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Creatinine Test

What is a creatinine test?

This test measures creatinine levels in a sample of your blood and/or urine (pee). Creatinine is a normal waste product in your body. It's made when you use your muscles and some of the muscle tissue breaks down.

Normally, your kidneys filter creatinine from your blood and remove it from your body in your urine. If there is a problem with your kidneys, creatinine can build up in your blood and less may be released in urine. If blood and/or urine creatinine levels are not normal, it may be a sign of kidney disease [https://medlineplus.gov/kidneydiseases.html] .

Creatinine in blood may be measured by itself or as part of a group of tests called a comprehensive metabolic panel (CMP) [https://medlineplus.gov/lab-tests/comprehensive-metabolic-panel-cmp/] or a basic metabolic panel (BMP) [https://medlineplus.gov/lab-tests/basic-metabolic-panel-bmp/] . Your health care provider may order these tests as part of a routine checkup [https://medlineplus.gov/healthcheckup.html] .

Other names: blood creatinine, serum creatinine, urine creatinine, kidney function, renal function

What is it used for?

A creatinine test is used to help:

- Check the health of your kidneys
- Diagnose kidney disease
- Monitor known kidney problems and see how well treatment is working
- Check for side effects from medicines that may affect your kidneys

Creatinine testing alone isn't the best way to check how well your kidneys are working. That's because people make different amounts creatinine depending on how much muscle they have, the foods they eat, their age, and how active they are. So, the results from creatinine testing are often used in calculations or compared with other substances to help get more information:

- **Creatinine levels in blood** are often used to calculate how fast your kidneys filter waste out of your blood. This is called an estimated glomerular filtration rate [https://medlineplus.gov/lab-tests/glomerular-filtration-rate-gfr-test/] **(eGFR)**. The calculation includes information about your age, weight, height, and sex. An eGFR is a more accurate way to measure kidney health than creatinine levels in blood or urine alone. An eGFR can also help show how serious kidney disease may be.
- **Creatinine levels in blood and urine** maybe be compared with each other. This is called a **creatinine clearance calculation**. Like an eGFR, it estimates how fast your kidneys filter waste. But an eGFR is more accurate. A creatinine clearance may still be useful to help identify the cause of high or low levels of

blood creatinine in people who have very high muscle mass or a loss of muscle mass from age, illness, or the loss of an arm and/or leg.

- **Creatinine levels in urine** may be used to calculate a **urine albumin to creatinine ratio** (UACR), which is sometimes called a microalbumin creatinine ratio [https://medlineplus.gov/lab-tests/microalbumin-creatinine-ratio/] . Albumin is the main protein found in blood. Normally your kidneys filter out just a trace of albumin, or none at all. If larger amounts of albumin pass into your urine, it may be a sign of kidney damage. A UACR compares the amounts of creatinine and albumin in your urine to get a more accurate measurement of how much albumin is in your urine.
- **Creatinine blood levels measured as part of a CMP or a BMP** may be compared with the level of BUN (blood urea nitrogen) [https://medlineplus.gov/lab-tests/bun-blood-urea-nitrogen/] that's measured in the same test. This can help find out the cause of a kidney problem.

Why do I need a creatinine test?

Your provider may order a creatinine test:

- **To check your kidney health** as part of a routine checkup.
- **If you have symptoms of kidney disease.** Symptoms may include:
  - Swelling [https://medlineplus.gov/edema.html] in the hands and feet or puffy eyelids
  - Dry skin, itching [https://medlineplus.gov/itching.html] , or numbness
  - Fatigue [https://medlineplus.gov/fatigue.html]
  - Increased or decreased need to urinate [https://medlineplus.gov/urineandurination.html] (pee)
  - Urine that is bloody or foamy
  - Loss of appetite and weight loss
  - Muscle cramps [https://medlineplus.gov/musclecramps.html]
  - Nausea and vomiting [https://medlineplus.gov/nauseaandvomiting.html]
  - Shortness of breath [https://medlineplus.gov/breathingproblems.html]
  - Sleep problems [https://medlineplus.gov/sleepdisorders.html]
  - Trouble thinking clearly
- **If you have a high risk for developing kidney disease**, even if you don't have symptoms now. Chronic (long-term) kidney disease [https://medlineplus.gov/chronickidneydisease.html] (CKD) often doesn't have symptoms in the early stages. Your risk for kidney disease is increased if you:
  - Have diabetes [https://medlineplus.gov/diabetickidneyproblems.html]
  - Have high blood pressure [https://medlineplus.gov/highbloodpressure.html]
  - Have a family health history of kidney disease, diabetes, or high blood pressure
  - Have heart disease [https://medlineplus.gov/heartdiseases.html]
  - Are over 50 years old
  - Smoke [https://medlineplus.gov/smoking.html]
  - Have obesity [https://medlineplus.gov/obesity.html]
- **If you have kidney problems or possible kidney problems** because you have:
  - Had an abnormal result on a kidney test in the past
  - Been diagnosed with kidney disease
  - Taken certain medicines that could affect your kidneys
  - Had a kidney transplant [https://medlineplus.gov/kidneytransplantation.html]

What happens during a creatinine test?

For a creatinine blood test:

A health care professional will take a blood sample from a vein in your arm, using a small needle. After the needle is inserted, a small amount of blood will be collected into a test tube or vial. You may feel a little sting when the needle goes in or out. This usually takes less than five minutes.

For a creatinine urine test:

You may need to provide all the urine you pass over 24 hours. That's because creatinine levels vary through the day. But your provider may use a urine sample from a shorter period of time.

For a 24-hour urine sample, you will be given a special container to collect your urine over a full day and instructions on how to collect and store your sample. Your provider will tell you what time to start. The test generally includes the following steps:

- To begin, urinate in the toilet as usual. Do not collect this urine. Write down the time you urinated.
- For the next 24 hours, collect all your urine in the container.
- During the collection period, store the urine container in a refrigerator or in a cooler with ice.
- 24 hours after starting the test, try to urinate if you can. This is the last urine collection for the test.
- Return the container with your urine to your provider's office or the laboratory as instructed.

If you have hemorrhoids that bleed or are having your menstrual period, tell your provider before your test.

Will I need to do anything to prepare for the test?

Your provider will let you know how to prepare for your test. You may be told to not eat meat for 24 hours before your test. That's because meat can temporarily increase creatinine levels.

If creatinine is being measured as part of a CMP or a BMP test, you may need to fast [https://medlineplus.gov/lab-tests/fasting-for-a-blood-test/] (not eat or drink) for up to 12 hours before your test.

Certain medicines and supplements can affect your test results. So be sure to tell your provider everything you're taking. But don't stop taking any medicine unless your provider tells you to stop.

Are there any risks to the test?

There is very little risk to having a blood test. You may have slight pain or bruising at the spot where the needle was put in, but most symptoms go away quickly.

There is no risk to having a urine test.

What do the results mean?

Creatinine levels that are considered normal for you will depend on how much muscle you have, what you eat, your age, and how active you are. If you're healthy, your levels are usually fairly stable over time.

But a normal creatinine test result doesn't always mean that your kidneys are healthy. Sometimes, blood creatinine levels remain in a normal range during the early stages of kidney disease. They rise as the condition of your kidneys becomes more serious. If your provider suspects you have a kidney condition, you will likely have other kidney tests [https://medlineplus.gov/kidneytests.html] even if your creatinine results seem normal.

If your results are abnormal, a single high creatinine test can't diagnose a specific condition. You will likely need to be retested and/or have other tests, too.

In general, if your **blood creatinine level** is:

- **High for you**, it may be a sign of:

- Kidney disease or injury, including infection [https://medlineplus.gov/urinarytractinfections.html] , poor blood flow to the kidneys, a blockage in the urinary system, or kidney failure [https://medlineplus.gov/kidneyfailure.html]
- A condition that affects your kidneys, such as heart failure [https://medlineplus.gov/heartfailure.html] or diabetes [https://medlineplus.gov/diabetes.html]

High blood creatinine levels don't always mean you have a kidney problem. They may be caused by dehydration [https://medlineplus.gov/dehydration.html] , muscle disorders [https://medlineplus.gov/muscledisorders.html] and injuries, muscular dystrophy [https://medlineplus.gov/musculardystrophy.html] , intense exercise, or a diet high in meat. Certain health problems in pregnancy [https://medlineplus.gov/healthproblemsinpregnancy.html] can also cause increases in creatinine.

- **Low for you**, it may be a sign of malnutrition [https://medlineplus.gov/malnutrition.html] or a condition that causes your muscles to get smaller, such as a long illness, a nerve disorder, or muscle loss from aging. Serious liver disease [https://medlineplus.gov/liverdiseases.html] can also lead to low levels. Low levels of blood creatinine aren't common.

If your results from creatinine blood or urine tests were used to calculate an eGFR, creatinine clearance, and/or a urine albumin to creatinine ratio, ask your provider to explain what these measurements say about your kidney health.

If you have questions about any your results, talk with your provider.

Learn more about laboratory tests, reference ranges, and understanding results [https://medlineplus.gov/lab-tests/how-to-understand-your-lab-results/] .

References

1. Centers for Disease Control and Prevention [Internet]. Atlanta: U.S. Department of Health and Human Services; Chronic Kidney Disease Basics; [reviewed 2022 Feb 28; cited 2023 June 8]; [about 4 screens]. Available from: https://www.cdc.gov/kidney-disease/about/ [https://www.cdc.gov/kidney-disease/about/]
2. Cleveland Clinic: Health Library: Diagnostics & Testing [Internet]. Cleveland (OH): Cleveland Clinic; c2023. Creatinine Clearance Test; [reviewed 2020 Oct 16; cited 2023 June 8]; [about 10 screens]. Available from: https://my.clevelandclinic.org/health/diagnostics/16380-creatinine-clearance-test [https://my.clevelandclinic.org/health/diagnostics/16380-creatinine-clearance-test]
3. Gounden V, Bhatt H, Jialal I. Renal Function Tests. [Updated 2022 Jul 18; cited 2023 Jun 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK507821/# [https://www.ncbi.nlm.nih.gov/books/NBK507821/#]
4. Hinkle J, Cheever K. Brunner & Suddarth's Handbook of Laboratory and Diagnostic Tests. 2nd Ed, Kindle. Philadelphia: Wolters Kluwer Health, Lippincott Williams & Wilkins; c2014. Creatinine, Serum; p. 198.
5. Hinkle J, Cheever K. Brunner & Suddarth's Handbook of Laboratory and Diagnostic Tests. 2nd Ed, Kindle. Philadelphia: Wolters Kluwer Health, Lippincott Williams & Wilkins; c2014. Creatinine, Urine; p. 199.
6. Mayo Clinic [Internet]. Mayo Foundation for Medical Education and Research; c1998-2023. Creatinine test: About; 2023 Feb 9 [cited 2023 Jun 8]; [about 11 screens]. Available from: https://www.mayoclinic.org/tests-procedures/creatinine-test/about/pac-20384646 [https://www.mayoclinic.org/tests-procedures/creatinine-test/about/pac-20384646]
7. National Institute of Diabetes and Digestive and Kidney Diseases [Internet]. Bethesda (MD): U.S. Department of Health and Human Services; Chronic Kidney Disease Tests & Diagnosis; [reviewed 2016; cited 2022 June 8]; [about 7 screens]. Available from: https://www.niddk.nih.gov/health-information/professionals/clinical-tools-patient-management/kidney-disease/laboratory-evaluation/frequently-asked-questions [https://www.niddk.nih.gov/health-information/professionals/clinical-tools-patient-management/kidney-disease/laboratory-evaluation/frequently-asked-questions]
8. National Institute of Diabetes and Digestive and Kidney Diseases [Internet]. Bethesda (MD): U.S. Department of Health and Human Services; Identify and Manage Patients with Chronic Kidney Disease; [cited 2023 Jun 8]; [about 3 screens]. Available from: https://www.niddk.nih.gov/health-information/professionals/clinical-tools-patient-management/kidney-disease/identify-manage-patients/manage-ckd [https://www.niddk.nih.gov/health-information/professionals/clinical-tools-patient-management/kidney-disease/identify-manage-patients/manage-ckd]

9. National Institute of Diabetes and Digestive and Kidney Diseases [Internet]. Bethesda (MD): U.S. Department of Health and Human Services; Laboratory Evaluation of Kidney Diseases: Frequently Asked Questions; [cited 2022 June 8]; [about 7 screens]. Available from: https://www.niddk.nih.gov/health-information/professionals/clinical-tools-patient-management/kidney-disease/laboratory-evaluation/frequently-asked-questions [https://www.niddk.nih.gov/health-information/professionals/clinical-tools-patient-management/kidney-disease/laboratory-evaluation/frequently-asked-questions]
10. National Kidney Foundation [Internet]. New York: National Kidney Foundation Inc., c2023. A to Z Health Guide: Creatinine; [cited 2023 Jun 8]; [about 4 screens]. Available from: https://www.kidney.org/atoz/content/what-creatinine [https://www.kidney.org/atoz/content/what-creatinine]
11. Nemours KidsHealth [Internet]. Jacksonville (FL): The Nemours Foundation; c1995-2023. Urine Test: Creatinine; [reviewed 2023 Mar; cited 2023 Jun 8]; [about 4 screens]. Available from: https://kidshealth.org/en/parents/test-creatinine.html [https://kidshealth.org/en/parents/test-creatinine.html]
12. Testing.com [Internet]. Seattle (WA): OneCare Media; c2023. Creatinine Test; [modified 2022 Dec 6; cited 2023 Jun 8]; [about 12 screens]. Available from: https://www.testing.com/tests/creatinine/ [https://www.testing.com/tests/creatinine/]
13. Testing.com [Internet]. Seattle (WA): OneCare Media; c2023. Creatinine Clearance; [modified 2021 Nov 9; cited 2023 Jun 8]; [about 16 screens]. Available from: https://www.testing.com/tests/creatinine-clearance/ [https://www.testing.com/tests/creatinine-clearance/]
14. UF Health: University of Florida Health [Internet]. Gainesville (FL): University of Florida; c2023. Creatinine blood test: Overview; [reviewed 2019 Jul 4; cited 2023 Jun 8]; [about 3 screens]. Available from: https://ufhealth.org/creatinine-blood-test [https://ufhealth.org/creatinine-blood-test]
15. UF Health: University of Florida Health [Internet]. Gainesville (FL): University of Florida; c2023. Creatinine clearance test: Overview; [reviewed 2019 Jul 7; cited 2023 Jun 8]; [about 3 screens]. Available from: https://ufhealth.org/creatinine-clearance-test [https://ufhealth.org/creatinine-clearance-test]
16. UF Health: University of Florida Health [Internet]. Gainesville (FL): University of Florida; c2023. Creatinine urine test: Overview; [reviewed 2019 Jul 7; cited 2023 Jun 8]; [about 2 screens]. Available from: https://ufhealth.org/creatinine-urine-test [https://ufhealth.org/creatinine-urine-test]
17. University of Rochester Medical Center [Internet]. Rochester (NY): University of Rochester Medical Center; c2023. Health Encyclopedia: Creatinine (Blood); [cited 2023 Jun 8]; [about 5 screens]. Available from: https://www.urmc.rochester.edu/encyclopedia/content.aspx?ContentTypeID=167&ContentID=creatinine_serum [https://www.urmc.rochester.edu/encyclopedia/content.aspx?ContentTypeID=167&ContentID=creatinine_serum]
18. University of Rochester Medical Center [Internet]. Rochester (NY): University of Rochester Medical Center; c2023. Health Encyclopedia: Creatinine (Urine); [cited 2023 Jun 8]; [about 4 screens]. Available from: https://www.urmc.rochester.edu/encyclopedia/content.aspx?contenttypeid=167&contentid=creatinine_urine [https://www.urmc.rochester.edu/encyclopedia/content.aspx?contenttypeid=167&contentid=creatinine_urine]
19. UW Health [Internet]. Madison (WI): University of Wisconsin Hospitals and Clinics Authority; c2023. Health Information: Creatinine and Creatinine Clearance; [updated 2022 Sep 8; cited 2023 Jun 8]; [about 5 screens]. Available from: https://patient.uwhealth.org/healthwise/article/en-us/hw4322 [https://patient.uwhealth.org/healthwise/article/en-us/hw4322]

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National Library of Medicine 8600 Rockville Pike, Bethesda, MD 20894 U.S. Department of Health and Human Services
National Institutes of Health
Last updated December 5, 2023