TEST

Ketones urine test

A ketones urine test checks whether your body is breaking down fat for energy

WHAT IT MEASURES
Ketone acetoacetate released into urine when fat supplies energy

SAMPLE
Urine

FASTING NEEDED?
No

HOW LONG IT TAKES
About five minutes

RESULTS IN
Minutes at home; laboratory timing varies

USED FOR
Detecting and monitoring ketosis, including possible diabetic ketoacidosis

MAIN LIMITATION
Misses beta-hydroxybutyrate, the main ketone in early ketoacidosis

Overview

A ketones urine test checks for ketones in a urine sample. Your body makes ketones when it breaks down fat instead of glucose, or sugar, for energy.

The three main ketones are acetoacetate, beta-hydroxybutyrate, and acetone. Standard urine strips mainly detect acetoacetate. They do not measure beta-hydroxybutyrate well, even though this may be the main ketone during diabetic ketoacidosis.

Small amounts of ketones can occur during fasting, a low-carbohydrate diet, prolonged exercise, pregnancy, or an illness that limits eating. Ketones can also build up when the body does not have enough effective insulin.

The test may be performed at home with a strip or in a laboratory as part of a urine test. A urine ketone result alone cannot diagnose diabetic ketoacidosis or explain why ketones are present.

Why the test is ordered

The test is commonly used when someone with diabetes is unwell, has high blood glucose, or

has symptoms that could be related to a serious ketone build-up. Your diabetes care plan may tell you when and how often to test.

A healthcare professional may also order it when investigating:

Some diabetes medicines called SGLT2 inhibitors can be associated with ketoacidosis even when blood glucose is not very high. Examples include dapagliflozin, empagliflozin, and canagliflozin. If you take one, follow the ketone-testing and sick-day instructions provided with your treatment plan.

- Repeated vomiting or difficulty eating
- Dehydration
- Unexplained weight loss or high blood glucose
- Ketosis during pregnancy
- The effects of fasting, restricted food intake, or a very low-carbohydrate diet
- Possible alcohol-related or diabetic ketoacidosis

Who should have the test

You may need urine ketone testing if it is included in your diabetes sick-day plan or recommended because of symptoms, pregnancy, vomiting, or reduced food intake.

Routine home testing is not necessary for everyone with diabetes. Blood ketone testing may be preferred for people at higher risk of diabetic ketoacidosis because it gives a more current picture.

Seek urgent medical advice if you have diabetes and a positive ketone result together with ongoing vomiting, worsening illness, or difficulty keeping fluids down. This is also important if you are pregnant or taking an SGLT2 inhibitor.

Call emergency services if ketones occur with deep or rapid breathing, confusion, severe drowsiness, collapse, or severe difficulty breathing. Do not wait for another urine test before seeking help.

How to prepare

You do not usually need to fast or change what you eat. Do not stop insulin or other medicines unless a healthcare professional has given you specific instructions.

Drink your usual amount of fluid. Drinking a large amount immediately before testing can dilute

the urine and make ketones harder to detect.

Check that home test strips are within their expiry date. Keep them tightly closed and store them as directed, since heat and moisture can damage the testing chemicals.

If several tests have been requested from the same urine sample, follow the preparation instructions for all of them.

What happens during the test

For a home test, you usually pass urine into a clean, dry container and briefly dip the test strip into it. Some strips can be held in the urine stream. Follow the product instructions because dipping and reading times differ.

Remove excess urine, wait for the stated time, and compare the test pad with the colour chart. Reading it too early or too late can give the wrong category.

For a laboratory sample, you may be asked for a "clean-catch" midstream specimen. This means cleaning the genital area, passing the first part of the urine into the toilet, and collecting the middle part in the container.

Results are usually reported as negative, trace, small, moderate, or large. Some laboratories or meters also provide a number.

Understanding your results

A negative result means the strip did not detect acetoacetate above its testing limit. It does not completely rule out an early or developing ketone build-up.

Trace or small amounts may occur after overnight fasting, prolonged exercise, vomiting, or eating very little carbohydrate. The result needs to be considered alongside your blood glucose, symptoms, medicines, and reason for testing.

Moderate or large amounts need more attention, particularly if you have diabetes, are unwell, are pregnant, or take an SGLT2 inhibitor. Follow your personal sick-day plan and seek prompt medical advice rather than relying on repeated urine checks alone.

Ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines, and clinical context. Use the categories and instructions supplied with your test rather than comparing results from different strip brands.

What affects the results

Several factors can change the result without a laboratory error:

SGLT2 inhibitors do not simply create a false strip result. They can allow significant ketoacidosis to develop with only a modest rise in blood glucose. A recent blood transfusion does not usually affect urine ketone chemistry.

- Hydration: Dilute urine may produce a lower reading, while concentrated urine can appear more strongly positive.
- Timing: Ketones in urine reflect what happened since you last passed urine, not necessarily what is happening in your blood now.
- Old samples: Acetoacetate breaks down if urine stands for too long, which can cause a falsely low or negative result.
- Strip storage: Expired strips or strips exposed to heat, air, or humidity may not work correctly.
- Reading time: Comparing the colour too soon or too late can give an inaccurate category.
- Diet and fasting: Low-carbohydrate eating, missed meals, or fasting can cause real ketone production without diabetic ketoacidosis.
- Exercise: Long or strenuous exercise may temporarily increase ketones.
- Vomiting and pregnancy: Reduced intake and faster use of stored energy can increase ketone production.
- Medicines and urine colour: Some medicines, including levodopa or medicines containing sulfhydryl compounds, and strongly coloured urine can interfere with certain strips.
- Kidney function: Changes in kidney function and urine output may weaken the link between urine and current blood ketone levels.

Accuracy and limitations

Urine ketone strips are useful for identifying acetoacetate, but they can miss early diabetic ketoacidosis. Early in this condition, much of the ketone burden may be beta-hydroxybutyrate, which ordinary urine strips do not measure.

During recovery, beta-hydroxybutyrate changes back into acetoacetate. The urine result can therefore stay positive or appear to worsen even while the person is improving.

A positive result does not always mean diabetic ketoacidosis. Fasting, low-carbohydrate diets, vomiting, and prolonged exercise can produce genuine ketones without the same dangerous

acid build-up.

False-positive readings can occur because of interfering medicines, strongly coloured urine, or incorrect timing. False-negative results can occur with old urine, damaged strips, very dilute samples, or a predominance of beta-hydroxybutyrate.

A blood beta-hydroxybutyrate test is usually better when a current, more precise assessment is needed. Blood tests, glucose measurements, symptoms, and tests of the blood's acidity may all be needed to assess possible ketoacidosis.

Risks and complications

Providing a urine sample is painless and has no significant physical risks. Careful handwashing and a clean container help prevent spills and contamination.

The main risk is relying on a negative or outdated urine result when symptoms suggest a serious problem. Seek care based on your symptoms and treatment plan, not on the strip alone.

What happens next

If your result is negative and you feel well, continue any routine monitoring recommended in your care plan.

An unexpected trace or small result may be rechecked with a fresh sample. If it continues, discuss it during routine follow-up, especially if you are losing weight, eating poorly, or frequently vomiting.

Seek same-day medical advice for moderate or large ketones if you have diabetes, are pregnant, take an SGLT2 inhibitor, or feel unwell. You may need blood ketone, blood glucose, electrolyte, and blood acidity tests.

Possible ketoacidosis is an emergency. Get immediate help for ketones with rapid or deep breathing, confusion, marked drowsiness, collapse, or an inability to keep fluids down.

Common questions

Can I drink coffee before a urine ketone test?

Usually, yes. Coffee does not directly react with the ketone pad. Sugar, milk, fasting requirements for other tests, and changes in hydration may still affect the clinical context.

Does the time of day matter?

The test can be performed at any time. First-morning urine is usually more concentrated, so results may look stronger. When monitoring a trend, test at the times stated in your care plan.

Can I exercise before the test?

Strenuous or prolonged exercise can temporarily increase ketones. If you are testing because of diabetes, illness, or high glucose, do not exercise to try to lower glucose while ketones are present; follow your sick-day plan.

Do I need to fast?

No. Fasting can itself produce ketones, so do not skip food solely for this test unless you have separate instructions for another procedure.

Can menstruation affect the result?

Menstrual blood does not produce ketones, but contamination or strong colour can make a strip harder to read. A clean-catch sample can reduce this problem.

Is a blood ketone test better?

Blood testing measures beta-hydroxybutyrate and reflects the current situation more closely. It is often more useful when diabetic ketoacidosis is suspected or when treatment decisions must be made promptly.

Sources

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