TEST

Home blood sugar monitoring

Home blood sugar monitoring uses a meter and blood drop to check glucose

WHAT IT MEASURES
Glucose in your blood at that moment

SAMPLE
Blood

FASTING NEEDED?
Sometimes, when checking a fasting blood sugar

HOW LONG IT TAKES
Usually less than two minutes

RESULTS IN
Seconds; no laboratory turnaround for home meters

USED FOR
Monitoring diabetes and treatment effects

MAIN LIMITATION
Technique and test-strip problems can give misleading readings

Overview

Home blood sugar monitoring checks the amount of glucose, or sugar, in your blood at a particular moment. It is usually done with a blood glucose meter, also called a glucometer.

You place a small drop of blood from your fingertip onto a test strip. The meter displays the result within seconds. Results are commonly shown as milligrams per decilitre (mg/dL) or millimoles per litre (mmol/L), depending on your country and meter.

This test is different from an HbA1c blood test, which estimates your average blood sugar over roughly two to three months. It is also different from continuous glucose monitoring, which uses a sensor under the skin to estimate glucose throughout the day and night.

Home readings can show how meals, activity, illness and medicines affect your blood sugar. A home meter should not be used by itself to diagnose diabetes.

Why the test is ordered

Home monitoring can help you and your healthcare team understand whether a diabetes

treatment plan is working safely. It may also help identify blood sugar that is lower or higher than your agreed target.

Testing may be used to:

Testing at planned times can be more useful than testing randomly. Your schedule may include readings before or after meals, before driving, around exercise, at bedtime or during illness. The timing should match the reason for testing.

- Check the effects of insulin or other diabetes medicines
- Look for low blood sugar after symptoms or treatment changes
- See how food, exercise, stress or illness affects glucose
- Guide insulin doses when you have been taught how to adjust them
- Monitor blood sugar during pregnancy
- Confirm an unexpected continuous glucose monitor reading

Who should have the test

Home monitoring is commonly used by people who take insulin. It may also be recommended if you take a medicine that can cause low blood sugar, are pregnant and have diabetes, or need closer monitoring during illness or a treatment change.

Not everyone with type 2 diabetes who does not use insulin needs frequent routine testing. Whether it is useful depends on your medicines, risk of low blood sugar, treatment goals and whether the results will change what you do.

Children and people who need help with hand control, eyesight or memory may need support from a parent, carer or trained helper. Meters with larger displays, spoken results or easier-to-handle strips are available.

How to prepare

No special preparation is needed for most readings. Do not fast unless you have been asked to check a fasting blood sugar. For a fasting check, follow the instructions you were given about food, drinks and medicines.

Gather your meter, compatible test strips, lancing device, a fresh lancet and a sharps container. Check that the strips are not expired, damaged or stored outside the temperature and humidity limits on the package.

Wash your hands with soap and warm water, then dry them completely. Food, juice or sugar on your fingers can cause a falsely high result. Water left on the skin can dilute the blood drop.

Make sure the date and time on the meter are correct. This matters when readings are reviewed later.

What happens during the test

Insert a test strip into the meter as directed. Some older meters require a code that must match the strip container, although many modern meters code themselves.

Place a fresh lancet in the lancing device. Prick the side of a fingertip, which may be less tender than the centre. If needed, gently massage from the base of the finger toward the tip. Avoid forcefully squeezing the fingertip because tissue fluid may mix with the blood.

Touch the blood drop to the correct part of the strip. Do not smear blood onto the strip unless the instructions specifically say to do so. The meter will count down and display a result.

Record the reading or allow the meter to save it. Add useful details such as the time, relation to meals, exercise, symptoms and insulin dose. Put the used lancet in an approved sharps container. Do not share a lancet or lancing device.

Understanding your results

Your result reflects blood glucose at that moment. It can change quickly after eating, exercising, taking insulin or treating low blood sugar.

There is no single target that is right for everyone. Your target may vary by age, type of diabetes, pregnancy status, medicines, risk of low blood sugar and other health conditions. Meter units and laboratory reference information also vary. Use the targets agreed with your healthcare team rather than a range found online.

Look for patterns rather than judging treatment from one isolated result. Several readings taken under similar conditions can be more informative than a single unusual number.

If a reading is unexpectedly high or low, wash and dry your hands and repeat the test with a new strip. If the repeat result still does not fit how you feel, follow your care plan and seek advice. Symptoms are important even when a meter result appears reassuring.

What affects the results

A misleading reading does not always mean that the meter is broken. Common causes include:

Some medicines and substances can interfere with certain meter-and-strip systems. Examples may include high levels of vitamin C, acetaminophen or sugars such as maltose, but the effect is device-specific. Check your meter instructions and ask a pharmacist if you are unsure.

Meals, caffeine, recent exercise, stress, pain, poor sleep, infection, steroid medicines and missed or delayed diabetes treatment can genuinely change blood glucose. These do not make the test inaccurate, but they can explain why a reading differs from your usual pattern.

- Sugar, fruit, food or lotion on your fingers
- Hands that are still wet after washing
- Expired, damaged or incorrectly stored strips
- Strips that are not designed for your meter
- Too little blood or blood applied incorrectly
- Extreme heat, cold, humidity or altitude outside the meter's limits
- Dehydration or poor blood flow to the fingers
- Forcefully squeezing the fingertip
- Testing at an alternate site when glucose is changing quickly
- A very high or low red blood cell concentration

Accuracy and limitations

Home meters are useful, but they are not as accurate as laboratory testing. A meter can report a high result when blood glucose is not truly high, or miss a low result by displaying a number that is higher than the actual level.

Errors are more likely when strips are expired or poorly stored, the blood sample is too small, the hands are contaminated, or the meter is used outside its approved conditions. Accuracy can also be reduced at very high or very low glucose levels.

Blood from the fingertip may change faster than blood from the forearm or another alternate testing site. During exercise, after meals, after insulin or when low blood sugar is suspected, a fingertip sample is generally the better home check unless your device instructions say otherwise.

A laboratory plasma glucose test is better for diagnosing diabetes. HbA1c is usually more useful for assessing longer-term glucose patterns. A continuous glucose monitor may be

better when frequent measurements, overnight trends or alerts are needed, although sensor readings can lag behind blood glucose.

If your symptoms and meter result do not match, repeat the test and act on concerning symptoms rather than relying only on the number.

Risks and complications

A finger prick may briefly hurt and can cause a small bruise or tender spot. Reusing the same finger repeatedly can make the skin sore, while infection is uncommon when clean equipment and a new lancet are used.

Lancets can injure someone if discarded loosely. Place them directly into an approved sharps container and follow local disposal rules.

What happens next

Continue testing at the times in your monitoring plan. Bring your meter, written log or downloaded report to routine diabetes reviews. Contact your healthcare team routinely if you see repeated readings outside your agreed range, have frequent low readings, or are unsure how to use the results.

Follow your personal low blood sugar plan if a reading is low or you have typical symptoms. Recheck when your plan tells you to. Do not drive if you may have low blood sugar.

Seek urgent medical advice for persistent very high readings, especially with ketones, vomiting or difficulty keeping fluids down.

Call emergency services if someone is unconscious, having a seizure, unable to swallow safely, severely confused, or having trouble breathing. Do not give food or drink to an unconscious person.

Common questions

Can I drink coffee before checking my blood sugar?

For a routine reading, you can test after coffee, but record that you drank it. Coffee with sugar, milk or cream can raise glucose, and caffeine may affect some people. For a fasting reading, drink only water unless your healthcare team gave different instructions.

Does the time of day matter?

Yes. A reading before breakfast answers a different question from one taken after a meal or at bedtime. Test at the planned time and record when you last ate, exercised or took diabetes medicine.

Can I exercise beforehand?

You can, but exercise may raise or lower glucose depending on its intensity, duration, food intake and insulin levels. If you are checking a usual fasting or pre-meal pattern, avoid unplanned exercise immediately beforehand.

Why do I get different results from different fingers?

Small differences are expected because blood glucose changes continuously and each blood drop is slightly different. Larger differences may come from unwashed hands, too little blood, squeezing the finger or strip problems.

Can I reuse a lancet?

A fresh lancet is recommended for each test. Reused lancets become blunt, may hurt more and can carry blood. Never share lancets or lancing devices.

How do I know whether my meter is working properly?

Use the control solution recommended for your meter when the instructions advise it, such as after opening new strips or when results seem unusual. You can also take your meter to a routine appointment and compare its use with a laboratory blood draw.

Sources

- Blood Glucose Monitoring Devices , US Food and Drug Administration
- Self-Monitoring Blood Glucose Test Systems for Over-the-Counter Use , US Food and Drug Administration, guidance for industry and agency staff
- Monitoring Your Blood Sugar , US Centers for Disease Control and Prevention
- Diabetes Tests and Diagnosis , National Institute of Diabetes and Digestive and Kidney Diseases
- American Diabetes Association Professional Practice Committee. "Diabetes Technology: Standards of Care in Diabetes-2025." Diabetes Care , 2025
- American Diabetes Association Professional Practice Committee. "Glycemic Goals and Hypoglycemia: Standards of Care in Diabetes-2025." Diabetes Care , 2025