TEST

Creatinine blood test

A creatinine blood test helps assess how well your kidneys filter waste.

WHAT IT MEASURES
Creatinine, a muscle waste product filtered by the kidneys

SAMPLE
Blood

FASTING NEEDED?
Usually no; fasting may be needed for other ordered tests

HOW LONG IT TAKES
Usually less than 10 minutes

RESULTS IN
Often within one day; timing varies by laboratory

USED FOR
Screening and monitoring kidney filtration

MAIN LIMITATION
Muscle mass can mislead creatinine-based kidney estimates

Overview

Creatinine is a waste product made during normal muscle activity. It travels in the blood to the kidneys, which remove most of it into the urine.

A creatinine blood test measures the amount in a blood sample. It is often part of a basic or comprehensive metabolic panel.

Laboratories commonly use the result to calculate estimated glomerular filtration rate, or eGFR. This estimate is usually more useful than creatinine alone.

Creatinine is an indirect measure of kidney function. Muscle mass, food, exercise, medicines and other factors can affect it, so results are interpreted alongside previous measurements, your medical history and other tests.

Why the test is ordered

The test may be ordered to:

Creatinine may also be checked during an acute illness, especially if you have vomiting, diarrhoea, dehydration or a condition that can reduce blood flow to the kidneys.

Kidney disease may cause no obvious symptoms. However, one abnormal result cannot show by itself whether a problem is temporary or long-lasting.

- Check kidney filtration during a routine assessment
- Investigate symptoms or another abnormal result
- Monitor known kidney disease
- Check whether an illness or medicine is affecting the kidneys
- Help guide the choice or dose of certain medicines
- Assess kidney function before some scans, procedures or treatments

Who should have the test

Testing may be considered if you have diabetes, high blood pressure, cardiovascular disease, a previous kidney problem or a family history of kidney disease.

You may also need it if you take a medicine that can affect the kidneys or requires dosing according to kidney filtration. Testing frequency depends on the medicine and your health.

Symptoms such as changes in urination, persistent swelling or unexplained nausea may also lead to testing, although they have many possible causes. Your age, medical history, medicines and previous results help determine whether testing is appropriate.

How to prepare

You usually do not need to fast for a creatinine test. If other blood tests are being collected, you may be asked not to eat beforehand. Follow your appointment instructions.

Tell the healthcare professional about all prescription medicines, over-the-counter products and supplements, particularly creatine and medicines known to alter creatinine.

Do not stop a prescribed medicine unless you have been specifically told to do so. Stopping treatment may be more harmful than the change being investigated.

A large serving of cooked meat or strenuous exercise can temporarily raise creatinine. You may be advised to avoid these if your result must be compared closely with earlier tests.

Drink normally unless instructed otherwise. Dehydration and unusually high fluid intake can affect interpretation.

What happens during the test

A healthcare professional places a band around your upper arm and cleans the skin. A small needle is inserted into a vein, usually inside the elbow or on the back of the hand.

Blood is collected into a tube, the needle is removed and pressure is applied. You may feel a brief scratch or sting.

The blood draw usually takes less than 10 minutes. You can normally resume your usual activities immediately.

Understanding your results

Creatinine may be reported in micromoles per litre, written as µmol/L, or milligrams per decilitre, written as mg/dL. Use the reference interval on your report rather than a range found online.

Interpretation varies with the laboratory, age, sex, pregnancy status, muscle mass, medicines and clinical circumstances.

A higher result can occur when the kidneys filter less effectively. Other causes include dehydration, recent meat intake, strenuous exercise, greater muscle mass and certain medicines.

A lower result is often associated with lower muscle mass. It can also occur during pregnancy, when kidney filtration normally increases, or with conditions that cause muscle loss. It does not automatically indicate disease.

eGFR is calculated using creatinine and factors such as age and sex. A lower eGFR suggests reduced estimated filtration, but one reduced result does not establish chronic kidney disease. Persistence over time or other evidence of kidney damage is usually required.

A change from previous results may be more important than whether one value falls just inside or outside the reference interval.

What affects the results

Factors that can influence creatinine include:

Creatinine may not rise immediately after a sudden reduction in kidney filtration.

- Muscle mass: Muscular people may have higher levels; older, frail or underweight people may have deceptively low levels
- Exercise: Strenuous activity can temporarily increase creatinine
- Food: A large cooked-meat meal can raise it for several hours
- Creatine supplements: These may increase creatinine and complicate interpretation
- Hydration: Dehydration may raise the blood concentration
- Pregnancy: Increased kidney filtration usually lowers creatinine
- Amputation or muscle-wasting conditions: Creatinine may overestimate kidney filtration
- Medicines: Trimethoprim, cimetidine and cobicistat can raise creatinine without necessarily reducing actual filtration
- Kidney-active medicines: Some blood-pressure and diabetes medicines cause an expected early change that requires clinical interpretation
- Laboratory interference: Some substances affect particular testing methods

Accuracy and limitations

The laboratory measurement is generally reliable, but creatinine is only an indirect marker of filtration.

Reduced kidney function can be missed in people who produce little creatinine, such as those with very low muscle mass. Conversely, hard exercise, cooked meat, creatine supplements or certain medicines can make filtration appear lower than it is.

eGFR improves interpretation but remains an estimate. It is less dependable when creatinine production is unusual or kidney function is changing quickly.

A cystatin C blood test may help when creatinine is likely to be misleading because it is less affected by muscle mass. A urine albumin-to-creatinine ratio checks for albumin, a protein that may indicate kidney damage even when eGFR is preserved.

More precise measured-filtration tests take longer and are generally reserved for decisions requiring greater accuracy.

Risks and complications

Possible effects are brief discomfort, light bleeding or a small bruise where the needle entered.

Some people feel faint during or after blood collection. Infection is possible but uncommon.

What happens next

A stable result within the expected range may need no further action.

An unexpected result is often repeated. Your healthcare team may compare previous measurements, review your medicines, calculate eGFR and request a urine albumin-to-creatinine ratio. Cystatin C or other tests may be used if creatinine could be misleading.

A mildly abnormal but stable result may only require routine follow-up if you otherwise feel well. Attend recommended repeat tests rather than changing medicines, supplements or fluid intake yourself.

Seek prompt medical advice if a new abnormal result occurs with reduced urination, ongoing vomiting, worsening swelling or signs of significant dehydration.

Seek emergency care for severe breathlessness, chest pain, confusion, collapse, or very little or no urine with rapidly worsening illness. These symptoms require urgent assessment regardless of the creatinine result.

Common questions

Can I drink coffee before a creatinine blood test?

Usually. Plain coffee is unlikely to prevent testing, but milk or sugar may interfere with other fasting tests. Follow your appointment instructions.

Do I need to fast?

Not for creatinine alone. Fasting may be required if glucose, cholesterol or another test is being collected at the same time.

Does the time of day matter?

Usually not. If small changes are being monitored, testing under similar conditions can make comparisons easier.

Can I exercise beforehand?

Avoid unusually strenuous exercise if possible, particularly during the day before testing. It can temporarily raise creatinine.

Can I eat meat before the test?

A large serving of cooked meat can raise creatinine for several hours. Follow any instructions and mention a recent meat-heavy meal if your result is unexpected.

Should I stop creatine or my medicines?

Do not stop prescribed medicines without instructions. Tell the healthcare professional about creatine and other supplements because they may affect the result.

Sources

- National Institute of Diabetes and Digestive and Kidney Diseases. Estimated Glomerular Filtration Rate Calculators
- MedlinePlus. Creatinine Test
- Kidney Disease: Improving Global Outcomes. KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease
- National Institute for Health and Care Excellence. Chronic kidney disease: assessment and management, NG203
- National Kidney Foundation and American Society of Nephrology. Reassessing the Inclusion of Race in Diagnosing Kidney Diseases: Final Report from the NKF-ASN Task Force 00828-3/fulltext)