

Checking Blood Glucose: What It Can Do for You

You can use the results of your blood glucose (blood sugar) checks to make decisions about food, physical activity, and medication. These decisions can help you feel better day to day and delay or prevent diabetes complications such as heart attack, stroke, or blindness.

What you can learn from this brochure:

- factors that can raise or lower your blood glucose levels
- recommended target ranges for your blood glucose
- answers to frequently asked questions about checking blood glucose levels
- tips on using your blood glucose results to make decisions about diabetes care
- why you need the A1C/eAG blood test

Before you were diagnosed with diabetes, no matter what you ate or how active you were, your blood glucose levels automatically stayed within a narrow range. But with diabetes, this is no longer true. Your blood glucose level can be higher or lower. These changes are common and can take place quickly.

There are two ways to keep track of your blood glucose levels:

- using a blood glucose meter to help you make decisions about day-to-day care
- getting an A1C at least twice a year to find out your average blood glucose for the past 2 to 3 months

Understanding factors that affect your blood glucose levels

Many factors can affect your blood glucose levels. Learning about these factors can help you avoid wide swings in your levels.

What can make my blood glucose rise?

- a meal or snack
- inactivity
- not enough diabetes medication
- side effects of other medications
- infection or other illness
- changes in hormone levels, such as during menstrual periods
- stress

What can make my blood glucose fall?

- a meal or snack with less food or fewer carbs than usual
- drinking alcoholic beverages, especially on an empty stomach
- missing a meal or snack
- extra activity
- too much diabetes medication
- side effects of other medications

Real-Life Stories from People with Diabetes

Even though I'd rather not stick myself to get a drop of blood, I do it because it helps me prevent low blood glucose. I always check my blood glucose before I go out dancing. If my blood glucose is less than 100, I need a snack before I leave. Then I can enjoy myself. Of course, I always take my meter and some glucose tablets with me just in case I go low while I'm out.

Sandy W., age 35 • type 1 diabetes

What are the blood glucose targets for people with diabetes?

The targets recommended by the American Diabetes Association (ADA) are listed below. Talk with your health care team about whether these targets are right for you.

	When I wake up and before meals	2 hours after starting a meal
ADA targets	70 to 130 mg/dl	below 180 mg/dl
My usual numbers	_____ to _____	below _____
My target numbers	_____ to _____	below _____

Self-monitoring with a blood glucose meter

Many people use a blood glucose meter, also called a monitor, to check their blood glucose several times a day. A meter is a small machine that rapidly analyzes a tiny drop of blood and then displays your blood glucose level at that moment. To obtain a blood sample, you use a spring-loaded device that pricks your skin with a small, pointed piece of surgical steel called a lancet. You can use the results to make decisions about food, physical activity, and medications.

When are the best times of day to check blood glucose?

Many people check blood glucose first thing in the morning before they eat (called “fasting”) as well as before other meals. You also may want to check 2 hours after the start of a meal (called “post-prandial”) when your blood glucose is likely to be higher. Other times to check include:

- when you’re having symptoms of high or low blood glucose
- when you’re ill, especially if you’re unable to keep food down
- before, during, and after physical activity
- before you drive
- before you go to sleep

How often do I need to check?

If you’re using your blood glucose results to decide how much insulin to take, you’ll want to check several times a day. If you have type 2 diabetes, you may be able to check less often if blood glucose results are usually on target. When you make changes in your medication, activity, or meal plan, or when you are pregnant, you should check more often. Talk it over with your health care team.

Are there ways to get a blood sample without sticking my finger?

There are now devices available that use alternative sites (meaning areas other than the fingertips) for obtaining blood. Other areas that can be used include the fleshy parts of the hand, the forearm, the outer thigh, the calf, or the abdomen. However, to get the most accurate results, experts recommend that you use your fingertips instead of alternate sites if:

- your blood glucose is low or likely to be low
- you have trouble realizing that your blood glucose is low
- it’s less than 2 hours after starting a meal
- you’ve been physically active

If you’re seeking ways to keep your fingertips from getting sore, or you can’t get blood from alternative sites, talk with your health care team about different types of lancets or other techniques that can help.

How do I keep track of my results?

You can use a log book or notebook to write down your blood glucose numbers with the date and time of the check. Electronic log books or software are also available to help keep track of your results. You also can use your log book to make notes about

Real-Life Stories from People with Diabetes

I recently learned how to check my blood glucose at home. I have a talking meter since I can’t see very well. And it was telling me that my blood glucose was too high—up around 250—most days before lunch. So I talked with my diabetes educator and we guessed the reason could be that big glass of orange juice I was having for breakfast, along with my cereal and toast. I have a smaller glass of orange juice and it does the trick—now my blood glucose is usually on target before lunch. Now I don’t feel like I need a nap by noon!

Bessie S., age 81 • type 2 diabetes

medications, physical activity, illness, low blood glucose, stress, or any other factors that affect your blood glucose levels. If your results seem out of your usual range, circle them and make notes about possible reasons. When you meet with your health care team, review your records. Together, you'll talk about whether changes are needed in how you take care of yourself in order to reach your goals.

What do my results mean and how can I use them to make decisions about my diabetes care?

Your results tell you how well your diabetes care plan is working. You'll be able to look at your log book and see patterns—similar results over and over. Looking at these patterns can help you and your health care team fine-tune your diabetes care plan.

Example: Almost every weekday, David's fasting blood glucose is between 90 and 110. But on weekends when he sleeps late, his fasting level is above his target. He decides to talk with his health care team about changing his insulin routine on weekends.

If most of your results are within your target range, your diabetes care plan is working well. But if your numbers are out of your target range at the same time of day for several days in a row, you may need a change in your meal plan, activity routine, or medication. Your health care team can work with you in deciding how and when to make changes.

Look at your record book and ask yourself these questions:

- Has my blood glucose been too low several times this week? What are the possible reasons?
- Has my blood glucose been too high several times this week? What are the possible reasons?
- Has my blood glucose been out of my target range at the same time of day for 3 days in a row? What are the possible reasons?

Example: Miguel has been on vacation this week. His blood glucose has been between 210 and 230 almost every day before dinner. Usually, his blood glucose before dinner is about 150. He realizes that he hasn't been as active as usual. To help keep his blood glucose on target, Miguel decides to take a walk each afternoon.

How can I stop feeling upset when my readings are too high?

It's normal to feel upset or even guilty when you see that your blood glucose is high. Try to think of your blood glucose numbers as information that can help you make an adjustment. For example, when you're driving, once in a while you check your speed by glancing at the speedometer. If you're going too fast, you step on the brakes or ease up on the gas pedal. The speedometer provides the information you need to meet your goal of driving safely, just as a meter gives you the information you need about your blood glucose levels.

How can I make sure that my meter provides accurate results?

You can help ensure you're getting accurate results by following the manufacturer's instructions for:

- keeping your meter clean
- making sure your test strips haven't passed their expiration date
- storing your strips as recommended
- coding (setting up) your meter for your strips if necessary and using the control solution as recommended
- making sure your blood sample is big enough

Review how you use your meter with your diabetes educator once a year. You can also compare the results of a meter check to results of a blood glucose check done at the lab. Your health care team can provide more information on how to do this type of comparison. If your meter isn't working at all, it may need new batteries. Check the back of your meter for the meter manufacturer's toll-free number in case questions arise.

Ask the Diabetes Advisor

Question: I always check my blood glucose first thing in the morning and am usually close to my target. I was shocked by my high A1C. My meter is fine. What's going on?

Oscar P., age 46 • type 2 diabetes

Answer: Blood glucose is often lowest in the morning. You can check at different times to see if your blood glucose is higher at other times of the day. This will help you see how your blood glucose level changes. If your blood glucose is high other times of the day, especially after meals, it can make your A1C high.

The A1C/eAG

What is an A1C?

The A1C is a blood glucose test that may also be reported as estimated average blood glucose (eAG). It tells you what your average blood glucose levels have been for the past 2 to 3 months. It does this by measuring how much glucose gets attached to red blood cells. Because new red blood cells are always being made to replace old ones, your A1C can change over time as blood glucose levels change.

How often should I have an A1C/eAG?

Remind your health care team to measure your A1C at least twice a year. If you're currently changing your medication or making other changes in how you take care of yourself, you may have the test more often.

What is the suggested target for the A1C/eAG?

The ADA says that if your number is higher than 7% or 154 mg/dl, you may need a change in your diabetes care plan. However, no matter what your number is, the closer you get to a result of less than 7% or 154 mg/dl, the better your chances of preventing or delaying long-term problems such as blindness. Studies have shown that for every one point decrease in A1C levels, you reduce your risk of long-term diabetes complications by up to 40 percent.

What does my A1C/eAG result mean?

Usually your A1C result will reflect the general trends you see with your day-to-day blood glucose checks. Sometimes, however, your A1C result may seem higher or lower than you expected. That may be because you aren't checking your blood glucose at times when it's very high or very low. To interpret your result, first find your A1C number on the left. Then read across to learn your average blood glucose for the past 2 to 3 months.

If your A1C is:	Then your average blood glucose was about:
6%	126 mg/dl
6.5%	140 mg/dl
7%	154 mg/dl
7.5%	169 mg/dl
8%	183 mg/dl
8.5%	197 mg/dl
9%	212 mg/dl
9.5%	226 mg/dl
10%	240 mg/dl

If your A1C/eAG is different from what you expect, talk to your health care provider.

Do I still need to check my blood glucose with a meter if I get the A1C/eAG test regularly?

Both kinds of checking are important. You'll use your meter results to make day-to-day decisions. The A1C provides an overall picture of what's going on.

More Information

To get more information about checking blood glucose and glucose meters, visit or call:

- diabetes.org/checkingBG
Download a Blood Glucose Journal, get tips on how to check blood glucose and find information about glucose meters.
- forecast.diabetes.org/consumerguide
Learn about the different kinds of blood glucose meters and other products available to help manage diabetes.
- **1-800-DIABETES (342-2383)**
Call with any further questions.

My Health Care Professional



1-800-DIABETES (342-2383)
www.diabetes.org