TEST

Creatinine clearance test

A creatinine clearance test estimates how effectively your kidneys filter creatinine from your blood.

WHAT IT MEASURES
Creatinine removed from blood into urine over time

SAMPLE
Blood and timed urine, usually collected for 24 hours

FASTING NEEDED?
No, unless your laboratory gives specific instructions

HOW LONG IT TAKES
Twenty-four-hour urine collection plus a brief blood draw

RESULTS IN
Often one to three days; laboratory turnaround may differ

USED FOR
Evaluating and monitoring kidney filtration

MAIN LIMITATION
Incomplete or incorrectly timed urine collection

Overview

A creatinine clearance test estimates how much blood your kidneys filter each minute. It compares creatinine in a timed urine collection with creatinine in your blood.

Creatinine is a waste product made during normal muscle activity. Healthy kidneys remove most of it from the blood and pass it into urine.

Urine is usually collected over 24 hours, with a blood sample taken during or near the end of the collection. The laboratory calculates clearance using urine creatinine, urine volume, collection time, and blood creatinine.

Creatinine clearance is related to glomerular filtration rate, or GFR, but is not identical. The kidneys also release a small amount of creatinine directly into urine, so clearance may be slightly higher than true GFR.

The test differs from estimated creatinine clearance and estimated GFR, or eGFR, which use a blood creatinine result and personal characteristics without a timed urine collection.

Why the test is ordered

The test may be ordered to assess whether kidney filtration is stable or changing. It can be useful when blood-based estimates may be misleading, including in people with unusually high or low muscle mass, major limb loss, severe malnutrition, or substantial changes in body size.

Other reasons include:

Many people do not need this test. Blood creatinine with eGFR is more convenient and is often used first.

- Investigating an unexpected blood creatinine or eGFR result
- Monitoring known kidney problems
- Assessing kidney function before certain treatments or procedures
- Supporting medicine dosing decisions in selected situations
- Completing a broader timed urine assessment

Who should have the test

You may be offered the test when your healthcare professional needs a timed measurement rather than a blood-based estimate alone. This may apply to people with very muscular builds, muscle-wasting conditions, major limb loss, or major changes in weight or nutrition.

It may also be used when kidney function could affect an important treatment decision. A cystatin C blood test or specialised measured GFR test may sometimes be more appropriate.

Children, pregnant people, and anyone unable to collect every urine sample reliably may need different instructions, additional interpretation, or another test.

How to prepare

Follow the laboratory's instructions carefully. Start and finish times matter, and storage requirements vary.

Fasting is not usually needed. A large amount of cooked meat can temporarily increase creatinine, so you may be asked to avoid meat before or during the collection. Do not change your diet unless instructed.

Tell your healthcare professional about all prescription medicines, non-prescription medicines, and supplements. Do not stop any medicine unless the person responsible for your care tells

you to.

Avoid unusually strenuous exercise before and during the collection if advised, because it can affect creatinine production. Drink your usual amount unless you have a fluid restriction or other instructions. Ask where to store the container; many collections must be kept cool.

What happens during the test

A standard collection lasts 24 hours.

At the stated start time, empty your bladder into the toilet. Do not collect this first urine. Record the time.

Afterward, collect all urine passed during the next 24 hours. At the same time the following day, empty your bladder and add this final urine to the container.

A blood sample is taken from a vein during the collection or soon afterward. The blood draw usually takes only a few minutes.

Tell the laboratory if you miss or spill a sample, collect for the wrong length of time, or include the first urine by mistake. You may need to repeat the collection to avoid a misleading result.

Understanding your results

Creatinine clearance is usually reported in millilitres per minute. Some laboratories adjust it to a standard body surface area and report millilitres per minute per 1.73 square metres.

A lower result can mean the kidneys are filtering less blood, but one result cannot show the cause, duration, or likely course of the change. A higher result does not always indicate a problem; filtration may increase during pregnancy, and collection errors can also raise the result.

Your result should be interpreted alongside blood creatinine, eGFR, urine albumin or protein tests, medical history, and earlier measurements. Trends are often more useful than one result.

Reference ranges vary with the laboratory, age, sex, pregnancy, body size, medicines, and clinical context. Use the range on your report rather than a general range found online.

What affects the results

Incomplete urine collection is the most common problem. Missing a sample can make clearance appear lower than it is.

Collecting for too long, including urine passed before the start time, recording incorrect times, or measuring the wrong total volume can produce a falsely high or low result.

Other influences include:

Tell the clinical team about any recent major transfusion, surgery, or hospital admission, as these may affect fluid balance and creatinine production.

- Muscle mass: More muscle generally produces more creatinine
- Strenuous exercise: Muscle activity or injury may temporarily raise creatinine
- Cooked meat: A meat-heavy meal may temporarily increase creatinine
- Pregnancy: Kidney filtration usually increases
- Age: Creatinine production and filtration change with age
- Hydration or acute illness: Vomiting, diarrhoea, fever, or fluid changes may alter results
- Medicines: Trimethoprim and cimetidine may raise blood creatinine without reducing filtration
- Rapidly changing kidney function: Blood creatinine may lag behind sudden changes

Accuracy and limitations

A correctly completed collection can provide useful information, but it does not measure GFR perfectly. Because kidney tubules release some creatinine into urine, creatinine clearance often reads slightly higher than true filtration.

Low muscle mass can make reduced filtration harder to detect. Missed urine samples may produce a falsely low result, while collecting for too long or recording the wrong times may be falsely reassuring. Rapid changes in kidney function also make results difficult to interpret.

Blood-based eGFR is easier and avoids collection errors. Cystatin C may help when creatinine is unreliable. If highly accurate measurement is needed, a specialist test using an injected filtration marker may be preferred.

Risks and complications

A blood draw may cause brief discomfort, a small bruise, or light-headedness. Urine collection has no direct medical risk, although collecting and storing every sample can be inconvenient.

What happens next

A result within the laboratory's expected range may require only routine follow-up. Repeat testing may be used to monitor a trend.

An unexpected result is usually compared with collection details and other kidney tests. If urine was missed or timing was incorrect, repeating the collection may be more useful than interpreting the original result.

Further tests may include blood creatinine with eGFR, urine albumin testing, cystatin C, imaging, or specialised GFR measurement.

Contact your healthcare service promptly for a marked decrease in urine, worsening swelling, persistent vomiting, or new shortness of breath. Seek emergency care for severe breathing difficulty, chest pain, fainting, severe confusion, or inability to pass urine with significant pain or illness. Do not wait for a routine test review.

Common questions

Can I drink coffee before or during the test?

Usually, yes. Follow the laboratory's fasting and fluid instructions, and avoid drinking much more or less than usual.

Does the time of day matter?

The starting hour is less important than collecting for the full instructed period. Record the start and finish times accurately.

Can I exercise beforehand?

Normal daily activity is usually acceptable. Avoid unusually hard exercise if advised because it can temporarily increase creatinine.

What if I forget to collect one urine sample?

Tell the laboratory. A missed sample can make the result falsely low, so you may need to repeat the collection.

Can I collect the urine while menstruating?

Often you can, but blood may affect other urine tests performed at the same time. Ask the laboratory whether to continue or reschedule.

Should I stop my medicines?

No, unless specifically instructed. Some medicines affect creatinine results, so provide an up-to-date list.

Sources

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