrate ("carbs"). Of these, carbs have the biggest effect on your blood glucose. Carbohydrates are found in breads, cereals, starchy vegetables like corn and potatoes, pasta, fruits, milk, and sweets. You need to match your insulin dose to your carbohydrate intake based on the ratio prescribed by your diabetes care provider. (This is called "covering" your carbs.) You do this by counting the grams of carbohydrate in your food and using that to figure out your insulin dose.



The diabetes “My Plate”

“My Plate” for people with diabetes shows the different food groups and which ones have more carbohydrates. The food groups that are dark blue have more carbohydrates. You will need to count the carbohydrates in these foods and “cover” them with insulin. The light blue food groups have very little carbohydrate and will not affect blood glucose very much.

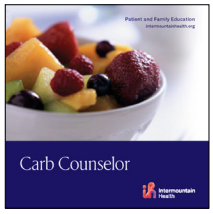
Tools to help you count carbs

How do you count carbs? You figure out how many carbohydrates are in a serving and how many servings you are going to eat. You can find out how many carbs a serving has (and the serving size) by using an app, a guidebook, or a nutrition label to figure out your serving size. At first, you may need to measure your portion sizes. Your doctor or diabetes educator can help you with this. Counting carbs may be a hassle, but be patient — it will get much easier as you go. Here are a few of the Intermountain tools available to you and your healthcare team:

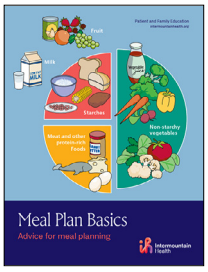
- **Carbohydrate Counting Module**
  Learn about nutrition, carb counting, and insulin dosing on your computer, tablet, or phone.

  Go to **intermountainhealthcare.org/primary-childrens/programs-specialties/endocrinology/diabetes/patient-resources** and scroll down to "Newly Diagnosed," then click **Carb Counting Module.**

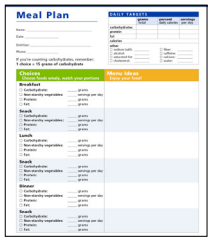
- **Carb Counselor: *Advice and tools for counting carbs***
  A pocket-size booklet available from your healthcare team or online at **Intermountain Patient Handouts**. Enter "Carb Counselor" in the search field and click **Search.**



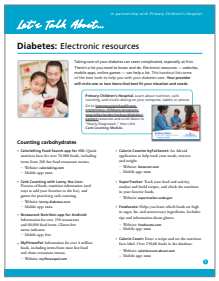
- **Food Finder**
  A foldout poster showing diabetes food groups and sample portions available from your healthcare team or online at **Intermountain Patient Handouts.** Enter "Food Finder" in the search field and click **Search**.



- **Meal Plan**
  A tool to help you and your healthcare team devise a meal plan that fits your needs and food preferences. Available from your team or online at **Intermountain Patient Handouts**. Enter "Meal Plan" in the search field and click **Search**.



- **Diabetes: *Electronic Resources***
  This handout brings together a number of tools to help patients and families count carbs, track blood glucose readings, and learn while playing, connecting, and sharing. Available from your team or online at **Intermountain Patient Handouts**. Enter "Diabetes: Electronic resources" in the search field and click **Search**.



How to read a food label

It is important to know how to read a food label because it can help you know how many carbohydrates you are eating. This is what you should watch for:

1. First, check the serving size. For the chocolate milk label on the right, a serving is 1 cup. Be careful to notice that there are 2 servings in this bottle.
2. Second, check how many grams of carbohydrate are in a serving by looking at the "Total Carbohydrate" number on the label.
3. You do not need to add or subtract the grams of fiber or sugars from the total carbohydrate as they are already included in that amount. Just dose insulin based on total carbohydrate.

There are 31 grams of carbohydrate in 1 cup of chocolate milk. So, ½ cup has 15 ½ grams of carbohydrate. Two cups have 62 grams of carbohydrate.

Nutrition Facts

Serving Size 1 cup (240 mL)
Servings per container: 2

Amount per Serving	
Calories 190	Calories from Fat 25
	% Daily Value*
Total Fat 2.5 g	**4%**
Saturated Fat 1.5 g	**9%**
Trans Fat 0 g	
Cholesterol 15 mg	**5%**
Sodium 230 mg	**10%**
Potassium 450 g	**10%**
Total Carbohydrate 31 g	**10%**
Dietary Fiber 1 g	**3%**
Sugars 29 g	
Protein 10 g	
Vitamin A 10 % • Vitamin C 0 %	
Calcium 35 % • Iron 4 %	
Vitamin D 25 %	

If you drink this whole bottle of chocolate milk you get 2 servings — or 62 grams of carbs.

Calculating insulin doses for meals and snacks

After you figure out how many grams of carbohydrate are in your meal or snack, you can calculate how much insulin you will need to cover those carbohydrates. You do this using your insulin-to-carbohydrate ratio (sometimes called your "carb ratio.") Your doctor or diabetes educator will tell you what your carb ratio is.

Here is an example of how to use your carb ratio to calculate your insulin dose. Say you are going to have a meal with **60 grams of total carbohydrate**.

1 **If you eat** (number of carbs)	2 **Your insulin-to-carbohydrate ratio is**	3 **Enter in your calculator**	**You need** (units of insulin)
60 grams	**1:20** (**1** unit for every **20** grams of carbs)	60 ÷ 20 = 3	= 3 units
	1:15 (**1** unit for every **15** grams of carbs)	60 ÷ 15 = 4	= 4 units
	1:12 (**1** unit for every **12** grams of carbs)	60 ÷ 12 = 5	= 5 units

Physical activity

Physical activity is good for everyone. So, like everyone else, you should aim for at least 60 minutes of play or exercise every day. Just keep in mind that your cells need more energy for physical activity. To prevent low blood glucose, you may need to cut down your insulin or increase your carbohydrates during or after exercise.

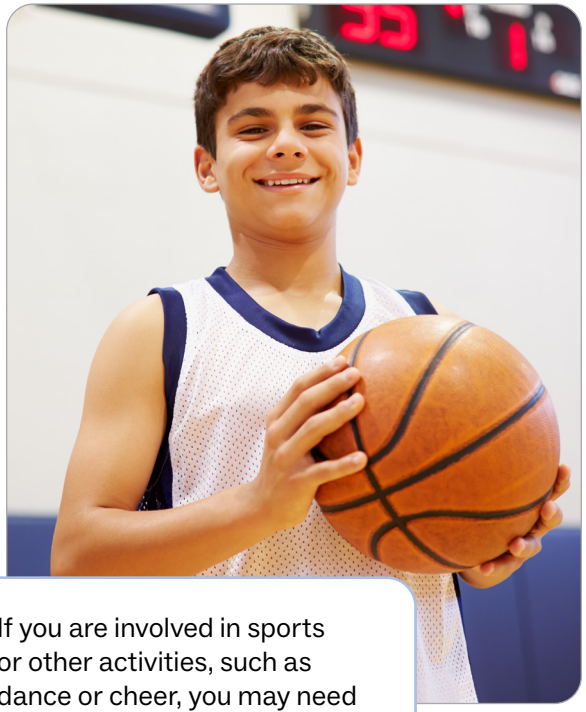
Follow these tips for healthy exercise:

Check your blood glucose before you exercise to know if you should eat a snack. You may also need to check halfway through or after a game.

Keep some carbohydrate snacks on hand to treat low blood glucose.

Drink plenty of water during exercise or hard play.

Keep track of how exercise affects your blood glucose, and discuss it with your doctor or diabetes educator at your next visit. Talk with your doctor or diabetes educator before starting a new sport or activity because your body may react differently



If you are involved in sports or other activities, such as dance or cheer, you may need to adjust your diabetes plan on the days when you have practice, competitions, or performances.

Quick Quiz: Eating well, being active

True or false?

People with diabetes cannot eat sugar.

true **false**

People with diabetes must limit exercise.

true **false**

What you eat and how hard you play or exercise can affect your blood glucose.

true **false**

Circle the correct answer:

Which food nutrient affects blood glucose the most?

A. Fat
B. Protein
C. Vitamins
D. Carbohydrate

Why do you need to learn to count carbs (carbohydrates) in your food?

A. To know how much insulin to take
B. To get enough vitamins
C. To choose the right type of insulin to take with meals
D. To improve your math skills

Which of these should you combine with exercise or active playtime?

A. Keep track of how physical activity affects your blood glucose, and talk it over with your doctor or diabetes educator at your next visit
B. Keep some carbohydrate snacks on hand to treat blood glucose lows
C. Drink plenty of water
D. All of the above

answers: false; false; true; D; A; D.

Notes

Taking Insulin

If your own pancreas is not producing the insulin you need, you have to take insulin injections (shots). For most people, this means several shots every day. This section tells you what you need to know to get started with this important part of your care.

When do I take insulin — and how much do I take?

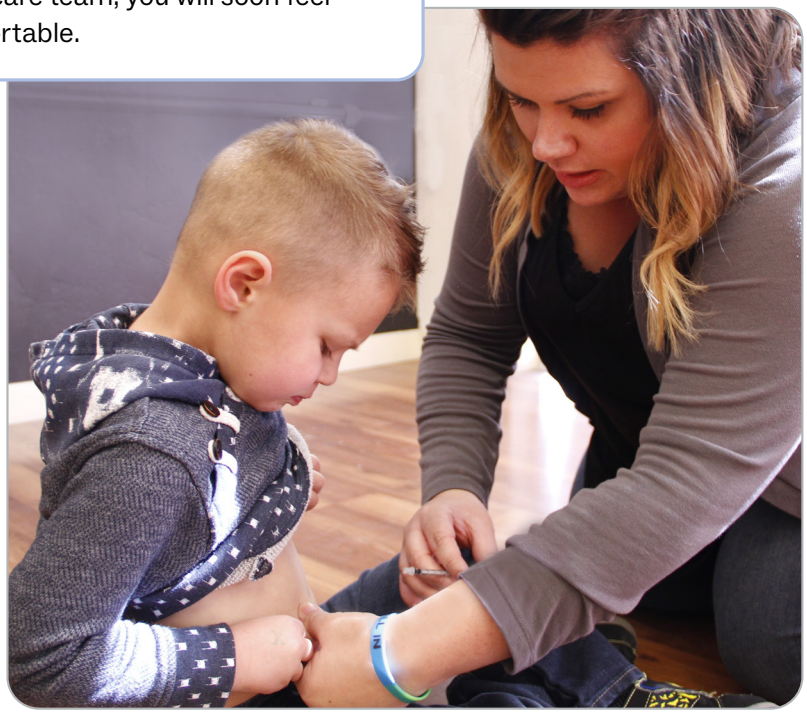
Your insulin regimen (plan) will tell you what kind of insulin to take, how much you should take, and the right time to take it. The plan is determined by your age, weight, and other factors. Keep in mind that it may take some time for you and your doctor to find the regimen that works best for you.

As you learn to take your insulin, it is helpful to know that one of your doctor's goals is to prescribe insulin in a way that closely resembles normal insulin production in the body. This means that you need:

- A small amount of insulin in your body at all times. This is called **basal** insulin. You will need to take your basal insulin at about the same time every day.
- More insulin with a meal. This extra surge of insulin is called a **bolus** or **carb coverage.**
- Extra rapid-acting insulin if your blood glucose is too high. This is called a **correction dose**. Correction doses are usually given as needed at meal times and bedtime, and should not be given more often than once every 2, or preferably every 3, hours. Your doctor may include this information in your insulin regimen.

About giving injections

Giving an injection — to yourself or to someone else — might be scary at first. You may worry about doing it wrong or worry that it will hurt. This section can help. It gives you the information, steps, and tips you need to learn this new skill. With practice, patience, and the help of your healthcare team, you will soon feel more comfortable.



What are the types of insulin?

There are 3 general types of insulin. They are described in the table below. You will see the key differences in basal and bolus insulins, and how they are used to make sure your insulin needs are met.

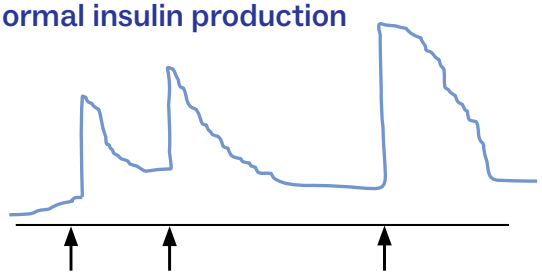
Insulin types and their action in the body*

Insulin type, brands	Begins working	Main effect	All gone	Used as basal or bolus?
Long-acting • glargine [GLAR-jean], (brand names: Lantus, Basaglar) • detemir [DET-uh-meer], (brand name: Levemir)	1 to 2 hours	2 to 22 hours	24 hours	basal
Rapid-acting • aspart [AS-spart], (brand name: NovoLog • glulisine [GLUE-leh-seen], (brand name: Apidra) • lispro [LISS-pro], (brand name: Humalog, Admelog)	10 to 15 minutes	30 to 90 minutes	4 to 6 hours	bolus

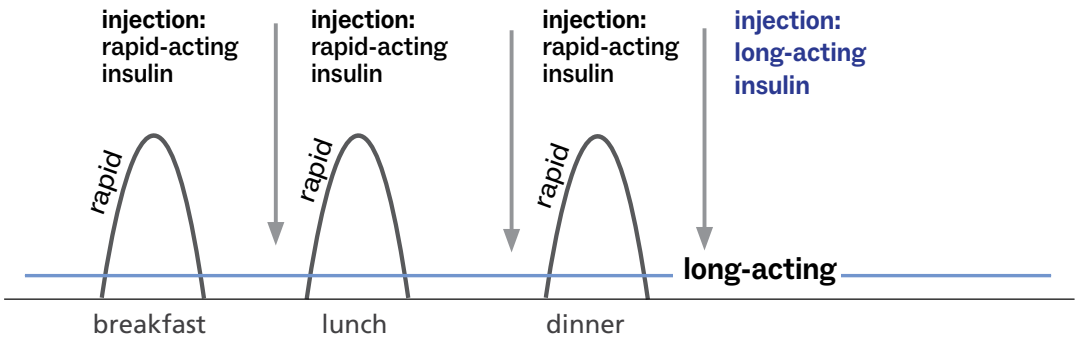
For more information on other types of insulin, refer to **page 4.2** in the resources section.

The graphs at right and below show how doctors prescribe different types of insulin to mimic the normal (non-diabetes) pattern.

Normal insulin production



Basal-bolus insulin regimen for a person with type 1 diabetes



Insulin syringes

To inject your insulin, you will use disposable (throw away) syringes. The syringe needles are short, thin, and very sharp. This helps the needles go in easily — and makes the shots less painful.

There are several different brands of insulin syringes. Some syringes have different needle lengths and different widths (gauges). Your doctor or diabetes educator will prescribe your syringes. Eventually, you will need to buy more.

For now, as you first learn to take insulin, you only need to keep the following in mind:

DO NOT re-use your insulin syringes. This helps ensure that the syringe is sterile (clean) and that the needle is very sharp every time.

DO throw them away in a heavy container so that the needles won't poke through — like an empty plastic bleach container or milk bottle. When full, put a lid on it and throw it in the trash.

LOOK at the lines and numbers on the barrel of the syringe. These show the amount of medication inside. You need to look carefully to make sure you are getting the right amount (dose) of insulin for each injection.

How to draw up insulin

"Drawing up insulin" means putting the insulin in the syringe for an injection. To get the right dose and reduce the pain of the injection, follow these steps carefully.

1 **Get everything you need: Insulin bottle, syringe, alcohol wipe, and your daily record log to write down the dose.**

2 **Wash your hands with soap and water.**

3 **Calculate your insulin dose and write it down.**

4 **Check the insulin.** First, make sure you have got the right bottle (the right type of insulin). Second, check the insulin for any discoloration, cloudiness, or sediment (stuff sitting on the bottom or floating around inside). If you see any of these, throw the insulin away and use new insulin.

5 **Wipe the top of the bottle with an alcohol wipe.**

6 **Pull back the plunger on the syringe to draw in enough air to equal your insulin dose** (use the lines and numbers on the barrel of the syringe), **then push the needle into the bottle and inject the air into the bottle.** (This prevents the vacuum inside the bottle from sucking the insulin back out of the syringe.)

7 **With the needle in the bottle, turn the bottle and syringe upside down.** First, draw up insulin past your correct dose. Then, slowly push on the plunger to the line of your correct dose of insulin.

8 **Before withdrawing the needle from the bottle, check for air bubbles.** If you notice any, tap the syringe so that the bubbles float to the top. Pull the plunger past your dose again and slowly push in the plunger until all bubbles are gone. Repeat as needed to get rid of air bubbles, then withdraw the needle from the bottle.

9 **If the insulin has been stored in the refrigerator, warm the syringe by holding it in your closed hand for a minute or so.** Injections hurt less if the insulin is warm.

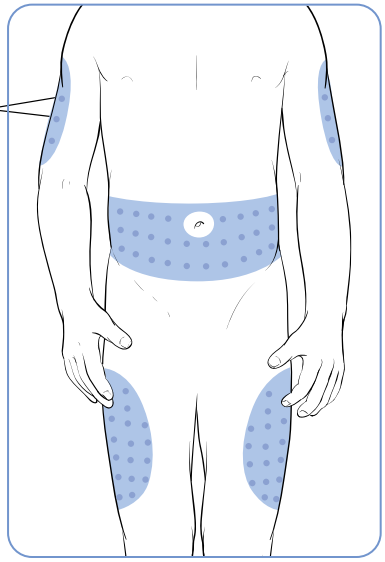
10 **Inject the insulin,** following the instructions on the next page.

Injection sites

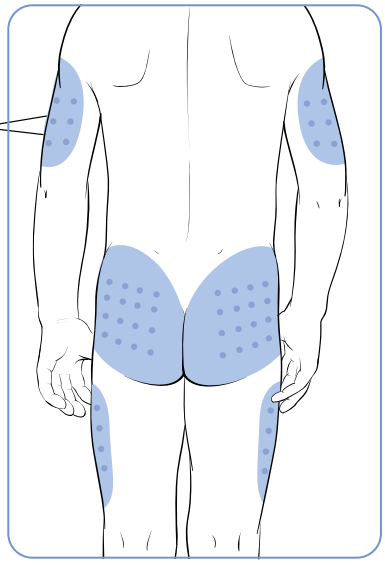
There is no single “best place” on your body for an injection. There are a few suitable **areas** on your body, and each has room for several **sites**. Since you will be getting several shots each day, you will need to switch between areas and sites to keep scar tissue from building up.

The pictures below show the suitable areas (abdomen, back of the upper arms, thighs, and buttocks) and the possible sites on each.

Injection sites front of body
(upper arms, torso, and upper thighs)



Injection sites back of body
(upper arms, buttocks, and upper thighs)



About absorption

How quickly insulin is absorbed (goes to work in your body) partly depends on what you do right after the injection.

- If you exercise the part of your body where you have just received an injection — for example, you play tennis right after an injection in your arm — you will speed up the absorption rate.
- Similarly, if you go in a hot tub or take a warm bath or shower right after an injection, you will also speed absorption.

Be aware of this as you prepare to inject your insulin. Faster absorption may put you at risk for low blood glucose, also known as hypoglycemia. Most of the time, it is best to avoid both of these situations.

How to give an injection

Inject insulin just below the skin, into the fat layer — not into a muscle or a blood vessel. This makes sure that the insulin works in the right way in your body. Here are the basic steps for injecting insulin:

1 **Choose the place on your body where you will inject the insulin.** This area is called the injection site.

2 **Make sure the area is clean.** If it is not clean, wash it with soap and water. As a general rule, do not use alcohol to clean the site. This dries and toughens the skin. Of course, if you are camping or someplace where you cannot wash, it is okay to use an alcohol swab.

3 **Lift up about an inch of the skin and fat tissue with your thumb and fingers.** Depending on the size of the needle and location, you may not need to lift the skin.

4 **Holding the syringe like a pencil, touch the needle to the skin, then push it into the skin.** Push it straight in, not at an angle — and make sure the needle is in all the way. You might feel a sting.

5 **Once the needle is in the skin, let go of the pinch of skin.**

6 **Push the plunger of the syringe down slowly and steadily**, all the way.

7 **When the plunger is all the way down, count to 5 slowly before removing the needle.** This helps prevent insulin from leaking out of the site.

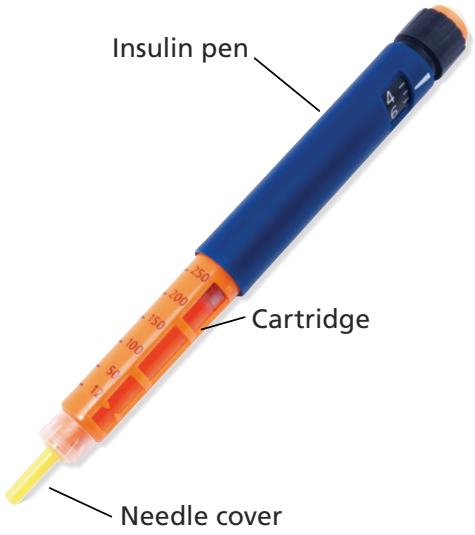
8 **Press your finger over the site for a few seconds.** This helps stop any bleeding that can happen when you pull out the needle.

How to use an insulin pen

In addition to a syringe, insulin can be given with an insulin pen. Insulin pens can be more convenient to use. But you have to use them correctly to make sure you are getting the right amount of insulin. Here are the steps to follow.

1 Check the pen before you use it.

- Make sure the dosage dial turns easily.
- Look at the amount of insulin in the cartridge — is there enough for your dose?
- Check the insulin for any discoloration, cloudiness, or sediment (stuff sitting on the bottom or floating around inside). If you see any of these, throw the pen or cartridge away and use another.



2 Attach a new needle to the pen. Using a new needle every time helps make sure you get the right amount of insulin. (A re-used needle can clog, and leaving the needle in the pen between injections can cause leaking and air bubbles.)

3 Prime the pen — this is important!

- Dial up 1 to 2 units of insulin, remove the needle cover, and point the pen upward.
- Tap the cartridge until any bubbles rise to the top.
- Prime the pen by pressing the injection button down all the way. If you do not see a stream of insulin, repeat until insulin does come out of the needle.

4 **Inject the insulin** following steps 1 through 5 on **page 1.23**: Choose your injection site, clean the site, lift up some skin, insert the needle straight into the fatty tissue, and let go of the of skin.

5 **Press the injection button down all the way, counting to 5 slowly before removing the needle.** For larger doses of insulin, you may need to count to 10 before removing the needle. In general, it takes a bit longer for insulin to come out of a pen than out of a syringe. If there is insulin dripping from the needle when you pull it out, that is a clue that you need to leave it in longer next time.

What if I miss a dose of long-acting insulin?

1 If you have missed a dose of long-acting insulin and it has been less than 4 hours since your scheduled dose of long-acting insulin, give a full normal dose of long-acting insulin. The next day, keep your long-acting insulin dose at the normally scheduled time it was routinely given.

Example: If your dose for 10 units of long-acting insulin was missed at 9 PM, and you notice the missed dose prior to 1 AM, you may give the full 10 units of long-acting insulin. The next night at 9 PM give 10 units and continue normal scheduled long-acting insulin dosing.

1st Night

- Missed dose at 9 PM for 10 units of long-acting insulin
- Missed dose is noticed before 1 AM
- Give 10 units of long-acting insulin

2nd Night

- At 9 PM give 10 units of long-acting insulin
- Continue normal schedule of long-acting insulin dosing

If you take your long-acting insulin 2 times a day, please ask your provider what to do if you forget to take a dose.

2 If you realize a long-acting insulin dose was missed and it's been longer than 4 hours, give half of the normal long-acting insulin dose when noticed. At the next scheduled time, when the long-acting insulin dose is due, give half of the dose of long-acting insulin. Resume normal dosing the next day.

Example: If your dose of or 10 units of long-acting insulin was missed at 9 PM on Monday, AND it's been longer than 4 hours (past 1 AM), give 5 units of long-acting insulin once you realize the dose was missed. At 9 PM on Tuesday, give 5 units of long-acting insulin. On Wednesday, resume your normal dose of 10 units at 9 PM.

1st Night (Monday)

- Missed dose at 9 PM for 10 units of long-acting insulin
- Missed dose is noticed after 1 AM (it has been longer than 4 hours)
- Give 5 units of long-acting insulin

2nd Night (Tuesday)

- At 9 PM give 5 units of long-acting insulin

3rd Night (Wednesday)

- Continue normal schedule of 10 units at 9 PM of long-acting insulin dosing

Quick Quiz: Taking insulin

True or false?

Insulin raises your blood glucose.

true **false**

People with type 1 diabetes may not need insulin injections.

true **false**

You need some insulin in your body at all times.

true **false**

It is important to inject insulin directly into a muscle.

true **false**

Circle the correct answer:

What is the term describing the use of insulin to cover your mealtime needs?

A. Basal
B. Glucose
C. Carb count dose
D. Hormonal

What is the term for the extra rapid-acting insulin you take if your blood glucose is too high?

A. Correction dose
B. Low dose
C. Basal dose
D. Long-acting dose

Where are some appropriate sites to inject insulin into your fatty tissues? (Circle all that apply.)

A. Abdomen
B. Thighs
C. Buttocks
D. Back of the upper arms

Whether you are using a syringe or a pen, which is an important step BEFORE you inject insulin?

A. Count to 15
B. Check the type and amount (dose) of insulin in the pen or syringe
C. Press on the injection site
D. Exercise the area you're injecting

Before removing the insulin needle from the injection site, you should count to _____.

A. 60
B. 30
C. 20
D. 5

answers: false; false; true; false; C ; A; all are correct; B; D.

Notes

Treating and Preventing LOW Blood Glucose (Hypoglycemia)

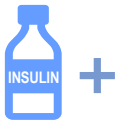
Low blood glucose (hypoglycemia) is when your blood glucose level drops below your target range. This section tells you how to treat and prevent low blood glucose.

It is especially important to watch for low blood glucose during the first few weeks of treatment. You and your doctor are still learning how your body responds to treatment — and your response may change. Check your blood glucose as often as your doctor suggests, or any time you have symptoms.

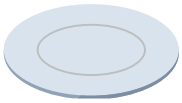
What causes low blood glucose?

There are several reasons why your blood glucose might drop too low:

Too much insulin



Skipped or late meal after giving rapid-acting insulin



Insulin injected into an arm or leg that is exercised right afterward

(for example, you inject into your throwing arm right before playing baseball)

Not finishing a meal after you've dosed for your meal

Playing or exercising for a longer time than usual

What does low blood glucose feel like (or look like)?

Low blood glucose can cause these symptoms:

- Shakiness, dizziness
- Fainting or seizure
- Hunger
- Clumsy or jerky movements
- Sweating
- Difficulty paying attention
- Confusion
- Tingling around your mouth
- Moodiness, irritability
- Feeling like you want to cry for no reason
- Fast heartbeat
- Nervousness
- Headache
- Pale skin color

What can I do to treat low blood glucose?

If you think your blood glucose is low, **test it right away if you can.** This helps make sure that the symptoms are coming from low blood glucose. Then, **treat with the 15 / 15 rule** if your blood glucose is below target, or you have symptoms of low blood glucose.

- **Treat with 15 grams of rapid-acting carbohydrate.** See the list at right for some suggestions. (Note: If the person cannot eat, drink, or respond — or if the person has passed out or is having seizures — it probably means that blood glucose is severely low. The person needs an injection of glucagon. See **page 1.32** in this section.)
- **Wait about 15 minutes for the treatment to work, then re-check your blood glucose.** If it's still below 80 mg/dL, have another snack with 15 grams of carbohydrate. Check your blood glucose in 15 minutes. Repeat until your blood glucose is above 80.

  If your blood glucose is between 80 to 100 mg/dL, and it will be more than 30 minutes before your next meal or snack, have a small snack with 15 grams of carbs and some protein to help stabilize your blood glucose. Check again in 1 hour.

Low before mealtime?

If your blood sugar is low right before mealtime, you can do either of these things:

- Have 15 grams of quick sugar as usual

OR

- Subtract 15 grams of carbohydrate from the total carb count for your meal

Rapid-acting carbohydrates

The following rapid-acting carbohydrates each contain about 15 grams of carbohydrate:

- ½ cup of fruit juice or punch (NOT sugar-free)
- 3 to 4 glucose tablets, or 1 tube of glucose gel
- 1 tablespoon of brown sugar, honey, or corn syrup
- 1 fruit roll-up
- 4 teaspoons of white sugar
- ½ cup of regular soft drink (NOT diet)
- 8 Life Savers candies (NOT sugar-free)
- 2 tablespoons of raisins
- 3 to 5 pieces of hard candy
- 11 jellybeans or Skittles candies
- 1 cup of skim milk

Note: If these foods are not available, any carbohydrate source will work. However, candy bars, cookies, and other higher-fat options are poor sources of quick energy — the fat slows down the digestion of carbohydrates. High-fiber foods (such as many fresh fruits) also slow digestion.

What if my child cannot eat or drink — or has passed out or is having seizures?

Give a glucagon injection and consider calling 911. Severely low blood glucose is dangerous, so give glucagon immediately, without waiting to test blood glucose. See **page 1.32** for instructions.

Preventing nighttime lows

When you first start using insulin, your dose is determined by your body weight and age, but it may need to be adjusted. And, as your body heals, your needs may change. These changes can cause periods of low blood glucose (hypoglycemia). Low blood glucose can happen at any time of day.

Here are steps you can take to help prevent low blood glucose during the night.

- **Check blood glucose at bedtime.** You need to make sure that your blood glucose is high enough to sustain you through the hours you are asleep. Most children and teens should aim for a bedtime blood glucose of more than 100 mg/dL. If you hit this bedtime target, you can go to sleep as usual.
- **If bedtime blood glucose is less than 100 mg/dL:**
  - **Have a nighttime carbohydrate snack.** (If a protein snack is already part of your daily schedule, add some carbohydrate to the snack.) Choose a snack from the list on this page — the items in this list have a bit of fat or protein along with the carbohydrate and will sustain you longer than a quick-sugar source will.
  - **Check your blood glucose in 1 to 2 hours.** You can go to sleep after the snack — but someone will need to re-check your blood glucose levels.

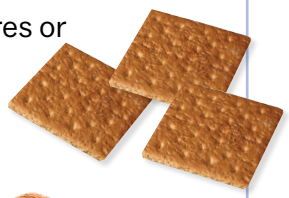
Take exercise into account

Your muscles must replenish the store of glucose they use during exercise, and they do this by drawing glucose from the bloodstream. This process can take hours — which is why you can have low blood glucose for up to 12 hours after exercise, even though your blood glucose was normal (or even high) right after exercise.

Nighttime snacks

These snacks contain about 15 grams of carbohydrate plus some fat, protein, fiber, or other nutrients. Be sure to check the label because carb counts can vary by brand.

- 8 ounces (1 cup) skim milk
- 5 to 6 ounces light yogurt
- 1 string cheese
- 1 small piece of fruit and cheese
- 4 ounces (½ cup) chocolate milk
- 3 graham cracker squares or 7 saltine crackers with 1 T of peanut butter
- 1 slice of bread with 1 T of peanut butter or 1 ounce of cheese
- 2 ounces (¼ cup) almonds



What to do at bedtime

Check your bedtime blood glucose. If your blood glucose level is:	Do this:
Less than 80 mg/dL	You MUST have a snack that has 30 grams of carbs. No insulin needed.
80 to 100 mg/dL	You MUST have a snack that has 15 grams of carbs. No insulin needed.
More than 100 mg/dL	NO bedtime snack is needed. • If you want a snack: Give insulin for carbs plus a high blood glucose correction dose if needed. (See dose correction card.) • If you don't want a snack: Give a high blood glucose correction dose if needed. (See dose correction card.)

Check your blood glucose again to confirm that it is more than 100 mg/dL before going to bed.

What you need to know about glucagon

Glucagon is a hormone that helps the liver release glucose into the body quickly. It is used as an emergency treatment for very low blood glucose when someone cannot or will not eat or drink.

Glucagon comes as a kit with a syringe and a small bottle of powdered medication, as a dry nasal spray, or as a pre-mixed single-dose syringe or pen. See more information in the box below.

There are 2 similar common brands of glucagon kits: **Glucagon Emergency Kit** and the **GlucaGen HypoKit**. You must mix the liquid in the syringe with the powder in the bottle right before you give an injection of glucagon with these kits.

Glucagon should be given whenever someone who takes insulin is:

- Unable or refusing to drink, swallow, or eat sugar (or sugar-sweetened products) when blood sugar is low
- Angry or aggressive
- Having seizures or convulsions
- Unconscious or unresponsive

While it is best to test the person's blood glucose level before giving glucagon, it is safe to give even if blood glucose is not dangerously low.

Glucagon is packaged in kits.

Two common brand-name kits are the **Glucagon Emergency Kit** and the **GlucaGen HypoKit**.

Glucagon is also available as a dry nasal spray — the brand name is **Baqsimi.** (Keep the bottle sealed until it is ready to use.)

Gvoke is another type of glucagon that is pre-mixed (reconstituted) and comes in a single-dose syringe or pen that is ready to use. Follow injection instructions included with the Gvoke syringe or provided by your diabetes care team.

Follow these steps to give a glucagon injection:

1. Open the kit and pop the seal off the bottle.
2. Take the cap off the syringe.
3. Stick the syringe needle into the bottle and push the plunger down so the liquid goes into the bottle.
4. Pull the syringe out of the bottle.
5. Swirl the bottle until the powder is completely mixed with the liquid.
6. Stick the syringe back in the bottle and draw up the liquid into the syringe. Remove the filled syringe from the bottle.
7. Hold the syringe like a pencil and insert the needle into the thigh, buttock, or upper arm of the person who needs glucagon.
8. Inject all of the glucagon.
9. Remove the syringe and turn the person on their side so they will not choke if they vomit (throw up).
10. Call 911 and stay with the person until help arrives.

Glucagon is necessary. If your pharmacy or insurance refuses to cover it, contact your doctor's office for advice.

Tips for storing glucagon kits

- ☐ **Always have a glucagon kit on hand.** Keep one kit at home and another one at school or daycare. You might also want to have some extra kits at a relative's, friend's, or babysitter's home, in a school backpack, and with a parent.
- ☐ **Store glucagon kits at room temperature**, away from direct sunlight and moisture. Do not leave one in a hot car.
- ☐ **Keep the instructions on how to give glucagon with the kits and review these steps often.** Teach all of the people who might need to give a glucagon injection when and how to do it.
- ☐ **Check the expiration date printed on your kits.** Order replacement kits before they expire. Use the expired kits to practice mixing and drawing up glucagon.

Quick Quiz: Treating and preventing low blood glucose (hypoglycemia)

True or false?

Very low blood glucose is healthy.

true **false**

Eating too many carbohydrates can cause low blood glucose.

true **false**

Low blood glucose can make you feel weak and dizzy.

true **false**

Circle the correct answer:

What can cause low blood glucose? (Circle all that apply.)

A. Skipped or late meal, or not finishing a meal
B. Testing blood glucose often
C. Particularly hard exercise or play
D. Too much insulin

What is a symptom of low blood glucose? (Circle all that apply.)

A. Headache
B. Moodiness or irritability
C. Weakness
D. Dizziness

What should you do if your blood glucose is too low?

A. Take additional insulin
B. Exercise vigorously
C. Eat a carbohydrate snack
D. Take a nap

What emergency medication should you inject to treat very low blood glucose when the person cannot swallow or respond?

A. Lantus insulin
B. Blood thinner
C. Rapid-acting insulin
D. Glucagon

What things should you do at bedtime to prevent a nighttime low?

A. Check your blood glucose
B. Consider the day's exercise and other physical activity
C. Adjust the bedtime snack if blood glucose is low
D. All of the above

answers: false; false; true; A, C, and D; all answers are correct; C; D; D.

Notes

Treating and Preventing HIGH Blood Glucose (Hyperglycemia)

High blood glucose (hyperglycemia) is when your blood glucose level goes above your target range. When your blood glucose is too high, you will use your correction dose to treat it at mealtime or snack time. This section tells you what you need to know to treat and prevent high blood glucose.

What causes high blood glucose?

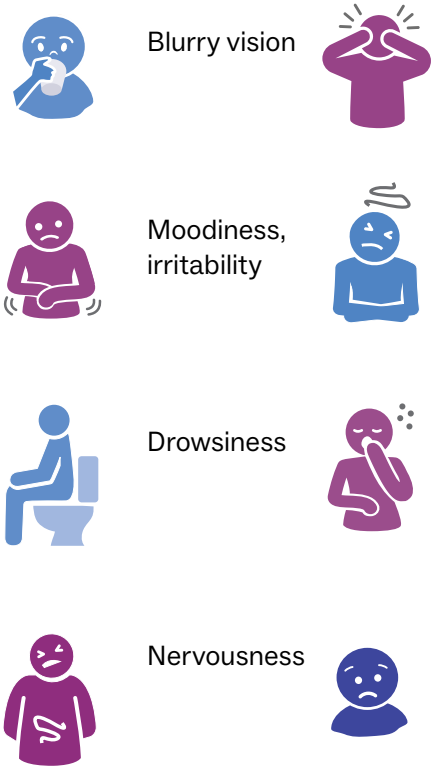
There are several reasons why your blood glucose might go too high:

- Skipped insulin dose
- Too little insulin
- Eating more carbs than your insulin dose can cover
- Illness, infection, or fever
- Emotional stress
- Less physical activity than usual

What does high blood glucose feel like (or look like)?

High blood glucose can cause these symptoms:

- Extreme thirst
- Blurry vision
- Hunger
- Moodiness, irritability
- Frequent urination (peeing a lot)
- Drowsiness
- Stomach ache
- Nervousness



Watch for highs . . .

During the first 2 weeks after your diagnosis, you will talk to your doctor or diabetes educator regularly to report your blood glucose readings and make insulin adjustments. If your glucose is over 300 mg/dL, follow the instructions on the **next page.**

How do I manage high blood glucose?

- **Check your blood glucose.** This helps make sure that the symptoms are coming from high blood glucose, not something else.
- **If your blood glucose is high, take your correction dose of insulin.** Follow your doctor's instructions for taking this dose. Correction doses are usually given as needed at mealtimes and bedtime, and at least 2 (preferably 3) hours after the last rapid-acting insulin dose.
- **If your blood glucose is more than 300 mg/dL at least twice in a row (checking at your regular times), also check for ketones in your urine.** Use the ketone test strips (such as Ketostix or Chemstrip UK) from the pharmacy. Follow the instructions exactly.

For more information on managing ketones, see the "Sick Day Care" instructions **on page 2.6** in Section 2.

Remember:

- Prevent high blood glucose by following your diabetes treatment plan, including insulin and regular blood glucose checks.
- Treat high blood glucose by taking your correction dose of insulin and following other instructions from your doctor.
- Tell your doctor about recurring high blood glucose, or about a very high reading with sickness or symptoms. You may need advice to keep a bad situation from getting worse.

Urine ketones or blood ketones?

You can check for ketones in either your urine or your blood. Blood ketones can only be checked with a blood ketone meter. However, during the first 2 weeks after diagnosis, you will likely check urine ketones.

If ketones are present and you are NOT vomiting (throwing up):

1. Take your correction dose if you have not already done so.
2. Drink plenty of water.
3. Re-check your urine for ketones every 3 hours until they are negative.
4. Call your doctor or diabetes educator.

If ketones are present and you ARE vomiting (throwing up):

1. Call your doctor or diabetes educator for advice.
2. Take your correction dose if you have not already done so.
3. Drink plenty of water.
4. Re-check your urine for ketones every 3 hours until they are negative.

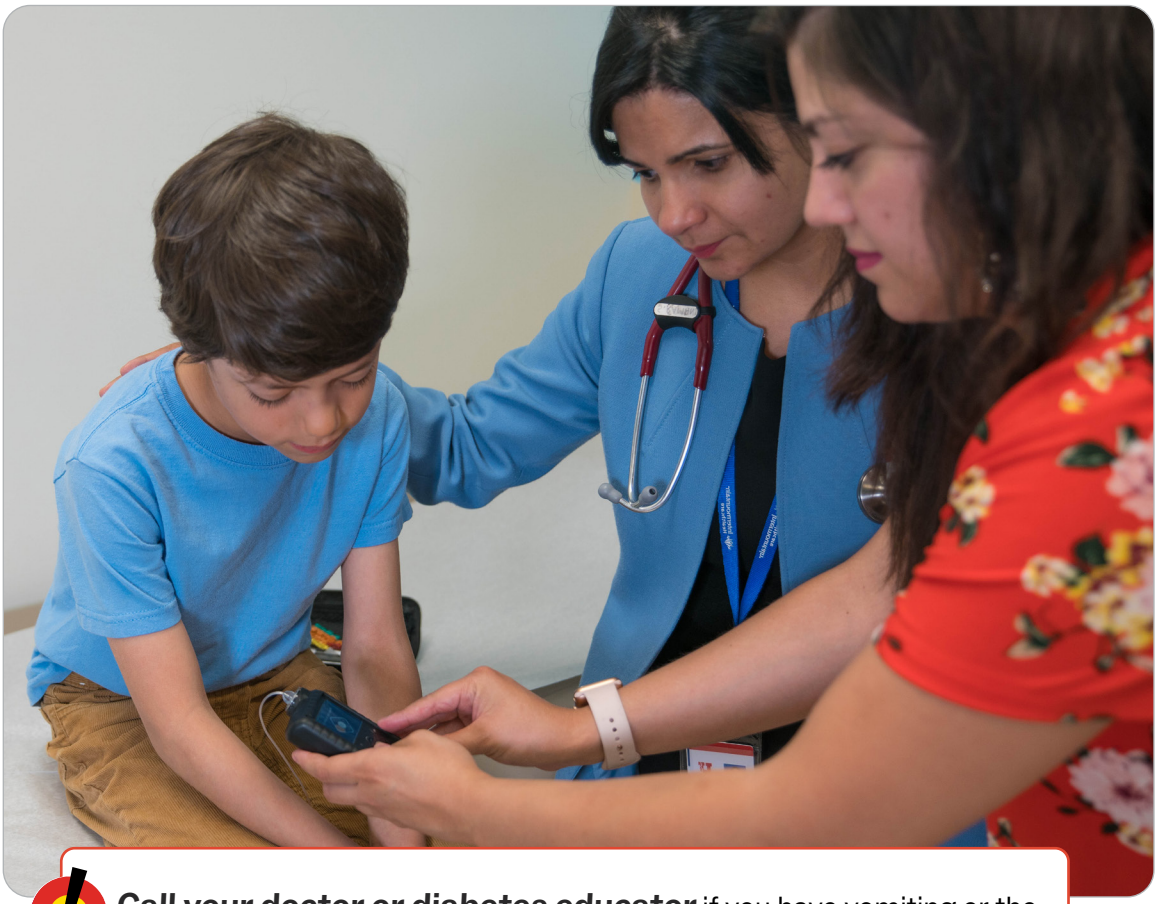
Report your high blood glucose reading to your doctor at the next scheduled phone call or visit.

What about diabetic ketoacidosis?

If you have high blood glucose and ketones, you can have a serious condition called diabetic ketoacidosis (DKA). You might be able to manage very mild DKA at home using the sick day care specific instructions on **page 2.7** in Section 2. However, with more severe DKA you might have to go to the hospital or clinic for intravenous fluids and insulin. DKA can become a medical emergency.

Besides high blood glucose and ketones, DKA can cause these symptoms:

- Deep, labored breathing — called "Kussmaul respirations"
- Sweet, fruity-smelling breath
- Dehydration (dry mouth, dry eyes, little or no urination, dark circles under the eyes)
- Tenderness or pain in your stomach area
- Confusion, slowness, or drowsiness



Call your doctor or diabetes educator if you have vomiting or the symptoms listed above along with blood glucose more than 300 mg/dL and ketones. Your doctor can decide whether you should treat it at home — or whether you need to go to a hospital.

Quick Quiz: Treating and preventing high blood glucose (hyperglycemia)

True or false?

Untreated high blood glucose can develop into diabetic ketoacidosis (DKA).

true **false**

Exercise usually causes high blood glucose.

true **false**

High blood glucose can make you feel thirsty and hungry.

true **false**

Circle the correct answer:

What can cause high blood glucose? (Circle all that apply.)

A. Emotional stress
B. Illness or infection
C. Skipped insulin dose
D. Eating more carbohydrates than your insulin dose can cover

What is a symptom of high blood glucose? (Circle all that apply.)

A. Hunger
B. Frequent urination (peeing a lot)
C. Thirst
D. Nausea

What should you do if your blood glucose is too high?

A. Take additional insulin (correction dose)
B. Take glucagon
C. Eat a carbohydrate snack
D. Take a nap

answers: true; false; true; all answers are correct, all answers are correct; A.

Notes

Notes

Skills to Learn Within 2 Weeks

When you first learned you had diabetes, you had a team of experts taking care of you in the hospital, including your doctor, nurses, dietitians, and others. Now you are probably home again and starting to get back to your regular activities.

What's ahead

This section will help you take the next steps in your journey. You will learn about:

- Coping with your feelings about diabetes
- Going back to school
- Exercising and playing sports with diabetes
- Managing diabetes when you have a cold or another minor sickness
- Getting your supplies and prescriptions
- More tools and tips for counting carbs, plus eating away from home and handling holidays
- Driving with type 1 diabetes

First Things First

You might be feeling a little nervous about managing diabetes on your own. Remember that you still have a team of experts ready to help. Do these important tasks every day:

- **Test** and track blood glucose levels before meals, at bedtime, and at other times if needed. Treat low blood glucose and high blood glucose as instructed.
- **Count** carbohydrates at every meal and snack.
- **Give** insulin as prescribed: Basal and bolus. Do not skip insulin doses.
- **Call** your doctor or diabetes educator every 2 to 3 days until your first doctor's office visit.

Things to do within 3 days after you go home

1. Pack a diabetes care kit that includes testing supplies, insulin and injection supplies, low blood glucose snacks, and a Glucagon or GlucaGen kit. Make sure it goes with your child whenever they leave home.
2. Call your insurance provider. Ask if they have a diabetes patient advocate or care manager who you can work with. Find out what you can expect to pay for insulin and supplies and which ones they cover. See **page 2.24** in this section for more information.
3. If your child goes to school or daycare, arrange a meeting to discuss diabetes care with their teachers, school administrators, the school nurse, coaches, and activity coordinators. See **page 2.5** for more information.

Call for help if your child:

- Is vomiting or has ketones
- Has 2 consecutive blood glucose readings below their target
- Has a blood glucose level below their target at the same time 2 days in a row

Call 911 and give Glucagon / GlucaGen if your child is unconscious or has a seizure

My Diabetes Support Team

Clinic:_____

Phone number:_____

Hours:_____

After hours and holidays / weekends:_____

My child's doctor:_____

Diabetes and Your Emotions

A type 1 diabetes diagnosis can bring up a lot of strong feelings. It's normal to feel shock, denial or disbelief, sadness, anger, fear, worry, and even guilt. You might also be feeling overwhelmed by all of the new things you have to learn and do to manage diabetes. Know that it will get better with time.

What can help

Meeting with other people who have type 1 diabetes, either in person or online, can help. Thousands of families have gone through this and understand what you are going through.

They will help you learn that even though type 1 diabetes is a life-changing diagnosis, your dreams and plans for the future do not have to change.

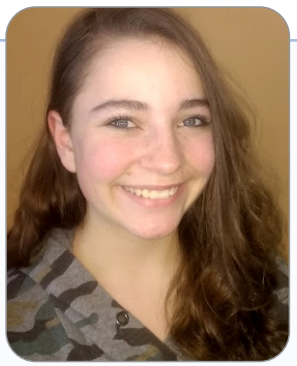
Through this shared experience, you will start to feel more comfortable and confident about managing diabetes. It will always take effort, but taking care of diabetes will soon become your new normal.

Living with diabetes

Over time, you will find ways to manage all your emotions in a healthy way. There are many places to find help. For example, you might:

- Take classes with other families who are new to diabetes.
- Meet one-on-one with a diabetes educator or dietitian.
- Use the online resources at **primarychildrens.org/diabetes.**
- Join an organization that supports people with type 1 diabetes, like JDRF **(jdrf.org).**

Helen's story



"When I first heard the diagnosis, I felt confused: What is diabetes? I think I've heard of that. Isn't that a disease in older people?

Everything felt like it was happening so fast, and the only thing I wanted was to get out of the hospital and go home. I wanted everything to be normal again. I wanted all of the stress and fear and tears and confusion to go away.

Good news: The stress and fear and tears and confusion DO go away, and faster than you'd think. Three years later, my life is normal and happy. It takes a while to adjust, but I got used to the routine and the needles and the carbohydrate counting.

ANYTHING is possible, with or without diabetes. Life doesn't end after diagnosis."

—*Helen*, age 13, diagnosed with type 1 diabetes at Primary Children's Hospital

For parents

Parents often feel guilty, angry, or anxious when their child's diabetes is first diagnosed. Some children, especially younger children, might think you are angry or frustrated with them, instead of with the disease. Be sure your child understands that you are not upset with them.

Diabetes and family finances

Unfortunately, diabetes can be a very expensive health condition to treat. This may add to your family's stress. Even with health insurance, there will probably be new expenses to budget for, such as co-pays for diabetes supplies and doctor visits. Later in this section, you will find information on working with your insurance company to keep your costs down as much as possible.

For kids and teens

Telling others that you have diabetes

Sometimes children and teens feel uncomfortable telling others they have diabetes. It can be hard to know how people might react, especially other kids. Not everyone needs to know that you have diabetes, but it is a good idea to tell the people you see often. You can start by telling someone you know well and trust, like your best friend or favorite teacher.

You will probably find that most people accept you just as you are. They might even want to help. For instance, they can remind you to check your blood glucose or give yourself an injection. Friends are sometimes the first people to notice signs of hypoglycemia or hyperglycemia and can help keep you safe.

Testing and treating in public

To manage your type 1 diabetes, you can check your blood glucose and give yourself insulin injections when and where you need to, including at school and in other public places. If it feels more comfortable, you can go somewhere more private to do these things, such as the school nurse's office or a restroom. Either way is fine. Do what works best to take care of yourself.

Diabetes and depression

Serious, life-long health conditions like diabetes can cause depression. Depression is a treatable condition and nothing to be embarrassed about.

Some of the signs of depression are the same as you might have with hypoglycemia or hyperglycemia, such as feeling tired, anxious or irritable. Talk to your care team if feelings persist or worsen. Other signs of depression are:

- Sadness that does not go away or get better
- Feeling hopeless
- Having trouble concentrating
- Problems sleeping (sleeping too much or not enough)
- Losing interest in things you used to enjoy
- Eating too much or very little

Your doctor understands that it's important to treat your depression if you have it, and may ask you questions or give you a screening tool to help figure out if you are depressed. If you think you might be depressed, or you have questions about depression, be sure to talk to your doctor.

Getting Ready to Go Back to School

What you need to know:

The school's responsibilities

School districts and staff must provide an individualized plan to accommodate a student's special healthcare needs. Two federal laws apply:

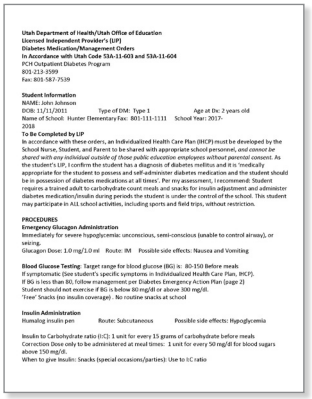
- **The Education for All Handicapped Act of 1975** entitles all physically, developmentally, emotionally, and other health-impaired children to free, appropriate public education. Any school that receives federal funding or is a facility that is considered open to the public must reasonably accommodate the special needs of children with diabetes.
- **Section 504** is a civil rights law that makes it illegal for any agency or organization that receives federal funds to discriminate in any way against qualified people with disabilities.

Staff at most schools are aware of their obligation to support your daily diabetes care — including helping with blood glucose monitoring and medication. Still, they will rely on you and your family to work with them on your needs — to teach them how to help you and give them the tools they need to do so.

What you need to do:

Prepare the school staff

- **Contact your school or district nurse.** The nurse can give you any additional forms and make sure that you have the support you need for your daily diabetes care.
- **Talk with the nurse about when and where you will check your blood glucose and inject insulin.** Younger children might need help from the nurse or another member of the school staff. Older kids may want to do these things on their own.
- **Make an appointment with your teacher, coach, and school counselor** to discuss diabetes care at school and after school. Give each person a packet that includes:
  - A copy of your Diabetes Medical Management Order signed by your doctor
  - The ***Diabetes: Information for teachers***, ***Low Blood Glucose***, and ***Diabetes Medicines: Glucagon*** handouts (see below). These documents are included in the Resources section of this handbook.
  - Glucose gel or tablets
  - A Glucagon or GlucaGen kit, a dry nasal spray, or pre-mixed single dose syringe or pen.


Utah Department of Health/Utah Office of Education
Licensed Independent Provider's (LIP)
Diabetes Medication/Management Orders
In Accordance with Utah Code 53A-11-603 and 53A-11-604
PCH Outpatient Diabetes Program
801-213-3599
Fax: 801-587-7539

Student Information
NAME: John Johnson
DOB: 11/11/2011 Type of DM: Type 1 Age at Dx: 2 years old
Name of School: Hunter Elementary Fax: 801-111-1111 School Year: 2017-2018

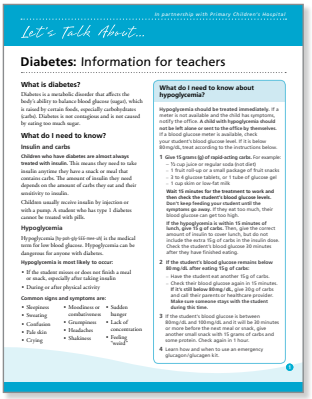
To Be Completed by LIP
In accordance with these orders, an Individualized Health Care Plan (IHCP) must be developed by the School Nurse, Student, and Parent to be shared with appropriate school personnel, *and cannot be shared with any individual outside of those public education employees without parental consent.* As the student's LIP, I confirm the student has a diagnosis of diabetes mellitus and it is 'medically appropriate for the student to possess and self-administer diabetes medication and the student should be in possession of diabetes medications at all times'. Per my assessment, I recommend: Student requires a trained adult to carbohydrate count meals and snacks for insulin adjustment and administer diabetes medication/insulin during periods the student is under the control of the school. This student may participate in ALL school activities, including sports and field trips, without restriction.

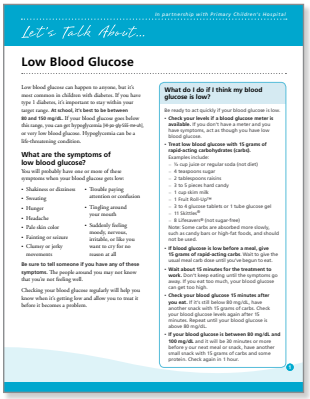
PROCEDURES
Emergency Glucagon Administration
Immediately for severe hypoglycemia: unconscious, semi-conscious (unable to control airway), or seizing.
Glucagon Dose: 1.0 mg/1.0 ml Route: IM Possible side effects: Nausea and Vomiting

Blood Glucose Testing: Target range for blood glucose (BG) is: 80-150 Before meals
If symptomatic (See student's specific symptoms in Individualized Health Care Plan, IHCP).
If BG is less than 80, follow management per Diabetes Emergency Action Plan (page 2)
Student should not exercise if BG is below 80 mg/dl or above 300 mg/dl.
'Free' Snacks (no insulin coverage) : No routine snacks at school

Insulin Administration
Humalog insulin pen Route: Subcutaneous Possible side effects: Hypoglycemia

Insulin to Carbohydrate ratio (I:C): 1 unit for every 15 grams of carbohydrate before meals
Correction Dose only to be administered at meal times: 1 unit for every 50 mg/dl for blood sugars above 150 mg/dl.
When to give insulin: Snacks (special occasions/parties): Use to I:C ratio


Let's Talk About...
in partnership with Primary Children's Hospital
Diabetes: Information for teachers
What is diabetes?
What do I need to know about hypoglycemia?
What do I need to know?
Insulin and carbs
Hypoglycemia
Common signs and symptoms are:


Let's Talk About...
in partnership with Primary Children's Hospital
Low Blood Glucose
What are the symptoms of low blood glucose?
What do I do if I think my blood glucose is low?


FACT SHEET FOR PATIENTS AND FAMILIES
Intermountain Healthcare
Diabetes Medicines: Glucagon
If you use insulin...
If you live, work, or study with someone who uses insulin...

Taking Care of Yourself on a Sick Day

You have to take extra care of yourself on a day when you have a cold, another illness, an injury, or extra stress. Your doctors or diabetes educators may call such a day a "sick day," and they will likely have some special instructions for you.

How does a sick day affect my diabetes?

Illness, injury, and stress affect people in different ways at different times. Still, it is generally true that on a sick day, your blood glucose is likely to be high, even when you are vomiting or not eating much. This is why you may need to increase your insulin until you are feeling better. **Follow the specific instructions on the next page**. Keep this information handy: Tape it inside a cabinet or closet door or in a place that is easy to get to.

What should I do on a sick day?

For the first sick day after your diabetes diagnosis, call your doctor or diabetes educator for advice. When you call, have this information handy:

- Current blood glucose level
- Current ketones (urine or blood)
- Current illness, injury, or problem

Your providers can talk you through the basics of sick-day care. It usually includes ketone testing, checking blood glucose more frequently, drinking plenty of fluids, and adjusting insulin as necessary. See more sick day guidelines on **page 2.8** of this section.

Go to the emergency room (ER) if:

- **You cannot keep blood glucose above 80 mg / dL**, even after following the instructions on the next page
- **Vomiting has continued for more than:**
  - **4 hours** (for a child younger than 2 years)
  - **6 hours** (for a child 2 to 7 years old)
  - **8 hours** (for a child 8 years or older)
- **You have large ketones and vomiting**
- **You notice signs of dehydration**, including little or no urination, no tears, a dry mouth, or dry skin
- **You feel sleepy, you don't have any energy** (lethargic), **or you are breathing heavily**

Specific instructions *for care on a sick day*

Note: Fluids, carbohydrates, and insulin are ALL needed to treat ketones.

<table>
<tr><th colspan="2" rowspan="2">Checking for ketones
(Use the test that works best for you)</th><th colspan="2">Managing your blood glucose</th></tr>
<tr><th>If you are vomiting:</th><th>If you are NOT vomiting:</th></tr>
<tr><td>Urine</td><td>Blood</td><td colspan="2"></td></tr>
<tr><td>No ketones to trace or small ketones</td><td>Less than 0.6 mmol/L</td><td>• If blood glucose is below 80 mg/dL, have some hard candy, ice pops, or sips of a sports drink or other fluid with carbs.
• If blood glucose is 80 mg/dL or higher, continue to drink and eat your meals and snacks when you feel up to it. Follow your regular home insulin routine.</td><td>• If blood glucose is below 80 mg/dL, eat your snacks and meals, and follow your regular home insulin routine.
• If blood glucose is 80 mg/dL or higher, eat your meals and snacks and follow your regular home insulin routine.</td></tr>
<tr><td rowspan="2">Moderate ketones</td><td rowspan="2">0.6 to 1.5 mmol/L</td><td>• Check blood glucose every 3 to 4 hours. Take rapid-acting insulin every 3 to 4 hours until urine ketones are normal or negative or blood ketones are below 0.6 mmol/L.
• If blood glucose is below 150 mg/dL, have some hard candy, ice pops, or sips of a sports drink or other fluid with carbs. See how much you should drink on <u>page 2.8</u>.
• If you have continuous vomiting, consider giving a mini-dose of glucagon (see instructions on <u>page 3.13</u> of Section 3). This may help get your blood glucose above 150 mg/dL so you can give a correction dose of insulin for the ketones.</td><td>• Check blood glucose every 3 to 4 hours. Take rapid-acting insulin every 3 to 4 hours until urine ketones are normal or negative or blood ketones are below 0.6 mmol/L.
• If blood glucose is below 150 mg/dL, eat carbs on a regular meal/snack schedule and take insulin. Make sure you do not skip meals.</td></tr>
<tr><td colspan="2">• If blood glucose is higher than 150 mg/dL, eat meals and snacks (with your regular carb dose) and give the normal rapid-acting correction dose PLUS another half of your correction dose. For example, if your correction is 4 units, have another half of this (4 + 2 = 6 units total). Remember: Blood glucose MUST be above 150 mg/dL before you take this extra insulin.</td></tr>
<tr><td>Large ketones</td><td>More than 1.5 mmol/L</td><td colspan="2">This is urgent. Follow the instructions above for managing moderate ketones.
• If ketones are still large after 3 to 4 hours, call your doctor or diabetes educator.
• If you can't keep fluids down, feel sleepy, don't have any energy (lethargic), or are breathing heavily, go to the nearest emergency room (see instructions at left).</td></tr>
</table>

Sick day guidelines

Check your glucose about every 3 hours when you are sick, even during the night.

Check ketones with any illness. If you're vomiting, check every 3 to 4 hours. If you have a mild illness (such as a cold or cough) with no ketones, you may only need to check 1 or 2 times a day. Do this even if your blood glucose has been low. Keep checking until your ketones are normal. (Follow the instructions on the table on **page 2.7**.)

Keep taking insulin while you're sick. Do NOT skip a dose entirely (unless your doctor tells you to), but **DO** make appropriate adjustments as described in the table on **page 2.7**.

Do not take metformin if you are vomiting.

Drink plenty of fluids, especially water. The type of fluid you drink — sweet or not — will depend on your glucose levels.

Keep eating, even if you are not feeling well.

How much to drink?

If you are sick and vomiting, you need to drink this much fluid during the day (and night) to prevent dehydration:

If the child weighs **less than 20 pounds**, drink 4 to 6 ounces every 4 hours

less than 20 lbs = 4 – 6 oz / 4 hrs

If the child weighs **20 to 45 pounds**, drink 6 to 8 ounces every 4 hours

20 – 45 lbs = 6 – 8 oz / 4 hrs

If the child weighs **over 45 pounds**, drink 8 ounces or more every 4 hours

more than 45 lbs = 8 oz / 4+ hrs

It can be hard to drink enough fluids when vomiting. Your provider may prescribe a medication to help with vomiting (anti-nausea medication). Follow the provider's instructions. If your child is still vomiting after 2 doses call your doctor or go to the ER.

Quick Quiz: Sick Day Care

True or False?

If your blood glucose is not high, you do not need to check for ketones.

true **false**

When you are sick, do NOT skip a dose of insulin entirely unless your doctor tells you to, but DO make appropriate adjustments.

true **false**

To get rid of ketones, you need fluids and insulin.

true **false**

For the first sick day after your diabetes diagnosis, call your doctor or diabetes educator for advice.

true **false**

Circle the correct answer:

Which of the following are reasons to go to the emergency department?

A. Vomiting for more than 4 hours (for a child under age 2), 6 hours (for a child 2 to 7), or 8 hours (for a child 8 or older)

B. Signs of dehydration, such as little or no urination, no tears, dry mouth, or dry skin

C. Feeling sleepy, having little energy, or breathing heavily

D. All of the above

When do you need to test for ketones?

A. Right before meals

B. When your blood glucose is over 300 mg/dL two times in a row, or when you are sick

C. Right after meals

D. Every time you check your blood glucose

What should you do if you have high blood glucose and ketones and you are vomiting (throwing up)?

A. Call your doctor or diabetes educator

B. Take a correction dose of insulin

C. Drink a lot of water

D. All of the above

answers: false; true; true; true; D; B; D.

Notes

Managing PE Class, Sports, and Other Exercise When You Have Diabetes

As you learned in Section 1, when you are playing hard or physically active, your cells need more glucose. To avoid low blood glucose (hypoglycemia), you might need to cut down your insulin or eat extra carbohydrates before or after exercise.

Here are some general guidelines to help you keep your blood glucose level in target range during and after exercise:

- Check your blood sugar before and after exercise. This will help you learn how to adjust your insulin for the activity.
- Always eat before heavy exercise and have snacks available during exercise. The table on the next page provides a general guide on how much food you might need when you exercise, depending on your blood glucose level. It is important to remember that exercise can affect people differently and you can adjust your plan as you learn about your body's needs.
- Have a rapid-acting source of glucose with you in case of low blood glucose while you are exercising. Some examples are glucose tablets, candy, or drinks containing carbohydrate.
- Make sure your coaches know that you have diabetes, know the symptoms of low blood sugar, and understand how to help you if your blood sugar is low.
- If you are allowed, wear a diabetes identification bracelet or necklace when you exercise or play sports, or have one nearby.
- Buddy up with a friend or teammate who knows about low blood glucose reactions.
- Do not exercise if you have moderate to large ketones.
- Drink plenty of water, especially in hot weather. Bring water along when exercising.
- If you usually have low blood glucose after exercising, have extra carbohydrate and protein with your next meal or snack.
- Do not take amino acids or protein supplements unless you have talked it over with your dietitian or doctor.

If you are exercising before a meal, you may not need any additional carbohydrates. If it's been more than 2 to 3 hours since your last meal, have a small snack before exercising. After very intense exercise, watch for low blood glucose 6 to12 hours later.

Remember to drink extra water, sports drinks (depending on your blood sugar levels), or other fluids during moderate exercise to prevent dehydration. Moderate exercises include walking, bicycling leisurely, shooting a basketball, or mowing the lawn. If you do more intense exercise (for example, jogging, bicycle racing, playing in a basketball game) for a similar period of time, then you may need to eat more food.

Amounts vary for different people. The best way to learn is to test blood sugars before and after the exercise and keep a record of your blood glucose.

Length and type of exercise you're planning	Blood glucose level	Grams of carbohydrates to eat before exercise
15 to 30 minutes		
• Walking half a mile • Riding a bicycle slowly for less than 30 minutes	less than 80 mg/dL	• 15 grams of carbohydrate (Examples: 4 ounces juice, 8 ounces Gatorade **or** 8 ounces milk, **or** ½ sandwich*)
	80 to 150 mg/dL	• 15 grams of carbohydrate (Examples: 4 ounces juice **or** 8 ounces Gatorade **or** 8 ounces milk, **or** ½ sandwich)
	more than 150 mg/dL	• Nothing
30 minutes up to 2 hours		
• Shooting baskets • Swimming laps slowly • Mowing the lawn • Bicycling • Walking or light hiking	less than 80 mg/dL	• 30 grams of carbohydrate (Examples: 4 ounces juice **or** 8 ounces Gatorade **or** 8 ounces milk, **plus** ½ sandwich for the other 15 grams)
	80 to 150 mg/dL	• 30 grams of carbohydrate (Examples: 4 ounces juice **or** 8 ounces Gatorade **or** 8 ounces milk, **plus** ½ sandwich for the other 15 grams)
	more than 150 mg/dL	• 15 grams of carbohydrate (Examples: 4 ounces juice **or** 8 ounces Gatorade **or** 8 ounces milk, **or** ½ sandwich)
2 to 4 hours		
• Running long distance • Dancing or aerobics • Playing football • Playing a basketball game • Swimming	less than 80 mg/dL	• 45 grams of carbohydrate (Examples: 4 ounces juice **or** 8 ounces Gatorade, **plus** a whole sandwich)
	80 to 150 mg/dL	• 30 grams of carbohydrate (Examples: 4 ounces juice **or** 8 ounces Gatorade **or** 8 ounces milk, **plus** ½ sandwich for the other 15 grams)
	more than 150 mg/dL	• 15 to 30 grams of carbohydrate (Examples: 4 ounces juice **or** 8 ounces Gatorade **or** 8 ounces milk, **or** ½ sandwich)

*Each of these items has 15 grams of carbohydrate, which will last for about 30 minutes of moderate exercise. A sandwich with meat or other protein will last longer. If you are exercising intensely for longer than 30 minutes, check your blood glucose every 30 minutes and treat accordingly.

More About Eating Well with Diabetes: *How carbohydrates, proteins, and fats affect blood glucose levels*

In Section 1 of this handbook, you learned that carbohydrates, proteins, and fats are the 3 nutrients in food that provide energy. Each of these nutrients affects your blood sugar differently.

Foods that contain carbohydrates have the greatest effect on blood glucose. Most of the glucose in the bloodstream comes from your body breaking down carbohydrates, especially right after eating. Only a small part of the protein and fat we eat is eventually changed to glucose.

The nutritional part of diabetes management is mostly about knowing how many carbohydrates you eat, and balancing that with the correct amount of insulin.

Carbohydrate is a broad term used to describe all types of sugar found in foods. As you learned in Section 1 of this handbook, carbohydrates are found in breads, cereals, starchy vegetables, pasta, fruits, milk, and sweets like candy, cookies, and cake. This group turns into glucose the fastest and will raise blood glucose levels as soon as 15 minutes and up to 2 hours after eating.

Protein is found in meats, nuts, eggs, milk, cheese, and beans. Protein gives our bodies energy, helping us grow, heal, build muscles, and stay healthy. For good health, it is important to have protein at each meal and with a bedtime snack. Proteins affect blood glucose much later than carbohydrates.

Because proteins do not affect blood glucose as quickly as carbohydrates, you do not have to measure these foods. However, you should be careful in controlling portion sizes of protein foods, especially high-fat sources of protein, to maintain a healthy heart.

Fats are found in oils, butter, margarine, nuts, meats, and snack foods such as chips and french fries. It is important not to eat too much fat in order to maintain a healthy heart. Because fats do not affect blood sugar as quickly as carbohydrates, you do not have to measure these foods.

Since protein and fat both affect blood glucose stability, it is important for you to eat mixed meals and snacks as much as possible. A combination food or mixed meal has carbohydrate plus protein or fat. This is especially important with bedtime snacks.

Remember, there are carbohydrates in almost every food. The amount of carbohydrate is what matters for diabetes meal planning.

About how many grams of carbohydrate should I eat at each meal?

Here are some ranges to keep in mind when you are planning meals and snacks. These are meant as a general guide. Talk with your diabetes team if this seems different from what your child usually eats.

Age	Average Calories / Day	Average Grams of Carbohydrate / Meal
0 to 1 years	900	20 to 40
1 to 2 years	1,000	30 to 50
3 to 5 years	1,300	40 to 60
6 to 7 years	1,600 to 1,800	45 to 75
8 to 9 years	1,800 to 2,000	60 to 90
10 to 12 years	2,000 to 2,200	75 to 120
Girls 13 to 19 years	2,000 to 2,200	60 to 100
Active girls 13 to 19 years	2,200 to 2,500	75 to 120
Boys 13 to 15 years	2,200 to 2,500	75 to 120
Boys 15 to 19 years	2,500 to 2,800	90 to 120
Active boys 15 to 19 years	2,900 to 3,000	100 to 150

Measuring and estimating portion sizes

When you look up foods in different carb-counting websites, apps, or books, the amount of carbohydrate in the food item will be listed for a specific serving or portion of that food.

There are several tools that can help you figure out exactly how much of a food equals one portion. These include the following:

- Measuring cups
- Measuring spoons
- Food scales

Measuring cups or spoons are most often used for foods like cereals, pasta, rice, cooked vegetables or beans, mashed potatoes, beverages, casseroles, and puddings.

Food scales are most often used to figure the portion sizes for foods such as meat, fruit, baked potatoes, and baked goods such as cookies, brownies, cake, homemade rolls or bread.

Measuring your portion with measuring cups, measuring spoons, or a digital food scale is the most accurate way to know how much you are eating.

When measuring your food is not convenient, you can estimate your serving size by comparing your serving to everyday objects.

For example:

1 cup is about the size of a tennis ball or a medium-sized apple

½ cup is about the size of a computer mouse

1 teaspoon is about the size of the tip of your thumb

1 ounce is about the size of 4 stacked dice or 4 cubes of cheese

3 ounces is about the size of a deck of playing cards

Cooking from scratch and analyzing recipes

Cooking from scratch is not only fun, it is also the healthiest way to eat, especially when compared to eating out or eating prepared meals from a box or bag.

With a few simple steps, counting carbs in your homemade recipes is easy. Here are some tips to help you get started:

1. Figure out the amount of carbohydrate in each ingredient for the recipe. You can do this with nutrition websites like **MyFitnessPal.com** (look for the green check mark that shows the nutrition information has been verified as accurate) or **CalorieKing.com**.
2. Add up the carbohydrate content for all the ingredients in the recipe.
3. Divide the total carbohydrates in the recipe by the number of servings. This will give you the carb count for one serving. The recipe on the right shows you how to do this.

No-Bake Energy Bites

1 cup old fashioned oats
½ cup peanut butter, low-sodium
⅓ cup sunflower seeds, raw, unsalted
⅓ cup toasted unsweetened coconut flakes
3 tablespoons semi-sweet chocolate chips
⅓ cup honey
1 teaspoon vanilla
¼ teaspoon sea salt

1. Mix all ingredients together in a medium bowl.
2. Let chill in the refrigerator for 30 minutes.
3. Once chilled, roll into small balls.
4. Store in an airtight container and keep refrigerated up to 1 week.

Here are the carb counts for each ingredient in the recipe, according to **MyFitnessPal.com**:

Oats = 46 grams carbs
Peanut butter = 28 grams carbs
Sunflower seeds = 3 grams carbs
Coconut flakes = 7 grams carbs
Chocolate chips = 27 grams carbs
Honey = 31 grams carbs
Vanilla = 1 gram carbs
Salt = 0 grams carbs

This recipe has 143 grams of carbohydrates total.

If you make 20 balls that are about the same size, each ball will have about 7 grams of carbohydrate:

143 ÷ 20 = 7.15

If you make 15 larger balls, the carb count will be almost 11 grams per ball:

143 ÷ 15 = 10.53

Healthy snacking

Healthy snacking is an important part of a kid's diet. Snacks can provide nutrients, help stabilize blood glucose, and provide a boost of energy to help kids get through the day. Most kids of all ages need an after-school snack. Depending on the age of the child, they also may need a mid-morning or bedtime snack.

It can be helpful if families schedule snack times at the same time for all kids, whether or not they have diabetes. For all children, "grazing" or unlimited snacking between scheduled meals and snack times should be limited or avoided.

By limiting grazing or snacking, you will not have to give multiple shots between meals or risk having high blood glucose levels from food that is not covered by extra insulin between meals.

Tips for making snack time easy and healthy

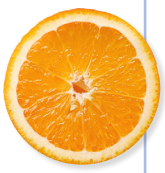
- Plan ahead. Put snacks together while preparing meals.
- Eat snacks between meals and not too close to meal times.
- Keep raw vegetable sticks and sugar-free gelatin on hand.
- Have a spot in the refrigerator and cupboard for snacks.
- Read the label on packaged items to make sure you know the serving size.
- Pick nutritious whole-food snacks like apples, string cheese, or light/low-fat popcorn. See the lists on the right for more healthy snack options.

Mixed snacks

Carbohydrate + protein, 15 to 20 grams carbohydrate per serving:

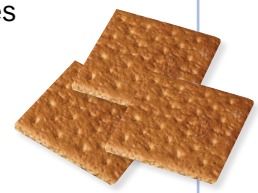
- Small slice of pizza or mini pizza
- Medium apple and peanut butter
- ½ of a meat serving
- 6-inch tortilla with cheese
- Slice of bread with peanut butter or cheese
- 4 to 6 crackers with string cheese
- ½ cup fruit with ½ cup cottage cheese
- 6-inch tortilla with cheese

Snacks with 15 to 30 grams carbohydrate per serving



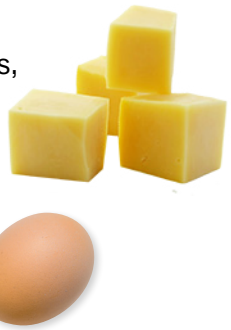
1 medium piece of fresh fruit
½ cup canned fruit
Fruit Roll-Up or fruit leather
Fruit-filled bars
1 cup milk

½ cup fruit juice, juice bars
1 cup sugar-free yogurt
1 ounce serving size of bread, dinner roll, or muffin
½ bagel (2 ounces)
3 graham cracker squares



4 to 6 snack crackers
1 granola bar
3 cups popped popcorn
2 brown rice cakes
1 ounce chips
¾ ounce pretzel sticks
½ cup hot cereal
¾ cup cold cereal
½ cup cereal mix

Snack foods with lots of protein



- Cheese slices, cubes, and sticks
- Cottage cheese
- Hard-boiled eggs
- Peanut butter
- Tuna fish
- Deli meats
- Leftover meats from dinner
- Beef jerky

Better-for-you beverages

Water is an ideal drink with meals, snacks, and whenever you are thirsty. Milk can be a healthy choice, too. Just remember to count and cover the carbs.

Regular soda and fruit juice have a lot of sugar and carbs and should not be a routine part of a daily diet. For a treat, choose diet (sugar-free) sodas or drinks such as Crystal Light.

You can also make no-carb and lower-carb beverages at home using sugar substitutes. Try mixing water, lemon juice, and sugar substitute for homemade lemonade. Or make lower-carb chocolate milk by mixing cocoa powder and sugar substitute with milk.

Eating lunch at school

Most schools in Utah participate in the National School Lunch Program.

On average, school lunches contain 75 grams of carbohydrate, which is usually broken down to:

- 2 ounces of meat or meat alternative
- 2 or more servings of fruits or vegetables
- 2 servings of bread or whole grains
- 1 serving of milk

This consistency in the elementary and junior high schools makes it easier to estimate how many carbohydrates your child will get at lunch.

If your child attends a school that participates in the National School Lunch Program, you should be able to get a list of the individual foods that are served with their specific carbohydrate content. You can get this from the school cafeteria manager, the school district website, or through the school district's main office.

If you are having trouble getting this from the school, talk to your school nurse. Schools are usually very willing to work with you to meet your individual needs.

Here are some other suggestions for managing lunch at school:

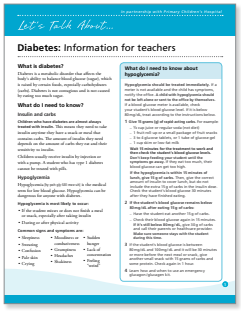
- Hang a copy of the weekly menu on the refrigerator at home and review it for the items you like.
- Review the menu each morning and decide what you will be eating and how many carbohydrates your lunch will contain.
- Parents might want their student to call them at lunchtime to discuss what they will be eating, how many carbohydrates the meal will contain, and what the dose of insulin should be.
- If you bring a packed lunch from home, you can write the carb counts on the lunch bag, or put a note in your lunch box.

Eating at preschool or daycare

- Daycare providers are required to post weekly menus for parents but may not have the carbohydrate amount information for the foods that are served.
- If the daycare receives Child Care Food Program funding for meals, they follow guidelines on amounts they must serve from each food group.
- Unlike schools, daycare providers may not be able to give your child an insulin shot. You may need to make other arrangements to ensure your child gets insulin injections with their meals and snacks.

Tips for parents with children in daycare or preschool

- Set up an appointment with the teacher(s) and the daycare director so you can talk for a few minutes without interruption.
- Ask them if you can get a copy of the weekly menus. Chances are they are fairly consistent in carbohydrates.
- Review with them the need to check your child's blood glucose and give insulin shots with meals and snacks. Ask about their policies.
- Find out what the arrangements will be for insulin shots before meals or snacks, including the calculation of insulin doses.
- Educate them about the importance of regular snack and meal times. Make arrangements with them so your child can eat at the same time each day.
- Go over the signs of low blood glucose and review what they should do if they notice the symptoms in your child. Give them a copy of the Intermountain Health handout ***Let's Talk About . . . Diabetes: Information for teachers*** about type 1 diabetes.


Let's Talk About...

Diabetes: Information for teachers

What is diabetes?

What do I need to know about hypoglycemia?

What do I need to know?

Insulin and carbs

Hypoglycemia

- Provide them with juice or other carbohydrate foods that they can use for a low blood glucose reaction.
- Suggest that they call you with any concerns during the day and that you will check in with them regularly to see how things are going.
- Teach your daycare provider how and when to give glucagon.

Eating out

Between work, school, after-school activities, and community service, families are busy. Most families eat out about 3 times per week. Eating at restaurants can be a challenge for people with diabetes.

The key to eating at restaurants is estimating the carbohydrate amounts as accurately as possible so you can match your insulin shot correctly to your food. One way to do this is to check the ***Nutrition in the Fast Lane*** booklet at **fastfoodfacts.com** for the carbohydrate content of fast foods. You can also ask the restaurant if they have nutrition information available or check the restaurant's website for information ahead of time. It is also helpful to have a portable carbohydrate-counting book with you to refer to as needed. Various smartphone apps, like **Calorie King**, **MyFitnessPal**, and **Carb Manager** are helpful.

Smartphone apps can be a helpful way to count carbs.

Some tips for eating out:

- **Serving sizes at restaurants often contain 2 to 4 servings.** Consider taking part of your meal home to eat the next day, or share a meal with someone else.
- **Restaurant and fast foods are typically higher in carbohydrates and fat** than foods made at home. They can also be lower in fruits and vegetables. Try to eat fruits and veggies at other meals and snacks to make up for this, or order a green salad instead of potatoes or another high-carb side dish.
- Soda pop is a popular choice when eating out. **Choose milk, water, or diet soda over regular soft drinks** to limit added sugar.

Handling holidays and special occasions

Special occasions are often served up with sweet treats, candy, and desserts. This can make meal planning and diabetes management a challenge when trying to stay focused on healthy eating during celebrations and special occasions.

You need to keep close track of your blood glucose levels on holidays and special occasions. Adjust food and insulin as needed, and remember that all foods can be worked into your meal plan. Try to eat snack foods and desserts with your meals to avoid having to take too many shots. Choose sugar-free beverages when possible.

Other tips for holidays and special occasions are to focus on the activities that go with them (such as parties, games, music, and costumes) and give less attention to the food. Use non-food items for gifts and favors.

Valentine's Day

Show your affection with these suggestions:

- Put the emphasis on the valentines and not candy. Make special homemade cards or gifts.
- Go skating, bowling, or to the movies as a way to spend time with those you love.

Easter

Instead of sugary treats, try filling Easter baskets with these items:

- Stuffed animals
- Books or games
- Small toys
- Plants or flowers
- Tickets to a movie or athletic event

Halloween

Halloween is one holiday that is all about candy. Here are some ideas to help manage the extra carbs. For parents:

- Work Halloween candy into your child's meal plans so they don't need extra shots.
- Buy back your child's Halloween candy or trade the candy for a special gift.
- Provide non-sugar treats like sugar-free gum.

For kids:

1. Decide on how many grams of carbohydrate you are going to eat. The resources section of this handbook has a list of carb counts for popular Halloween candies.
2. Figure out how much insulin you need to cover those carbs. Keep in mind that you are likely to be more active while trick or treating.

Quick Quiz: Healthy eating

True or False?

As much as possible, it is important to eat mixed meals and snacks that have carbohydrates plus protein or fat.

true **false**

Using a food scale or measuring cups and spoons is the most accurate way to measure serving sizes.

true **false**

Restaurant meals are usually lower in carbohydrates and fats than meals cooked from scratch at home.

true **false**

Circle the correct answer:

A 1-cup serving is about the same size as:

A. A deck of playing cards
B. A small handful
C. A ping-pong ball
D. A tennis ball

Which of these are not good beverage choices for every day?

A. Fruit juice
B. Water
C. Regular soda
D. Unflavored milk

Which of these are mixed snacks?

A. Popcorn and a cheese stick
B. Graham crackers with peanut butter
C. Cereal with milk
D. All of the above

answers: true; true; false; D; A and C; D.

Notes

Diabetes and Driving: *Staying safe behind the wheel*

People with type 1 diabetes need to be extra careful when they drive. If your blood glucose is not in your target range, you could be a danger to yourself and other people on the road.

Before you get behind the wheel, ALWAYS:

- Know your A1c and work with your doctor to meet your goal. An A1c is a blood test that shows your average blood glucose level during the past 3 months. You can read more about the A1c and other tests for people with diabetes on **page 3.2** in Section 3 of this handbook.
- Know your blood glucose before you get behind the wheel. You either need to wear your CGM routinely, or check at least 4 times a day. ALWAYS check before you drive.
- Keep a blood glucose meter with you so you can check quickly and easily.
- If you are driving a long distance, stop and check your blood glucose regularly and be sure to have food in the car.
- If your blood glucose is less than 90 mg/dL, treat with 15 grams of carbs and retest before driving.

DO NOT DRIVE if you are having symptoms. Even mild hypoglycemia can make it hard to react quickly in a dangerous situation. Severe hypoglycemia can make you pass out. If this happens when you are driving, you, your passengers, or anyone else on the road could be injured or killed.

Wait at least 20 minutes to drive after treating for hypoglycemia. Test your glucose before you start driving again. Don't drive until it is above 90 mg/dL.

- Always keep fast-acting carbs in the car. Some examples include glucose tablets, soda (not diet), fruit juice, sports drinks, and fruit chews.
- If you start to feel funny while driving, pull over right away. Test and treat if needed.
- Know the signs of hypoglycemia:
  - Weakness or exhaustion
  - Shakiness or trembling
  - Feeling nervous or sick to your stomach
  - Feeling sweaty, dizzy, or confused
  - Headaches or hunger
  - Problems seeing well
- Wear a medical ID that can be easily seen

Always wear a seat belt, and make sure that your passengers also wear one.

No license yet?

When you fill out an application for a driver's license in Utah, you will be asked if you have diabetes. You must check the "yes" box. Your doctor will need to fill out a form showing that you take care of your diabetes and are not a driving risk before you can get your driver's license. Your doctor may have specific requirements for your A1C and blood glucose testing.

After you get your license, your doctor will be asked to fill out that same form every year. If your diabetes is not well-controlled, it is possible that your driver's license could be suspended.

Wearing a medical ID

Even if you do not drive yet, it is a good idea to get a bracelet or necklace that identifies you as having type 1 diabetes. Your ID should also have the names and phone numbers of your parents or guardian and doctor. There are lots of different styles of medical IDs to choose from.

A medical ID helps first responders take care of you if you are unconscious and no one is around who knows that you have diabetes. The American Diabetes Association recommends that everyone with diabetes wear one.

Quick Quiz: Driving with diabetes

True or False?

You should always check your blood glucose before you drive.

true **false**

It is okay to drive if your blood glucose is at least 80 mg/dL.

true **false**

You should have fast-acting carbs and a blood glucose meter in the car with you when driving.

true **false**

Circle the correct answer:

How long should you wait after treating hypoglycemia before you drive?

A. 5 minutes
B. 10 minutes
C. 20 minutes
D. You can drive as soon as you feel better.

What should you wear or have with you whenever you drive?

A. A blood glucose meter
B. A fast-acting source of carbohydrates
C. A medical ID
D. All of the above

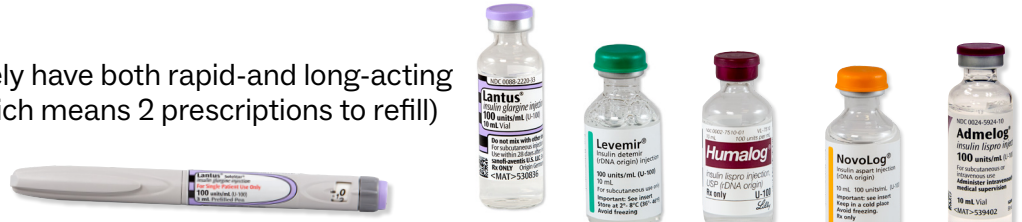
answers: true; false; true; C; D.

All About Diabetes Supplies: *What you need, how to store it, and how to order more*

You may receive some of the things you need (like insulin and a glucose meter) when you are first diagnosed. But you will need to get more diabetes supplies sooner or later.

You can find most of these items at a mail-order, online, or local pharmacy (drug store) or a diabetes supply store:

- Insulin
  (You will likely have both rapid-and long-acting insulins, which means 2 prescriptions to refill)



- Syringes*

- Glucose test strips for your blood glucose meter

- Lancets

- Pen needles* (if you're using an insulin pen)

- Urine ketone test strips

- Alcohol wipes

- Glucose gel or tablets

- A Glucagon or GlucaGen kit

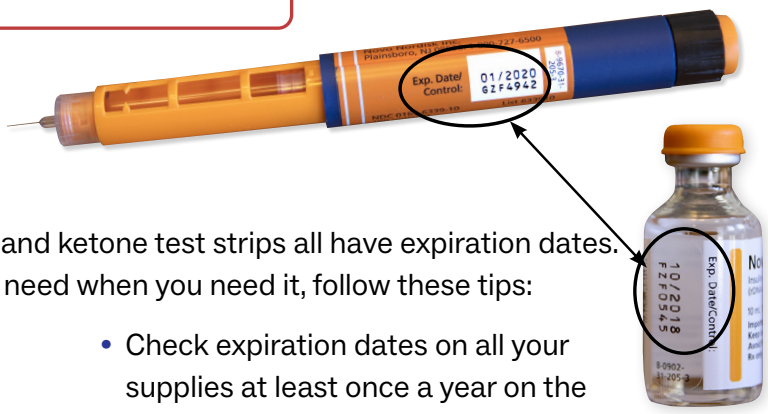
*See **page 4.6** of Section 4 to learn more about specific syringes and needles.

Insulin

To make sure your insulin is working in the right way, you need to store and handle the bottles of medication properly. Insulin may not work right if it is not stored and handled correctly. Review the DOs and DON'Ts below for storing and handling bottles to make sure you are storing and handling insulin correctly:

DO	DON'T
Store insulin bottles you're not using in your refrigerator. (You can keep the bottle you're currently using at room temperature for up to 28 days.)	Leave bottles on windowsills or heaters, or let sunlight shine directly on the bottle. Don't let insulin get colder than 36°F or warmer than 86°F.
Throw away an insulin bottle that has been open or unrefrigerated for more than 28 days, even if there's still some left in the bottle.	Shake an insulin bottle vigorously.
Check the expiration dates on your insulin bottles, and throw away any that are past the date.	Use expired insulin or insulin that is cloudy or has sediment in it (stuff floating around in the bottle or sitting on the bottom of the bottle).
Consider marking your current insulin bottles so that you can see at a glance which type of insulin — long-acting or rapid-acting — you're holding. Some ways to mark your insulin bottles include using a marker to draw a ring on the label, putting a rubber band around the bottle, or putting a sticker on the bottle.	

Always have a spare unused insulin vial or pen on hand. Most insurance policies will not cover a replacement if you break a bottle or leave your insulin in the heat or cold.



Expiration dates and refill information

Your insulin bottles and pens, glucagon kit, and ketone test strips all have expiration dates. To make sure you have the medication you need when you need it, follow these tips:

- Never run out of insulin. Refill your prescriptions **BEFORE** you run out and before it expires. Try to replace refill orders at the pharmacy at least 1 week before you need it.
- Insulin expires 28 days after you begin using the bottle or pen.
- Check expiration dates on all your supplies at least once a year on the medications you rarely use (like glucagon). To help you remember, pick a holiday or birthday to do this on. Throw out old supplies and replace them with new ones.

Working with Your Insurance Company

Every insurance company has different preferred drugs. This can affect your prescription cost and choice of products. To make sure you meet the requirements of your insurance plan, do the following:

1 Call your insurance company and ask to talk to a Pharmacy Benefits person. Have your insurance ID # with you. Write down the name of the person you talked to, as well as the date and time of your conversation.

2 Find out what products are on the preferred product list (formulary) for your plan:

- What brand of glucose meter is covered?

  _____

- How many blood testing strips are routinely allowed per month?

  _____

- What is the preferred brand of long-acting insulin?

  ☐ Lantus ☐ Basaglar
  ☐ Levemir ☐ Tresiba

- What is the preferred brand of rapid-acting insulin?

  ☐ Novolog ☐ Apidra
  ☐ Humalog

- Are insulin pens covered?

  ☐ YES ☐ NO

- If pens are covered, for which of the insulin types listed above?

  _____

3 Ask if there is a deductible to meet before the prescriptions are covered.

☐ YES ☐ NO

4 Find out what the prescriptions will cost each month. Monthly diabetes supplies include:

- Test strips: 200 strips/month
- Lancets: 200 lancets/month
- Long-acting insulin: 10 mL vial and/or a box of 5 pens
- Rapid-acting insulin: 10 mL vial and/or a box of 5 pens
- Syringes or pen needles: 200 count/month
- Glucagon or GlucaGen: 1 kit

If you do not have insurance:

- Some Intermountain Healthcare facilities have social workers and nurse care managers who can help with Medicaid applications and Intermountain Financial Assistance application forms.
- If you do not qualify for Medicaid, there are some patient assistance options from the insulin companies, which might provide some help with the cost of medication. At your first office appointment, ask the clinic staff for information.

Also ask the pharmacy benefits person at your insurance company these questions:

- What is the lowest cost source for prescriptions?
- Are 30-day or 90-day prescriptions more cost-effective?
- Are there preferred pharmacies or mail-order pharmacies to help reduce costs? If mail-order pharmacies are preferred, how do I set up a mail order pharmacy account?
- Within the next 2 weeks, choose a local or mail-order pharmacy you will use. Have your prescriptions transferred to your new pharmacy.
- If 90-day prescriptions from mail order pharmacies are preferred by your insurance company, please call your diabetes nurse or educator at the number written in your packet to have updated prescriptions sent to the pharmacy.
- To reduce the risk of running out of insulin, refill your order when you've used up 80% of your prescription. For example: At 24 days into a 30-day supply, or 72 days into a 90-day supply.

My pharmacy _____

Phone: _____

Hours: _____

Location: _____

Website: _____

My insurance _____

Insurance ID: _____

Phone: _____

Case Manager/Advocate: _____

Email: _____

☐ Meter and strips: _____

☐ Syringes: _____

☐ Pen needles: _____

☐ Ketone strips: _____

☐ Glucagon or GlucaGen kit (circle one)

☐ Lancets: _____

☐ Alcohol wipes: _____

☐ Other: _____

Notes

Advanced Topics

By now you have mastered the basics of type 1 diabetes and know a lot about managing diabetes day to day. However, there are still a few more things to learn on your way to becoming an expert in your diabetes care.

What's ahead

This section covers some of the more advanced topics you may need in the months and years ahead, including:

- HbA1c tests and other important health checks
- Insulin timing
- Continuous glucose monitors (CGMs)
- Insulin pumps
- Teaching others about type 1 diabetes
- Topics for teens
- Transitioning to adult care

Important Tests and Check-ups

As part of your regular, ongoing diabetes care, you will need regular health checks. These checks tell your doctor about your overall health and how your diabetes treatment is working. They can also help prevent long-term complications that sometimes happen with diabetes.

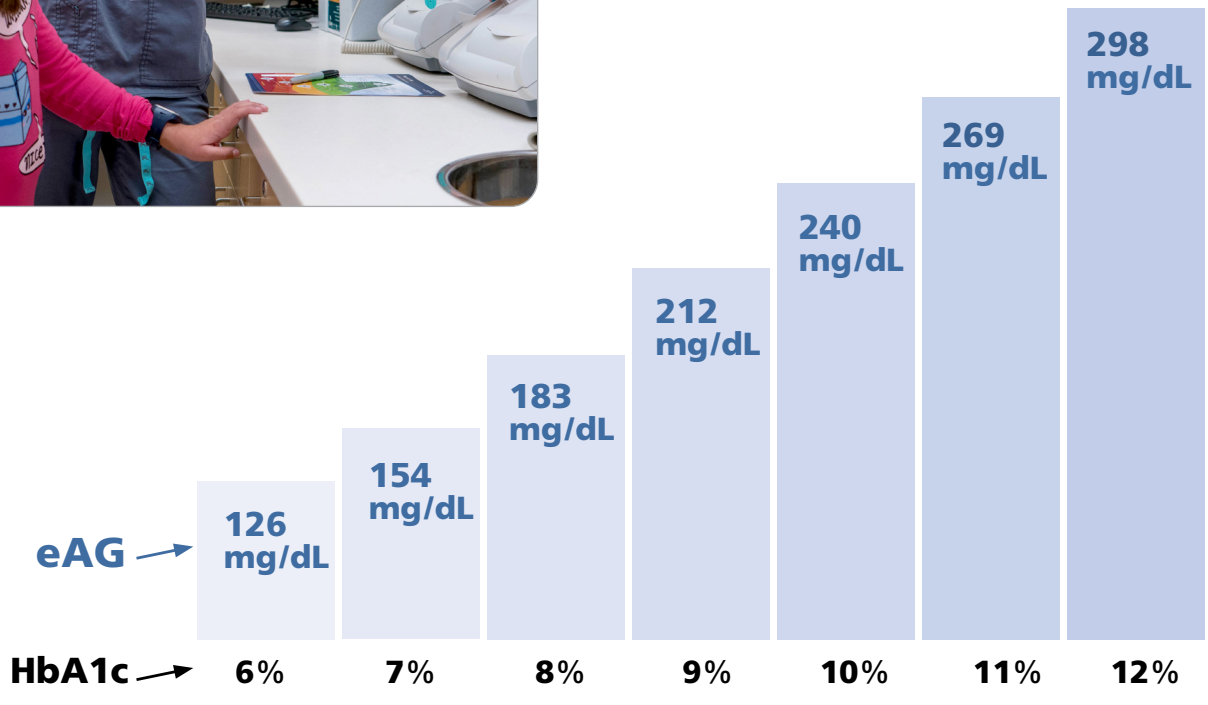
Make sure all of your healthcare providers, including your dentist and eye doctor, know that you have type 1 diabetes. This will help them take the best possible care of you.

HbA1c (also called "A1c")

HbA1c is a blood test that shows your average blood glucose level over the past 3 months. This test is performed in your doctor's office and takes a tiny amount of blood, like a fingerstick for your daily blood glucose checks.

The chart below shows how HbA1c test results match up with average glucose levels (eAG).

The American Diabetes Association recommends that children and teens with type 1 diabetes try to keep their HbA1c score under 7.5%. Your doctor might set a different goal for you based on your individual situation.



Here is how your HbA1c results compare with your eAG (estimated average glucose) fasting blood glucose test results.

Other health checks for people with diabetes

Blood pressure checks

Having diabetes makes you more likely to have high blood pressure.

Blood pressure is the force of blood pressing against the walls of your arteries, like the pressure of water in a garden hose. You need some blood pressure to move blood through the arteries. But if you have too much pressure inside your arteries you have high blood pressure, or **hypertension** [hy-per-TEN-shun].

High blood pressure can damage your blood vessels. It makes your heart work harder and increases your chance for serious health problems throughout your body.

Your doctor will probably check your blood pressure at every office visit. Your blood pressure target will depend on your age, sex, and height.

Dental cleanings and exams

Diabetes can also cause periodontal disease, an infection of the gums and other tissues in your mouth. It is important to see your dentist twice a year to have your teeth cleaned and examined and make sure your gums stay healthy.

Eye exams

Because of diabetes, you are at risk for a serious eye disease called **retinopathy** [ret-n-OP-uh-thee]. Early detection and treatment are the keys to preventing blindness caused by retinopathy. Your doctor may recommend you have an eye exam with dilation performed by an **ophthalmologist** [off-the-MAHL-eh-jist] or optometrist.

Kidney function testing

Diabetes can also cause problems with the way your kidneys work. This is called **nephropathy** [neh-FROP-uh-thee]. Your doctor may order urine tests to see if your kidneys are working as they should.

Foot checks

Your doctor may check your feet at office visits and ask you to check your feet at home, too. To keep your feet healthy:

- Wash and check your feet every day
- Keep your toenails trimmed
- Wear comfortable shoes that fit well

Other tests you may need:

- **Cholesterol screening.** Cholesterol is a waxy substance your body needs to make new cells. Too much cholesterol can build up in your arteries and cause problems such as heart disease. Your doctor may want to measure the cholesterol levels in your blood to make sure they are in a healthy range.
- **Autoimmune disease tests.** As you know, type 1 diabetes is an autoimmune disease (when your body attacks and destroys its own cells). Because you have type 1 diabetes, you are at higher risk for certain other autoimmune diseases, most commonly thyroid and celiac diseases.
  - The thyroid is a gland in your neck that makes hormones. Problems with the thyroid gland can cause many different symptoms, such as weight gain or weight loss, feeling cold, or a depressed mood. Expect to have screening tests for thyroid disease every 1 to 2 years after your diabetes diagnosis.
  - Celiac disease happens when your body attacks cells in your small intestine, a part of your digestive system. Symptoms of celiac disease can include bloating and diarrhea. You will have periodic tests for celiac disease after your diabetes diagnosis.

Quick Quiz: Health checks

True or False?

An HbA1c test shows your average blood glucose level over the past 3 months.

true **false**

The higher your HbA1c score, the lower your chances of developing diabetes-related complications.

true **false**

It is important for all of your healthcare providers to know that you have type 1 or type 2 diabetes.

true **false**

Circle the correct answer:

An HbA1c score of 8 compares to an average blood glucose level of:

A. 126
B. 154
C. 183
D. 212

What HbA1c score does the American Diabetes Association recommend for children and teens with type 1 diabetes?

A. Less than 9
B. Less than 8.5
C. Less than 7.5
D. Less than 7

Some health problems that can be linked to diabetes include:

A. High blood pressure
B. Retinopathy, an eye disease that can cause blindness
C. Periodontal (gum) disease
D. All of the above

Which of the following are autoimmune diseases?

A. High blood pressure
B. Celiac disease
C. Nephropathy
D. Type 1 diabetes

answers: true; false; true; C; C, D; B and D.

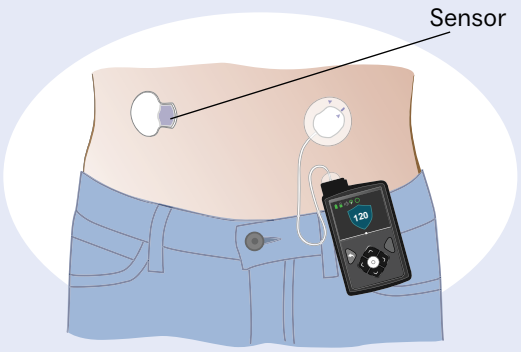
Notes

What is a continuous glucose monitor (CGM)?

A CGM is a device that tracks the glucose in your body's tissues as you go through your day. It can tell you when your glucose levels are rising or falling, how often they change, and how fast the changes are happening. CGMs are usually worn all the time. Sometimes, they are worn for only a few days.

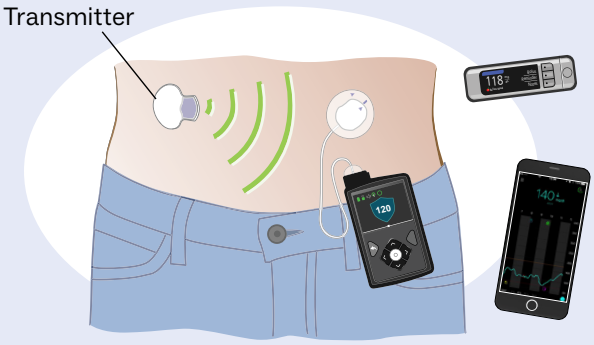
How does a CGM work?

1 The glucose sensor is smaller than a bristle in a toothbrush. It is placed in the tissue under your skin with a needle. Once in place, the needle is removed. This is a simple procedure that you can do at home. You will need to move the sensor to a new location every 1 to 2 weeks. The sensor will measure glucose in your body's tissues every 5 minutes.

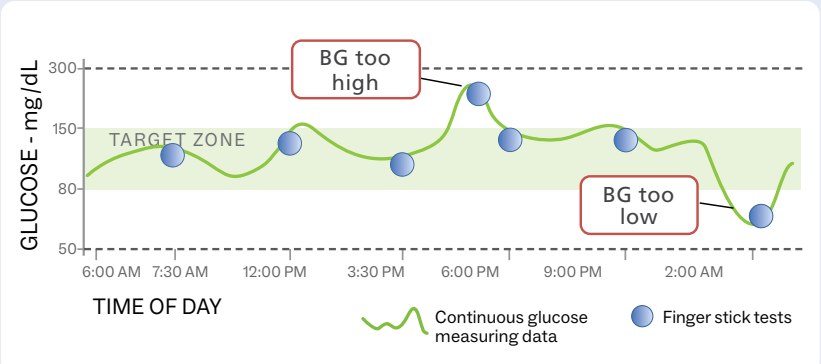


2 The sensor is connected to a transmitter that is taped to your skin. The transmitter sends a signal with information to a receiver, insulin pump, or smartphone that you carry with you.

If you have an insulin pump and a CGM, you will have 2 insertion sites.



3 The CGM can help you recognize when your blood glucose (BG) is getting too high or too low. Some CGMs can send your glucose readings to your parents' or caregiver's smartphone. In some cases, the information from your CGM can be shared with your healthcare provider over the Internet.



Questions and answers about CGMs

How can a CGM help me?

A CGM can help you, your parents or caregivers, and your healthcare providers see how food, exercise, illness, and stress change your blood glucose. Understanding your personal pattern of high and low blood glucose may make it easier to reach your target A1c.

Some CGMs can send information to your pump to stop insulin delivery if your blood glucose is dangerously low. This can help avoid problems from severe low blood glucose (hypoglycemia).

Do I still have to do finger sticks if I have a CGM?

This will depend on the type of CGM you have. Some CGMs require a blood glucose check with a finger stick at least 4 times a day to calibrate your CGM. Others do not. Work with your diabetes care team to understand what you need to do for testing with your specific CGM.

Can I use a CGM if I have type 2 diabetes?

Yes. A CGM can be used by anyone with either type 1 or type 2 diabetes.

Can I have a CGM if I don't have an insulin pump?

Yes. You can have a CGM even if you don't have a pump.

Will it keep me from my favorite activities?

No. You can exercise, swim, and shower with the sensor and transmitter in place.

Can I use it with my smartphone?

Some CGMs will communicate with your smartphone. Talk with your parents or caregivers and your healthcare providers about your expectations and needs. They can help you decide if a CGM is a good fit for you or your family.

Will my insurance pay for it?

Parents or caregivers should ask their health insurance provider if a CGM is covered.

Quick Quiz: CGMs

True or False?

With a CGM, you do not need to check your blood glucose level using fingersticks.

true **false**

A CGM can help you avoid high and low blood glucose levels, even during the middle of the night.

true **false**

Circle the correct answer:

CGMs can show:

A. Whether your blood glucose is rising or falling
B. How fast your blood glucose is changing
C. How exercise, illness, and stress affect your glucose levels
D. All of the above

How often does a CGM measure glucose in your body tissues?

A. Constantly
B. Every 5 minutes
C. Once an hour
D. Every 3 to 4 hours

answers: false; true; D; B.

Getting started on an insulin pump

What is an insulin pump?

An insulin pump is a small device that gives rapid-acting insulin. The insulin is given in small, steady amounts over the course of the day and night. This covers your basal insulin needs. It can also give a bolus dose of insulin to cover meals and correction doses.

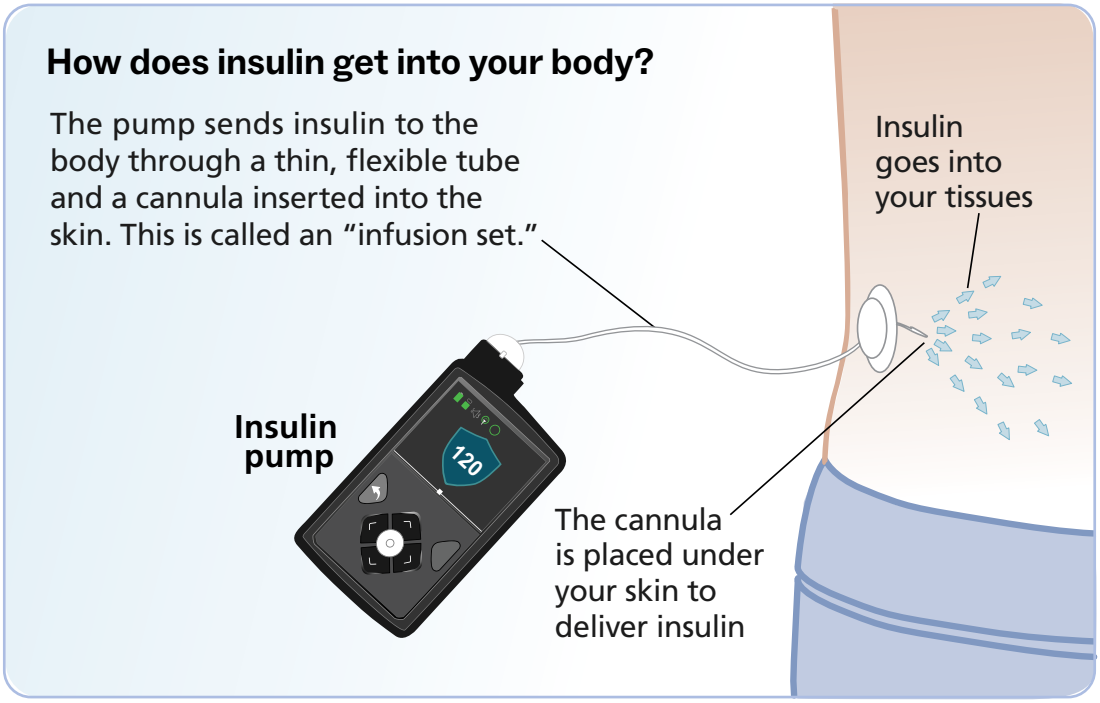
Learning to use an insulin pump takes time and education. You must first understand the basic concepts of diabetes management and show your healthcare team that you can manage well on your own. You are not likely to be ready for an insulin pump until about 6 months after diagnosis.

How does an insulin pump work?

Each insulin pump is different from the others. In general:

- Insulin is stored inside the pump.
- The pump sends insulin to the body through a thin, flexible tube and a cannula (a small, flexible plastic tube).
- The most common places to insert the cannula are the belly, upper arm, and upper butt cheek (buttock). To prevent infection, the pump site and cannula should be changed at home every 2 to 3 days.
- The pump is worn all day, every day. It can be temporarily disconnected when you need to shower or swim.
- The insulin dose can be adjusted to cover exercise, carbs (carbohydrates), and sick days, as needed.

An insulin pump only delivers insulin. It cannot check blood glucose, and most pumps cannot adjust insulin doses on their own. You will need to do this, and it takes some work to get it right.



Why have an insulin pump?

Some reasons to have an insulin pump include:

- Ability to dose insulin in very small amounts — for example, less than a half unit.
- Improved blood glucose control during sleep or after exercise.
- More flexibility in managing meals and blood glucose.
- Fewer injections.

What are some possible drawbacks of using an insulin pump?

Drawbacks depend on the person and their expectations. For example, you:

- Could go without insulin for a long time if your tubing comes out and you do not notice. This could cause **diabetic ketoacidosis** (DKA).
- Might not like having a device attached to your body.
- Might not have the time and patience to learn to manage an insulin pump. Use of these devices requires special training and frequent communication with your healthcare team to make proper adjustments.
- May not have the budget. Insulin pumps and supplies can be expensive.

Is pump therapy right for me?

Pump therapy is not for everyone. Pumps work best for:

- Children and families who know how to manage diabetes well. They will need to:
  - Monitor blood glucose and respond appropriately to highs and lows
  - Keep records of all blood glucose readings
  - Show that they know how to count carbs
  - Be able to solve insulin dosing problems (including correction doses and adjustments for exercise) on their own
  - Understand instructions for a sick day
- Children who want the pump and have good family support. It is not enough that the parents or caregivers want it for their child. The child must be ready for it too.
- Families who can afford the cost of the pump and supplies. Every insurance provider has different requirements. Check with your insurance provider to figure out your coverage.

What should I think about before getting a pump?

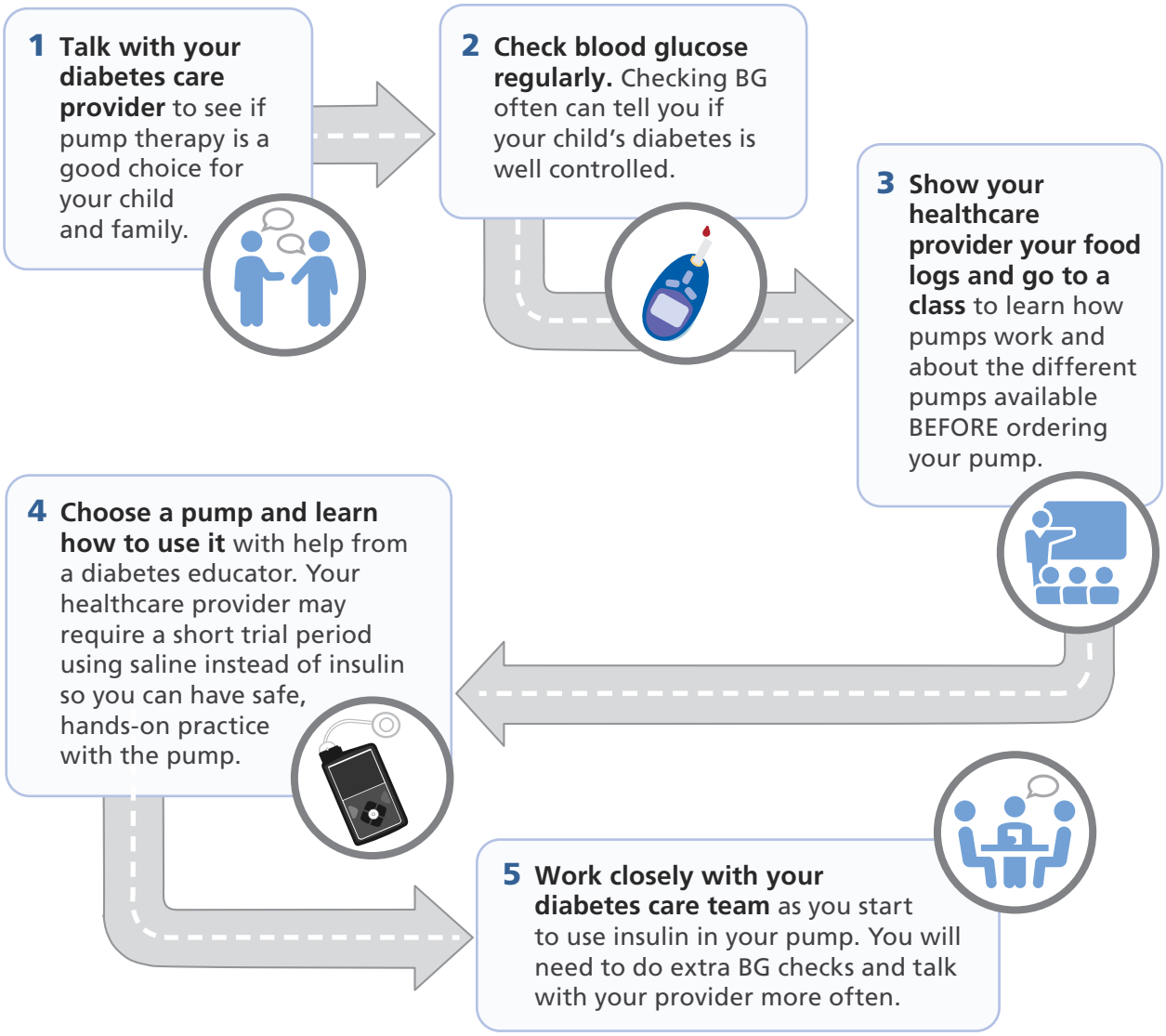
Some things a family should consider before getting an insulin pump are:

- It can be easy to forget to give insulin boluses before eating.
- The pump and supplies are more expensive than injections.
- Pump site infections are a risk.
- A pump needs to be worn almost all the time.
- Pumps must be removed when you swim, shower, or bathe. They can be damaged if they get wet.
- It is still possible to get DKA with a pump, especially with poor control or illness.

Questions for my doctor

What does it take to get started on a pump?

6 to 12 months after diagnosis:



After starting an insulin pump

About 1 month after starting a pump, you and your child should go to an advanced pump education class where you will learn how to:

- Better manage your glucose highs and lows, lifestyle, and sick days while on the pump
- Use the advanced features on your pump

Quick Quiz: Insulin pumps

True or False?

A pump gives you insulin in small, steady amounts during the course of the day and night.

true **false**

An insulin pump can be used to check blood glucose levels.

true **false**

A pump must be worn almost all of the time.

true **false**

You cannot develop hyperglycemia or DKA when using a pump.

true **false**

Circle the correct answer:

What is a reason to have an insulin pump?

A. More flexibility for managing meals
B. Smaller insulin dose increments
C. Fewer injections
D. All of the above

What is a possible drawback of using an insulin pump?

A. Can be expensive
B. Some people do not like having a device attached to their body
C. Education and training are needed and can take time
D. All of the above

How often do the insulin pump site and cannula need to be changed?

A. Every day
B. Every 2 to 3 days
C. Once a week
D. Once a month

When should you remove an insulin pump?

A. Before bed
B. In between bolus doses of insulin
C. When you bathe, shower, or swim
D. Before you exercise

answers: true; false; true; false; D; D; B; C.

Notes

Mini-Dose Glucagon

What is mini-dose glucagon?

Mini-dose glucagon is a small dose of the hormone glucagon. It is used to treat severe low blood glucose, also called **hypoglycemia** [hy-poh-gly-SEE-mee-uh]. Glucagon helps the body use glucose (sugar) and fat.

You should give your child mini doses of glucagon when they are awake and alert and are refusing or unable to eat, but their BG is below 70 mg/dL. This might happen when your child is:

- Sick to their stomach and can't keep food or carbohydrate drinks down
- Being uncooperative and won't eat

Dosing Chart

Age	Dose (in units)	Age	Dose (in units)
Younger than 2 years	2	9 years	9
2 years	2	10 years	10
3 years	3	11 years	11
4 years	4	12 years	12
5 years	5	13 years	13
6 years	6	14 years	14
7 years	7	15 years	15
8 years	8	16 years and older	15

Glucagon is also available as a dry nasal spray — the brand name is **Baqsimi.**

(Keep the bottle sealed until it is ready to use.)

Giving mini-dose glucagon

1. Prepare the glucagon using the instructions in your child's Glucagon Emergency Kit or GlucaGen HypoKit. Both can be kept in the refrigerator and are good for 24 hours after being mixed.
2. Using an insulin syringe, draw up 1 unit of glucagon for each year of life. (See the dosing chart at left.) **Don't give more than 15 units in the first dose.**
3. Inject the glucagon just as you would inject insulin.
4. Check your child's BG in 20 minutes. If it remains below 70 mg/dL, **double the dose and give another injection using the same amount.** Check your child's BG again in 20 minutes. If it remains below 70 mg/dL, repeat this step.
5. **If your child's BG remains below 70 mg/dL after 3 double doses, or if your child becomes sleepy, unconscious, or has a seizure, give the standard dose of glucagon and call 911.**

Glucagon Emergency Kit

Gvoke is another type of glucagon that is pre-mixed (reconstituted) and comes in a single-dose syringe or pen that is ready to use. Follow injection instructions included with the Gvoke syringe or provided by your diabetes care team.

Surgery or Procedure Guidelines

When you (or your child) are scheduled for surgery or a procedure during which you will be sedated or told to fast (have nothing to eat or drink beforehand), **contact your diabetes provider at least 3 to 4 business days before the procedure.** (Examples of procedures that might require sedation or fasting include dental surgery, an MRI, or echocardiogram.)

It's important that you work with the provider's scheduling team to ensure that your procedure is scheduled for early morning or the first one of the day, if possible.

Schedule your appointment first thing in the morning

Follow these guidelines to manage your blood glucose on the day of the procedure.

Before your procedure

- **Do not adjust the dose or time of long-acting insulin injections** unless instructed to do so by your provider. Long-acting insulin includes Lantus, Basaglar, Levemir, Tresiba, or Toujeo.
- **If you have an insulin pump, continue your normal basal rate.**
- **If you are on metformin, do not take it 24 hours before your scheduled surgery time.**
- **Bring diabetes supplies and insulin** with you on the day of your procedure.
- **Check and correct as needed.** Your ideal blood glucose range is 100 to 300 mg/dL. If blood glucose is greater than 300, check for ketones and take half of a correction dose of insulin. If your blood glucose is less than 80, drink 4 ounces of apple juice. Tell your dentist, surgeon, or anesthesiologist (sedation specialist) about this as soon as possible.

During your procedure

When you arrive, remind your healthcare team that you have type 1 diabetes and that your:

- Insulin pump does NOT need to be disconnected unless you are having an MRI or it will interfere with the surgical procedure.
- Long-acting insulin dose is:

  _____.

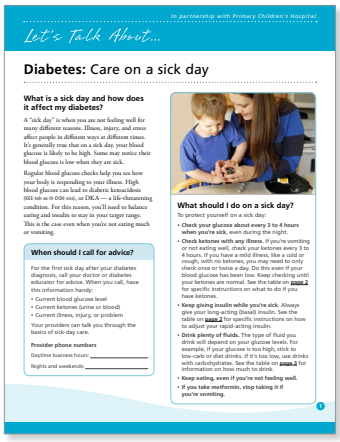
  Your healthcare team needs to know your long-acting insulin dose in case the pump needs to be removed. During procedures and after (if needed), a "temporary basal rate" can be used. Be sure to contact your diabetes provider before the day of your procedure so you know what your temporary basal rate should be.

If you have any questions about what to do, be sure to call your diabetes care team.

After your procedure

When you go home, manage your blood glucose with the following:

- **Always keep a Glucagon / GlucaGen emergency kit and a few insulin syringes close by.** You may need to give mini glucagon doses if you have nausea or vomiting or can't keep fluids down.
- Once you feel well enough to start drinking and eating, resume your usual diet and normal insulin regimen. Your glucose levels may be higher right after your procedure due to the stress on your body from the procedure.
- **Check your glucose and ketone levels every 3 hours after your procedure.** Low blood glucose and high ketones can be prevented with frequent monitoring.
- Keep the ***Diabetes: Care on a sick day*** handout nearby and follow it for the rest of the day. It is important to have both sugar-free and full-sugar fluids available throughout the day. Frequent monitoring can prevent problems.



In partnership with Primary Children's Hospital

Let's Talk About...

Diabetes: Care on a sick day

What is a sick day and how does it affect my diabetes?

A "sick day" is when you are not feeling well for many different reasons. Illness, injury, and stress affect people in different ways at different times. It's generally true that on a sick day, your blood glucose is likely to be high. Some may notice their blood glucose is low when they are sick.

Regular blood glucose checks help you see how your body is responding to your illness. High blood glucose can lead to diabetic ketoacidosis (DKA-tuh-ah-ih-DOH-sis), or DKA — a life-threatening condition. For this reason, you'll need to balance eating and insulin to stay in your target range. This is the case even when you're not eating much or vomiting.

When should I call for advice?

For the first sick day after your diabetes diagnosis, call your doctor or diabetes educator for advice. When you call, have this information handy:

- Current blood glucose level
- Current ketones (urine or blood)
- Current illness, injury, or problem

Your providers can talk you through the basics of sick-day care.

Provider phone numbers

Daytime business hours: _____

Nights and weekends: _____

What should I do on a sick day?

To protect yourself on a sick day:

- **Check your glucose about every 3 to 4 hours when you're sick,** even during the night.
- **Check ketones with any illness.** If you're vomiting or not eating well, check your ketones every 3 to 4 hours. If you have a mild illness, like a cold or cough, with no ketones, you may need to only check once or twice a day. Do this even if your blood glucose has been low. Keep checking until your ketones are normal. See the table on page 2 for specific instructions on what to do if you have ketones.
- **Keep giving insulin while you're sick.** Always give your long-acting (basal) insulin. See the table on page 2 for specific instructions on how to adjust your rapid-acting insulin.
- **Drink plenty of fluids.** The type of fluid you drink will depend on your glucose levels. For example, if your glucose is too high, stick to low-carb or diet drinks. If it's too low, use drinks with carbohydrates. See the table on page 2 for information on how much to drink.
- **Keep eating, even if you're not feeling well.**
- **If you take metformin, stop taking it if you're vomiting.**

Advanced Nutrition: *Making sense of popular diet trends*

Fiber

Fiber is a type of carbohydrate found in **fruits**, **vegetables**, **dried beans** (e.g., kidney, pinto, or black beans), and **whole grains**. Fiber is digested more slowly than other carbohydrates and so does not cause a significant rise in blood sugar levels. Fiber improves your health by:

- Keeping your intestines (gut) healthy
- Reducing constipation
- Keeping your cholesterol levels in a healthy range

Sugar alcohols

Sugar alcohols are a type of sugar substitute used in foods like sugar-free ice creams, puddings, cakes, cookies, candies, energy bars, and jams. These foods may say "sugar free" or "no sugar added" on the label but often still contain carbohydrates. You may still need to give insulin to manage blood sugar after eating these foods.

You can tell which items on a Nutrition Facts label are sugar alcohols because they end in –ol. Examples include:

- **Sorbitol**
- **Mannitol**
- **Xylitol**
- **Maltitol**
- **Erythritol**

If you eat too many sugar alcohols, you may have bloating, gas, cramping, and diarrhea. Children are more sensitive to these side effects.

The bottom line:

Sugar-free foods are not required for good diabetes management. However, foods like sugar-free syrup, sugar-free gelatin, and diet or calorie-free drinks can be useful in reducing calories and carbohydrates in a meal.

The keto diet

The keto diet is not appropriate for growing children and adolescents. The keto diet requires the body to be in a state of chronic acidosis. This compromises normal growth and bone health. It is particularly unsafe for children with type 1 diabetes.

Low-carb diet

Some families prefer to eat a lower-carb diet. If you have questions about how to manage this safely with diabetes, talk with your diabetes team.

For more resources on counting carbs and healthy eating, see **Section 5: Carb Reference.**

Net carbs

Net carbs is a term you may see on the label of foods that contain higher amounts of fiber or sugar alcohols. This term, and others like it, have not been legally defined by the U.S. Food and Drug Administration (FDA) and are not used by the American Diabetes Association. To calculate net carbs, subtract the fiber and sugar alcohol carbohydrates from the total carbohydrates listed on a "Nutrition Facts" label.

Example:

Nutrition Facts

Serving Size 1 bar (39g)
Servings Per Container 12

Amount per Serving	
Calories 80	Calories from Fat 45
	% Daily Value*
Total Fat 5g	**8%**
Saturated Fat 4.5g	**22%**
Trans Fat 0g	
Cholesterol 5mg	**1%**
Sodium 30mg	**1%**
Total Carbohydrate 9 g	**3%**
Dietary Fiber 2g	**7%**
Sugars 2g	
Sugar Alcohol 3g	

9 grams (g) total carbs
– 3 grams sugar alcohol

= 6 grams

6 grams
– 2 grams fiber

= 4 grams "net carbs"

The bottom line:

Don't use net carbs as a way to figure your carb dose because it may cause you to underestimate how this type of food will affect your blood glucose.

Glycemic index

The low **glycemic index** diet is a hot topic in the media these days. The glycemic index (GI) is a measure of how quickly blood glucose rises after eating a certain food. Each food is measured on a scale of 0 to 100.

- A **higher GI number** means that blood sugar rises faster after eating that particular food. High GI foods are often high in sugar or processed (have added ingredients).
- A **lower GI number** is typically found in foods that are higher in fiber, protein, and certain fats and may help a person feel satisfied longer.

These rules don't apply to everything. For instance, some healthful foods (such as beets) may have a high GI, and some low-nutrient foods (such as chocolate cake) may have a low GI.

GI ranking of individual foods only applies if that food is eaten alone and on an empty stomach. Combining a high GI food, such as a potato, with protein- or fiber-rich foods (such as meat, fish or vegetables) will lower the glycemic index of the meal. Other factors affecting a food's GI include:

- Ripeness
- Storage time
- How the food has been processed / cooked
- Hormone levels in the body
- Time of day the food is eaten

The bottom line:

The GI is an imperfect system and, if used alone, can be misleading about the food's impact on blood glucose levels. Overall it is best to limit processed, high-sugar foods and choose a diet rich in fruits and vegetables, lean protein (such as fish, chicken, or turkey), whole grains, and healthy fats.

Healthy fats

Dietary fats (the fat naturally found in food) are essential to good health. Your body needs fat for energy and to support cell growth. Fat protects your organs, keeps your body warm, and helps your body absorb nutrients and produce hormones.

There are 4 major dietary fats in the foods we eat: Saturated fats, trans fats, monounsaturated fats, and polyunsaturated fats.

The “good” fats

Polyunsaturated and **monounsaturated** fats are often called “good fats” because they:

- Lower bad cholesterol (LDL)
- Decrease risk of heart disease
- Help our bodies absorb vitamins and minerals from foods

Poly- and monounsaturated fats tend to be more liquid at room temperature and can be found in:

- **Olive oil**
- **Avocados**
- **Nuts**
- **Fish**

The bottom line:

Include these foods in your diet to improve your overall health.

The ”bad” fats

Saturated and **trans fats** are classified as “bad fats” because they:

- Raise bad cholesterol (LDL)
- Lower good cholesterol (HDL)
- Increase risk of heart disease and type 2 diabetes

Saturated and trans fats tend to be more solid at room temperature (like a stick of butter) and are found in:

- **Fatty meats and some poultry** (poultry skin, goose, duck, bacon, sausage, red meats with marbling)
- **Full-fat dairy** (whole milk, ice cream, cream)
- **Tropical oils** (palm kernel and coconut oil)
- **Partially hydrogenated oils** (such as margarine and vegetable shortening)
- **Fried foods**
- **Desserts** (cakes, cookies, donuts, pastries, cream fillings, and frosting)

The bottom line:

As part of a healthy diet, limit the amount of saturated and trans fats you eat.

Smart snacking based on hunger

Your body is designed to tell you when it's hungry and when it's not. These signals are called "cues." Following these cues can help you stay at or reach a healthy weight.

It is common to eat for reasons other than hunger, such as:

- Habit
- Boredom
- Entertainment
- Distraction
- Anxiety
- Celebration
- Sadness
- Because it's offered
- Because it's "time" to eat
- Because it sounds good

If you are eating to treat low blood glucose more than 1 to 2 times per week, you may need to adjust your insulin so that you are not getting more calories than your body actually needs.

If you need a snack between meals, avoid "grazing." Plan what you will eat and don't be afraid of feeling a little hungry. This will allow you to be ready to eat at the next meal. Keep healthy, nutrient-rich foods in the house for snacking. These include:

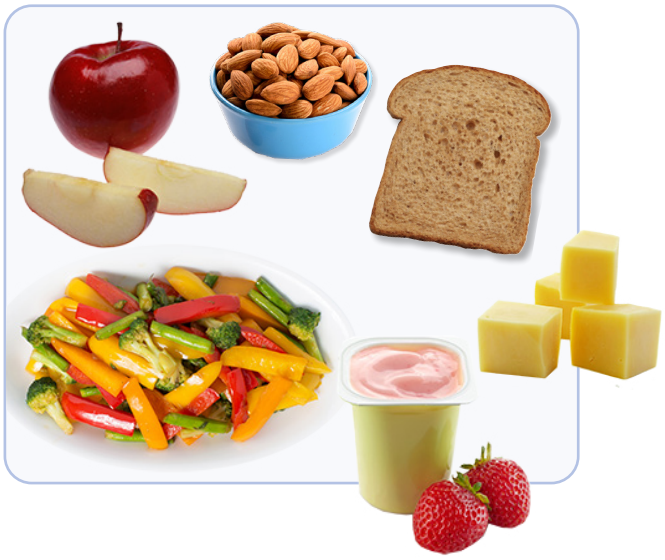
- Fruits and vegetables
- Whole grain bread or crackers
- Nuts
- Low-fat cheese or yogurt

Pair protein-rich foods (low-fat dairy, meat, beans, or nuts) with high-fiber foods (fruits, vegetables, whole grain bread or crackers). This will help you feel full longer and keep your blood glucose more stable. Avoid high-calorie snacks that offer little nutritional benefit (such as soda pop, chips, and candy).

The bottom line:

Pay close attention to your body's cues:

- Eat when hungry
- Stop eating when gently full
- Choose healthful foods most of the time and save treats for special occasions



Teaching Others About Type 1 Diabetes

Type 1 diabetes is not as rare as you might think. About 1 in every 350 to 450 people have it. However, many people don't know a lot about type 1 diabetes. They often confuse type 1 with type 2, or might have outdated or incorrect information. You will probably have many chances to help others understand type 1 diabetes better.

Here are some questions and comments you might hear, and suggestions about what you can tell people:

Why did you get diabetes? You eat healthy foods most of the time.

Type 1 diabetes, the kind I have, is not caused by eating too much of certain foods or not getting enough exercise. You might be thinking of type 2 diabetes. That type can be caused by being overweight or not moving enough.

Nobody knows exactly what causes type 1 diabetes, but experts think it probably happens because of genes you inherit from your parents plus factors in the environment, such as a virus that triggers the disease.

Is it OK for you to eat (or drink) that? Or: Do you have to follow a special diet?

People with type 1 diabetes can eat all the same foods other people eat. We do not need to follow a special diet or avoid eating sugar. We just need to give ourselves insulin so our bodies can convert food to energy. I dose my insulin based on how many carbohydrates I eat.

Do injections and fingersticks hurt? Are they scary?

They can sting a little, even though the needle is small and thin. At first, pricking my fingers and giving myself injections was a bit scary, but now it is just a part of my everyday life.

What is that clipped to your waistband? Or: What is that on your arm?

This is my insulin pump. It gives me little doses of insulin all day and all night plus extra insulin when I eat. I need insulin from the pump to help my body convert food into energy because I have type 1 diabetes. With type 1 diabetes, your body stops making its own insulin or does not make enough insulin.

This is my continuous glucose monitor, also called a CGM. It automatically checks the glucose level in my body every few minutes. I use it because I have type 1 diabetes. With type 1 diabetes, you need to check your glucose level and give yourself insulin throughout the day to make sure you stay healthy.

I know someone with diabetes and they take pills for it. Can you take pills for your diabetes?

No, I have type 1 diabetes. People with type 1 diabetes must take insulin every day to stay healthy. You cannot get insulin from pills, only in a shot (or from an insulin pump).

With type 2 diabetes, your body still makes insulin but it does not use insulin as well as it should. Type 2 diabetes is sometimes treated with pills and sometimes treated with insulin.

Questions and comments you might hear, and suggestions about what you can tell people (continued):

Will you have complications because of your diabetes?

When you have diabetes for a long time, it can cause different problems if it is not well controlled. By taking good care of myself now, I am making sure that my chances of having a complication are as low as possible.

That is why it is important for me to check my blood glucose and give myself insulin several times every day. Doing these things keeps me healthy now and in the future.

Are you allergic to sugar?

No, diabetes is not an allergy. It is a disease that changes the way your body uses sugar. I can eat foods that have sugar in them, but I need to take insulin so my body can convert the food to energy.

Is diabetes contagious? Can I catch it from you?

No, there is zero chance of catching diabetes from someone who has the disease.

Does diabetes run in families?

You are more likely to develop type 1 diabetes if other people in your family also have it, but type 1 often happens to people who have no relatives with the disease. It is probably caused by a combination of factors, including the genes you inherit from your parents.

Were you born with diabetes?

I was diagnosed with type 1 diabetes when I was ____ years old. Most people who have this type are diagnosed when they are babies, kids, or teenagers. Once in a while, it happens in adults.

Type 2 diabetes usually happens in older adults but sometimes affects younger people.

Are there things that you can't do?

There are very few limitations. One is that I can't be drafted or serve in the military. Otherwise, I expect to be able to do everything you can do, including graduate from school, drive, get a job, raise a family, and grow old.

Is there a cure for diabetes?

Not yet, but scientists are working to find one. They are also looking for better ways to treat diabetes and even prevent it from starting in the first place.

Diabetes and the Teen Years

Adolescence brings all kinds of changes: Physical, emotional, and social. It also changes how diabetes affects your body and how you manage type 1 diabetes.

For a variety of reasons, teens with type 1 diabetes tend to have A1c scores that are about 1 point higher than adults. Families might need to adjust their goals and expectations for diabetes care during the teen years. Talk with your doctor or diabetes educator about reasonable guidelines.

Puberty's effects on your insulin needs

Most kids start puberty sometime between ages 9 and 14. For both boys and girls, puberty is triggered by the release of hormones.

When you start puberty, you will probably need more insulin. This is normal and expected. There are several reasons you might need extra insulin during puberty:

- Estrogen and testosterone, the hormones that trigger puberty, also make your body more resistant to insulin. This means that insulin does not work as well as it did before you started puberty.
- Girls might have higher blood glucose levels during their periods.
- Stress hormones can increase blood glucose levels, too. Puberty is often a high-stress time.
- Your appetite will probably increase during puberty as you go through a growth spurt, so bolus doses will most likely increase, too.

If you have unexplained increases in your blood glucose levels, talk with your doctor about adjusting your insulin dosing.

Special challenges for teens with diabetes

Many factors can make it more challenging to manage type 1 diabetes when you are a teen. For example, you are probably eager to be more independent. You might not want your parents to help you with diabetes care, or not help as much as they once did.

At the same time, you probably have a busy schedule. Many things are competing for your time and attention, such as school, extracurricular activities, and socializing. It can be easy to forget to check your blood glucose or give yourself an insulin injection once in a while.

For many teens, it is also important to fit in with friends and not be seen as different. You might feel like putting off diabetes care when you are at school or with your friends, even though you know that is not a good idea.

As much as you can, try to make managing diabetes a priority. Remember to check your blood glucose, count your carbohydrates, give yourself insulin as directed, and see your doctor regularly. That way, you will have the time, energy, and good health for all the things you want to do.

Tips for parents of teens with type 1 diabetes

Parenting a teen with type 1 diabetes can feel like walking a tightrope. You need to balance helping your teen manage their diabetes by letting them learn self-reliance. Your teen is changing quickly, and you have to adapt and change, too. Here are tips to help:

- Try to encourage open and honest communication with your teen. One way to do this is to avoid showing anger or disappointment about blood glucose numbers that are not what you hoped for. Instead of seeing the numbers as "bad" or "good," treat them all as information that can help your teen learn to manage their diabetes better.
- Most teens are focused on the here and now. Talk about how taking care of diabetes helps your teen feel good now and do well at things that are important to them today.
- Some teens respond well to incentives for taking care of their diabetes. For example, your teen's driving privileges could be tied to checking their blood glucose a certain number of times every day. Or you could give your teen a special reward for achieving an A1c target.
- Parents of children with diabetes may struggle with anxiety. Get help if you have signs of anxiety such as:
  - Feeling nervous, anxious, or on edge
  - Not being able to stop or control worrying
  - Trouble relaxing
  - Being restless so that it's hard to sit still
  - Feeling afraid something awful might happen
- Remember that your long-term goal as a parent is to raise a young adult who can manage type 1 diabetes on their own. It is a big job and there are likely to be a few mistakes along the way, but mistakes are part of the learning process for both of you.

Andrea's story

"Getting the news that my son had type 1 was devastating. I was so overwhelmed, so afraid, and even angry. Looking back, I can honestly say that I was going through various stages of grief: Shock, denial, anger, and finally, acceptance. After eight years, I still struggle when something changes in our routine or with my son's health. But with the help of our medical team, and technology, we have adjusted to a 'new normal.'"

"What has really made a positive difference for us is networking with other families on social media. We have met some incredible people who truly understand the impact of diabetes. Through these channels, we can express concerns, share ideas and emotions, problem-solve, and offer support. It's a challenging journey, but having a supportive group to rely on really helps."

—*Andrea*, parent of a teen with type 1 diabetes

Diabetes, Alcohol, and Tobacco

We don't recommend that you drink alcohol or use tobacco products. However, we know that people often choose to try these things, even at great risk. If you do decide to use alcohol or tobacco, you can take action to stay safe. The first step is knowing how alcohol and tobacco can affect your diabetes.

Alcohol can cause low blood glucose (blood sugar)

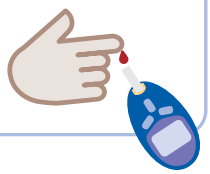
Your body cannot adjust blood glucose while it tries to break down alcohol. This raises your risk of severe low blood glucose (hypoglycemia). You can remain at risk of hypoglycemia for many hours after you stop drinking.

How do I know if my blood glucose is too low?

Normal symptoms of low blood glucose like shaking, sweating, and a rapid heartbeat can be covered up by the effects of alcohol.

The ONLY way to know for sure is to test.

NOTE: Glucagon may not work as well when you're drinking, but should still be used for severe hypoglycemia.



How to stay safe if you choose to drink alcohol

Wear your medical ID.

Use the buddy system. Drink with a sober friend who is willing to stay with you and knows what to do if your blood glucose gets low.

NEVER drink on an empty stomach. Eating a meal first will take the pressure off your liver. This is especially important if you are taking medications called sulfonylureas or meglitinides. Check your prescriptions.

Be aware of how you're feeling. Medications and insulin may act differently with alcohol. It's harder to notice symptoms of low blood glucose when you're drinking.

Drink slowly. Take sips, not gulps. Drink a glass of water with every drink of alcohol. Write down each drink of alcohol where you'll remember. *Remember, it takes about 2 hours to break down 1 drink.*

Stick to sugar-free mixers, such as club soda, sugar-free soda, or water. Avoid sugary sodas and liqueurs. They can raise your blood glucose.

Check your blood glucose. Alcohol and activities like dancing can make your BG spike or drop, so you need to keep track.

- **Check before your first drink, while drinking, and before you go to bed.**
  - Eat a carb meal while drinking.
  - Eat a snack before bed if your blood glucose is below 130.

- **Check during the night and when you wake up.**
  - Set alarms for the night and morning.
  - Ask someone to check on you in the morning.

Take your insulin, even if you're hungover, throwing up, and feeling too sick to eat. If you have concerns, call your diabetes team.

How to stay safe if you choose to drink alcohol (continued)

Have no more than 1 drink a day for a woman or 2 drinks a day for a man. **What is 1 drink?** Each of these counts as 1 drink:

5 ounces of wine

12-ounce can or bottle of beer (light or regular)

1.5 ounces (one shot) of hard liquor (vodka, whiskey, or gin)

4 ounces sherry or liqueur

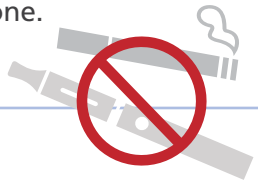
TIP: Always keep an alcohol-free drink on hand. If you don't want your friends to know it isn't alcohol, pour it in a glass or plastic cup.

Tobacco contains nicotine, which can make your diabetes worse

- **Nicotine can raise your A1c.** The nicotine in tobacco, vapes, e-cigarettes, or hookahs is unhealthy for everyone, but especially for people with diabetes. It can make it harder to control your diabetes, leading to **high A1Cs**. It can increase your **insulin resistance,** which means that your body needs more and more insulin to respond as it should.
- **Nicotine increases your risk of complications.** Nicotine can also increase your risk of other diabetes complications, including:
  - **Heart and kidney disease.**
  - **Poor blood flow in your legs and feet.** This can lead to infections, ulcers, and possible removal of a body part by surgery, such as toes or feet (amputation).
  - **Eye disease** that can cause blindness (called retinopathy).
  - **Damaged nerves to the arms and legs** that causes numbness, pain, weakness, and poor coordination (called peripheral neuropathy).

How to stay safe: QUIT

The best thing you can do for your health is to quit using tobacco and other products with nicotine. Ask your healthcare provider for a copy of Intermountain's booklet, ***Quitting Tobacco: Your Journey to Freedom***. It can help you quit for good and connect you with support groups and classes, so you aren't going it alone.



Transitioning to Adult Care

Starting in high school and continuing through the next few years, your diabetes team will connect with you regularly to provide support. They can offer advice and help with skills training to make the transition to working with an adult healthcare team as smooth as possible.

Here are some of the skills you and your care providers will focus on as you move into adulthood:

- Finding an adult doctor/provider and healthcare team
- Learning to order your insulin and supplies
- Working with your insurance company and managing the cost of your care
- Becoming more independent and taking more responsibility for your own care
- Adjusting to life after high school (such as college, work, or volunteer service)
- Setting goals and establishing techniques to support your success
- Developing the important skills needed to manage your condition
- Deciding what your goals are now and after graduating from high school
- Developing a plan for success and the skills needed to accomplish your plan
- Identifying skills that will help you become more independent in taking care of yourself and in making healthcare decisions
- Coordinating healthcare team members to help if you are struggling with stress, depression, or anxiety

TIP: Establishing a social network of support will be key to helping you manage all the feelings you may have as you go through this transition. You will need to find friends and workmates you can trust with information about your diabetes and how to help you in an emergency.

Living Life to Its Fullest

Managing diabetes takes work, but it does not have to keep you from reaching your goals and fulfilling your dreams. When you take good care of yourself and your diabetes, anything is possible!

Some famous people with type 1 diabetes:

- Brec Bassinger, actress
- Halle Berry, actress
- Crystal Bowersox, singer/songwriter, and American Idol alumnus
- Nick Boynton, National Hockey League player
- Jay Cutler, National Football League quarterback
- Conor Daly, professional race car driver
- Chris Dudley, former National Basketball Association player
- Kris Freeman, national champion cross-country skier
- Gary Hall, Jr., Olympic swimmer
- Nicole Johnson, former Miss America
- Nick Jonas, pop star
- Kevin Kellerman, mixed martial arts fighter
- Dustin McGowan, Major League Baseball pitcher
- Bret Michaels, rock star
- Sonia Sotomayor, Associate Justice, Supreme Court of the United States

Nick Jonas

Multi-platinum singer, recipient of the 2017 Hero Award

Kris Freeman

Four-time US Olympian and cross country skier

Nicole Johnson

Former Miss America, author, journalist, and speaker

Notes

Resources

This section has additional resources you may find helpful.

What's ahead?

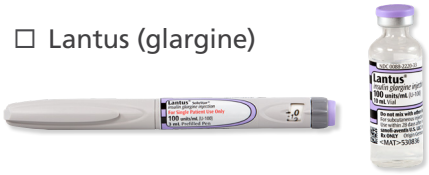
- More information on insulin and syringes
- Being prepared for an emergency, vacations, travel, and other unexpected life events
- Handouts to give your teachers, coaches, school administrators, and activity coordinators with information about diabetes and helping you stay safe at school
- A glossary of key diabetes-related terms
- Websites with information and resources for patients with type 1 diabetes and their families

Types of Insulin

Ask your doctor or diabetes educator to circle the type(s) of insulin you use.

Long-acting

☐ Lantus (glargine)



☐ Basaglar (glargine)

☐ Semglee (glargine)

☐ Levemir (detemir)

☐ Tresiba (degludec)

☐ Toujeo (U300 glargine)

Rapid-acting

☐ Humalog (lispro)

☐ Novolog (aspart)

☐ Humalog Jr (lispro)

☐ NovoEcho (aspart)

☐ Insulin Lispro (lispro)

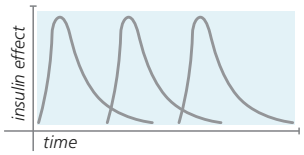
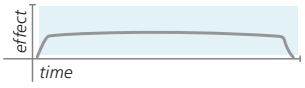
☐ Insulin Aspart (aspart)

☐ Admelog (lispro)

☐ Apidra (glulisine)

Types of insulin and instructions

Ask your doctor or diabetes educator to circle the type(s) of insulin you use.

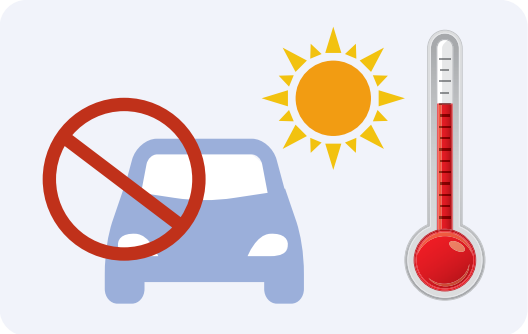
Insulin type	Name	Onset	Peak	Duration	Dosing time
	generic (brand)	How soon it starts to work	When its effect is strongest	How long it works	When it is usually taken
Rapid-acting	aspart (NovoLog) glulisine (Apidra) lispro (Humalog, Admelog)	10 to 20 minutes	1 to 2 hours	3 to 5 hours	3 times a day 
Ultra rapid-acting	aspart (Fiasp)	5 to 10 minutes	1 to 1½ hours	3 to 5 hours	
Short-acting (regular)	Novolin R Humulin R	30 to 60 minutes	2 to 4 hours	4 to 8 hours	3 times a day 
Also used, but less often: **Intermediate-acting**	NPH (Novolin N) NPH (Humulin N)	1 to 2 hours	3 to 8 hours	12 to 15 hours	2 times a day 
Long-acting (peakless)	glargine (Lantus, Toujeo, Basaglar)	2 to 3 hours	peakless	24+ hours	1 time a day 
	detemir (Levemir)	1 hour	peakless	18 to 24 hours	
	degludec (Tresiba)	1 hour	peakless	42+ hours	

Storing Your Insulin

To make sure your insulin stays safe and effective, follow the storage instructions in the table on the next page. In general:

To keep your insulin safe and effective

Don't let it freeze



Don't leave it in a hot car

You will need to store it at **room temperature** [59°F (15°C) to 86°F (30°C)], or in the **refrigerator** [36°F (2°C) to 46°F (8°C)].

Check the expiration date on the insulin vial, pen, or cartridge before using it. If it's past the date, throw it away, even if there's insulin still in it.

When you open a new pen, vial or cartridge, write the date on it so you know how long to use it. Follow the instructions in the table on **page 4.5**.

Don't use your insulin if it has particles floating in it or the color doesn't look normal.

Insulin storage instructions

Insulin type	Name		Storage instructions	
			Unopened	Opened
Rapid-acting	aspart (NovoLog) glulisine (Apidra) lispro (Humalog)		Store vials, pens, or cartridges in refrigerator.	Store vials, pens, or cartridges at room temperature for 28 days. Protect from light.
	lispro (Ademelog)		Store pens and vials at room temperature for 28 days or in refrigerator until the expiration date.	Store vials at room temperature or in the refrigerator for 28 days.
				Store pens at room temperature for 28 days.
Short-acting (regular)	Novolin R		Store vials in refrigerator.	Store vials at room temperature for 42 days. Protect from light.
	Humulin R		Store vials in refrigerator.	Store vials at room temperature for 28 days. Protect from light.
Intermediate-acting	NPH (Novolin N)		Store vials, pens, or cartridges in refrigerator. Protect from light.	Store vials at room temperature for 31 days. Store pens and cartridges at room temp for 14 days
	NPH (Humulin N)			Store vials at room temperature for 42 days.
	Humulin R U-500			Store vials at room temperature for 28 days.
Ultra rapid-acting	aspart (Fiasp)		Store pens and vials at room temperature for 28 days or in refrigerator until the expiration date.	Store pens and vials at room temperature or in the refrigerator for 28 days.
Long-acting (peakless)	glargine	Lantus	Store vials, pens, or cartridges in refrigerator. Protect from light.	Store vials, pens, or cartridges at room temperature for 28 days.
		Toujeo		Store pens at room temperature for 42 days.
		Basaglar	Store pens at room temperature for 28 days or in the refrigerator until the expiration date.	Store pens at room temperature for 28 days.
	detemir (Levemir)		Store vials, pens, or cartridges in refrigerator. Protect from light.	Store vials or pens at room temperature for 42 days.
	degludec (Tresiba)		Store pens in refrigerator until the expiration date.	Store pens in refrigerator or at room temperature for 8 weeks. Protect from heat and light.

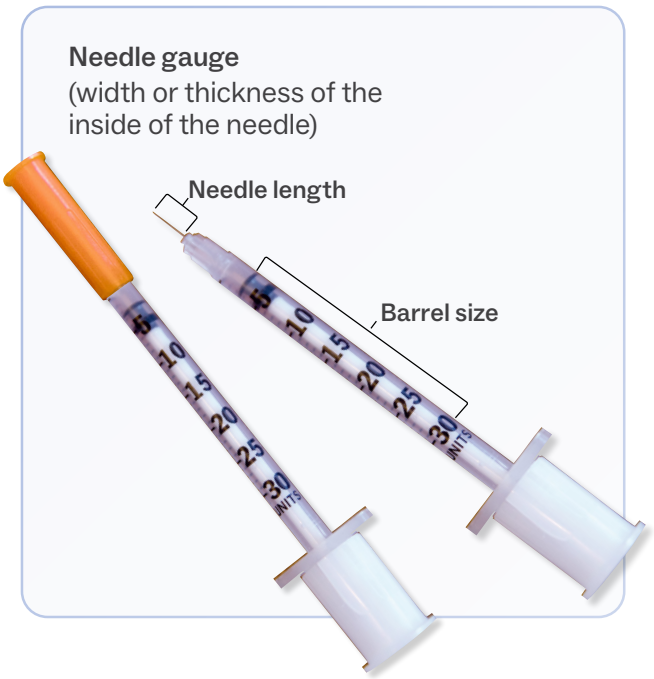
Syringes and Pen Needles

You will need to buy syringes and/or pen needles for everyday use. You will also need to throw out the used supplies in a safe way.

Insulin syringes and pen needles come in several sizes. When buying supplies, keep these things in mind:

Syringes

- **Needle gauge.** The gauge of the needle means its width or thickness inside of the needle. Insulin syringes range from 28 gauge to 31 gauge, and the larger the number the smaller the gauge. (An Ultra-Fine II brand needle is the smallest, and the Ultra-Fine is the next size up.) Smaller, thinner children may do well with the smaller gauge needle. Some older and larger children may prefer the larger needle.
- **Needle length.** Common needle lengths are 12.7 mm (½") and 6 mm ($^{15}/_{64}$"). The 6 mm needle is the length that is preferred.
- **Barrel size.** The barrel size determines how much insulin the syringe can hold. Buy a barrel size that best matches your standard insulin dosage.



For example (see next page at right):

- **$^{3}/_{10}$ cc syringe** is best for 30 units or less
- **½ cc syringe** is best for 30 to 50 units
- **1 cc syringe** is best for injections of 50 to 100 units

To make sure you have the size you need, always check the box before you leave the pharmacy.

When you draw up insulin, look closely at the markings on the barrel, especially whenever you change syringe sizes. The markings will be different, and you need to make sure you are drawing up the right dose.

- **Use each syringe just once.** This helps ensure that the syringe is sterile (clean).

Pen needles

- **Needle gauge.** The gauge of the needle means its width or thickness inside of the needle. Pen needles range from 29 gauge to 32 gauge. An Ultra-Fine brand "Nano" needle is the shortest and thinnest pen needle, and the "Mini" needle is the next size up. (See the next page at right for examples.) Smaller, thinner children may prefer a smaller gauge needle, while some older and larger children may prefer a larger one.
- **Needle length.** Common needle lengths are 4 mm ($^{5}/_{32}$"), 5 mm ($^{3}/_{16}$"), and 8 mm ($^{5}/_{16}$"). Most people prefer the 4 mm or 5 mm lengths.

30 Unit Syringes = 3/10 cc

capacity
3/10 mL cc
Doses up to 30 units

(includes ½ unit markings on barrel)

length
6mm
(15/64")

gauge
31G

capacity
3/10 mL cc
Doses up to 30 units

length
6mm
(15/64")

gauge
31G

50 Unit Syringe = ½ cc

capacity
½ mL cc
Doses up to **50 units**

length
6mm
(15/64")

gauge
31G

100 Unit Syringe = 1 cc

capacity
1 mL cc
Doses up to **100 units**

length
6mm
(15/64")

gauge
31G

Insulin Pen Needles

Nano
4 mm x 32 G (5/32")

Mini
5 mm x 31 G (3/16")

Short
8 mm x 31 G (5/16")

Original
12.7 mm x 29 G (½ ")

Throwing away used syringes and needles

There are a couple of ways to throw away used syringes and needles:

- Use a needle clipper to snip the needle off the syringe. The clipper safely stores the used needle, and you can throw away the rest of the syringe in the trash.
- Throw away the whole syringe in a heavy container that the needles won't poke through — like an empty coffee can or a plastic bleach container. Or, if local or state law requires it, use a special disposal container and keep it separate from the rest of your household garbage.

Disposing of syringes at home and when you travel

Regulations for medical waste disposal can change. For current regulations for your home state or a travel destination, check here: **SafeNeedleDisposal.org**

Currently in Utah, state law does not require a special container to dispose of used syringes at home. Still, you should use a heavy, poke-proof container for disposal. When your container is full of used syringes, tape it shut and put it in the trash.

In Idaho, state law requires a special container and special disposal of the container. Contact your garbage hauler, local government solid waste department, or public health department to get the disposal containers and service information for packaging and collection in your area.

Preparing for an Emergency

We never know when an emergency will happen. During an emergency, it may be 72 hours (3 days) before you and your family can go home, are moved to a temporary shelter, or have the power and water turned back on.

During those 72 hours, you will need to have food, water, shelter, and extra medication. **Medical care or access to a pharmacy may not be possible.** For these reasons, you or your child need to be prepared for diabetes care. The best way to do this is to have a diabetes 72-hour kit ready to go.

What should be in my diabetes 72-hour kit?

- ☐ **Make a list of all of your medical conditions and the medications used to treat them.** Include the phone number of your diabetes clinic or care manager and your healthcare provider.
- ☐ **Keep an insulated pouch or cooler and an ice pack handy to store your insulin.** (Keep insulin in the refrigerator and the ice in the freezer until you need it. Don't put insulin next to the ice pack in the cooler. It will go bad if it gets too cold.)
- ☐ **Gather enough supplies for 72 hours.** Include the following:
  - ☐ Glucometer and strips.
  - ☐ Glucose control medications, such as metformin and insulin.
  - ☐ Syringes, lancets, pen needles, and alcohol wipes (if needed). Include a hard plastic container to hold your used syringes, needles, and lancets.
  - ☐ Urine ketone strips.
  - ☐ Glucagon / GlucaGen emergency kit.
  - ☐ Insulin pump supplies and extra batteries (if you use a pump).
  - ☐ Fast-acting carbohydrates for 72 hours (such as fruit snacks, lifesavers or other hard candy, or glucose tablets or gel).

Put all of these supplies (except the insulin) in a waterproof carrying case. Put it in a location that will be easy to reach if you are in a hurry. Be sure to put a full water bottle, the chilled insulin, a cooling case, and an ice pack (if you have one) in your carrying case before you leave. **Water is one of the most important emergency supplies to have on hand.**

Managing blood glucose before a surgery or procedure

If your child is scheduled for surgery or a procedure in which they will be sedated or required to take nothing by mouth (such as a dental procedure, MRI, or echocardiogram), contact your doctor or diabetes educator at least 3 to 4 business days before the procedure for instructions on managing your child's blood glucose. The procedure should be scheduled for early morning or be the first one of the day, if possible.

Pre-hospital care

- Do not change your **Lantus, Basaglar, Levemir, Tresiba, or Toujeo** dose or time unless you are told to do so by your healthcare provider.
- If you are on a subcutaneous **insulin pump**, continue your normal basal rate.
- If you are on **metformin**, do not take it 24 hours before scheduled surgery time.
- **Bring diabetes supplies and insulin** to the hospital on the day of the surgery. Ideal pre-procedure blood glucose range is between 100 and 300.
  - If blood glucose is less than 300, check ketones and take ½ correction dose of insulin.
  - If your blood glucose is less than 80, drink 4 ounces of apple juice. **Alert the surgeon or anesthesiologist of this right away.**

Procedure care

- When you arrive remind the healthcare providers your child has type 1 diabetes.
- It is not necessary to disconnect an insulin pump unless your child is having an MRI or the pump will interfere with the surgical procedure. You should know your long-acting insulin dose in case the pump needs to be removed. During procedures and after (if needed), a "temporary basal rate" can be used. By contacting your diabetes doctor before the day of your procedure, this can be discussed.

Post-hospital care

- Always keep a Glucagon Emergency Kit close by as well as a few insulin syringes as you may need to give mini-dose glucose for nausea/vomiting, or if you are unable to keep fluids down with low blood glucose.
- When you are able to tolerate oral liquids again, resume your usual diet and insulin regimen. Glucose may be higher following surgery due to the stress from surgery or any procedure. Check glucose and ketones every 3 hours following surgery. Low blood glucose and ketones can be prevented with frequent monitoring after a procedure.
- Have the sick day guidelines available. Follow them for the rest of the day. It is important to have both sugar-free as well as sugar-containing fluids available throughout the day. Monitoring can prevent problems.

Traveling with Diabetes

Diabetes is a very manageable condition. It should never keep you or your child from doing the things you love to do. But some extra planning is needed before you go to ensure a safe trip for all.

Medications and supplies

Keep all prescription medications in the container they came in with the original prescription label.

Keep all of your diabetes supplies in a carry-on bag so that you can get to it as soon as you need it. If you are traveling to a location with very warm or cold temperatures, you may need to keep your insulin in a cooler or insulated bag so that it stays between 36°F (2.2°C) and 86°F (30°C). Don't let it touch any ice or sit in ice water.

Plan for time zone changes. Make sure you always know when to take your insulin. Set an alarm on your phone or watch to help you remember. You will need separate reminders for your long-acting insulin and your rapid-acting insulin.

Safety

Get and wear a medical ID bracelet or necklace. You are likely to be around strangers and they will need to know how to help if you suddenly become ill.

Carry your "health passport" with you at all times. This should include a list of your health conditions, the contact information of all of your doctors and pharmacy, and a list of all your prescription medications.

Security

Check the security regulations of your airline, train, or bus company to find out what the regulations are for traveling with your insulin and supplies. You may need a letter from your healthcare provider or a written copy of your prescriptions to take with you. Be sure to ask for these things at least 1 week (7 days) before you are scheduled to leave.

Tell airport security that you or your child has diabetes. Let them know if you or your child are wearing an insulin pump, CGM, or both. **Do not put your pump through the x-ray machine.**

Food and activity

Be sure to pack healthy snacks in your diabetes supply bag to help keep your glucose level steady in case a delay keeps you from a regular meal. Include a snack with fast-acting glucose in case your blood glucose gets too low.

Drink water and other fluids regularly to prevent dehydration.

Get out of the car or bus and walk around as often as you can. It's important to keep active if you are snacking a lot during your trip.

Diabetes: Information for teachers

What is diabetes?

Diabetes is a metabolic disorder that affects the body's ability to balance blood glucose (sugar), which is raised by certain foods, especially carbohydrates (carbs). Diabetes is not contagious and is not caused by eating too much sugar.

What do I need to know?

Insulin and carbs

Children who have diabetes are almost always treated with insulin. This means they need to take insulin anytime they have a snack or meal that contains carbs. The amount of insulin they need depends on the amount of carbs they eat and their sensitivity to insulin.

Children usually receive insulin by injection or with a pump. A student who has type 1 diabetes cannot be treated with pills.

Hypoglycemia

Hypoglycemia [hy-poh-gly-SEE-mee-uh] is the medical term for low blood glucose. Hypoglycemia can be dangerous for anyone with diabetes.

Hypoglycemia is most likely to occur:

- If the student misses or does not finish a meal or snack, especially after taking insulin
- During or after physical activity

Common signs and symptoms of hypoglycemia are:

- Sleepiness
- Sweating
- Confusion
- Pale skin
- Crying
- Moodiness or combativeness
- Grumpiness
- Headaches
- Shakiness
- Sudden hunger
- Lack of concentration
- Feeling "weird"

What do I need to know about hypoglycemia?

Hypoglycemia should be treated immediately. If a meter is not available and the child has symptoms, notify the office. **A child with hypoglycemia should not be left alone or sent to the office by themselves.** If a blood glucose meter is available, check your student's blood glucose level. If it is below 80 mg/dL, treat according to the instructions below.

1. **Give 15 grams (g) of rapid-acting carbs.** These examples each have about 15 g of carbs:
   - ½ cup juice or regular soda (not diet)
   - 1 Fruit Roll-Up or a small package of fruit snacks
   - 3 to 4 glucose tablets, or 1 tube of glucose gel
   - 1 cup skim milk or low-fat milk

   Wait 15 minutes for the treatment to work and then check the student's blood glucose levels. **Don't keep feeding your student until the symptoms go away.** If they eat too much, their blood glucose can get too high.

   If the hypoglycemia is within 15 minutes of lunch, give 15 g of carbs. Then give the right amount of insulin to cover lunch, but do not include the extra 15 g of carbs in the insulin dose. Check the student's blood glucose 30 minutes after they have finished eating.
2. **If the student's blood glucose remains below 80 mg/dL after eating 15 g of carbs:**
   - Have the student eat another 15 g of carbs.
   - Check their blood glucose again in 15 minutes. **If it's still below 80 mg/dL,** give 30 g of carbs and call their parents or healthcare provider. **Make sure someone stays with the student during this time.**
3. If the student's blood glucose is between 80 mg/dL and 100 mg/dL and it will be 30 minutes or more before the next meal or snack, give another small snack with 15 g of carbs and some protein. Check again in 1 hour.
4. Learn how and when to use an emergency Glucagon/GlucaGen kit.

Hyperglycemia

Hyperglycemia [hy-per-gly-SEE-mee-uh] is the medical term for high blood glucose. It can be caused by:

- Illness
- Eating too much
- Missing an insulin dose
- Stress

Common signs and symptoms of hyperglycemia are:

- Thirst (drinking more than usual)
- Urinating (peeing) more than usual
- Lack of concentration
- Hyperglycemia is not a medical emergency.

What should I do?

- Allow the student unlimited access to water and the restroom.
- If symptoms persist, or if the student's blood glucose meter reading is above 300 mg/dL, follow the instructions on the student's diabetes medical management order (DMMO).
- Notify the student's parents.

Nutrition at school

Students who are insulin-dependent must count the carbs in their food.

Provide meal and snack menus for students and their families. These should include carb counts so insulin doses can be calculated correctly.

If food is given during class times, the student may need to give insulin to cover the carbs.

Low Blood Glucose

Low blood glucose can happen to anyone, but it's most common in children with diabetes. If you have type 1 diabetes, it's important to stay within your target range.

At school, it's best to be between 80 and 150 mg/dL. If your blood glucose goes below this range, you can get hypoglycemia [hy-po-gly-SEE-me-uh], or very low blood glucose. Hypoglycemia can be a life-threatening condition.

What are the symptoms of low blood glucose?

You will probably have one or more of these symptoms when your blood glucose gets low:

- Shakiness or dizziness
- Sweating
- Hunger
- Headache
- Pale skin color
- Fainting or seizure
- Clumsy or jerky movements
- Trouble paying attention or confusion
- Tingling around your mouth
- Suddenly feeling moody, nervous, irritable, or like you want to cry for no reason at all

Be sure to tell someone if you have any of these symptoms. The people around you may not know that you're not f eeling well.

Checking your blood glucose regularly will help you know when it's getting low and allow you to treat it before it becomes a problem.

What do I do if I think my blood glucose is low?

Be ready to act quickly if your blood glucose is low.

- **Check your levels if a blood glucose meter is available.** If you don't have a meter and you have symptoms, act as though you have low blood glucose.
- **Treat low blood glucose with 15 grams of rapid-acting carbohydrates (carbs).** Examples include:
  - ½ cup juice or regular soda (not diet)
  - 4 teaspoons sugar
  - 2 tablespoons raisins
  - 3 to 5 pieces of hard candy
  - 1 cup skim milk
  - 1 Fruit Roll-Up
  - 3 to 4 glucose tablets or 1 tube glucose gel
  - 11 Skittles
  - 8 Life Savers (not sugar-free)

  Note: Some carbs are absorbed more slowly, such as candy bars or high-fat foods, and should not be used.
- **If blood glucose is low before a meal, give 15 grams of rapid-acting carbs**. Wait to give the usual meal carb dose until you've begun to eat.
- **Wait about 15 minutes for the treatment to work.** Don't keep eating until the symptoms go away. If you eat too much, your blood glucose can get too high.
- **Check your blood glucose 15 minutes after you eat.** If it's still below 80 mg/dL, have another snack with 15 grams of carbs. Check your blood glucose levels again after 15 minutes. Repeat until your blood glucose is above 80 mg/dL.
- **If your blood glucose is between 80 mg/dL and 100 mg/dL** and it will be 30 minutes or more before your next meal or snack, have another small snack with 15 grams of carbs and some protein. Check again in 1 hour.

How can I help prevent low blood glucose?

Blood glucose often gets too low:

- When you miss or don't finish your meal or snack, especially after taking insulin
- During or after exercise

Your healthcare team will help you make a plan for medication, food, and exercise to prevent low blood glucose. It's important to follow this plan closely.

- **Eat regular meals and snacks.** When you don't eat regularly or go a long time between meals, your blood glucose can drop.
- **Take your medications exactly as prescribed.** Medications can cause low blood glucose if you take the wrong amount or take it at the wrong time. (For example, giving yourself too much insulin can cause low blood glucose. This is sometimes called an "insulin reaction.")
- **Try to get the same amount of exercise every day.** Exercising harder than usual can cause low blood glucose. This is because your body uses more glucose when you're exercising hard. Exercise is important for your health but check your blood glucose regularly during your activities to stay safe. Keep an extra snack or two with you (see list above for rapid-acting carbs) just in case your blood sugar gets too low.

Once you get used to balancing your medication with food and exercise, it will be easier to keep your blood glucose levels in your target range. However, it's always best to be prepared in case you have low blood glucose.

If you have diabetes, wear a medical ID that includes an emergency contact number, your doctor's name, and a place to look for more information (like a wallet card or your smartphone). You can wear this on your neck or wrist so emergency responders or people around you know you need treatment right away.

What should I tell my caregivers about low blood glucose?

Even if you check your blood glucose regularly, low blood glucose can happen. Tell your caregivers (family, friends, babysitters, teachers, coaches, and the parents of your friends) about low blood glucose so they can help you. Make sure they know:

- The signs and symptoms of low blood glucose
- To call 911 if you faint or have a seizure
- When to give carbohydrates, what kind of carbohydrates (rapid-acting or low-fat), and how much (15 to 30 grams) usually works best
- When to use glucagon and how to use your emergency glucagon kit

When should I call my doctor?

If you think you're about to pass out, get help right away.

Your parent or caregiver should call your healthcare provider if:

- You can't control your low blood glucose, even after trying to make it better
- You have more than 2 periods of low blood glucose in a week and don't know why
- You have repeated low glucose readings during a certain time of day

Diabetes Medications: *Glucagon*

Glucagon is an emergency medication used to treat severe hypoglycemia (very low blood glucose). See below for why and when to use this important medication.

Glucagon is packaged in kits.

Two common brand-name kits are the **Glucagon Emergency Kit** and the **GlucaGen HypoKit**.

Glucagon is also available as a dry nasal spray — the brand name is **Baqsimi.**

(Keep the bottle sealed until it is ready to use.)

Glucagon is a prescription medicine. Work with your diabetes care team to obtain a prescription. Make sure to fill the prescription as soon as you get it, so you always have a source of glucagon on hand.

Gvoke is a type of glucagon that is pre-mixed (reconstituted) and comes in a single-dose syringe or pen that is ready to use. Follow injection instructions included with the Gvoke syringe or provided by your diabetes care team.

If you use insulin...

ALWAYS have glucagon on hand. An injectable Glucagon kit contains the glucagon medicine (a powder and a liquid to be mixed together when needed), a syringe to inject it with, and instructions. A Baqsimi (nasal glucagon) kit contains a nasal applicator with glucagon that can be given in one nostril. The kit seal **should not be opened** until it is going to be used. You might want to leave kits in several places, such as home, work, or school. Store kits at room temperature. (Don't leave a kit or the spray in a hot or cold car, for example.)

Keep it current. Check the date on each kit, and replace it when necessary. Don't use glucagon after its expiration date.

Share this handout with the people who live, work, and study with you. Help them practice mixing and injecting glucagon according to the instructions.

If you live, work, or study with someone who uses insulin...

Share the glucagon app and other tools with everyone who needs to know. The apps and instructions include step-by-step instructions.

Know where the glucagon kit is stored. A kit contains the glucagon medicine (a powder and a liquid to be mixed together when needed), a syringe to inject it with, and instructions.

Read the back of this handout to learn why and when to use glucagon.

Practice mixing and injecting glucagon following the instructions in the kit. (Use an orange for the practice shots.)

Be prepared to give a glucagon shot. You could save a life!

Why is glucagon important?

People who take insulin are at risk for episodes of severe hypoglycemia (low blood glucose). During such an episode, brain cells don't get the fuel (glucose) they need. Unless blood glucose is quickly raised, it can cause brain damage or even death.

Glucagon is one way to quickly raise blood glucose. It's a natural hormone that helps the liver release glucose into the bloodstream. It's the fastest and safest way to raise blood glucose when a person is unconscious.

Do not open a glucagon kit, pre-filled syringe, pen, or dry nasal spray bottle until you are ready to give it.

When should glucagon be used?

A person who has diabetes and is using insulin needs an injection (shot) of glucagon if their blood glucose has dropped so low that the person is:

- Unable to drink, swallow, or eat sugar (or sugar-sweetened products)
- Refusing to eat or drink quick-acting sugar products
- Angry or aggressive
- Having seizures or convulsions
- Unconscious or unresponsive

Ideally, the person's blood glucose is tested first, to make sure the symptoms are due to hypoglycemia. But since severe hypoglycemia is an emergency, and since the person helping may not know how to test blood, this isn't crucial. When in doubt, use glucagon! Glucagon is safe, even if it's given inappropriately.

What should I know about my glucagon kit?

Glucagon is packaged in kits with all of the equipment you need for preparing and giving the medicine. These kits include instructions and unmixed glucagon medicine. Here are some storage tips:

- **Consider having more than one kit.** That way, you can keep one at home, one at school, one for grandma's house, and so on. Take a kit with you if you're camping or traveling.
- **Keep the kit at room temperature,** out of direct sunlight or extreme cold, and away from moisture.
- **Note the expiration date on the kit and ask for a refill before the kit expires**. Don't mix or use old glucagon after the expiration date printed on the kit or the vial.

Once you have your new (refill) glucagon kit, use the expired kit to practice mixing and drawing up glucagon. It's a good idea for family members and caretakers to practice this skill so they'll be ready in an emergency. Practice by injecting an orange. (Throw the orange away when you are finished practicing.)

Glossary

albumin screen: a test for microalbuminuria, a condition that may indicate kidney disease.

albuminuria: a condition where albumin (a type of protein) is present in the urine. This may be an indication of kidney disease.

autoimmune process: a process in which the body's immune system — which is responsible for protecting your body from invading germs — mistakenly attacks healthy tissue. Type 1 diabetes results from an autoimmune process that attacks the pancreas, damaging it so it can't produce enough insulin.

basal: a baseline amount. In insulin treatment, your basal insulin refers to the insulin you take to keep a minimum level of insulin in your body at all times.

beta cells: the cells in the pancreas that normally produce insulin.

blood glucose: the amount of glucose in your blood.

bolus: a single, large dose of medication — a surge. In insulin treatment, your bolus insulin refers to the insulin you take with food to help your body process the glucose from food.

carbohydrates (carbs): a nutrient in many foods. Eating and drinking carbohydrates have a big effect on your blood glucose. For this reason, people who take insulin need to match their insulin dose to their carbohydrate intake (they need to "cover their carbs").

correction dose: an insulin treatment.

cholesterol: a type of lipid (fat) found in the blood. Too much cholesterol in the blood can lead to a heart attack or stroke.

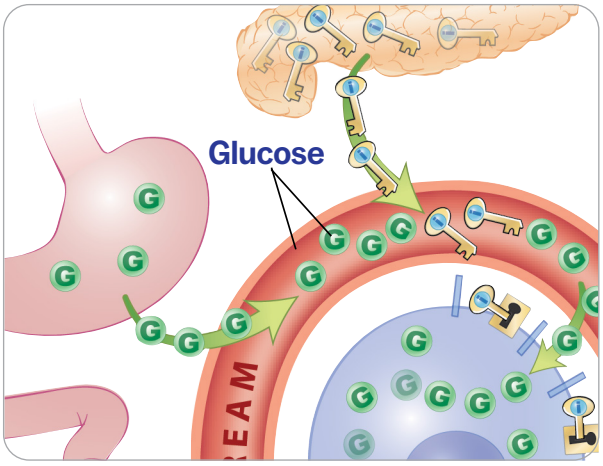
diabetes educators (also called certified diabetes educators, or CDEs)**:** specially trained nurses, dietitians, or other healthcare providers who can help explain your diabetes and create individual treatment plans for you. They can also teach you skills such as how to take medication correctly, and offer support and encouragement to keep you on track. Educators can work with you individually, or in a diabetes education class.

DKA (diabetic ketoacidosis): a serious condition that involves high blood glucose, ketones, and dehydration. DKA must be treated right away.

fat: one of the 3 major nutrients in food (along with protein and carbohydrate). All fats contain different percentages of monounsaturated, polyunsaturated, and saturated fat. Your body uses fats to repair cells and help cells send signals.

glucagon: emergency medication used to treat very low blood glucose (hypoglycemia). It comes in a kit and is given by injection when a person's blood glucose has dropped so low that they cannot eat or drink, or are unconscious or having seizures.

glucose: a type of sugar that is your body's main source of energy. (Blood glucose refers to the glucose in your bloodstream.)

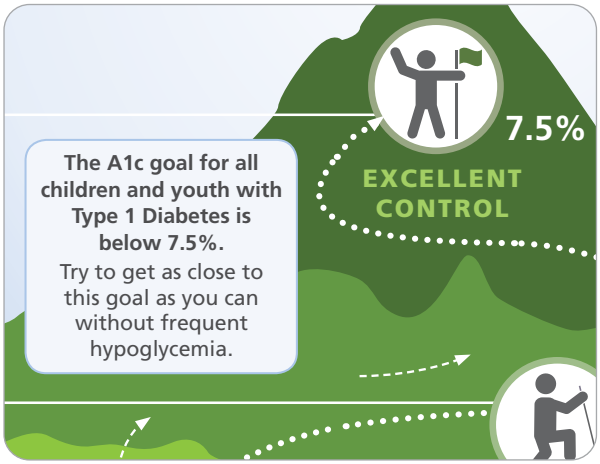


Glossary (continued)

glucometer: a glucose meter.

glucose meter: a machine that measures the glucose in your bloodstream (your blood glucose).

HbA1c (also called A1C, or glycosylated hemoglobin)**:** a blood test that measures the amount of glycosylated hemoglobin in your bloodstream. The result reflects your overall average blood glucose control over the previous 2-month to 3-month period.



hyperglycemia: high blood glucose.

hypoglycemia: low blood glucose.

insulin: a hormone produced by the pancreas that allows glucose to move out of your bloodstream and into your body's cells. Insulin is the "key" that "unlocks" your cells and allows glucose to enter. Once inside, the glucose can serve as fuel for the cells.

insulin deficiency: when the pancreas has stopped — or nearly stopped — making insulin.

insulin resistance: when the cells in the body do not respond properly to insulin. Insulin resistance is the most common cause of type 2 diabetes.

islet cells: see islets of Langerhans, below.

islets of Langerhans: clumps of cells within the pancreas. These clumps contain the cells that make insulin (the beta cells). Transplanting islet cells from a donor pancreas to the body of a person with diabetes is a promising treatment for people with type 1 diabetes.

lipid profile: a blood test that measures the lipids (fats) found in your blood. A full lipid profile will measure your total cholesterol, LDL cholesterol, HDL cholesterol, and triglyceride levels.

ketones: a by-product of the breakdown of fat and protein inside your body. High levels of ketones can be harmful.

metabolic disorder: any condition — such as diabetes — that affects how your body uses food for energy and growth.

mg / dL: abbreviation for "milligrams per deciliter." Blood glucose is often measured in units of mg / dL.

mmol / L: abbreviation for "millimoles per liter." Blood ketones are often measured in units of mmol / L.

pancreas: the organ that normally produces insulin, located behind your stomach.

protein: one of the 3 major nutrients in food (along with fat and carbohydrate). Your body uses protein to build and repair muscles, bones, organs, and other tissues.

Glossary (continued)

receptors: structures on cell surfaces (or inside cells) that receive and bind a specific substance. For example, insulin binds to insulin receptors on the cell surface to allow glucose to enter the cell.

retinopathy: an eye disease caused by damage to the small blood vessels of the retina.

target range: the range of levels between which your blood glucose should stay. (For example, many school-age children have a blood glucose target range of 80 to 150 mg/dL.) Your medical team will tell you what your target range is.

type 1 diabetes: the type of diabetes that occurs when the pancreas has stopped — or nearly stopped — making insulin.

type 2 diabetes: the type of diabetes that occurs when the body no longer uses insulin properly (insulin resistance), fails to make enough insulin, or has a combination of these problems.

triglycerides: a type of lipid (fat) found in the blood. High triglycerides are often found in people who have high levels of LDL (bad) cholesterol and low levels of HDL (good) cholesterol. High triglycerides signal increased heart risk.

Notes

Online Resources

Organization	Website
Intermountain Healthcare	**intermountainhealthcare.org/diabetes**
Primary Children's Medical Center Diabetes Clinic at the Utah Diabetes Center	**healthcare.utah.edu/utahdiabetescenter**
American Diabetes Association	**diabetes.org**
Children with Diabetes	**childrenwithdiabetes.com**
Juvenile Diabetes Research Foundation	**jdrf.org**
Foundation for Children and Youth with Diabetes (camp)	**fcydcamputada.org**
College Diabetes Network	**collegediabetesnetwork.org**
Barbara M. Davis Center for Childhood Diabetes	**barbaradaviscenter.org**
National Institutes of Health (NIH): • National Diabetes Education Program • National Institute of Diabetes and Digestive and Kidney Diseases	Primarily for physicians: **niddk.nih.gov** Primarily for patients: **diabetes.niddk.nih.gov** For school/daycare personnel—as well as patients and families: **niddk.nih.gov/health-information/communication-programs/ndep/health-professionals/helping-student-diabetes-succeed-guide-school-personnel**

Notes

Carb Reference

Refer to this section for more information on counting carbs and healthy eating.

What's ahead

- The Carb Smart Cookbook, a collection of family-friendly recipes with serving sizes and carbohydrate counts
- A quick Reference List for weighing foods
- An alphabetical list of foods with carb counts per serving
- Popular holiday candies with carb counts

Carb Smart Cookbook: Drinks and syrups

Banana Malted Shake

1 pint (2 cups) nonfat vanilla or chocolate ice cream (regular or no sugar added)

1 banana, cut into chunks

½ cup skim milk

3 tablespoons malted milk powder

Combine all ingredients in a blender and blend on high until smooth. Pour into chilled glasses and serve immediately. Serves 4.

One serving = 6 ounces or ¾ cup
Calories per serving = 150
31 grams carbohydrate

Berry Shake

1 cup skim milk

2 packets Equal

1 cup frozen berries (strawberries, raspberries, blueberries)

Combine all ingredients in blender. Blend on high speed until smooth and creamy. Pour into glasses and serve immediately. Serves 2.

One serving = 8 ounces or 1 cup
Calories per serving = 85
14 grams carbohydrate

Lemonade

1 packet Equal
2 tablespoons lemon juice
1 cup cold water

Combine Equal sweetener with lemon juice. Add 1 cup cold water and ice as desired. Serves 1.

One serving = 1 cup
Calories per serving = 4
1 gram carbohydrate

Orange Smoothie

½ cup 2 % milk

1 cup orange sherbet

1 cup orange juice

Pour milk, orange juice, and orange sherbet into a blender and blend at high speed for 10 seconds. Serves 6.

One serving = approximately ¾ cup
Calories per serving = 75
15 grams carbohydrate

Melon Cooler

2 cups chopped cantaloupe (or any other fresh fruit)
¼ cup orange juice
1 cup plain nonfat yogurt
2 teaspoons sugar
2 teaspoons minced mint

In a blender, combine 2 cups of cantaloupe with the remaining ingredients and blend until smooth, about 1 minute. Serves 4.

One serving = 1 cup
Calories per serving = 73
15 grams of carbohydrate

Peanut Butter — Maple Syrup

½ cup creamy peanut butter

1 cup low-calorie/sugar-free maple syrup

Heat peanut butter for 30 seconds in the microwave and whisk with maple syrup until combined. Heat mixture for an additional 30 seconds in the microwave. Whisk before serving on top of pancakes or waffles.

One serving = ¼ cup
Calories per serving = 129
4 grams carbohydrate

Carb Smart Cookbook: Soups and stews

Beef Stew

6 ounces lean beef cubes

2 tablespoons flour

1 cup water

1 medium tomato, chopped

1 stalk celery, chopped

1 small onion, chopped

1 small potato, diced

½ cup green beans

½ cup sliced carrots

Salt and pepper to taste

Roll beef cubes in flour. Brown beef cubes lightly on all sides in a greased frying pan. Add water, chopped tomato, celery, and onion. Cover pan and simmer for 45 minutes. Add diced potato, green beans, and carrots. Continue simmering until meat is tender (15 to 30 minutes). Season with salt and pepper to taste. Serves 3.

One serving = approximately 1 cup

Calories per serving = 215

16 grams carbohydrate

Chicken Noodle Soup

2 teaspoons chicken soup base

3 cups chicken soup stock

2 cups chopped carrots

2 cups chopped celery

¾ cup chopped onion

2 cans condensed cream of chicken soup

½ cup 2 % milk

1 cup butter

2 cups flour

2 cups diced chicken

4 cups cooked noodles

Salt and pepper to taste

Heat chicken soup base and stock together. Add carrots, celery, and onions. Simmer until vegetables are tender. Add cream of chicken soup and milk. Thicken with butter and flour as desired, then add cooked chicken and noodles. Add salt and pepper to taste. Serves 15.

One serving = approximately 1 cup

Calories per serving = 285

27 grams carbohydrate

Carb Smart Cookbook: Soups and stews (continued)

Clam Chowder

3 cups diced potatoes

1 cup diced celery

1 cup finely chopped onions

2 small cans of clams (6½ oz.)

1 teaspoon sugar

½ cup butter

¾ cup flour

1 ½ teaspoon salt

1 quart half and half*

Boil the potatoes, celery, and onions in ½ cup of water mixed with the drained clam juice and sugar. While the vegetables are cooking, melt the butter in another saucepan. When the butter is melted, stir in the flour and salt to make a roux. Pour half and half into the roux mixture, stirring constantly until the mixture is thickened. Add the cooked vegetables and clams to the half and half mixture. Simmer and serve. Serves 16.

* For fewer calories, use 2 % or skim milk in place of half and half.

One serving = approximately ¾ cup

Calories per serving = 200

14 grams carbohydrate

Vegetable Soup

1 cup diced tomatoes

1 ½ cups diced carrots

1 cup diced celery

1 ½ quarts water

¼ cup diced onion

1 tablespoon beef soup base

½ cup green beans

1 cup diced potatoes

½ pound cooked beef pieces

1 cup water

1 cup peas

Cook together tomatoes, carrots, celery, water, onion, and beef soup base until carrots and celery are tender. Add beans, potatoes, beef, and an additional cup of water. Simmer until vegetables are tender. Add peas about 5 minutes before serving. Taste to correct seasonings. Serves 12.

One serving = approximately 1 cup

Calories per serving = 92

11 grams carbohydrate

Carb Smart Cookbook: Breads, muffins, and rolls

Banana Nut Bread

2 cups white sugar

½ cup butter

2 eggs

2 medium ripe bananas, mashed

1 teaspoon salt

1 teaspoon baking soda

2 teaspoons baking powder

2 cups flour

½ cup chopped walnuts

Preheat oven to 375°F.

Cream together sugar, butter, eggs, and mashed bananas. Sift together dry ingredients and add to the first mixture. Mix well and fold in nuts. Pour mixture into 9 x 5-inch greased and floured loaf pan.

Bake for 1 hour. Yields 18 slices.

One serving = approximately 1/18 of a loaf

Calories per serving = 143

36 grams carbohydrate

Banana Nut Muffins

1½ cup currants

1 egg

1 small banana

1 teaspoon vanilla

2 teaspoons water

1 cup cake flour

½ teaspoon salt

3 teaspoons baking powder

1 teaspoon cinnamon

2/3 cup 2 % milk

2 tablespoons melted shortening

½ cup finely chopped walnuts

Preheat oven to 400°F.

Soak currants in hot water and drain well. Beat egg and then add banana, vanilla, and water. In a separate bowl, mix flour, salt, baking powder, and cinnamon. Add flour mixture alternately with milk to banana mixture. Add currants, shortening, and nuts and mix well.

Fill small, greased muffin pans ¾ full and bake for about 20 minutes. Makes 12.

One serving = 1 muffin

Calories per serving = 111

15 grams carbohydrate

Carb Smart Cookbook: Breads, muffins, and rolls (continued)

Dinner Rolls

½ cup sugar

2 teaspoons salt

½ cup butter

2 cups scalded 2 % milk

2 tablespoons yeast (2 packages)

½ cup lukewarm water

6 ¾ cups flour

3 slightly beaten eggs

Measure sugar, salt, and butter into a large mixing bowl. Pour scalded milk over mixture, stirring until butter is melted. Dissolve yeast in water. Add yeast mixture to milk mixture when milk mixture has cooled to lukewarm.

Add 1 cup sifted flour. Beat well. Gradually add one half of the remaining flour, beating well after each addition. Add beaten eggs and beat well. Gradually add remaining flour, beating well after each addition to make a soft but easily workable dough. Let rest for 10 minutes, then knead until dough is satiny and leaves the board without sticking.

Put dough in a large greased bowl. Brush lightly with shortening and cover with a towel. Let rise until double in size (about 2 hours). Punch down and let rise again until almost double (about 1½ hours).

Preheat oven to 400°F.

Punch down and divide dough into 4 equal parts. Let rest 10 minutes. Roll dough out and brush with butter. Cut each piece of dough into eight triangles. Roll up fat end first, pinch edge to seal and set on cookie sheet. Let rise for 20 to 25 minutes. Bake for 15 to 20 minutes. Makes 32 rolls. This recipe can also be used to make cinnamon rolls (see right).

One serving = 1 roll

Calories per serving = 131

20 grams carbohydrate

Cinnamon Roll Filling

1 cup butter

1 cup brown sugar*

1 cup chopped pecans

1 cup raisins

1 teaspoon ground cinnamon

Follow the roll dough recipe. Divide the roll dough into 4 equal parts, let rest for 10 minutes. Roll each section of dough into a 12 x 8-inch rectangle.

Spread each section with ¼ cup softened butter. Sprinkle with ¼ cup brown sugar, ¼ cup pecans, ¼ cup raisins, and ¼ teaspoon cinnamon. Roll up from long side, jelly-roll fashion, and pinch edge to seal.

Cut crosswise into 8 pieces per section and place in pan, cut side down. Let rise for 20 to 25 minutes. Bake at 375°F for 25 to 30 minutes, or until golden brown. Makes 32 rolls.

* To reduce calories and carbohydrate grams, try ¼ cup brown sugar and ½ cup artificial brown sugar substitute.

One serving = 1 roll

Calories per serving = 370

42 grams carbohydrate

Carb Smart Cookbook: Salads

Chicken Exotic

1 can water chestnuts

2 cups cubed, cooked chicken or turkey

3 cups seedless green grapes

½ cup diced celery

¼ cup slivered almonds

¾ cup mayonnaise

½ teaspoon curry powder

2 teaspoons soy sauce

2 teaspoons lemon juice

1½ cups unsweetened pineapple chunks

Combine sliced water chestnuts with meat and mix. Add the washed grapes, celery, and almonds. Mix mayonnaise, curry powder, soy sauce, and lemon juice together. Combine with meat and chill for several hours. Sprinkle with more almonds and garnish with pineapple chunks. Can be served on a slice of fresh cantaloupe. Serves 8.

* To reduce calories from fat, try low-fat or fat-free mayonnaise.

One serving = approximately ½ cup

Calories per serving = 243

17 grams carbohydrate

Summer Tuna Salad

1 can water-packed tuna fish

1 chopped fresh tomato

¼ cup chopped green pepper

½ peeled and chopped cucumber

4 green onions, chopped (including green part)

¾ cup chopped celery

3 to 5 tablespoons vinegar, depending on your taste

Clove of garlic, minced

Freshly ground pepper to taste

Drain and rinse the tuna fish. Combine all ingredients. Toss and serve on a bed of lettuce. Serves 4.

One serving = approximately ½ cup

Calories per serving = 73

0 grams of carbohydrate

Turkey Pasta Salad

8 ounces elbow macaroni, uncooked

2 cups sliced fresh mushrooms

1 cup sliced green onions

⅓ cup lemon juice

3 cups diced, cooked turkey (white meat only)

1½ cups (10-ounce package) thawed frozen peas

½ cup chopped fresh parsley

¼ cup olive oil

2 teaspoons garlic powder

½ teaspoon pepper

1 tablespoon oregano

2 teaspoons salt (optional)

Cook macaroni according to package directions. Combine cooled macaroni with remaining ingredients. Toss lightly and chill. Serves 7.

One serving = approximately 1 cup

Calories per serving = 325

37 grams carbohydrate

Carb Smart Cookbook: Main dishes, beef and pork

Beef and Cheese Enchiladas

1 pound lean ground beef

¼ cup chopped onion

¼ cup sliced black olives

¼ cup chopped green peppers

1 cup grated cheddar cheese

9 6-inch flour tortillas

1 envelope enchilada sauce mix

2 cups canned tomatoes with liquid, chopped until chunky

Jalapeno pepper rings for garnish (if desired)

Preheat oven to 350°F.

Brown ground beef until slightly pink, then drain excess fat. Add raw onion, olives, and green peppers to meat mixture. Equally divide meat mixture and ½ cup grated cheese among all 9 tortillas. Roll tortillas and place in baking dish with seam down.

Mix enchilada sauce with canned tomatoes and pour over rolled tortillas. Sprinkle remaining ½ cup of grated cheese over the top and garnish with jalapeno pepper rings if desired. Cover baking dish with foil and bake for 45 minutes. Serves 9.

One serving = one tortilla with sauce

Calories per serving = 325

21 grams carbohydrate

Pulled Pork

2 large sweet onions, cut into ½ inch slices

1 (4½ to 5 pounds) boneless pork shoulder roast (Boston butt)

2 tablespoons garlic-oregano-red pepper seasoning blend

1 teaspoon kosher salt

1 can (10½ ounces) condensed chicken broth

Buns/rolls for sandwiches

Optional: BBQ sauce

Preparation time: 10 minutes hands-on; 8 hours total

Place onions in a lightly greased 6-quart slow cooker. Rub roast with seasoning blend and salt; place roast on onions. Pour broth over roast. Cover and cook on low 8 to 10 hours or 6 to 8 hours on high until meat shreds easily with a fork.

Transfer roast to a cutting board or serving platter; shred with 2 forks, removing any large pieces of fat. Remove onions with a slotted spoon, and serve with pork. Mix pork with BBQ sauce if desired. Place on buns for sandwiches.

Nutrition tip: Use whole wheat buns instead of white buns to add more fiber.

Side idea: Make a side of light coleslaw to eat with or on top of pulled pork sandwiches.

One serving = 3 ounces (without bun or BBQ sauce)

2 grams carbohydrate without bun or BBQ sauce.

Carb Smart Cookbook: Main dishes, beef and pork (continued)

Beef Stroganoff

2 pounds round steak, cut ½ inch thick

1 tablespoon plus 1 teaspoon flour

1 teaspoon salt

¼ teaspoon pepper

2½ tablespoons butter

Water to cover

¾ cup mushrooms

¼ teaspoon flour

½ teaspoon paprika

½ cup sour cream*

½ cup unflavored nonfat yogurt

4 cups medium cooked noodles

Cut round steak into strips about 1¼ inches wide and 3 inches long. Mix flour, salt, and pepper and dredge meat in seasoned flour. Brown meat with shortening in a frying pan. Pour off drippings. Be careful not to overcook. Add water, cover pan tightly, and simmer for 1½ hours.

Remove meat from frying pan. Add mushrooms, ¼ teaspoon flour, paprika, and butter. Cover and simmer for 2 to 3 minutes. Add meat and fold in the sour cream and plain yogurt. Heat thoroughly but do not boil. Serve over warm noodles. Serves 8.

*To reduce calories and fat, use plain unflavored nonfat yogurt or substitute fat-free sour cream.

One serving = approximately 1 cup

Calories per serving = 366

21 grams carbohydrate

Teriyaki Steak

½ cup soy sauce

½ teaspoon ginger

½ cup brown sugar

½ cup water

½ teaspoon Ajinomoto (MSG)*

3 pounds lean sirloin tip (or substitute chicken)

Cut meat into strips and marinate in the remaining ingredients for 1 hour. Thread on skewers and grill about 1 minute on each side. Serves 12.

Side idea: Serve with grilled pineapple, watermelon, peaches, or nectarines.

* Ajinomoto or MSG is used as a flavor enhancer. This is an optional ingredient.

One serving = 2 ounces

Calories per serving = 269

12 grams carbohydrate

Carb Smart Cookbook: Main dishes, beef and pork (continued)

Easy Mexicali Dinner

1 pound lean ground beef

½ cup chopped onion

4 cups cooked elbow macaroni

½ cup corn

1 large can of tomatoes

1 small can (6 ounces) tomato paste

1½ cups shredded cheese

½ cup ripe olives

1 teaspoon salt

¼ teaspoon basil

Preheat oven to 350°F.

Cook meat and onion in a large skillet until onion is tender. Stir in noodles, corn, tomatoes, tomato paste, 1 cup cheese, olives, and seasoning. Turn into a 2-quart casserole dish. Top with remaining cheese. Bake for 45 minutes or until hot. Serves 12.

Nutrition tip: Use whole grain pasta for added fiber.

Side idea: Serve with a side of black or pinto beans.

One serving = approximately ¾ cup

Calories per serving = 295

16 grams carbohydrate

Popover Pizza

1 pound lean ground beef

1 envelope spaghetti sauce mix

½ cup water

2 eggs

1 tablespoon vegetable oil

½ teaspoon salt

½ cup chopped onions

1 can (15 ounces) tomato sauce

8 ounces sliced mozzarella cheese

1 cup 2 % milk

1 cup sifted all-purpose flour

½ cup grated Parmesan cheese

Preheat oven to 400°F.

Grease a 13 x 9 x 2-inch baking pan. Brown beef with onion in a large skillet, breaking it up with a spoon as it cooks. Spoon off excess fat from skillet. Stir in sauce mix, tomato sauce, and water. Simmer for 10 minutes. Spoon into prepared pan, top with slices of cheese. Place in oven to keep hot.

Beat eggs, milk, and oil in a small bowl with electric mixer until foamy. Beat in flour and salt until batter is smooth. Pour batter over hot meat filling, spreading to cover completely. Sprinkle with cheese and bake for 30 minutes. Cut into squares and serve while hot and puffy.

Serves 12.

Nutrition tip: Use whole wheat flour instead of white flour for added fiber.

Side idea: Spinach salad with balsamic vinaigrette.

One serving = $^{1}/_{12}$ of pizza

Calories per serving = 183

7 grams carbohydrate

Carb Smart Cookbook: Main dishes, seafood

Shrimp Fried Rice

3 tablespoons oil

2 slightly beaten eggs

1 cup bean sprouts

½ cup diced mushrooms

3 cups cooked rice

2 tablespoons soy sauce

2 finely chopped green onions

1 cup diced shrimp (can substitute chicken or other meat)

Prepare vegetables. Set wok or frying pan on high heat. Add 1 tablespoon oil and heat until hot. Add eggs and stir until soft scrambled.

Remove cooked eggs from pan. Add 2 tablespoons oil, bean sprouts, and mushrooms. Stir fry for 1 minute. Add rice and stir fry until heated thoroughly. Add soy sauce, green onions, and meat. Return cooked eggs to pan and serve. Serves 8.

Nutrition tip: Use brown rice for added fiber.

Side idea: Serve with a side of mandarin oranges or throw some peanuts into the fried rice for a bit of crunch.

One serving = ½ cup

Calories per serving = 172

19 grams carbohydrate

Fish Tacos

1 pound flaky white fish, such as mahi-mahi or tilapia

¼ cup canola oil

1 lime, juiced

1 tablespoon ancho chili powder

1 jalapeno, coarsely chopped

8 small flour tortillas

Possible garnishes: Shredded white cabbage, hot sauce, sour cream, shredded cheese, thinly sliced red onion, green onion, chopped cilantro leaves, or salsa.

Preheat grill to medium-high heat. Place fish in a medium-size dish. Whisk together the oil, lime juice, chili powder, jalapeno, and cilantro and pour over the fish. Let marinate for 15 to 20 minutes.

Remove the fish from the marinade and place onto a hot grill, flesh side down. Grill the fish for 4 minutes on the first side and then flip for 30 seconds and remove. Let rest for 5 minutes then flake the fish with a fork.

Place the tortillas on the grill and grill for 20 seconds. Divide the fish among the tortillas and garnish with any or all of the garnishes.

Serves 6 to 8.

Nutrition tip: Use whole wheat tortillas instead of white tortillas for added fiber content.

One serving = 1 taco shell, ¼ cup fish mixture

Calories per serving = 119

12 grams carbohydrate

Carb Smart Cookbook: Main dishes, vegetarian

Chicken Cashew Casserole

¼ cup chopped onion
1 cup chopped celery
1 teaspoon butter
¼ pound cashew nuts
2 cups cooked chicken, cut into small pieces
1 can (13 ounces) chow mein noodles
¼ cup chicken broth
1 can condensed cream of mushroom soup

Preheat oven to 350°F.

Sauté onions and celery in shortening. Mix with other ingredients (except chow mein noodles) and bake in a 1½-quart casserole dish for 35 to 40 minutes. Serve over chow mein noodles. Serves 8.

Side idea: Serve with sliced fruit or a small orange.

One serving = approximately 1 cup
Calories per serving = 410
30 grams carbohydrate

Chicken Cordon Bleu

2 whole chicken breasts, boned and halved
4 1-ounce slices of ham
4 1-ounce slices of Swiss cheese
Thyme or rosemary as desired
Salt and pepper
½ cup melted butter
½ cup bread crumbs

Sauce

½ can condensed cream of mushroom soup
¼ cup unflavored nonfat yogurt
Dash of lemon juice

Preheat oven to 400°F.

Skin and bone chicken breast halves. Place each half between sheets of plastic wrap, skinned side down, and pound with meat mallet to about ⅛-inch thickness. On each ham slice, place a slice of cheese. Sprinkle lightly with seasonings. Roll ham and cheese jelly-roll style, then roll each chicken breast with ham and cheese inside. Tuck in ends and seal well (tie rolls if necessary or fasten edges with toothpicks).

Dip each roll into melted butter, then roll in bread crumbs thoroughly. Place rolls in 9 x 13 x 2-inch baking dish. Bake uncovered for about 40 minutes.

While chicken is baking, mix the ingredients together for the sauce. Heat sauce on low heat or in a double boiler until hot. Be careful not to overcook. Spoon sauce over chicken. Serves 8.

Side idea: Serve with a side of steamed broccoli or brown rice.

One serving = 1 chicken breast half with sauce
Calories per serving = 332
14 grams carbohydrate

Carb Smart Cookbook: Main dishes, vegetarian (continued)

Vegetable Lasagna

14 lasagna noodles

2 tablespoons extra-virgin olive oil

1 cup chopped onion (½ of a large onion)

3 garlic cloves, minced

⅛ to ¼ teaspoon crushed red pepper flakes

2 medium zucchinis cut into ½-inch pieces (about 4 cups)

2 medium yellow squash cut into ½-inch pieces (about 4 cups)

12 ounces jar roasted red peppers, drained and cut into ½-inch pieces (1 heaping cup)

1 can (28 ounces) crushed tomatoes

Generous handful fresh basil leaves, chopped

15 ounces container whole-milk ricotta cheese or cottage cheese

2 large eggs

1 cup parmesan cheese, grated

8 ounces low-moisture whole-milk mozzarella cheese, shredded

Salt and black pepper to taste

Heat oven to 350°F. Lightly oil or spray 13 x 9-inch baking dish with non-stick cooking spray.

Cook noodles according to package instructions in a large pot of boiling salted water. Add a few teaspoons of olive oil to prevent the noodles from sticking together. Drain the noodles and lay on a sheet of aluminum foil.

While noodles are cooking and cooling, heat olive oil in a large frying pan over medium heat. Add onion and cook, stirring occasionally until translucent (3 to 5 minutes). Add garlic, red pepper flakes, zucchini, yellow squash, and a pinch of salt. Cook, stirring occasionally until softened but still crunchy (5 to 8 minutes). Add roasted red peppers and crushed tomatoes. Stir and bring to a low simmer. Simmer until liquid has thickened and reduced by half (5 to 8 minutes). Add basil, then season to taste with additional salt and pepper.

Add ricotta cheese (or cottage cheese), eggs, and ½ teaspoon of salt to a medium bowl. Stir until well combined.

Assemble lasagna by spooning the vegetable mixture into the baking dish to lightly cover the bottom (about 1 cup). Arrange 4 noodles lengthwise and side-by-side to cover the baking dish.

Spread about half of the ricotta cheese (or cottage cheese) mixture over the noodles. Sprinkle with a third of the parmesan cheese and a third of the mozzarella cheese. Top with about a third of the vegetable mixture. Add another layer of 4 noodles, then repeat with remaining cheese and vegetables. Finish with a final layer of noodles, vegetables, parmesan, and mozzarella cheese.

Cover lasagna loosely with aluminum foil and bake 20 minutes. Uncover then bake 15 minutes until cheese is crusty around the edges. Let rest at least 15 minutes before serving. Serves 12.

Side idea: Green salad with Italian dressing.

One serving = one 3 x 3-inch square

Calories per serving = 278

29 grams carbohydrate

Carb Smart Cookbook: Desserts

Applesauce Bran Cookies

1 ¾ cups flour

½ teaspoon salt

1 teaspoon cinnamon

½ teaspoon nutmeg

½ teaspoon cloves

1 teaspoon baking soda

½ cup butter

1 teaspoon vanilla

1 cup white sugar

1 egg

1 cup unsweetened applesauce

½ cup raisins

1 cup All-Bran cereal

Preheat oven to 375°F.

Sift together the flour, salt, cinnamon, nutmeg, cloves, and baking soda. In a separate bowl, cream together butter, vanilla, sugar, and egg until light and fluffy. Add flour mixture and applesauce alternately to creamed mixture, mixing well after each addition. Fold in raisins and All-Bran.

Drop by level teaspoonfuls onto greased cookie sheet. Bake for 10 minutes or until golden brown.

Makes 36 cookies. This recipe is a good source of fiber.

One serving = 2 cookies

Calories per serving = 116

26 grams carbohydrate

Oatmeal and Applesauce Cookies

½ cup flour

½ teaspoon cinnamon

½ teaspoon baking soda

¼ teaspoon salt

¼ teaspoon nutmeg

¼ teaspoon cloves

¼ teaspoon allspice

½ cup quick-cooking oatmeal

½ cup raisins

½ cup unsweetened applesauce

¼ cup cooking oil

½ cup white sugar

1 medium egg

1 teaspoon vanilla

Preheat oven to 375°F.

Mix flour, cinnamon, baking soda, salt, nutmeg, cloves, allspice, oatmeal, and raisins. Add applesauce, oil, sugar, egg, and vanilla. Mix just to moisten. Drop by spoonfuls onto greased sheets. Bake for about 12 minutes. Serve warm. Makes 24 cookies. This recipe is a good source of dietary fiber.

One serving = 2 cookies

Calories per serving = 100

16 grams carbohydrate

Carb Smart Cookbook: Desserts (continued)

Oatmeal Cookies

1 ½ cups quick-cooking oatmeal
⅔ cup melted butter
2 beaten eggs
1 cup white sugar
1 ½ cups sifted flour
½ teaspoon salt
2 teaspoon baking powder
½ cup 2 % milk
1 tablespoon vanilla
¼ cup currants or raisins

Preheat oven to 400°F.

Measure oatmeal into a 1-quart mixing bowl. Stir in melted butter. Blend in combined eggs and sugar. Sift remaining dry ingredients together with combined milk and vanilla mixture. Mix in currants or raisins. Drop by spoonfuls onto a baking sheet. Bake for 10 to 15 minutes or until golden brown. Makes 6 dozen cookies.

One serving = 3 cookies
Calories per serving = 110
19 grams carbohydrate

Peanut Butter Cookies

¾ cup soft butter
2 cups white sugar
1 cup brown sugar
2 eggs
1 cup peanut butter
1 cup flour
1 teaspoon salt
1 ½ teaspoons baking soda
1 cup oatmeal

Preheat oven to 300°F.

Cream butter, sugar, and brown sugar together. Beat in eggs and peanut butter. Mix dry ingredients together. Add dry ingredients to the wet mixture and blend well. Drop by spoonfuls onto a baking sheet. Bake for 15 to 17 minutes. Makes 48 cookies.

One serving = 2 cookies
Calories per serving = 162
34 grams carbohydrate

Carb Smart Cookbook: Desserts (continued)

Chocolate Chip Cookies

2 ½ cups sifted flour
1 teaspoon baking soda
1 teaspoon salt
½ cup softened butter
¾ cup brown sugar
2 eggs
1 ½ cups white sugar
½ teaspoon water
1 teaspoon vanilla
6-ounce package semi-sweet chocolate chips
1 cup finely chopped walnuts

Preheat oven to 375°F.

Sift together flour, salt, and baking soda. Set aside. Heat butter and brown sugar until melted. Cool slightly. Add sugar, water, eggs, and vanilla to the butter mixture. Blend until creamy. Add flour mixture and mix well. Fold in chocolate chips and nuts. Drop by spoonfuls onto greased cookie sheet. Bake for 10 to 12 minutes. Makes 36 2-inch cookies.

One serving = 1 cookie
Calories per serving = 110
26 grams carbohydrate

Peach Crunch

4 cups canned, sliced, unsweetened peaches
1 cup corn flakes
¾ cup unsweetened coconut
¾ teaspoon cinnamon
2 tablespoons butter

Preheat oven to 350°F.

Drain peaches and place in a shallow, 6-cup baking dish. Crush corn flakes and mix with coconut and cinnamon. Sprinkle over peaches. Dot with butter. With a fork, work the crumb mixture into the peaches just slightly. Bake for about 25 minutes or until bubbly hot. Serves 8.

One serving = approximately ½ cup
Calories per serving = 115
12 grams carbohydrate

Jell-O Jigglers

2 ½ cups boiling water
2 packages sugar-free Jell-O (8-serving size each)

Stir boiling water into dry gelatin mix in a large bowl for at least 3 minutes until completely dissolved. Pour into a 9 x 13-inch pan. Refrigerate at least 3 hours or until firm. Dip bottom of pan in warm water for 15 seconds. Cut into 24 decorative shapes using 2-inch cookie cutters, being careful to cut all the way through gelatin to bottom of pan. Lift Jigglers from pan. Reserve scraps for snacking. Store in tightly covered container in refrigerator. Serves 16.

One serving = approximately ½ cup
Calories per serving = 4
4 grams carbohydrate

Quick Reference List for Weighing Foods

The table below includes some foods that kids and teenagers eat which you can weigh on a food scale to figure the portion sizes and carbohydrate amounts per ounce.

Common Foods	Serving Size	Carbs (grams)
Pancakes/Waffles	1 oz	12
Cold Cereal	1 oz	22
Muffins/Rolls	1 oz	15
Apples/Grapes	1 oz	4
Melon	1 oz	2
Tortilla Chips	1 oz	19
Potato Chips	1 oz	15
Potatoes, cooked	1 oz	5.5
French Fries	1 oz	10
Spaghetti with meat sauce	1 oz	5
Lasagna	1 oz	4
Pizza	1 oz	8.5
Cookies/Brownies	1 oz	20
Ice Cream	1 oz	
Plain		6
Candy/caramel added		8
Cake with/without frosting	1 oz	20
Cheesecake	1 oz	7
Pie	1 oz	
Fruit/Cream		10
Pumpkin/Pecan		6.5

Carbohydrate Counting with a Scale

Using a food scale to count carbohydrates is useful when eating foods that are baked, vary in size or are difficult to measure in a measuring cup.

Follow these steps to figure out how many carbohydrates are in the portion you are eating:

1. Weigh food on a food scale
2. Find the number of carbohydrates per ounce listed on the table
3. Use a calculator to multiply the food's weight in ounces by the number of carbohydrates per ounce
4. The answer is the number of grams of carbohydrate in the food you weighed

Example

You place an apple on the scale and it weighs 3 ounces. The list shows that 1 ounce of apple contains 4 grams of carbohydrate. Multiply 3 x 4 to get the total amount of carbohydrates:

3 ounces of apple x 4 carbs per ounce = 12 grams of carbs

Tips for using a scale

Make sure your scale is set to weigh in ounces. When using a plate or bowl, place it on the scale before adding the food and press the zero or tare button to erase the weight of the dish. Then, place food to be weighed onto the dish.

Numbers used to calculate carbohydrates per ounce were based off the USDA Nutrient Database and are only an estimate.

Food List With Carbohydrate Counts per Serving

Food	Serving Size	Carbohydrate Grams
A		
Angel food cake, unfrosted	1/12 of cake (2 oz.)	30
Apple, dried	5 rings	20
Apple, unpeeled	1 medium (6 oz.)	22
Applesauce, unsweetened	½ cup	15
Apricots,		
canned, unsweetened	½ cup	15
dried	8 halves	15
fresh	1 medium (2 oz.)	6
Arroz con leche	1 cup	63
Artichoke	½ cup cooked or 1 cup raw	5
Artichoke hearts	½ cup cooked or 1 cup raw	5
Asparagus	½ cup cooked or 1 cup raw	5
Avocado	1/8 medium (1 oz.)	0
B		
Bacon, cooked	1 slice	0
Bagel	1 medium (4 oz.)	60
Banana	1 medium (5 oz.)	27
Beans, baked	½ cup	20
black, garbanzo, kidney, lima, pinto, split, white	½ cup cooked	20
green, Italian, wax	½ cup cooked or 1 cup raw	5
Bean sprouts	½ cup cooked or 1 cup raw	7
Beef chuck and rump roast, cubed, ground beef, meatloaf, porterhouse, rib, short and prime ribs, sirloin and flank steak, T-bone, tenderloin	1 oz.	0
Beef stew	¾ cup	15
Beef Stroganoff, with noodles	¾ cup	25

Food	Serving Size	Carbohydrate Grams
Berries, whole unsweetened		
blackberries	½ cup (2½ oz.)	7
blueberries	½ cup (2½ oz.)	10
boysenberries	½ cup (2½ oz.)	8
raspberries	1 cup (4 oz)	15
strawberries	18 medium or 9 large, 1 cup (5½ oz.)	12
Beets	1 cup cooked or raw	15
Biscuit	2" diameter (1 oz.)	20
Bread,		
banana	1 small slice (2 oz.)	30
corn	2" square (2 oz.)	20
light	2 slices	15
French, raisin, rye, wheat, white	1 slice (1 oz.)	15
Breadstick	1½ oz.	22
Broccoli	½ cup cooked or 1 cup raw	5
Brownie,		
with frosting	2 oz.	40
without frosting	2 oz.	40
Brussels sprouts	½ cup cooked or 1 cup raw	7
Bulgur	½ cup	15
Bun,		
hamburger	1 regular (1½ oz.)	22 to 25
hot dog	1 whole	20 to 22
Burrito,		
bean	1 burrito	40 to 70
beef	1 burrito	35
Butter,		
reduced-fat	1 Tbsp. (1 oz.)	0
stick	1 tsp	0
whipped	2 tsp	0

Food	Serving Size	Carbohydrate Grams
C		
Cabbage	½ cup cooked or 1 cup raw	5
Cake, with or without frosting	1 oz.	20
Cake bite/pop	1 small	20
Candy, hard	3 candies	15
Caramel apple	1 large apple	75
Cantaloupe, small	½ medium or 1 cup cubes (6 oz.)	5
Carrots	½ cup cooked or 1 cup raw	5
Cauliflower	½ cup cooked or 1 cup raw	3
Celery	½ cup cooked or 1 cup raw	2
Cereal,		
cooked, sweetened	½ cup prepared or 1 packet	30
cooked, unsweetened	½ cup prepared or 1 packet	15
granola	½ cup	30
Grape-Nuts	½ cup	48
puffed rice/wheat	1 cup	10 to 15
muesli	¾ cup	50
Cereal, heavy bran/grain (All-Bran, All-Bran Buds, Crunchy Nuggets, Fruit & Nut, Just Right, Muesilix)	1 cup	45 to 50
Cereal, mostly bran/grain (Bran Flakes, Corn Bran, Corn Chex, Frosted Mini Wheats, Fruit & Fiber, Life, Nutri-Grain, Post Toasties, Shredded Wheat, Sun Flakes, Total, Wheat Chex, 40 % Bran Flakes)	1 cup	25 to 30
Cereal, sweetened (Apple Cinnamon Cheerios, Apple Jacks, Banana Crunch, Cap'n Crunch, Cinnamon Life, Cocoa Pebbles, Corn Pops, Crunch Berries, Fiber One, Froot Loops, Frosted Flakes, Fruity Pebbles, Golden Grahams, Honey Bunches of Oats, Lucky Charms)	1 cup	30 to 35

Food	Serving Size	Carbohydrate Grams
Cereal, unsweetened (Cheerios, Corn Flakes, Crispix, Grape-Nut Flakes, Kix, Rice Chex, Rice Krispies, Special K, Total, Wheaties)	1 cup	20 to 25
Chayote	1 cup	8
Cheese, all regular	1 oz	0
American, cheddar, Monterey		
Jack, Swiss, cottage, parmesan	¼ cup	5
feta, mozzarella	1 oz.	1
ricotta	¼ cup (2 oz.)	3
Cheese, cream, reduced-fat,	1 Tbsp. (1 oz.)	2
regular	1 Tbsp. (1 oz.)	1
fat-free	1 Tbsp. (1 oz.)	3
Cherries,		
canned, unsweetened	½ cup	15
sweet, fresh	8 (2 oz.)	10
Chicken	1 oz.	0
Chicken, fried or nuggets	1 piece or 6 nuggets (3 oz.)	15
Chicken, casserole	1 cup	30
Chilaquiles	1 cup	29
Chili con carne	½ cup	15
Chips,		
potato	10 to 15 (1 oz.)	15
tortilla	12 chips (1 oz.)	20
Chop suey, vegetable	½ cup	3
Chow mein, meat	1 cup	10
Chow mein noodles	½ cup	20
Churro	1 small (1 ½ oz.)	20
Clams	1 oz.	0
Cocoa,		
hot, sugar-free with water	1 packet	8 to 12
hot, with water	1 packet	20 to 25
Coconut, shredded sweetened	¼ cup	7

Food	Serving Size	Carbohydrate Grams
Cookie,		
fortune	3 cookies	15
gingersnaps	3 cookies	15
homemade, all types	1 small, 2-inch (1 oz.)	20
Lorna Doone	3 cookies	15
sandwich with cream filling	2 small cookies	15
vanilla wafers	5 wafers	15
Condiments/sauces,		
ketchup, honey mustard, fry sauce, steak sauce	1 Tbsp	4
mustard, soy sauce	1 tsp	0
BBQ sauce	1 Tbsp	2
sweet & sour sauce	1 Tbsp	4
Corn	½ cup	15
Cornbread	1 piece (2 oz.)	30
Corn dog	1 corn dog	20 to 25
Corn on the cob	1 5-inch piece (2¼ oz.)	15
Cornmeal	3 Tbsp	22
Cotton candy	1 oz.	28
Couscous	½ cup	20
Crab	1 oz.	0
Crackers,		
animal	8 crackers	16
goldfish	55 crackers (1 oz.)	20
graham	3 crackers, 2½-inch square	15
oyster	20 crackers	10
round butter	5 crackers	10
saltine	6 crackers	15
sandwich, cheese, or peanut butter	5 crackers	20
Teddy Grahams	15 crackers	15
Vanilla Wafers	5 wafers	15
whole wheat	4 to 6 crackers (1 oz.)	15

Food	Serving Size	Carbohydrate Grams
Cranberry sauce, jellied	¼ cup	27
Cream, half and half	2 Tbsp	2
Creamers,		
nondairy, liquid	1 Tbsp	2
nondairy, powdered	1 Tbsp	2
Croutons	¼ cup	15
Cucumber	½ cup cooked or 1 cup raw	3
Cupcake,		
frosted	1 small (2 oz.)	40
unfrosted	1 small (2 oz.)	40
D		
Dates	5 medium (1½ oz.)	30
Donut,		
glazed,	1 donut, 3-inch (2 oz.)	30
plain cake	1 small (2 oz.)	30
Duck	1 oz.	0
E		
English muffin	1 muffin (2 oz.)	30
Empanada	1 large	69
Egg	1 egg	0
Egg substitutes, plain	¼ cup	0
Egg whites	2 egg whites	0
Eggplant	½ cup cooked or 1 cup raw	3
Enchilada, cheese and meat	6 oz.	30
F		
Figs,		
dried	3 medium (1 oz.)	23
fresh	1 medium (2 oz.)	10
Fish, breaded and fried	1 piece (4 oz.)	8
Fish (not breaded), fresh or frozen cod, flounder, haddock, halibut, herring (uncreamed or smoked), salmon (fresh or canned), trout, catfish or tuna fish (canned in water or oil)	1 oz.	0
sardines, canned	2 medium	0
Fish sandwich, with tartar sauce	1 sandwich	45
Fish sticks	2 sticks (2 oz.)	12
Flauta	1 each	14
Flan	½ cup	35

Food	Serving Size	Carbohydrate Grams
Flour,		
wheat, dry	2 Tbsp	12
wheat, dry	½ cup	50
white, dry	2 Tbsp	16
white, dry	½ cup	63
French fries	Small order (3 oz.)	30
French toast	1 slice	15
Fruit cocktail, unsweetened	½ cup	15
Fruit juice bars, frozen	1 bar	15
Fruit salad, fresh	1 cup	20
Fruit snacks, chewy (pure fruit concentrate)	1 small package	15 to 20
Fruit spreads, 100 % fruit	1 Tbsp	15
G		
Gelatin dessert,		
regular	½ cup	18
sugar-free	½ cup	0
Granola bar	1 bar	15 to 22
Grapefruit	½ large (10 oz. or 6 oz. flesh)	15
Grapes	15 medium, ⅔ cup (3 oz.)	18
Gravy,		
homemade, thick	¼ cup	8
prepared from mix	¼ cup	4
Green onions or scallions	½ cup cooked or 1 cup raw	5
Greens, collard, kale, mustard	½ cup cooked or 1 cup raw	5
Grits,		
cooked	½ cup	15
uncooked	3 Tbsp	15
Gum, sugar-free	2 sticks	1 to 2
H		
Ham, fresh, canned, cured, boiled	1 oz.	0
Hamburger,		
small bun	2 oz.	30
large bun	3 oz.	45
Hamburger Helper	1 cup	30
Honey	1 Tbsp	15
Honeydew	1 slice, 1 cup cubes (6 oz.)	15
Hot dog, without bun	1½ oz.	0
Hot dog, with bun (without condiments)	1 hot dog	20 to 22

Food	Serving Size	Carbohydrate Grams
I		
Ice cream,		
light or fat-free	½ cup	20
regular	½ cup	20
Ice cream cone,		
sugar	1 cone	11
waffle	1 small cone	14
J		
Jam or jelly,		
low-sugar or light	1 Tbsp	5
regular	1 Tbsp	15
Juice,		
apple, orange, pineapple, cranberry juice cocktail, fruit juice blends	½ cup	15
grape	½ cup	20
prune	⅓ cup	15
reduced sugar, carrot	1 cup	15
tomato	½ cup	5
V-8 vegetable	1 can (11½ oz.)	15
V-8 Splash® vegetable	1 cup (8 oz.)	20
K		
Kasha	½ cup	15
Kiwi	1 medium (2½ oz.)	10
Kohlrabi	½ cup cooked or 1 cup raw	5
L		
Lamb, chop, ground, leg, roast	1 oz.	0
Lasagna,		
meat	1 cup	30
vegetable	1 cup	35
Leeks	½ cup cooked or 1 cup raw	5
Lentils,		
cooked	½ cup	20
uncooked	3 Tbsp. (1 oz.)	15
Lettuce	1 cup raw	2

Food	Serving Size	Carbohydrate Grams
M		
Macaroni,		
cooked	½ cup	20
uncooked	¼ cup	20
Macaroni & cheese	½ cup	25 to 30
Mandarin oranges, canned	½ cup	15
Mango, small, no skin	½ cup cubes (3 oz.)	15
Margarine,		
fat-free	4 Tbsp	0
low-fat (30 to 50 % vegetable oil)	1 Tbsp	0
stick, tub, squeeze	1 tsp	0
Marshmallows	5 regular	30
Mayonnaise,		
reduced-fat	1 Tbsp	0
regular	1 tsp	0
Meat, sandwich spread with 3 grams of fat or less	1 oz.	0
Melba Toast	4 slices	15
Melon	1 cup cubes	15
Milk,		
chocolate,	½ cup	15
evaporated, fat-free, whole	½ cup	15
fat-free, goat's, Kefir, whole, ½ %, 1 %, 2 %	1 cup	12
Milk, soy,		
flavored	1 cup	25
flavored, light	1 cup	15
plain	1 cup	5
Millet	½ cup cooked	20
Miracle Whip,		
reduced-fat	2 Tbsp	6
regular	2 Tbsp	4
Miso	3 Tbsp	15
Muffin,		
prepared from mix	1 small (2 oz)	30
ready-to-eat	1 medium, cupcake size (3 oz.)	45
Mushrooms	½ cup cooked or 1 cup raw	5

Food	Serving Size	Carbohydrate Grams
N		
Nachos, chips with cheese	15 chips	30
Nectarine	1 small (4 oz.)	12
Nonstick cooking spray		0
Noodles,		
uncooked	¼ cup (1 oz.)	20
cooked	½ cup (3 oz.)	20
Ramen	1 large package	52
Nuts,		
almonds, cashews, mixed (50% peanuts)	6 nuts	3 to 6
peanuts	10 nuts	5
pecans, walnuts	4 halves	2
O		
Oatmeal,		
dry	½ cup uncooked	30
sweetened	1 packet or ½ cup prepared	30
unsweetened	1 packet or ½ cup prepared	15
Oats,		
cooked, instant, flavored	1 packet	30
dry	½ cup	30
Oil,		
canola, olive, peanut (monounsaturated)	1 Tbsp	0
corn, safflower, soybean (polyunsaturated)	1 Tbsp	0
Okra	½ cup cooked or 1 cup raw	5
Olives,		
green, stuffed	10 large	0
ripe	8 large	0
Onions	½ cup cooked or 1 cup raw	5
Orange	1 medium (7 oz.)	20
Oysters	6 medium	0
P		
Pancake	1 4-inch diameter (1 oz.)	10
Papaya	½ fruit or 1 cup cubes (5 oz.)	15
Pea pods	½ cup cooked or 1 cup raw	5
Peach,		
canned, unsweetened	½ cup	15
fresh	1 medium (3 oz.)	10

Food	Serving Size	Carbohydrate Grams
Peanut butter, smooth, chunky	2 Tbsp	5
Pear,		
canned, unsweetened	½ cup	15
fresh	½ large (4 oz.)	13
Peas, green	½ cup	10
Peppers	½ cup cooked or 1 cup raw	5
Pie,		
chocolate, cream	⅛ of 8-inch pie	40
fruit, made with 2 crusts	⅛ of 9-inch pie	45
pumpkin, custard	⅛ of 8-inch pie	30
Pineapple,		
canned, unsweetened	½ cup	15
fresh, no skin	¾ cup (4 oz.)	15
Pita,		
white	½ 6-inch diameter (1 oz.)	15
wheat	½ 6-inch diameter (1 oz.)	15
Pizza,		
deep dish (stuffed crust)	1 medium slice	35 to 45
deep dish (individual)	1 6-inch pizza	65 to 70
hand-tossed	1 medium slice	25 to 35
homemade	1 medium slice (3 oz.)	30
thin crust	1 medium slice	15 to 25
Plantain	1 cup sliced	48
Plums,		
canned, unsweetened	½ cup	15
fresh	2 small (5 oz.)	15
Popcorn, buttered	3 cups	15
Pork, tenderloin, center loin chop, chop, top loin, Boston butt, cutlet, spare ribs, ground pork, pork sausage	1 oz.	0
Pork & beans	⅓ cup	5
Pot pie	1 (7 oz.)	30
Potato chips	12 to 18 (1 oz.)	15
Potato,		
baked, boiled	1 medium (8 oz.)	55 to 60
mashed	½ cup	15 to 18
Pretzels	1 oz. or 20 mini-size	25
Pretzel, Pretzel Maker	1 pretzel	75 to 80
Prunes, dried	3 fruit	15
Pudding,		
regular	½ cup	30
sugar-free	½ cup	15

Food	Serving Size	Carbohydrate Grams
Q		
Quinoa	½ cup cooked	20
R		
Radishes	½ cup cooked or 1 cup raw	5
Raisins	2 Tbsp	15
Raisin bread	1 slice (1 oz.)	15 to 18
Rice cakes	2 cakes	15
Rice,		
brown, instant, long grain, white, wild	1 cup cooked	45
Spanish	½ cup	20
Rice milk	1 cup	varies
Roll,		
plain	1 small (1 oz.)	15
sweet, Danish	1 medium roll (3 oz.)	45
S		
Salad dressing, regular	2 Tbsp	1 to 8
Salsa	¼ cup	5
Sauerkraut	½ cup cooked or 1 cup raw	5
Sausage	1 oz.	0
Scallops	1 oz.	0
Sesame seeds	1 Tbsp	0
Sherbet or sorbet	½ cup	30
Shortening or lard	1 tsp.	0
Shrimp	1 oz.	0
Soup,		
beef, chicken, turkey (noodle or vegetable)	½ can	10
clam chowder, minestrone, tomato, cream of chicken, cream of mushroom	½ can	15
made with water	½ can	9
made with milk	½ can	10 to 20
ready-to-eat	10 oz.	20 to 25
ready-to-eat with meat (bean with bacon, green pea, split pea with ham or bacon)	½ can	15 to 30
ready-to-eat with meat (beef, chicken vegetable, sirloin burger, stroganoff, beef vegetable)	10-oz. can	30
Soup, Medudo	1 cup	23
Soup, Posole	1 cup	16 gm
		15 gm

Food	Serving Size	Carbohydrate Grams
Sour cream,		
reduced-fat	2 Tbsp	2
regular	2 Tbsp	1
Spaghetti,		
cooked	½ cup	20
sauce	½ cup	8 to 10
Spaghetti O's	1 cup	30 to 35
Spinach	½ cup cooked or 1 cup raw	5
Squash,		
summer (zucchini)	½ cup cooked or 1 cup raw (3½ oz)	5
sweet potato, plain	½ cup (3 oz.)	20
winter (acorn/butternut)	½ cup cooked or 1 cup raw (3½ oz.)	10
Stuffing, bread, prepared	½ cup	20
Submarine	1 6-inch sandwich	45
Sugar substitutes, approved by FDA Equal, Splenda, Sprinkle Sweet, Sugar Twin, Sweet One, Sweet-10, Sweet'N Low		0
Sugar, white or brown	1 Tbsp	15
Syrup,		
light	¼ cup	26
regular	¼ cup	53
sugar-free	¼ cup	10
T		
Taco shell	1 6-inch diameter	15
Tamale	1 each	22
Taquito	1 each	14
Tangerines	1 medium (4 oz.)	13
Tater tots	6 pieces (2 oz.)	12 to 15
Tempeh	1 piece (3 oz.)	12
Tofu	½ cup (4 oz.)	3
Tomato, fresh, canned as sauce	½ cup cooked or 1 cup raw	5
Tomatillo	1 each	2
Tortilla,		
corn	1 small (6-inch diameter)	10
flour	1 small (6-inch diameter)	15
flour	1 large (12-inch diameter)	30
Tuna casserole	½ cup (4 oz.)	20
Turkey, white or dark meat, no skin	1 oz.	0
Turnips	½ cup cooked or 1 cup raw	5

Food	Serving Size	Carbohydrate Grams
V		
Venison	1 oz.	0
W		
Waffle	1 4-inch round (1½ oz.)	15
Water chestnuts	½ cup cooked or 1 cup raw	5
Watercress	½ cup cooked or 1 cup raw	5
Watermelon	1 small slice or 1 cup cubes (5½ oz.)	10
Wheat germ	¼ cup	15
Yam, plain, cooked	½ cup cooked (2½ oz.)	20
Yogurt,		
regular	1 container (6 oz.)	30 to 35
lite	1 container (6 oz.)	15 to 20
Greek, flavored	1 container (5.3 oz.)	20
Greek, non-flavored	1 container (5.3 oz.)	15
Yogurt, frozen,		
no sugar	½ cup	20
regular	½ cup	25
Yucca root	1 cup	78
Z		
Zucchini	½ cup cooked or 1 cup raw (3½ oz.)	5

Holiday fun size candies

Candy	Serving Size	Carbohydrate Grams
Airhead, mini size	13 pieces	10
Almond Joy, snack size	1	10
Almond Joy, mini	1	8
Baby Ruth, fun size	1	14
Baby Ruth, minis	2 bars	15
Butterfinger, fun size	1	15
Butterfinger, minis	2 bars	15
Candy corn	9 pieces	15
Caramels	3	17
Charms Blow Pops	1	14
Cinnamon bears	2	17
Creme Savers	3 pieces	13
Nestle Crunch Bar, Nestle miniatures	2 bars	14
Dove Bar, mini pieces	3	15
Dum Dums (0.6 oz.)	2	15
Fruit gummy, fun size	1	15
Hershey's, snack size	1	10
Hershey's, minis	3	10
Hugs – Chocolate	6	15
100 Grand, fun size	1	15
Kisses – Chocolate	6	16
Kit Kat, fun size	1	12
Life Savers Gummies, snack size	1 roll	14
M&M's peanut, fun size	1 pack	12
M&M's plain, fun size	1 pack	13
Milky Way, fun size	1	12
Milky Way, mini size	5 pieces	30
Nips, all flavors	2 each	11
Nuggets, chocolate	3	16
Pixy Stix	7	15
Red Vines licorice, reg. size	2 pieces	17
Reese's, fun size cup	1	12
Reese's, miniatures	7	30
Reese's Pieces	1 package (1.6 oz., 50 pieces)	25

Low Carbohydrate Foods

Low carb food	Carbohydrate (grams)
Sugar-free Jell-O	0
Cheese (1 slice, 1 stick, 1 square)	0 to 1
Parmesan crisps	0
Carb-Master yogurt	5
Eggs	0
All meat and fish (without added flavoring or breading)	0
Beef jerky	0 to 8
Avocado, guacamole (½ cup)	5
Peanut butter (2 tablespoons)	5
Celery, cucumber, cauliflower (½ cup cooked or 1 cup raw)	2
Broccoli (½ cup cooked or 1 cup raw)	5
Almonds, cashews, mixed (about 6 nuts)	5
Peanuts (10 nuts)	5
8 black olives	2
Edamame (½ cup steamed)	5
Peppers (½ cup cooked or 1 cup raw)	5
Tofu (½ cup)	3
Tomato (½ cup cooked or 1 cup raw)	5
Carrots (½ cup cooked or 1 cup raw)	5
Salsa (2 tablespoons)	3
Hummus (2 tablespoons)	4
Ranch dressing (2 tablespoons)	2

Snack ideas for low carb foods

- Non-starchy vegetables (cucumbers, carrots, celery, peppers) dipped in ranch, guacamole, salsa, or hummus
- Celery and peanut butter (limit to 2 tablespoons of peanut butter)
- Sugar-free Jell-O plus lite cool whip (1 to 2 tablespoons)
- Turkey, cheese, and avocado rollup
- Tuna salad
- Hard-boiled eggs with salt and pepper
- Small handful of nuts (1 ounce)
- Mozzarella, lunchmeat and tomato skewers (4 cherry tomatoes, 1 slice lunchmeat, plus 1 cheese stick)
- Kale chips
- Riced cauliflower (1 cup or less) with chicken
- Steamed edamame with salt and pepper
- Pickles and a cheddar cheese square
- Homemade jalapeño poppers (no breading, can replace with bacon)

Note: The snack ideas, including the non-starchy vegetables, should not exceed ½ cup of cooked or 1 cup raw vegetables to fit within 5 grams or less of carbohydrates.

Notes

"Lunchtime!"

— Art by Hannah Kallakher, diagnosed with type 1 diabetes at Primary Children's Hospital

Intermountain Children's Health