

How is CKD treated?

The kidneys perform a number of different functions in the body, including one of the most important function of filtering waste products from the blood, and are vital organs for the proper functioning of the body. The kidneys are also adaptable organs, having the ability to function even when they are damaged to a certain extent.

In chronic kidney disease (CKD), there is a gradual loss of kidney function over time.

Symptoms of CKD

Very often, a patient with CKD does not have any obvious symptoms in the early stages. If the kidney disease continues to get worse, patients may slowly begin to develop some symptoms, for e.g.

- Fatigue and lack of energy.
- Difficulty in concentrating.
- Swelling in the feet and ankles.
- Muscle cramps at night.
- Dry itchy skin.
- Changes in urine output.
- Shortness of breath.
- Hiccups.
- Chest pain.
- Poor appetite.
- Sleep problems.

Those with CKD may often feel normal, until their kidneys are about to fail. This is why it is important to stay aware and alert to the possible signs of CKD.

Diagnosing CKD

Since CKD does not show any obvious symptoms in the early stages, it is often identified and diagnosed only in the later, or advanced, stages. But sometime, a routine blood or urine test may help the doctor detect that something is wrong with the kidney.

A diagnosis of CKD is often made using one of these tests:

- A blood test that measures the estimated glomerular filtration rate (eGFR): the glomerular filtration rate is an estimation of how well the kidneys are working.
- A urine test to check for protein (albumin): when the kidneys are damaged, a protein called “albumin” is not filtered well by the kidneys, and so, it is found in the urine.

More about the glomerular filtration rate

The glomeruli (plural of “glomerulus”) refer to a cluster of blood vessels in the kidney. The glomerular filtration rate is a measure of how much waste fluid (in mL) is being filtered from the blood by the kidneys in 1 minute. It's difficult to estimate this number directly so instead the “estimated glomerular filtration rate” is calculated by, for e.g., looking at the level of creatinine (a waste product) in the urine

Normally, the kidneys can filter more than 90 mL per minute. So if the eGFR is 50 mL in a minute, it means that there is about 50% kidney function.

Stages of CKD

For CKD there is a 5 stage classification system, based on the eGFR (mL per minute per 1.73 m²) value:

- Stage 1: eGFR ≥ 90 (normal value), but there is some indication of kidney damage and careful annual monitoring is needed.
- Stage 2: eGFR 60 to 89; though this may still be considered normal, there may be evidence of kidney damage and careful annual monitoring is needed.
- Stage 3a: eGFR 45 to 59 with a mild-moderate reduction in kidney function.
- Stage 3b: eGFR 30 to 44 with moderate-severe reduction in kidney function.
- Stage 4: eGFR 15 to 29; symptoms are evident now.
- Stage 5: eGFR < 15 and either dialysis or a transplant is needed.

The higher the stage (i.e. the higher the number), higher is the disease severity.

Treating CKD

Although there is no cure for CKD, there are different ways to treat and manage the condition, depending on the stage of kidney disease.

Earlier stages of kidney disease (pre-dialysis)

In the early stages of CKD, it is possible to slow down its progression. Here are some things that can be done:

Medication: Different medications are prescribed to help manage different parameters.

- Blood pressure: angiotensin converting enzyme inhibitors (e.g. Ramipril, enalapril), angiotensin-ii receptor blockers (e.g. Temisartan, valsartan), first line diuretics or calcium blockers may be prescribed to help ensure that blood pressure is $< 130/80$ mm hg (or $< 125/75$ mm hg in case of proteinuria ≥ 1 g/24 hours).
- Blood glucose: insulin and oral hypoglycemic agents may be prescribed to keep glycated hemoglobin (hba1c) levels $< 7\%$.
- Lipid levels: statins, along with certain changes in diet, help to keep low density lipoprotein ≤ 70 mg/dl, high density lipoprotein ≥ 40 mg/dl and triglycerides ≤ 150 mg/dl.
- Phosphate: phosphate binders may be prescribed to help maintain phosphate levels at 3.5–4.5 mg/dl.
- Uric acid: allopurinol may be prescribed to help maintain serum uric acid ≤ 7 mg/dl.
- Hemoglobin levels: hemoglobin (hb) should be maintained between 11–12 g/dl.

Lifestyle changes: These include reducing salt and water intake, eating a low calorie diet, staying active, quitting smoking, among other things. These will help the patient maintain a body mass index ≤ 25 and ≥ 18 Kg/m² and ensure that urine protein levels should be less than 1gm/day.

Later stages of kidney disease

When the eGFR drops below 15 or when 85–90% of kidney function is lost, then a patient has to either opt for dialysis or a kidney transplant, in order to manage CKD.

Dialysis: The purpose of dialysis is to filter the blood. There are two ways to do this — either the blood is filtered in the body (peritoneal dialysis), or it is removed, filtered and returned to the body (hemodialysis).

- For peritoneal dialysis, a catheter is placed in the belly, through minor surgery, and the lining of the abdomen acts as a filter. A cleansing solution (called “dialysate”) is introduced through the tube into the abdomen. Here, the wastes and extra fluid from the blood enter the solution, and the used solution is then drained out by the patient and replaced with fresh fluid. This procedure may take several hours and has to be done daily, but it can be done at home.
- For hemodialysis, a patient must go to a dialysis center, where the patient is connected to the dialysis machine. The blood passes into the machine, is filtered with a special filter (called “dialyzer”) and is returned back to the blood stream of the patient. This procedure can take up to 4 hours, and may have to be done about thrice a week.

Transplant: Here, the affected kidney is replaced with a healthy kidney from a donor (a living or deceased person). The person receives special medication to try to ensure that the body does not reject the new kidney. Other precautions are also important to manage possible complications including heart/blood vessel disease, infections and diabetes.

CKD = chronic kidney disease eGFR = estimated glomerular filtration rate

HbA1c = glycated hemoglobin Hb = hemoglobin

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