

Testing (Monitoring)

Blood Glucose

What is blood glucose monitoring?

This test is a simple way to measure the amount of glucose in your blood at *that* moment of the test. You cannot tell for sure what your blood glucose is by the way that you feel.

There are many different types of blood glucose meters. Talk with your diabetes health care team to choose the one that best meets your needs.

Why test your blood glucose?

- You can find out what your glucose is at any time.
- It is easier to have good control of your blood glucose when you test the level several times a day.
- You can test whenever you think there is a problem (high or low blood glucose symptoms).
- You can ask for help and have changes made in your treatment plan if there is a problem.
- You can see how changes in your treatment plan affect your blood glucose control.
- You can see what happens to your blood glucose control if you do not follow your treatment plan.

What are target blood glucose goals?

- Your personal target blood glucose goals should be discussed with your health care team.
- Goals can vary depending on age, other medical problems and frequency of low blood glucose reactions.

The American Diabetes Association has recommended the following target goals for blood glucose monitoring. **Remember, your goals may be different!**

	Whole Blood Glucose	Plasma
Time	Goals	Goals
Before Meals	80-120 mg/dl	90-130 mg/dl
Bedtime	100-140 mg/dl	110-150 mg/dl

All blood glucose meters use whole blood to measure glucose, while laboratory equipment uses the plasma portion of blood. Whole blood results run about 12% lower than plasma results. Some blood glucose meters can be calibrated to give plasma test results. It is important to know the type of meter you are using when you are comparing your results to published goals.

What equipment is needed?

- A blood glucose meter*
- Strips specific for the meter you will be using
- A device to prick the finger (lancing device) and lancets
- Sharps disposal container

**Some strips allow you to test the blood glucose without using a meter.*

This method is not as accurate.

How do you test your blood glucose?

- Prepare lancing device with lancet.
- Wash hands.
- Prepare meter and strip.
- Prick side of finger (or other area as recommended by lancing device manufacturer).
- Get drop of blood.
- Place drop of blood onto strip according to specific meter instructions.
- Meter will read results.
- Record value in log book.
- Dispose of lancet in sharps disposal container.

Things to remember

- Review the manual that comes with your meter.
- Use soap and warm water to wash hands before testing. Warm water will help give you a good drop of blood.
- Before pricking, work to increase blood flow to the finger.
 - Gently “milk” finger - squeeze and release finger several times.
 - Hold hand in a downward position, below the level of your heart.
 - Rub hands together.
- Get the right amount of blood on the strip!
- Doing the test wrong will give you the wrong results.
- Dispose of lancets properly.

- Know your blood glucose goals.
- Keep a record or log of your blood glucose results.
- Take your log book with you when you visit your health care team.
- Use the toll-free number on the back of your meter if you are having problems with the meter.
- Your test results will help you and your health care team know when to make changes in your treatment plan.

Care of the strips and meter

- Keep the strips in the original container. Don't loosely lay strips in the meter case!
- Keep the cap tightly closed on the bottle of strips.
- Keep your meter and strips out of direct sunlight, very hot or cold weather and high humidity.
- Clean your meter as directed. Some meters do not require cleaning.
- Your strips have an expiration date. Discard strips if the expiration date has passed.
- Code or calibrate your meter when new strips are used.
- Use control solution to check for accuracy of strips and meter. Check the manufacturer's directions about how often you should do so. Once the bottle of control solution has been opened, it is good for three months.

Blood glucose testing timetables

- There is no one testing plan for everyone.
- There are many reasons to test at different times of the day.
- Checking only one time of the day does not indicate the level of your blood glucose throughout the day.
- Checking at different times lets you and your health care team know your overall blood glucose control and how to make changes in your treatment plan.
- Some of the most common times to check are:
 - Before each meal and at bedtime.
 - Once a day, testing before a different meal each day.
 - Twice a day: one day, test before breakfast and supper; the next day, test before lunch and at bedtime. Or one day, test before and after breakfast; the next day, before and after lunch; the next day, before and after your evening meal.

- Once a day, alternating times; then a few days before your physician visit, increase frequency to two to four times a day.
- Fasting and one or two hours after a meal.
- Between 2 and 4 a.m. You may need to occasionally check a blood glucose reading during the sleeping hours.
- Ask your health care team for a testing timetable for you.

When to increase the frequency of testing:

- During times you are sick
- Before and after exercise
- When your blood glucose is too high or too low
- When you are under a lot of stress
- When changes in your treatment plan are made

How to use your blood glucose readings:

Watch for patterns. Look for high or low glucose values at the same time each day. Look at the whole picture. Don't let one reading upset you. If your glucose level is high, do extra testing until levels return to the target range.

Call your health care team if you have:

- Blood glucose readings less than 70 mg/dl for two readings in a row that cannot be explained
- Blood glucose readings over 240 mg/dl or over your target range for two readings in a row
- Blood glucose readings over 240 mg/dl with symptoms of high blood glucose (extreme thirst, excessive urination, positive ketones in urine or blood, fatigue)
- Blood glucose readings over 240 mg/dl with symptoms of illness

Do not wait until your next appointment. You may need to change your treatment plan now. Call your health care team!

Ketones

Ketone testing

People with type 1 diabetes should test for ketones. If you have type 2 diabetes, ask your health care team if there are times you should test for ketones.

Some key points to remember about ketones are:

- When there is not enough insulin, your body cannot use glucose for an energy source, so your body tries to use fat as its fuel source.
- Fat breakdown causes ketones to build up.
- An excess of ketones causes the blood to be acidic. This causes you to be very sick!
- The body tries to get rid of the ketones, mainly through the urine.
- You can test for ketones with strips that can be purchased from the drugstore.

How to test for ketones:

There are two ways to test for ketones: blood or urine.

For urine testing, urinate in a container and dip the stick into the urine or urinate directly onto the strip. Wait the amount of time stated on the bottle.

Compare (match) the strip to the color chart.

- The pad will not change colors if the urine is negative for ketones.
- The pad will change to a different color if ketones are present in the urine.
- Usually, the darker the color, the more ketones there are in the urine.

For blood testing, there are some meters that will test for either blood glucose or blood ketones. You will want to follow the manufacturer's instructions. The meters that can test for ketones are very useful for people who may be using insulin pumps or for people with type 1 diabetes who are experiencing difficulty with blood glucose control.

Test for ketones when:

- Your blood glucose is higher than 240 mg/dl
- You are feeling sick

What to do with the results:

If the amount of ketones present is:

- Negative - Keep testing if glucose is over 240 mg/dl or if you feel sick
- Small - Drink plenty of non-sugar liquids and keep testing
- Moderate/large - Drink plenty of non-sugar liquids and call your doctor