TEST

Home blood sugar monitoring in children

Home blood sugar monitoring measures a child's current glucose level using a small blood sample and a handheld meter.

WHAT IT MEASURES
Glucose level in a small drop of blood

SAMPLE
Capillary blood from a fingertip or approved alternative site

FASTING NEEDED?
No, unless the care plan requests a fasting reading

HOW LONG IT TAKES
Usually less than five minutes

RESULTS IN
Immediately on the meter

USED FOR
Monitoring diabetes and guiding daily care

MAIN LIMITATION
Technique, strip problems, and rapidly changing glucose can mislead

Overview

Home blood sugar monitoring checks how much glucose is in a child's blood at that moment. Glucose is the body's main source of energy. Insulin helps glucose move from the blood into cells.

The test usually uses a blood glucose meter, a test strip, and a spring-loaded lancet. The lancet makes a small puncture, usually on the side of a fingertip. The meter reads the blood sample and displays a result within seconds.

This is different from a continuous glucose monitor, or CGM. A CGM estimates glucose in the fluid beneath the skin every few minutes. A finger-prick test measures glucose directly in capillary blood.

Home meters are mainly used to monitor known diabetes. They are not considered accurate enough to diagnose diabetes by themselves.

Why the test is ordered

Testing shows how glucose changes during daily life. The results can help you and your child understand the effects of food, insulin, other medicines, illness, stress, and physical activity.

Testing may be used:

The timing should come from your child's individual diabetes plan. Some children need several checks each day. Others use a CGM and need finger-prick checks only in particular situations.

- Before meals, snacks, sleep, or insulin doses
- When low or high blood sugar is suspected
- During illness or changes in routine
- Before, during, or after exercise
- To check an unexpected CGM reading
- Before safety-sensitive activities, such as driving for older teenagers

Who should have the test

Home testing is commonly used by children with type 1 diabetes. It may also be used by some children with type 2 diabetes, especially if they take insulin or medicines that can cause low blood sugar.

Short-term monitoring may be suggested during an illness, a medicine change, or an investigation of unusual glucose results. Healthy children do not usually need routine home blood sugar screening.

If your child has symptoms that could be related to diabetes, arrange a medical assessment rather than relying on a borrowed or newly purchased meter. Diagnosis usually requires a properly collected laboratory blood test.

Children can gradually take part in testing as their skills and confidence develop. Adult supervision remains important until they can test safely, understand the result, and follow their care plan.

How to prepare

Fasting is not usually needed. Test at the time stated in your child's plan, such as before eating or a set time after a meal.

Gather the meter, compatible strips, lancet device, fresh lancet, and a sharps container. Check that the strips are not expired and have been stored as directed. Some meters or strip batches require setup, coding, or control-solution checks.

Wash the child's hands with soap and water, then dry them completely. Food, juice, or sweets on the fingers can cause a falsely high reading. Water left on the skin can dilute the sample.

Warm hands often provide blood more easily. Avoid repeatedly squeezing the fingertip hard because this can mix tissue fluid with the blood.

Do not share lancets or lancet devices. A meter should not be shared unless it was designed for professional multi-person use and can be disinfected correctly.

What happens during the test

Insert a test strip into the meter as directed. Place a new lancet in the device and select a suitable depth.

Prick the side of a fingertip rather than the centre of the pad. Touch the required amount of blood to the strip. Most meters then show the result within seconds.

If the meter reports an error, use a new strip and repeat the test after checking the instructions. Record the result if the meter or connected app does not store it automatically. Include useful context, such as meals, insulin, exercise, symptoms, or illness.

Some meters allow testing from the palm, forearm, or another site. These sites may respond more slowly when glucose is changing quickly. Use them only if the meter allows it and your child's diabetes team has explained when they are appropriate.

Understanding your results

Meters may display glucose in milligrams per decilitre, written as mg/dL, or millimoles per litre, written as mmol/L. Make sure the meter uses the units expected in your child's care plan.

There is no single target that is suitable for every child or every time of day. Targets may differ before meals, after meals, overnight, during exercise, or during illness.

Any printed reference range needs context. Ranges and interpretation may vary by laboratory, age, sex, pregnancy status, medicines, and the clinical situation. For children with diabetes, personal targets are usually more useful than a general laboratory range.

Follow your child's written plan for low or high readings. An unexpected result should usually be repeated after washing and drying the hands, especially if it does not match how the child

feels.

Severe low blood sugar is an emergency. If your child is having a seizure, is unconscious, or cannot safely swallow, use prescribed emergency glucagon if available and call emergency services. Do not give food or drink by mouth.

High glucose needs urgent assessment when it is accompanied by concerning ketone results, repeated vomiting, abdominal pain, deep or difficult breathing, marked drowsiness, confusion, or signs of dehydration. Follow the sick-day plan and seek urgent or emergency care as directed.

Readings that are often outside the agreed target, without emergency symptoms, usually need routine review with the diabetes team.

What affects the results

Several factors can produce a misleading number even when the meter is working:

Some medicines and substances interfere with particular strip technologies. Examples may include high levels of vitamin C, acetaminophen, uric acid, or certain sugars used in medical treatments. The exact interferences differ by meter, so check its instructions and tell the diabetes team about medicines and supplements.

A recent transfusion can change blood composition and may affect interpretation. Pregnancy in an adolescent can also change glucose targets and monitoring needs.

- Sugar or food residue on the fingers can cause a falsely high result
- Wet hands can dilute blood and cause a falsely low result
- Too little blood can cause an error or inaccurate reading
- Hard squeezing can mix tissue fluid into the sample
- Expired, damaged, or incorrectly stored strips may not work properly
- Extreme heat, cold, humidity, or altitude may exceed the meter's limits
- Testing at an alternative site can lag behind fingertip glucose
- Dehydration, poor circulation, or an unusual red blood cell concentration can affect some meters

Accuracy and limitations

Home meters are less accurate than laboratory testing. Small differences between repeated

readings are expected, even when both tests are performed correctly.

A meter may miss a true low or high reading, particularly when glucose is changing rapidly or is near the limits of the meter's measuring range. It may also report a low or high result when the child's actual blood glucose is not outside target.

Repeat a result that is unexpected, conflicts with symptoms, or would lead to a major treatment decision. Use clean, dry hands and a fresh strip. If the repeat result still does not fit the situation, follow the care plan and contact the diabetes team.

A laboratory plasma glucose test is better for diagnosing diabetes or confirming unexplained results. A blood glucose meter also does not measure ketones. Ketone testing may be needed during illness or persistent high glucose.

A CGM is often better for showing trends, overnight patterns, and the direction glucose is moving. However, a finger-prick check may still be needed when CGM symptoms and readings do not match, during sensor problems, or when the device instructs you to confirm a result.

Risks and complications

Finger-prick testing can cause brief pain, a small bruise, or occasional light-headedness. Frequent testing may make fingertips sore, so rotate sites and use the lowest lancet depth that provides enough blood.

Used lancets can cause needlestick injuries. Put them directly into an approved sharps container and follow local disposal rules.

What happens next

Record or review the result alongside insulin, meals, activity, illness, and symptoms. Follow the child's written plan rather than changing insulin or other medicines based on a single unexplained reading.

Contact the diabetes team routinely if readings repeatedly fall outside the agreed target, testing is becoming difficult, or sore fingers are limiting checks. They can review technique, meter settings, strip storage, and whether another monitoring method would help.

Use urgent or emergency care for severe low blood sugar, loss of consciousness, seizures, breathing changes, repeated vomiting, serious dehydration, or high glucose with concerning ketone results.

Common questions

Can my child eat or drink before testing?

Usually, yes. Home monitoring often measures glucose around normal meals. If the plan asks for a fasting result, give only plain water during the stated fasting period.

Can my child drink coffee first?

Coffee can affect glucose, especially if it contains milk, sugar, syrup, or caffeine. If a fasting reading is required, plain water is the safest choice unless the care plan says otherwise.

Does the time of day matter?

Yes. Glucose changes with meals, sleep, hormones, medicines, and activity. Compare readings taken under similar conditions and label whether they were before or after food.

Can my child exercise beforehand?

Exercise can lower glucose, although intense activity can sometimes raise it temporarily. Test at the times given in the exercise plan and keep fast-acting carbohydrate available if advised.

Why is the result different when we repeat it?

Meters and strips have normal measurement variation. Differences can also result from dirty or wet hands, changing glucose, too little blood, or poor strip storage.

Can we use someone else's meter?

Avoid sharing home meters, lancets, or lancet devices. Blood can remain on equipment, and different meters may use different units, strips, settings, or measurement methods.

Sources

- U.S. Food and Drug Administration. Blood Glucose Monitoring Devices .
- U.S. Food and Drug Administration. Self-Monitoring Blood Glucose Test Systems for Over-the-Counter Use: Guidance for Industry and Food and Drug Administration Staff .
- U.S. Food and Drug Administration. Blood Glucose Monitoring Test Systems for Prescription Point-of-Care Use: Guidance for Industry and Food and Drug Administration Staff .
- de Bock M, Codner E, Craig ME, et al. ISPAD Clinical Practice Consensus Guidelines 2022: Glycemic targets and glucose monitoring for children, adolescents, and young people with diabetes . Pediatric Diabetes . 2022;23(8):1270-1276.



- American Diabetes Association Professional Practice Committee. 7. Diabetes Technology: Standards of Care in Diabetes-2024 . Diabetes Care . 2024;47(Supplement 1):S126-S144.
- American Diabetes Association Professional Practice Committee. 14. Children and Adolescents: Standards of Care in Diabetes-2024 . Diabetes Care . 2024;47(Supplement 1):S258-S281.