



Your kidneys filter your blood by removing waste and extra water to make urine. The kidney's filtration rate, called the glomerular filtration rate (GFR), shows how well the kidneys are filtering. An estimated 37 million adults in the United States may have chronic kidney disease (CKD) but nearly 90% are unaware of their condition. When found early, people can take important steps to protect their kidneys.

Measuring and estimating GFR

Getting an accurate GFR level is challenging because measured GFR (mGFR) is a complicated and lengthy process. This makes it impractical for both clinicians and patients. It is for this reason that healthcare professionals use a formula to estimate GFR (eGFR).

Often, CKD does not have any symptoms until the later stages of the disease. This is the reason why reliable estimates of GFR are so important for identifying CKD as early as possible. The standard way to estimate GFR is with a simple blood test that measures your creatinine levels.

Creatinine is a waste product that comes from the digestion of dietary protein and the normal breakdown of muscle tissue. Aside from CKD, creatinine levels can be affected by other factors including diet; muscle mass (weight of your muscles); malnutrition; and other chronic illnesses.

Differences between eGFR and mGFR

	Estimated GFR (eGFR)	Measured GFR (mGFR)
How it works	A calculation used to estimate how well your kidneys are filtering certain agents produced by your body, such as: • creatinine (a waste product that comes from the normal wear and tear on muscles) • cystatin C (a protein that slows down the breakdown of other protein cells)	A measurement of how well your kidneys are filtering certain agents not produced by your body, such as: • inulin (a kind of fiber that is found in some plant foods) • iohexol (contrast agent used in imaging tests)
Availability	Widely available	Not widely available
Cost	Less expensive	More expensive
Time to complete the test	Less time needed	More time consuming
What the test involves	A one-time blood sample drawn from the vein	A series of blood samples drawn from the vein over several hours or by collecting all of your urine over a 24-hour period
Accuracy	Possible inaccurate estimates of GFR, especially in early stages of kidney disease (stages 1 and 2)*	Accurate measures of GFR, including early stages of kidney disease (stages 1 and 2)
Precision	Can miss early GFR changes , such as a rapid decrease in levels, which may be a sign of diabetic kidney disease	Can identify early GFR changes , such as a rapid decrease in levels, which may be a sign of diabetic kidney disease

*Other factors that can affect eGFR include: pregnancy, being over the age of 70, unusual muscle mass, cirrhosis (a disease caused by scarring in the liver), nephrotic syndrome (a condition caused by having too much protein in your urine), a past solid organ transplant, and some medications.

Why eGFR testing is done

Early-stage CKD doesn't usually cause symptoms, but your healthcare professional may recommend an eGFR test if you are at higher risk of developing the disease. CKD risk factors include:

- Diabetes
- High blood pressure
- Overweight/obesity
- Being over the age of 60
- Family history of CKD or kidney failure

Usually, developing CKD is not due to any single reason, but because of a combination of physical, environmental, and social factors.

Later stage CKD does cause symptoms. So, you may need an eGFR test if you have any of the following CKD symptoms:

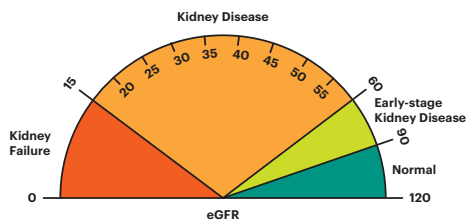
- Urinating more often or less often
- Itching
- Feeling tired
- Swelling in your arms, legs, or feet
- Muscle cramps
- Nausea and vomiting
- Loss of appetite

What to expect during the test

A healthcare 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. The test usually takes less than five minutes. There are typically no restrictions after blood is drawn for the test.

Results

- eGFR of 90 or higher is in the normal range
- eGFR of 60–89 may mean early kidney disease
- eGFR of 15–59 may mean kidney disease
- eGFR below 15 may mean kidney failure



Understanding your results

There are five stages of kidney disease. Your healthcare provider determines your stage of kidney disease based on the amount of kidney damage shown by your eGFR. Now that you know your eGFR, find out your kidney disease stage in this table to the right.

Kidney disease stage and eGFR

Stage	Description	eGFR	Kidney Function
1	Possible kidney damage (e.g., protein in the urine) with normal kidney function	90 or above	90–100%
2	Kidney damage with mild loss of kidney function	60 to 89	60–89%
3a	Mild to moderate loss of kidney function	45 to 59	45–59%
3b	Moderate to severe loss of kidney function	30 to 44	30–44%
4	Severe loss of kidney function	15 to 29	15–29%
5	Kidney failure	Less than 15	Less than 15%

What to do next

Now that you know your eGFR and your stage of kidney disease, use this table to find questions to ask your healthcare professional at your appointments.

Questions for your healthcare team

If your kidney disease is in stage...						Ask your healthcare professional if you should...
1	2	3a	3b	4	5	
✓	✓	✓	✓	✓	✓	Test your urine for albumin to have a complete picture of your overall kidney health
	✓	✓	✓	✓	✓	Repeat your eGFR test in 3 months to check if your eGFR remains lower than 90
	✓	✓	✓	✓		Take medication that may help slow progression of kidney disease (such as ACE inhibitors, ARBs, SGLT2 inhibitors, or non-steroid mineralocorticoid receptor blockers)
		✓	✓	✓	✓	Adjust any current medications due to reduced kidney function
		✓	✓	✓	✓	Get nutritional and dietary counseling to help support kidney function and overall health
				✓	✓	Start seeing a kidney specialist (nephrologist)
				✓	✓	Learn more about end-stage kidney disease and treatment options
					✓	Be evaluated for a kidney transplant and be placed on a kidney transplant list

For more information, contact the National Kidney Foundation

Toll-free help line: **855.NKF.CARES** or email: **nkfcares@kidney.org**