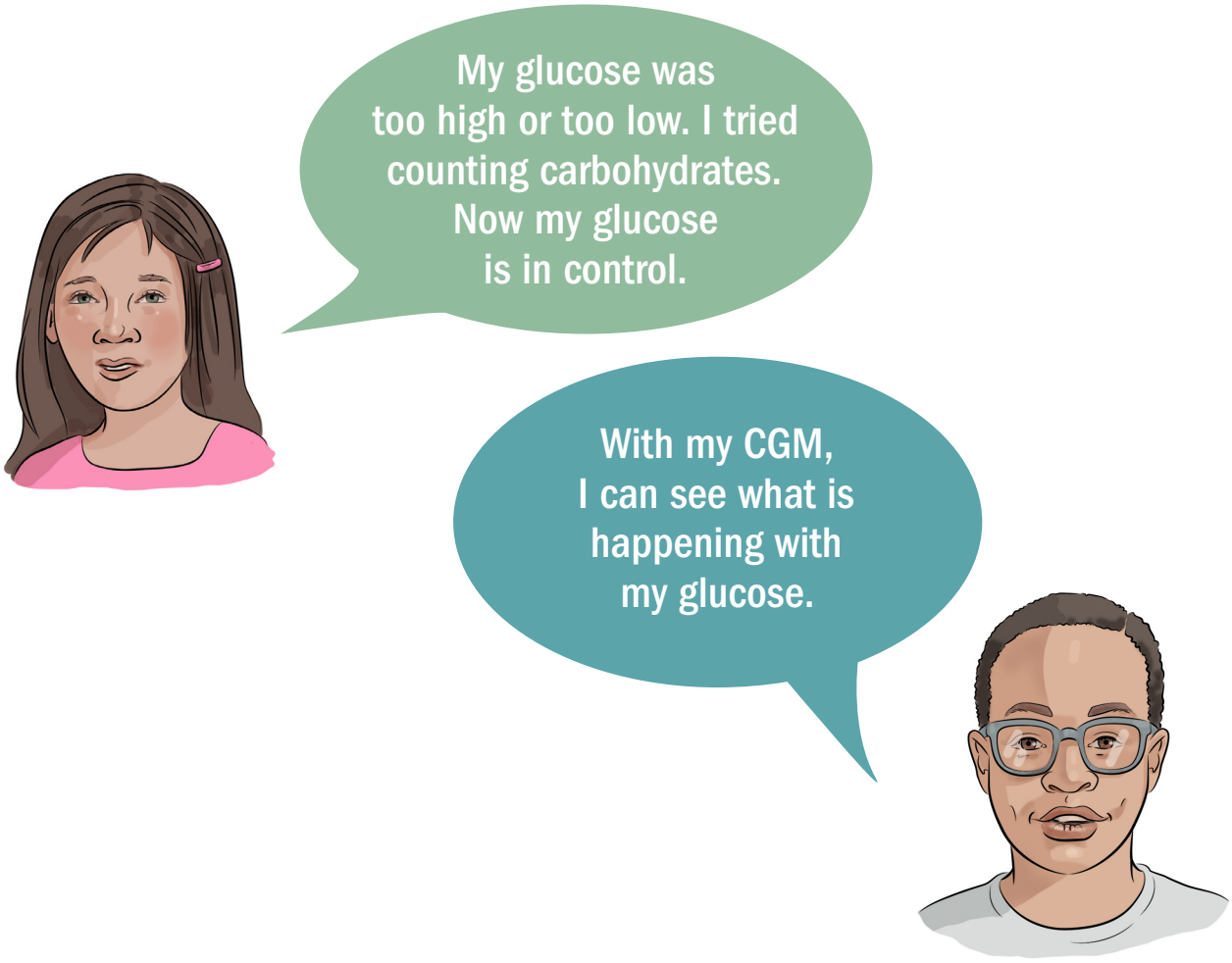
A GUIDE FOR TEENS

How can carb counting and using a CGM help me manage my type 1 diabetes better?

A CGM is a Continuous Glucose Monitor. It is a way to check your sugars all the time without needing to prick your finger. This guide tells you about counting carbohydrates and using CGM to reduce low and high sugars, and more.



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Dear Reader

We are a group of adults with Type 1 Diabetes. We gave advice on putting this guide together. We also gave advice on our other guides you may want to read:

- Is the Insulin Pump Right for Me?
- How Do I Use an Insulin Pump?
- Is the Insulin Pen Right for Me?
- How Can I Manage My Type 1 Diabetes Better?
- Is the Continuous Glucose Monitor Right for Me?
- How Can a Continuous Glucose Monitor Help Me Manage My Diabetes Better?

Some of us use an insulin pump. Some of us use insulin pens and some use vials and syringes. Some of use Continuous Glucose Monitors (CGM's) and some of us check our glucose with a glucometer. Our group got together to look at all the ways to treat Type 1 Diabetes. We did this to help us learn how to treat our Type 1 Diabetes better.

We want to try to help people understand what we have learned from our teachers and from each other. That is why we want to share it with you.

We hope that in the future there will be even more ways to help us manage diabetes and one day cure it. In the meantime, we invite you to be curious and explore all the ways we have for treating diabetes.

Let's get started!

THIS IS WHAT ALEX FROM OUR GROUP HAS TO SAY ABOUT MANAGING HER TYPE 1 DIABETES:

"My glucose was not too good. It would be high a lot and then I would have low glucose because I would give too much insulin. My diabetes team helped to get me a CGM and the dietitian taught me and my family how to count carbs. I like the CGM right away. I could see how food and insulin would make my glucose go up and down. I have to admit I let my mother do most of my carb counting at first. Then as I got older, I wanted to take more control. I am mot perfect at it but the CGM also helps because I can eat more or give a bolus of insulin when I notice my glucose levels changing "

How can a CGM
help with Carb counting?

Carb counting?
Carb ratios?
Food Labels?
I am going to have to go to
school to learn this stuff?

It can
be hard at first. But
is gets easier with practice.
My family helps me.

Introduction

How can I learn more about ways to manage my diabetes better?

We are glad you are curious to learn more about ways you can manage your diabetes better. This guide has basic information about:

- Carbohydrate counting
- Continuous Glucose Monitoring
- Staying healthy with Type 1 Diabetes.

We want to help you learn about some ideas that can help you:

- Improve your glucose or blood sugar control
- Adjust your insulin based on the information your CGM gives you
- Adjust your insulin based on the carbs you eat
- Have more freedom to eat a greater range of foods while giving the correct dose of insulin

This guide can help you manage your Type 1 Diabetes better whether you decide to use the insulin pump, pen or stay on shots with a vial and syringe.

Do you have more guides I could read?

Yes. After reading this guide you may want to read our other guides:

- How Can I Manage My Type 1 Diabetes Better?
- Is the Insulin Pump Right for Me?
- How Do I Use an Insulin Pump?
- Is the Insulin Pen Right for Me?
- Is the Continuous Glucose Monitor Right for Me?
- How Can a Continuous Glucose Monitor Help Me Manage My Diabetes Better?
- How Can a Continuous Glucose Monitor Help and Carb Counting Help Me Manage My Diabetes Better?

I'm the one who needs to make decisions about how I treat my Type 1 Diabetes.

That's right. This is about your health, your life, and your choice to become the most active member on your diabetes team.

In this guide, we talk about your "team". That is because it often takes many people to take care of your diabetes.

The first part of your team is always you. Family members and friends that you include in helping you with your diabetes are part of your team. Then you have your doctor. You may also see a diabetes educator, a nurse, nurse practitioner or physician assistant. You may see a dietitian and maybe a social worker or a psychologist. Your pharmacist and eye doctor are part of your team, and anyone else you want to include. All these people are part of your diabetes team. Each can help you take better care of your diabetes.

Thank you for inviting us to join your team!

Table of Contents

SECTION 1 — What are Carbohydrates and How Do I Count Them?

1 Why Do I Need to Learn About Carbohydrates?

2 How Do I Count Carbs?

2 What Are Some Tools for Carb Counting?

SECTION 2 — What Do I Need to Know About Checking My Glucose, Carb Counting and the Amount of Insulin I Should Give?

3 Can You Remind Me of the Basics of Blood Glucose?

3 What Are the Ways I Can Check My Glucose or Sugar Levels? Tell Me More About It.

5 What Do My CGM Glucose Numbers Mean?

5 What Is a Carbohydrate Ratio?

6 What Is a Correction Factor?

6 How Do I Know What My Correction Factor Is?

6 What Is a Correction Dose?

7 When Do I Give a Correction Dose?

8 How Do I Give a Correction Dose Between Meals If I Am Going to Eat Something?

8 What Is a Pre-Meal or Bolus Dose?

SECTION 3 — Carb Counting and CGM

10 How Can I Manage My Glucose Levels With Carb Counting The CGM?

10 CGM Receiver Or Smartphone Window:

10 How Do I Give A Bolus Dose With An Injection?

11 How Do I Give a Bolus If I Use a Pump?

11 What Is Trending?

12 Can You Show Me Examples of What My CGM Might Tell Me After I Eat?

14 What Is a Retrospective View?

Table of Contents

SECTION 4 — Conclusion

15 The Control of My Diabetes Is In My Hands!

15 How Else Can I Learn to Manage My Diabetes Better?

15 Either Way, I'm Committed to Taking Care of My Diabetes?

APPENDIX 1 — Resources

APPENDIX 2 — Glossary of Diabetes Terms

SECTION 1 —What are Carbohydrates and How Do I Count Them?

Why do I need to learn about carbohydrates?

When you have type 1 diabetes your body does not make insulin. So, you must give yourself insulin. The amount of insulin you give yourself depends on your glucose level and the food you eat. It also on depends whether or not you plan on exercising.

Most of the insulin you give goes to helping your body use carbohydrates. A carbohydrate is called a carb for short. Carbs give you energy. They also keep your brain and muscles working. You need insulin and carbs to stay alive and healthy!

The problem with carbs is that people do not eat the same thing every day. One day you may eat rice. The next day you may eat potatoes. One day you may eat more, the next day less. That means you need to give a different amount of insulin before the meal to keep your glucose level normal.

If you are unsure about what carbs are, please see our guide — "How Can I Manage My Type 1 Diabetes Better?" In this guide, we talk about what carbs are and how to count them.

How do I count carbs?

To carb count you need to learn how to read food labels. You also need to learn how to find the amount of carbs in the foods you are eating. A carbohydrate is called a carb for short.

Carbs are counted in grams. One serving of carbs is 15 grams. A food that has 15 grams of carbs is "one carb serving".

One carb serving = 15 grams

To learn about carb counting, it is best to work with a dietitian. She or he can help you with carb counting your basic foods. You can also use a book or an app to figure out how many carbs are in a food. In restaurants you may be able to get information on the carb content of the foods.

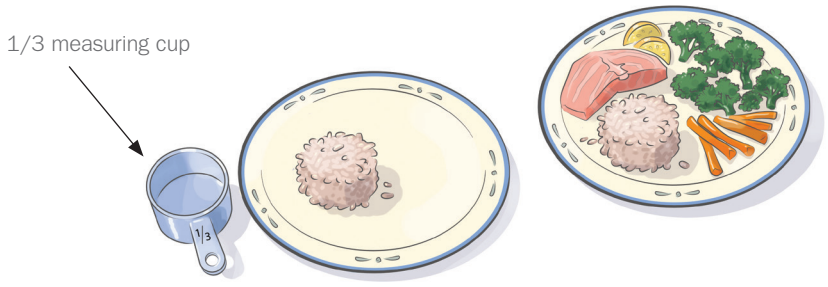
When you start counting carbs, it helps to measure and weigh the food. This works well if you are at home. In time, you will learn how to guess how many grams of carbs are in the foods you eat. After a while, you won't always have to measure or weigh food.

What are some tools for carb counting?

An important part of carb counting is knowing how much of a certain food you are eating. **Measuring cups** and **a scale** are helpful tools for this. When you measure, it helps give you a good visual idea of how different servings look like on a plate, in a bowl, or in a glass.

For instance, measure ⅓ cup (80 ml) of rice onto your plate when you are eating at home. ⅓3 cup (80 ml) rice is equal to 15 grams of carbs. After you have done this a number of times, you will know what a ⅓ cup (80 ml) serving looks like on a plate. Then you will be able to estimate a ⅓ cup (80 ml) serving size without having to measure each time.

⅓ (80 ml) cup serving of rice = 15 grams of carbs.



In our guide, "How Can I Manage My Type 1 Diabetes Better?", we have more tips about counting carbs. We also have a chart with common foods and their carb amounts.

SECTION 2 — What Do I Need to Know About Checking My Glucose, Carb Counting and the Amount of Insulin I Should Give?

Can you remind me of the basics of blood glucose?

When a person has diabetes, it is important to know what their glucose levels are to help decide how much insulin to give or how much food to eat. In the diabetes world, the glucose level is often called the sugar level. The glucose level means how much sugar is in the blood. These levels are measured in the U.S. in milligrams per deciliter, or mg/dl. In other countries, it is measured in millimoles, or mmol/l. In this guide, we call sugar "glucose".

A normal range (for someone without diabetes) is about 70 to 100 mg/dl before breakfast and below 140 mg/dl after meals. If someone has diabetes they will give more insulin if their glucose levels are high and less if they are low. If a glucose level is low, a person will eat or drink something to raise their glucose level.

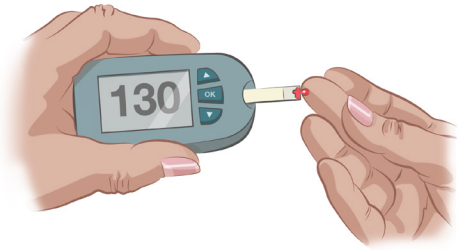
What are the ways I can check my glucose or sugar levels? Tell me more about it.

A person can check their glucose levels two ways. One way is to use a **blood glucose meter**. This is also called a glucometer.

There are many meters you can buy. Diabetes Forecast publishes a list of them each year *(http://main.diabetes.org/dforg/pdfs/2019/2019-cg-blood-glucose-meters.pdf)*

Common names of glucometers are:

- OneTouch,
- Accu Check
- Bayer Contour

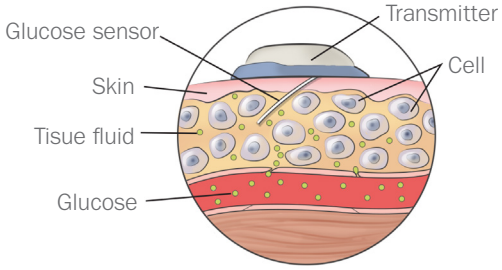


After pricking the skin with a lancet, you place a drop of blood on a test strip. You place the test strip in the machine. The meter tests the drop of blood and shows the glucose level in the blood as a number on a digital display. When you use a blood glucose meter, they have to prick the skin many times a day. **You should prick the skin at least 4 times per day** — before each meal and at bedtime. Your diabetes care team may recommended you test more than 4 times a day.

Another way to check glucose is by using a **Continuous Glucose Monitoring device**. This is called a CGM. The CGM does not use blood to give a reading. It uses the fluid from your body just under the skin. This is called interstitial fluid.

Common names of CGMs are:

- Dexcom
- Libre
- Guardian
- Sensionics.



The CGM is a system that helps track glucose levels about every 5 minutes. This is called “Near real time” There is a special device placed under the skin that reads your glucose level. This is called a sensor.

Placing the device is less painful than finger sticks. Depending on the brand of CGM, the sensor lasts from 10 –90 days. You can look at a screen to see your glucose level any time.

To learn more about the basics of the CGM you can read our guides, Is “CGM Right For Me?” and “How Do I Use CGM?”

Here are some photos of CGM systems:

FREESTYLE LIBRE

DEXCOM G-6

GUARDIAN CONNECT

EVERSENSE

What do my CGM glucose numbers mean?

The CGM will give you a number to let you know if your glucose is too high, too low or just right. When you know your numbers, you can decide how much to eat or how much insulin to give. To find out more about how to treat glucose levels that are too high or too low, read our guide “How Can I Manage My Diabetes Better?”.

Before we talk more about glucose numbers and the CGM, you should also know about:

- Carb ratios
- Correction factors
- Correction doses

What is a carbohydrate ratio?

A carbohydrate ratio is also known as a carb ratio. A carb ratio is how many carbs one unit of insulin will cover.

Carb ratios vary from person to person. Weight, activity level and gender are some things that affect what carb ratio a person needs.

For a general idea, a carb ratio is 1 to 15. This means 1 unit of insulin for every 15 grams of carbs.

But, your diabetes team will figure out your carb ratio with you. If you are very resistant to insulin this could be something like 1 to 5 or 1 to 7. This means you need more insulin for each gram of carbs. If you are very sensitive, it could be 1 to 20 or 1 to 25.

At first keeping a record of how some foods affect your blood glucose can help. Some carbs cause blood glucose levels to raise more than you think they will. If this happens a number of times for the same food, your diabetes team may recommend a change. They may tell you to give more insulin or eat a smaller serving of that food.

Many people find they need different carb ratios at different times of day. For breakfast people often need more insulin for their food. At lunch people often need less and at dinner somewhere in between the two.

What is a correction factor?

This is how much 1 unit of rapid acting insulin will lower your blood glucose over 2 to 4 hours. Some people need more insulin to do this and some need less. In most cases, a good starting point is a factor of 1 to 50 (1 to 3.8 mmol/L). This means 1 unit of insulin will bring your blood glucose down by a 50 (3.8) point drop.

Your diabetes care team will set your blood glucose target. You want to give enough correction insulin to bring your glucose down to the target, or normal, range.

How do I know what my correction factor is?

Your correction factor can be a lower number, such as 10 mg/dl (0.6 mmol/L). A low number means that you are resistant to insulin. This means that you need more insulin to bring your glucose level down.

If your correction factor is a higher number such as 75 mg/dl (4.2 mmol/L) or 100 mg/dl (5.6 mmol/L), it means you are very sensitive to insulin. This means you will need less insulin to bring your blood glucose down.

In most cases the correction factor is in the range of 30 mg/dl (1.7 mmol/L) to 50 mg/dl (2.8 mmol/L).

What is a correction dose?

This is the dose of insulin you give yourself to bring your glucose level back down to normal if you are high.

To figure out how much insulin you will need, you have to do some math using your correction factor. For instance, let's say your glucose level is 200 mg/dl (11.1 mmol/L). Let's say your glucose target is 150 mg/dl (8.3 mmol/L). And let's say your correction factor is 1 to 50 (1 to 2.8). You will give one unit of insulin to bring your glucose level down by 50 (2.8) to be at the 150 mg/dl (8.3 mmol/L) level..

The mg/dl correction factor math looks like this:

Current glucose level is 200 minus 150, which is your desired glucose level.

200 – 150 = 50

So, 50 is how much you need to correct your glucose down.

Since the correction factor is 50 that means you divide 50 correction factor by 50 that you want to bring down by 1 unit of insulin.

50 ÷ 50 = 1

Then 1 is the correction dose you would give yourself to bring your glucose level down.

The mmol/l correction factor math looks like this:

Current glucose level is 11.1 minus 8.3, which is your desired glucose level.

11.1 – 8.3 = 2.8

So, 2.8 is how much you need to correct your glucose down.

Since the correction factor is 2.8 that means you divide 2.8 correction factor by 2.8 that you want to bring down by 1 unit of insulin.

2.8 ÷ 2.8 = 1

Then 1 is the correction dose you would give yourself to bring your glucose level down.

You may need different correction doses through the day. Most often people need a different correction dose, more for breakfast and less for lunch.

When do I give a correction dose?

It is important to check your glucose before you eat a snack or a meal so you can know if you need to give a correction dose.

Before a meal after checking your glucose:

The best time to give a correction dose is before a meal. This is so your glucose does not go too low or too high.

Between meals if you snack or eat something:

If you are giving a correction dose between meals, you will need to consider the insulin that is still in your body from the last shot. This is called "insulin on board". If you give correction doses too often you can "stack" insulin, which means giving too much insulin within a short period of time. Because insulin can take an hour or two to peak and can last in your body for 6 hours, it is easy to think the dose hasn't worked. Remember to wait and see what each dose does before adding more.

How do I give a correction dose between meals if I am going to eat something?

With the insulin pump:

You will enter the amount of carbs you plan to eat and your glucose. The pump will subtract the dose still in your body from your correction dose.

With insulin shots:

A good rule is to give half a correction if you are correcting between meals or at bedtime. This avoids stacking. Stacking can lead to a low glucose reaction. For example, if your correction dose is 1:50 (1 to 2.8 mmol/L), a half correction dose is 1:100 (1 to 5.6 mmol/L). A half dose will help safely reduce your blood glucose level.

What is a pre-meal or bolus dose?

This is the total dose of insulin you give before you eat. It consists of a correction dose if you need one and a dose of insulin to cover the amount of carbs you are about to eat. It can also be called a carb dose or carb bolus.

It is important to check your blood glucose before you eat. If your blood glucose is high, you will need to add a correction dose to the carb dose. This is an example if your correction factor is 1 to 50 (1-2.8 mmol/L) and you plan to eat 15 carb grams. This is an example if your correction factor is 1 to 50 (1-2.8 mmol/L) and you plan to eat 15 carb grams.

Your blood glucose is 200 mg/dl (11.1 mmol/L) and should be 150 mg/dl (8.3 mmol/L). You want to eat a small apple that is 15 grams of carbs. Your correction dose is 1 unit of insulin and your carb bolus is 1 unit of insulin. You will need to give yourself 2 units of insulin.

If you are low you may need to subtract insulin from the total dose, in most cases by 1 or 2 units. This is an example if your correction factor is 1 to 50 (1-2.8 mmol/L), your blood glucose is 70 (3.9 mmol/L) and you plan to eat 30 grams of carbs.

You need to eat. You plan to eat 15 carb grams of cereal and 15 carb grams of milk. That is 30 total carb grams. You would normally give yourself 2 units of insulin. You check your blood glucose. It is at 70 (3.9 mmol/L) and should be 150 mg/dl (8.3 mmol/L). You would subtract 1 unit of insulin from the total carb dose of 2 units. You would only need 1 unit of insulin to cover the food you plan to eat and bring your blood glucose up from the low.

SECTION 3 — Carb Counting and CGM

How can I manage my glucose levels with carb counting the CGM?

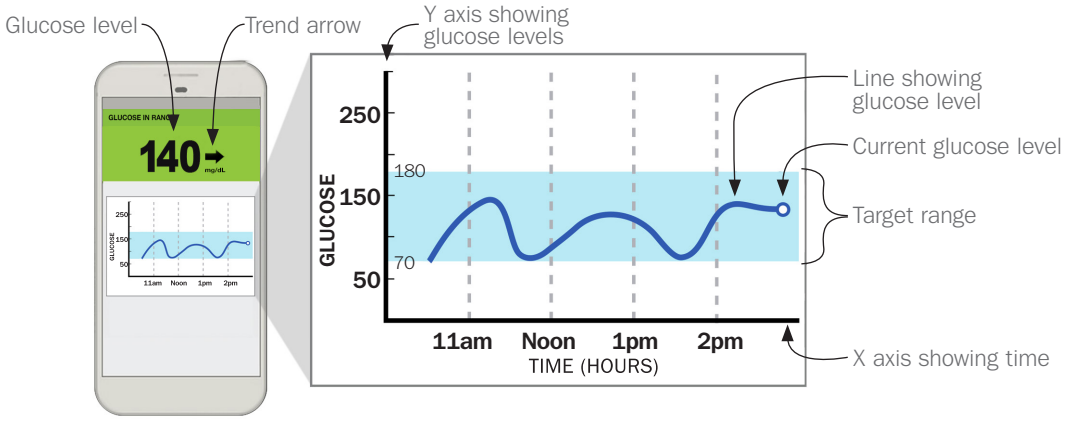
CGMs help you to make real time adjustments to your glucose levels in real time. This can help you know how your carb counting and the food you eat impact your glucose levels.

When you look at your CGM before a meal, you can use the glucose reading to calculate your pre-meal dose, bolus dose. You can also use the reading to give corrections in between meals.

When you have a CGM and you go to eat a meal or a snack, it is easy to check your glucose level on your smartphone or receiver. Once you know your glucose level, you can count your carbs for the meal that you are going to eat. Then you can give a bolus based on the number of carbs you are going to eat and your glucose level.

The GCM will help you see how your carb counting is impacting your glucose levels throughout the day. It is easy see how each meal changes your glucose over time. You can also learn to give more insulin if the glucose level is increasing or less insulin if it is falling.

CGM RECEIVER OR SMARTPHONE WINDOW:



How do I give a bolus dose with an injection?

If you use injections, you will need to calculate your insulin bolus for each meal. You will look at your CGM glucose level reading. Once you know your glucose level, you can give a bolus. See page 11 for how to calculate a bolus dose.

How do I give a bolus if I use a pump?

Your pump has a bolus calculator. Here are the steps to take to give a bolus:

1. Find the bolus calculator screen on your pump.
2. Decide what you are going to eat.
3. Count the carbs of what you are going to eat.
4. Look at your CGM glucose level.
5. Once you know how many carbs you are about to eat and your glucose level, enter your glucose and carb count into the pump.
6. The bolus calculator calculates the correct bolus dose for your meal.

Your pump will also consider your "active insulin" or "insulin on board" when you give a bolus. Also your pump is programmed to give you insulin doses that keep you in your target range.

What is Trending?

CGMs track whether your glucose is going up, down or staying the same. This is call "trending". It tells you what your glucose is likely to do within the next half hour or so. You can see your glucose trending by looking at the trend arrow.

Looking at your glucose level and trend arrow at the same time can help you decide if you want to eat or give insulin. Once you do eat, watching your trend arrows will let you see if you are counting your carbs correctly at each meal.

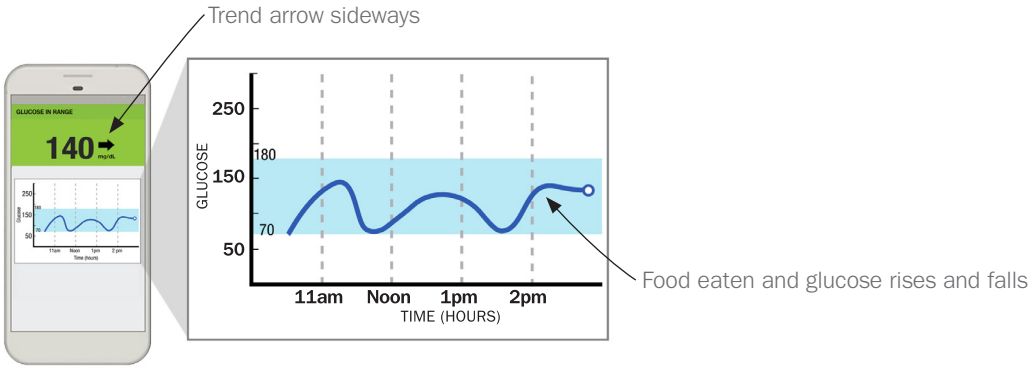
If you counted your carbs correctly, you should start to see arrows pointing down or to the side within two hours after you eat. If your glucose levels continue drop after two hours, this means that you gave too much insulin. If this happens sometimes, you may not be counting your carbs correctly. If this happens often, you should meet with your diabetes team to check your insulin ratio.

Can you show me examples of what my CGM might tell me after I eat?

Example 1:

- You ate your lunch around 11:30 am.
- You look at your CGM graph and see that your glucose level raised a little bit and then came back down.
- Your trend arrow is pointing to the side. This shows that you counted your carbs correctly for your meal.

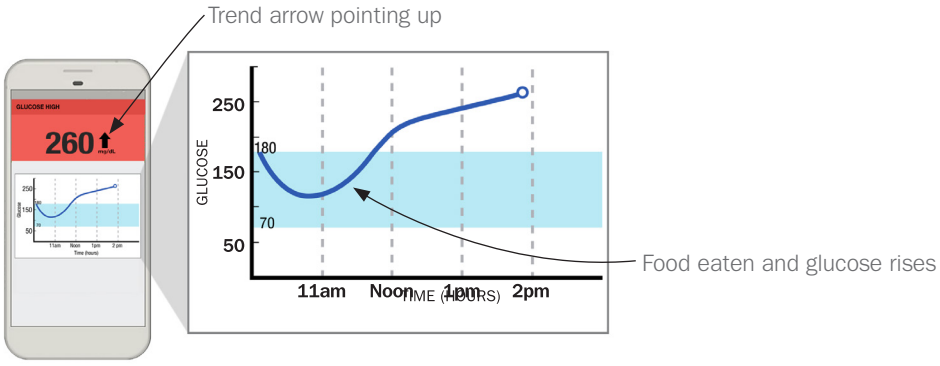
When you count your carbs correctly, your CGM graph should show your glucose level being in range 2 hours after you eat.



Example 2:

- You ate your lunch around 11:00 am.
- You look at your CGM graph and see that your glucose level has been going up for 3 hours.
- Your trend arrow is pointing up. This shows that you probably counted your carbs incorrectly for your meal.

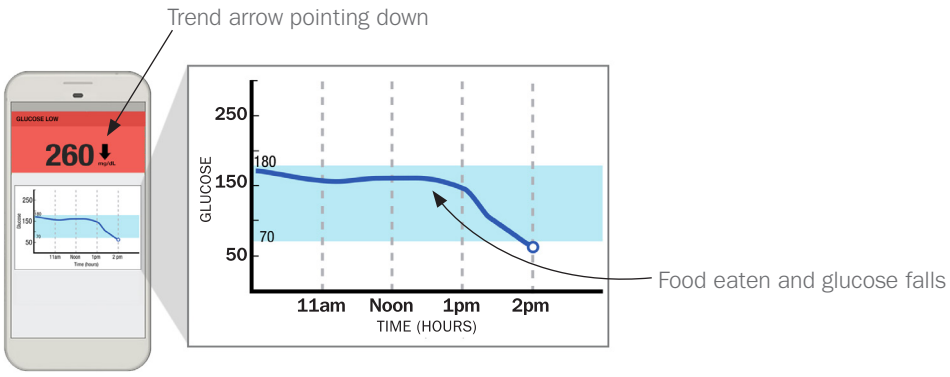
When you do not count enough carbs for your meal, your CGM graph may look like this. Your glucose levels will continue to rise until you give a correction bolus.



Example 3:

- You ate your lunch around noon.
- You look at your CGM graph and see that your glucose level is dropping quickly.
- Your trend arrow is pointing down. This shows that you likely did not count your carbs correctly for your meal.

When you count too many carbs for your meal, you will give too much insulin. Your CGM graph will show your glucose level dropping. In this case, it is important to correct your low glucose or hypoglycemia with fast acting glucose.



Being able to look at your CGM graphs allows you to see how your carb counting is impacting your glucose levels over time. This tells you if you are counting your carbs correctly for each meal.

It can also tell you if you are giving your insulin dose at the correct time. You need to give your insulin dose 15–30 minutes before eating so the insulin can start acting as the food is being absorbed into your body.

What is a Retrospective View?

When you have a CGM you can review weekly reports with your diabetes care team. This allows you to see if you are counting carbs correctly at each meal. Looking at the patterns over time is a helpful way to assess how you can improve your glucose levels. Look at our guide, "How Can CGM Help Me Manage My Diabetes Better?" to learn more about what CGM reports can tell you.

If you really want to focus your glucose control, you can keep a food log. You can compare your food log to your CGM reports. This will let you see what meals impact your glucose levels and if you are carb counting correctly. You and your diabetes team can analyze these patterns to help you be in your post meal target range more often. It is very helpful to share your food logs with a registered dietitian or diabetes educator so they can give you feedback on your dosing and ratios.

SECTION 4 — Conclusion

We hope that the information we have shared has helped you learn more about carb counting, using your CGM, and treating low and high glucoses. All these skills can help you manage your type 1 diabetes better.

The control of my diabetes is in my hands!

That's right. The control of your diabetes is in your hands. When you control it, you can avoid many of the serious problems that can happen if your glucose stays too high or too low for too long.

How else can I learn to manage my diabetes better?

A great way to learn about diabetes management is from your diabetes team and other people. Your diabetes team may be able to suggest people you can talk to. Or you can look on-line to see what other people write about who have diabetes. Look at our resource section on page 16 for more information on diabetes.

Either way, I'm committed to taking care of my diabetes?

Congrats for committing to take good care of your diabetes. We know that it is not easy to treat type 1 diabetes. We know you can do it, and do it well.

Keep up the good work!

APPENDIX 1 — Resources

In this appendix, we offer some resources that may help you. We have the information in this order:

- Organizations
- Carb Counting and Nutrition
- Insulin Pump Companies
- Insulin and Insulin Pens
- Diabetes Supplies and Medications

We have provided internet links. These are US based links so most information is in English. If a site is available in your language, we recommend using that link. To see the information in Spanish or other languages, try Google Translate. It does a pretty good job at changing the information into the language you wish. But, a computer program does this translation so it may not be accurate.

To use Google Translate go to **http://translate.google.com/manager/website/** and follow the step-by-step guide. This is free!

ORGANIZATIONS

AMERICAN ASSOCIATION OF DIABETES EDUCATORS (AADE)

(800) 338-3633
www.aadenet.org

This is a group of diabetes educators. This is their link for patient resources: https://www.diabeteseducator.org/patient-resources. Here they offer information for people with diabetes.

AMERICAN DIABETES ASSOCIATION (ADA)

(800) 342-2383
www.diabetes.org
Spanish link: http://www.diabetes.org/es/?loc=util-header_es

This is the biggest group of people with diabetes and diabetes professionals. It helps people with both Type 1 as well as Type 2 Diabetes. There are local chapters that you can contact for help or to volunteer. They also have an online store to buy books, gifts and other helpful items.

ACADEMY OF NUTRITION AND DIETETICS

(800) 877-1600

www.eatright.org

This is a site for information about food and nutrition.

CHILDREN WITH DIABETES

www.childrenwithdiabetes.com

This started as a group having mostly to do with children with diabetes. Now it includes young adults as well as parents of people with Type 1 Diabetes.

It is a good site to learn about many tools and resources for people with Type 1 Diabetes.

CLINICAL RESEARCH STUDIES WEBSITE

clinicaltrials.gov

This site lists all the clinical research studies that are in process in the United States. You can do a search using the key words "Type 1 Diabetes" if you want to find those research studies.

DIABETES MINE

www.healthline.com/diabetesmine

This is a blog about Type 1 Diabetes. It has been around for many years and is very helpful. A woman who has Type 1 Diabetes started it. It shares many people's experiences and advice.

DIABETES SISTERS

www.diabetessisters.org

This is a group for women with diabetes, mostly Type 1. They share ideas and experiences.

DIABETIC DANICA

www.facebook.com/DiabeticDanica

Danica is a kind young woman with Type 1 Diabetes. She makes YouTube videos about having Type 1 Diabetes and how to use diabetes devices. These videos can be helpful.

DIABTRIBE

www.diatribe.org

Diatribe is a non-profit organization. It evaluates and comments on new approaches and treatments for diabetes, both Type 1 and Type 2.

GLU

www.myglu.org

GLU is the largest interactive on-line network for people with Type 1 Diabetes as well as their care givers and family members. The nonprofit Helmsley Charitable Trust funds it.

It offers excellent advice and information about Type 1 Diabetes. You can also connect with others who have the same questions and concerns about diabetes as you do.

JDRF

www.jdrf.org

This used to be the Juvenile Diabetes Research Foundation. It was started to help do research on Type 1 Diabetes. Now it helps people living with Type 1 Diabetes as well as funds research. There are local JDRF offices that may be helpful to you.

TRIAL NET

www.diabetestrialnet.org

This is a group of researchers who work on preventing and treating early Type 1 Diabetes. Contact your local Trial Net site for screening risk of new onset Type 1 diabetes for yourself or family members.

TUDIABETES

www.tudiabetes.org
Spanish link: http://www.estudiabetes.org

This is a large on-line group of people with both Type 1 and Type 2 Diabetes. They share concerns and ideas in Spanish about living with diabetes.

CARBOHYDRATE (CARB) COUNTING AND NUTRITION RESOURCES

CALORIE KING

www.calorieking.com

This offers information on foods, carbs, calories and more.

CARBS AND CALS

www.carbsandcals.com

This offers books and a $5 App that gives pictures of foods and their carb count.

THE DIABETES CARBOHYDRATE AND FAT GRAM GUIDE

(The American Diabetes Association)

This guide has quick, easy meal planning using carbohydrate and fat gram counts. You can buy it on many shopping websites like Amazon, Barns and Noble and the American Diabetes Association online store. www.store.diabetes.org

THE DOCTOR'S POCKET CALORIE, FAT & CARBOHYDRATE COUNTER

(949) 642-1993

Family Health Publications publish this. You can buy it on many shopping websites like Amazon and Barns and Noble and the calorie king online store at www.calorieking.com.

FIGWEE

www.figwee.com

This is an iPhone App for $2.99 that gives pictures of many different foods along with their carbohydrate count.

NUTRITION IN THE FAST LANE

(Franklin Publishing)
(800) 643-1993
www.fastfoodfacts.com

This book has nutrition information for 60 of the most common restaurants in the United States.

NUTRITION AND DIABETES

(International Diabetes Center)
(888) 637-2675
www.idcpublishing.com

This web site has books for sale in English and Spanish for $3 on nutrition and diabetes.

INSULIN PUMP COMPANIES

These websites give you lots of information about their pumps. They also offer on-line lessons about how to use their pumps.

It can be very useful to look at these sites. You can learn about pumps. You can review how to use the pump you have as well.

ACCU-CHECK PUMPS: ROCHE DIAGNOSTICS

(800) 280-7801
www.accu-checkinsulinpumps.com

This site provides information on the Accu-check Spirit pump.

ANIMAS PUMPS: ANIMAS CORPORATION

(877) 937-7867
www.animas.com

These pumps include the Animas Ping and Animas Vibe.

OMNIPOD PUMPS: INSULET CORPORATION

(800) 591-3455
www.myomnipod.com

This site shares about the Omnipod system. It also gives you the option to try a demo Omnipod pump.

MINIMED PUMPS: MEDTRONICS, INC.

(800) 646-4633
www.medtronicdiabetes.com/home

This is the site for all the MiniMed Medtronic devices.

TSLIM PUMPS: TANDEM DIABETES CARE

(858) 366-6900
www.tandemdiabetes.com

This site describes the features of the TSlim pump.

INSULIN AND INSULIN PENS

SHORT ACTING INSULIN (REGULAR INSULIN) AND INTERMEDIATE ACTING INSULIN (NPH)

These are the oldest and lowest cost types of insulin. They are Regular insulin (short acting) and NPH insulin (intermediate acting insulin).

There are different names for these kinds of insulin including Novolin R, Humulin R, and others. Often these insulins come in vials. But sometimes they come in pens.

www.humulin.com/other-humulin-products.aspx

This offers information on Humulin Regular and NPH insulin as well as 70/30.

Novolin Regular and NPH do not have a website in the U.S. but you can buy them here.

www.diabetesselfmanagement.com/blog/relion-insulin-and-other-products-at-walmart

ReliOn Regular and NPH insulin come in vials. They are part of Walmart's low cost selection of diabetes supplies and products.

RAPID ACTING INSULIN

Apidra (Glulisine) made by Sanofi

www.apidra.com

These come in vials and pens.

Humalog (Lispro) made by Lilly Pharmaceuticals

www.humalog.com/index.aspx

These come in both disposable and refillable pens as well as vials.

Novolog (Aspart) made by Novo Nordisk

www.novolog.com

These come in both disposable and refillable pens as well as vials.

LONG ACTING INSULIN

Biosimilar Glargine

www.basaglar.com

This is a copy of the insulin known as glargine (U100 Lantus). It acts in a similar way and costs somewhat less. It is a long acting basal insulin.

U100 Lantus or Glargine insulin

www.lantus.com

This comes in vials and pens. It is a long acting basal insulin.

U300 Lantus or Glargine insulin

www.toujeo.com

This concentrated Lantus (glargine) insulin acts longer than U100 glargine. It only comes in a pen.

Levemir or Detemir insulin

www.levemir.com

Levemir comes in pens and vials. It is a long acting insulin but it is somewhat shorter acting than Lantus, Degludec or Toujeo.

Tresiba or Degludec insulin

www.tresiba.com

This is the very longest lasting basal insulin. It only comes in pens. It comes in two strengths: U100 and U200.

Glucagon Pens

www.lillyglucagon.com

This is the site for the Lilly brand of glucagon.

www.cornerstones4care.com/tracking/what-to-know/glucagen.html

This is the website for the Glucagon Kit which is the Novo-Nordisk brand of glucagon.

DIABETES SUPPLIES AND MEDICATIONS

CASES FOR INSULIN

www.frioinsulincoolingcase.com

These cases keep insulin cool and are easy to carry.

www.myabetic.com
These are carrying cases for insulin and supplies.

GLUCOSE TABLETS

www.dex4.com

These are one type of glucose tablet on the market. Many pharmacies have their own generic brands. You can look for a type of glucose tablet that you think tastes the best. But be warned, these do not taste like candy.

PEN NEEDLES

www.novonordisk.com/patients/diabetes-care/insulin-pens-and-needles.html

These are insulin pens and needles made by Novo-Nordisk.

PEN NEEDLES AND INSULIN SYRINGES

www.bd.com/diabetes

BD makes many diabetes products. They include syringes, pen needles and insulin infusion sets. BD offers very helpful educational information.

WEBSITE FOR COMPARING THE LOCAL COSTS OF MEDICATIONS

www.GoodRX.com

This is a good free App for finding the best prices for your medications. You enter the medication you are looking for and your location. Then it tells you the cost of it at your nearby pharmacies. It also gives you discount coupons.

APPENDIX 2 — Glossary of Diabetes Terms

In this glossary, we list and define key words that have to do with diabetes. You can use this to look up words you want to learn more about.

A1c

This is also:

- HbA1c
- Hemoglobin A1c
- Glycosylated hemoglobin

It is a blood test. The test can be a finger stick or blood taken from your vein. It tells you what your average blood sugar has been over the past three months. It does this by measuring the percentage of red blood cells in your body that have glucose stuck to them.

In most cases, normal A1c levels are 4% to 5.6%. The goal is to have your A1c as close to normal as possible, without having too many low blood sugar reactions. Your diabetes team will help you figure out what is the best target for you.

Be sure to do this test as often as your diabetes team orders it, about every 3 months.

Antibodies

These are proteins the body makes to protect itself from outside threats. These threats can include bacteria or viruses.

People get type 1 diabetes when their antibodies destroy the body's own beta cells that make insulin.

Aspart

This is the generic name of one kind of rapid-acting insulin. The branded (trade) name for aspart is Novolog. See rapid-acting insulin for more information.

Apidra

This is a branded (trade) drug name of one kind of rapid-acting insulin. The generic name for Apidra is glulisine. See rapid-acting insulin for more information.

Autoimmune disease

This is a disease caused by a problem in the body's immune (infection fighting) system that causes an attack on the body itself, rather than an infection. Type 1 diabetes is this kind of disease.

Basaglar

This is a brand drug name of one kind of basal insulin. The generic name for Basaglar is glargine. This long-acting basal insulin drug comes in one strength written as U100. See basal insulin and long-acting insulin for more information.

Basal insulin

You give this insulin with a shot once or twice a day. In most cases this insulin is only for patients on multiple daily shots. Basal insulin comes in different strengths shown as U100, U200 and U300. There are two types of basal insulin, long-acting insulin and intermediate acting insulin. See long-acting insulin and intermediate acting insulin for more information.

Basal insulins are:

Generic name	Brand name
NPH U100	Humulin (N) or Novolin (N) or ReliOn (N)
Degludec U100	Tresiba U100
Degludec U200	Tresiba U200
Detemir U100	Levemir
Glargine U100	Lantus or Basaglar
Glargine U300	Toujeo

Basal rate

Your body needs insulin on an ongoing basis even when you are not eating. The basal rate is the amount of insulin you need to give by shots or with an insulin pump. When the basal rate or basal insulin dose is set just right, the blood sugar does not go high or low when you are not eating.

For those using a pump, basal rates are in units per hour. You may see units per hour written as units/hour or u/hr. Typical rates are between 0.4 u/hr. and 1.6 u/hr. If you are using shots, you give yourself basal insulin doses in daily units, such as 15 units or 20 units. Your diabetes team will tell you what your basal doses should be.

Beta cells or ß -cells

Beta cells or ß-cells are cells that make insulin.

These cells are in the part of the pancreas called the Islets of Langerhans. See Cells for more information.

Blood glucose (BG) or Blood sugar

Blood glucose is also blood sugar.

This is the main sugar that is in the blood. This sugar is the body's main source of energy.

Bloodstream

The blood flowing through the circulatory system in the living body.

Blood sugar level

This means how much sugar is in the blood.

Blood sugar levels are measured in the U.S. in milligrams per deciliter, or mg/dl. In other countries, in milimoles, or mmol/l.

A normal range (for someone without diabetes) is about 70 to 100 mg/dl (3.9 to 5.6 mmol/L) before breakfast and below 140 mg/dl (7.8 mmol/L) after meals.

Blood sugar meter

This is a small, portable machine. People with diabetes use it to check their blood sugar levels.

After pricking the skin with a lancet, you place a drop of blood on a test strip. The test strip is placed in the machine. Then the meter, or monitor, shows the blood sugar level as a number on the digital display.

Blood sugar monitoring

This means checking your blood sugar level on a regular basis to manage diabetes.

You need a blood sugar meter or blood sugar test strips that change color when a drop of blood touches them. This is so you can check your blood sugar often.

Bolus

This is a burst of short or rapid acting insulin. It acts over a short period.

Most often, a bolus is to offset the blood sugar rise that happens after eating or drinking carbohydrates. It is also a correction dose to bring down a high blood sugar level back to normal.

The insulins for this are:

Generic name	Brand name
Insulin Regular	Humulin (R) or Novolin (R) or ReliOn (R)
Lispro	Humalog
Aspart	NovoLog
Glulisine	Apidra

Cannula

This is a small and flexible tiny piece of tubing. It stays under the skin once you remove the needle from the infusion set of an insulin pump.

Carbohydrate or Carb

Carbohydrates are also called carbs. Carbohydrates are one of the three main parts in foods:

1. Carbs
2. Fats
3. Proteins

They are the most important part of foods to control sugar. Carbohydrates are mainly sugars and starches. They have four calories per gram.

Carb bolus

This is a spurt of insulin that gets sent out quickly in the body to match carbs you are about to eat in a meal or snack. Most people use between 1 unit of rapid acting insulin for each 5 grams of carbs up to 1 unit for each 25 grams of carbs.

Carb counting

This means counting the grams of carbs in any food you eat or liquid you drink. This is a useful way to find out the amount of insulin you need to keep a normal blood sugar.

Carb factor or Carb Ratio or Insulin-to-carb ratio

This is the number of grams of carbs that one unit of insulin covers for a person. This varies from person to person. Your diabetes team will tell you your ratio.

Catheter

This is also pump tubing. Insulin goes through this plastic tube from the pump to the insertion set of a pump.

Cells

Cells are the smallest units of life. They are basic building blocks for all known life forms. Cells make up the parts of your body, like your skin, bones, heart, liver, or lungs. A person has over 10 trillion cells in their body.

Certified diabetes educator (CDE)

This is a health care professional with expertise in diabetes education. Trained and certified.

Continuous subcutaneous insulin infusion (CSII) or Insulin pump

CSII is the formal name for an insulin pump. See Insulin pump for more information.

Coma

This is a sleep-like state where a person is not conscious. Very high or very low blood sugar in people with diabetes can cause a coma.

Continuous glucose monitor (CGM)

A system consisting of a sensor, transmitter and receiver which determines subcutaneous or under the skin glucose levels every 1 to 5 minutes.

Correction bolus

A spurt of short or rapid acting insulin sent out quickly in the body. It is to bring a high blood sugar level back within a person's target range before a meal, after a meal, or at bedtime.

Correction factor or Insulin sensitivity factor

This is the fall in blood sugar level that one unit of insulin will produce. It is set by your diabetes team. It is often in the range of 25 to75 but can be more or less depending on what your body needs.

A correction factor of 50 is used as a starting point. This means that 1 unit of insulin will lower your blood sugar by 50 mg/dl (2.8 mmol/L). For instance, if your correction factor is 50 and your blood sugar is 200 mg/dl (11.1 mmol/L), you expect that giving 1 unit of insulin will lower your sugar by 50 points. Which means that after 1 unit of insulin, the blood sugar will fall from 200 mg/dl (11.1 mmol/L) to 150 mg/dl (8.3 mmol/L).

Dehydration

This is when a person does not have enough water in their body. This can come from drinking too little fluid. It can also come from losing too much body fluid when a person pees or urinates often, sweats, has diarrhea or vomiting.

Delayed-onset hypoglycemia

A drop in blood sugar levels that can happen many hours after intense exercise.

Diabetes team

A group of people who help you take care of your diabetes. You are the most important member of your team. The other people on your team can be:

- Doctor
- Nurse or nurse practitioner or physician assistant
- Diabetes educator
- Dietitian or diabetes educator
- Social worker
- Psychologist
- Eye doctor

These people are part of your diabetes team. Each one of them can help you take better care of your diabetes.

Diabetic coma

This is when a person with diabetes is not conscious and is in a sleep-like state. Very high or very low blood sugar in people with diabetes can cause this.

Diabetic ketoacidosis (DKA) or Ketoacidosis

This is a very serious condition where the body does not have the insulin it needs. This results in dehydration and the buildup of acids in the blood. This needs to be treated in the hospital. It is life-threatening.

Dietitian

A health care professional who tells people about meal planning, carb counting, weight control and diabetes management. A registered dietitian (RD) has more training. Dietitians can also be diabetes educators.

Degludec

This is a generic drug name of one kind of basal insulin. The brand name for degludec is Tresiba. This long-acting basal insulin drug comes in two strengths written as either U100 or U200. See basal insulin and long-acting insulin for more information.

Detemir

This is a generic drug name of one kind of basal insulin. The brand name for detemir is Levemir. This long-acting basal insulin drug comes in one strength written as U100. See basal insulin and long-acting insulin for more information.

Endocrinologist

A doctor with the title MD or DO trained to treat diseases related to glandular problems. This includes diabetes.

Exchange lists

These lists are one of the ways for people with diabetes can plan meals. The lists have different types of food and show the amount carbs, proteins and fats in a serving size. Knowing this information helps you know how much insulin you will need if you eat that food.

Extended bolus

The insulin pump sends out a bolus over a fixed period set by the patient. For example, the pump could be set to give the bolus dose over 2 or 3 hours instead of right away. In most cases, the pump gives the bolus right away. This is a way to give insulin over a longer period, which is good for foods that the body absorbs more slowly, such as foods with a lot of fat in them.

Fasting

This means not eating food or drinking any fluids except water.

Fasting plasma glucose (FPG) test

A lab test that people take after fasting for 8 to 10 hours. In most cases, people fast overnight and take the FPG test in the morning.

An FPG level of less than 100 mg/dl (5.6 mmol/L) is normal. A level of 100 to 125 mg/dl (5.6 to 6.9 mmol/L) means prediabetes. A level of 126 mg/dl (7.0 mmol/L) or more means a person likely has diabetes. When a level is over 126 mg/dl (7.0 mmol/L), there will be more tests to confirm if the person has diabetes

Fats

Fats are one of the three main parts of foods along with carbohydrates and protein. Fats occur alone as liquids or solids. This includes oils and margarines. They also can be a part of other foods.

Fats come from animals, veggies, nuts or seeds. Fats have 9 calories per gram.

Fiber

A kind of carb that passes through the digestive system intact. It does not raise blood sugar levels. It comes from plants.

Fiber adds bulk to your diet. It is very important for keeping your intestines healthy.

Food bolus

A dose of insulin that a person with diabetes takes before meals or snacks. This is to cover the expected rise in blood sugar from the food. Often, food boluses match the amount of carbohydrates in the food.

Glargine

This is a generic drug name of one kind of basal insulin. The brand name for glargine is Lantus or Basaglar or Toujeo. This long-acting basal insulin drug comes in two strengths written as either U100 or U300. See basal insulin and long-acting insulin for more information.

Glucagon—the hormone

This is a hormone. The alpha cells make it in the Islet of Langerhans in the pancreas. This hormone raises blood sugar levels. The opposite hormone to insulin that lowers blood sugar levels. In people without diabetes, the glucagon and insulin work together, to keep blood sugars normal. In people with diabetes, not enough glucagon is made to keep the blood sugars normal so they can fall too low.

Glucagon—the medication

Glucagon is given as a shot to help raise your blood sugar level. It is something that another person would give you if you were having a low blood sugar reaction and were not able to eat or drink sugar to bring it back up. The shot raises the blood sugar quickly. It does this by releasing sugar that is stored in the liver.

Glucagon emergency kit

A kit that has glucagon and a syringe. It is used to treat severe low blood sugar. Glucagon is a hormone that quickly increases blood sugar.

You need a prescription to get glucagon. It is a shot that someone else must give you. You should always have a glucagon kit at home, just in case. Be sure the one you have is not expired.

Glucose

A simple sugar that is in the blood. The body uses glucose for energy.

Glucose tablets

These are tablets that you chew and swallow. They are made of pure glucose. People take them to treat low blood sugar.

Glulisine

This is a generic drug name of one kind of rapid-acting insulin. The trade name for glulisine is Aprida. See rapid-acting insulin for more information.

Glycemic index (GI)

This is a method to classify foods, most of all carbs. The Index is based on how much the blood sugar level goes up after eating the certain food.

Glycogen

When you eat, carbohydrates they turn into a form of sugar called glycogen. This is a storage form of glucose in your liver and muscles. The glycogen is stored in your liver and muscles. When you have a low blood sugar, fast, or exercise, the glycogen turns into glucose and is release into the blood stream when you need it.

Gram

This is a small unit of weight in the metric system. People with diabetes use grams to weigh food.

Hormone

This is a chemical substance made by a gland or tissue. The blood carries it to other cells in the body. There, the hormone attaches to cells and causes them to do a certain job. For instance, when insulin attaches to a muscle cell it lets sugar go inside the cell. This is described as a "lock and key" effect. The hormone is the key and the cell is the lock. When the hormone insulin attaches to the cell, it opens the door and let's sugar inside.

Insulin and glucagon are hormones.

Humulin [N]

This is a brand drug name of one kind of intermediate-acting insulin. The generic name for Humulin [N] is NPH. See intermediate-acting insulin for more information. It is a cloudy insulin.

Humulin [R]

This is a brand drug name of one kind of short-acting insulin. The generic name for Humulin [R] is Insulin Regular. See short-acting insulin for more information.

Humalog

This is a brand drug name of one kind of rapid-acting insulin. The generic name for Humalog is lispro. See rapid-acting insulin for more information.

Hyperglycemia or High blood sugar

This is when a person has a higher than normal level of sugar in the blood. In most cases, this means a blood sugar level of more than 180 mg/dl (10.0 mmol/L).

Hypoglycemia or Low blood sugar or Insulin reaction

This is when a person has a lower than normal sugar level in the blood. In most cases, this means a blood sugar level of less than 70 mg/dl (3.9 mmol/L).

Symptoms can vary. They can include feeling confused, nervous, shaky, drowsy or moody. They can also include sweating, headaches or numbness in the arms and hands.

If it is not treated, severe low blood sugar can cause loss of consciousness, convulsions, or even death.

Infusion set

This is part of an insulin pump. This set transfers insulin from the pump through an infusion line to below the skin. The set includes the tubing, tubing connector, insertion set, cannula and adhesive.

Infusion site or Insertion site

This is the area on the body where someone who uses an insulin pump inserts the cannula or needle.

Injection or Shot

This is when someone inserts liquid medication or nutrients into the body with a syringe. A person with diabetes injects insulin just under the skin, into what is subcutaneous tissue. Subcutaneous means below the skin.

Injection sites

These are places on the body where people most often inject insulin.

Injection site rotation and Infusion site rotation

The place you change on the body where you inject insulin or put the infusion sites. When you rotate, it prevents lipodystrophy. This means an abnormal build-up of fat under the skin.

Insertion set

The part of the infusion set that a person inserts through the skin. It may be a thin or a large metal needle. When the person removes the needle, it leaves a small Teflon catheter or cannula under the skin.

Insulin

This is a hormone made by beta cells in the Islet of Langerhans in the pancreas. The body sends out insulin when blood sugar levels go up, for instance after eating a meal. Its job is to lower blood sugar levels to normal.

Insulin lets sugar go into cells. Sugar gives your cells the energy to live. Without insulin, the sugar stays on the outside of the cells and goes up to very high levels in the blood. Without insulin, you would die because your cells would have no energy to live.

When your body cannot make its own insulin, there are different types for insulin drugs you can take. Your diabetes team will figure out the best insulin for you. The table below explains about the different types of insulin. You can also look up the types and names of insulin in this glossary for more information.

Generic Name (Brand Names)	**Onset** — Time for insulin to reach blood-stream	**Peak** — Period when insulin is most effective	**Duration** – How long the insulin works
RAPID-ACTING INSULIN			
Lispro (Humalog)	About 15 to 30 minutes	About 30 to 90 minutes	About 3 to 5 hours
Aspart (Novolog)	About 15 to 30 minutes	About 30 to 90 minutes	About 3 to 5 hours
Glulisine (Apidra)	About 15 to 30 minutes	About 30 to 90 minutes	About 3 to5 hours
SHORT-ACTING INSULIN			
Insulin Regular [R] (Humulin [R], Novolin [R] or ReliOn [R]	About 30 minutes to 1 hour	About 2 to 5 hours	About 5 to 8 hours
INTERMEDIATE-ACTING INSULIN AND CALLED A BASAL INSULIN			
NPH [N] (Humulin [N], Novolin [N] or ReliOn [N]	About 1 to 2 hours	About 4 to 12 hours	About 18 to 24 hours
LONG-ACTING INSULIN AND CALLED A BASAL INSULIN			
U100 Glargine (Basaglar or Lantus)	About 1 to 1 and a half hours	Maybe slight peak at 12 hours in some people; no peak time in others	About 20 to 24 hours
U300 glargine (Toujeo)	About 1 to 1 and a half hours	No peak	About 28 to 36 hours
Detemir (Levemir)	About 1to 2 hours	About 6 to 8 hours	Up to 24 hours
Degludec (Tresiba)	About 30 to 90 minutes	No peak time	About 42 hours
PRE-MIXED INSULIN			
	About 30 minutes	About 2 to 4 hours	About 14 to 24 hours
50% NPH/50% regular insulin Humulin 50/50	About 30 minutes	About 2 to 5 hours	About 8 to 24 hours
70% long acting/30% rapid acting insulin Novolog 70/30	About 10 to 20 minutes	About 1 to 4 hours	Up to 24 hours
75% long acting/25% rapid acting insulin Humalog mix 75/25	About 15 minutes	About 30 minutes to 2 and a half hours	About 16 to 20 hours

Insulin adjustments

A change in the amount of insulin a person with diabetes takes. Based on factors like meal planning, activity levels and blood sugar levels.

Insulin pen

A device that injects insulin. It looks like a pen for writing.

There are two kinds of insulin pens:

1. Prefilled pen with insulin that is disposable
2. Reusable pen that holds replaceable cartridges of insulin

To inject the insulin under the skin, you need to screw on a needle to the top of the pen.

Insulin pump

This is a small machine about the size of a small cellphone. It is computerized. You can program it to deliver a constant amount of basal insulin and give a bolus of insulin for a meal or high blood sugar. It takes the place of insulin shots.

A pump sends out fast-acting insulin through a plastic catheter, or tube. A Teflon infusion set or a small metal needle connects to the tube. You insert the set or small needle through the skin. The body gradually absorbs the insulin into the bloodstream.

Insulin Regular

This is a generic drug name of one kind of short-acting insulin. The brand name for insulin Regular is Humulin [R], Novolin [R], or ReliOn [R]. See short-acting insulin for more information.

Insulin sensitivity

This is a term to describe how the body reacts to insulin. Everyone reacts differently whether your body is making its own insulin or you must get insulin by shots or a pump. If a person is sensitive to insulin, it means that a smaller amount will lower the level of sugar in the blood. If a person is not sensitive to insulin it means she or he will need more insulin to lower the level of sugar in the blood. When a person needs more insulin to lower blood sugar, they are more resistant to insulin.

Insulin-to-carb ratio

A formula you use to match the dose of insulin to the amount of carbs you eat and drink.

Intermediate-acting insulin

This is a type of basal insulin. It controls blood sugar for about half the day or overnight. This insulin starts working in about 1 to 2 hours. It works best in your body at 4 to 12 hours and then starts fading. How it works is different for each person.

NPH is the generic name of the drug. Humulin [N], Novolin [N], or ReliOn [N] are brand names.

This insulin looks cloudy. You can mix it with regular or rapid-acting insulin in a syringe. See basal insulin, regular insulin and rapid-acting insulin for more information.

Islets of Langerhans

Small islands of cells scattered throughout the pancreas that make hormones. They have beta-cells, which make insulin and alpha cells which make glucagon. Other cells include delta cells, PP cells and Epsilon cells which make other hormones.

Ketoacidosis—See Diabetic ketoacidosis

Ketones

The body releases these acids when body fat breaks down.

Ketones can build up to dangerous levels in the absence of insulin. This is because the body is not able to break down sugar as fuel.

A urine or a blood test can measure them. A urine dip stick is usually used.

Lancet

A spring-loaded device that you use to prick the skin with a small needle. You do this to get a drop of blood to check your blood sugar.

Lipodystrophy

This is when the fat tissue below the skin becomes swollen, hard or forms dimples. It also limits the body from absorbing insulin if you inject in that area.

Giving yourself many shots into the same area of skin or putting the pump cannula in the same site time after time often causes this.

Lantus

This is a brand drug name of one kind of basal insulin. The generic name for Lantus is glargine. This long-acting basal insulin drug comes in one strength written as U100. See basal insulin and long-acting insulin for more information.

Levemir

This is a brand drug name of one kind of basal insulin. The generic name for Levemir is detemir. This long-acting basal insulin drug comes in one strength written as U100. See basal insulin and long-acting insulin for more information.

Lispro

This is a generic drug name of one kind of rapid-acting insulin. The brand name for lispro is Humalog. See rapid-acting insulin for more information.

Long-acting insulin

This type of basal insulin controls blood sugar consistently for an entire day or longer. After injecting, it begins working many hours and can stay in the bloodstream up to 42 hours. How long it works can be different for different people. It may start weakening a few hours earlier for some, while it may work a few hours longer for others. It comes in different strengths shown as U100, U200 and U300.

See basal insulin to learn more.

Long-acting insulins are:

Generic name	Brand name
Degludec U100	Tresiba U100
Degludec U200	Tresiba U200
Detemir U100	Levemir
Glargine U100	Lantus or Basaglar
Glargine U300	Toujeo

Medical insurance or health insurance

This is a plan that a person signs up for that pays for some or all the costs of medical and surgical care. These plans differ from state to state. Sometimes people must buy their own insurance. Other times they get it from their job or the government. Government plans include Medicare and Medicaid. In some states, the plan may have its own name. For instance, in California it is Medi-Cal.

Multiple daily injections (MDI)

This is a schedule where you give yourself many insulin shots each day. In most cases, you use a long-acting insulin along with shots of rapid-acting insulin before each meal or snack. Some people also use intermediate-acting insulin. See long-acting, intermediate-acting and rapid-acting insulin for more information.

Novolin [N]

This is a brand drug name of one kind of intermediate-acting insulin. The generic name for Novolin [N] is NPH. See intermediate-acting insulin for more information. It is a cloudy insulin.

Novolin [R]

This is a brand drug name of one kind of short-acting insulin. The generic name for Novolin [R] is Insulin Regular. See short-acting insulin for more information.

NPH

This is a generic drug name of an intermediate-acting insulin. The brand names for NPH are Humulin [N], Novolin [N] or ReliOn [N]. See intermediate-acting insulin for more information.

Occlusion

The infusion set or infusion site clogs or blocks. This can stop or slow insulin delivery.

In most cases, an occlusion happens when the cannula gets pinched, kinked or dislodged. The cannula blocks when insulin crystals form.

An occlusion can be partial. That means it only reduces, but does not stop the flow of insulin. Or it can be complete. That means no insulin gets through the tubing.

Pancreas

This gland is near the stomach. It is deep in the center of the body. It releases insulin and other hormones. It also releases digestive enzymes.

Pharmacist

This health care professional prepares and gives medicine to people. She or he also gives information on medicines.

Pre-mixed insulin

In most cases, people with diabetes take these two or three times a day before a meal. They are insulins where a shorter and longer acting insulin mixed. In most cases, they look cloudy. The numbers after the name describe how much long-acting and short-acting insulin is in the mix. They have many names, including:

- Humulin 70/30 (70% long acting/30% short acting insulin)
- Novolin 70/30 (70% long acting/30% short acting insulin)
- Novolog 70/30 (70% long acting/30% rapid acting insulin)
- Humulin 50/50 (50% long acting/50% short acting insulin)
- Humalog mix 75/25 (75% long acting/25% rapid acting insulin)

Proteins

These are one of the three main parts of foods along with carbohydrates and fats. Proteins are made of amino acids. Foods like milk, meat, fish, and eggs have protein.

The body burns proteins more slowly than fats or carbohydrates. There are four calories per gram of protein.

Rapid-acting insulin

If you give yourself shots, you will give both long-acting insulin and short or rapid-acting insulin. The rapid-acting insulin covers insulin needs for meals. You give yourself a shot at the same time you eat.

If you use a pump, you only use rapid acting insulin. The pump gives out rapid-acting insulin in small amounts on an ongoing basis. You also program your pump to give you a bolus of insulin for meals. See long acting insulin and bolus for more information.

Rapid acting insulins are:

Generic name	Brand name
Lispro	Humalog
Aspart	Novolog
Glulisine	Apidra

Reservoir, syringe, cartridge

This container holds the fast-acting insulin inside a pump.

Self-management

In diabetes, this means the ongoing process of managing diabetes. It includes when you:

- Plan meals
- Plan physical activity
- Check blood sugar
- Take diabetes medicines
- Handle diabetes when you are sick
- Handle low and high blood sugar
- Manage your diabetes on trips

People with diabetes design their own self-management treatment plan. They do this with the support of their diabetes team. This includes doctors, nurses, dietitians, pharmacists and others.

Sensitivity factor

This is the amount that a single unit of insulin lowers the blood sugar level in a person. Often this is first set at 50. But based on how a person reacts to insulin it can change.

A lower number, such as 25, means that the person is less sensitive to insulin. A higher number, such as 75, means that the person is more sensitive to insulin.

Sharps container

This is a container where you get rid of used needles and syringes. It is often made of hard plastic so that needles cannot poke through.

Self-monitoring of blood glucose (SMBG)

This is when you check your blood sugar with a blood sugar meter.

Short-acting insulin

Short-acting insulin covers insulin needs for meals. You give yourself a shot about 30 minutes before you eat. Short-acting insulin brand names are Humulin [R], Novolin [R] or ReliOn [R]. The generic name is regular insulin.

Starch

This is a type of complex carbohydrate. Some examples are bread, pasta and rice.

Sugar

A kind of carbohydrate that most often has a sweet taste. This includes glucose, fructose and sucrose. In the diabetes world, the word sugar is often used instead of glucose. Blood glucose and blood sugar mean the same thing.

Sugar alcohol

This is a sugar substitute. It has simple sugars with an alcohol molecule attached to them. This lowers the calorie content. It also delays the effect on blood sugar levels.

Syringe

This is a device used to inject medication or other liquids into body tissues. The syringe for insulin has a hollow plastic tube with a plunger inside. It also has a needle on the end.

Team management

This is an approach to treat diabetes where a team provides medical care. See Diabetes team for more information.

Total daily dose (TDD)

The total amount of insulin a person uses in a day. It means adding all the insulin doses: faster and slower acting insulin together. You use the TDD to help figure out the basal rate, carb factor and correction factor.

Tresiba

This is a brand drug name of one kind of basal insulin. The generic name for Tresiba is degludec. This long-acting basal insulin drug comes in two strengths written as either U100 or U200. See basal insulin and long-acting insulin for more information.

Toujeo

This is a brand drug name of one kind of basal insulin. The generic name for Toujeo is glargine. This long-acting basal insulin drug comes in one strength written as U300. See basal insulin and long-acting insulin for more information.

Type 1 Diabetes

In Type 1 Diabetes, the pancreas makes little or no insulin. This is because the beta cells in the body that make insulin are destroyed.

It is an autoimmune disease. This is caused by a defect where the body's internal defense system attacks a part of the body itself.

Most often, this type of diabetes appears suddenly. It is more common in people younger than 30. But it can appear at any age.

The ways to treat it are:

- Give daily insulin shots or use an insulin pump
- Count carbohydrates
- Exercise regularly
- Self-monitor blood sugar levels each day through finger sticks or by using a continuous glucose monitoring (CGM).

Units of insulin

This is the basic measure of insulin. U-100 insulin means 100 units of insulin per milliliter (mL) or cubic centimeter (cc) of solution.

It is a way to describe the concentration of insulin. In the United States, there are U100, U200, U300 and U500 insulins.