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What is
Chronic Kidney Disease?



Chronic Kidney Disease

Chronic means ongoing, persistent and long-term, it does not mean as severe as some people think. Chronic Kidney Disease (CKD) refers to a condition in which a person's kidneys do not function as well as a healthy person's kidneys do. A number of causes can lead one to this condition, but majority of the cases are either mild or moderate. Severity can vary but most cases are mild or moderate. They occur in older people, are generally asymptomatic, and tend to become worse with the progression of disease.

Chronic Kidney Disease used to be called Chronic Renal Failure but Chronic Kidney Disease is considered to be a better term, as the word failure implies that the kidneys have totally stopped working, but this is not the same in most cases of Chronic Kidney Disease. In many people who have this condition, only a mild or moderate drop in kidney function is reported, which usually does not cause symptoms, and the kidneys are not 'failed'.

Acute Kidney Injury (AKI) occurs when the function of the kidneys is rapidly affected - over hours or days. For example, the kidneys may go into Acute Kidney Injury state if you have a serious blood infection which can affect the kidneys.



This is in contrast to Chronic Kidney Disease where the decline in function of the kidneys is very gradual - over months or years.

How is Chronic Kidney Disease diagnosed?

Kidney function is assessed using a combination of:

- A blood test called the estimated glomerular filtration rate (eGFR); and
- A measure of the amount of protein in the urine (proteinuria)
- A blood test for kidney function
- Ultrasound KUB region

Increased protein in the urine and decreased eGFR both are associated with an increased risk of progressive Chronic Kidney Disease.

Estimated Glomerular Filtration Rate (eGFR)

A normal eGFR is 90 ml / minute / 1.73 m or more. If some of the glomeruli do not filter as much as normal, then the kidney is said to have reduced or impaired kidney function.



The eGFR test involves a blood test which measures a chemical called creatinine. Creatinine is a breakdown product of muscle. Creatinine is normally cleared from the blood by the kidneys. If your kidneys are not working very well and the glomeruli are not filtering as much blood as normal, the level of creatinine in the blood goes up. The eGFR is calculated from your age, sex and blood creatinine level.

Proteinuria

Proteinuria means that your urine has an abnormal amount of protein. Most proteins are too huge to pass through the kidneys' filters and get into the urine. However, we all excrete tiny amounts of small protein called albumin into our urine.

If a kidney is damaged, then increased amounts of albumin and other larger proteins from our blood can pass into the urine. This abnormal amount of protein in the urine is known as proteinuria. The amount of proteinuria is a good indicator of the extent of kidney damage. Proteinuria is also associated with an increased risk of development of heart and blood vessel disease.



Proteinuria is first detected by a simple dipstick urine test. The amount of proteinuria is then usually measured by a sample of urine sent to the laboratory to measure the ratio of the level of either albumin or total protein in the urine compared with the amount of creatinine in the urine.

A lower level of excess protein in the urine is called microalbuminuria.

What are the symptoms of Chronic Kidney Disease?

One is unlikely to feel unwell or have symptoms with mild-to-moderate Chronic Kidney Disease - that is, stage - 1 to 3. However, there may be symptoms of an underlying condition such as kidney pain with certain kidney conditions. Chronic Kidney Disease is usually diagnosed by the eGFR test before any symptom develops.

Symptoms tend to develop when Chronic Kidney Disease becomes severe (stage 4) or worse. The symptoms at first tend to be vague and non-specific, such as feeling tired, having less energy than usual, and just not feeling well. With severity more symptoms may develop :



- Difficulty thinking clearly
- Poor appetite
- Weight loss
- Dry, itchy skin
- Muscle cramps
- Fluid retention which causes swollen feet and ankles
- Puffiness around the eyes
- need to pass urine more often than usual
- Being pale due to anaemia
- Feeling sick

If the kidney function declines to stage 4 or 5, then various other problems may develop - for example, anaemia and an imbalance of calcium, phosphate and other chemicals in the bloodstream. These can cause various symptoms, such as tiredness due to anaemia, and bone thinning or fractures due to calcium and phosphate imbalance. End-stage kidney failure (stage 5) is eventually fatal unless treated on time.



How common is Chronic Kidney Disease?

About 1 in 10 people have some degree of Chronic Kidney Disease. Women are more prone to Chronic Kidney Disease as compared to men. With age one becomes more susceptible to Chronic Kidney Disease; although about half of people above 75 years of age or more, have some degree of chronic kidney disease, most of them do not actually have disease of kidneys; they have normal ageing of their kidneys.

Most cases of Chronic Kidney Disease are mild or moderate (stages 1-3).

What causes Chronic Kidney Disease?

A number of conditions can cause permanent damage to the kidneys and/or affect the function of the kidneys leading to Chronic Kidney Disease. Three common causes, which probably account for about 3 in 4 cases of Chronic Kidney Diseases in adults, are:

- **Diabetes:** Diabetic kidney disease is a common complication of diabetes.



- **High Blood Pressure:** Untreated or poorly treated high blood pressure is a major cause of Chronic Kidney Disease. However, Chronic Kidney Disease can also cause high blood pressure, as the kidney plays a key role in blood pressure regulation. About 9 out of 10 people with Chronic Kidney Disease stage- 3 to 5 have high blood pressure.
- **Ageing kidneys:** There is an age-related decline in kidney function. About half of people aged 75 or more have some degree of Chronic Kidney Disease. In most of these cases, Chronic Kidney Disease does not progress beyond the moderate stage, unless other problems of the kidney, such as diabetic kidney disease develop.
- **Medication:** Medication includes non-steroidal anti-inflammatory drugs (if they are used long-term, especially with high doses); lithium, ciclosporin and tacrolimus. If you are taking one of these medicines, you should go for blood test and check your kidney function at least once a year

Other less common conditions that can cause Chronic Kidney Disease include:

- Diseases of the tiny filters in the kidneys (glomeruli), such as inflammation of the glomeruli (glomerulonephritis).
- Narrowing of the artery taking blood to the kidney (renal artery stenosis)
- Blockages to the flow of urine, and repeated kidney infections.
- Previous injury to your kidney. If you have an acute kidney injury, you should be followed up for at least three years to check your kidney function.



- Having only one functioning kidney. Even though most people with a single kidney do not have any problems, your doctor would want to keep an eye on your kidney function.

Preventing or slowing down the progression of Chronic Kidney Disease

There are ways to stop Chronic Kidney Disease from getting any worse or to slow down any progression. You should have regular check-ups as advised by your doctor every now and then, or have your kidney function monitored - through regular eGFR test.

They will also give you treatment and advice on how to prevent or slow down the progression of Chronic Kidney Disease, which usually includes:

- **Blood Pressure control:** The most important treatment to prevent or delay the progression of Chronic Kidney Disease, whatever the underlying cause is to keep your blood pressure well controlled. Most people with Chronic Kidney Disease require medication to control their Blood Pressure. Depending on the amount of albumin in your urine, your doctor may recommend a target blood pressure level to aim for below 140/90 mm Hg or 130/80 mm Hg, and even lower in some circumstances. For children and young people with Chronic Kidney Disease and high levels of albumin in the urine, blood pressure should be kept less than average for their height.



- **Review of your medication:** Certain medicines can affect kidneys as a side-effect which can make the condition worse. For example, if you have Chronic Kidney Disease you should not take anti-inflammatory medicines unless advised by a doctor. You may also need to adjust the dose of certain medicines that you may take if your condition gets worse.
- **Diet:** if you have more advanced CKD (stage 4 or 5) then you will need to follow a special diet

Treating end-stage kidney failure

Only a small number of people with Chronic Kidney Disease progress to end-stage kidney failure (stage 5) and require Dialysis or Kidney Transplant. If you reach stage 4 or 5, you are likely to be referred to a specialist of kidney disease at the hospital.

You will need regular follow-ups to monitor your kidney function depending on how much kidney function is affected (including how often they get affected), and the stability of results. You might be advised following blood tests:



- Full blood count (for anaemia).
- Calcium.
- Phosphate.
- Vitamin D.
- Parathyroid hormone.

The options for treatment include:

- **Haemodialysis:** blood is taken from a vein in the arm, filtered to remove waste products and returned through another tube.
- **Peritoneal Dialysis:** a thin tube is inserted into the stomach near the tummy button. Fluid is pumped into the stomach cavity to filter waste products, and drained into a bag.
- **Kidney Transplant:** A procedure in which a diseased kidney is replaced with a healthy kidney either from a living or dead matched donor.