Diabetes Education

ST. LOUIS CHILDREN'S HOSPITAL

Welcome to Diabetes Education

Dear Family,

The diagnosis of diabetes can be a lot. You may be feeling many emotions: confusion, anger, sadness, or a mix. It is ok. Please take time to recognize your feelings and care for yourself. Remember to eat, sleep, drink water, and take deep breaths. It will take a while to get used to living with diabetes. Each day will get a bit easier. Your care will be led by the "Diabetes Team" which is the endocrine physicians, diabetes nurse educators, diabetes social worker, and the diabetes dietitian. We will help you learn the basics of diabetes so you can be healthy and get back to doing the things you enjoy.

Diabetes research, care, and treatment has progressed over the years. With proper daily care, people with diabetes live long, healthy lives. Life with diabetes will have its challenges. Some days will be easier than others, and some days may be frustrating. Your diabetes team is here to support you and give you the resources to take care of diabetes.

Here is what to expect:

- We will provide the information and resources necessary for you to properly care for diabetes at home.
- There will be about **8–12 total hours** of initial education that will need to be completed in-person with the child's primary caregivers. A member of our team will discuss the education plan with you.
- During diabetes classes, you will learn the basics of diabetes care. We will teach you how to count carbohydrates, test blood sugar, test urine ketones, calculate insulin doses, and give insulin injections. Please ask questions during sessions. We are here to help you add diabetes care into your daily life.
- Learning about diabetes is a lifelong journey. Learning continues at diabetes clinic visits, classes, and during phone calls.

We are here to support you in this journey. You are not alone.

—The Diabetes Team

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☐ Meet with social worker

What Is Diabetes?

Basic facts

Diabetes is a condition of high blood sugar due to lack of insulin or problems with how insulin is used in the body. The most common conditions that cause high blood sugar in children are Type 1,Type 2, cystic fibrosis-related-diabetes (CFRD), and medication-induced diabetes.

Diabetes impairs the body's ability to use food the right way. Energy needed by the body to work normally comes from carbohydrates, found in the foods we eat.

What should happen when you eat:

- Your body turns carbohydrates into sugar (glucose) to use for energy. Sugar is your body's main source of energy.
- Sugar enters the bloodstream, which causes your blood glucose level to rise.
- Your body sends a message to your pancreas to secrete insulin (a hormone).
- Insulin lets the glucose out of the bloodstream and into the body's cells to use for energy.
- Blood glucose levels go down.
- Your body uses glucose for energy inside the cell.

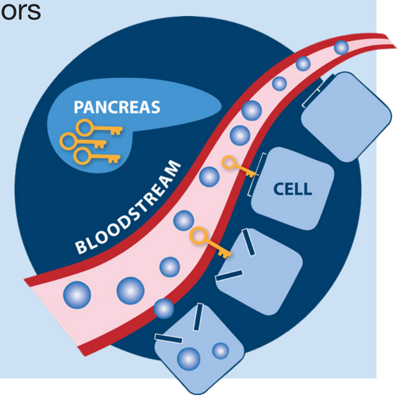
Blood glucose (BG) levels need to be regulated to keep the body healthy and working the right way. The body keeps the blood glucose levels regulated with the help of the hormone insulin.

When people are diagnosed with diabetes, they have a lack of energy because glucose is stuck in the bloodstream and cannot enter the cells. Blood glucose builds to high levels. This build-up of glucose in the blood is called hyperglycemia. Hyperglycemia can be caused by a lack of insulin production, insulin resistance, other conditions, and certain medications.

Ask your endocrinologist what type of diabetes you have. Tests may be needed to determine the type of diabetes.

Normal Cells

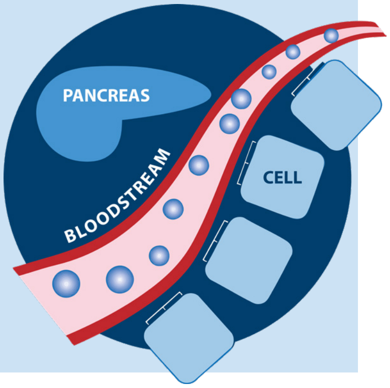
The pancreas makes insulin (keys) that goes into the bloodstream to open cell doors and let sugar (blue circles) into the cells for energy.



Type 1	Type 2
The body's immune system destroys the insulin-producing cells (beta cells) in the pancreas causing an autoimmune disease. The pancreas can no longer make insulin, meaning the keys are no longer present to let the sugar into the cells.	Pancreas still makes insulin, but it does not make enough or the body is unable to use insulin properly (insulin resistance). Insulin (keys) is present, but cannot unlock the cell doors to let the sugar in.
Requires multiple daily insulin injections for life.	Can sometimes be controlled with diet, exercise, and oral medications (may still require insulin injections).
Diabetes antibodies present.	No diabetes antibodies present.
Treatments: Rapid- and long-acting insulin	**Treatments:** • Metformin, Liraglutide, and insulin • Diet, exercise, and weight loss

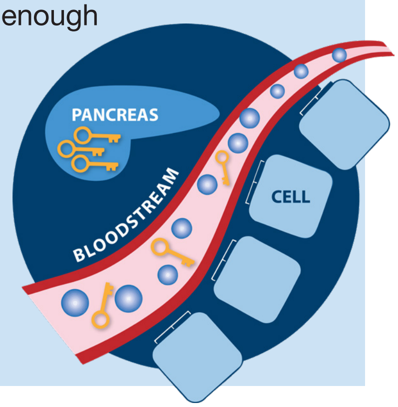
Type 1 Diabetes

No insulin is present to let the sugar into the cells.



Type 2 Diabetes

The pancreas makes insulin (keys) but does not make enough or the body is unable to use insulin properly. Insulin is present, but cannot unlock the cell doors to let sugar in.



What helps insulin open cell doors to let glucose in?

- Exercise and physical activity
- Eating healthy meals and snacks
- Taking diabetes medications
- Losing weight (Type 2)

What are signs the body is not able to use insulin properly (insulin resistance)?

- Dark patches appear on the neck, stomach, knees, armpits, hands, breast, or groin. These dark patches are called acanthosis nigricans (AN).

Symptoms of diabetes

Without insulin the blood sugar cannot pass into the body's cells to be used for fuel and energy. The blood sugar rises to a high level and overflows through the kidneys into the urine. The results are the most common symptoms of hyperglycemia:

- Frequent urination, nighttime urination, and sometimes bed-wetting
- Increased thirst (to make up for water lost in urine)
- Hunger (because the body is hungry for energy)
- Weight loss (when the body cannot get sugar for energy, it burns its own muscle and fat)
- Tiredness, lethargy, or lack of usual energy level
- Changes in behavior, such as mood swings, irritability, stubbornness, shift in attitude, or acting out

	Type 1	Type 2	CFRD	Medication
Incidence	5–10% of people with diabetes (1 in every 400 children)	90–95% of all diabetes (1 of every 4 to 5 persons)	20% of adolescents and 50% of adults with CF	Varied
Common Names	T1D, juvenile diabetes, insulin-dependent diabetes, IDDM	T2D, adult-onset diabetes, non-insulin dependent diabetes, NIDDM	Cystic fibrosis-related diabetes	Post-transplantation diabetes mellitus, new onset diabetes after transplantation (NODAT)
Age	Most often less than 18 years of age but can occur at any age	Usually after puberty	Usually after puberty	Any age
Cause	Autoimmune B-cell destruction, usually leading to absolute insulin deficiency (no insulin produced)	Progressive loss of adequate B-cell insulin secretion and insulin resistance (body doesn't use insulin properly)	Insulin deficiency related to pancreatic scarring and insulin resistance related to disease process and treatment	Dependent on the medication: insulin deficiency, insulin resistance, beta cell destruction, excessive glucose influx
Ketone Formation	Yes, due to lack of insulin	Possible	Possible	Possible
Body Type	Tend to be thin	Tend to be overweight	Tend to be thin	Varied
Treatment	Always requires insulin injections	Controlled with diet, weight loss, exercise, oral medication, insulin	Usually requires insulin injections	Usually requires insulin injections

Type 1 diabetes accounts for roughly 10% of the diabetes cases in the world with the majority of cases being Type 2. Gestational diabetes mellitus (GDM) is a form of diabetes that affects pregnant women, and occurs in 1 in 25 pregnancies worldwide. An estimated 1–5% of all diagnosed cases of diabetes are rare types, such as latent autoimmune diabetes in adults (LADA), maturity onset diabetes in the young (MODY), cystic fibrosis-related diabetes (CFRD), Cushing's syndrome, neonatal diabetes, Wolfram syndrome, and Alstrom syndrome.

Myths and Facts About Type 1 Diabetes

Myth: Eating too much sugar causes diabetes.
Fact: Type 1 diabetes is caused by a destruction of the insulin-producing cells of the pancreas, which is unrelated to sugar consumption. Type 2 diabetes results from the body's inability to respond to insulin normally. Although the tendency to get Type 2 diabetes is genetically inherited in most cases, eating too much sugar (or foods with sugar, like candy or regular soda) can cause weight gain, which can increase the risk for developing the disease.

Myth: Kids with diabetes can never eat sweets.
Fact: Kids with diabetes can eat a certain amount of sugary food as part of a balanced diet, but they need to control the total amount of carbohydrates they eat, which includes sugary treats. Because sweets provide no real nutritional value other than calories, they should be limited, but not necessarily eliminated. All kids (and adults) should avoid excessive consumption of foods that provide little nutritional value and can crowd out healthier foods.

Myth: Kids can outgrow diabetes.
Fact: Kids do not outgrow diabetes. In Type 1 diabetes, the cells of the pancreas that produce insulin are destroyed. Once they're destroyed, they will never make insulin again. Kids with Type 1 diabetes will always need to take insulin until a cure is found. Although kids with Type 2 diabetes may see an improvement in their blood sugar levels after puberty or with lifestyle adjustments, they will probably always have a tendency toward having high blood sugar levels, especially if they are physically inactive or gain too much weight.

Myth: Diabetes is contagious.
Fact: Diabetes is not contagious. You can't catch it from another person. Although researchers think that getting Type 1 diabetes may be triggered by something in the environment, like a virus, most people who get Type 1 diabetes have inherited genes that make them more susceptible to the disease.

Myth: High blood sugar levels are normal for some people and aren't a sign of diabetes.
Fact: Certain conditions (like illness or stress) and certain medications (like steroids) can temporarily cause high blood sugar levels in people without diabetes. High blood sugar levels are never normal. People who have higher than normal blood sugar levels or sugar in their urine should be checked for diabetes by a doctor.

Myth: People with diabetes can feel whether their blood sugar levels are high or low.
Fact: Although someone with diabetes may feel physical symptoms (such as extreme thirst, weakness, or fatigue) if blood sugar levels are high or low, the only way to know for sure what the levels are is to test them. For example, because blood sugar levels have to be very high to cause symptoms, a person who isn't testing regularly may be having blood sugar levels high enough to damage the body without even realizing it.

Myth: All people with diabetes need to take insulin.
Fact: All people with Type 1 diabetes have to take insulin injections because their pancreases don't make insulin anymore. Some, but not all, people with Type 2 diabetes have to take insulin with or without other medications to manage their blood sugar levels.

Myth: Insulin cures diabetes.
Fact: Taking insulin helps manage diabetes, but doesn't cure it. Insulin helps get glucose out of the bloodstream and into the cells, where it can be used for energy. This helps keep blood sugar levels under control, but taking insulin doesn't correct the underlying cause.

Myth: Tablets or pills for diabetes are a form of insulin.

Fact: Diabetes medications taken by mouth are not a form of insulin. Insulin is a protein that would be broken down or destroyed by the acids and digestive enzymes in the stomach and intestines if swallowed. Currently, there is no other practical way to deliver insulin except via injections, although researchers are working on ways to give insulin by mouth, in the nose, or inhaling it into the lungs. Some people with Type 2 diabetes take pills or other medications that help the body make more insulin. Pills for diabetes cannot help kids with Type 1 diabetes because they are no longer able to make insulin.

Myth: Having to take more insulin means diabetes is getting worse.

Fact: Insulin doses need to be continuously adjusted to help keep blood sugar levels in a healthy range. Many factors affect blood sugar levels, including diet, exercise, and time of day. In addition, insulin doses may need to be changed over time. At the time of diagnosis, the pancreas may still be able to make some insulin, so less injected insulin may be needed. However, as the pancreas makes less and less insulin, more insulin needs to be given by injection to keep blood sugar levels in a healthy range. How fast kids are growing, whether they're going through puberty, how much they eat, and how active they are affect the amount of insulin needed each day.

Myth: Kids with diabetes don't have to take their insulin or pills when they're sick.

Fact: When kids are sick, especially if they are throwing up or not eating much, giving insulin might not seem like the right thing to do. However, it is very important to keep taking insulin during illness. Insulin doses may need to be adjusted during illness (check with your doctor) but they can't be skipped altogether. Kids need energy when they're sick to help the body heal itself, and insulin helps them use that energy properly and prevent ketosis. Speak with the diabetes health care team to make sure you understand what to do during a sick day.

Myth: Kids with diabetes can't exercise.

Fact: Exercise is important for all kids—with or without diabetes. Exercise offers many benefits to kids with diabetes. It helps them manage their weight and prevents them from gaining excess body fat. It also improves cardiovascular health, boosts mood, relieves stress, and helps blood sugar control. Discuss exercise guidelines and blood sugar management with the diabetes health care team.

Myth: Low-carbohydrate diets are good for kids with diabetes because they should avoid carbs.

Fact: Carbohydrates (carbs) are the body's preferred source of energy, and carbohydrate-containing foods should provide about 50% to 60% of a person's calories each day. Low-carb diets tend to be overloaded with protein and fat. Following a high-fat, high-protein diet over the long term may increase the risks of heart and kidney disease in adulthood (which people with diabetes are already at increased risk for). People with diabetes should follow a healthy, balanced diet. Usually this means adopting a meal plan that helps them balance carbohydrate intake with medication and exercise to achieve good diabetes control.

Myth: There are cures for diabetes, but doctors and the government aren't telling anyone.

Fact: No matter what you may hear or see on the internet, there is no cure for diabetes. Many scientists and researchers have dedicated their careers to finding a cure for diabetes, and they've made many advances in diabetes research. But the only way to manage diabetes now is to take insulin and medications as prescribed, eat a balanced diet, get plenty of physical activity, and check blood sugar levels regularly. Until there really is a cure for diabetes, do your best to manage your child's diabetes with the tools available now.

Note: All information is for educational purposes only. For specific medical advice, diagnoses, and treatment, consult your doctor.

hopkinsallchildrens.org/Patients-Families/Health-Library/HealthDocNew/Diabetes-Facts-and-Myths

Type 1 Diabetes and the Honeymoon Period

Type 1 diabetes is one of the most common chronic diseases in children, affecting 1 child out of every 400. Researchers are still learning how and why people get Type 1 diabetes. Though diabetes cannot be cured, it can be managed. Your child will never outgrow diabetes and will always need insulin. With family support and good health care, your child with diabetes can lead a healthy, active, and fun-filled life.

In Type 1 diabetes, the pancreas will eventually stop making insulin. This is caused by the autoimmune process in which the person with Type 1 diabetes has developed antibodies against the beta cells of the pancreas. The immune system will destroy all the insulin-making beta cells and eventually no more insulin will be made. We do not know exactly what causes this process.

The time between Type 1 diabetes diagnosis and the pancreas not making any more insulin is called the "honeymoon period." During this time, a person with diabetes may only need small amounts of insulin. Some people even have normal or near normal blood sugar levels without taking insulin. This happens because the pancreas is still making some insulin to help control blood sugar. Not all people with Type 1 diabetes have a honeymoon period. There is not a cure for diabetes and a honeymoon period is only temporary. Everyone's honeymoon period is different and there is not a set time frame for when it starts and ends. Most people notice its effects shortly after being diagnosed. The phase can last weeks, months, or even years. Your insulin needs may change throughout your life, but you will not have another honeymoon period. This is because with Type 1 diabetes, your immune system destroys insulin-making cells in your pancreas.

During the honeymoon phase, the remaining cells keep making insulin. Once those cells die, your pancreas can't start making insulin again. If you had been meeting blood sugar goals before with little or no insulin but you notice that blood sugars are above your target range more often, it could be a sign that your honeymoon period is ending. Talk to your endocrinologist about the next steps. Do not stop taking insulin on your own during your honeymoon period. Instead talk to your doctor about what adjustments you may need to make to your insulin routine. During the honeymoon period it is important to find a balance in your insulin intake. Taking too much could cause hypoglycemia and taking too little could raise your risk of diabetic ketoacidosis. Your doctor can help you find that initial balance and readjust your routine as your honeymoon period changes or ends.

Type 2 Diabetes

With Type 2 diabetes, the pancreas continues to make insulin but the body is not able to use it properly. This is also referred to as insulin resistance. Once called "adult onset" diabetes, Type 2 diabetes is becoming more common in childhood. Children and teens diagnosed with Type 2 diabetes often have a family history of diabetes and are overweight.

Treatment is based on blood sugar patterns. Medications may change. Please check with your doctor.

Causes of Type 2 diabetes

We don't fully understand why some people develop Type 2 diabetes. Certain factors increase the risk, including:

Family history. If family members have Type 2 diabetes (parents or siblings), there is greater risk.

Weight. Being overweight is a primary risk factor for Type 2 diabetes. Fatty tissue leads to an increase in insulin resistance. However, you don't have to be overweight to develop Type 2 diabetes.

Inactivity. Less active people are at a higher risk. Physical activity helps maintain a healthy weight and can make your cells more sensitive to insulin.

Race. For still unknown reasons, certain races are more likely to develop Type 2 diabetes. At higher-risk are: African Americans, Hispanics, Native Americans, Pacific Islanders, and Asian-Americans.

Age. The risk of Type 2 diabetes increases as people get older, especially after age 45.

Pre-diabetes. Pre-diabetes is a condition in which blood sugar level is higher than normal, but not high enough to be classified as diabetes. Left untreated, pre-diabetes can eventually develop into Type 2 diabetes.

Gestational diabetes. Women who develop gestational diabetes during pregnancy have an increased risk of developing Type 2 diabetes.

Polycystic ovary syndrome. Women with polycystic ovary syndrome have an increased risk of developing Type 2 diabetes.

Cystic Fibrosis-Related Diabetes (CFRD)

Cystic fibrosis-related diabetes (CFRD) is different from Type 1 and Type 2 diabetes yet shares some characteristics of both. Persons with cystic fibrosis (CF) may also have Type 1 or Type 2 diabetes.

People with CFRD have:

- **Insulin deficiency (like Type 1 diabetes).** In CFRD, a lack of insulin is mostly caused by scarring (fibrosis) of the pancreas due to the thick mucus.
- **Insulin resistance (like Type 2 diabetes).** This means that for sugar (glucose) to be used by the cells for energy, more than usual amounts of insulin are needed.

  Insulin resistance in CF can be caused by:

  —Underlying infection which leads to chronic inflammation

  —Medications such as steroids to treat the lung disease, and immunosuppressive drugs to prevent rejection after a lung transplant

For more in-depth information, please refer to “Managing Cystic Fibrosis-Related Diabetes (CFRD): An Instruction Guide for Patients and Families.”

You can access the guide at **cff.org/media/22666/download** or by scanning the QR code.

Symptoms, screening, and diagnosis:

CFRD often has no symptoms, but when present symptoms can include:

- Polyuria—peeing a lot
- Polydipsia—being very thirsty
- Fatigue—feeling tired
- Not able to gain weight or weight loss without trying
- Loss of lung function

Screening for CFRD is recommended for those over 10 years old every year. The best way to test is with an oral glucose tolerance test (OGTT). For this test, you fast (nothing to eat or drink for 8 hours); have blood drawn to measure fasting glucose; drink glucose-containing liquid; and have blood glucose levels measured over a certain period. Most often, hemoglobin A1C levels are not measured to diagnose CFRD because the results can be falsely low.

Treatment

Treating CFRD is aimed at keeping blood sugars as close to normal as possible, weight gain, preventing muscle loss, feeling well, and having energy. Treatment includes blood sugar checks, a high calorie, healthy meal plan (high protein, high fat, high salt), avoidance of sweet drinks and juices, and possibly insulin. Staying active helps with lung function and lets insulin work more effectively.

Once diagnosed with CFRD, you will always have it. Treatment changes are based on blood sugars, and you may not always have to take insulin. You may only need it at times, or you may need it all the time. Please check with your doctor.

Medication-Induced Diabetes

Sometimes steroids like prednisone and other medications cause high blood sugars.

Steroids stimulate the liver to make more sugar and release this extra sugar into the bloodstream. They can also prevent the insulin from working properly (insulin resistance). If the pancreas can't make enough insulin, blood sugars rise.

When blood sugars are high, it is important to treat them. High blood sugars put the body at risk for infections and loss of nutrients for healing and growth.

The body works best when blood sugars are in the range of 60–125 mg/dL. When blood sugars are above this range, the doctors will order blood sugar monitoring several times per day. Insulin may be started. Insulin doses are determined by blood sugar patterns. Insulin doses are adjusted in order to keep the blood sugars in a safe range (target range).

Typical ways to give insulin

- **Rapid-acting insulin with meals.** The dietitian will discuss which foods to avoid and which foods to eat. Foods to stay away from include soda, juice, and candy because they cause quick rises in blood sugar. The diabetes educator will teach you how to give insulin, calculate mealtime insulin doses, check blood sugars, and treat low and high blood sugars.

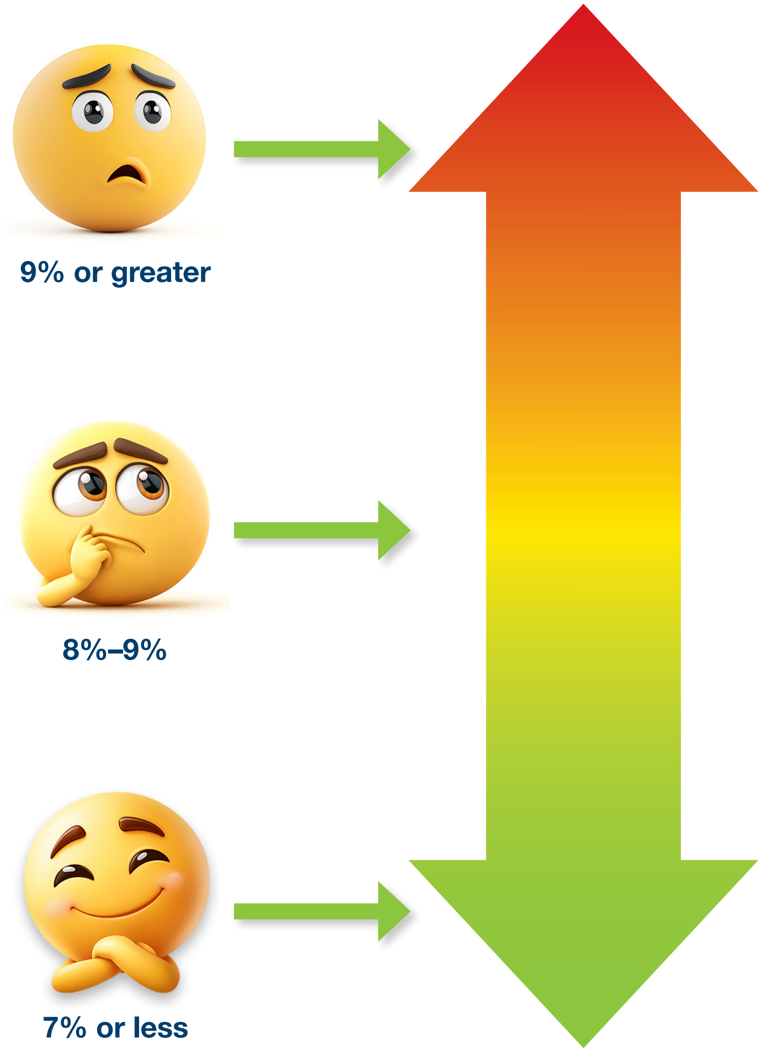
- **A long-acting insulin** given once each day may also be needed.

Insulin is needed if blood sugars remain above a certain range. The diabetes doctor and diabetes nurse educator will let you know this range. Many times insulin is no longer needed when the steroids are stopped. If steroids are restarted, there is a chance that insulin may be required again.

Hemoglobin A1C Test

The Hemoglobin A1C is a blood test to measure your child's average blood sugar control for the past 2 to 3 months. Hemoglobin is the protein in the red blood cells that carry oxygen to parts of the body. If the blood sugar is high, sugar attaches to the hemoglobin and stays there for the life of the red blood cell (an average of 2 to 3 months). The hemoglobin A1C test can be done at the clinic visit, and the child does not have to be fasting. The test can be done by drawing blood from a vein or from a finger stick. The result will usually be available during the clinic visit. In general, the goal for hemoglobin A1C for all children with diabetes is 7% or less.

A1C%	eAG mg/dl
19	498
18.5	483
18	469
17.5	455
17	440
16.5	426
16	412
15.5	398
15	383
14.5	369
14	355
13.5	340
13	326
12.5	312
12	297
11.5	283
11	269
10.5	255
10	240
9.5	226
9	212
8.5	197
8	183
7.5	169
7	154
6.5	140
6	126

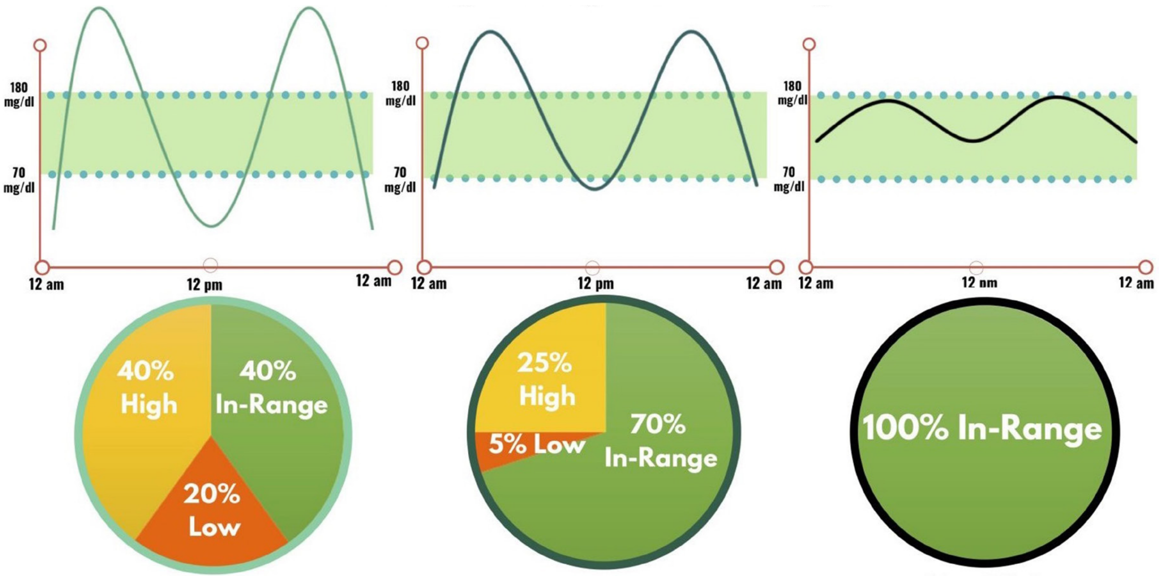


Your A1C is _______________.

Your average blood sugar for the last 3 months has been _______________.

The Many Faces of a 7% A1C

(and an average blood glucose of 154 mg/dL)

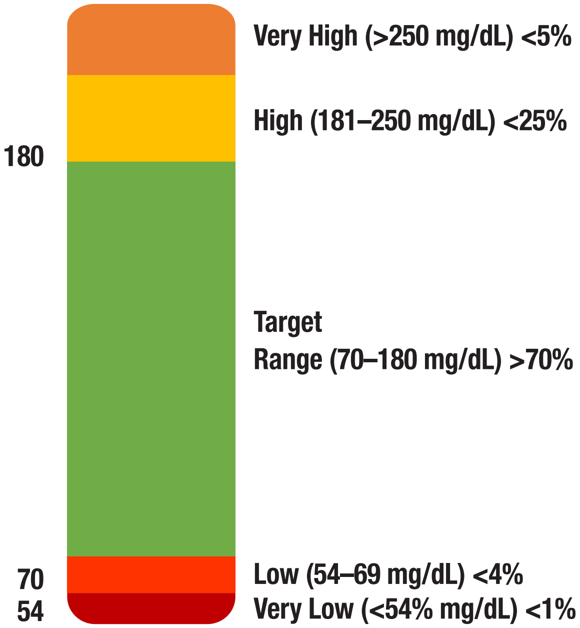


Source: www.DiaTribe.org

Additional Measurements of Glucose Control: Time in Range (TIR)

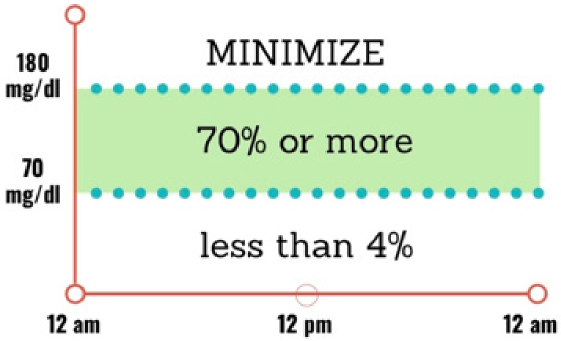
- Time in range provides a more realistic picture of what is going on day-to-day
- Captures the variability of highs, lows, and in-target blood sugars
- Empowers the person with diabetes to take control of their diabetes in between follow-up visits

Time in Range Goals



People with Diabetes

Type 1 and Type 2



Developed by the WashU Medicine and St. Louis Children's Hospital diabetes team, 2020.

Diabetes Daily Care

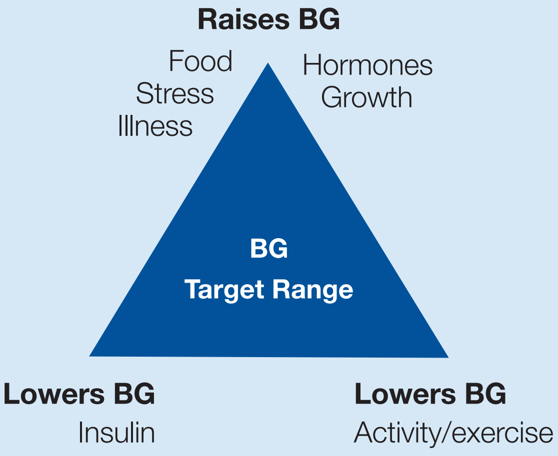
Goals of diabetes treatment in children

- Maintain normal growth and development.
- Keep blood glucose levels within a target range (not too high or low) **as much as possible**.
- Promote healthy emotional well-being.

Keeping blood glucose levels in a target range means balancing insulin, food, and exercise.

Remember: Food raises blood glucose levels, while insulin and exercise lower them.

Blood Glucose Levels



A successful diabetes treatment plan should be specific to the needs of the individual child and their family and include:

- Eating healthy choices in moderation, consistently, and on schedule.
- Testing blood glucose levels regularly, **minimum** of 4 times per day.
- Adjusting insulin as blood glucose levels and activities warrant.
- Exercising regularly and being active at least 1 hour per day.

Preferred mealtime routine for every meal

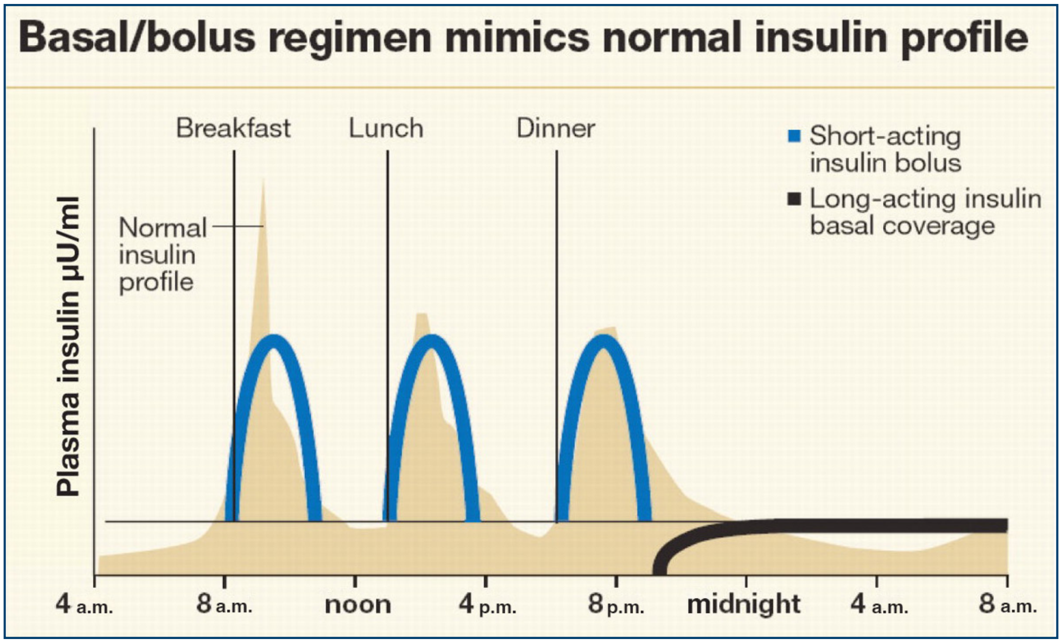
1. Check blood sugar.
2. Count carbohydrates.
3. Calculate insulin dose.
4. Insulin injection (before eating is best or within 30 minutes of first bite of food)
5. Document in log book.
6. Eat.

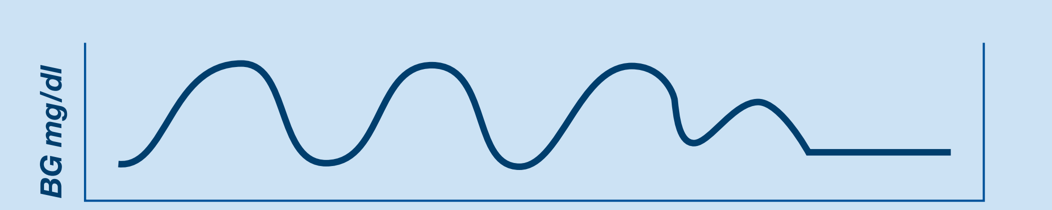
Alternate mealtime routine

1. Check blood sugar.
2. Eat.
3. Count carbohydrates.
4. Calculate insulin dose.
5. Insulin injection (before eating is best or within 30 minutes of first bite of food)
6. Document in log book.

Basal Bolus Insulin Regimen

Long acting insulin dose based on weight	**Rapid acting insulin** dose based on carbs, BG
Examples: Lantus, Basaglar, Semglee, Tresiba	Examples: Humalog, Novolog, Apidra, Admelog, Fiasp
Given once a day at the **same time every day**	Given 3 to 4 per day (meals, snacks, or for sick day)
Starts to work in 1 to 2 hours	Starts to work in 10–15 minutes
No peak	Peaks (works hardest) in 60–90 minutes
Lasts 22–24 hours	Lasts 3 to 4 hours





Blood glucose still rises with food intake, but doesn't peak as high.

Diabetes Care Skills and Monitoring of Blood Glucose

Self-monitoring is the key to achieving successful management of blood glucose levels.

Reasons for blood glucose testing

- Be sure that blood glucose is in a safe range.
- Detect patterns in blood glucose levels.This may help you to better understand the effects of insulin, food, exercise, stress, and illness on blood glucose levels.
- Assist in adjusting insulin dosage.
- Improve blood glucose control.

When to check blood glucose

- Must be checked **at least** 4 times per day, every day.
- Check before breakfast, before lunch, before dinner, and before going to bed. Try to test before any bites of food have been eaten at mealtimes.
- Check during the night when the dose of long-acting insulin is increased or decreased.
- Check blood sugar any time your child "feels funny."
- Occasionally spot-check the blood sugar during the night.

Keep records of blood glucose

- Record keeping is preferred over meter memory.
- Keep records of blood glucose in order to identify patterns in blood glucose levels.
- Record all low blood sugars and possible causes.
- Record times of exercise.
- Record all insulin dosages.
- Record carbohydrate count of meals and snacks.
- Record urine ketones when checked.
- Call your diabetes care provider for assistance in adjusting insulin dosage if blood sugar results are consistently outside of the target range. See chart for blood sugar target range details.

Note: Illness, stress, and menstrual periods may affect blood sugar.

Plasma Blood Glucose and A1C Goals for Type 1 Diabetes Across All Pediatric Age Groups

My Target Blood Sugar Range	
Before meals	
Bedtime	
Overnight	
A1C	

Key concepts in setting glycemic goals

- Goals may by individualized, and lower goals may be reasonable based on benefit-risk assessment.
- Blood glucose levels should be modified in children with frequent hypoglycemia or hypoglycemia unawareness.
- After meal blood glucose values should be measured when there is a discrepancy between before meal blood glucose values and A1C levels, and to help assess glycemia in those on basal-bolus regimens.

Testing Your Blood Glucose

- Wash hands with warm water (to increase blood flow and clean hands).
- Load lancing device with a new lancet (always use new lancet with each poke).
- Alcohol may be used to clean the finger. Let alcohol dry completely because wet alcohol will interfere with the chemical reaction for the blood sugar test.
- Place test strip in meter.
- Obtain blood from sides of fingers, above the first knuckle. Avoid the tip and pad of the finger since it may be more painful.
- Hold the finger down to the side below the level of the heart to increase the blood flow to the finger, if having difficulty getting enough blood.
- Obtain a large drop of blood—obtaining too small a drop of blood on the test strip will cause an error message.
- Touch test strip (after insertion into meter) to the blood drop. The meter will count down and then display the blood sugar result.
- Remove used lancet from lancing device and dispose of in sharps container.
- Record blood glucose value in your log book.

Having trouble getting a blood drop?

- Milk finger starting at base and working toward fingertip.
- Shake hands out and massage to increase blood flow.
- Press finger against a table when applying lancing device.
- Increase lancet depth.

What Is Insulin?

Insulin is a hormone made in the pancreas. The insulin-making cells in the pancreas are found in a group called beta cells. The food we eat is converted to sugar for the body to use as energy. Insulin lets the sugar pass from the bloodstream into the cells where it is used for energy. The body cannot turn sugar into energy without insulin. When a child has Type 1 diabetes, the beta cells stop making insulin and the child must take insulin injections. In Type 2 and other forms of diabetes, the beta cells continue to make insulin, but based on the type, it is either not enough or it is not used the right way by the body.

Insulin is both a hormone and a protein. It must be injected for use. It cannot be taken by mouth because the stomach would digest it and destroy it. Insulin is injected into the fatty tissue under the skin. From there, it is absorbed into the bloodstream and travels to all parts of the body. Insulin lowers blood sugar.

Types of insulin

The first insulin came from cows and pigs. Most people with diabetes now use synthetic human insulin or analog insulin. These insulins are made in a lab and cause less allergic reactions than animal insulin. Different types of insulin work for different lengths of time in the body. Most children will use rapid acting and long-acting insulin. Other available insulins are short-acting and intermediate-acting.

Rapid-acting insulin: Humalog® and Admelog® (insulin lispro), Novolog® and Fiasp® (insulin aspart) and Apidra® (insulin glulisine) start to work right away after being injected. They work hardest for about 60 to 90 minutes after injection and may last for 3 to 4 hours. These rapid-acting insulins manage the rise in blood sugar when eating, lower high blood sugars, and help clear ketones.

Long-acting insulin: Lantus®, Basaglar®, and Semglee® (insulin Glargine) are given once a day, at the same time every day. These insulins are clear and cannot be mixed in the same syringe with any other insulin. Care must be taken not to mix up long-acting insulins with rapid-acting insulins. They are all clear.

Long-acting insulins give a basal dose of insulin for up to 24 hours with no official peak in action. Long-acting insulin works by forming a slowly dissolving crystal in the fatty tissue. Giving the other injections in the same spot can disrupt the long-acting insulin crystal and should be avoided.

Tresiba (insulin degludec) is an ultra-long-acting insulin that is given 1 time per day. It starts to work in 30 to 90 minutes, has no peak in action, and can work for 24 to 42 hours.

Short-acting insulin: Regular insulin starts to work within half an hour after injection is given. It works hardest 2 to 3 hours after the injection. Regular insulin is most often given 30 to 60 minutes before a meal.

Intermediate-acting insulin: NPH (also called “cloudy” insulin) works best about 6 to 9 hours after the injection and often works for about 12 hours. This type of insulin is usually given in the morning and evening.

How often is insulin given?

Using multiple daily insulin injections helps keep blood sugar levels stable. When children are diagnosed, they often start with rapid-acting insulin at each meal and a long-acting insulin once a day. The insulin plan will be tailored to your child's needs.

Mealtime insulin:

- Give rapid-acting insulin 10–15 minutes before eating or right before the meal.
- For young children with unpredictable appetites, you can give insulin right after eating, but within 30 minutes of the first bite.

Long-acting insulin:

- Give at the same time every day to avoid gaps or overlaps.
- Choose a time that fits your daily routine.
- Talk to your diabetes care provider before changing the timing.

Important tips:

- Avoid injecting insulin just before a bath, shower, or hot tub, as heat can make insulin absorb faster and change its effectiveness.
- Try to inject insulin at least 20–30 minutes before or after these activities.

Determining insulin needs: Your child's insulin needs depend on their weight and blood sugar levels. These needs can change frequently, especially right after diagnosis. Regular blood sugar monitoring is crucial to adjust insulin doses accurately.

Initial phase: Right after diagnosis, insulin doses may change daily. You will be in close contact with the diabetes team during this time.

Honeymoon period: A few weeks after diagnosis, many children need less insulin. Some might even maintain normal blood sugar levels with little or no insulin. This period ends when the remaining insulin-producing cells are destroyed, and more insulin will be needed.

Adjustments over time: Insulin doses will be adjusted to fit your child's needs and lifestyle. As your child grows, they will need more insulin. During puberty, hormone levels can block insulin activity, requiring higher doses. Activity levels can also affect insulin needs, with more insulin often needed in winter than in summer.

Insulin administration

Methods: Insulin is measured in units and can be administered using a syringe with a vial, an insulin pen with a pen needle, or an insulin pump.

Equipment: Syringes and pen needles come in many sizes and lengths. The diabetes nurse educator will help you choose the right size for your child.

Adjustments

The diabetes team will initially handle all insulin dosage adjustments. Over time, you will learn to make minor adjustments yourself, following the guidelines provided. Major changes should always be made with the guidance of your diabetes doctor or nurse educator.

Insulin Administration

Injecting insulin with a syringe and vial

1. Place insulin vial on a flat surface and clean off top of insulin vial with alcohol.
2. Remove both caps from insulin syringe and draw air (same amount as dose) into the syringe.
3. Insert needle into vial at a 90-degree angle and inject air into vial.
4. With one hand holding the vial and the other hand holding the syringe, turn the vial (with the syringe still inserted) upside down so that the needle is pointing toward the sky.
5. Pull the plunger of the syringe down to the correct number of units, being sure to avoid air bubbles. Remove syringe from vial.
6. Clean off injection site with alcohol and allow alcohol to dry.
7. Pinch up the skin and insert the needle at a 90-degree angle.
8. Push insulin injection into the tissue and count to 5.
9. Let go of skin, remove needle from skin, and dispose of syringe in a sharps container.

Getting rid of air bubbles:

- Try pulling plunger down quickly past the amount of insulin that you need. Let bubbles rise to top of syringe, then push excess insulin and air back into vial.
- Pull 1 to 2 units more of insulin than what you need, remove needle from vial, and flick syringe until bubbles rise to the top. Once bubbles are at top of syringe, push plunger up to correct dose. This technique does waste insulin.

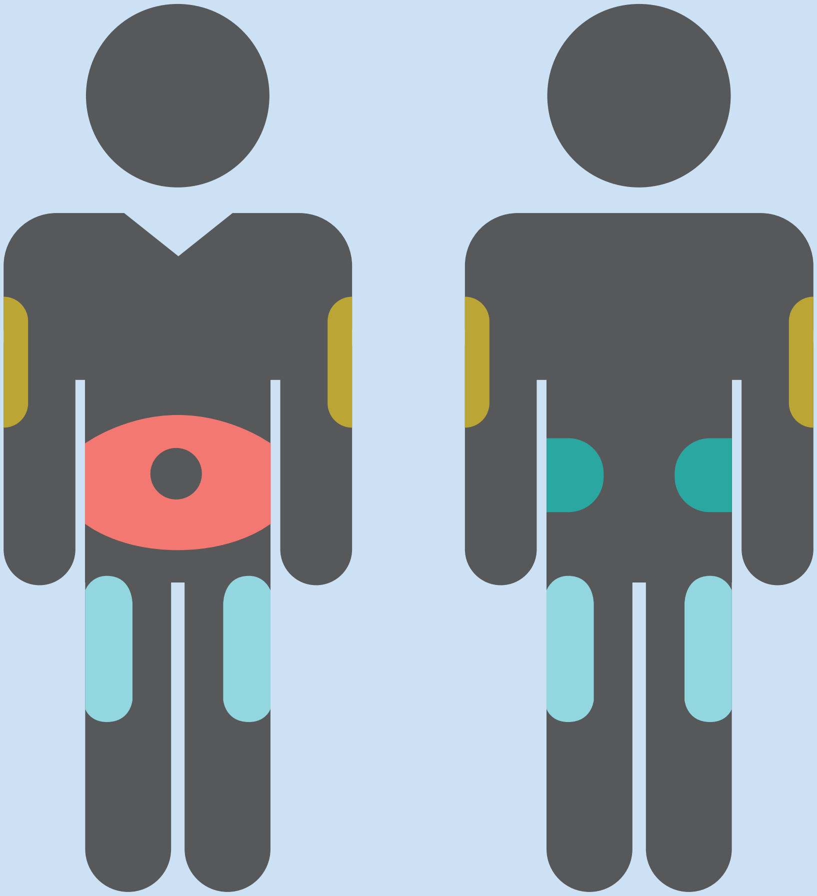
Injecting insulin with a pen

1. Clean off top of insulin pen with alcohol.
2. Remove paper cover from pen needle, push needle onto pen, and screw onto pen until snug.
3. Remove both caps from pen needle.
4. Dial insulin pen to 2 units and “prime” the needle (remove air) by pushing 2 units out with the needle pointing toward trash container or sink. Ensure that you see liquid come out of needle. New insulin pens may require 2 or 3 priming doses before you see liquid.
5. Dial insulin pen to calculated dose.
6. Clean off injection site with alcohol and let dry.
7. Pinch up the skin and insert the needle at a 90-degree angle.
8. Push the button on end of the pen until the dial reaches 0 then count to 10. Hold button until needle is removed from skin.
9. Let go of skin and remove needle from skin. Release button.
10. Recap pen needle with large cap only and unscrew needle from pen.
11. Dispose of pen needle in sharps container.

If using insulin cartridges or pens with syringes, you **do not** inject air into the cartridge before removing insulin. This will put too much pressure in the cartridge. If insulin cartridge or pen is used with insulin syringe, it may **not** be used as insulin pen (calibration of doses is no longer accurate).

Insulin Injection Sites and Rotation

Arms, Legs, Abdomen, and Buttocks



- Stay at least 1 inch away from the navel (belly button).
- Rotate sites.

Lipohypertrophy or a lump occurs when injections are given in the same place too often. If you feel a lump, do not use that site for at least 1 to 3 months or until the lump goes away. Insulin absorption can be unpredictable in that area, so it is not safe to use.

What Is Lipohypertrophy?

Lipohypertrophy (LHT) is a thickened or rubbery lump under the skin. It is mostly fatty tissue not scar tissue.

Lipohypertrophy is a common condition for people with diabetes, where a lump of fat and sometimes scar tissue is formed under the skin from repeated insulin injections or infusion. It occurs most often in people with diabetes who must take multiple daily injections, but can also occur in people who wear multiple devices such as an insulin pump and continuous glucose monitor.

Lipohypertrophy may also cause insulin pooling. When insulin doesn't enter the bloodstream fast enough, it forms a "pool" in the area it was injected. In a short period of time, the pool of insulin is released all at once, and a person's blood sugar lowers rapidly. Lipohypertrophy often happens in your favorite injections sites. It can be a small pea size to a tennis ball size.

But another, more problematic one is insulin resistance. When you're injecting insulin into these lipohypertrophy regions, its absorption rate is slowed down by those abnormal fat build-ups.

Variability in insulin absorption results in wide swings in blood sugar levels, from the highs that come with the slow absorption rate to the insulin pooling that results in rapid (and unneeded) insulin release.

Reducing lipohypertrophy results in fewer unexplained low blood sugars, less glucose variability, reduced consumption of insulin, lower overall insulin cost, and better overall blood sugars.

You are more likely to get lipohypertrophy if you:
- Always use the same injection site
- Reuse needles
- Inject through clothing
- Inject cold insulin
- Are not rotating pump and CGM sites

Why is lipohypertrophy a problem?
Areas of LHT have fewer blood vessels than normal fat tissue. Insulin does not absorb properly when given in LHT sites. It can causes blood sugars to be higher and more variable (*see graph*).

Going back and forth between LHT sites and normal sites leads to unpredictable insulin effects with both high and low blood sugars.

These peaks and valleys when you think you have counted carbs and dosed right can be frustrating.

Injection site regions options
- Abdomen *(Stay 2 fingers away from the belly button.)*
- Outer thighs
- Hips
- Upper buttocks
- Lower back
- Arms

Avoid spots with scar tissue, moles, swelling, or redness and swelling.

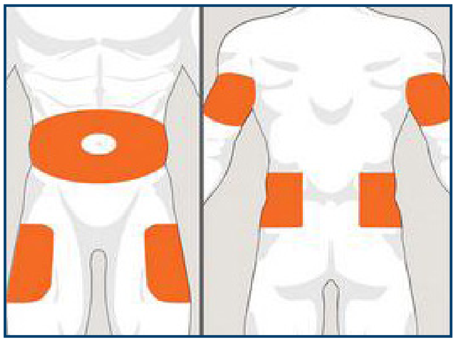
Reduce Risk of Lipohypertrophy

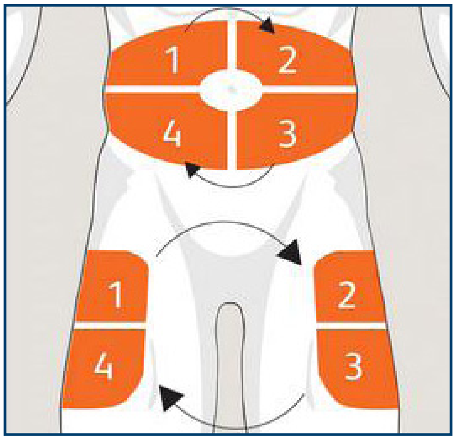
Always remember to rotate your sites with each injection. Your sites are not a single point in each region.

When you rotate sites:

- Use different areas.
- Use the whole region.

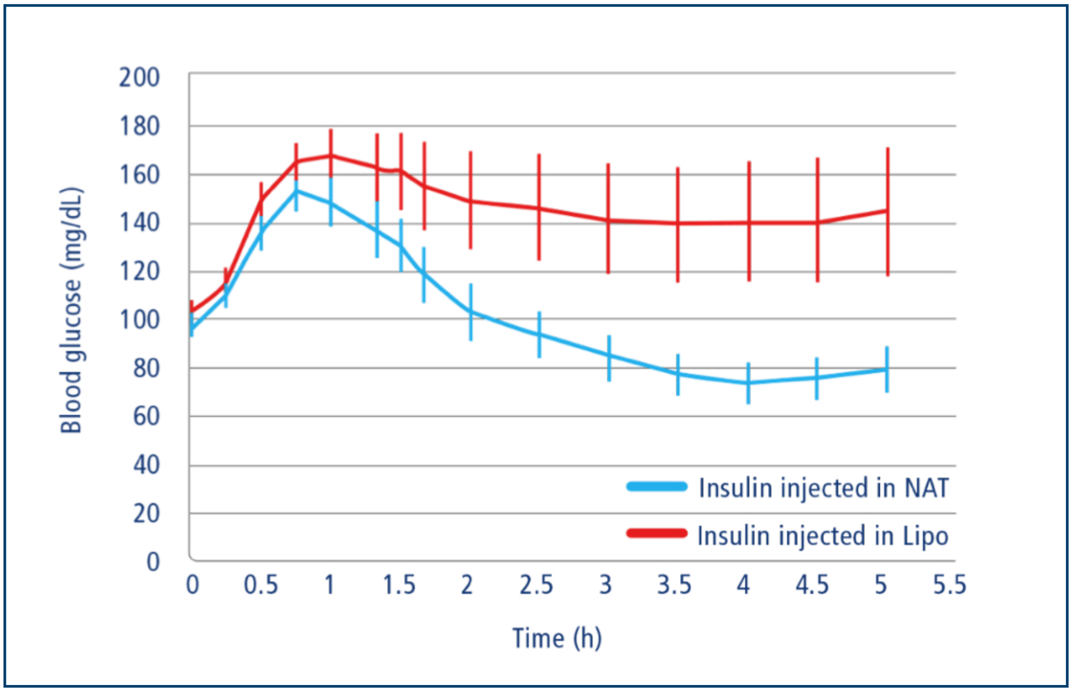
You can use different patterns to spread out your injection sites in the same body region. On the right is an example of how to use the whole abdomen.





Tips

- Avoid lipohypertrophy sites until the tissue returns to normal. This can take several months.
- Use syringes and pen needles only once. Blunt needles increase trauma to skin tissue with each additional injection.
- Inspect injection, infusion, and insertion sites frequently.
- Give insulin injections into the fat layer just under the skin.
- Rotate insulin pump injection sites and CGM sites.



Rapid-Acting Insulin Dose Calculation

What is it?

- The insulin sensitivity formula is used to calculate rapid acting insulin doses. It uses 3 pieces: the **target blood glucose**, the **insulin to carbohydrate ratio (ICR)**, and the **ISF (hyperglycemia correction factor)**.
- The **target blood glucose** is the number to which the formula should lower blood glucose after insulin is given.
- The **insulin to carbohydrate ratio** takes into consideration how much a certain amount of carbohydrate is expected to raise the blood sugar.
- The **correction factor** takes into consideration how much 1 unit of insulin is expected to lower the child's blood glucose.
  - — Most often used for dosing at meals and snacks.
  - — Previously referred to as the insulin sensitivity factor.
  - — May also be used to clear ketones and for sick day management.

How does it work?

Carbohydrate Dose + **Correction Dose** = **total mealtime insulin dose**

1. How to calculate a **carbohydrate dose:**
   Total carbohydrate eaten ÷ **ICR (insulin to carbohydrate ratio)** = **Carbohydrate dose (units)**
2. How to calculate a **correction dose:**
   BG (from glucometer) – **Target BG** (from Endo) ÷ **Correction factor** (from Endo) = **Correction dose (units)**

Spacing doses

Rapid Acting Insulin has a duration of 3–4hours. To avoid "stacking" doses, follow these guidelines for spacing doses.

- If insulin dose is within 2 hours from previous rapid acting insulin dose, the dose should only be calculated using the **Carbohydrate Dose** (without additional insulin for hyperglycemia correction).
- Any subsequent doses of rapid acting insulin within 2 hours should also be calculated using only the **Carbohydrate Dose**.
- If 3 or more hours have passed since previous rapid acting insulin dose, the dose should be calculated using both the **Carbohydrate Dose** and **Hyperglycemia Correction Dose**.

Example

- **ICR** is **1 unit of insulin per 15** grams of carbohydrate.
- Target BG is **120** and correction factor is **50**.
- Pre-meal blood glucose is **189** and the patient eats **79 grams** of carbohydrates.

Step 1: Calculate carbohydrate dose

79 grams of carbohydrate ÷ **15 (ICR)** = **5.27 units** ⟶ this is your carbohydrate dose.

Step 2: Calculate correction dose

BG – **Target BG** ÷ **ISF (Correction Factor)** = **BG Correction dose (units)**

189 – **120** = **69** ⟶ This means the child's blood glucose is 69 points above target BG.

69 ÷ **50 (ISF)** = **1.38 units**⟶ This is your correction dose.

Step 3: Add carbohydrate dose to correction dose, then round at the end

5.27 units + **1.38 units** = **6.65**

Step 4: Round

This child would get 6.5 units if dosing in half units, 7 units if dosing in full units.

Target Blood Glucose	
ICR **(Insulin to Carb Ratio)**	The number should be less than ISF
ISF **(Correction Factor)**	The number should be more than ICR
Circle one: **Full unit dosing**	**Half-unit dosing**
All these values will come from your diabetes doctor.	

Long-acting insulin
(Lantus®, Basaglar®. Semglee®, Tresiba®)

______ **units**

Insulin to carbohydrate dose

_______ ÷ _______ = ⟶ _______

Carbs in Meal ÷ **Carb ratio/ICR** = **Insulin for Carbs** Do not round

Blood glucose correction dose

(Use only if premeal BG is above target blood sugar.)

_______ − _______ = _______

Pre-meal BG − **Target BG** =

_______ ÷ _______ = ⟶ _______

÷ **Correction factor/ ISF** = **BG Correction** Do not round

+

=

____

Rounding rules

Half or whole unit dosing will be specified by your child's doctor.

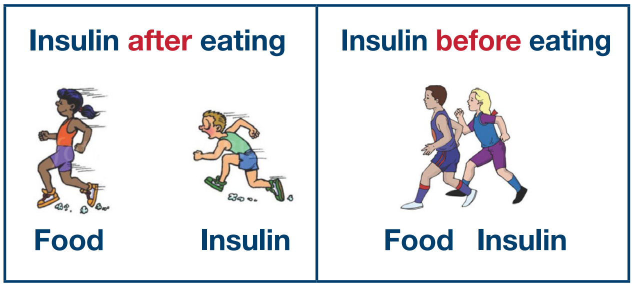
- Full unit rounding
  - —0.01 to 0.49 round down to nearest whole number
  - —0.50 to 0.99 round up to nearest whole number
- Half unit rounding
  - —0.01 to 0.24 round down to nearest whole number
  - —0.25 to 0.74 round to nearest 0.5
  - —0.75 to 0.99 round up to nearest whole number

Why Give Insulin Before Eating?

Insulin vs. food

It's a race.

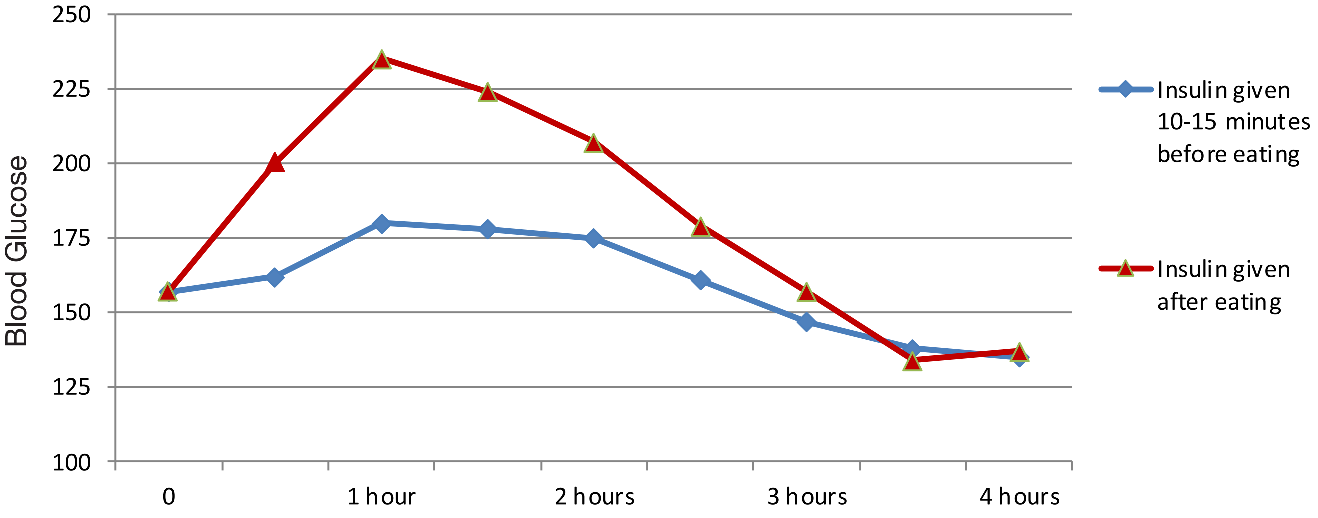
When insulin and food are put in a race, it is likely food will always win. Give your insulin a headstart by taking your insulin before you eat. This will help your blood sugar stay closer to your target range. If you don't, your insulin has a hard time catching up. Your blood sugar goes higher and it takes longer for your insulin to bring your blood sugar back down.

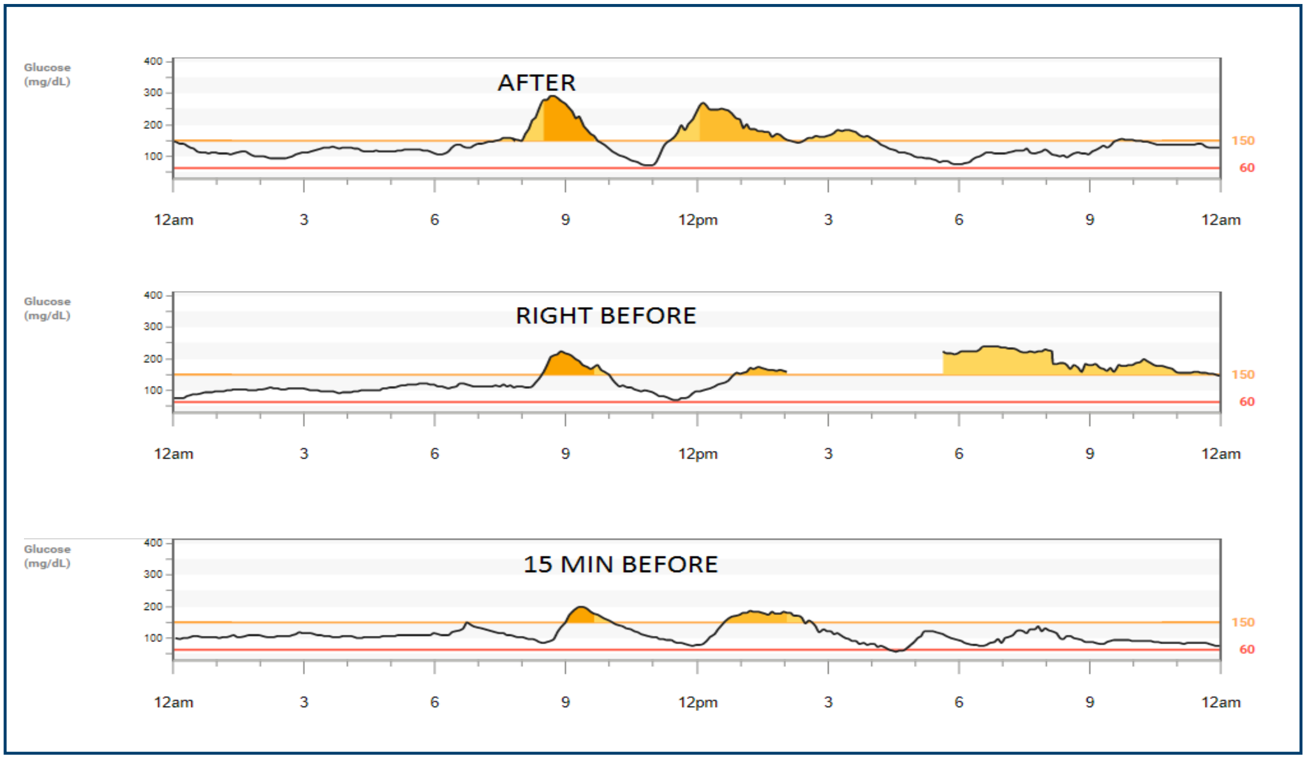


- After eating a meal with carbohydrates, your blood sugar quickly starts to go up.
- The type and amount of carbs you eat will also determine how quickly your blood glucose will rise. Ask your diabetes team about how fat and protein effect the absorption of carbs.
- Insulin helps lower your blood sugar after eating, but it takes time to start working.
- Digestion of food starts after your first bite. Insulin takes longer to work because it is absorbed by the adipose tissue, then sent to be used by the appropiate cells. This takes time.
- Take insulin up to 15–20 minutes before eating, so your insulin starts working when your blood sugar starts to go up.

It is expected to see blood sugars rise when eating, even when dosing insulin before. The graph below tells you what your blood sugar does after eating depending on when give your insulin.

Giving insulin 10–15 minutes before eating vs. after eating





Frequently asked questions:

Q: What if I take my insulin before I eat and then don't finish my meal?

A: This depends on how much of your meal you do not eat and your insulin to carbohydrate ratio. If you must replace a significant amount of carbohydrates you did not eat, consider using white milk to replace the missed carbs. You should not use candy, soda, or juice to replace missed carbs from food.

Q: What if I take my insulin before I eat, then I decide I want more food?

A: Take an additional injection to cover any additional carbohydrates.

Q: Should everyone give insulin before eating?

A: In some young children and toddlers, it may be necessary to give their insulin after they eat if they are unpredictable eaters. Most children should start dosing insulin before they eat as soon as possible.

Q: What if my blood sugar is low before I eat?

A: Whenever possible, you should first treat the low blood sugar with 15 grams of carbs. Then dose for the carbs in your meal and eat your meal. Do not count carbs for low treatment in the meal time dose.

Q: Sometimes I still see rises in blood sugar even when I dose my insulin before I eat, why?

A: Different types of food will affect your blood sugar differently. Even with dosing before you eat, if you are eating high glycemic index foods they will cause your blood sugar to rise faster.

Daily Diabetes Plan

Wake up and breakfast

Check blood sugar before breakfast

1. Count carbohydrates to be eaten
2. Calculate fast acting insulin dose
3. Give insulin (before meals is best or within 30 minutes of first bite of food)
4. Eat breakfast
5. Document in log book

Lunch

Check blood sugar before lunch

1. Count carbohydrates to be eaten
2. Calculate fast acting insulin dose
3. Give insulin (before meals is best or within 30 minutes of first bite of food)
4. Eat lunch
5. Document in log book

Snack *(optional)*

A zero gram carb snack does not require insulin dose

1. Count carbohydrates to be eaten and dose for carbs only
2. Calculate fast acting insulin dose
3. Give insulin (before eating is best or within 30 minutes of first bite of food)
4. Eat snack
5. Document in log book

Dinner

Check blood sugar before dinner

(at least 3 hours after snack, check insulin to avoid "stacking of insulin")

1. Count carbohydrates to be eaten
2. Calculate fast acting insulin dose
3. Give insulin (before meals is best or within 30 minutes of first bite of food)
4. Eat dinner
5. Document in log book

Bedtime

Check blood sugar (before any snacks) and 3 hours after dinner insulin dose

- BG should be greater than 120 mg/dL before going to bed or over 100 through the night.
- *Do not correct a high blood sugar before bed unless you have ketones.*
- If blood sugar is greater than 120 mg/dL, no snack is necessary.
- If blood sugar is 70-120 mg/dL, eat 15 gm carbohydrate plus protein snack before bed (no insulin).
- If blood sugar is less than 70 mg/dL, *see low blood sugar* ***Rule of 15****.*
- If you want to have a snack even though blood sugar is 120 mg/dL or greater, dose for carbs eaten only (do not correct blood sugar).

Give long-acting insulin once a day, at the same time every day, during a time that is convenient for your family.

Target blood sugar range

- 70–180 mg/dL daytime
  (may vary depending on age)
- Greater than 120 mg/dL at bedtime and over 100 mg/dL overnight

Meal-time insulin

- Target blood sugar: 120 mg/dL
- Correction factor or sensitivity factor: ________

Insulin to carbohydrate ratio for all meals:

Breakfast: 1 unit for every ______ g of carb
Lunch: 1 unit for every ______ g of carb
Dinner: 1 unit for every ______ g of carb

Long-acting insulin

(Lantus, Basaglar, Semglee, Tresiba)

_____ units at _______
Insulin doses will change over time.

Exercise rules

Check blood sugar:

- Before starting
- Every 30 to 60 minutes of exercise
- When done

Blood Sugar	Action
above 120	Go ahead and exercise. No snack needed.
70 to 120	Eat a 15g carb plus protein snack (no insulin necessary).
under 70	Follow ***Rule of 15***, then give 15 g carb + protein snack; exercise when BG > 120.
above 300	Check ketones. Do not exercise if ketones are moderate or large.

Low blood sugar Rule of 15

Use the **Rule of 15** when blood sugar is less than 70. Signs of low blood sugar include feeling shaky, starving, sweaty, sleepy, spacey, confused, headache, irritable, restless sleep, feeling “funny,” or other symptoms.

- Check blood sugar **immediately** if you have signs or symptoms of low blood sugar. If no meter is available, assume blood sugar is low if you have signs of low blood sugar.

1. Eat 15g fast-acting carbohydrate (14 Skittles, 3 teaspoons sugar, 4 ounces juice or regular soda, 1 tablespoon syrup, 1 tablespoon frosting, or 4 glucose tablets).
2. Check blood sugar in 15 minutes.
3. If still low, give another 15g fast-acting carbohydrate and recheck blood sugar in 15 minutes.
4. Continue to check and treat until blood sugar is greater than 70.
5. If blood sugar is under 70 before a meal, eat 15g fast-acting sugar and eat meal. Give insulin only for the carbs in the meal, not the fast-acting sugar.
6. If next meal is more than an hour away, eat 15g complex carbohydrate snack with protein (crackers or bread with cheese, meat, or peanut butter, or milk). No insulin needed for this snack.

Check ketones if:

- Blood sugar is greater than 300
- You’re sick or vomiting
- You missed insulin doses

Call 314-454-6051 or 314-454-6000 (after hours) immediately if you have:

- Vomiting with low blood sugar
- Low blood sugar with loss of consciousness, confusion, or seizure
- Moderate or large ketones with vomiting or if they do not clear after 2 correction doses

Diabetes Bag

Your Diabetes Bag is made up of the supplies to properly care for your diabetes when you are away from home. This bag should be with you at all times and holds the necessary items to test your blood sugar, treat a low, or administer insulin.

It is a good idea to identify this bag with your name, address, phone number, and a diabetes medical alert card in case it is misplaced.

What to pack

Having these items on hand will give you peace of mind and keep you feeling prepared should the unexpected occur.

Glucose meter: Ideally, your glucose meter is with you at all times, even if you're just going to the grocery store.

Oral diabetes medication: Pack your pills so you don't miss a dose.

Insulin pump: If you rely on an insulin pump to regulate your blood sugar, make sure you bring it with you.

Extra battery for the meter (and insulin pump if you use one): Glucose meter batteries differ by manufacturer. Make sure you know which type you need and keep spares in your testing kit.

Insulin: If you're heading to a hot climate, pack an insulated bag with cold packs to keep your insulin cool.

Syringes and pen needles: Calculate how many syringes and pen needles you use on an average day, multiply that by the number of days you'll be away, and pack at least that many—preferably more.

Test strips: Always keep an ample supply of test strips with you in case you need to test more frequently than you anticipate.

Lancing device and lancets: Carry at least the number of lancets needed for an entire day of testing. It is preferable to not reuse a lancet since it is no longer sterile after a single use and is duller, which increases the discomfort.

Ketone strips: Even if you rarely use them, these are good to always have on hand.

Glucagon®/Baqsimi®/Gvoke®: Learn how to use it, teach those closest to you how and when to use it, and don't leave home without it.

Fast-acting glucose: You should always carry a small supply of fast-acting glucose with you at all times in case you have a low blood sugar reaction. Glucose tablets and glucose gels are available for this specific purpose.

Snacks: Peanut butter crackers, a juice box, or an apple sauce pouch could also come in handy to treat low blood sugar. Don't forget your water in case you have ketones.

Medical identification: It is a good idea to wear some sort of identification that indicates to emergency personnel that you have diabetes. If you are in an accident or found unconscious, this alerts medical responders to address your diabetes needs immediately.

Health history: For more extensive travel, it's wise to carry a copy of your health history with you. A basic history includes known conditions (including Type 1 diabetes), allergies, medications you are taking (include vitamin and herbal supplements), emergency contact information, health care providers and their contact information.

Once you return home, get into the habit of replacing the items used throughout the day or trip to ensure your bag is fully stocked for your next outing.

Storage of Supplies

Insulin

- Keep extra unopened vials or pens of insulin in the refrigerator.
- Keep insulin as cool as possible. If using ice, avoid freezing and do **not** use insulin that has been frozen.
- Insulin can break down and not work if it gets too cold (less than 36°F) or too warm (over 86°F). Keep insulin away from direct heat and out of direct sunlight.
- Unopened and refrigerated insulin is good until the stamped expiration date on the box or vials of insulin.
- Insulin vials or pens that are open and currently in use may be kept at room temperature or in the refrigerator. All opened insulin bottles should be discarded after 28 days, regardless of storage conditions (in refrigerator or not) and amount of insulin remaining in vial or pen.
- Insulin vials or pens that are open and currently in use should be stored at room temperature and away from heat and light. Humalog®, Novolog®, and Lantus® pens must be used within 1 month of opening and the first dose given. If you are using any other type of insulin pen, contact your pharmacist or see product insert for details.
- Store dilute insulin (U10) in refrigerator. It is good for only 28 days from date prepared by pharmacy.

When you travel

- Protect insulin from becoming too hot or too cold. Keep below 86° F and above 35° F. (Do not leave insulin in a parked car).
- When traveling by plane, keep insulin and syringes in a carry-on bag. Do not put insulin in luggage that will be checked and placed in the baggage compartment.

Blood sugar test strips: Discard 6 months after opening. Keep stored in airtight container when not in use.

Urine ketone test strips: Discard 6 months after opening. Store in tightly closed container when not in use.

Sharps disposal: Sharps should never be thrown loosely into the trash or toilet. Sharps should never be recycled. Sharps that retract after use, or sharps that are very small, should be disposed of like all other sharps. (See **SafeNeedleDisposal.org**.)

Sharps may be disposed of with your regular trash if you follow proper protocols. To protect sanitation workers, place sharps in rigid, leak-proof, and puncture resistant containers (liquid detergent bottle, for example). Tightly seal the container and place in your regular trash.

Special Hygiene Needs

Proper hygiene is important for all children. However, children with diabetes have some special needs.

Dental care

Children with diabetes usually do not have any more dental problems than other children. Diabetes may make children more susceptible to periodontal (gum) disease.

It is important to have good blood sugar control to lessen this risk. It is also important to practice good oral hygiene. This includes 6-month dental check-ups, brushing and flossing daily, and possibly antibacterial plaque treatments.

See your dentist if you notice that the gums bleed with brushing.

If your child needs dental surgery, the application of braces, or any other device which may affect their eating habits, consult your diabetes doctor or nurse first. Insulin doses may need to be adjusted.

Yeast infections and diaper rash

Vaginal infections may occur in females with diabetes. This is especially true if the blood sugar is high. The most common vaginal infection is caused by the growth of the fungus *Candida albicans*. This fungus also causes diaper rash. It is normally present in the skin, mouth, intestinal tract, and vagina. When the fungus multiplies abnormally, it can cause an infection. Having a high level of glucose in the blood and urine and taking some kinds of antibiotics can cause an overgrowth of this fungus.

Symptoms of *Candida* infection include itching, burning, and a thick white or yellow discharge. These infections can usually be treated with over-the-counter creams.

Improving diabetes control can help to prevent *Candida* infections.

Foot care

Foot problems due to poor circulation or nerve damage do not usually occur in children. A child may be at risk for these long-term problems if they have had diabetes for more than 5 years. Your child's doctor should examine their feet regularly.

It is important to begin to practice healthy foot-care habits in childhood, because these habits need to be carried into adulthood. Clean feet daily and dry them carefully. Children should be taught to tell their parents of any scrapes or cuts on their feet, so that they can be examined and treated to ensure that they heal properly.

Low Blood Sugar/Hypoglycemia

Hypoglycemia, or low blood sugar, is any blood sugar below 70. Our goal is for you to have less than 2 low blood sugars in a week during the daytime, never have a low blood sugar while you are asleep, and to avoid severe hypoglycemia at all times. Check blood sugars before each meal, at bedtime, when you feel low blood sugar symptoms, and before driving a car.

Common causes of hypoglycemia

- More insulin than your body needs relative to other factors
- Not enough food or a delayed meal
- More exercise or activity than usual
- Drinking alcoholic drinks (low blood sugar will occur several hours later)

Symptoms of hypoglycemia


Shaky


Sweaty


Spacey


Stubborn


Starving


Sleepy

Other symptoms of hypoglycemia: Confusion, pallor, crying, disorientation, irritability, anger, headache, and strange behavior.

Nighttime symptoms: Nightmares, sleep walking or talking, and restless sleep can be additional signs of hypoglycemia at night.

Severe hypoglycemia is defined as low blood sugar symptoms that you cannot treat alone and may result in seizures, unconsciousness, and can result in brain damage or death.

Treating hypoglycemia

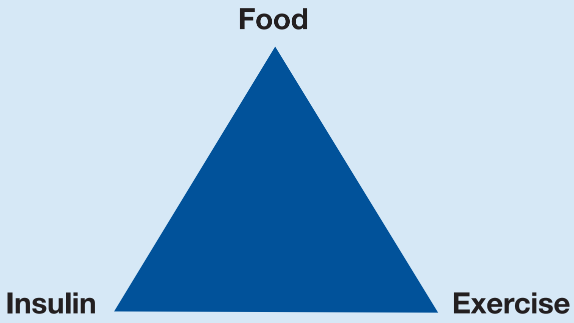
If blood sugar is less than 70, use the **Rule of 15** to treat hypoglycemia.

Examples of 15g fast-acting carbs: 4 oz. of juice, 4 oz. of regular soda, 4 glucose tabs, fruit pouch, or 1 tbsp. of honey. If eating candy, choose Skittles or Smarties and avoid chocolate as it takes longer to absorb.

On step 4, if you need to repeat the **Rule of 15**, make sure the 15g of complex carbs includes protein. Examples: cup of milk, cheese and crackers, apple and peanut butter, or a slice of bread with peanut butter.

Once blood sugar is above 70, eat a small carb plus protein snack if your next meal is more than 1 hour away.

Blood Sugar Less Than 70



Causes

- Too much insulin
- Excessive exercise
- Not enough food
- Delayed meal or snack
- Drinking alcoholic beverages

Rule of 15

How to treat low blood sugar (less than 70):

1. **TEST:** Test blood glucose with blood glucose meter.
2. **FEED:** If less than 70 (regardless of age) give 15 grams of fast-acting carbohydrate (examples: fruit snacks, glucose tablets).
3. **TEST:** Re-check blood glucose 15 minutes after initial hypoglycemia event. The goal of this test is to be within the blood glucose target range for the current time of day.
    - If still below target range at this point, repeat steps 2–3.
4. **FEED:** If hypoglycemia event occurs overnight or next meal more than 1 hour away, feed patient a snack.
    - Post hypoglycemia snack = 15 grams of complex carbohydrate plus protein (examples: milk, crackers and peanut butter).
    - This sustains blood glucose levels for many hours.
    - Do not dose insulin for the blood glucose in step 3 or the carbohydrate content of this snack.

5. **RE-TEST:** Only if hypoglycemia event occurs after last meal of the day (such as at bedtime or overnight).
    - Re-test of blood glucose should occur at 1 to 2 hours after step 4 of the **Rule of 15** protocol.
    - If 1 to 2 hour BG re-test is at least 100, no additional testing beyond as ordered. It is always ok to re-test earlier if symptomatic.

Diabetes Hypoglycemic Emergency

Glucagon

Glucagon is a hormone that raises blood sugar by releasing sugar from the liver. It is used as an emergency rescue medication to treat severe low blood sugars. There are three forms of glucagon available: Baqsimi, Gvoke, and Glucagon Emergency Kit.

Baqsimi nasal glucagon powder

Baqsimi Nasal Glucagon is indicated for the treatment of severe hypoglycemia in patients with diabetes ages 1 year and older. Baqsimi is available in 3 mg standard dose for all ages 1 year and older.

How to give Baqsimi (nasal glucagon powder)

- Remove the shrink wrap by pulling on the red stripe.
- Open the lid and remove the device from the tube.
  Do not press plunger until ready to give the dose.
- Hold device between the fingers and thumb.
- Insert the tip gently into 1 nostril until fingers touch the outside of the nose.
- Push plunger firmly, all the way in. Dose is complete when the green line disappears.
- Turn your child on their side to prevent choking if they vomit.
- Call 911 after administering the dose.

See **baqsimi.com/how-to-use-baqsimi**

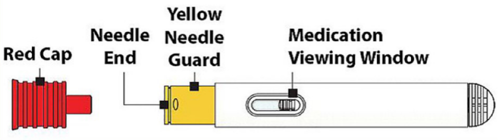
Gvoke HypoPen or Prefilled Syringe

Gvoke is used for the treatment of severe hypoglycemia in pediatric and adult patients with diabetes ages 2 years and older. Gvoke comes in an auto-injector and pre-filled syringe that are for subcutaneous injection only.

How to give Gvoke HypoPen™

1. Tear open pouch at the dotted line and carefully remove Gvoke HypoPen.
   - Use 0.5 mg if child weighs less than 100 pounds.
   - Use 1 mg if child weighs more than 100 pounds.
2. Pull the red needle cap straight off the device.
3. Choose the lower abdomen, outer thigh, or outer upper arm for your injection site (any insulin injection site).
4. Remove any clothing covering the injection site. The injection must be performed straight into the skin.
5. Push and hold Gvoke HypoPen straight down against the injection site.
6. Listen for a "click."
7. Continue to hold the device down and count slowly to 5.
8. When the injection is complete, the viewing window will be red.
9. Important: Do not lift up Gvoke HypoPen until the injection is complete.
10. Turn your child on their side to prevent choking if they vomit.
11. Call 911 after giving Gvoke.

See **gvokeglucagon.com/how-to-use-gvoke**



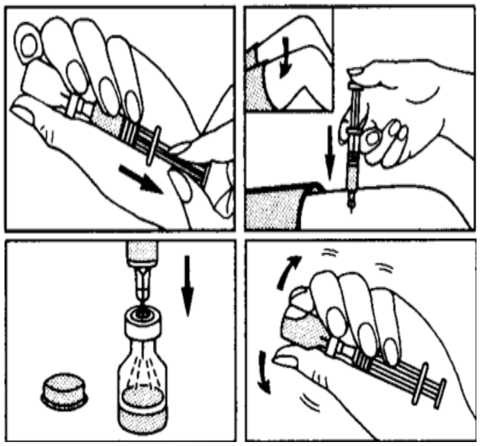
Pull red cap off.

Push yellow end down on skin and hold 5 seconds. Window will turn red.

Administer into upper arm, stomach, or thigh.

How to give glucagon:

1. Remove cap from bottle that contains white tablet or powder.
2. Inject the mixing liquid from the syringe into the bottle with the white tablet or powder.
3. Gently shake the bottle. Liquid will foam and mix quickly. When it is mixed, pull out your child's dose with syringe from kit:
   - Use 0.5 mg (half the syringe) if child weighs less than 45 pounds.
   - Use 1 mg (whole syringe) if the child weighs more than 45 pounds.
4. Inject into the thigh muscle. Don't waste time removing clothing. Inject through pants or clothing.
5. Turn your child on their side to prevent choking if they vomit.
6. Call 911 after giving glucagon.



I had to use glucagon. What do I do now?

- Call for emergency medical help right after Glucagon, Gvoke HypoPen, or Baqsimi has been given. Seek medical care even if seizure resolves and patient is responsive.
- The patient's health care provider should also be notified whenever a severe drop in blood sugar (hypoglycemic reactions) happens. Hypoglycemia may happen again after receiving Glucagon, Gvoke HypoPen, or Baqsimi. The patient's insulin doses may need to be changed.
- Continue to check child's blood glucose via finger stick. Give your child a fast-acting source of sugar (such as a regular soft drink or fruit juice) and a long-acting source of sugar (such as crackers and cheese or a meat sandwich) as soon as the patient is able to eat or drink.
- If your child does not respond within 15 minutes, give another dose of Glucagon if a second dose of the emergency kit is available.
- Severe low blood sugar could result in a seizure. Only use an emergency diabetes kit if your child is unconscious, or unable or unwilling to safely eat or drink.
- A reoccurring hypoglycemic event is likely to occur after using a diabetes emergency kit. Glucose storage in the liver becomes depleted and must be restored by keeping blood glucoses greater than 120 mg/dL for 4 weeks.

Bedtime Blood Glucose

- Check your blood sugar before you go to bed and make sure you are above 120 to stay in a safe range throughout the night.
- If a bedtime snack is desired and your pre-bedtime blood sugar was above 120, only give a rapid acting insulin dose for the carbs in the snack.
- Check your blood sugar at 2 a.m., aiming to be above 100, if you have a low blood sugar before bed, your long acting insulin dose was increased, or you were more active than normal throughout the day.

Blood Sugar	Action
More than 120 (This number may change to a goal of more than 100.)	• Administer long-acting insulin (if scheduled at bedtime). • Safe to go to sleep. • No re-check of BG at 2 a.m. – Unless long acting insulin dose was increased, or your child participated in more activity than baseline. – BG should be above 100 at 2 a.m.
70–120	• Administer long-acting insulin if scheduled at bedtime. • Eat a 15g carb plus a protein snack. • Questionable re-check of BG in 1 hour and 2 a.m. – In 1 hour, BG should be over 120. At 2 a.m., BG should be over 100.
Less than 70	• Rule of 15 ending with a 15g carb plus protein snack. • Administer long-acting insulin if scheduled at bedtime. • Re-check BG in 1 hour and at 2 a.m. – In 1 hour, BG should be over 120. At 2 a.m., BG should be over 100.

Exercise and Diabetes

The American Diabetes Association recommends:

- 60 minutes of moderate-to-vigorous intensity aerobic activity every day
- Vigorous muscle-strengthening and bone-strengthening activities at least 3 days a week

Exercise has many positive health benefits:

- Increasing insulin sensitivity
- Improving A1C and blood sugar management
- Decreasing the risk of heart disease
- Improving cholesterol, which is important for your overall health

Aerobic Exercise	Anaerobic Exercise
• Activities that involve continuous movements of large muscle groups • Walking, running, cycling, swimming, rollerblading, jumping on trampoline • Typically decreases blood sugar • More prone to low blood sugar during this activity	• Activities resistant in nature, using muscle strength to move weight or work against resistance • Weightlifting, football, baseball, wrestling, volleyball, gymnastics • May initially **increase** blood sugar, but can cause a **decrease** in blood sugar later

Some activities can be considered **both** aerobic and anaerobic and the blood sugar can **increase or decrease**:

- Basketball, soccer, tennis, playground activities, dancing, downhill skiing, golf, yoga

Blood glucose targets with exercise

Goal: Above 120 before and during exercise. Do not dose for the snacks in this chart.

Less than 70	70–120	Above 120	Greater than 300
1. Rule of 15 2. Once >70 eat a carb plus protein snack. 3. Do not start activity until blood sugar is above 120. 4. Check glucose every 30 minutes.	1. Eat a 15-gram carb plus protein snack, then start activity. 2. Check glucose every 30 minutes.	1. Start activity. 2. Check glucose every 30 minutes.	1. Check ketones • If ketones are negative, trace, or small, it is okay to exercise. • **If ketones are moderate or large, do not exercise.** Follow sick day action plan.

Things to keep in mind

- **Low blood sugar can occur up to 24 hours** after activity, so close blood sugar monitoring is needed.
- During exercise, check blood sugar every 30 minutes.
- Blood sugar typically **increases** during tryouts, performances, or competitions.
- Blood sugar typically **decreases** during practices.

Is there a time when I should not exercise?

- If you have moderate or large ketones.
- If a severe low blood sugar (hypoglycemic) event occurred in the past 24 hours.
  - —You're at risk for a more severe hypoglycemic episode during exercise.
- If you are unprepared to monitor blood sugars or treat a low.
  - —Blood sugar should be checked before, during, and after exercise. If you don't have your meter or CGM, you should not exercise.

Exercise considerations

These recommendations should be used as a starting point. If you are having difficulty with your glycemic control and exercise you should start keeping a logbook to identify patterns of lows or highs. **Exercise plans can be very individualized based off experience and activity.**

- Decreasing bolus dose by 10% at meal prior to activity.
- May need less insulin at meal following activity as exercise can increase insulin sensitivity.
- If on a pump, running a temporary basal or put pump in exercise mode, decreasing 10–20%, 60–90 minutes prior to activity.
- Eating a 15-gram carb plus protein snack prior to activity if you are having a pattern of lows during or after activity.
- Monitor blood sugar closely overnight if the activity is in the afternoon or evening.

Percent reduction in pre-meal (bolus) insulin dose

Exercise Intensity	30 Minutes of Exercise	60 Minutes of Exercise
Low	25%	50%
Moderate	50%	75%
High	75%	Ask your provider

Additional option for pump users—basal reduction

Exercise Intensity	Percent Reduction in Basal Insulin Dose
Low (30–60 min)	10–20% basal rate reduction 1 hour before
Moderate (1–2 hours)	30–50% basal rate reduction 1 hour before and 1 hour after exercise
Isometric Weight Lifting	You do not need to make any adjustments
High Intensity	Stop pump before exercise; do not suspend for longer than 90 minutes

Always be prepared

- Bring several fast-acting carb snacks (juice, glucose tabs, sports drink) with you to all activities.
- Make sure you always have your glucometer and testing supplies.
- Have your Glucagon/Baqsimi/Gvoke with you in case of emergency.
- Always wear a medic-alert ID.

- Let your coach, teammates, or workout buddy know that you have diabetes and teach them how to help you if you have a low blood sugar. Also teach them how and when to use emergency medications.
- Drink plenty of water to stay hydrated.
- The best way to understand how your body or your child's body reacts to exercise is be consistent and keep accurate logs of what works and what does not. Everyone is different.

High Blood Sugar/Hyperglycemia

You will learn to recognize the signs and symptoms of high blood sugar in your child.

One of the most helpful strategies to prevent high blood sugar levels is to frequently test blood sugars, keep records, and contact your diabetes doctor or nurse when you notice patterns of high blood sugars. This will help you adjust your child's insulin dose, food intake, or exercise level to prevent symptoms from occurring.

What are ketones?

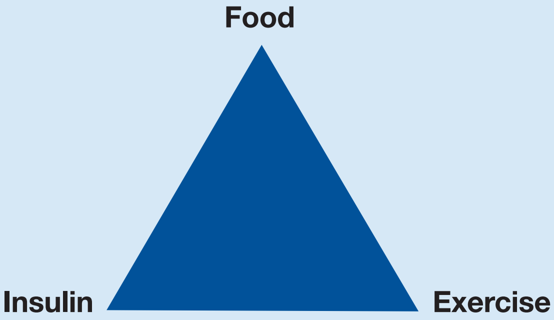
Ketones are chemicals (acids) made by the liver. When the body doesn't have enough insulin to use sugar for energy, it uses fat as a replacement source of energy. The liver then produces acids called ketones which are released into the blood stream. Ketones are also made when the body does not get enough carbohydrates. This might happen when you do not eat during a sick day.

Ketone Formation

Check for ketones if blood sugar is higher than 300.

Without insulin, glucose cannot enter the body's cells to provide energy. The cells are forced to burn fat to get the energy they need. When fat is burned, by-products called ketones build up in the blood and spill into the urine. When ketones build up they cause the blood to turn acidic, which can act like a poison. A high level of ketones in the blood is called diabetic ketoacidosis (DKA). Diabetic ketoacidosis usually comes on slowly, over several hours.

Blood Sugar Greater Than 200



Causes

- Too little insulin
- Spoiled insulin
- Too much food
- Too little exercise
- Illness, infection, fever
- Late insulin injections (delayed or missed insulin injections)
- Sneaking food
- Inaccurate carbohydrate counting

Signs and Symptons

- Increased thirst
- Increased urination (frequent use of bathroom or bed-wetting)
- Increased appetite
- Weight loss
- Vision problems (blurred vision)
- Tired, weak
- Headache
- Irritable, crabby

Diabetic Ketoacidosis (DKA)

The most common causes of diabetic ketoacidosis are:

- newly diagnosed diabetes
- missed insulin injections
- severe illness

Eating extra food, sugar, or candy does not directly cause ketones.

Symptoms of Diabetic Ketoacidosis (DKA)

- Upset stomach
- Vomiting
- Confusion
- Dizziness
- Chest pain
- Deep breathing or difficulty breathing
- Sweet, fruity odor to breath
- If not treated—coma, brain damage, death

The prevention of diabetic ketoacidosis is based on being able to detect changes early, when ketones are present in the urine, but before the ketones build up in the body.

Check urine for ketones using a Ketostix. See page 50 for Use of Ketostix.

Blood glucose in target range can sometimes be present with ketoacidosis, so urine must be checked for ketones with every illness or any time your child vomits.

Call the diabetes doctor immediately (day or night) if ketones are moderate or large. Your child may need extra rapid-acting insulin (Humalog®, Novolog®, or Apidra®) to clear the ketones.

Drinking lots of sugar free fluids (water, diet soda) is also important to help clear the ketones out in the urine.

A one-time high blood sugar with negative ketones is not a diabetes emergency. If your child has a pattern of frequent high blood sugars, call the diabetes doctor or nurse educator during office hours for assistance with insulin dosage adjustments.

Sick Day Management

How does DKA (diabetic ketoacidosis) start?

In a person with diabetes, dangerous levels of ketones can develop when there is not enough insulin to use sugar for energy. The fat cells then release fat for energy and the liver makes more and more ketones. Without insulin, ketones go higher until the blood becomes very acidic. This leads to DKA—an emergency situation needing immediate attention. DKA is serious and if left untreated can lead to coma, brain damage, or even death. Most of the time it is preventable.

Symptoms include: nausea, vomiting, stomach ache, fruity breath, excessive thirst and urination, weakness, fatigue, deep heavy breathing, confusion, and unconsciousness.

What are the main causes of Ketones or DKA?

- Not enough insulin
- Forgetting your insulin
- Using expired or "spoiled" insulin (insulin got too hot or froze)
- Illness
- Insulin pump not working

Eating extra food, sugar, or candy does not directly cause ketones.

Why I may need extra insulin when sick:

Illness is stressful on the body. Stress hormones (growth hormone, cortisol, epinephrine, and glucagon) are released during illness. These hormones help the body to release stored sugar from the liver. This sugar supplies the body with extra energy to overcome illness or stress. In someone without diabetes, the pancreas makes extra insulin when blood sugar rises. This helps move the sugar into the body's cells. The cells will then have the energy they need to work properly.

However, a person with diabetes cannot produce the extra insulin needed for higher blood sugars. During illness, your blood sugar will often go up. When there is not enough available insulin, the body begins to break down fat as an energy source. Ketones are acids that build up in the blood when fat is used for energy. As ketone levels rise, your blood becomes acidic. Extra insulin is needed to keep blood sugars within range and to avoid ketone buildup.

Why do I need to drink extra fluids when blood sugars are elevated?

The body responds to high blood sugars by flushing the extra sugar and ketones out in the urine. You will urinate more often and in greater amounts, and can quickly become dehydrated. It is important to replace these lost fluids to prevent dehydration.

Having diabetes does not mean that you will get sick more often. It does mean that you must take extra care of diabetes to prevent diabetic ketoacidosis (DKA). Being sick puts more stress on the body and extra insulin may be needed. Not enough insulin can lead to ketones and DKA.

Call the diabetes team immediately if you:

- Have moderate to large ketones and you have not received a sick day action plan
- Vomit more than 2 times or are not able to drink fluids
- Don't know how much insulin to give
- Have signs of DKA: fast breathing, weakness, confusion
- Have questions about taking care of diabetes during illness

314-454-6051 during office hours
314-454-6000 after office hours

What can I do to stay healthy?

- Practice good handwashing.
- Avoid people who are sick.
- Get the flu shot each year.
- Get plenty of rest and at least 7 hours of sleep each night.
- Eat plenty of fresh fruits and vegetables and other healthy foods.
- Follow your daily diabetes plan.

What do I do if I get sick?

- Pull out your diabetes sick day action plan and follow the instructions.
- Check ketones to know your zone—this is essential.

  Ketones need to be checked any time you:
  - —Have blood sugars over 300 mg/dL
  - —Vomit
  - —Are sick or feel sick, even if your blood sugar is under 300 mg/dL
  - —Miss an insulin dose
- Check ketones and blood sugar every 2 to 3 hours.
- Drink plenty of water and sugar-free fluids.
  - —1 ounce per year of age per hour
- Never skip insulin.
  - —Call the diabetes team if you have questions about how much insulin to take.
  - —You may need higher doses during sick days.
- Eat on a regular schedule. Your body needs carbohydrates. If you are unable to eat your usual foods, choose foods from the list of sick day foods.
  - —During illness, it will be ok to eat and drink things that you usually avoid, like juice and sugared items (Jell-O, soda, popsicles) if you can't eat enough carbohydrates to give mealtime insulin.
  - —Each time your child consumes more than 15 grams of carbohydrates, you should try to dose rapid-acting insulin like you would at a normal meal. It is acceptable to dose afterwards when a child is sick. Dose according to your normal meal time guidelines unless a diabetes doctor or nurse instructs you otherwise.
  - —Return to your usual meal plan as soon as you are able.

Most over-the-counter medications are safe to take and won't interfere with your diabetes.

- Some prescriptions, such as oral steroids, can cause high blood sugars.
- Make sure health care providers know you have diabetes.

Sick Day Food in 15 Gram Portions		
½ cup orange juice	½ cup cooked cereal	½ cup sugar-free pudding
1 cup Gatorade®	1 cup milk	½ cup ice cream
1 slice toast or bread	½ cup custard	1 cup chicken noodle soup
1 regular popsicle	½ cup regular Jell-O®	½ cup flavored yogurt
¼ cup sherbet	6 saltine crackers	½ cup regular soda

Diabetes Sick Day Action Plan

Your diabetes care provider will help you fill out this plan.

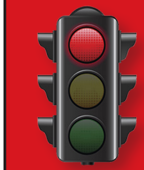
Name: ______________________________

Date: ______________________________

Cause of Ketones: Ketones are an acid made by the body from breaking down fat when sugar cannot be used for energy. This happens when there is not enough insulin in the body.

Signs & Symptoms of Diabetic Ketoacidosis (DKA): Nausea, vomiting, drowsiness, severe headache, chest pain, weakness, confusion, abnormal breathing.

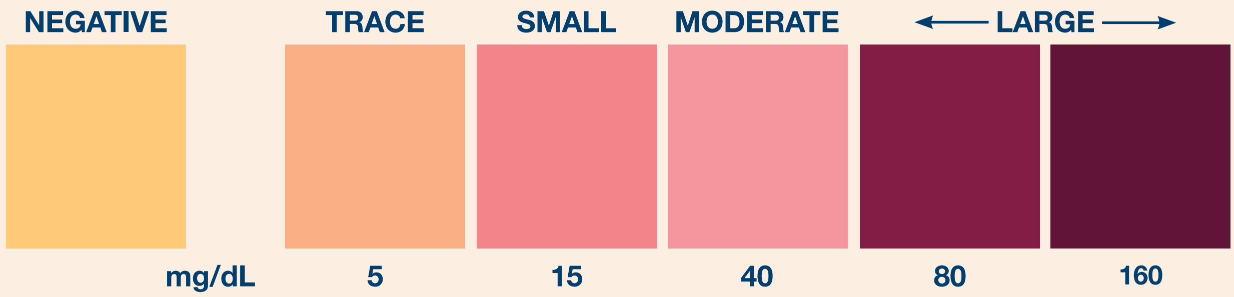
Check for ketones if you are ill or BG is >300 for 2 hours.

Zone	Ketones	Instructions
Green 	• Urine: trace–negative • Blood: less than 0.6	• Drink lots of sugar-free fluids, ____ ounces per hour, at least 1 ounce for each year of age, every hour. **Example:** *A 5-year-old should drink at least 5 oz. of water every hour.* • Assess pump site and consider changing infusion set. • Continue usual insulin dosing • Check ketones and blood sugar every 2 hours until ketones are negative (<0.6) and blood sugar is <300.
Yellow 	• Urine: small • Blood: 0.6–1.4	
Red 	• Urine: moderate–large • Blood: 1.5–3.0 Call outpatient clinic for assistance if needed. ***If unable to wake your child or if child appears very weak, call 911 immediately.**	• **If BG >200, Administer Fast-Acting insulin *with an insulin pen or syringe* & *change pump site*:** ____ **units** + blood sugar correction dose. • Consider pump malfunction/bad pump site or missed long-acting dose as cause of ketones. —If long-acting was missed, consult office for dosing instructions. —If pump is broken or unable to be replaced immediately, administer long-acting dose: ____ units. • Drink ____ ounces of water per hour. • Give Fast-Acting insulin sick day dose every 2 hours until ketones go down to trace, small, or negative (<0.9). • **If BG is <200, eat or drink sugar-containing fluids to get blood sugar >200 prior to administering sick day dose.** • **If vomiting for more than 2 hours and/or not eating/drinking well, go to nearest emergency room.**

Phone: 314-454-6051 **After Hours:** 314-454-6000 (ask for endocrinologist on-call)

Ketostix

KETONE—Read at exactly 15 seconds.



Use of Ketostix

- Clean hands.
- Place end of ketone test strip in fresh urine or place strip directly into urine stream.
- Completely saturate square on end of strip.
- Follow timing instructions.
- Compare the test area with the colored chart.
- Immediately record the result in the logbook.
- If ketones are present, follow sick day action plan.

DKA prevention decision tree

Ketones are caused by lack of insulin.

Check urine ketones using ketostix:

- Any time the blood sugar level is greater than 300 mg/dL.
- Any time your child vomits.
- When your child is sick (fever, stomachache, flu symptoms) even if blood sugar is low or in the target range.
- Missed dose.

To reduce ketones:

- Drink lots of sugar-free fluids to help flush out ketones.
- Continue to check ketones until ketones are negative for 2 consecutive checks.

****Remember: If moderate or large ketones are present, your child needs more INSULIN.***

Diabetes Sick Day Management

Name							Date of Birth		Approximate Weight	
Date										
Time										
Blood Sugar										
Ketones										
Insulin										
Bolus: Humalog, Novolog or Apidra doses for carbohydrates										
Correction: Humalog, Novolog or Apidra doses for ketones										
Basal: Lantus or Levemir insulin doses										
Fluids: ounces/total for day										
Food										
Total carbs										
Temperature										
Medications										
Vomiting										
Diarrhea										
If unable to wake your child, call 911 immediately.										

High risk of diabetic ketoacidosis

Ketones are caused by lack of insulin.

- Blood ketones more than 3.0
- Urine ketones moderate to large
- Chest pain
- Vomiting twice
- Dizziness or confusion
- Fast or abnormal breathing
- Weak or difficult to awaken

Call your diabetes doctor or nurse

Office hours: **314-44-6051**

After hours: **314-454-6000**

Ask for the diabetes doctor or nurse on-call.

Diabetes Sick Day Management

Name							Date of Birth		Approximate Weight	
Date										
Time										
Blood Sugar										
Ketones										
Insulin										
Bolus: Humalog, Novolog or Apidra doses for carbohydrates										
Correction: Humalog, Novolog or Apidra doses for ketones										
Basal: Lantus or Levemir insulin doses										
Fluids: ounces/total for day										
Food										
Total carbs										
Temperature										
Medications										
Vomiting										
Diarrhea										

If unable to wake your child, call 911 immediately.

Involvement of the Family

Family involvement

Family is crucial for a child with diabetes. Diabetes affects the whole family, so open and honest communication is essential.

Educate yourself about diabetes to understand how your family can help. Involve and educate all family members to share responsibilities fairly.

Sibling involvement

It can be helpful to involve siblings in diabetes education sessions. Teach siblings about symptoms of diabetes and emergency responses. Reassure younger siblings that diabetes is not contagious and explain the low risk of diabetes running in the family to older siblings. Siblings learn from parents' attitudes and behaviors. Share honest information about diabetes to help siblings adjust to the changes. Watch siblings for signs of negative emotions and allow them to express their feelings. Give each sibling special time alone with parents when possible. Try not to overburden siblings with too much responsibility for the child's care.

Diabetes care tasks

Upon diagnosis, have a family meeting to discuss tasks like:

- Insulin injections (usually 4 times a day)
- Blood glucose testing (before meals and bedtime)
- Meal planning, shopping, and cooking
- Contacting doctors and the diabetes team
- Exercise
- Financial tasks (insurance forms)
- Sick day management (ketone testing, calling the doctor)
- Educating school staff and caretakers
- Being supportive

Family meetings

- Adjust and rotate tasks as needed
- Discuss strategies for emergencies, organizing the home, planning holidays, and schedules to minimize conflicts
- All caregivers should help with daily diabetes care, like insulin injections and blood glucose testing
- Caregivers should stress the importance of the daily regimen to the child
- Get support from extended family, friends, and support groups, especially in single-parent families
- Consistency among caregivers is key.

Positive family factors

- Parental involvement and shared responsibilities
- Positive self-esteem and low conflict
- Problem-solving skills and stable family life
- Clear communication and high marital satisfaction
- Encouraging the child's independence and accepting diabetes
- Strong social support and realistic expectations
- Being non-judgmental and an attentive listener

Ongoing education

- Continue diabetes education as the child grows and their needs and abilities change
- Sharing feelings and solving problems about diabetes can bring families closer

Be patient with your child

Children's reactions can include crying, temper tantrums, whining, clinging, and acting out in frustration. Don't be alarmed if your child starts acting like a much younger child. Be patient and supportive. Your child is adjusting to big changes. These feelings and behaviors are common, but temporary and will stop in time.

Your child may be:

- Easily upset or angry
- Feeling anxious or confused
- Irritable or uncooperative
- Uncertain about what might happen next
- Fearful about what others will think
- Fearful of 'being different' to their peers
- Fearful of dying

Help your child understand what is happening

Use simple words that your child can understand. If your child is anxious about injections or finger pokes, explain the purpose is to help them to be safe and healthy. Provide reassurance.

Family relationships

A crisis puts stress on family and close relationships. You may find yourself being irritable and flaring up easily. Remember that you are all under stress and these reactions are part of the situation. Sometimes partners or other family members feel 'out of step' with their reactions to the diagnosis. One parent may be tearful and want to talk about things. The other becomes practical and wants to 'get on with it' and not dwell on the sadness or other feelings. These are different ways of coping with the same situation. Accepting each other's differences can help people to support each other.

Brothers and sisters

Siblings of the child with diabetes also need to have their feelings understood. They need to know what is going on and be given an appropriate explanation about diabetes and the daily care required. Some siblings may become very upset about what has happened to their brother or sister and may become fearful that they too will get diabetes or some other illness. Some siblings may react to the extra attention provided to the child with diabetes. Siblings require understanding, support, and reassurance.

Adjusting to diabetes after discharge

Going back to normal routines helps children feel safe. Help your child return to doing their usual activities as soon as possible. Diabetes loves routine.

Be patient and give everyone time to readjust

Keep in mind that people in the same family can react in different ways. Brothers and sisters can feel upset, too. Most family members just need time and reassurance that they will adjust.

Set limits

You may be tempted to relax the rules to help your child feel special, or to compensate for the hard times that they are experiencing. However, it is often better for your child if you set limits on behavior and keep most of the family rules and expectations the same.

Allow your child to talk about feelings and worries

Ask your child (and their brothers and sisters) what they are thinking, feeling, and imagining. Listen to their concerns. Share the facts as well as your own feelings and reactions. Children may feel different from their friends and feel their life is ruled by diabetes and routines. They may be reluctant to let people know they have diabetes or be embarrassed to test blood glucose or eat when needed. They may become more dependent on their parents at a time when they would otherwise be becoming more independent.

Age-Related Guidelines for Diabetes Responsibilities

As children grow and mature, they learn to care for themselves. This is true for diabetes-related tasks. This is a guideline to help you know when children may be able to do some diabetes-related tasks along with some normal developmental tasks and family issues that may happen with managing diabetes. Some additional resources are also provided. Keep in mind, each child is different, so this is a guideline only.

Here are a few questions many parents have as children learn to manage their diabetes.

1. How do children manage tasks and responsibility?

This depends on their age and developmental stage. It is important to know your child and work with him or her. Your child's ability to manage tasks related to diabetes can also change at different times in each stage.

2. What age should I allow my child to start doing tasks for their diabetes care?

There is not an exact age when children can assume their diabetes care either with supervision or on their own. Your child's age is one of the factors to use when making this decision. However, there are other important factors to think about including:

- Developmental level
- Interest shown by your child
- Other health issues or concerns

Your child should be encouraged to start helping with their diabetes care when they can follow simple instructions and make simple choices. They can start self-care as they show they are able to do the tasks for diabetes care correctly and consistently. Continue to help and watch your child. **You may have to take over as the parent or caregiver (for example: if they are omitting or incorrectly doing diabetes care).**

3. Are there any problems that can come up by letting my child start doing some of their diabetes care?

Yes. A common problem is to push the child into more responsibility before they are ready. If you give your child more responsibility when they are not ready, the result can be poor control of their diabetes as well as feelings of failure and low self-esteem.

4. How will my child do depending on how much I let them do their own diabetes care?

- The right amount of responsibility and information given to a child, plus the right amount of adult supervision, can increase the child's knowledge of diabetes and adherence (doing what they are supposed to do) to the diabetes plan. Blood sugars tend to be mostly in the target range and hospitalizations are infrequent.
- A child given too much responsibility and not enough adult supervision, can lead to non-adherence to the diabetes plan, blood sugars frequently out of range ("all over the place"), and frequent hospitalizations.
- A child who has not been given enough responsibility and has adults who do too much of their diabetes care, is at risk of having a low level of knowledge about their daily diabetes care.

5. Why does my child need to have more responsibility?

- To develop self-confidence
- To learn their own limitations
- To be prepared for becoming an adult living on their own

6. When can I stop being involved in my child's diabetes care and management?

It is very helpful to have a supportive adult for any person with diabetes, no matter what their age.

It is important for a parent or caregiver to be involved in their child's diabetes care. As your child grows and develops this will range from doing all the tasks for the child, to watching the child doing the tasks, to checking that the tasks are being done as they should.

Our goal is to help you learn to manage your child's diabetes, so you can teach them to manage their diabetes and assume self-care at the right time.

What to think about when giving your child more responsibility:

- Your child's understanding of diabetes
- Your child's interest in having more responsibility
- Your child's actual performance of diabetes tasks
- Your child's overall maturity

Teamwork and shared responsibility lead to healthy living with diabetes.

Every child is different.

Age by itself does not tell you when a child is ready for more diabetes responsibility.

Most children will want to do tasks that they are ready to do.

It is important for them to have a sense of accomplishment.

Infancy

0–12 months

Behaviors

- Responds to love
- Developing trust
- Bonds with parent or primary caregiver
- Starts to develop motor skills (for example: lifts head, kicks legs, reaches for objects, and crawls)

Diabetes management

- Parent or caregiver to perform all tasks
- Prevent and treat hypoglycemia (low blood sugar)
- Try to avoid large swings in blood sugar (feedings are not too close together and no longer than 3 hours apart)
- May give insulin right after feedings or meals, but first talk to your diabetes health care provider

Potential family issues

- Coping with stress
- Avoid burnout by sharing diabetes care between parents or caregivers
- Accepting diabetes as part of life
- Inform and teach daycare and other caregivers about managing child's diabetes

Toddler

13–36 months

Behaviors

- Learning how to control their body and their environment
- Developing a sense of "self"
- Developing speech skills
- Continues to develop motor skills (for example: walking, playing with simple toys, and feeding themselves)

Diabetes management

- Parent or caregiver to perform all tasks
- Prevent and treat hypoglycemia (low blood sugars)
- Try to avoid large swings in blood sugar by allowing the child to help make simple food choices when possible
    - —offering finger foods since most children this age like to hold the food themselves
    - —not having meals or snacks too close or too far apart
- May give insulin right after meals, but first talk to your diabetes health care provider

Potential family issues

- Coping with stress
- Avoid burnout by sharing diabetes care between parents or caregivers
- Managing picky eaters or "grazing" (wanting to eat small amounts all day long)
- Accepting diabetes as part of life
- Inform and teach other caregivers from their daycare or school about managing child's diabetes

Preschool and Early Elementary

3–7 years

Behaviors

- Increase in language development
- Self-centered
- Big imagination—has a hard time knowing what is real or pretend
- Not able to problem solve on their own
- Does not fully understand concept of time

Diabetes management

- Parent or caregiver to perform all tasks
- Prevent and treat hypoglycemia (low blood sugar)
- Learning how to recognize low blood sugar symptoms
- Learning to help with blood sugar checks and insulin shots
  - —Allow them to choose which finger to stick for blood sugar check and where to give shots as long as you rotate fingers and injections sites
  - —Help to count before taking out syringe or insulin pen
- How much they eat and the foods they like may vary, involve child in simple food choices when possible
- May give insulin right after meals, but first talk to your diabetes health care provider

Potential family issues

- Coping with stress
- Avoid burnout by sharing diabetes care between parents or caregivers
- Accepting diabetes as a part of life
- Inform and teach caregivers from their daycare or school about your child's diabetes
- Remind child that having diabetes is no one's fault

Older Elementary

8–11 years

Behaviors

- Thinking is more concrete (thinks of right now, not future)
- Developing logic and understanding
- Becoming more social and curious
- Becoming more responsible
- Self-esteem linked to friends
- Puberty may start

Diabetes management

- Parent or caregiver to perform all tasks or closely supervise if the child is performing tasks
- Child can begin testing their blood sugar with adult supervision and monitoring
- If interested, around age 10–11 can start to draw up and give shots although adult supervision is still needed
- Can recognize and start treating low blood sugars
- Can start making some independent food choices and learning basic carbohydrate counting
- Cannot fully understand that taking care of diabetes now helps to prevent problems later (diabetes complications)
- Begin teaching the child about short- and long-term complications and the need to keep blood sugar in target range most of the time.
- If using an insulin pump, can do their boluses but adult supervision and monitoring needed
- If child is not doing diabetes care, or is doing care incorrectly, the adult will need to take over care
- Once child can again show they can provide correct diabetes care, then parent or caregiver may allow child to resume some self-care of diabetes with supervision

Potential family issues

- Coping with stress
- Accepting diabetes as part of life
- Parent or caregiver staying involved in all diabetes related tasks while allowing for self-care on special occasions
- Avoid burnout by sharing diabetes care and supervision between parents and caregivers
- This is the time when having a friend spend the night or staying at a friend's house often starts
- They can also become more active in school and other activities, which may need more flexibility in schedule and regimen
- Inform and teach school or other caregivers about child's diabetes

Early Adolescence

12–15 years

Behaviors

- Puberty starts or continues
- Body image is important
- May begin to be away from home more
- Developing self-identity
- Becoming more responsible and independent
- Developing abstract thinking (can see cause and effect)

Diabetes management

- Parent or caregiver to monitor tasks or perform tasks as needed
- Increased insulin needs during puberty can make blood sugar control and diabetes management more difficult
- Weight and body image concerns can also affect diabetes management
- Can do most shots or insulin pump management and blood sugar checks but still needs parent or caregiver to be involved and monitor care
- Several times a week, review log book, meter or insulin pump download with child
- Look for patterns in blood sugars and that diabetes management is consistent
- Knows carb (carbohydrate) counting and can make correct food choices
- Around age 12–13, can begin to understand that good blood sugar control will prevent diabetes complications later; continue teaching child to keep blood sugar in target range most of the time
- By age 15, begin talking to child about diabetes and driving; ask diabetes health care provider for brochure on diabetes and driving
- If child is not doing diabetes care, or doing care incorrectly, the adult will need to take over diabetes care of the child
- Once child can again show they can provide correct diabetes care, then parent or caregiver may allow child to resume some self-care of diabetes with supervision.

Potential family issues

- Coping with stress or conflicts
- Accepting diabetes as part of life
- Parents or caregiver and teen work together to allow teen to manage most of diabetes care
- Avoid burnout by sharing diabetes care and supervision between parents and caregivers
- Teen is learning new coping skills to help self-manage diabetes
- Observe for signs of depression, eating disorders, or any other risky behaviors
- Report concerns to primary health care provider as well as your diabetes health care provider
- Inform and teach the employees of their children's school about your child's diabetes

Later Adolescence

16–19 years

Behaviors

- Developing identity for after high school (for example: making decisions about college, work, and social issues)
- Able to understand that proper diabetes management will prevent problems in the future
- Independent
- Frequently away from home
- Better problem solving skills

Diabetes management

- Parent or caregiver to be involved by monitoring self management and offering support and performing tasks if needed
- Can do most, if not all, of shots or insulin pump management and blood sugar checks, but still needs help
- Frequent review of book, meter, or insulin pump
- Look for patterns in blood sugars and that diabetes management is consistent
- At times may still need help with insulin dosing
- Can count carbs (carbohydrates) correctly and know what foods to eat
- Knows the importance of keeping blood sugar in target range most of the time to help prevent complications later
- If the teen is not doing diabetes care, or doing it incorrectly, the adult will need to take over diabetes care of the child
- Once teen can again show they can provide correct diabetes care, then a parent or caregiver may allow child to resume some self-care of diabetes with supervision
- Combining diabetes with new lifestyle
- Diabetes team will begin discussion of transition to adult endocrinologist

Potential family issues

- Coping with stress or conflicts
- Accepting diabetes as part of life
- Parent or caregiver and teen continue to adapt to new roles as teen assumes more self-management and parent or caregiver monitors the teen
- Avoid burnout by sharing diabetes care and supervision between parents and caregivers
- Teen continues to learn copping skills for self-management of diabetes
- Inform and teach school and employers about teens diabetes
- Observe for signs of depression, eating disorders, or any other risky behaviors
  - Report any concerns to primary health care provider as well as your diabetes health care provider
- Support transition of teen to independence

Mental Health and Diabetes

Feelings at diagnosis

The period just after you discover your child has diabetes is likely to be a very unsettled time for the whole family. At this difficult time your usual ways of coping with things may be disrupted and you may feel vulnerable and confused. You may experience a whole range of feelings.

Feelings include

Shock: You may feel numb, or that you're operating on 'automatic.' Maybe the diagnosis hasn't hit you yet.

Denial: The diagnosis feels so overwhelming that you simply can't believe it. You think that there has been a mistake. Children can also be in denial and can express this by trying to avoid injections or finger pokes.

Anger: You wish there was someone to blame. You may find yourself being angry with the doctors, nurses, your partner, or other family members. You may ask 'why me, why my child?' People sometimes question their faith or feel that life has dealt them an unfair blow.

Sadness or depression: There will always be the feeling of loss associated with the loss of perfect health in a child. With any loss, grieving occurs and can continue on and off for some time. Your mood can range from feeling sad to feeling depressed.

Fear: You may be full of fears for your child including fear about the constant management of diabetes and the impact on their future. As you learn about diabetes and put your new skills into practice, these fears begin to fade.

Guilt: As a parent, your instinct is to protect your child from hurt and harm. You may find yourself thinking about the last few weeks and wondering if you could have done something differently. There is nothing you or your child could have done to prevent your child from getting Type 1 diabetes. Sometimes brothers and sisters may have feelings of guilt. Children can feel guilty, too. Sometimes they feel like diabetes is a punishment for something they have done wrong. We know from child developmental milestones that children are egocentric; therefore, they think that the world revolves around them. If something bad happens they tend to blame themselves. Constant reassurance that they are not to blame and talking to their social worker can help them to explore these thoughts.

Adjusting to diabetes

Keep in mind that this difficult time will pass and you will regain your feeling of balance. The feelings of shock and confusion will subside. Talking through your feelings with family, friends, and members of the diabetes team will be very helpful. Your social worker is specially trained to help you understand your reactions and make sense of your family's experience. Even if you feel that you are coping, their input will assist and support you in many other ways.

It is helpful to recognize that you as a parent are in a vulnerable state, so be mindful of your own needs. This can mean setting aside some time just for you. You may be feeling overwhelmed by the amount of information you have to learn and understand. Don't be afraid to ask the nurse educators or doctors to repeat or go over anything you don't understand.

The responsibility for day-to-day diabetes care ideally needs to be shared with a partner or another person close to you. This may mean giving basic education about diabetes management to a range of people.

Children's feelings

You are the best person to help your child through this difficult time. Your child may experience any or all the feelings described above. Like you, they need someone to talk to who is calm and can provide reassurance and support. You may request a referral to a psychologist if necessary.

Encourage your child to spend time with friends

After the diagnosis some children feel a little 'different'. They may also wonder how their friends will react. Invite your child's friends to visit. It may be helpful to assist your child in answering questions their friends or classmates may have about diabetes (*Is it contagious? Why do you have to poke your finger? What is diabetes?*).

Help your child do some things on their own

It is often tempting to do more for your child after they have been diagnosed with diabetes. Encourage your child to do the things (including jobs around the house) they used to do.

Find ways to communicate with your child about diabetes

It is important that a young person's identity does not become defined by diabetes. It can be tempting to ask your child what their blood glucose levels are as soon as they walk through the door after school. Children do not want to identify themselves as a 'diabetic' with nothing else to offer or share. Try asking about other things first, for example how their day went. This will build your relationship and encourage communication. Teens have reported that the most frequent thing they talk or argue about with their parents is diabetes. It is helpful to approach diabetes care as important, and when managed properly can be mostly in the background while they live life.

After the initial learning phase

The "novelty" of the new routine wears off quickly and often young people hit a difficult patch some weeks after the diagnosis as they realize that diabetes is a permanent condition with continuing daily demands. Parents need to provide close support to their children and be prepared to take over control of diabetes routines again if needed for a time.

Take time to deal with your own feelings

It will be more challenging for you to help your child if you are feeling worried, upset, or overwhelmed. Parents' concerns include fear of low blood glucose levels and dealing with the day-to-day management issues associated with diabetes (diet, carbs, insulin, blood glucose levels, exercise, school, sleep); and parents are concerned about long-term complications. Parents also worry about how much responsibility they should let their child have for diabetes management and when to start handing over more responsibility for the child to self-manage. Most parents feel very protective about their child and worry when their child is away from them. Most people have very little understanding of Type 1 diabetes or the level of time and commitment involved in living with diabetes. There is an enormous amount of time and effort required to explain the condition to family, friends, teachers, and others.

Support from family members, friends, support groups, and primary care physicians is important. Take time to address your own feelings. At the regular follow-up clinic appointments, your social worker and other members of the diabetes team are available to help and advise you.

Follow up with clinic appointments

Even if you feel you and your child are adjusting and coping well with the diabetes management it is important to attend your scheduled clinic visits. In addition to the physical checkup, there is help available for children and families who may be feeling overwhelmed with the emotional impact of diabetes on their lives. Your social worker or a member of your diabetes team will be able to help you to consider what is best for you and your family.

Telling My Friends I Have Diabetes

What is Type 1 diabetes?

Diabetes is a condition that does not allow my body to use glucose (sugar from carbohydrates in food) as it should. A hormone called insulin helps our bodies use glucose as energy. My body no longer makes insulin. When glucose is not used for energy, it builds up in the blood. Too much sugar in the blood stream is not healthy.

You cannot "catch" diabetes. I did not do anything to make it happen. Doctors do not know why, but my immune system hurt the cells in my body that make insulin. My diabetes is different than the diabetes that some adults have. Sometimes these adults do not have to take insulin, but I need to take insulin injections every day.

Why do I give myself insulin and poke my finger?

My body does not make insulin anymore. I give myself insulin so that sugar from the food I eat can be used as energy. Insulin cannot be taken by mouth, so I need to give it by injection. My body needs insulin all day long. Insulin can be given by injection or a pump. If I take insulin by injection, I get fast-acting insulin with each meal and long-acting insulin once a day. If I take insulin with a pump, a little bit of fast acting insulin is given every few minutes and a bigger amount when I eat.

I also poke my finger at least 4 times a day and put a drop of blood onto the test strip of my blood sugar meter. This tells me if my blood sugar is in a safe range and how much insulin I need. I check my blood sugar before every meal, before I go to sleep, and when I am not feeling well. I may also use a special sensor called a continuous glucose monitor (CGM) to check my sugars.

How can you help?

At times, my blood sugar may get **too low** or **too high**. I may start acting and feeling funny when my blood sugar is low or high.

- I may have **low blood sugar** if I become shaky, sweaty, pale, sleepy, confused, tired, crabby, spacey, have a headache, cannot see well, or act weird. I may not be able to check my blood sugar. You can help by making sure I eat or drink something sugary such as glucose tablets, juice, sugared soda, or candy. Please let an adult know this is happening.
- If my blood sugar is **too high**, I might feel tired and thirsty and go to the restroom a lot.

You can always call for help if you are not sure what to do.

I'm still me

Please remember that diabetes does not change who I am. Please do not treat me any differently now that I have diabetes. I am still a healthy kid, but I will have to do more work to stay healthy. You can help me by:

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Goal Setting

Taking care of diabetes each and every day can be overwhelming. You may be asking yourself, "How will I be able to do all this?" Setting goals can help you stay on track and manage diabetes safely.

Here are examples of questions to help yourself or your child identify goals for managing diabetes:

Healthy eating: Can you increase the number of fruits and vegetables your child eats each day? Do you want to count carbohydrates more accurately?

Physical activity: Do you want your child to start exercising or increase their activity level?

Monitoring: Do you want your child to write blood sugar levels in the logbook? Do you want to increase the number of times you test your child daily? Do you want to review the logbook with your child weekly?

Medications: Does your child want to take their own insulin? Should we call in blood sugars each week?

Reducing risk: Do you want to make sure your child carries quick-acting sugar with them? Do you want your teen to check their blood sugar before driving?

Keeping well: Do you make and keep appointments with the diabetes team 4 times per year? Does your child brush and floss their teeth twice every day? Does your child see their pediatrician at least once per year and a dentist twice per year?

Healthy coping and reducing stress: Do you want your child to ask others to help with blood glucose testing and insulin injections when they don't feel like doing them?

Here are some tips on goal setting:

- Identify the change you want to make.
- Identify steps you need to take to make the change.
- Identify the goal in Specific, Measurable, Attainable, Realistic or Relevant, Time-related terms (SMART goals).

Develop a plan

Ask yourself:

- What am I going to do?
- How much or how often am I going do it?
- When am I going to do it?
- How confident am I that I will achieve this goal? If you don't think you can be successful, set a different goal.

Reflect on your progress

Did you achieve your goal?

If yes: What helped you stay on task? What will you do next to maintain or move toward healthy management of diabetes?

If no: What got in the way? How will you change the goal to make it achievable and meaningful?

Staying motivated

- Write down your goal.
- Keep your self-talk positive.
- Surround yourself with people who are dedicated to helping you succeed.
- If you slip up, remember it's a normal part of making a change. Get back on track by recommitting or revising your goal.

My Goals	Date to Achieve Goal	I Achieved My Goal!	How Did I Do?
		☐	
		☐	
		☐	
		☐	
		☐	

Managing Diabetes at School

Advance planning with your child and with school staff will make management of your child's diabetes a regular, non-disruptive part of your child's daily routine. Fulfilling your responsibilities as primary caregiver will help your child feel safe and confident they can fit in and be a normal kid around their classmates.

- Teach your child as much about diabetes as possible. Try to plan for specific school situations with your child prior to their return to school. However well-organized you and your child are, there will be some days when the plans do not work well and this prior planning will enable your child to deal with problems more confidently. Also, make sure they know when and who to ask for help.
- Provide the school with diabetes supplies (for example, blood glucose monitor, CGM supplies, blood glucose test strips, lancets, Ketostix, alcohol wipes, an adequate supply of instant glucose for treatments of low blood sugars, insulin, syringes, pump supplies, appropriate snacks, and glucagon).
- Provide the school with a list of emergency phone numbers, including the parent's home, cell and office number, alternate persons, physician and hospital numbers, and a diabetes health care plan (school letter).
- Educate those who will be working with your child by setting up a school conference and distributing written information.

School conference

Should be initiated by the parents at the following times:

- Prior to the child's return to school following a new diagnosis of diabetes
- Beginning of the new school year (if possible the week prior to the start of classes)
- A child's transfer to a new school
- Throughout the school year, if the child is having specific problems with blood sugar control, or to answer any questions the teacher may have

Topics discussed at the conference should include:

- General information about diabetes
- Section 504 of the Federal Rehabilitation Act of 1973 stating "all children are entitled to participate fully and without discrimination in school programs"
- Low blood sugar (also called hypoglycemia or an insulin reaction): recognition and treatment
- High blood sugar (also called hyperglycemia): recognition and treatment
- School lunch and snack
- Blood glucose monitoring
- Substitute teachers
- Class parties
- Exercise and sports
- Field trips
- Bus travel
- Diabetes supplies
- Continuous glucose monitoring
- Pump supplies

When You First Go Home

Call every day to review your child's blood glucose readings

- Monday–Friday, 8 a.m.–noon call **314-454-6051**.
  - Tell the secretary you are calling to review blood glucose trends with a diabetes nurse educator.
- Weekends or holidays, 11 a.m.–2 p.m. call **314-454-6000**
  - Ask for the diabetes doctor on call.
- When you call, please have your child's logbook and the following information prepared:
  - Blood glucose readings for the past 24 hours
  - Your child's insulin doses (insulin to carb ratio, target BG, insulin sensitivity factor, long-acting insulin dose)
  - Any questions or concerns regarding hyperglycemia, hypoglycemia, or exercise

The diabetes nurse educator or doctor will review your child's blood sugar readings with you and may advise changes in your insulin dosing.

Continue to call in daily until the doctor or the diabetes nurse educator advises you to stop.

Please reserve the after-hours line at **314-454-6000** for emergencies from this point on.

For emergencies

What is an emergency?

- Vomiting with moderate or large ketones or if they do not clear after 2 correction doses
- Vomiting with low blood sugars
- Severe low blood sugar with loss of consciousness, confusion, or a seizure
- Monday–Friday, 8:30 a.m.–4 p.m. call **314-454-6051**.
- After hours, weekends, and holidays call **314-454-6000**. Ask for diabetes doctor on call.

For non-emergencies

Please call and ask to speak to a diabetes nurse educator if any of the following occur:

- A pattern of 2 low blood sugars (less than 70) occurs at any time in 1 week
- A pattern of 4 blood sugars above your child's target range occurring at the same time of day within 1 week
- Patterns of blood sugars less than 120 mg/dL at bedtime

Calls for routine insulin adjustments and other non-emergency calls will be returned within 24–48 hours.

Questions about carb counting, meal planning, and nutrition?

Please call **314-454-6051** and ask to speak to the dietitian.

Questions about resource assistance?

Please call **314-454-6051** and ask to speak to the diabetes social worker.

Prescriptions and Supplies

New prescriptions

- Prescriptions are usually written as a 30-day or 90-day supply. Insurance companies may have a preference or requirement for frequency of refills. Please check with your insurance company.
- If your insurance prefers 90-day supply, they may require you to use a specific mail order company.
- If your child is newly diagnosed with diabetes and hospitalized at St. Louis Children's Hospital:
  - —We send the first set of prescriptions (30-day supply) to St. Louis Children's Hospital outpatient pharmacy to be picked up before your child is discharged. This allows the diabetes educators to make sure you get the correct supplies and to review the prescriptions with you. Plus, you don't have to stop at a pharmacy on the way home.
  - —You will be able to transfer these prescriptions to your local pharmacy or use mail order for refills.
- To transfer prescriptions, call your local pharmacy and have the pharmacist contact St. Louis Children's Hospital outpatient pharmacy at **314-657-9005**.
- To switch to mail order or a 90-day supply, contact the diabetes team at **314-454-6051**.

Refills and renewals

- Refills are good for 6 months from your child's last office visit.
- If your child has not been seen by an endocrinologist or nurse practitioner in the last 6 months, an appointment will be scheduled and prescriptions filled 1 time. Prescriptions for more refills will be written during the next appointment.
- The best way to get refills is for your pharmacy to contact the diabetes team directly.

- Plan ahead:
  - —Refilling a prescription can sometimes take several business days. Call the pharmacy for refills several days before you run out.
  - —Your child's prescription may need a prior authorization which can take 1 to 2 weeks.
  - —Think about travel plans well in advance. Make sure your child has enough medication and supplies before leaving home.

More things to consider

- Please make sure we have your current insurance and pharmacy information.
- Check with your insurance about deductibles, copays, coverage, and the preferred pharmacy.
- Insurance companies have preferred products and may have your child use the preferred medication or supply first before paying for another product.
- Prior authorizations for another product take time. Plan ahead. Please have your pharmacy call or fax us with the information. A prior authorization does not lower the cost, it approves the medication or supply.
- If you need help paying copays, research drug company websites for discount cards to help lower your cost.
- If, for any reason, you lose insurance coverage, please contact the diabetes team immediately so we can help you problem solve.

Caring for Your Health

For the best diabetes care, the American Diabetes Association (ADA) recommends:

- Diabetes clinic visits every 3 months with a hemoglobin A1C test
  - These may alternate between a physician and a nurse practitioner
- Yearly visits with a diabetes dietitian
- Ongoing diabetes education
- Screening for complications of diabetes

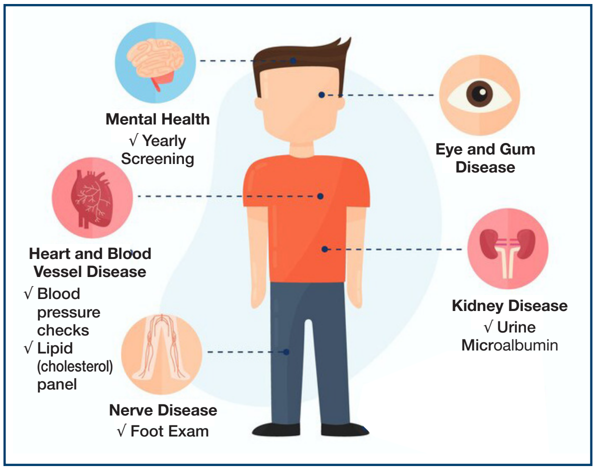
Possible complications from diabetes

Mental health: Unrecognized and undiagnosed mental health issues can make caring for diabetes more difficult. People with diabetes may experience diabetes distress, burnout, denial, or depression as a result of the stresses that can arise from daily diabetes management. Ask for help from your provider if you need mental health resources or if you would like to meet with a mental health professional.

Eye and gum disease:
Retinopathy: Damage to the blood vessels in the retina (back of the eye). Some early changes may be reversible. Cataracts: Clouding of the lens of the eye. This happens when blood sugar levels have been very high for a long time. Glaucoma: Pressure builds up in the eye causing damage to the optic nerve. This results in vision loss.

Gum disease: When there is plaque on the teeth and the body cannot fight against it because of poor blood circulation in the gums. Bone and gums become weaker and can lead to tooth loss.

Heart and blood vessel disease: Having diabetes puts you at an increased risk for early heart and blood vessel disease. Having your blood pressure checked at each clinic visit and a lipid panel checked regularly helps catch problems early before they become a major health risk.



Kidney disease (nephropathy): Kidneys filter waste and water from blood. When blood sugar levels are high, pressure increases in the kidneys' filtering system which can damage the blood vessels of the kidneys. This can also cause proteins (albumin) to start leaking into the urine. A urine microalbumin test checks for the presence of small amounts of protein (microalbumin) which is a sign of early kidney damage. This early damage may be reversible.

Nerve disease (neuropathy): This may cause persistent numbness, tingling, and sharp pains in the extremities, usually starting with your feet and lower legs. Check your feet for redness, pain, hard skin buildup, or numbness regularly. It can also lead to increased hypoglycemia unawareness (difficulty recognizing when your blood sugar is low), dizziness, heart problems, erectile dysfunction, and gastrointestinal problems such as gastroparesis or diarrhea.

Other screenings: Thyroid disorders and celiac disease are not complications from diabetes. They are not caused by having diabetes or by taking insulin. However, it is common for people with Type 1 diabetes to also have these conditions. We routinely check thyroid labs and screen for celiac disease in all our patients with Type 1 diabetes. Left untreated, these conditions can make controlling blood sugars more difficult.

Caring for Your Health

Screening test	Frequency	Date			
A1C	Every 3 months				
Eye exam *(eyes must be dilated by an eye doctor)*	**Type 1:** Yearly for those who have been diagnosed for more than 5 years, or after 10 years of age (whichever is first) **Type 2:** At diagnosis and then yearly				
Urine microalbumin	**Type 1:** Yearly for those who have been diagnosed for 5 or more years **Type 2:** At diagnosis and then yearly				
Foot exam and blood pressure	Every visit				
Lipid panel	**Type 1:** Every 3 to 5 years from ages 8-18 years, and yearly after age 18 **Type 2:** At diagnosis and then yearly				
Dental visit	Every 6 months				
Thyroid labs	**Type 1:** Once every 1 to 2 years or with symptoms **Type 2:** Only if symptomatic				
Celiac screen	**Type 1:** Soon after diagnosis, within first 2 years, after 5 years, or with symptoms **Type 2:** Only if symptomatic				

Support and Social Groups

American Diabetes Association
diabetes.org
Focuses on advocacy, education, and research. Provides online tools for school nurses.

Breakthrough T1D
breakthrough1d.org
Provides information and tools to help you navigate type 1 diabetes. Focuses on advocacy, research, and community. Offers guides for school and parenting with diabetes.

St. Louis Children's Hospital and WashU Medicine
Offers diabetes survival skills classes and other fun, family networking events throughout the year. Call **314-454-6051** for more information.

The Diabetes Link
thediabeteslink.org
The Diabetes Link helps "teens and young adults navigate their diabetes" and "figure out how to do this thing called life." This organization offers peer support, expert resources, scholarships, and connections they need to thrive.

Assistance Programs for Supplies and Medications

Accu-Check SimplePay
A program that keeps cost of test strips consistent. Home delivery or pharmacy pick-up are options. Coupon for Accu-Check Fast Clix lancing device.
accu-chek.com

Blink Health
Purchase medications through their website at lower prices.
blinkhealth.com

Fifty50pharmacy.com
Online pharmacy offers various subscriber services including discounts on some diabetes supplies. 50% of sales is donated to diabetes research.

Lilly Insulin Value Program
Information on discount programs and savings cards for Lilly insulin (Basaglar and Humalog).
insulinaffordability.com

Lilly Cares® Patient Assistance Program
Eligibility based on income, assets, and lack of health insurance. Provides vouchers for purchasing insulin and medication (Humalog, Basaglar, Glucagon).
800-545-6962
lillycares.com

Medtronic/Mini-Med Financial Assistance Program
Eligibility based on income and lack of insurance coverage. Provides financial assistance with insulin pump supplies.
800-MINIMED (646-4633)
medtronicdiabetes.com/financial-support-programs

GetInsulin.org
Tool for people who need help affording their insulin today, regardless of the brand of medication.

Novo Nordisk NovoCare Patient Assistance Program

Eligibility based on income and lack of health insurance. Assists with access to Novo-Nordisk diabetes medications and insulin (Tresiba, Levemir, Novolog, and GlucaGen).
866-310-7549
novocare.com/diabetes/home.html

Prescription Hope
Brand name medication, made affordable.
prescriptionhope.com

Professional Prescription Advice
Eligibility based on income and lack of insurance coverage. May get medications and supplies free or at very low costs.
888-477-2669
pparx.org

Rx Assist
Patient assistance program center provides a comprehensive database of pharmaceutical assistance program.
rxassist.org

Rx Outreach
Non-profit, St. Louis-based pharmacy whose mission is to provide affordable medication. Eligibility based on household income. Various medications are eligible, as well as syringes and lancets.
rxourtreach.org

Sanofi-Aventis Patient Assistance Connection
Eligibility based on income and lack of health insurance. Assists with access to Sanofi diabetes medication and insulin (Lantus and Toujeo).
888-847-48777
sanofipatientconnection.com

Notes

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ST. LOUIS
Children's
HOSPITAL
BJC HealthCare

St. Louis Children's Hospital
One Children's Place | St. Louis, MO 63110
314-454-6000 | StLouisChildrens.org