



Type 1 Diabetes Education Guide

This diabetes self-management education program has been awarded recognition by the American Diabetes Association in accordance with the National Standards for Diabetes Self Management Education Programs.



Texas Children's
Hospital®

Welcome!

Welcome to Texas Children's Hospital Diabetes care program! We are honored that you have chosen us for your child's care. We strive to provide you with the highest quality diabetes care so that you can live a long, healthy and active life with diabetes. Our goal is to partner with you to ensure that all of your diabetes care needs are met.

During your hospital stay, you will meet many members of the Texas Children's diabetes team. The team includes doctors, advanced practice providers, bedside nurses, dietitians, social workers, child psychologists, child life specialists, and our certified diabetes educators. Each team member is specially trained to ensure you get the best diabetes care possible. You will have the opportunity to visit with multiple members of the team each day.

This instruction manual, along with our Pillars of Successful Management and the Pink Panther book you received, contains important information that will reinforce skills you will need moving forward. You will also find helpful tips about school, camp, travel and answers to frequently asked questions. We hope you will continue to use these resources in the future.

As you go through this learning process, we encourage you and your family to ask plenty of questions. Let us know how we are doing in serving and educating you. We are eager to hear your feedback on your experience and how we can make it better.

Sincerely,
Texas Children's Hospital Diabetes Care Team

What to expect from us

- High-quality diabetes care with a multidisciplinary team
- Open communication with your healthcare provider
- Regular meetings with our diabetes care team members to help you get the optimal benefit of your diabetes care
- Information on the latest advances and state-of-the-art technology for your diabetes care
- Regular screenings for health conditions that can be associated with diabetes

What we expect from you

- Diabetes clinic visits may include multiple members of your healthcare team. Please be prepared for longer visits to ensure you get the best care possible
- Please bring your technology (blood glucose meter, Continuous Glucose Monitor, insulin pump) to EVERY clinic visit
- Please bring snacks/drinks just in case
- Most importantly — be ready to learn and actively engage in your care!

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The information in this document is educational and not intended as medical advice or the practice of medicine. This information is not a substitute for the medical advice, diagnosis, or treatment of a health care provider based on the health care provider's examination and assessment of a patient's specific and unique circumstances. Patients must speak with a health care provider for complete information about their health, medical questions, and treatment options, including any risks or benefits regarding use of medications or treatments.

BUILDS

The pillars of successful type 1 diabetes management

Children and adolescents with diabetes have different characteristics and needs than those of adults. The Texas Children’s Department of Diabetes and Endocrinology team is dedicated to helping children, families and others in the community learn about these differences and successfully manage diabetes as a unit. Remembering these six important pillars will help you and your child successfully navigate diabetes for a lifetime.

B olus before eating	Ensure your child has an accurate insulin dose before eating. This will help your child handle the rise in blood glucose that happens during meals.
U nited family approach	Approach diabetes with a team spirit by communicating and sharing responsibilities as a family. This will help lessen the burden of diabetes for everyone and help maintain a positive environment that is physically and emotionally healthy.
I ncrease physical activity	Engage your child in daily exercise, limiting sedentary activities such as screen time. Turn off the TV and other devices and spend time being active. Walking, hiking, playground time, playing sports and other physical activities are healthy and enjoyable.
L ow-glucose management	Treat hypoglycemia (low blood glucose) quickly and appropriately. Your child should eat or drink something with sugar, such as orange juice, cake icing or hard candy. Your health care provider can help you determine when to give these and which options are best for your child.
D iabetes technology	There are different types of technologies for glucose monitoring and insulin delivery. Talk with your health care team about diabetes technology to decide what is best for your child. Continuous glucose monitoring is often the first step.
S tructured meals	Creating a structured mealtime routine can be challenging for busy families, but it is an important part of successful diabetes management. Eating balanced meals on a regular schedule and limiting “grazing” are great ways to keep blood glucose levels in check.

As your child develops independence through the middle and high school years, your goal should be to help him or her gradually transition to diabetes self-care and self-management with appropriate adult supervision. Our team is here to provide the step-by-step diabetes support, education and care you and your child need to live a healthy and full life.

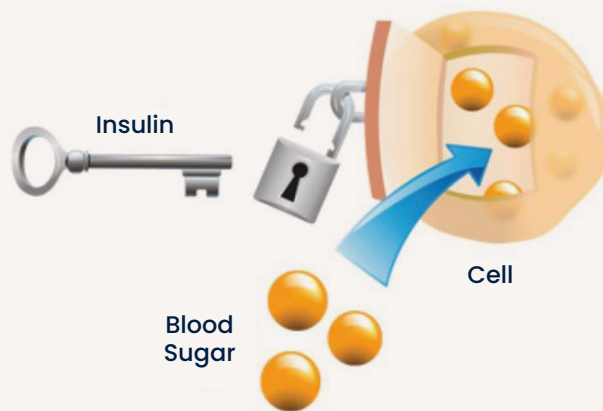
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What is Diabetes?

Diabetes mellitus refers to a group of disorders involving the way the body uses glucose (sugar). Typically, the food a person eats is broken down into glucose, the body's main fuel source, and enters the blood. This triggers the production of a hormone called insulin. Insulin allows glucose to travel from the blood stream into the cells — it acts as a key to open the door so that glucose can enter every cell in the body. Glucose is then used for energy or stored in the body for later use.



There are several different forms of diabetes. The most common forms of diabetes are type 1 and type 2.

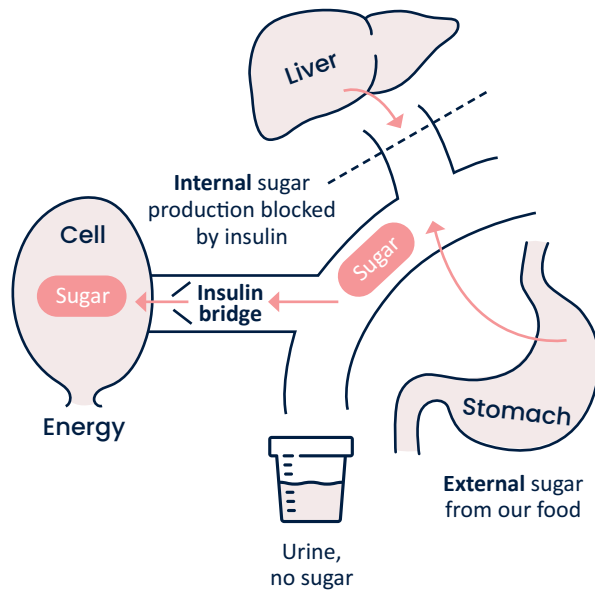
Type 1 Diabetes	Type 2 Diabetes
Type 1 diabetes is an autoimmune disease in which your immune system mistakenly attacks the cells in your pancreas (beta cells); therefore, the body no longer makes insulin. Since the body no longer makes insulin, these individuals must receive insulin to manage their blood glucose levels.	In type 2 diabetes, the body continues to make insulin but it is not enough, or it does not work correctly, usually due to insulin resistance. At first, the pancreas may be able to make adequate insulin, but over time it is not able to produce enough to keep blood glucose at normal levels.

Basic diabetes Management Skills

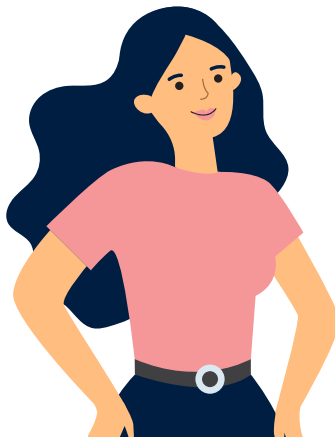
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Understanding diabetes

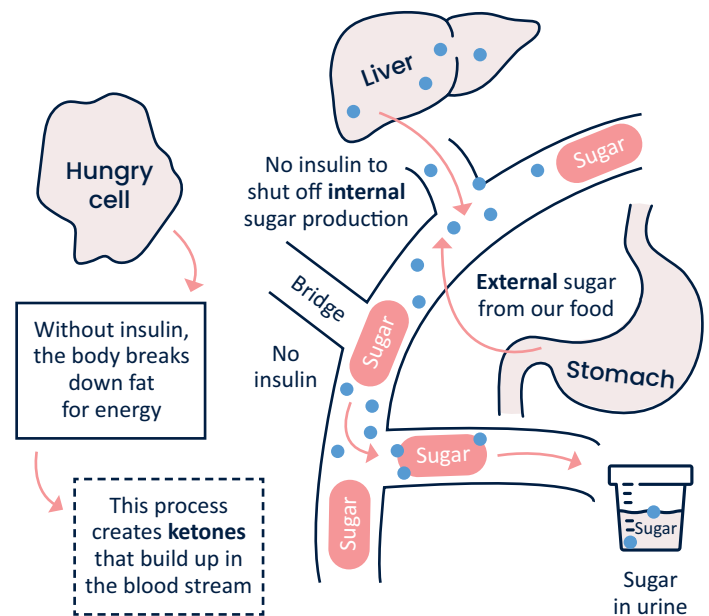
Normal



How sugar is normally used



Diabetes



What happens to sugar in a person with diabetes



No energy from sugar

When the body does not have enough insulin, glucose stays in the blood causing hyperglycemia. The body tries to get rid of the extra glucose by releasing it through the kidneys into the urine. This can cause the person to use the bathroom often and become very thirsty. Because the body cannot use glucose for energy, the person can become tired, hungry, and lose weight.

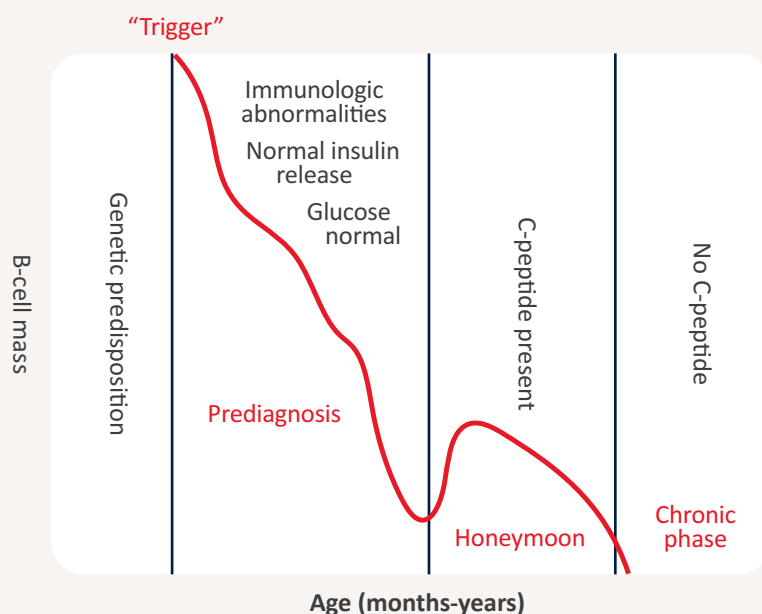
Ketones begin to develop when there is not enough insulin. When the body is unable to use glucose for energy, it breaks down fat for energy and produces ketones. As ketones build up, the body becomes more acidic which can become dangerous. You will learn in Chapter 3 how to test for ketones in the urine or blood.

Possible causes of type 1 diabetes

- Genetic risk
 - An environmental trigger could potentially start the process of autoimmunity in people with genetic risk, but genes alone are not enough.
- Environmental trigger
 - Possible triggers are not necessarily causes. For instance, one suspected type of environmental trigger is a viral illness.
- Autoimmunity
 - The body mistakes its own cells (beta cells in the pancreas) as a threat. It attacks and destroys these cells, making them permanently nonfunctional. Since beta cells produce insulin, the body then has no way to make insulin for itself.

Honeymoon period

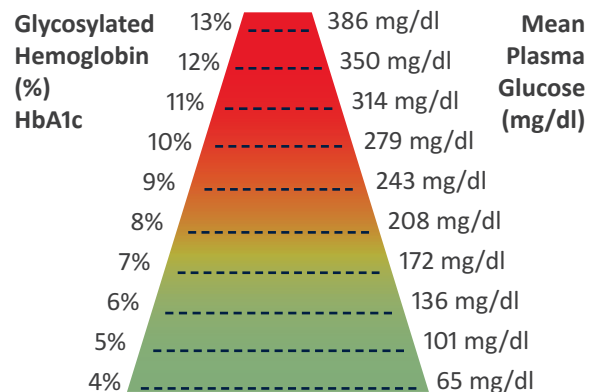
A honeymoon period can occur in type 1 diabetes after diagnosis when the individual's beta cells in the pancreas are still able to produce some insulin. This period could last from a few months to up to a year. During this time, you may experience a decrease in the amount of insulin needed and blood glucose levels may be unpredictable. As the honeymoon period ends, blood glucose trends may rise higher than usual and the amount of required insulin may increase.



How is diabetes diagnosed?

Your doctor will use several different blood labs to determine if you have diabetes. Some lab results may take a few weeks to get the result.

- **Hemoglobin A1c (HgbA1c):** Lab value showing average blood glucose level over the last 3 months.

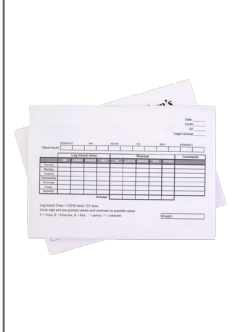


- **C-peptide:** Indicates if the body is still producing any insulin (This can help in distinguishing type 1 and type 2 diabetes).
- **Antibodies:** May be produced by the body when an autoimmune process occurs within the body. In type 1 diabetes, these antibodies are related to the production of insulin. If the results of one or more of these tests are positive, it confirms type 1 diabetes. Negative results suggest the diabetes is caused by other reasons, such as in type 2 diabetes.
 - Glutamic acid decarboxylase autoantibodies (GADA)
 - Insulinoma-associated-2 autoantibodies (IA-2A)
 - Insulin autoantibodies (IAA)

Blood glucose (BG) monitoring

How to Monitor Blood Glucose

Equipment

Blood glucose meter	Test strips for your home meter	Lancets	Lancing device	Logbook	Sharps container
					

The Importance of monitoring blood glucose and HgbA1c

Frequent monitoring and recording of your blood glucose allows the diabetes team to help you in managing your diabetes. It helps prevent long term complications, reduces occurrence of low blood glucose, improves Hemoglobin A1C (HgbA1c) and helps the diabetes team to determine the best insulin regimen for you.

Hemoglobin A1C a blood measurement that is used to monitor what your blood glucose has been over the past 2-3 months. HgbA1c is measured as a percentage with the goal for individuals with diabetes being 7% or lower.

When to check:

- Before meals
- Before bedtime
- Before and after exercise
- During illness
- When experiencing symptoms of hyperglycemia (high blood glucose) or hypoglycemia (low blood glucose)
- At 2 am:
 - If long-acting insulin dose was changed in the past few days
 - If extra physical activity occurred
 - If recommended by healthcare provider

NOTE: Refer to “Diabetes Technology” section for information on continuous glucose monitoring (CGM).



1

Wash hands.
Screw lancing device.



2

Put lancet inside
lancing device.



3

Twist off lancet cap
(do not throw away).



4

Close lancing device
and adjust the depth.



5

Pull the cover back.



6

Take a glucose meter
test strip.



7

Insert test strip in
the meter.



8 & 9

Cleanse finger with alcohol
wipe and allow to dry.
Press the trigger to get the
blood sample.



10

Apply blood to the
test strip.



11

Result will appear on
the screen.



12

Push test strip ejection
button and dispose of
test strip.



13

Dispose of lancet in
sharps container.

Steps for monitoring:

- Wash hands with soap and warm water or use an alcohol swab, make sure they are completely dry
- Load lancing device with lancet
- Insert a test strip in the meter
- Use the lancing device, poke the clean side of the fingertip
- Gently squeeze the base of the fingertip to get a drop of blood
- Apply blood to the test strip
- In a few seconds, the meter will display a number on the screen (blood glucose level)
- Record blood glucose level in the logbook
- Dispose of the used lancet in an approved sharps container (example: empty detergent bottle)

Target blood glucose levels

greater than 300 mg/dL	• Check for ketones — call urgent line if ketones are moderate or large: 832-822-3670 • May need a correction dose of insulin				
greater than 180 mg/dL	• Drink water • Exercise				
180 mg/dL 70 mg/dL	<u>Target glucose range!</u> This is the target BG range to achieve a hemoglobin A1c of less than 7% <table><tr><td><u>Before meals</u></td><td><u>Overnight</u></td></tr><tr><td>70-150 mg/dL</td><td>80-180 mg/dL</td></tr></table>	<u>Before meals</u>	<u>Overnight</u>	70-150 mg/dL	80-180 mg/dL
<u>Before meals</u>	<u>Overnight</u>				
70-150 mg/dL	80-180 mg/dL				
less than 70 mg/dL	• Treat low BG with 8-15 grams carbohydrates • If child is unable to swallow or is unconscious, administer glucagon				

**These are general recommendations based on the American Diabetes Association Standards of Medical Care in Diabetes for 2023. Blood glucose targets will be individualized by healthcare provider on a case-by-case basis.*

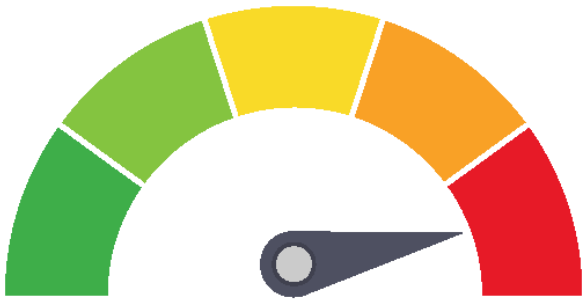
Supply storage

- Keep glucose meter test strips in their original container at room temperature, away from sunlight, high-humidity areas and very hot or cold weather.
- Monitor expiration dates based on manufacturer guidelines.

When to contact your healthcare provider

- If your child has 3 or more glucose readings less than 70 mg/dL in one week.
- If your child has 2 or more glucose readings less than 70 mg/dL in one day.
- If your child has 3 or more glucose readings greater than 250 g/dL at the same time of the day in 1 week.
- If glucose readings are consistently outside of target range or have concerns about blood glucose trends.

**Remember to bring your child’s meter to every clinic visit.*



Glucose levels

High blood glucose (Hyperglycemia)

Hyperglycemia is when there is too much sugar in your blood. Over time, it can cause serious health problems.

Common causes

High blood glucose can happen if you:

- Skip a dose of insulin or diabetes pills
- Eat more than usual
- Are less active than usual
- Are under stress or sick

Signs and symptoms

Here's what may happen when your blood glucose is high:



Very thirsty



Needing to pass
urine more than usual



Very hungry



Sleepy



Blurry vision



Infections or injuries heal
more slowly than usual

What are ketones?

Ketones are made by the body from breaking down fat when glucose cannot be used for energy. **This happens when there is not enough insulin in the body.** Ketones can be measured in the urine or blood.

Consequences of ketones

High amounts of ketones in the blood can make the body acidic. In individuals with diabetes (particularly type 1 diabetes), this can lead to a life-threatening condition called diabetic ketoacidosis (DKA).

When to check for ketones

- If taking insulin by injections: glucose levels more than 300 mg/dL twice in a row 3 hours apart
- If using an insulin pump: glucose levels more than 250 mg/dL twice in a row 3 hours apart and/or increasing glucose level after giving insulin correction via pump
- During an illness, even if blood glucose is in target range, every 3-4 hours
- Missed insulin doses
- Nausea, vomiting and/or abdominal pain
- Rapid breathing and/or fruity smelling breath
- Very thirsty and/or have very dry mouth
- Lethargy, confusion and/or not acting like self

How to check for urine ketones



Make sure you have urine ketone strips with you at all times. Each bottle of ketone testing strips will have an expiration date. The expiration date is for **unopened** bottles. Opened bottles of ketone testing strips must be discarded **6 months** after opening.

How to check for blood ketones

Blood ketone monitoring is similar to measuring blood glucose.

- 1 Open a foil wrapped ketone strip from the package and insert it into the meter.
- 2 When prompted by the meter display, place a drop of blood on the strip.
- 3 Read blood ketone level result and record the value in your logbook.

Results of urine and blood ketones

	OK	Caution	Danger	Emergency
Blood ketone results	Less than 0.6	0.6 – 1.0	1.1 – 1.5	More than 1.5
Urine ketone results	Negative or trace (0 – 14)	Small (15 – 39)	Moderate (40 – 80)	Large (more than 80)
What to do	Continue your child's usual diabetes management. If blood glucose levels are high for more than 3 days, the insulin dose may need to be changed. Call your diabetes clinic for a blood glucose log review.	Drink sugar free fluids. Recheck blood glucose and ketones every 3 hours until blood glucose is less than 300 and ketones are trace or negative (for urine) or less than 0.6 (for blood).	Rapid-acting insulin is needed. Give insulin as directed and call the Diabetes Urgent Line at 832-822-3670, option "0". Ask for diabetes doctor on-call or diabetes educator. Drink water or sugar-free fluids. Do NOT exercise. Go directly to the Emergency Room if child is vomiting and not tolerating fluids, is breathing fast and/or lethargic.	

Low blood glucose (Hypoglycemia)

Hypoglycemia is when there is not enough glucose in the blood. It is important to treat it **immediately**.

Common causes

- Too much insulin
- Physical activity
- Skipping meals or prolonged time between meals (4 or more hours)
- Sickness, especially if vomiting or having diarrhea

Signs and symptoms

Here's what may happen when your child's blood glucose is low:



Shaky



Sweaty



Dizzy



Sudden
behavior change



Hungry



Weak
or tired



Headache



Nervous
or upset

If low blood glucose is not treated, it can become severe and cause your child to pass out.

If low blood glucose is a problem for your child, talk to your doctor or diabetes care team.

Note: Please refer to page 18 in the Pink Panther book to learn the difference between mild, moderate and severe hypoglycemia.

Hypoglycemia

(Low blood glucose)

Hypoglycemia occurs when the blood glucose level drops less than 70 mg/dL.

Classification	Blood glucose level
Hypoglycemia	Less than 70 mg/dL
Target range	70-180 mg/dL
Hyperglycemia	Greater than 180 mg/dL

When experiencing hypoglycemia, the goal is to increase the blood glucose level quickly by using simple, rapid-acting carbohydrates.

See Hypoglycemia Treatment Guide for food and beverage examples based on age group.

Treatment process for hypoglycemia



1

Check blood glucose

If less than 70 mg/dL, proceed with treatment.

2

Consume rapid acting carb

- 5-10 g if less than 6 years old.
- 10-15 g if 6 years and older.



3

Wait 15 minutes

For CGM users, refer to CGM action tool.

4

Recheck blood glucose

- If less than 70 mg/dL, repeat treatment.
- If greater than or equal to 70 mg/dL, no additional treatment.



Hypoglycemia treatment guide

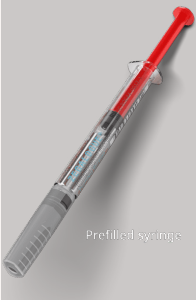
Age	Carbohydrate treatment (g)	Food and beverage examples
Less than 2 years old	5-8 g	• 1/4 cup (2 oz) juice or regular soda • 1 box (6 oz) Honest Kids Juice • 1 pouch (6 oz) Kool Aid Jammer • 1 tsp maple syrup • 1 ½ tsp sugar • 1 tsp gel cake icing • ½ fruit puree pouch or tub
2-5 years old	8-10 g	• 1/4 cup (2 oz) juice or regular soda • 1 box (6 oz) Honest Kids Juice • 1 (6 oz) pouch Juicy Juice Splashers • ½ pouch fruit snacks • 5 gummy bears • 1 ½ rolls of Smarties candy • 2 tsp gel cake icing • 2 tsp maple syrup, honey, or sugar • 2 glucose tablets
6 years and older	10-15 g	• 1/2 cup (4 oz) juice or regular soda • 1 (6 oz) box Hi-C Juice • 1 bottle (6.75 oz) Sunny D Tangy Original • 1 cup (8 oz) Gatorade • ½ pouch fruit snacks • 1 pouch Fun Size Skittles • 5-8 gummy bears • 13 pieces of Sweet Tarts • 4 Starburst candies • 2 tsp gel cake icing • 1 tbsp maple syrup, honey, or sugar • 3-4 glucose tablets

*Please confirm accuracy of carbohydrate amounts on product labels as this information may change.

How to administer glucagon

Glucagon is the rescue medication for severe hypoglycemia (low blood glucose). It is a hormone released by the pancreas that tells the liver to release stored glucose to raise blood glucose levels. It should be used when a person with diabetes who uses insulin is either unconscious or unable to respond to the usual treatment of hypoglycemia. Possible glucagon side effects are nausea and vomiting.

Glucagon comes in the form of a nasal powder, pre-filled syringe, auto-injector, and vial kit.

Baqsimi® nasal powder	Gvoke® PFS (pre-filled syringe)	Gvoke® HypoPen (autoinjector)	Gvoke® Kit (vial kit)	Zegalogue® prefilled syringe	Zegalogue® Autoinjector
					

Baqsimi® (Glucagon nasal spray):

Store BAQSIMI® at temperatures up to 86°F (30°C).

- 1 Remove shrink wrap by pulling on red strips.
- 2 Open lid and remove device.
- 3 Hold device between fingers and thumb.
- 4 Insert tip gently into one nostril.
- 5 Push plunger all the way in until green line disappears.
- 6 Position individual on their side after administration as medication can cause nausea and/or vomiting.



1

Hold the device between fingers and thumb, do not push plunger yet.



2

Insert tip gently into one nostril until fingers touch the outside of the nose.



3

Push plunger firmly all the way in until green line disappears.

Gvoke® or Zegalogue® (Glucagon pre-filled syringe and auto-injector pen)

(Both brand-name medications come in set doses of 1.0 mg or 0.5 mg, in either a pre-filled syringe or an auto-injector pen.)

Storage

- Gvoke® should be stored in the original foil pouch until time of use and should be kept at room temperature: 20°C to 25°C (68°F to 77°F). Do not refrigerate or freeze Gvoke. Protect from light exposure.
- Zegalogue® should be stored in a refrigerator (36 °F to 46 °F) for up to 3 years, until the printed expiration date on the label. Once removed from refrigeration, Zegalogue can be stored at room temperature (68 °F to 77 °F) for up to a year, or until the original expiration date on the label, whichever comes first. Do not return to the refrigerator after storing at room temperature.

Instructions for using pre-filled syringe

- 1 Remove from foil pouch.
- 2 Pull cap off the syringe.
- 3 Pinch skin of upper arm, lower stomach, or outer thigh (subcutaneous).
- 4 Insert the needle at a 90-degree angle with skin being pinched.
- 5 Push the syringe plunger as far it will go to deliver the medication.
- 6 Turn individual on their left side after injection as this medication can cause nausea and/or vomiting.



Instructions for using auto-injector pen

- 1 Remove from foil pouch.
- 2 Pull off cap from the device.
- 3 Push yellow end onto abdomen, upper arm, or thigh (subcutaneous) until window is completely red.
- 4 Turn individual on their left side after injection as this medication can cause nausea and/or vomiting.



Tips to Remember

- Call 911 after administering glucagon. Give carbohydrates if able to swallow. Recheck blood glucose in 15 minutes.
- Check the manufacturer's expiration date on all glucagon.
- For Baqsimi®, do not remove shrink wrap until time of use. If on warfarin or beta blockers Baqsimi may alter the effectiveness. Speak to your doctor for more information.
- For Gvoke® and Zegalogue®, do not open pouch/box until time of use. If on warfarin or beta blockers Gvoke and Zegalogue may alter the effectiveness. Speak to your doctor for more information.
- Store all glucagon at room temperature away from direct sunlight and according to manufacture's recommendations.
- Contact the Texas Children's Hospital Diabetes Urgent Line at **832-822-3670** to review blood glucose and insulin doses.
- Gvoke and Zegalogue also available in vial kits. See package insert for administration information.

What is insulin?

Insulin is a hormone made in the pancreas. It allows the glucose in our blood to enter the body's cells to provide us energy thus lowering the glucose levels in the blood. Insulin doses will vary with each child and will change with time. It can be administered by insulin pen or insulin vial and syringe.



Insulin storage

- Unopened insulin pens or vials should be stored in the refrigerator.
- Do not freeze insulin.
- Once the insulin pen or vial is opened, it may be kept at room temperature (not above 90° F).
- Once the insulin pen or vial is opened, it is good for 28 days, or until the expiration date on the bottle, whichever comes first. Consider writing down the date the insulin was opened.
- Insulin should be colorless — no cloudiness or yellowing.
- Keep insulin away from sunlight.

Note

Do not inject 2-3 inches around or inside of the belly button.

You must rotate injection sites to prevent nodules (tender hardened areas) from forming!

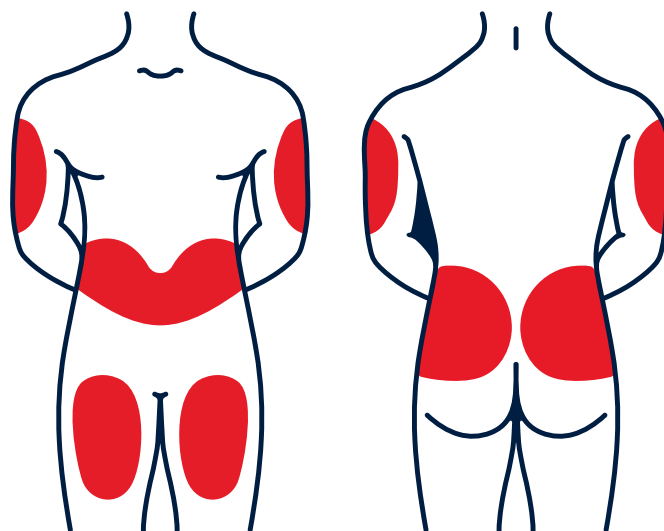
If leakage from injection site is noted, do not replace with extra insulin and continue to monitor blood glucose.

Unless otherwise instructed, insulin should be given 10-15 minutes before the meal.

Injection site selection

Insulin is meant to be injected under the skin into the fatty tissue such as:

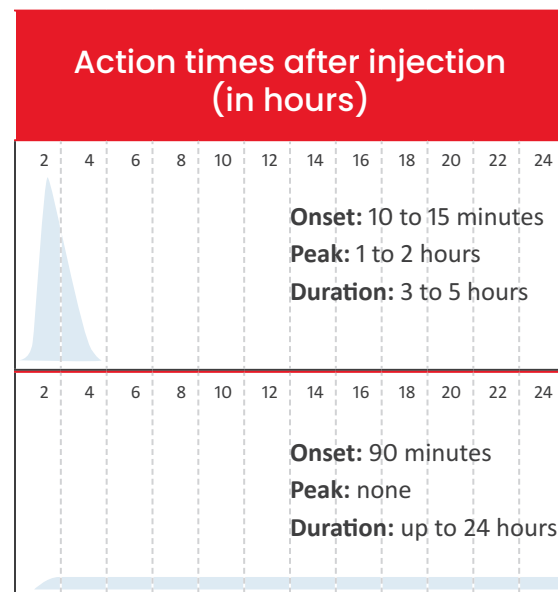
- Back of upper arms
- Abdomen
- Outer thighs
- Upper buttocks



Insulin

action times

Type of insulin	Brand names	Action time after injection	When to use
Rapid-acting	Humalog Novolog Lyumjev Fiasp	Onset: 10-15 minutes Peak: 1-2 hours Duration: 4 hours	Taken with meals
Long-acting	Lantus Tresiba Basaglar Semglee Toujeo	Onset: 90 minutes Peak: none Duration: up to 24 hours	Taken once daily

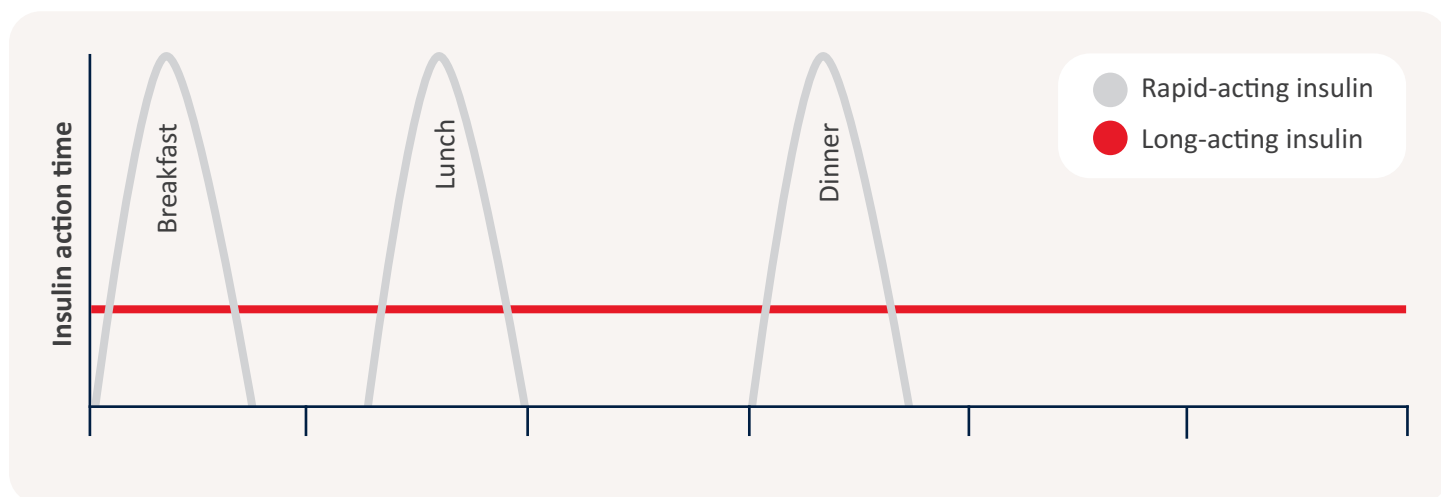


Onset: The length of time before insulin reaches the bloodstream and begins lowering blood glucose.

Peak: The time in which insulin is at maximum strength to lower blood glucose.

Duration: How long insulin continues to lower blood glucose.

Effects of insulin over 24 hours



Insulin pen use

- 1 Remove the pen cover or cap and clean the top with an alcohol swab.



- 2 Pen needle preparation:
 - a. Pull the paper tab off of the pen needle.
 - b. Screw the pen needle onto the insulin pen.
 - c. Remove the clear outer needle cover and colored inner needle cover to expose the needle.
- 3 Prime the pen needle.
 - a. Turn the dial up to 2 units.
 - b. Press down on the dose knob until the dial is back at 0.
 - c. Repeat until insulin drops or stream appears.
- 4 Select the dose.
 - a. Turn the dial to the dose given to you by your provider.
 - b. Double check the dose window to ensure you have selected the proper dose.



- 5 Select the injection site and clean it with alcohol. Allow it to air dry completely.
- 6 Injecting insulin
 - a. Insert the needle at a 90 degree angle. If your child is less than 5 years old or has minimal fatty areas, pinch the area to raise the skin before inserting the needle.
 - b. Use your thumb to press down on the dose knob until it is back at zero.
 - c. Hold the needle in place for 10 seconds to prevent leaking.
 - d. Pull the needle straight out of the skin.
- 7 Pen needle removal and disposal
 - a. Place the outer needle cover over the needle and twist it to unscrew the needle from the pen.
 - b. Throw the used needle away as directed by your sanitation department.
 - c. Place the outer pen cover back on the pen.
- 8 Store the insulin pen for future use as directed by manufacturer.

Insulin vial use

drawing insulin from the vial



1

Remove cap from insulin vial.



2

Clean rubber top of vial with alcohol swab.



3

Remove clear cap and orange cap from insulin syringe.



4

Pull air into syringe to match dose by pulling the plunger.



5

Inject air into the insulin vial.



6

Turn vial upside down and draw 5-10 units into the insulin syringe then push back into vial. This will remove air from the insulin syringe.



7

Draw insulin dose.

Calculating Insulin Dose for carbohydrates & correction

What is an insulin to carbohydrate ratio?

The insulin to carbohydrate ratio (ICR) tells you how many grams of carbohydrates (CHO) are covered by one unit of rapid-acting insulin. An ICR will allow you to adjust the rapid-acting insulin dose based on the amount of carbohydrates you choose to eat at meals.

What is a correction factor?

A correction factor (CF), sometimes called sensitivity factor, is used to calculate the amount of insulin you need to bring your blood glucose into target range. The goal of the CF is to help bring the elevated blood glucose level down to target range.

Putting it all together

The rapid-acting insulin dose will be determined by the total number of carbohydrates calculated at each meal (breakfast, lunch, or dinner) plus any extra rapid-acting insulin required for a blood glucose over the target.

Note: You will still take your set dose of Long-Acting insulin.

Calculating your dose of insulin for carbohydrates (ICR):

Sarah's ICR is 1:25 (one unit of rapid-acting insulin for every 25 grams of carbs)

Sarah will be eating 70 grams of carbohydrates for breakfast

Calculation for insulin to CHO Ratio (ICR)

Calculation for insulin to CHO ratio (ICR)

	÷		=		=	A
Number of CHO to be eaten at meal time	divided by	ICR (insulin to CHO ratio)		Units of rapid-acting insulin to be given to cover that meal		

A = 70 grams ÷ 25 (ICR) = 2.8 units of rapid-acting insulin to cover carbohydrates for breakfast

Calculating your dose of insulin for blood glucose (CF)

Sarah's correction factor (CF) is 1 unit for every 50 mg/dL with a target glucose of 100. This means that 1 unit of insulin will bring Sarah's blood glucose down by 50 mg/dL.

Her glucose is 201.

Calculate her insulin dose for correction.

$$\begin{array}{ccccccc} \text{[Box]} & - & \text{[Box]} & = & \text{[Box]} & \div & \text{[Box]} = \text{[Box]} = \text{B} \\ \text{Blood glucose} & \text{minus} & \text{Target} & & \text{Number of} & \text{divided by} & \text{CF} \\ \text{before meal} & & & & \text{points above} & & \text{Correction} \\ & & & & \text{target number} & & \text{Factor} \\ & & & & & & \text{Units of} \\ & & & & & & \text{rapid-acting insulin} \\ & & & & & & \text{needed to } \textbf{CORRECT} \\ & & & & & & \text{blood glucose to bring it} \\ & & & & & & \text{back to target number} \end{array}$$

B = 201 mg/dL – 100 mg/dL = 101 points above target, then
101 points above target ÷ 50 (CF) = **2 units** of rapid-acting insulin to correct for high glucose

Putting it all together

What is Sarah's total dose of rapid-acting insulin based on meal ICR (A) and CF (B)?

$$\begin{array}{ccccccc} \text{[Box]} & + & \text{[Box]} & = & \text{[Box]} & & \text{Do not round up or down} \\ \text{A} & \text{add} & \text{B} & & \text{Total units of} & & \text{until the very end!} \\ & & & & \text{rapid-acting insulin} & & \\ & & & & \text{your child will receive} & & \\ & & & & \text{for this meal time only} & & \end{array}$$

Add the meal dose (A) plus the correction dose (B) = Total rapid-acting insulin dose for meal
2.8 units (A) + 2 units (B) = 4.8 units which rounds to 5 units total rapid-acting insulin

*Rounding:

If greater than or equal to 0.5 round up to the next whole number (i.e. 10.8 = 11)

If less than 0.5 round down to the nearest whole number (i.e. 10.3 = 10)

Using insulin to carbohydrate ratio (ICR) & correction factor (CF)

Sample ICR: _____ CF: _____

Formula for insulin to CHO ratio (ICR). This means one unit of Novolog/Humalog will cover this many CHOs

$$\begin{array}{ccccccc} \boxed{} & \div & \boxed{} & = & \boxed{} & = & \text{A} \\ \text{Number of CHOs} & \text{divided} & \text{ICR (insulin to} & & \text{Units of} & & \\ \text{to be eaten} & \text{by} & \text{CHO ratio)} & & \text{rapid-acting insulin} & & \\ \text{at meal time} & & & & \text{to be given to cover} & & \\ & & & & \text{that meal} & & \end{array}$$

Formula for CF. This means 1 unit of Novolog/Humalog will bring the glucose down by this many points.

$$\begin{array}{ccccccccc} \boxed{} & - & \boxed{} & = & \boxed{} & \div & \boxed{} & = & \boxed{} & = & \text{B} \\ \text{Glucose} & \text{minus} & \text{Target} & & \text{Number of} & \text{divided} & \text{CF} & & \text{Units of} & & \\ \text{before meal} & & & & \text{points above} & \text{by} & \text{Correction} & & \text{rapid-acting insulin} & & \\ & & & & \text{target number} & & \text{Factor} & & \text{needed to } \textbf{CORRECT} & & \\ & & & & & & & & \text{blood glucose to bring it} & & \\ & & & & & & & & \text{back to target number} & & \end{array}$$

Now add two doses together!

$$\begin{array}{ccccccc} \boxed{\text{A}} & + & \boxed{\text{B}} & = & \boxed{} & & \text{Do not round up or down} \\ & \text{add} & & & \text{Total units of insulin} & & \text{until the very end!} \\ & & & & \text{(rapid-acting insulin)} & & \\ & & & & \text{your child will receive} & & \\ & & & & \text{for this meal time only} & & \end{array}$$

If blood glucose is 70-100 there is no need to correct it!

Simply give insulin calculated for the carbs to be eaten.
Do not use CF.

If blood glucose is below 70, first treat the low with carbohydrates immediately.

Example: 15 grams rapid acting CHOs like juice, recheck blood glucose 15 minutes later, after verifying that it is > 70-80, give the Novolog/Humalog insulin calculated using ICR. NEVER use correction factor (CF) with a high blood glucose that is a result of a low blood glucose treatment NEVER include CHOs used to treat low blood glucose when calculating insulin for the food.



Sick Day Management

- 30 Steps to take when you are sick
- 31 Sick day recommendations
- 32 Ketone and ketones testing
- 33 Results of urine and blood ketones
- 34 Guidelines for giving extra Insulin
- 36 Ketosis management guidelines
- 37 Diabetic Ketoacidosis
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Sick day management

People with diabetes get sick like everyone else, but they may require additional care to keep glucose levels close to target range. Glucose may rise with infections, inflammation, stress, pain, and some medications. Alternatively, hypoglycemia (low glucose) may result from a decrease in food intake or the body using more energy to fight illness. It is especially important to closely monitor glucose and ketone levels during illness and aim to keep glucose levels close to target range for a faster healing time.

Steps to Take When You Are Sick

- 1 Continue to take medications as directed by your physician, especially if you are taking insulin.** It is especially important for a person with diabetes to continue taking their medications as directed. If glucose levels are outside of target range, contact your diabetes clinic for assistance with adjusting insulin doses. When prompted by the meter display, place a drop of blood on the strip.
- 2 Continue to consume the same amount of carbohydrates as normal if possible.** This will decrease the risk for hypoglycemia (low glucose). If a meal cannot be tolerated, encourage to drink beverages with carbohydrates equivalent to a typical meal. Take small sips every 10-15 minutes if needed to help keep the liquid down.
- 3 Monitor glucose levels more frequently. Check glucose every 3 hours unless otherwise specified by your healthcare provider.** Call the Urgent Diabetes Line if BG is >300 mg/dl (on injections) or >250 mg/dl (on pump) 3 or more times in one day.
- 4 Drink plenty of sugar-free or low-sugar fluids with electrolytes. Drink carbohydrate containing liquids if glucose is low.**
 - Broth
 - Pedialyte or Pedialyte popsicles
 - Gatorade zero
 - Powerade Zero
 - DripDrop
 - Sugar-free popsicles
- 5 If you have type 1 diabetes or take insulin, check ketones at least every 3 hours during illness, even if glucose is normal. If vomiting occurs more than 2 times and you are unable to keep fluids down, **Go to the Emergency Room** for a DKA evaluation.**
- 6 If you notice consistent hyperglycemia (high glucose) for over 24 hours, a medication adjustment may be required. Please contact your diabetes clinic for assistance.**

Emergency Contacts at TCH

Texas Children's Diabetes Urgent Line: 832-822-3670, option "0"

Texas Children's Pavilion for Women: 832-826-7500, option "3"

Sick day diet recommendations

When you are sick, it may be difficult to follow your normal diet. It is important to try and follow your regular meal plan as close as possible to decrease risk for hypoglycemia (low glucose). Try to drink plenty of low-sugar/sugar-free fluids to stay hydrated and flush out ketones. If you are unable to tolerate meals, aim for **30-45 grams** of liquid carbohydrate every 3-4 hours until you are able to tolerate your regular diet. See below for meal ideas.

Try to match your usual intake of carbohydrates, but with foods that are easy-on-the-stomach.

Low-Sugar/Sugar-Free Fluids	Liquid Carbohydrates	Carbohydrate Foods
• Broth • Crystal Light® • DripDrop® • G2 • Gatorade zero • Pedialyte Popsicles® • Pedialyte® • Powerade Zero®	• Creamed soups • Frozen juice bars • Yogurt • Popsicles • Pudding • Sherbet	• Applesauce • Crackers • Gelatin • Soups

See chart below to help you with food ideas to meet your daily needs.

Sick Day Foods by Carbohydrate Amount*			
15 Grams	30 Grams	40 Grams	50 Grams
• ½ cup regular Gelatin • ½ cup juice • 6-8 crackers • 1 cup of chicken noodle soup	• ½ cup sweetened applesauce • 1 cup juice • 16 oz regular Gatorade or Powerade • Sandwich (2 slices of regular bread with protein)*	• 12 oz can of ginger ale • 2 Creamsicle bars • 6 oz Real Italian ice • 2-3 frozen fruit bars	• 1 cup orange sherbet • 1 package of cooked ramen noodles • 2 pudding snacks • 2- 6oz flavored regular yogurts

*Always read specific product label for accurate carbohydrate amount.

Ketone and Ketones testing

What are ketones?

Ketones are made by the body from breaking down fat when glucose cannot be used for energy. This happens when there is not enough insulin in the body. Ketones can be measured in the urine or blood.

Consequences of elevated ketones:

When too many ketones are produced, they can build up to dangerous levels in your body. In individuals with diabetes (particularly type 1 diabetes), this may lead to diabetic ketoacidosis (DKA), an acute life-threatening condition.

When to check for ketones:

- If taking insulin by **injections**: Glucose levels more than 300 mg/dL twice in a row 3 hours apart
- If using an insulin **pump**: Glucose levels more than 250 mg/dL twice in a row 3 hours apart and/or increasing glucose level after giving insulin correction via pump
- During an illness, every 3 hours, even if blood glucose is in target range
- Missed insulin doses
- Nausea, vomiting, and/or abdominal pain
- Rapid breathing and/or fruity smelling breath
- Very thirsty and/or have very dry mouth
- Lethargy, confusion, and/or not acting like self

How to Check Urine for Ketones:

Each bottle of ketone testing strips will have an expiration date. The expiration date is for unopened bottles. Opened bottles of ketone testing strips must be discarded 6 months after opening.

- 1 Dip the strip in urine that has been collected in a cup. Do not check urine from the toilet.
- 2 Wait for the test strip to develop. The instructions on the bottle will tell you how long to wait.
- 3 Compare the color of the strip to the color chart on the bottle.

How to check blood for ketones

Measuring blood ketones using a ketone meter is similar to measuring blood glucose using a glucometer.

1

Open a foil wrapped ketone strip from the package and insert it into the meter.

2

When prompted by the meter display, place a drop of blood on the strip.

3

Read blood ketone level result and record the value in your logbook.



Results of Urine and Blood Ketones:

	OK	Caution	Danger	Emergency
Blood Ketone Results	Less than 0.6	0.6-1.0	1.1-1.5	More than 1.5
Urine Ketone Results	Negative or Trace (0-14)	Small (15-39)	Moderate (40-80)	Large (more than 80)
What to do:	Continue your child's usual diabetes management. If blood glucose levels are high for more than 3 days, the insulin dose may need to be changed. Call your diabetes clinic for a blood glucose log review.	Drink sugar free fluids. Recheck blood glucose and ketones every 3 hours until blood glucose is less than 300 and ketones are trace or negative (for urine) or less than 0.6 (for blood).	Rapid-acting insulin is needed. Give insulin as directed and call the Diabetes Urgent Line at 832-822-3670, option "0". Ask for diabetes doctor on-call or diabetes educator. Drink water or sugar-free fluids. Do NOT exercise. Go directly to the Emergency Room if child is vomiting and not tolerating fluids, is breathing fast and/or lethargic.	

Guidelines for Calculating Extra Insulin for Ketones:

Extra insulin must be given if someone has moderate or large urine ketones or blood ketones above 1.0 mmol/L.

Call the Diabetes Urgent Line at 832-822-3670 and choose option '0' to reach the operator. Ask for the diabetes doctor or CDE if:

- If you have a child that was recently diagnosed with diabetes.
- If your child is younger than 5 years old.
- If you do not feel comfortable giving extra insulin on your own.

Giving extra doses of **rapid-acting** insulin can be repeated **every 3 hours** until the urine ketones are small, or blood ketones are less than 0.6. During this time continue to drink additional sugar-free fluids.

Calculating an Extra Insulin Dose:

Use the Correction Factor (CF) or sliding scale provided by your healthcare provider to calculate your rapid-acting insulin correction dose. If you do not have a Correction Factor or sliding scale dose, **contact the Diabetes Urgent Line at 832-822-3670** for assistance with extra insulin dosing.

Example:

James's CF is 1 unit for every 50 mg/dL with a target glucose of 100.

This means that 1 unit of insulin will bring James's blood glucose down by 50 mg/dL.

His current glucose is 350 mg/dL. Calculating insulin dose for correction

	-		=		÷		=		=	B
Blood glucose before meal	minus	Target		Number of points above target number	divided by	CF Correction Factor		Units of Novolog/Humalog needed to CORRECT BG to bring it back to target number		

Calculation:

350 mg/dL – 100 mg/dL = 250 points above target, then

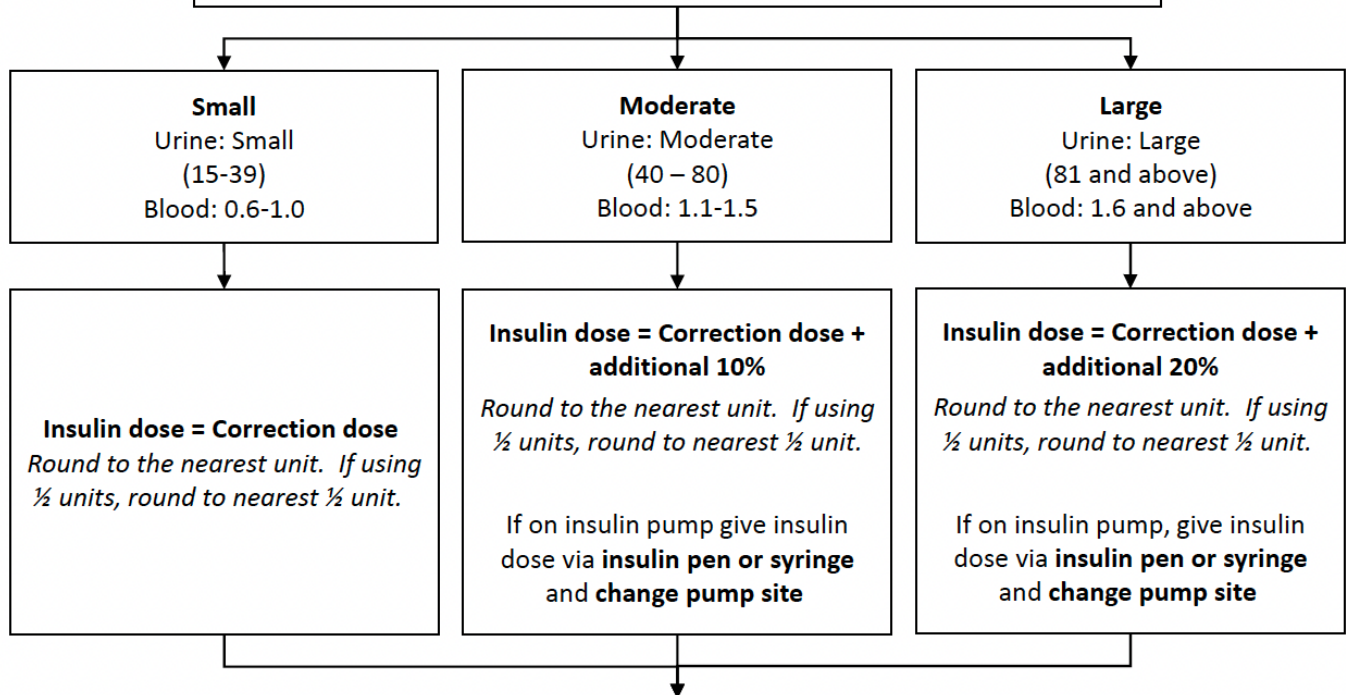
250 points above target ÷ 50 (CF) = **5 units** of rapid-acting insulin to correct for high glucose.

***Note: To avoid causing hypoglycemia (low blood glucose), only give extra rapid-acting correction insulin if the last rapid-acting insulin dose was given 3 or more hours ago.**

Ketosis Management Guidelines (Age 6 years and older)

Correction factor: _____ Target: _____

If last injection of rapid-acting insulin was 3 or more hours ago,
blood glucose above 300 mg/dL (on injections) **or** above 250 mg/dL (on pump),
and Ketone level is:



- **Encourage fluids:**
 - If blood glucose is greater than 250 mg/dL: Drink sugar free fluids
 - If blood glucose is less than 250 mg/dL: Drink fluids containing carbohydrates such as Gatorade/Powerade or fruit juice
 - If blood glucose is less than 150 mg/dL and ketones moderate to large: Drink 15g rapid acting carbohydrates such as Gatorade/Powerade or fruit juice. Once blood glucose is above 150 mg/dL, give correction dose
- **Re-check ketones and blood glucose every 3 hours**, repeat above insulin dose based on ketone level, until negative or trace (less than 0.6)

When to call Diabetes Emergency line (832-822-3670, option "0")

- If blood glucose remains below 150 mg/dL despite drinking 15g rapid acting carbohydrates
- Ketones are not trending down, and continue to stay moderate to large
- Last injection of rapid-acting insulin was less than 3 hours ago
- If you need help calculating insulin dose

When to go to nearest Emergency Room AND call Diabetes Emergency line (832-822-3670, option "0"):

- Patient is vomiting more than twice
- Patient is not able to drink fluids
- Patient looks lethargic, has altered mental status, or difficulty breathing

Ketosis Management Guidelines (Age 6 years and older) Calculations Sheet



Correction Factor: _____ Target: _____

Step 1: Calculate Correction Dose:

Step 1a: Subtract Target blood glucose current from blood glucose

Step 1b: Divide answer from Step 1a by Correction Factor

$$\left(\begin{array}{c} \text{Current Blood} \\ \text{Glucose} \end{array} - \begin{array}{c} \text{Target Blood} \\ \text{Glucose} \end{array} \right) \div \begin{array}{c} \text{Correction Factor} \end{array} = \begin{array}{c} \text{Correction Dose} \end{array}$$

Step 2: Calculate Insulin Dose based on Ketones:

Ketones levels:	Calculations:
Small ketones Urine: Small (15-39) Blood: 0.6-1.0	Insulin dose = Correction dose (see above) Round to the nearest unit. If using ½ units, round to nearest ½ unit.
Moderate ketones Urine: Moderate (40 – 80) Blood: 1.1-1.5	Insulin dose = Correction dose (see above) + additional 10% $\begin{array}{c} \text{Correction dose} \\ \text{(see above)} \end{array} \times 1.10 = \begin{array}{c} \text{Insulin dose} \end{array}$ Round to the nearest unit. If using ½ units, round to nearest ½ unit. If on insulin pump give insulin dose via insulin pen or syringe and change pump site
Large ketones Urine: Large (81 and above) Blood: 1.6 and above	Insulin dose = Correction dose (see above) + additional 20% $\begin{array}{c} \text{Correction dose} \\ \text{(see above)} \end{array} \times 1.20 = \begin{array}{c} \text{Insulin dose} \end{array}$ Round to the nearest unit. If using ½ units, round to nearest ½ unit. If on insulin pump give insulin dose via insulin pen or syringe and change pump site

Step 3: Recheck blood glucose and ketones in 3 hours, encourage fluids, as per algorithm (page 1)

Diabetic Ketoacidosis (DKA)

What is DKA?

DKA is a serious, life-threatening condition. It occurs when the body's cells do not get the glucose that they need for energy and the body begins to burn fat, which produces ketones. When too many ketones are produced, they can build up to dangerous levels in your body.

What can cause DKA?

- Missing insulin/not getting enough insulin.
- Illness – ketone production can increase with illness, especially if not eating or having persistent vomiting
- Not rotating injection sites – overusing the same injection site can cause scar tissue which does not allow the body to absorb insulin.
- Using spoiled or expired insulin – unopened insulin vials and pens need to be refrigerated. Once opened, insulin may be kept at room temperature (not above 90 degrees) for up to 28 days or the expiration date on the bottle, whichever comes first.
- Insulin pump occlusion – if on an insulin pump, the plastic cannula may bend or kink which can cause a blockage in insulin delivery.

What are symptoms of DKA?

Early Symptoms	Later Symptoms
High blood glucose	Nausea/vomiting/abdominal pain
Elevated ketones in urine or blood	Rapid breathing
Frequent urination	Fruity smelling breath
Very thirsty/very dry mouth	Dry or Flushed skin
	Confusion/not acting like self

Surgery management

- Call the diabetes team once you find out the time and date of surgery. You will be given a procedure letter which includes instructions on how to manage diabetes before and after the surgery.
- Take all your diabetes supplies with you on the day of the procedure.

Alternatives to the Emergency Room

- Some urgent diabetes situations may be able to be handled in our Diabetes Urgent Care Bay
- Call **832-822-3670** to speak with a Diabetes Educator or on call Diabetes Doctor to assess your child
- Locations at:
 - Texas Medical Center
 - West Campus
 - The Woodlands
 - Austin

Nutrition & Physical Activity

- 40 Carbohydrate counting
 - 42 Carbohydrate plan
 - 44 Carbohydrate foods breakdown
- 46 Reading food labels
- 47 The Plate Method
- 48 Exercise
 - 49 Does exercise help
 - 50 How to manage exercise
- 51 Snacks
- 57 Carbohydrate counting practice

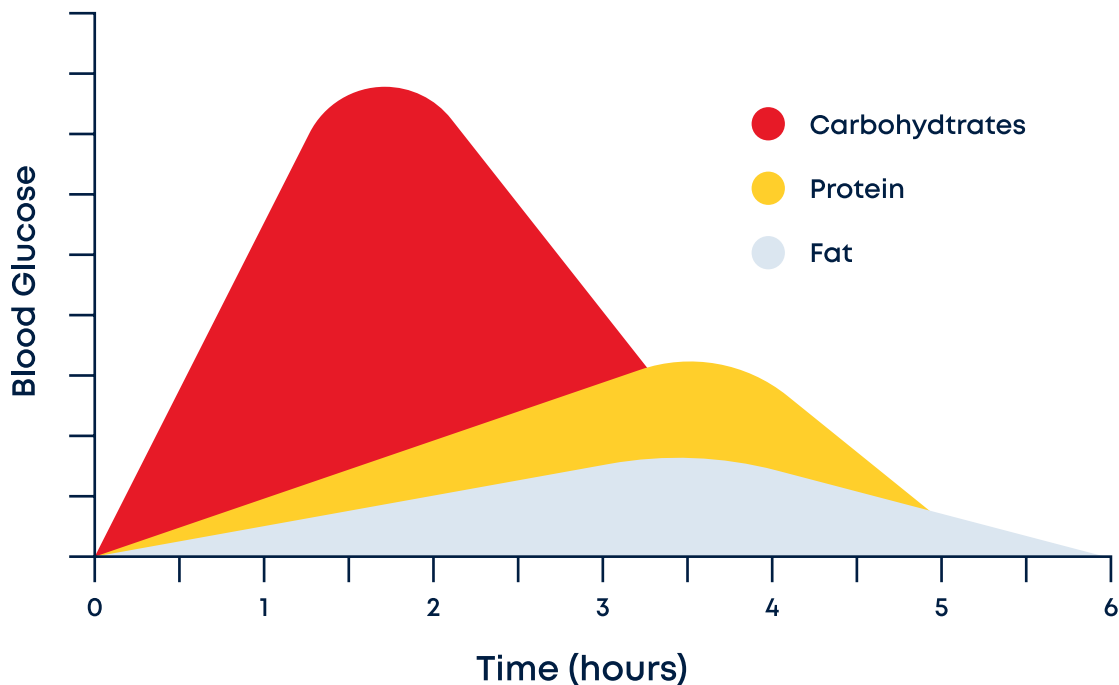
Carbohydrate Counting:

Focus On Consistency

Carbohydrates are the foods that are broken down into glucose (sugar) in our body. They are the main foods that will affect our blood glucose.

Carbohydrates are the body's best source of energy and necessary for optimal growth and development.

Effects on blood glucose over time



What are Carbohydrates?

Bread/starch, fruit, dairy, starchy vegetables, and sugar are carbohydrate-containing foods.

Learning to identify which foods and drinks contain carbohydrate and managing the portions of these foods will help you meet your blood glucose goals. It is important to watch your portions to maintain good blood glucose control and meet our nutrition needs.

Bread/Starch



Fruit



Dairy



Starchy Vegetables



Sugar



Groups	Carbohydrates	Non-Carbohydrates
Bread & Starches	Breads, pasta, rice, crackers, cereal, breaded food items (chicken nuggets, fried pickles, fried cheese), chips beans and lentils	
Vegetables	Corn, potatoes, peas, winter squash	Green beans, lettuce/leafy greens, cucumbers, celery, broccoli, carrots (see chart on page D-6)
Fruit	Fruit and fruit juice, dried fruits	
Dairy	Milk and yogurt, ice cream	Cheese, butter, sour cream, half and half, heavy cream
Meats/Protein	Breaded meats (chicken nuggets, chicken tenders)	Eggs, meat, fish, nuts
Other	Sweetened beverages such as: regular soda, Gatorade®, Kool Aid®, sweet tea Sugary desserts such as candy, cake, cookies Condiments that contain sugar such as: honey, syrup, ketchup, BBQ sauce	Sugar-free beverages such as: Diet soda, Gatorade® Zero Condiments such as: mustard, mayonnaise, ranch dressing, herbs and spices, oils

Focus on Consistency

Eating consistent amounts of carbohydrates across the day can help you achieve better blood glucose control.



Eating **too many** carbohydrate-containing foods without taking adequate insulin will make your blood glucose go up.



Eating **too few** carbohydrates can mean missing nutrients and may cause you to experience low blood glucose (hypoglycemia).

Eating consistent amounts of carbohydrate at meals and snacks from one day to the next helps keep your blood glucose in a healthy range. It also helps you and your health care team identify whether your current diabetes plan is working for you and if you need medication added or adjusted for better blood glucose control. Following a balanced diet is important for your child's growth and development.

My Carbohydrate Plan

This chart serves as a starting point for carbohydrate intake. Each child’s needs are different and will fluctuate based on their growth, development and physical activity. Your diabetes care team will help you customize carbohydrate intake goals.

Boys: Carbohydrate Amounts per Age*						
Ages (years)	Breakfast	Snack	Lunch	Snack	Dinner	Snack
1-3	30	8	30	8	45	8
4-5	45	8	45	15	45	8
6-8	45	0/15	45	0/15	60	0/15
9-11	45	0/15	60	0/15	75	0/15
12-13	45	0/15	60	0/15	75	0/15
14-16	60	0/15	90	0/15	90	0/15
17-18	60	0/15	90	0/15	90	0/15

Girls: Carbohydrate Amounts per Age*						
Ages (years)	Breakfast	Snack	Lunch	Snack	Dinner	Snack
1-3	30	8	30	8	45	8
4-5	45	8	45	15	45	8
6-8	45	0/15	45	0/15	45	0/15
9-11	45	0/15	60	0/15	60	0/15
12-13	45	0/15	60	0/15	60	0/15
14-16	45	0/15	60	0/15	75	0/15
17-18	45	0/15	60	0/15	60	0/15

*CHO patterns for nutritional management of diabetes are developed based on the Dietary Reference Intakes (DRI), American Diabetes Association (ADA) and International Society for Pediatric and Adolescent Diabetes guidelines. Snacks for children >6 years of age with established diabetes should be individualized for the individual.

My Personalized Carbohydrate Plan

	Breakfast	Morning Snack	Lunch	Afternoon Snack	Dinner	Bedtime Snack
Time of day						
Grams of Total Carbohydrate						

General Tips for Managing Blood Glucose

- Give short-acting insulin before eating all meals
- Eat moderate amounts of carbohydrates spread evenly across the day
- Choose complex carbohydrates (fruits, starchy vegetables, whole grains)
- Limit intake of simple sugars (i.e. soda, juice, candy, desserts)
- Plan carbohydrate intake based on appetite and nutritional needs.
Avoid force feeding situations.



Carbohydrates

All items listed below contain approximately **15 grams of carbohydrates** per listed serving.

Starches		
Breads • 1 slice regular bread • 1 biscuit • 1 square cornbread (1 3/4 inch) • 1 pancake/waffles 4" across, 1/4" thick • 1 plain roll • 1/2 English muffin • 1/2 hamburger bun • 1/2 slice pita bread • 1/4 large bagel • 1 flour or corn tortilla (6 inch) • 2 taco shells • 1/3 cup stuffing • 2 slices reduced calorie bread	Cereal and Grains • 1/4 cup (1 cup = 60g of carbohydrate) ○ Dry oat bran ○ Granola • 1/2 cup (1 cup = 30g of carbohydrate) ○ Cooked grits ○ Cooked wild rice ○ Cooked Oatmeal ○ Dry wheat bran ○ Cold breakfast cereals (check food label) • 1/3 cup cooked (1 cup = 45g of carbohydrate) ○ Pasta ○ Rice ○ Couscous ○ Barley ○ Millet ○ Quinoa	Crackers and Snacks • Crackers ○ 8 animal crackers ○ 6 Ritz (Round Butter) ○ 6 saltines ○ 2-5 whole wheat crackers ○ 3 Graham squares ○ 4 pieces Melba toast ○ 20 oyster crackers ○ 42 Goldfish • Snacks ○ 3 cups popcorn ○ 13-18 pretzel twists or sticks ○ 2 rice cakes • Chips ○ 1 oz baked or regular (approximately 15-20 chips)
Dairy	Starchy Vegetables	Fruits
Milk* • 1 cup cow's milk (non-fat, 1%, 2%, whole) • 1/2 cup ice cream • 1/2 cup evaporated milk Yogurt • 1 cup plain from whole milk • 2/3 cup with fruit, low-fat *Dairy alternatives vary in carb content, so read labels for accuracy	• 1/2 cup cooked (1 cup = 30g of carbohydrate) ○ Corn ○ Mashed potatoes ○ Boiled potatoes ○ Beans ○ Lentils ○ Peas ○ Yams/ sweet potato ○ Winter squash • 1/3 cup (1 cup = 45g of carbohydrate) ○ Baked beans ○ Hummus • 1/4 cup (1 cup = 60g of carbohydrate) ○ Mixed vegetables ○ Edamame ○ Pumpkin • Whole Foods ○ 1/2 Corn on cob ○ 1/4 Large potato • French Fries- <i>consult Nutrition Facts Label</i>	• Apple, 1 small • 1/2 cup applesauce • Apricots, 1/2 cup canned • Apricots, 4 whole • Banana, 1/2 medium • Berries, 3/4 cup • Cantaloupe, 1/3 melon or 1 cup cubes • Cherries, 1/2 cup canned or 12 fresh • Fruit juice, 1/2 cup • Dried Fruits, 2 Tbsp • Figs, 1 1/2 fresh or dried • Fruit Cocktail, 1/2 cup • Grapefruit, 1/2 large, 3/4 cup canned • Grapes, 17 small grapes • Honeydew, 1 slice or 1 cup cubes • Dates, 3 • Kiwi, 1 • Mandarin oranges, 3/4 cup canned • Mango, 1/2 small, 1/2 cup • Nectarine, 1 small • Orange, 1 small • Papaya, 1/2 fruit or 1 cup cubes • Peaches, 1/2 cup canned, 1 medium • Pears, 1/2 cup canned, 1/2 med pear • Pineapple, 1/2 canned, 3/4 cup fresh • Plantains, 1/3 cup sliced or 1/6 fruit • Plums, 1/2 cup canned, 2 small • Strawberries, 1 1/4 cup whole berries • Tangerines, 2 small • Watermelon, 1 slice or 1 1/4 cup cubed
Combination Foods		
• 1/2 cup casseroles (lasagna, spaghetti with sauce, chili with beans, mac/cheese) • 1 cup stew • 1 cup soup without beans, corn, lentils • 1/2 cup soup with beans, corn or lentils • 1/2 sandwich • 1/2 slice thin crust pizza • 5-8 chicken nuggets (depending on brand)		
Condiments		
• 1 Tablespoon (3 teaspoons) ○ Honey or agave ○ Sugar ○ Jelly/jam or syrup ○ BBQ sauce or ketchup ○ Sweet salad dressing • 2 Tablespoons ○ BBQ sauce (10-15g) ○ Ketchup (8-10g)		

Low-Carbohydrates/ Carbohydrate-Free

Does not significantly raise blood glucose levels.

Non-Starchy Vegetables	Proteins (Meat & Meat Substitutes)	Fats
Note: 1 cup raw or 1/2 cup cooked = 5 grams of carbohydrate • Artichoke • Asparagus • Baby corn • Bamboo shoots • Beans (green, wax, Italian) • Bean sprouts • Beets • Broccoli • Brussels sprouts • Cabbage • Carrots • Cauliflower • Celery • Coleslaw, no dressing • Cucumber • Eggplant • Gourds • Greens (collard, kale mustard, turnip) • Leeks • Mixed vegetables (without corn, peas or pasta) • Mushrooms • Okra • Onions • Oriental radish or daikon • Pea pods or pea snaps • Peppers • Radishes • Salad greens • Sauerkraut • Soybean sprouts • Spinach • Squash (summer, crookneck, zucchini) • Tomatoes • Turnips • Water chestnuts	Eat correct portion size and prepare meats without a batter. Bake, grill, broil, etc. • Meats ○ Beef ○ Poultry ○ Fish ○ Pork ○ Canned salmon ○ Shellfish ○ Wild game ○ Processed sandwich meats • Meat Substitutes ○ Beef jerky ○ Cheese ○ Cottage cheese ○ Egg substitutes ○ Egg whites ○ Whole egg ○ Hot dog ○ Canned sardines • Plant-Based Proteins ○ Nut spreads - almond, peanut butter and soy (without added sugars) ○ Tofu	Will help slow the rise of blood glucose after meals. Should be used sparingly. Choose low-fat options when possible. Fat should represent 30% or less of daily intake. • Unsaturated Fats - Monounsaturated ○ Avocado ○ Nut butters (without added sugars) ○ Nuts ○ Olive, canola or peanut oil ○ Olives • Unsaturated Fats - Polyunsaturated ○ Low fat margarine, reduced fat mayo or salad dressing, seeds ○ Stick or tub margarine, regular mayo or salad dressing, oil: corn, cottonseed, flaxseed, grape seed, safflower, sunflower, soybean • Saturated Fats ○ Stick butter, lard, shortening, Oils: coconut, palm, palm kernel ○ Reduced fat butter, heavy cream, regular cream cheese ○ Light cream, reduced fat cream cheese ○ Regular or light sour cream ○ Bacon

Reading Food Labels

To better manage your diabetes and make healthy food choices it is important to know how to read and understand a nutrition label.

Serving Size

Start with the serving size. Compare the amount you actually eat to the serving size listed on the label. All the nutrition values are for that one serving size.

Serving per container

It is important to know how many servings are in the package as a whole. If you eat 8 servings in this container, you will need to multiply all nutrition values by 8.

Total Carbohydrates

To count carbohydrates, look at grams of total carbohydrates only. The amount of sugar, dietary fiber, and sugar alcohols are already included in the total carbohydrate amount.

NUTRITION FACTS

Serving size 1 cup (110g)
4 servings per container

Amount Per Serving
Calories 55

	% Daily Value*
Total Fat 3g	4%
Saturated Fat 1g	5%
Trans Fat 0g	
Cholesterol 2mg	0.2%
Sodium 210mg	9%
Total Carbohydrate 30g	14%
Dietary Fiber 3g	5%
Total Sugars 2g	
Protein 7g	

Vitamin A 1mcg	1%
Vitamin B 2mcg	2%
Vitamin C 1mcg	1%
Calcium 210mg	12%
Iron 2mg	0.3%
Potassium 110mg	2%

*The % Daily Value are based on 2000 calorie diet.

Serving Size grams

This is the product weight in grams and not grams of carbohydrates. This is helpful if you have a food scale.

Total Fat

Healthier foods contain more grams of unsaturated compared to saturated fats.

Choose foods that limit saturated fat, and foods that are Trans-fat free.

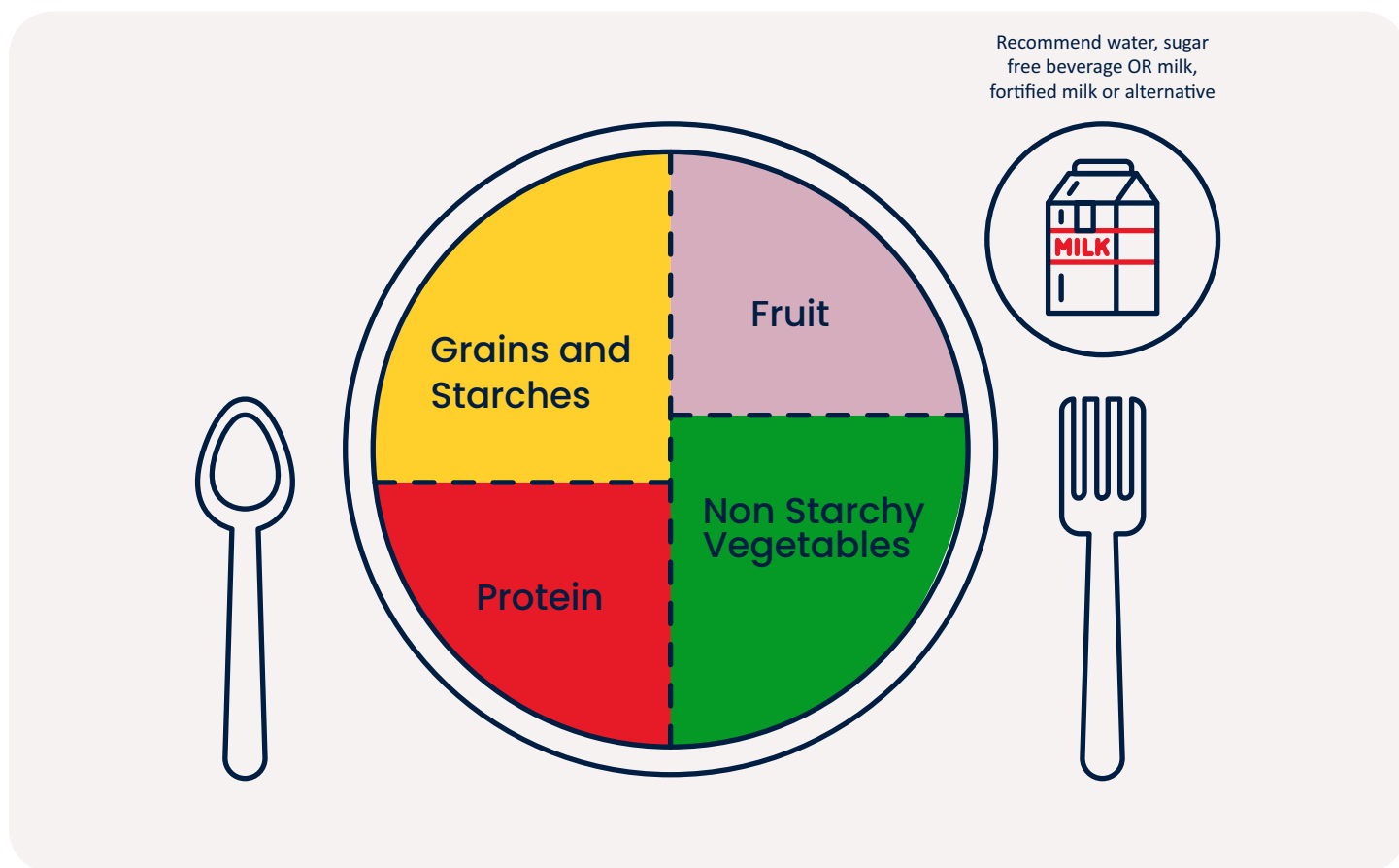
Sodium

Try to limit sodium intake to less than 2400 mg per day.

Low sodium foods will have less than 140 mg per servings.

Plate Method

The Plate Method is a convenient way to make sure you are eating proper portion sizes. All you need is an appropriate size plate.*



*7 inch plate for school age children, 9 inch plate for adolescent

Grains and starches examples

- starchy vegetables
 - corn
 - green peas
 - potatoes (includes yams/sweet potato)
 - winter squash (acorn, pumpkin)
- beans
- lentils
- breads
- tortillas
- crackers/chips
- bagels
- English muffin
- waffles
- pancakes
- cereals
- pasta
- rice and grains

Protein examples

- meats
- poultry
- pork
- turkey
- veal
- fish
- cheese
- cottage cheese
- nuts and nut butters
- eggs
- soy and other plant-based meat alternatives

Non-starchy vegetable examples

- artichokes
- asparagus
- green beans
- beets
- broccoli
- cabbage
- tomatoes
- carrots
- cauliflower
- celery
- cucumber
- lettuce
- mushrooms
- onions

Fruit examples

- apple
- banana
- mango
- grapes
- pear
- berries
- peaches
- melons

Resources & Applications

There are many available resources that can help assist with carbohydrate counting. If a restaurant or fast food chain has more than 20 locations, the US Food & Drug Administration requires nutrition information to be posted. This can be found within the restaurant's phone app or on their website online.

Here are some other applications that can help:



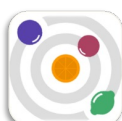
CalorieKing® app allows you to look up nutrition information for various restaurants and fast food places, as well as specific food items. Search by food category, food brand, restaurant, or even scan a barcode to find what you need. This app is FREE and available for iOS and Android.



Cronometer® is a nutrition tracker that allows you to search foods and restaurants for carbohydrate content. It also allows you to plug in recipes so you can carbohydrate count some of your favorite home cooked meals. This app is FREE and available for iOS and Android.



My Fitness Pal® is similar to Cronometer in that you can search a large database of food items and input recipes to help count carbohydrates. However, My Fitness Pal allows any user to input nutrition information, so make sure searched food items have a green verified check next to them to ensure accuracy. This app is FREE and available for iOS and Android.



Figwee® is another nutrition tracker, but it allows you to assess carbohydrate content from pictures of real food rather than measurements. Search and select your food item, then adjust the volume of food on the app to match the volume of food on your plate. The carbohydrate content will be shown for your food portion. This app is FREE to download on iOS and offers 7-day free trial (\$7.99 per month subscription).



School Café App® shows the nutrition information for school breakfast and lunch. Select your state and school district, search for your school, then browse the school breakfast and lunch menu by day to assess the nutrition information of what's being served.

Benefits of Exercise

Exercise is an important part of a healthy lifestyle for everyone. Children and teens should aim to get at least 60 minutes of moderate to vigorous physical activity daily. Physical activity plays an important role in blood glucose control.

The right balance between food, activity and insulin is the key to success. Your diabetes team members will work with you to help you get there.

How Does Exercise Help?

Reduce Stress



Strengthen Bones and Muscles



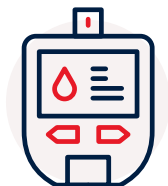
Healthy Weight Management



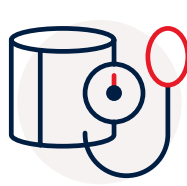
Lowers Cholesterol Levels



Helps Improve Glucose Control



Lowers Blood Pressure



Increases Energy



Examples of Daily Activity

- Play a sport
- Play with friends outdoors
- Ride a bike
- Take the stairs
- Have a dance party
- Go for a pre- or post-dinner walk
- Dance or exercise to YouTube videos
- Do homework at a standing desk
- Active chores like raking, mowing the lawn, car washing, vacuuming, dusting, etc.
- Do exercises during commercial breaks (squats, sit-ups, push-ups, jumping jacks)
- Look into student memberships at local gyms

How to Manage Exercise

In order to keep blood glucose in a safe range, you may need to eat before exercise. Be sure to monitor and record your blood glucose before and after exercise (and every 30 minutes during exercise). Each person responds to exercise and food differently. Snacks for activities need to be individualized with the help of a dietitian.

Type 1 Diabetes: Check for ketones if blood glucose is more than 250 mg/dL before or after exercise.

Intensity	Examples	If blood glucose is	Then eat	Suggestions
Light	Walking a half mile or leisurely biking for less than 30 minutes	Less than 90 mg/dL	10-15g carbohydrate per hour	• 1 Fruit with a cheese stick • 8 oz. Low-sugar sports drink • Applesauce pouch (3.2 oz.)
		90 mg/dL or above*	No food needed	
Moderate	Tennis, jogging, swimming, leisurely biking, gardening, golfing, vacuuming for 30 minutes to 1 hour	Less than 90 mg/dL	15-30g carbohydrate before exercise, then 10-15g for every 30-60 minutes of exercise	• 8 oz. Low-fat milk and 1 fruit • 1 Cup Low-fat yogurt and 1 fruit • 1 Package Peanut butter crackers • 1 Granola bar with protein or cheese stick
		90 mg/dL or above*	15-30g carbohydrate for every 30-60 minutes of exercise	• 1 Fruit with 1 tbsp peanut butter • 1/2 Banana with cheese stick • 1 Cup Low-fat yogurt
Strenuous	Football, hockey, racquetball, basketball, strenuous biking, or swimming, shoveling heavy snow, raking leaves	Less than 90 mg/dL	30-45g of carbohydrates; check blood glucose often	• 1 Peanut butter and jelly sandwich • 1 Banana, peanut butter, and low-fat milk • 8 oz. Sports drink
		90 mg/dL or above*	30g of carbohydrates (depends on intensity and duration)	• 1 Banana and 1 tbsp peanut butter • Energy gel/goo/or chew pack

Bedtime Snacks

Below are guidelines for when your child may benefit from a bedtime snack. Carbohydrate-containing snacks can be used to maintain blood glucose levels overnight. If your child is consistently requiring a bedtime snack due to low blood glucose levels, contact your Diabetes Care Team.

Bedtime Snack Guidelines (Children less than 6 years of age):

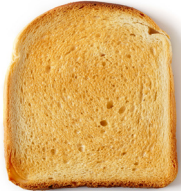
Blood Glucose Level	Action to take
Less than 70 mg/dL	Give 5-10g of fast-acting carbohydrates*, re-check blood glucose in 15 minutes
Between 70 mg/dL and 120 mg/dL	Consume 5-10 g of complex carbohydrates (carbohydrate + protein)
120 mg/dL or above	No snack needed or consume a carbohydrate free snack

Bedtime Snack Guidelines (Children 6 years of age and older):

Blood Glucose Level	Action to take
Less than 70 mg/dL	Give 5-10g of fast-acting carbohydrates*, then re-check blood glucose in 15 minutes
70 mg/dL or above	No snack needed or consume a carbohydrate free snack

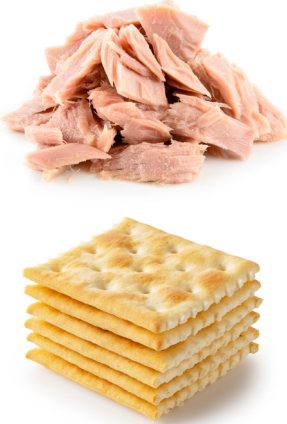
*Examples of fast acting carbohydrates include juice, glucose tablets, skittles, starburst and sugar. Please refer to chapter 3 for more examples of fast-acting carbohydrates.

15g Carbohydrate Snacks

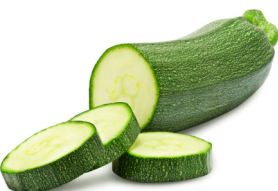
			
small apple	1/2 banana	1/2 mango	1 cup watermelon
			
1 medium orange	12 fresh cherries	15 medium strawberries (or 1 1/4 cup)	2 small plums, clementines apricots
			
1 small bunch (about 17 grapes)	1/4 cup raisins or small matchbox size	1/2 cup unsweetened applesauce	1/2 cup canned fruit in juice (not syrup)
			
1 slice toast	2 rice cakes	3 cups popcorn	8 oz. (white) milk
			
1/2 cup sugar free pudding	4-6 oz greek yogurt (Check Label)	42 goldfish (about 22grams)	8 animal crackers
			
1 oz. bag chips	15-20 pretzels	15-20 Cheez-Itz®	1 granola bar (Check Label)

Healthy Combination Snack Ideas

Great snacks include 15g carbohydrate + protein.

 8 animal crackers & 1 tablespoon peanut butter	 1 slice toast & 1 tablespoon peanut butter	 3 cups plain popcorn & 1 oz. nuts
 1 rice cake with ½ banana, & 1 tbsp nut butter	 1 small fruit & 1 oz. cheese	 1 cup berries & ¾ cup cottage cheese
 ½ sandwich (meat, cheese, vegetables or peanut butter with no jelly)	 6 saltine crackers & ¼ cup tuna salad	 8-9 pita chips & 2 tablespoons hummus

Low-Carbohydrates/ Carbohydrate-Free Snack Ideas

			
carrots	celery	cherry tomatoes	lettuce
			
spinach	cauliflower	bell peppers	pickles
			
cucumbers	zucchini	avocado/guac	broccoli
			
string cheese	cheese cubes	cottage cheese	egg
			
sliced turkey, chicken, ham, roast beef	tuna or chicken	nuts	peanut butter
			
turkey sausage links	beef jerky	sugar-free Jello	sugar-free popsicles

Healthy Combination Snack Ideas

Great snacks include low or no carbohydrates and protein.



turkey and string cheese



salad with egg or avocado



carrots and ranch dressing



celery & peanut butter



cucumber slices & tuna



nuts and cheese cubes



cherry tomato &
mozzarella cheese



lettuce wrap with
chicken or tuna salad



cucumbers & guacamole

Estimating Portion Sizes

Using measuring cups or pre-measured bowls/cups can help you determine exact portion sizes. Or, you can use parts of your hand to estimate your portion.

Fist
(Or tennis ball)



1 cup

Thumb
(Or lip balm)



1 ounce meat or cheese

Palm
(Or deck of cards)



3 ounce of meat

Fingertip



1 teaspoon

Thumb Up



1 tablespoon

Measurement Conversion Chart

Use this chart to convert various measurements to help with carbohydrate counting.

Cup	Fluid Oz (fl oz)	Tablespoon (Tbsp)	Teaspoon (tsp)	Milliliters (mL)
1 cup	8 oz	16 Tbsp	48 tsp	237 mL
3/4 cup	6 oz	12 Tbsp	36 tsp	177 mL
2/3 cup	5.33 oz	10.67 Tbsp	32 tsp	158 mL
1/2 cup	4 oz	8 Tbsp	24 tsp	118 mL
1/3 cup*	2.67 oz	5.33 Tbsp	16 tsp	79 mL
1/4 cup	2 oz	4 Tbsp	12 tsp	59 mL
		1 Tbsp	3 tsp	

*1/3 cup + 1/3 cup + 1/3 cup = 3/3 cup → 1 cup

Decimal Conversions

- 1/4 = 0.25
- 1/3 = 0.33
- 1/2 = 0.5
- 2/3 = 0.67
- 3/4 = 0.75

Carbohydrate Counting Practice

Sample:

Quantity	Food/Beverage Item	Contains carbs?	Total Carbohydrates (g)
1 cup	Cooked rice	☒ Y ☐ N	45 g
4 oz	Grilled chicken	☐ Y ☒ N	--
1/2 cup	Steamed broccoli	☐ Y ☒ N	--
3/4 cup	Blueberries	☒ Y ☐ N	15 g
8 oz	Crystal Light Lemonade	☐ Y ☒ N	--
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	
		☐ Y ☐ N	

Total Carbohydrates: **60g**

Insulin to Carb Ratio (1:10) ÷ **10**

Units of Insulin = **6 units**

Carbohydrate Counting Practice

Quantity	Food/Beverage Item	Contains carbs?	Total Carbohydrates (g)
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	

Total Carbohydrates:

Insulin to Carb Ratio (1:) ÷

Units of Insulin =

Carbohydrate Counting Practice

Quantity	Food/Beverage Item	Contains carbs?	Total Carbohydrates (g)
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	

Total Carbohydrates:

Insulin to Carb Ratio (1:) ÷

Units of Insulin =

Carbohydrate Counting Practice

Quantity	Food/Beverage Item	Contains carbs?	Total Carbohydrates (g)
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	
		Y / N	

Total Carbohydrates:

Insulin to Carb Ratio (1:) ÷

Units of Insulin =

Diabetes Technology

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Technology



Omnipod



Tandem
(Control IQ)



Medtronic



Libre 2 & 3



Dexcom (G6 & G7)



iLet

Continuous Glucose Monitors (CGM)

What is a CGM?

A continuous glucose monitor (CGM) is a medical device that tracks glucose levels throughout the day. It measures glucose in the interstitial fluid underneath the skin approximately every 5 minutes. This is different from a blood glucose meter, which measures glucose in the blood. The correct use of an FDA-approved CGM can reduce or eliminate the need to perform multiple finger sticks throughout the day. When wearing a CGM, a finger stick is indicated to make treatment decisions if your child's symptoms do not match the readings from the CGM.

Benefits of a CGM

- Displays current glucose values and trends (shows whether glucose is rising, falling, or stable)
- Has the option of alerting to out-of-range glucose levels allowing you to treat a low or high glucose immediately. It also has trending alerts enabling you to be proactive to prevent out-of range glucose values.
- Ability to see the effects of food, insulin, exercise, illness and other variables that affect glucose in real time or patterns over time. Observing and understanding patterns will help to make informed decisions about food, exercise or insulin to improve overall blood glucose control.
- Provides data sharing with the medical team and care givers to assist in adjusting insulin doses and overall diabetes management.

Limitations of a CGM

- Because glucose is being monitored from the interstitial fluid and not the blood, there may be a 10-15 minute delay in the CGM reading compared to the glucometer reading when the glucose is rapidly rising or falling.
- Depending on which CGM system is being used, blood glucose values may be about 10-20% higher or lower than a CGM reading.
- Always verify a CGM reading less than 70mg/dl or greater than 300mg/dl with a finger stick.

Components of a CGM:

- **Sensor:** a short, thin, flexible wire that is placed under the skin using an applicator and held in place with adhesive (similar to a Band-Aid). It is recommended that a new sensor be placed every 10-14 days (depending on brand) in a different area on your body.
 - Sensor placement areas will depend on which brand is chosen. Please check manufacturer specifications.
 - Sensors are water resistant and can be worn for bathing and showering.
- **Transmitter:** attaches to the sensor and wirelessly sends the glucose information to the receiver. Not all models of CGM have a separate transmitter; some models have the transmitter and sensor all in one piece.
- **Receiver/Display Device:** Receives the glucose information from the transmitter and displays it for you to see. Depending on the CGM brand, the receiver can be a separate device or can be sent to your smartphone or insulin pump.
 - Depending which CGM system is used, family and friends may be able to see and follow glucose levels through a separate app, even when they are not with the individual, if given access to this.

CGM and Alerts

- When starting on a CGM, consider setting the low alert to 70-80 mg/dl and turn off the high alarm. The receiver will alert when glucose goes out of range.
- Over time, you and your diabetes care team will work to tighten the range of glucose values and different alarm settings to meet your goal and match your lifestyle.

What to expect from your CGM after Meals

- Hyperglycemia after meals is common, especially initially after diagnosis when your insulin doses are still being adjusted. If you notice that blood glucose levels do not come back in target range 3 hours after a meal for multiple meals, please contact the clinic.
- After giving the initial mealtime (rapid-acting) insulin, avoid administering additional rapid-acting insulin for the next 3 hours.
- Administering multiple rapid-acting insulin boluses within 3 hours of each other is called “stacking” and can lead to hypoglycemia.

To Reduce Post-Meal Hyperglycemia, Follow the Rule of 10s:

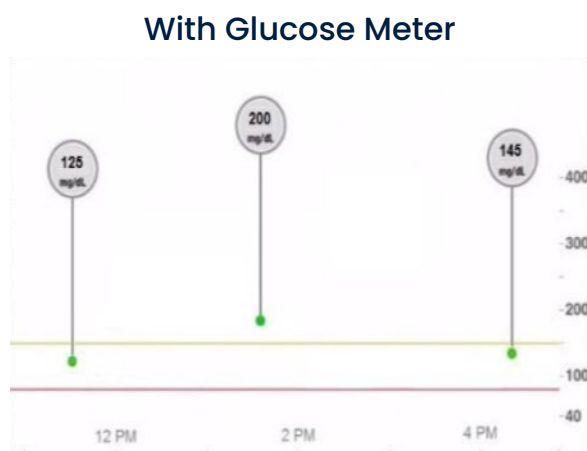
- If pre-meal blood glucose is in the 100s, bolus 10 minutes before eating
- If pre-meal blood glucose is in the 200s, bolus 20 minutes before eating
- If pre-meal blood glucose is in the 300s, bolus 30 minutes before eating

CGM and Exercise

- CGM can be worn while exercising, even swimming.
- If blood glucose is below 120-150 before exercising, consider eating a small snack of 10-15 grams of carbohydrates to prevent low blood glucose.
- Adhesive products (such as Skin Tac and Mastisol) and adhesive patches (such as Grif Grips and Simparch) are a helpful and fun way to keep the sensor and/or transmitter secure.

Continuous Glucose Monitor (CGM) Functionality

Provides a visual of your daily glucose levels



Provides more data that you and your diabetes team can use to improve your diabetes treatment plan.

Glucose

Average Glucose

169 mg/dL

Standard Deviation
62 mg/dL

GMI
7.4 %

Time in Range

10% Very High
30% High
59% In Range
<1% Low
0% Very Low

Target Range:
70-180 mg/dL

Sensor Usage

Days with CGM data
93 %
13/14

Avg. calibrations per day
0.0

Benefits and Considerations to Continuous Glucose Monitor (CGM)

- There are multiple types of CGMs available and manufactured by different companies. Your diabetes team will discuss different options and help you choose one that is best for you.
- CGMs can work independently with a receiver or smart device to view blood glucose and trends. If a smart device is used with a CGM to view blood glucose values and trends, that information can be shared with other smart phones or devices.
- When integrated with an insulin pump, CGM information can be seen on the pump. If a CGM is used with an automated insulin delivery pump, the pump will adjust insulin according to blood glucose values sent from the CGM to help prevent large fluctuations in blood glucose values.

Things to consider when deciding to utilize a CGM

Benefits	Considerations
Fewer blood glucose checks	Wearing a device on your body (24 hr/day)
Helps prevent and manage low and high blood glucose	Cost
Visible blood glucose trends in real time help make treatment decisions	Need to still check blood glucose if symptoms do not match blood glucose value on CGM
Alerts inform rapidly rising or lowering blood glucose levels	Adhesive issues or possible allergic reaction to sensitive skin
May improve overall diabetes control and A1c over time	Technology can fail
	Alerts can be disrupting
	Insurance coverage is variable

Consult with your Diabetes Team to see if a CGM is right for you and your family and to receive detailed information on the products available.



Freestyle Libre 2



Freestyle Libre 3



Dexcom G6



Dexcom G7

<https://www.freestyle.abbott/us-en/home.html>

<https://www.dexcom.com/en-us/g6-cgm-system> <https://www.dexcom.com/en-us/g7/how-it-works>

Introduction to Insulin pumps

What is an insulin pump and how does it work?

An insulin pump is a small device that delivers insulin 24 hours a day. Insulin pumps are connected to the body via an infusion set that is inserted underneath the skin. Insulin, which is stored in the pump, goes through tubing to the infusion set. There is a pump brand that does not use tubing but instead has a disposable pod that contains insulin and has an incorporated infusion set; this is referred to as “tubeless.”

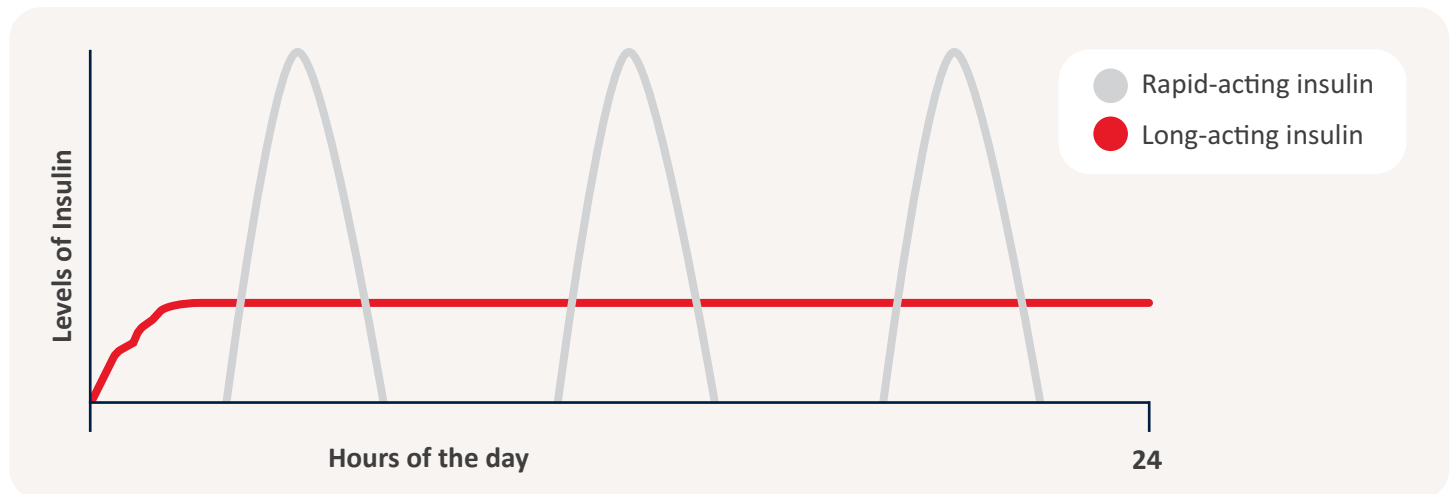
The location where the infusion set is attached to the skin is called the infusion site. Every 2-3 days the infusion site is changed to a different location such as the abdomen, arms, upper buttocks and legs (same as insulin injection sites). For active children, adhesives can be used to keep infusion sets from falling off between site changes.

What is the difference between insulin injections and pump therapy?

Two types of insulins are given via injections. Long-acting insulin (such as Lantus, Tresiba, Basaglar, Semglee, etc) is given once or twice a day, and provides long-acting insulin coverage.

Rapid-acting insulin (such as Humalog, Novolog, Apidra, Fiasp, Lyumjev, etc) is given before eating meals or snacks to bring down the blood glucose spike which occurs after eating. Rapid acting insulin is also called bolus insulin.

Insulin injection therapy



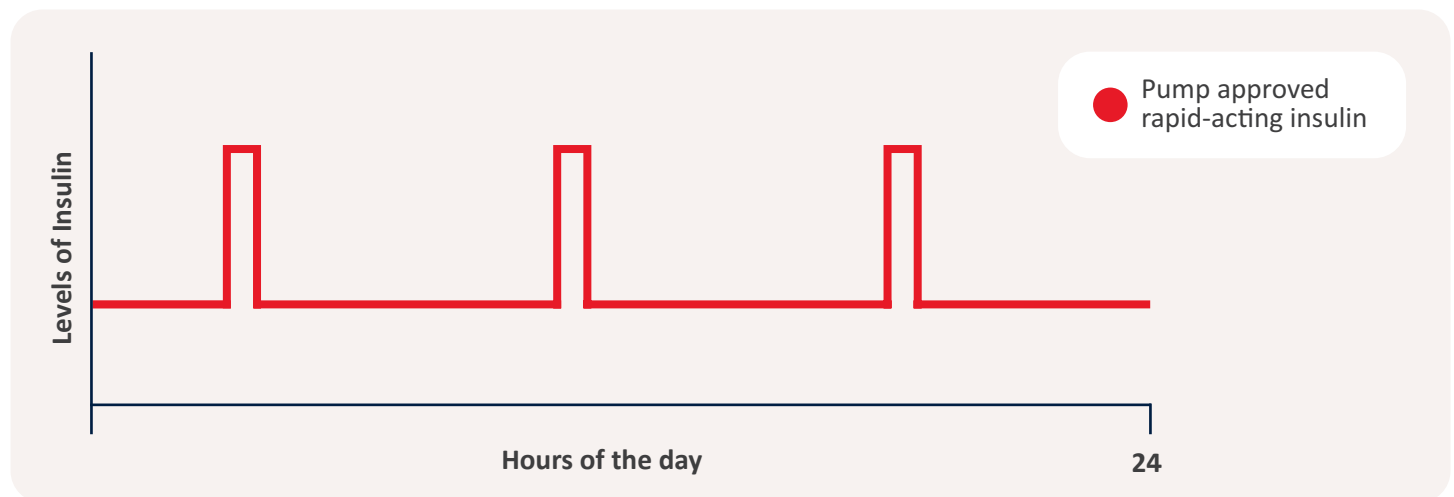
Basal Insulin

- Insulin pumps utilize only rapid-acting insulin. The pump delivers a small amount of rapid-acting insulin every hour for 24 hours a day instead of long-acting insulin. This is called “basal” insulin.
- The advantage of an insulin pump is that the basal rate can be programmed to change throughout the day and night to help keep blood glucose in target range.

Bolus Insulin

- Rapid-acting insulin is given before eating a meal/ snack or to correct high blood glucose. This is called “bolus” insulin.
- This is not automated and requires you and/or your child to count carbohydrates, check blood glucose or use the sensor glucose reading to enter these numbers into the pump.
- An insulin pump can deliver a more precise insulin bolus than possible with an insulin pen or syringe - this is particularly helpful if your child takes small insulin doses.

Insulin pump therapy



Advantage of pump therapy

- Using an insulin pump is associated with better diabetes outcomes and blood glucose control when used as prescribed.
- Boluses can be given without needing multiple needle pokes.
- Insulin dosages can be precisely set for different times of the day.
- More flexibility to manage blood glucose during or after exercise.
- Hybrid closed-loop systems can adjust insulin delivery based on CGM sensor glucose readings by increasing or decreasing basal insulin depending on glucose level. This may help to reduce time spent with low or high blood glucose levels.

Things to consider

- Finding your child's effective pump settings may take some time. Your child may not see immediate improved glucose levels after first starting a pump.
- It is important to remember that while an insulin pump may decrease the workload of caring for diabetes, it does not decrease the amount of responsibility for your child's diabetes care.
- Pump malfunctions or issues may disrupt insulin delivery.
- Pump devices should be worn consistently. Certain pumps may allow the user to disconnect for short periods of time such as during exercise.

Cost associated with pump therapy

- Insulin pump (and related supplies) coverage and costs vary by insurance policy.
- Your insurance and personal preference will determine which insulin pump your child receives.
- It is important to note that once an insulin pump is chosen, some insurance policies may not allow changing to another type of insulin pump for 4-5 years.

If you think your child/your family is ready to discuss switching to an insulin pump, please discuss it at an office visit with your diabetes health care provider and diabetes educator at Texas Children's.



Resources & Support

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- 74 How a child life specialist can support your child and family
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New to Diabetes

Support Team

Through the New to Diabetes Program, patients and parents are provided with the support and care necessary to help them effectively navigate the start of their journey with diabetes.

New Onset Diabetes Support Line: 832-824-7900

General Diabetes

resources

 American Diabetes Association Connected for Life	“We lead the fight against the deadly consequences of diabetes and fight for those affected by diabetes. We fund research to prevent, cure and manage diabetes. We deliver services to hundreds of communities. We provide objective and credible information. We give voice to those denied their rights because of diabetes.” Central South Texas office: 713-977-7706 www.diabetes.org
“diaTribe seeks to empower our readers with useful, actionable information that gives them hope for a better future, and helps them live happier and healthier lives.” www.diatribel.org	 diaTribe Learn MAKING SENSE OF DIABETES
 diabetes daily	“Diabetes Daily is a leading online community that helps people with diabetes thrive. We believe that everyone with diabetes can live healthy, happy, and hope-filled lives. Every year we help millions of people meet their peers, learn to manage diabetes, and advocate for a better future.” www.diabetesdaily.com
“The Diabetes Link is a national nonprofit organization that specializes in helping teens and young adults navigate their diabetes among an ever-changing and fast-paced world.” www.thediabeteslink.org	 THE DIABETES LINK Where Young Adults Thrive

Type 1 Diabetes

resources

	“JDRF works every day to change the reality of this disease for millions of people—and to prevent anyone else from ever knowing it—by funding research; advocating for government support of research and new therapies; ensuring new therapies come to market and are recommended by healthcare providers; and connecting, engaging, and educating the T1D community.” Southern Texas Chapter 1776 Yorktown, Suite 560 Houston, TX 77056 713-334-4400 www.jdrf.org
Type One Family Network (TOFN) South Texas is a network for parents/caregivers of children with type 1 diabetes in the Houston/South Texas area.” Search for TOFN-South Texas on Facebook	
	“Children with Diabetes is a nonprofit organization dedicated to providing education and support to families living with type 1 diabetes. Children with Diabetes focuses on care today, so we are ready for a cure tomorrow.” www.childrenwithdiabetes.com
Beyond Type 1 is a place for everyone impacted by Type 1 diabetes to share their stories, get connected to the community and find resources on topics from daily management to mental health.	

Type 2 Diabetes

resources



“Beyond Type 2 is a place for everyone impacted by type 2 diabetes to share their stories, get connected to the community, and find resources on topics from daily management to mental health.”

www.beyondtype2.org

Medical identification jewelry

Medical IDs are jewelry that alert first responders to a person’s medical condition in the event of an emergency. Children with diabetes should wear a medical ID so they can receive appropriate care in an emergency. Many different types and styles are available at many price points. If you have a Health Savings Account (HSA) or Flexible Spending Account (FSA) through your insurance plan, you may be able to use those funds for a medical ID. Below is a selection of web sites where you can buy medical IDs.

- Walmart.com, Amazon.com - available for \$10 or less
- Diabeteswellness.net - free ID necklace available
- RoadID.com
- Americanmedical-ID.com
- Laurenshope.com

Family and Medical Leave Act (FMLA)

FMLA provides eligible employees with up to 12 work weeks of unpaid leave per year and requires group health benefits to be maintained during the leave as if the employee continued to work instead of taking leave.

Your child’s diagnosis of diabetes qualifies as a “serious health condition” under FMLA. You can request intermittent leave, meaning leave is taken in separate blocks of time. You may use FMLA to take your child to appointments or stay home with them if they have high or low blood glucose, for example.

Ask your employer if you are eligible for FMLA or visit the Department of Labor web site at www.dol.gov for further information about FMLA.

Community support/social groups

Diabetes Social Group, Texas Children's Hospital

Usually fourth Thursday of the month, 6 pm – 7 pm

Held virtually on Microsoft Teams

Visit <https://tinyurl.com/TCHDMSupport>

Contact Katelyn Yzquierdo at keyzquie@texaschildrens.org with questions

JDRF Southern Texas Chapter

Visit www.jdrf.org/southerntexas and click on “Events” for upcoming opportunities

Follow JDRF Houston on Facebook for updates on local events

Type 1 Diabetes Summer Camps

Diabetes camp is an opportunity for children with diabetes to enjoy themselves in an environment that is prepared to support their specific care needs. It allows them to create new relationships and experience adventures with other children living with diabetes. Camp usually includes typical activities like swimming, arts and crafts, sports, archery, and hiking, with the added benefit that campers never have to feel like they are the “odd one out” due to their diabetes. Below are area camps that TCH individuals often attend.

Day Camps	
Camp New Horizons Dallas area	• ages 5-12 (13-17 can attend as Counselors In Training) • sponsored by the American Diabetes Association • visit diabetes.org/camps
Camp Rainbow Houston area	• ages 5-14, (15-17 can attend as Counselors in Training) • sponsored by the American Diabetes Association • visit diabetes.org/camps

Sleepaway Camps	
Camp Sweeney Whitesboro, TX 940-665-2011	• ages 5-18 • three 3-week sessions offered each summer • visit campsweeney.org
Texas Lions Camp Kerrville, TX 830-896-8500	• ages 8-15 • one-week sessions • visit lionscamp.com

Many other camps are available in other areas of Texas and throughout the country. Please visit www.diabetescamps.org for information on other camps.

Child life and Diabetes

Child life specialists are trained professionals to assist children with their psychosocial and educational needs. With a background in child development, child life specialists aim to increase positive coping and lower anxiety surrounding challenging experiences using play, therapeutic activities, diagnosis education, age-appropriate interventions, and self-expression activities.

Learning you or your child has a new diagnosis of diabetes can be confusing and overwhelming while also creating a sense of sadness, anger, or even guilt. We understand these are normal responses and emotions, and the child life team is available to provide support.

How a child specialist can support your child and family

- Help your child prepare for and cope with medical procedures (e.g., blood work, finger sticks, IVs, insulin injections, taking medications)
 - Provide age appropriate explanations
 - Use medical play that involves real or toy medical equipment to help children become familiar with medical equipment
 - Utilize therapeutic activities to help them process their feelings
 - Create a coping plan using relaxation and distraction techniques
 - Encourage the use of non-pharmacological pain management techniques
 - Provide positive praise
- Explain diabetes in a way your child can understand.
- Validate you or your child's fears, worries, and anxieties while offering advice on how to cope with them.
- Support siblings to understand a brother/sister's diabetes.
- Help individuals and families to adjust to changes in routine.
- Offer ideas about how to talk about diabetes with children's friends and classmates.
- Engage children in therapeutic play to reduce stress and help them feel more comfortable during hospitalization and office visits.



Developmental and age specific considerations

Infants and Toddlers

When your infant or toddler is diagnosed with diabetes, caregivers are encouraged to ask the medical team questions and be involved in your child's care. During your hospital stay and when you go home, it is important to provide as much consistency and routine as possible to meet your child's needs. You can also bring favorite items, such as a teddy bear or blanket, to the hospital to keep your child comfortable. It is also important that you take care of yourself by having someone to talk to and offer you support.

Preschoolers

As with infants and toddlers, caregivers are encouraged to ask the medical team questions and be involved in your child's care. During your hospital stay and when you go home, it is important to provide as much consistency and routine as possible to meet your child's needs. You can also bring favorite items, such as a teddy bear or blanket, to the hospital to keep your child comfortable. It is also important that you take care of yourself by having someone to talk to and offer you support.

Preschoolers are curious about what is going on around them and may want to do more by themselves. They may ask questions about their diabetes and want to be involved in their own care. Your child can wash their hands by themselves or choose their insulin injection site. Because of their wild imagination, some preschoolers have a hard time telling the difference between what is real and what is pretend. Preschoolers may believe they have to get injections because they are in trouble or that hospitalization is a form of punishment. It is important to be honest with your child and tell them that their behavior did not cause diabetes.

School-Age Children

School-age children with diabetes may ask questions about their medical condition and treatment. They are learning to become more independent and want to be more involved in their own care. When talking with your child about diabetes, it is important to be honest and help them understand that diabetes is a disease they will have for the rest of their lives. While your child is learning about diabetes and becoming more involved in their own care, it is important for you to manage their care. For example, while your child can pick their insulin injection site, it is important for you to make sure that the insulin dose is correct and is injected safely. Your child may also need help explaining their diagnosis and treatment to their friends and classmates. You can speak with your child's child life specialist at the hospital for tips on ways to share information about your child's diagnosis with friends.

Adolescents

When a teenager is diagnosed with diabetes, it can be stressful and overwhelming since teenagers are already facing many changes and are trying to make friends with their peers. It can be helpful to establish a routine for your teenager at home and at school to help them take care of their diabetes. It is important to talk with your teenager about the effects of diabetes if it is not managed correctly. It is normal for teenagers to be concerned about how their diagnosis might affect what others think of them, or how this might impact their image. Remind your teenager as they build friendships that their personality and identity are not limited to their diagnosis. Also, remind your teenager that they can still participate in the same activities, such as sports and spending time with friends, as they did before they were diagnosed with diabetes, however, it is important for them to still take care of their diabetes. You can speak with your teenager's child life specialist at the hospital for tips on ways to share information about your teenager's diagnosis with friends.

Supporting siblings of individuals with Diabetes

Siblings

Siblings may easily be overlooked when their brother or sister is newly diagnosed with diabetes. Here are some common feelings that siblings may experience due to a new diagnosis:

- Confusion about what is happening and why
- Guilt about having angry feelings or thoughts that they may have had towards the child who is newly diagnosed
- Fear that may become sick themselves or “catch” diabetes
- Abandonment or worry that their own needs will not be met
- Rejection since they are not involved and feel unimportant
- Jealousy due to the attention that the newly diagnosed child is receiving

You can help your child’s siblings cope with the new diagnosis by being honest and using child-friendly language when talking to them about diabetes. You can also keep your child’s siblings involved by letting them pick out healthy snacks for the family at the grocery store or reminding their sibling when it is time for diabetes care. It is important to tell siblings about the signs and symptoms of when your child may be ill and how to contact an adult when your child needs medical attention.

CHILD LIFE SPECIALISTS ARE AVAILABLE DURING HOSPITALIZATION AND CLINIC VISITS.

PLEASE CONTACT YOUR DIABETES CARE TEAM FOR MORE INFORMATION ON HOW TO CONTACT THE CHILD LIFE TEAM AT TEXAS CHILDREN’S HOSPITAL THE WOODLANDS.



Requesting a 504 Plan

What is a 504 Plan?

Section 504 of the Rehabilitation Act of 1973 is a federal law to ensure eligible disabled students are provided with educational benefits and opportunities equal to those provided to non-disabled students. A student with a physical or mental impairment that significantly limits one or more major life activities is considered “disabled” under Section 504. Examples of major life activities include caring for oneself, seeing, hearing, eating, walking, speaking, breathing, reading, communicating, etc. This may include individuals with ADHD, dyslexia, cancer, diabetes, severe allergies, chronic asthma, Tourette’s syndrome, digestive disorders, cardiovascular disorders, depression, Conduct Disorder, Oppositional Defiant Disorder, HIV/AIDS, or behavior disorders.

Parents can use a 504 Plan to ensure that, while at school, their child is treated fairly, is medically safe, and can fully participate in all school activities. Any school (public or private) that receives federal funding must comply with Section 504 laws.

What is the difference between an Individualized Education Plan (IEP) and a 504 Plan?

An IEP is for a child who has an intellectual or learning disability and requires specialized instruction and related services. A 504 plan is not an IEP as required for special education students. If a child has an IEP for special education, AND the student also has a physical or mental impairment, the 504 accommodations will be incorporated into the IEP.

What Parents/Guardians Need to Do

- 1 Contact the school and request a 504 Plan (can be done verbally or in writing). Most schools have a 504 coordinator, however this may not be their primary role (may be a teacher or a counselor, for example).
- 2 Parent/Legal Guardian will receive written notification of a 504 Plan eligibility meeting.
- 3 504 Plan eligibility meeting is held. Individuals present may include parent/guardian, principal or designee, nurse, teacher, counselor, or school social worker.
 - Write down any questions prior to your meeting.
 - Take notes and ask questions if you do not understand.
 - If you speak a language other than English, you are entitled to have an interpreter at the meeting. You should request this as soon as you receive notice of the meeting.
- 4 If your child is approved, the school will work with you to create a 504 Plan. You are your child’s advocate, so ask for accommodations that you think will help (must be related to diabetes diagnosis). The 504 Plan is developed.
- 5 Once the 504 Plan is implemented, it must be reviewed at least every three years OR each time your child changes schools. The 504 Plan may be revised any time during the school year if needed.

What if the school does not approve or follow the 504 Plan?

If a parent/guardian disagrees with the school decision, the parent can file a grievance with the school's 504 Coordinator or file a complaint with the Department of Education's Office of Civil Rights, which can be done online at www.ed.gov/about/offices/list/ocr/complaintintro.html.

Are there accommodations for taking standardized tests for college (PSAT, SAT)?

Some students with documented disabilities are eligible for accommodations on College Board Exams like the SAT, SAT Subject Tests, PSAT/NMSQT, PSAT 10, or AP Exams. Students must have prior approval for accommodations from the Services for Students with Disabilities (SSD) prior to taking a College Board Exam. It can take up to seven weeks for accommodations to be processed, so speak with your school's SSD Coordinator to assist with the process. Visit collegeboard.org for further information.

Is a college student eligible for a 504 Plan?

Section 504 of the Rehabilitation Act of 1973 also protects college students. Colleges offer a lot of support, but your child must seek out the services and advocate for himself or herself. Students must voluntarily disclose they have a disability, provide documentation, and request support or accommodations.

Suggestions for 504 accommodations might include

- Assuring that there are staff trained to check blood glucose levels and administer insulin and glucagon.
- Assuring that any staff member with immediate custodial care of the child is trained to recognize high and low blood glucose levels and knows what he or she is supposed to do in response. This would include staff members such as teachers, coaches, and bus drivers.
- Allowing the child to test their blood glucose level and take necessary actions in response such as administering insulin, or, if the child is not yet able to do so, provisions for who will perform this task.
- Provisions for where blood glucose levels will be tested and insulin administered.
- Ensuring full participation in all sports, extracurricular activities, and field trips, with the necessary assistance and/or supervision provided.
- Eating whenever and wherever necessary, including eating lunch at an appropriate time with enough time to finish eating.
- Taking extra trips to the bathroom or water fountain.
- Permitting extra absences for medical appointments and sick days when necessary.
- Making academic adjustments for classroom time missed for medical appointments, testing, or because of periods of high or low blood glucose.

The ADA maintains numerous resources regarding attending school with diabetes. Visit their website at www.diabetes.org and search for Safe at School.

Psychology & Behavioral Health support for Diabetes

Psychology services are available to help your child or teen cope with diabetes.

We have Diabetes & Endocrinology Psychologists who work especially with kids who have diabetes, as well as other endocrine conditions, to help them manage and cope with stress related to diabetes and health.

Ask your child's medical provider about Psychology services if your child is having trouble with:

- Feeling "burned out" and upset about having diabetes
- Taking care of or managing diabetes
- Arguing about diabetes management
- Feeling sad, worried, or angry since being diagnosed with diabetes
- Other emotional and behavioral concerns related to diabetes
- Emotional and behavioral concerns related to another medical condition

If you would like to request a visit with Psychology, ask your child's medical provider to place a referral. The Endocrine Social Work team can also answer questions about Psychology.

You may also request a Psychology appointment online:

<https://www.texaschildrens.org/health-professionals/referrals/psychology>

See the next two pages for advice from the psychology team about adjustment to diabetes.

Tips for helping your child cope

support for Diabetes

Let your child know that it is OK to cry and talk about feelings. It is normal to have some sad and angry feelings about diabetes. Encourage your child to share how they are feeling about their health care experience and adjustment.

Praise your child for behaviors, not numbers. Notice what they are doing well. Do not punish your child for blood glucose numbers. Tell your child “Good job sitting still for the blood glucose check” or “Thanks for asking before eating a snack.”

Blood glucose are not “good” or “bad” – they give you information to help you make decisions. Describing numbers as “bad” can cause your child to feel guilty or worry about getting in trouble when they are out of range. Praising children for “good” numbers might make them only want to report those numbers, or be confusing because they can’t always control these numbers. Instead, describe blood glucose as “high” “low” or “in-range.”

Allow your child to have choices and feel in control when possible. Let them choose which finger to use for blood glucose checks, choose a healthy snack, pick insulin sites, or where to sit for blood glucose checks and insulin.

Tell your child what they can still do – just like before, they can still play outside, go to school, play with friends, do chores, and have “treat” foods sometimes.

Have consistent food “rules” for everyone in the household. If your child with diabetes is eating an orange and other kids are eating a chocolate granola bar, diabetes might start to feel like a punishment. Try to have everyone eat similar snacks when possible.

Be honest and talk with your child about what to expect and what they need to know about diabetes. Remember that children have active imaginations and if they do not have enough information, they may make up a story to fill in the gaps.



What families “need to know” about adjusting to Diabetes (Teens)

Diabetes is a big change

- It is normal to have some sad and angry feelings about diabetes.
- It's OK to cry and talk about feelings with family and friends.
- It's OK to say “This is hard!”

Parents and caregivers play a huge role in helping kids take good care of themselves

- Help your child have a routine they follow every day for medicine and blood glucose – this will make it easier to remember diabetes tasks and help diabetes feel more manageable.
- Decide together which diabetes tasks teens are responsible for and which parents are responsible for completing. Teens still need help and can't yet manage diabetes on their own.
- Parents, tell your child what they are doing well. Focus on behaviors they can control, like “Thanks for checking your blood glucose” or “Good job remembering your insulin before dinner.”
- Parents, do not punish your child for blood glucose numbers or get angry if their numbers are high. Focus on helping them with problem solving to get numbers back down.
- Parents, if you happen to have diabetes, set a positive example for taking care of diabetes. When your child sees you taking good care of your health, they learn it is important for them too.

Make sure your child can get support from others too

- Get the school nurse and other staff involved in helping your teen at school. Make sure your child can check blood glucose, take medicine, participate in physical activities if available, and have time to eat meals at school. Help educate your family and friends about diabetes so they know how to support your child.
- Talk to your child about how they might tell some of their close friends about diabetes – having trusted friends who can support you may help diabetes not feel so hard.
- Have consistent food “rules” for everyone in the household. If your child with diabetes is eating broccoli and everyone else is eating chips, diabetes might start to feel like a punishment.

Help your child live well with diabetes

- Remember what people with diabetes CAN do – they can still spend time with friends, go to school, play sports, do chores, travel, and have “treat” foods sometimes.
- Parents, spend time with your child engaging in physical activity or talk with your child about inviting friends to participate in physical activity together.

Know that your healthcare team is here to help

- Tell your healthcare team if you or your child begins to feel overwhelmed with taking care of diabetes or you feel like you are failing at managing diabetes.

General resources

Medicaid, CHIP, SNAP, WIC, & TANF

www.yourtexasbenefits.com or
Your Texas Benefits app

Medicaid Transportation

varies based on managed care company,
please check your child's Medicaid card

Supplemental Security Income (SSI)

800-772-1213 or www.ssa.gov

Children under age 6 with diabetes may be eligible for SSI. Children ages 6 and up are usually not eligible if they do not have other health, emotional, behavioral, or learning problems.

Community Resources in Your Area

call 211 or visit www.unitedwayhouston.org

Billing and Insurance Questions

call the TCH financial counselors at 832-824-5505
or the TCH billing department at 832-824-2300

Pediatrician or Primary Care Provider (PCP)

Texas Children's Pediatrics has many offices throughout the Houston area.
Visit www.texaschildrenspediatrics.org to find one near you.

Travel & Emergency Preparedness

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It is important to plan for unexpected emergencies to ensure you have enough supplies on hand for diabetes management. Hurricanes, flooding, tornados, power outages, etc, are all examples of emergencies to be prepared for. You will need to make similar preparations for travel and diabetes management. Planning ahead will help ensure you are always prepared for successful diabetes management.

List of Emergency Supplies in Case of Disaster

Diabetes Supplies (at least two weeks' worth):

Consider storing the following in a waterproof, insulated bag:

Important Documents

- Printed copy of all prescription medications and supplies – and/or – copy of prescription labels
- Printed copy of health insurance and prescription card
- Emergency contact information
- Printed copy of insulin regimen. For pump users, a list of pump settings including: basal rate(s), insulin to carbohydrate ratio(s), insulin sensitivity factor(s) and pump action plan

General Diabetes Medications and Supplies

- Cooler and cooling packs (such as FRIO Bags)
- Long-acting insulin
- Rapid-acting insulin
- Insulin pen needles or syringes and disposal container
- Glucagon (Baqsimi, Gvoke, or Zegalogue)
- Blood glucose meter, test strips, lancets, and batteries
- Alcohol swabs
- Ketone testing supplies
- If CGM user, Continuous Glucose Monitoring supplies
- If pump user, insulin pump supplies and batteries/charger
- Anti-nausea medicine, prescriptions, and over-the-counter medications
- Medical Alert ID

Low and high blood glucose supplies

- Sugar-free beverages, water
- Glucose tablets or other non-perishable fast-acting carbohydrates for treating hypoglycemia
- Glucagon emergency medication (Baqsimi, Gvoke, or Zegalogue)

Food

- Non-perishable food, preferably food that does not have to be heated. If packing canned food, make sure to have a can opener (e.g., juice boxes, peanut butter, canned foods, crackers, shelf-stable milk)

Check with your local Red Cross chapter about other recommended emergency supplies for your region. You can also visit the Federal Emergency Management Agency (FEMA) for more disaster preparation information at www.fema.gov.

Traveling Tips for Packing

During vacation, routines may be disrupted. Simple things such as meal times, different types of foods, being more active than usual, or being in a different time zone can affect your glucose control. It is important to plan ahead so you'll have more fun and less worry!

- Pack twice as much medicine as you think you'll need
- Carry meds in the original pharmacy bottles
- Have a carry-on bag with insulin, snacks and diabetes supplies



Other Recommendations

What to PACK

For Day Trips:

- Cooler for insulin/cooling packs (such as FRIO pack) (Never put insulin directly on ice)
- Rapid-acting insulin
- Long-acting insulin
- Insulin pen needles or syringes
- Glucagon emergency medication (Baqsimi, Gvoke, or Zegalogue)
- Blood glucose meter, strips, and lancets
- Ketone testing supplies
- Alcohol swabs
- If CGM and/or pump user, backup CGM supplies, pump supplies, and batteries/chargers
- Glucose tablets or other fast-acting carbohydrates for treating hypoglycemia
- Snacks with and without carbohydrates
- Sugar-free beverages, water
- Medical bracelet

For Overnight Trips:

- All the supplies listed under “Day Trips”
- Bring at least DOUBLE the supplies you think you will need
- Diabetes clinic and pharmacy contact information
- Anti-nausea medicine
- Emergency Contact Information

For Pump Users:

- List of pump settings, including basal rate(s), insulin to carbohydrate ratio(s), insulin sensitivity factor(s)
- Supplies including pump infusion sets and reservoirs/pods (one set for each day)
- Extra batteries and or chargers
- Pump instruction manual with contact information
- Back up long-acting insulin with pen needles or syringes in case of pump failure (be sure you know your doses!)

What to PACK

For Plane Travel:

- Insulin and supplies should always be carried on – NOT “checked-in” luggage
- Pumps and continuous glucose monitors should be worn at all times and should not be removed for scanners. Request alternate screening methods such as using a hand-wand or pat down.
- Extra snacks in case of delays
- Make plans regarding time changes especially if traveling internationally. Insulin pump times will need to be reset.
- In case of a hypoglycemic event, if child refuses packed snacks, don’t hesitate to ask the flight attendant for a regular soda or juice.

For Beach Vacation:

- Bring coolers/ice packs/Frio packs to keep insulin and supplies cool – phone cannot read Dexcom if overheated
 - Never put insulin directly on ice
 - Tandem pumps and meters have temperature sensor – will not work above certain temp
 - Consider Zip-Lock bags to keep supplies dry (Tandem pump is water resistant, NOT waterproof!)
- Bring extra Skin-Tac, over-patches, Grifgrips, etc for Dexcom and pump infusion sites
- Don’t disconnect from pump for more than 1 hour at a time. If interested in taking a “pump break” for your beach vacation discuss back up insulin regimen with provider.
- HYDRATE, HYDRATE, HYDRATE!!! Heat can spike blood glucose levels if not well hydrated as blood glucose becomes more concentrated when dehydrated.

- TSA tips:
 - Although not required, you can get a TSA notification card for a quick and smooth screening process. The TSA notification card discreetly informs airport security about medical conditions, medications and/or devices that might impact the screening process.
 - Know that people with diabetes are exempt from the 3.4 oz. liquid rule for medicines, fast-acting carbs like juice, and gel packs to keep insulin cool.
 - Know that a continuous glucose monitor or insulin pump could be damaged going through the X-ray machine or conveyer belt. Therefore ask for a hand inspection which is performed by a TSA officer of the same gender so you do not have to remove medical devices attached to your body. You may also request a private screening.
 - If you have any additional questions or need assistance at the checkpoint, reach out to TSA Cares at 855-787-2227. Simply call 72 hours prior to your trip or visit TSA Cares website.

For Amusement Parks:

- Attraction accessibility accommodations are available many theme parks. Please contact guest services for further information. Special accommodations to help address concerns of long lines and possible hypoglycemia may be available.
- Locate First Aid Facility
- Stay hydrated
- Keep diabetes supplies from overheating
- Keep low treatments available at all times.
- Consider close monitoring of diabetes technology and have replacement available should a site become compromised or dislodged.

Sample Packing List for 7-day trip to Hawaii

(from Victoria Wright, NP, on OmniPod and Dexcom)

- 10 pods minimum
 - Enough for a daily change if needed plus extra in case of plane delays/missed flights/unintentional trip extensions
- 2 vials Humalog (in case one breaks!)
- Back-up long-acting insulin (i.e., Lantus)
- Back-up syringes and pen needles
 - Enough for long-acting insulin daily + 3 meals + 2 daily snacks or corrections minimum
- Bottle of ketone strips
- PDM and charger
- 2 extra Dexcom sensors
- 2 glucometers
- 2 bottles of test strips
- Glucagon

You CAN have a safe and fun vacation with diabetes!

- Plan ahead and be prepared to eliminate additional stress while on vacation
- Expect blood glucose to run higher or lower than usual due to adrenaline, different activity levels, different eating patterns, time changes, etc.
- With preparation, you will be able to make adjustments and have a great time!
- Don't hesitate to reach out to your diabetes clinic with any questions or concerns about your travel plans



Pediatric Diabetes Research

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Pediatric Diabetes and Endocrinology Research Team

About Our Research

The Pediatric Diabetes and Endocrinology Research Program at Baylor College of Medicine is committed to be at the forefront of research to advance the science and improve the lives of children living with diabetes and various endocrinological diseases.

Vision

The Texas Children's Hospital Diabetes and Endocrine Research Program is dedicated to leading cutting-edge, multidisciplinary research to prevent diabetes and endocrinologic disorders and improve the life and well-being of all youth affected with these diseases.

Mission

Our mission is to be at the forefront of advancing scientific knowledge and treatment of endocrinology and diabetes disorders through basic, clinical and behavioral research. We are committed to making research accessible to all youth, from birth to young adulthood.

To learn more about the research conducted in the Division of Pediatric Diabetes and Endocrinology, please visit the Baylor College of Medicine Research site:
<https://www.bcm.edu/departments/pediatrics/divisions-and-centers/diabetes-and-endocrinology/research>

Areas of Interest

- Understanding how type 1 and type 2 diabetes develop in children
- Prevention and treatment of type 1 diabetes in children
- Prevention and treatment of type 2 diabetes in children
- Improving outcomes of diabetes care in children by medical treatments, diabetes technologies and behavioral interventions
- Understanding other forms of diabetes in children and developing individualized treatment strategies for them
- Understanding obesity in children and developing new therapeutics for them
- Disorders of sex development:
 - Diagnosis, treatment, genetics and psychological factors in disorders of sexual development
 - Developing practice guidelines in the area of sexual differentiation disorders
- New treatment approaches for various endocrine conditions such as Prader-Willi Syndrome and endocrinopathies in cancer survivors
- Thyroid cancer in children

Get Involved

Help change the future of type 1 diabetes research and care.

The T1D Exchange Registry is a research study, designed to harness the power of individuals with type 1 diabetes.

You complete a questionnaire once a year.

- Add your voice, experience, and data to a body of evidence that grows over time.
- Help accelerate the discovery and development of new treatments and potentially inform policy and insurance decisions.
- Once you enroll, you can participate in more studies on specific topics related to type 1 diabetes.
- The Registry is open to both adults and children with type 1 diabetes living in the United States.

Become a member of the Quality Improvement Collaborative

Clinics in our QIC network develop and disseminate best practices in T1D care. QIC currently brings together 23 clinics across the United States that treat 40,000+ type 1 diabetes individuals.

QIC has seen significant success in improving individual care across member clinics, including a 15% increase in the acceptance and use of continuous glucose monitoring, and a 64% increase in depression screening.

T1D Exchange is actively recruiting new QIC clinics. Are you a clinician interested in joining our growing network? Learn more about the QIC here or contact us at qi@t1dexchange.org.



T1D Risk Screening

A few drops can make a big difference.

TrialNet T1D risk screening can detect type 1 diabetes years before it appears. You can know you or your child's risk for T1D with a free blood test delivered to your door.

1 Sign up

Answer a few questions. TrialNet screening kits are sent directly to you and can be done from the safety of your home.

2 Stick it

Each kit includes everything you need. All it takes is a few drops using a finger-stick and provided collection tube.

3 Ship it

Send your samples back for free using FedEx® contactless at home pickup. Get your results in 4-6 weeks.

Risk screening allows for early action. Based on your results, you may be able to join a research study to slow or stop the disease. You can help advance prevention research. #screen4T1D

Who's Eligible?

- Understanding obesity in children and developing new therapeutics If you have a family history of T1D
- If you have not been already diagnosed with diabetes
- If you're between the age of 2.5 and 45 with a parent, sibling, or child with T1D
- If you're between the age of 2.5 and 20 with an aunt, uncle, grandparent, cousin, niece, nephew, or half-sibling with T1D

How does it work?

TrialNet T1D screening looks for markers in the blood—five diabetes related autoantibodies—to detect your risk of type 1 diabetes years before symptoms appear.

Have questions? We can help.

The TrialNet Team at Texas Children's Hospital and Baylor College of Medicine
phone 1-800-425-8361 or email info@trialnet.org.

Relative of someone with T1D?

You (or your child) may be eligible for Texas Children's Type 1 Diabetes Screening & Prevention Program.

Who is eligible for the Texas Children's Type 1 Diabetes (T1D) Screening & Prevention Program?

Family members of a person with T1D who are under the age of 18.
In most cases this will be the **sibling of someone with T1D**.

What is the risk of developing T1D in family members?

Those with a family member with T1D have a **1 in 20** risk of developing T1D, which is about **15x higher** than those without a family history.

What is the benefit of screening for T1D?

There are ways to identify people with early stages of T1D – even before symptoms and the need for insulin arise. One way to identify early stages of T1D includes screening for autoantibodies, which indicate the autoimmune process in the pancreas has begun.

By identifying T1D early, it may be possible to prevent the onset of diabetic ketoacidosis (DKA).

We now have an FDA-approved medication for patients aged 8 years and older, Tzield (teplizumab), which has been shown to delay the onset of insulin-required T1D by ~2 years on average.

What does the T1D Screening & Prevention Program entail?

- Telemedicine visit(s) with a Texas Children's Diabetes & Endocrinology Provider.
- Laboratory screening for autoantibodies, staging of T1D, monitoring for progression and counseling on teplizumab if eligible.

How do I schedule a T1D screening & prevention visit?

- Talk to your PCP about a referral for T1D screening & prevention at Texas Children's.
- Depending on your insurance, you may be able to schedule a screening on MyChart or by calling central scheduling at **832-822-2778**.

Stage 1

Two or more autoantibodies can be identified, but blood sugar levels are normal, and the person has no symptoms.

Stage 2

Two or more autoantibodies can be identified, and blood sugar levels are not normal, but most people still have no symptoms.

Stage 3

Two or more autoantibodies can be identified, blood sugar levels are high, and the person typically has symptoms.

Symptoms of type 1 diabetes include:

Frequent Urination



Extreme Thirst



Dry Mouth



Fatigue and Weakness



Increased Appetite



Unexplained Weight Loss



Slow Healing Cuts





Recommended Vaccines

for Patients with Diabetes

Vaccinations

Explore how staying up-to-date on vaccinations can offer substantial benefits for people living with diabetes and provide an important shield against illness.

Flu and Pneumonia Shots

Having the flu can be dangerous for anyone but it is extra risky for people with diabetes or other chronic health problems. Having diabetes means having more instances of high blood glucose (blood sugar) than a person without diabetes. High blood glucose hinders your white blood cells' ability to fight infections.

Should you get a flu shot?

In general, every person with diabetes needs a flu shot each year. Talk with your doctor about having a flu shot. Flu shots do not give 100% protection, but they do make it less likely for you to catch the flu for about six months.

For extra safety, it's a good idea for the people you live with or spend a lot of time with to get a flu shot, too. You are less likely to get the flu if the people around you don't have it.

The best time to get your flu shot is beginning in September. The shot takes about two weeks to take effect.

Pneumococcal diseases & pneumonia shots

There is a category of diseases called pneumococcal disease, of which pneumonia is one of the most dangerous—the other most dangerous being meningitis. People with diabetes are more at-risk for severe illness with flu and pneumococcal diseases.

A pneumonia shot is a safe and effective way to protect you against getting these illnesses, so the most important step you can take in preventing pneumococcal infection is to get vaccinated. Talk to your doctor about a plan to get vaccinated. Factors for which vaccine is right for you include your age and if you've already received a one. Typically, you'll get one vaccine, wait a year, and then get the second immunization.

Other recommended vaccines

- Tdap vaccine (tetanus, diphtheria, and pertussis)
- Hepatitis B vaccine (in three parts)
- COVID-19

Notes

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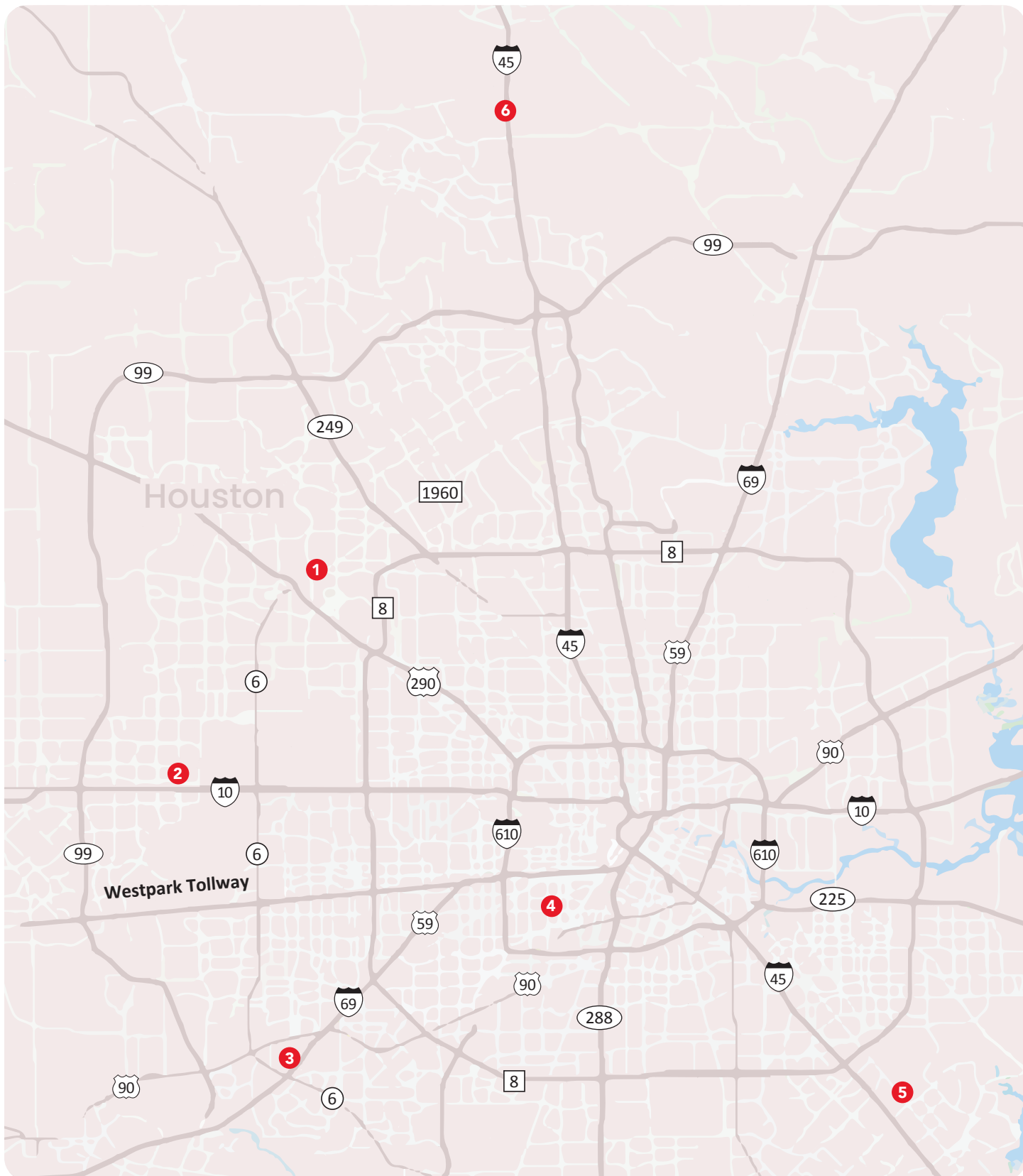
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Texas Children's Locations



1 Cy-Fair Specialty Care

11777 FM 1960 West
Houston, TX 77065
281-469-4688
281-477-9898 fax

2 West Campus

18200 Katy Freeway
(I-10 and Barker Cypress)
Houston, TX 77094
832-227-1370
832-825-8277 fax

3 Sugar Land Specialty Care

15400 Southwest Frwy.
Suite 200
(Williams Trace at Hwy. 59)
Sugar Land, TX 77478
281-494-7010
281-494-7807 fax

4 Mark Wallace Tower

6701 Fannin Street, 11th Floor
Houston, TX 77030
832-822-3670
832-825-9320 fax

5 Clear Lake Specialty Care

940 Clear Lake City Blvd.
Suite 200
Webster, TX 77598
281-282-1900
281-285-9642 fax

6 The Woodlands

17580 Interstate 45-South
Suite 560
The Woodlands, TX 77384
936-267-7500
936-321-3271 fax

Texas Children's Hospital

Texas Medical Center Campus



Clinic Location

Texas Children's Diabetes and Endocrinology Clinic
Mark Wallace Tower 11th floor
6701 Fannin Street, Houston, TX 77030
(corner of Fannin St. and Holcombe Blvd)

Parking

Self-parking is available in TMC Garage 16.
Valet parking is also available at Mark Wallace Tower.
We do not validate parking.



Please arrive at least 15 minutes before your scheduled appointment time.
If you are more than 15 minutes late, you will be asked to reschedule.

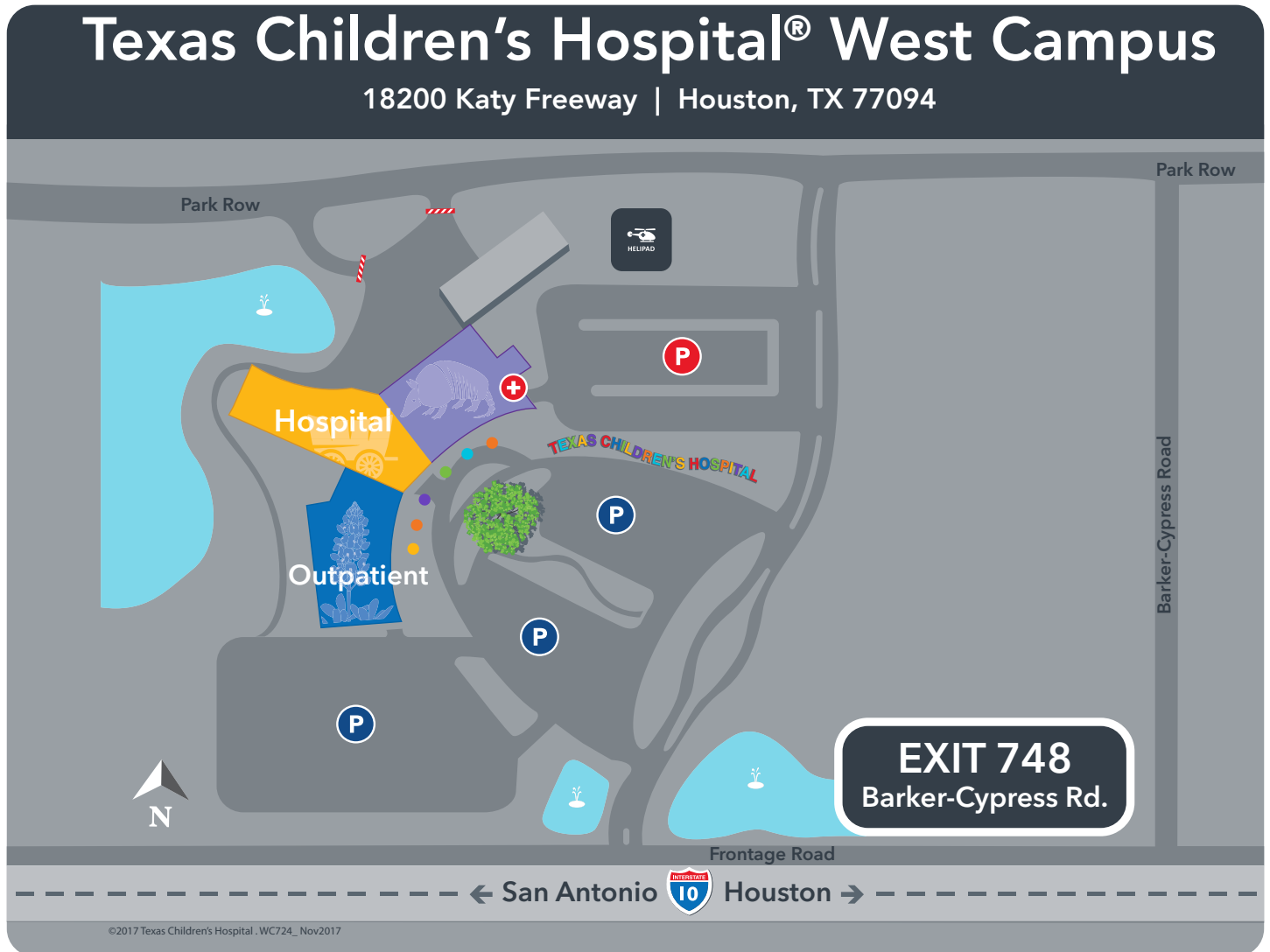
Diabetes and Endocrine Care Center

Medical Center Campus

832-822-3670

Diabetes/Endocrine Providers	Diabetes/Endocrine Fellows	Certified Diabetes Educators
Rebecca Aguirre, MD, PhD Ionna Athanassaki, MD Fida Bacha, MD Andrea Balazs, MD Nidhi Bansal, MD Meghan Craven, MD Selorm Dei-Tutu, MD Daniel DeSalvo, MD Shannon French, MD Sheila Gunn, MD Vince Horne, MD Alfonso Hoyos-Martinez, MD Kathy Hwu, MD Lefkothea Karaviti, MD, PhD Sarah Kelly, DNP, APRN, NP-C Yuezhen (Lynda) Lin, MD Sarah Lyons, MD Siripoom McKay, MD Katerina Nella, MD David Paul, MD Maria Redondo, MD, PhD Richard (Ogs) Roberts, MD Stephanie Sisley, MD Rona Sonabend, MD Mustafa Tosur, MD Suzanne Wheat, RN, FNP-C Victoria Wright, APRN, CPNP-PC	Guido Alarcon Mantilla, MD Gabriel Castano Heredia, MD Michael Ferm, MD Kushboo Golani, MD Fulfilled Ighalo, MD Jean Lafontaine, MD Colleen Macke, MD Pavandeep Rakhra, DO Alejandro (Alex) Siller, MD Javier Velasquez Munoz, MD Manal Tantoush, MD Xu Xu, MD	Denise Bryant, RN, Diabetes Educator Fellow Jacqueline Hernandez, RD, LD, CDCES Kevin Hernandez, MPH, RDN, LD, CDCES, BC-ADM Leah Farnsworth, RD, LD, CDCES Kim Mason, RN, CDCES Angelique Munoz, RD, LD, CDCES Sem Ohland, RD, LD, CDCES Jamie Segovia, RN, CDCES Jessika Troche, RD, LD, CDCES Jennifer Clark, RD, LD, CDCES Carol Smeltz PhD, MS, MBBS, RD, LD, CDCES Wanqi “Tina” Jing MA, MED, RD, LD, CDCES
	Diabetes Dietitians Rebekah Burnett, MPH, RD, LD Jennifer Cleveland, MS, RD, LD Kyle Lavka, MS, RD, LD Dan Nguyen, MS, RD, LD Stephania Savvas, MS, RD, LD	Phone: 832-822-3670 Fax: 832-825-9320 Hours: 8:00 am – 4:30 pm Monday – Friday
	Diabetes Social Workers Rebecca (Becky) Butler, LMSW 832-822-1278 Le’Toia Cleveland, LMSW 832-824-7127 Leslie Paredes, LMSW 832-822-4315 Diana Scroggins, LMSW 832-822-1012	Patient Account Services Department – Billing Family Relations
Central Scheduling / Appointments 832-822-2776 (English) 832-822-2775 (Español)	Patient Navigator Nicole Barnes Bertha Soto	832-824-2300 (Billing) 832-824-5200 (Pt & Family Services)

Texas Children's Hospital West Campus



Clinic Location

18200 Katy Freeway (I-10 and Barker Cypress), 2nd floor
Houston, TX 77094

West Campus Hospital is located off the frontage road of Interstate 10 West.



Please arrive at least 15 minutes before your scheduled appointment time.
If you are more than 15 minutes late, you will be asked to reschedule.

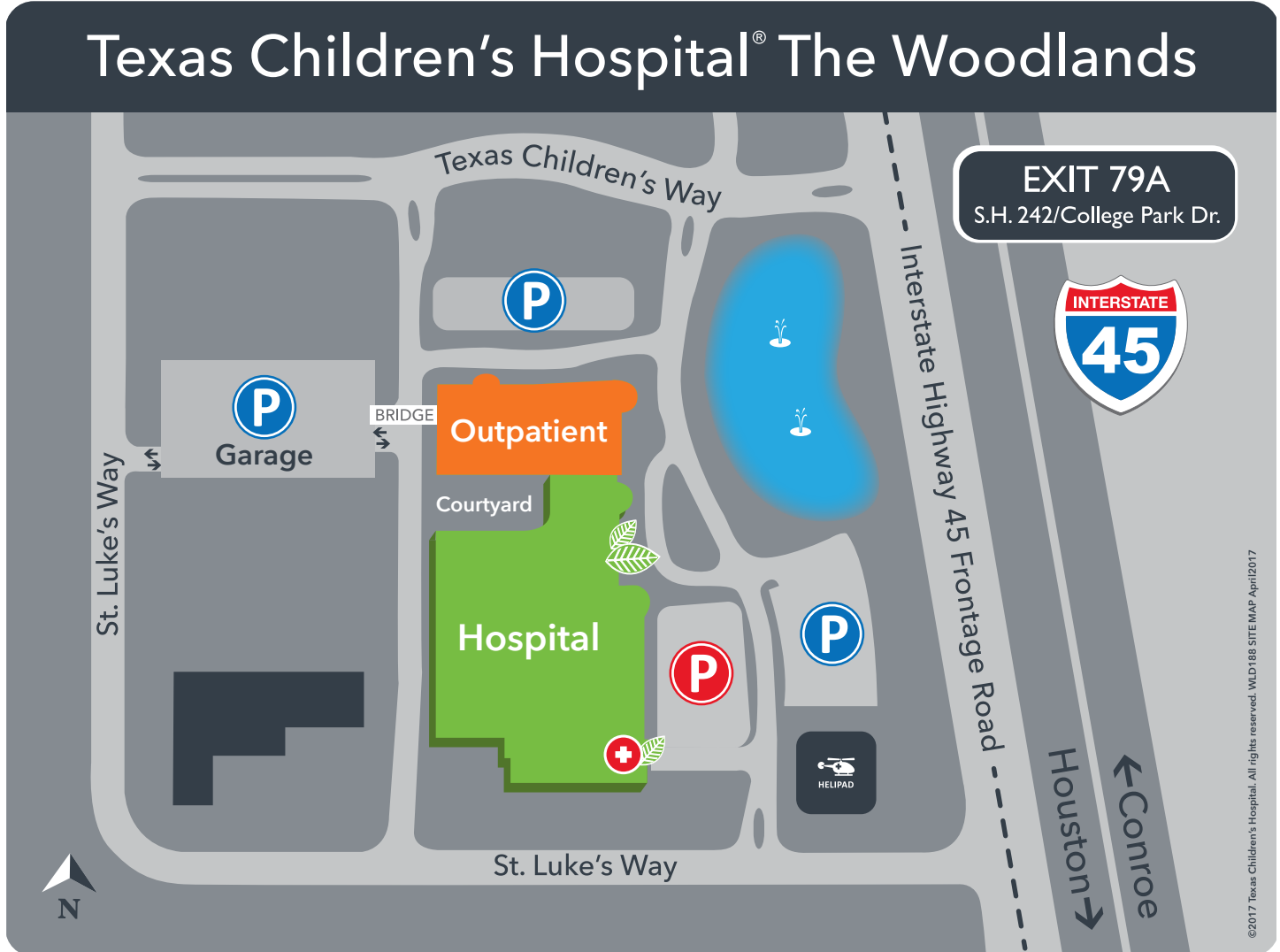
Diabetes and Endocrine Care Center

West Campus

832-227-1370

Diabetes/Endocrine Providers	Certified Diabetes Educators	Patient Navigator
Jennifer Bell, MD Kelly Hicks, MD Alfonso Hoyos-Martinez, MD Tracy Patel, MD Mili Vakharia, APRN, FNP-C, CDCES	Caroline Elenberg, RD, LD, CDCES Erin Macaluso, MS, RD, LD, CDCES Jessica Madden, MS, RD, LD, CDCES Merielle Mercado, RN, CDCES, CPN Jocelyn Mills, RD, LD, CDCES Nelly Miranda, RN, CDCES Frenny Sureja-Shah, MS, RD, LD, CDCES Ashley Townsend, MS, RD, LD, CDCES Christina Treybig RN, CDCES, CPN Danielle Rodriguez, MS, RD, LD, Diabetes Fellow	Emily Sigbjornsson, CMA
Diabetes Dietitian		Central Scheduling / Appointments
Emily Smith, MS, RD, LD		832-822-2776 (English) 832-822-2775 (Español)
Diabetes Social Workers		Patient Account Services Department – Billing Family Relations
Elyssa Cantu, LMSW Madalyn Ruble, LMSW Phone: 832-227-1138	Phone: 832-227-2232 Fax: 832-825-9277	832-824-2300 (Billing) 832-824-5200 (Pt & Family Services)

Texas Children's Hospital The Woodlands



Clinic Location

Texas Children's Diabetes and Endocrinology Clinic
Texas Children's Hospital The Woodlands
Outpatient Building, Floor 5
17580 Interstate 45 South, The Woodlands, TX 77384



Please arrive at least 15 minutes before your scheduled appointment time.
If you are more than 15 minutes late, you will be asked to reschedule.

Diabetes and Endocrine Care Center

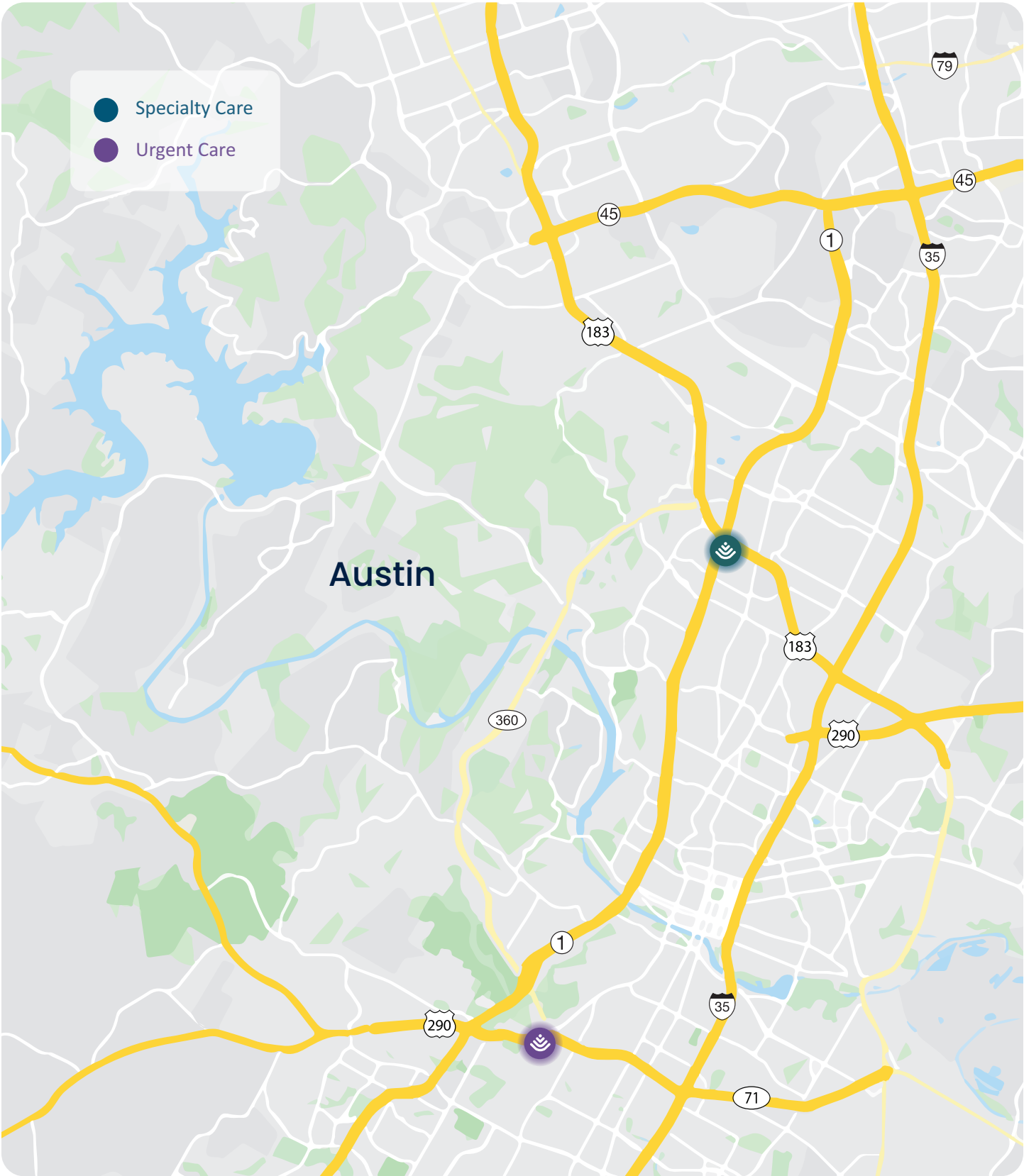
The Woodlands Campus

832-227-1370

Providers	Certified Diabetes Educators	Patient Navigator
Sophia Ebenezer, MD Olivia Ginnard, DO Grace Kim, MD Elizabeth Kubota-Mishra, DO Bonnie McCann-Crosby, MD Cynthia Sanders, APRN, MS, CPNP-PC, CDCES Serife Uysal, MD	Sonia Guerra, RN, CDCES Rebecca Hutchinson, BSN, RN, CDCES Krista Marston, BSN, RN, CDCES Jamie Rey, RN, BSN, CDCES Phone: 936-267-7529 Fax: 936-267-7923	Frances (Frenchiee) Moreno, CMA Central Scheduling / Appointments 832-822-2776 (English) 832-822-2775 (Español) Patient Account Services Department – Billing Family Relations 832-824-2300 (Billing) 832-824-5200 (Pt & Family Services)
Diabetes Dietitian Brittany Jones, MPH, RD, LD		
Diabetes Social Workers Nicole Daglis, LMSW Aimee Broussard, LCSW		

Texas Children's Hospital

Austin Campus



Texas Children’s Hospital

Austin Campus

737-229-2000

Providers	Certified Diabetes Educators	Diabetes Dietitians
Ryan Stewart, MD	Kristen Davis, RD, LD, CDCES Melissa Hepler, RD, LD, CDCES Amber Smith, MBA, RD, LD, CDCES	Lee Dunn, MS, RD, LD
		Patient Account Services Department – Billing Family Relations 832-824-2300 (Billing) 832-824-5200 (Pt & Family Services)

Texas Children’s Specialty Care Center

Cy Fair

281-469-4688

Diabetes/Endocrine Providers	Certified Diabetes Educators	Diabetes Dietitians
Meghan Craven, MD Richard (Ogs) Roberts, MD Cynthia Sanders, RN, MS, CPNP-PC	Nelly Miranda, RN, CDCES Frenny Sureja-Shah, MS, RD, LD, CDCES Christina Treybig, RN, CDCES, CPN	Monica Emerson, RD, LD Miranda Mann, RD, LD
		Diabetes Social Workers
		Maria Grosu, LMSW

Texas Children’s Specialty Care Center

Clear Lake

281-282-1900

Diabetes/Endocrine Providers	Certified Diabetes Educators	Diabetes Dietitians
Selorm Dei-TuTu, MD Daniel DeSalvo, MD Kathy Hwu, MD Sarah Kelly, APRN, FNP Victoria Wright, APRN, CPNP-PC	Katherine Trimino RD, LD, CDCES	Amanda Winston, RD, LD
		Diabetes Social Workers
		Louisa Barausky, LCSW

Texas Children’s Specialty Care Center

Sugarland

281-494-7010

Diabetes/Endocrine Providers	Certified Diabetes Educators	Diabetes Dietitians
Sheila Gunn, MD Vincent Horne, MD Silvia Michael, APRN, FNP Aikaterini Nella, MD Suzanne Wheat, APRN, FNP	Xin Guo, RD, LD, CDCES Radhika Koppanur, MBA, RD, LD, CDCES	Autumn Holloway, RD, LD Rebecca Lang, RD, CSP, LD Emily Samuels, RD, CSP, LD
		Diabetes Social Workers Sarah Cohen, LMSW Robin Slusher, LMSW

Online access to your medical records

Texas Children's offers MyChart, an easy and convenient way to access your medical records and other helpful information online.

To learn more about **MyChart**, please read the Frequently Asked Questions (FAQ) at mychart.texaschildrens.org/MyChart

MyChart makes it easy to:

- Request, confirm and cancel appointments.
- Review your child's appointment history, chronic illnesses, medical and surgical history, allergies, medications and after-visit summaries.
- Email non-urgent medical questions and get a response within two business days.
- Request prescription refills.
- View many test results online and print them.
- Complete medical questionnaires prior to appointments.
- View and print immunization records.
- Access your child's growth chart.

This service is not for urgent medical needs. If your child needs urgent medical attention, please dial 911.





The information in this document is educational and not intended as medical advice or the practice of medicine. This information is not a substitute for the medical advice, diagnosis, or treatment of a health care provider based on the health care provider's examination and assessment of a patient's specific and unique circumstances. Patients must speak with a health care provider for complete information about their health, medical questions, and treatment options, including any risks or benefits regarding use of medications or treatments.

texaschildrens.org/diabetes

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