

Chronic Kidney Disease (CKD)

Patient Brochure

What are the kidneys and how do they help maintain good health?

Your kidneys are two bean-shaped organs, each about the size of your fist. They are located near the middle of your back, just below the rib cage. Your kidneys are a filtering system. Each kidney is made up of about one million tiny units called nephrons. The kidneys filter about 200 quarts of blood each day. They remove about two quarts of waste products and excess fluid in the form of urine. The urine flows through two tubes, called ureters, to the bladder. The urine is stored there until you go to the bathroom. The wastes come from the breakdown of food you eat and normal muscle activity.

In addition to removing wastes and fluid from your body, your kidneys perform these other important jobs:

- They regulate your body water and other minerals in your blood such as sodium, potassium, phosphorus, and calcium
- They remove drugs and toxins introduced into your body
- They release hormones into your blood to help your body. These hormones:
 - . Control blood pressure
 - . Make red blood cells
 - . Promote bone health

What is chronic kidney disease?

Chronic kidney disease means the kidneys have been damaged by diabetes, high blood pressure or other disorders. Damaged kidneys may not be able to keep you healthy by doing the jobs listed above. If kidney disease gets worse, wastes can build to high levels in your blood and make you feel sick. You may get complications like high blood pressure, anemia (low red blood cell count), weak bones, poor nutrition and nerve damage. Also, kidney disease increases your risk of having heart and blood vessel disease. These problems may happen slowly over a long period of time. Early detection and treatment can often keep chronic kidney disease from getting worse. If kidney disease gets worse, it may lead to kidney failure, which means the person will need dialysis or a kidney transplant to stay alive.

Can anyone get chronic kidney disease?

Yes. Anyone can get chronic kidney disease at any age. However, some people are more likely than others to get kidney disease. You may have an increased chance for kidney disease if you:

- Have diabetes
- Have high blood pressure
- Have a family history of chronic kidney disease
- Are age 60 or older
- Are African American, Hispanic, Asian/Pacific Islander or American Indian.

What are the symptoms of chronic kidney disease?

Most people do not have any symptoms until their kidney disease is advanced. This is why testing is important.

Why do I need kidney tests?

CKD has a silent onset, which means there are often no symptoms until the kidneys are badly damaged. Kidney tests will tell you how your kidneys are working. You should find out as early as possible if you have kidney disease to avoid problems and slow the loss of kidney function.

How often do I need kidney tests?

If you have diabetes, high blood pressure, heart disease or a family history of kidney disease, you should have kidney tests done at least once each year. Ask your health care professional how often you should be tested.

What tests do I need to see how my kidneys are working?

Blood and urine tests show how well the kidneys are doing their job. Blood and urine tests reflect the level of function of the kidneys. Urine tests can show how well the kidneys remove body wastes and whether they are leaking too much protein.

Blood Tests:

Serum Creatinine

Creatinine (kree-AT-uh-nin) is a waste product that comes from the normal wear and tear on muscles of the body. A creatinine level around 1 is normal in most people, but can differ based on age, race, and body size. The level of creatinine in the blood goes up if kidney disease gets worse. Estimated Glomerular Filtration Rate (eGFR) is the more accurate test of kidney function.

Estimated Glomerular Filtration Rate (eGFR)

This test is the best measure of how well the kidneys are removing wastes and excess fluid from the blood. Your healthcare professional can estimate GFR (eGFR) from the blood creatinine level using your age, weight, gender, and body size. Normal eGFR can vary according to age (as you get older it goes down). An eGFR below 60 is a sign that the kidneys are not working properly. An eGFR below 15 may mean that the person will need treatment for kidney failure, such as dialysis or a kidney transplant. You can think of eGFR as a percent of kidney function with less than 60% being lower than normal. The eGFR goes down if kidney disease gets worse.

Urine Test:

Albumin-Creatinine Ratio (ACR)

The urine albumin test or albumin-creatinine ratio (ACR) is a test which can find a tiny amount of protein called albumin in the urine. Albumin is found in high amounts in the blood, but almost no albumin is in the urine when the kidneys work well. However, kidney disease may cause albumin to leak into the urine, even early on in the disease.

Protein-Creatinine Ratio (PCR)

The protein-creatinine ratio is another test for kidney damage.

How do I know if I have Kidney Disease?

Kidney disease is present when either the eGFR is less than 60 or the ACR is greater than 30 on 2 tests, for 3 or more months.



What are the stages of kidney disease?

There are five (5) stages of kidney disease (shown below).

Stages of Chronic Kidney Disease

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|------------------|--------------------|--|
| Stage 1 | eGFR 90 or greater | Normal or high eGFR AND elevated ACR* |
| Stage 2 | eGFR = 60-89 | Mildly decreased eGFR AND elevated ACR* |
| Stage 3 a | eGFR = 45-59 | Mild to moderately decreased eGFR |
| Stage 3 b | eGFR = 30-44 | Moderately to severely decreased eGFR |
| Stage 4 | eGFR = 15-29 | Severely decreased |
| Stage 5 | eGFR 15 or less | Kidney failure |

**When the eGFR is above 60, you don't have CKD unless the albumin-creatinine ratio (ACR) is more than 30 mg/g.*

If I have chronic kidney disease, what will my treatment include?

Your treatment plan will depend on your stage of kidney disease and other health problems you may have. Your treatment may include the following:

- **Controlling other health problems.** You may have other problems, such as diabetes, and high blood pressure, which can damage your kidneys. One of the goals of your treatment is to make sure these are well-controlled. Your doctor may ask you to lose weight if you are overweight and cut down on salt in your diet to help lower your blood pressure. If you have diabetes, you will also need to watch your glucose (blood sugar), follow your diet and take your medicine as prescribed by your doctor.
- **Preventing heart problems.** People who have kidney disease also have an increased chance of having heart problems. Controlling diabetes and high blood pressure is also very important to help prevent heart problems. Smoking makes heart and kidney disease worse, and, if you are a smoker, you will need to quit.
- **Tracking your progress.** Your healthcare practitioners will check your eGFR regularly to find out whether your kidney disease is getting worse. Your healthcare practitioner will also check the amount of protein in your urine from time to time. Nutritional tests will be done to make sure you are getting enough protein and calories to stay healthy. Your doctor or dietician may ask you to eat less protein, so you will need to get extra calories from other food sources.

What questions should I ask my healthcare practitioner?

Here are some questions to ask your healthcare practitioner to find out about your kidney health:

- What is my eGFR?
- What is my urine albumin or ACR?
- What is my blood sugar? (for people with diabetes)
- What is my blood pressure?
- What are my chances of having kidney disease?
- Do I have kidney disease?
- If I have kidney disease, what stage?
- What should I do to keep my kidneys healthy?