

# Blood glucose monitoring: a user's guide

**This handout provides advice on self-monitoring of blood glucose for people with diabetes.**

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The blood glucose monitoring (BGM) system used for self-monitoring of blood glucose levels (self-BGM) comprises a blood glucose meter, a lancet device, blood glucose testing strips and quality control fluid.

## How the meter works

The blood glucose meter measures the amount of glucose in the blood you have put on the testing strip. A chemical reaction occurs between the glucose and a chemical in the strip, generating a signal that the meter converts into the reading displayed on the screen (Figure below). The meter is set up so that it gives a blood glucose value that is the same as a laboratory would determine from a blood sample taken from one of your veins.

Meters need to be adjusted (calibrated) for different batches of strips – some do this automatically and others require you to re-set the meter with a calibration strip.



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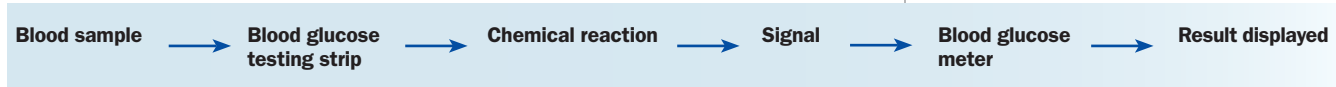


Figure. The stages of blood glucose level measurement.

## Obtaining the best results

The chemical reaction between the glucose and the chemicals in the strip can be affected by storage, temperature, some medications and interfering substances on your finger. This can affect the blood glucose reading given by the meter.

To obtain accurate results, make sure your meter, strips and blood glucose monitoring technique are all in good shape. The Box on the next page provides some tips for testing.

You can check that the results of your self-BGM are accurate in three different ways:

- **Test/re-test**

Measure your blood glucose level and then re-measure it with a different blood sample and a new strip. The two values should lie within 30% of each other.



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- **Quality control**

Use the quality control fluid on the strip in place of your blood. This fluid is known to have a certain blood glucose value and you can compare this with the meter reading.

- **Self-BGM versus laboratory result**

Your doctor can arrange for you to have a laboratory blood glucose test (this is best performed before breakfast, when your blood glucose will be at its lowest level and it is most important that it is measured accurately). If you measure your blood glucose level using your meter immediately (i.e. within minutes) before and again after the blood sample is taken for the laboratory test, you and your doctor can compare your two values with the laboratory value, as well as with each other.

**Self-BGM schedules**

A full schedule for self-BGM includes tests performed before and two hours after each meal and during the night as well a quality control check. Fortunately this full schedule is rarely needed. You are doing the tests to help you and your diabetes professionals modify your lifestyle and medication; you are not doing them just to fill out the spaces in your BGM record.

- **BGM for you**

You may want to measure your blood glucose level if you feel ‘funny’ (a possible indicator of a low blood glucose level) or unwell (a possible indicator of a high blood glucose level). If you take insulin or sulfonylurea tablets, you should always test your blood glucose before you drive and every two hours while driving because these medications may cause you to have low levels (hypoglycaemia). Diabetes Australia recommends ‘You need to be above 5 to drive’ – i.e. your BGL is over 5 mmol/L.

- **BGM for your professionals**

The healthcare professionals looking after you like to see a record of your BGM results over the last week or so, particularly the blood glucose levels before meals. They can then advise you on changes to your medication and/or lifestyle. If you think you may be testing too often or not enough, talk to your diabetes professionals and work out a schedule that will provide them with all the information they need.

**Getting help**

Your doctor and/or Diabetes Nurse Educator can advise you on getting the most out of your self-BGM. The National Diabetes Services Scheme (NDSS) is free and gives you access to subsidised blood glucose testing strips without a doctor’s prescription. To join, visit the NDSS website ([www.ndss.com.au](http://www.ndss.com.au)).

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**10 TIPS FOR TESTING – SELF-BLOOD GLUCOSE MONITORING**

1. Look after your glucose meter. Clean it often and don’t leave it in bright light, including sunlight, or in the car.
2. If needed, calibrate the meter each time a new pack of blood glucose testing strips is started. Check the meter’s accuracy regularly.
3. Note the expiry dates on the strips and quality control fluid, and discard them after that date.
4. Protect the strips from heat, bright light and high humidity. Keep them in the bottle or foil packets until you use them. Don’t leave them in the sun or the car.
5. Always wash your hands with soap and warm water before you do a test. This makes it easier to get a blood sample and removes any substances that might affect the blood glucose reading.
6. Use a fresh lancet each time – for hygiene and to reduce pain and tissue damage. Dispose of used lancets in a sharps container.
7. Use the recommended amount of blood on the strip. Drip the blood on to the strip – don’t smear it.
8. Record the meter readings so you and your diabetes professionals can clearly see the pattern in your blood glucose levels over time.
9. Check your blood glucose levels more often when you are unwell, when you get an unexpected reading and, if you are taking insulin or a sulfonylurea, every time you drive.
10. Join the National Diabetes Services Scheme to buy subsidised strips.



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