NATIONAL KIDNEY FOUNDATION®

Tests to Check Your Kidney Health

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Medically reviewed by NKF Patient Education Team

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About your kidneys

Most people have two kidneys, each about the size of an adult fist, located on either side of the spine just below the rib cage. Although they are small, your kidneys do many important jobs. Some of the ways they keep your whole body in balance include:

- Removing natural waste products and extra water from your body
- Helping make red blood cells
- Balancing important minerals in your body
- Helping maintain your blood pressure
- Keeping your bones healthy

Your healthcare provider will order tests every so often to check on your kidney health. The specific test(s) they order depends on any symptoms you may have and other factors.

The information below serves as a quick guide to the different tests that your healthcare provider might order to check your kidney health.

What are your Kidney Numbers? uACR and eGFR Explained

Blood tests

Serum creatinine

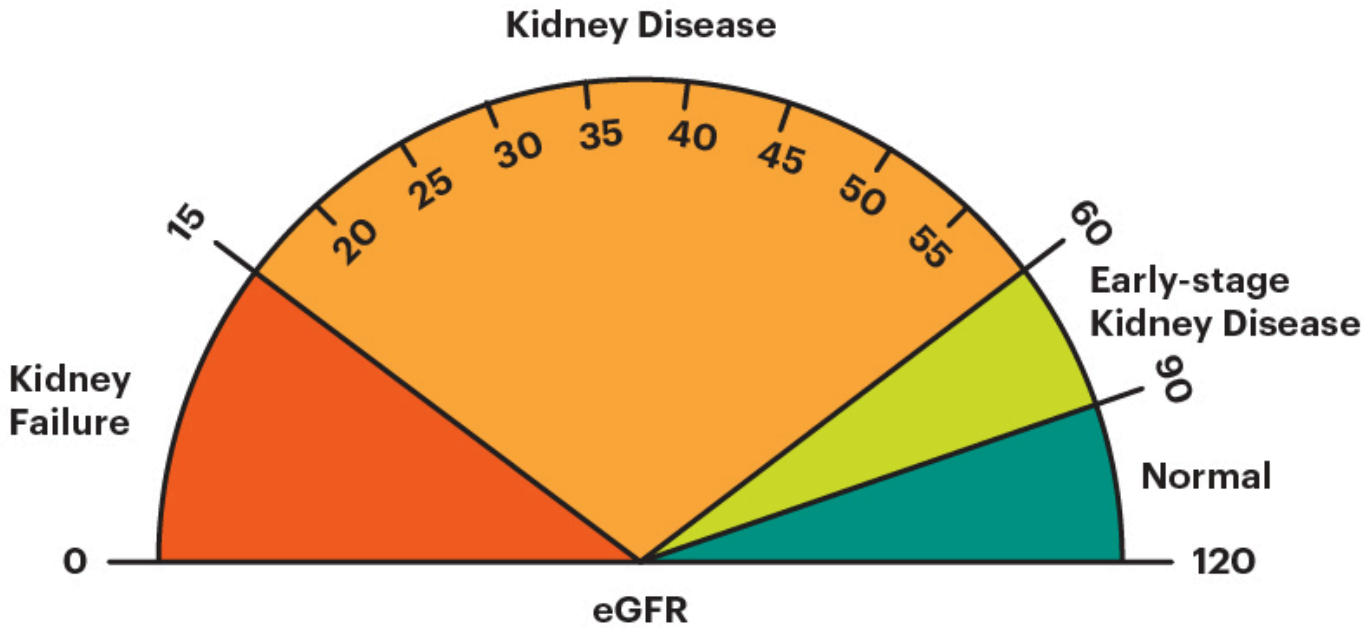
Creatinine is a waste product that comes from the digestion of protein in your food and the normal breakdown of muscle tissue. It is removed from your body through the kidneys. A "normal" creatinine level in the blood is hard to define because it can change depending on your age, sex, body size, and other factors. For this test, a **lower number** is better. High creatinine levels can be a sign of acute kidney injury and/or chronic kidney disease.

Cystatin C

Cystatin C is a protein that is produced by the cells in your body. Like creatinine, it is also removed from the body through the kidneys. So, it is another option to use to calculate your eGFR, if needed. This test is not as common as the creatinine test and can be more expensive. For this test, a **lower number** is better.

Estimated glomerular filtration rate (eGFR)

The estimated glomerular filtration rate (eGFR) is an estimate of how well your kidneys are removing waste products from the blood. It is calculated using your serum creatinine level, age, and sex. It can also be calculated using your cystatin C level. A "normal" eGFR varies according to age – it decreases as you get older. For this test, a **higher number** is better. In general, an eGFR value lower than 60 is a sign that the kidneys may not be working properly. An eGFR lower than 15 is a marker of kidney failure.



In less common situations where a more accurate measure of your kidney function is needed, your healthcare provider may order a measured GFR (mGFR).

Blood urea nitrogen (BUN)

Urea nitrogen is a waste product in your blood that comes from the breakdown of protein in the foods you eat. It is removed from the body through the kidneys. A "normal" BUN level varies, and usually increases as you get older. Checking your BUN level is usually not very

helpful by itself. So, your healthcare provider will likely compare your BUN level to your creatinine and eGFR levels when evaluating your kidney health.

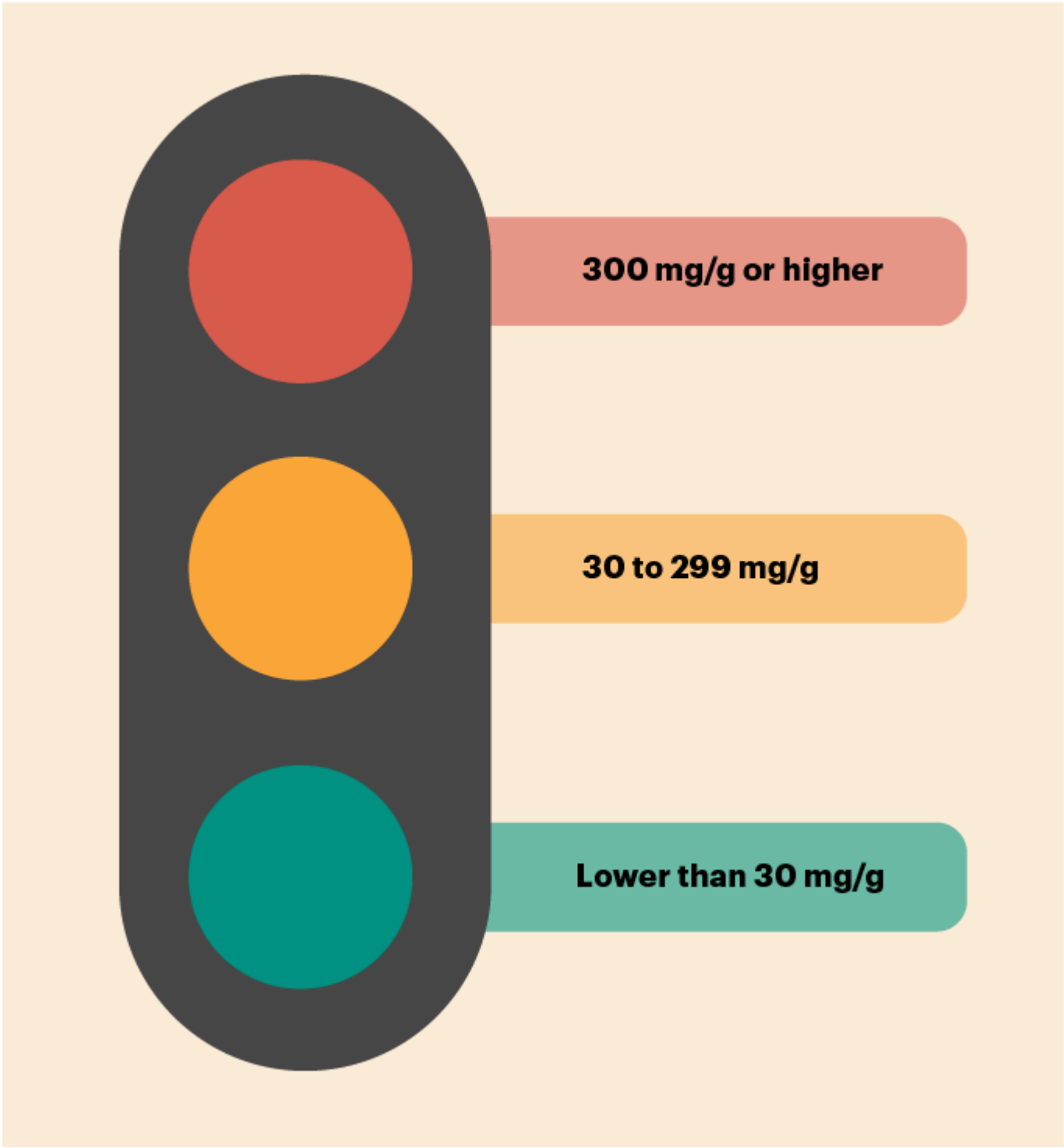
Urine tests

Urinalysis

A urinalysis is a simple test that checks a small sample of your urine for many different things. First, a visual exam is done to check for things like color and how cloudy the sample is. Next, a dipstick (chemically treated test strip) is dipped into the urine sample. The strip changes color in the presence of abnormalities – for example, high amounts of acid, albumin (protein), bacteria, blood, pus, or sugar. Last, the sample may be looked at under a microscope for a more detailed look, though not always.

Urine albumin-creatinine ratio (uACR)

The urine albumin-creatinine ratio (uACR) test measures the amount of two different substances in your urine – albumin (protein) and creatinine. Healthy kidneys keep the albumin in your blood while filtering the creatinine out into the urine. So, there should be very little or no albumin in your urine. The uACR is calculated by dividing the amount of urine albumin by the amount of urine creatinine to find the ratio. A “normal” uACR level is lower than 30 mg/g. For this test, a **lower number** is better. A uACR level of 30 mg/g or higher can be a sign of albuminuria.



24-hour urine collection

A 24-hour urine collection test can be ordered for many reasons – kidney stones, glomerular disease, or to measure your kidney function. This test requires collecting all the urine you make over a 24-hour period in a special container. So, it is not as common as the other urine tests that only need a small sample given at one time. It is usually used as a next-step option if abnormal results are found using one of the other testing methods or in less common clinical situations.

Imaging tests

Ultrasound

This test uses **sound waves** to get a general picture of your kidneys or other organs. It may be used to look for abnormalities in size or position of the kidneys, or look for obstructions such as stones or tumors. This test does not use intravenous contrast dye to be done.

Computerized tomography (CT) scan

This test uses **x-rays** to get many detailed pictures of the kidneys or other parts of the body. Like ultrasound, it can also be used to look for structural abnormalities or obstructions. This test may require the use of intravenous contrast dye which can be of concern for people living with kidney disease.

Magnetic resonance imaging (MRI)

This test uses **strong magnets and radio waves** to get many detailed pictures of the kidneys or other parts of the body. Like ultrasound, it can also be used to look for structural abnormalities or obstructions. This test may require the use of intravenous contrast dye which can be of concern for people living with kidney disease. An MRI scan can last about 20-90 minutes depending on which part of the body is being imaged.

Other tests

Kidney Biopsy

A kidney biopsy is a test in which one or more tiny pieces (samples) of your kidney is removed and then looked at with a microscope. Your healthcare provider may order a kidney biopsy if they need more information after looking at your blood tests, urine tests, or medical imaging results. Some examples of when a biopsy may be needed include certain types of kidney disease such as nephrotic syndrome or glomerular disease. A biopsy may also be needed if you received a kidney transplant and it is not working well.

Measured glomerular filtration rate (mGFR)

The measured glomerular filtration rate (mGFR) directly measures how well your kidneys are removing waste products from the blood. It can be a complicated and lengthy process. So, it is not used as often as the estimated GFR (eGFR). Your healthcare provider may recommend this test if a more accurate measure of your kidney function is needed. There are many ways to complete this test – some involve a 24-hour urine collection while others involve multiple blood samples taken over several hours.

More resources

- United States Food & Drug Administration – Medical Imaging
- Stages of chronic kidney disease (CKD)