

# Diabetes & Self Glucose Monitoring

## Why do self blood glucose monitoring?

Measuring blood sugar levels at home has become a cornerstone of diabetes care. Measuring your blood sugar regularly can:

- prevent low blood sugar at night
- reduce the risk of eye, kidney and nerve complications
- help us make informed decisions about the amount and type of insulin to use
- help you manage illness at home and alert you if you need to do a ketone test
- help you understand the effects of certain foods, exercise, and stress on your blood sugar.

## What supplies are needed?

Doing a blood test requires a method of pricking the skin to get a drop of blood as well as a method of reading the results. Results are read using test strips that are put in a blood glucose meter or that change colour to show the results.

**Finger-pricking (lancing) device:** A finger-pricking device (called a lancet) is used to get the drop of blood. The lancet can often be set at different depths for different people. The adjustable lancets are particularly good for young children who have tender skin and may not need much lancing depth. Remember to change the lancet everyday. A sharp lancet helps prevent injury and infection.

**Blood glucose meter:** Most people use blood glucose meters to test their blood sugars. Where meters are not available, colour-changing blood sugar strips are used. Not all meters measure in the same way, so the results from different meters are not always comparable. It doesn't matter which type of meter you choose as long as you consistently use the same meter. Bring your meter to each clinic visit. We may take the information from the meter to keep as a record.

Some features to look for in a meter include:

- Accuracy (Make sure the meter is accurate in the environment in which you live, for example, cold, heat, high humidity, or high altitude.)
- Storage of at least the last 100 test values

- Small size
- Short determination time
- Cleaning is easy or not necessary
- A control solution or strip can be used to check meter accuracy.

**Test strips:** When choosing test strips, make sure they work in the meter you are using. Look for strips that need only a small drop of blood and can draw the blood into the strip (capillary action).

## How do I do a blood sugar test?

To get a drop of blood from a finger (or toe):

1. Wash the area with warm water. This increases blood flow and makes sure there is nothing on the finger (or toe) that may alter the reading. Do not routinely wipe the finger with alcohol. Any trace of alcohol left on the skin will interfere with the test.
2. Air dry the area before pricking.
3. Use the lancet to prick the side of the finger or toe rather than the fleshy pad on the fingertip or toe (which is more painful). It is often helpful to place the finger on a table. This helps prevent the natural reflex of withdrawing the finger when poked. If the drop is not coming easily, hold the hand down to the side of the body to increase the blood in the finger.
4. Put the drop of blood on the strip. (If a test strip has been in a cooler or refrigerator, bring it to room temperature before using.) Make sure you completely cover the required area on the strip with blood. Putting too small a drop on the strip is one of the most common errors.
5. Use your blood glucose meter to measure the sugar level from the strip. If you are using colour-changing strips, compare the colour to the colour chart on the package at the appropriate time. You will have to use a watch with a second hand and be careful to check the level after an exact amount of time specified on the package directions.

## Do I have to prick a finger or toe?

Many people prick sites other than the fingers or toes because they may not hurt as much. The most common alternate site is the forearm. Other places to test include the fleshy part of the hand, upper arm, thigh, and back of the calf. The lancet must be dialed to the maximum depth to get enough blood from these sites. Make sure you have a meter that works for these testing sites.

The main problem with not using the fingertips is that the blood flow through the arm is slower than through the fingers. The slower blood flow means the blood sugar value from the arm is 10 minutes behind the fingertip. It is important to rub the site to be used on the arm before pricking. Rubbing increases blood flow in the area. If you have symptoms of low blood sugar, use the fingertip.

## When should I do a blood sugar test?

You should do 3 to 4 blood sugar tests every day, with occasional days off for a rest. The most common times to do a blood sugar test include:

- **Before breakfast:** This test reflects the blood sugar value during the night and is probably the most important time to test. The short-acting insulin dose can be adjusted based, in part, by the value of this test. The dose of Lantus insulin is also based on this test.
- **Before lunch:** This helps you decide if the morning Humalog / NovoLog and / or Regular insulin dosage was correct.
- **Before dinner:** This test reflects how well the dose of morning NPH or Lente insulin worked. It may also reflect the effect of afternoon sports activities and an afternoon snack. A test should not be done unless it has been at least 2 hours since food was eaten. If it is time for dinner and you had an afternoon snack 1 hour earlier, it is best to wait and do a test before the bedtime snack. If this is a common occurrence, change to doing a blood sugar test before the afternoon snack.
- **Before the bedtime snack:** This test lets you know if the short-acting insulin dose given at dinner was correct. This test is important for people who tend to have reactions during the night, children who play outside after dinner, and anyone who did not eat well at dinner. If the bedtime values are low, an extra snack should be given in addition to the usual solid protein and carbohydrate so your blood sugar does not drop too low during the night.

The more often you measure your blood sugar level, the more information we will have for making the right decisions about your diabetes management.

**Testing after meals:** Doing a blood sugar test 2 hours after eating a meal is becoming a more common practice. You should check blood sugar values 2 hours after each meal once or twice weekly. The blood sugar value goals are the same for 2 hours after a meal as they are for 2 hours before a meal. Testing after meals is a useful for people who count carbohydrates and inject insulin just before eating based on how many carbohydrates they plan to eat.

**Testing at night:** Occasionally, you may need to do a blood test in the middle of the night to make sure the value is not getting too low. A nighttime blood sugar test is important for people who tend to have low blood sugars during the night. More than half of the severe low sugars occur during the night. It is important to test on nights when there has been extra physical activity (for example, a cricket game in the evening or playing hard outside on a nice summer evening). The best time to do a check varies with each person. For some, between midnight and 2 a.m. is the best. For others, the early morning hours are better.

**Testing at school:** Some doctors request that a test be done prior to eating lunch. For some children and schools this is not a problem and can be done without interfering with the child's normal school routine. If a low blood sugar reaction occurs at school, it is helpful for your child to do a blood sugar test at the time of the reaction.

## Should I keep written records?

Keeping good records to look for patterns in blood sugars is essential. It is wise to keep written records even if your meter is able to store results (in case the meter breaks). Write down the time of the test, the date, how you feel, and the blood sugar value. You may also want to note times of heavy exercise, illness, or stress. It may be helpful to record what was eaten for the bedtime snack or any evening exercise to see if these are related to morning blood sugars. Also, keep a record of when you have low blood sugar reactions and possible causes. Bring these results to your appointments.

Good record keeping and bringing the results to clinic visits allow the family and diabetes team to work together most effectively to achieve good diabetes management.