



# Kidney-Buster

## Learning about Chronic Kidney Disease (CKD)

**C**hronic kidney disease (CKD) or chronic kidney failure is a long-term health condition where the kidneys are damaged and no longer functioning as they should. This refers to the ability of the kidneys to remove excess fluid and toxins from our body, and produce hormones that regulate our blood pressure, control the production of red blood cells in our bodies (preventing anaemia) and maintain bone health.

CKD is different from acute kidney injury or acute renal failure, where the kidney stops working suddenly due to various causes, such as:

- Severe dehydration
- Blood loss
- Traumatic injuries
- Severe liver or heart failure
- Autoimmune diseases
- Sudden shock due to sepsis
- Pregnancy complications
- Enlarged prostate or kidney stones that block urine flow
- Taking certain drugs that damage the kidneys



Acute kidney failure can be severe enough to cause significant kidney dysfunction very quickly. This can be reversible in many instances, if identified promptly and treated adequately. However, some patients with acute kidney failure can develop

permanent damage to the kidneys or even total kidney failure with no recovery. These patients will need dialysis thereafter. In contrast, CKD tends to progress gradually.

When the kidney damage worsens, high levels of waste products are built up in the blood, causing health complications, such as fluid retention, breathlessness, weaker bones, anaemia, muscle cramps, itch, nausea, vomiting, malnutrition and loss of weight, diminished energy, insomnia, heart disease and even heart failure.

These health problems usually manifest gradually over a long period of time. Thus, for most people, CKD is only discovered at the late stages. However, regular health screening can help in early detection and treatment. This helps to keep CKD from getting worse - leading to complete kidney failure.

A kidney patient with end-stage kidney disease would require dialysis or a kidney transplant to stay alive. Dialysis helps in removing excess fluid, salt and toxins from the body. It is usually done in a dialysis center, hospital or at home through a dialysis machine in the case of haemodialysis or through a catheter inserted into the tummy in the case of peritoneal dialysis. On the other hand, a kidney transplant involves the surgical insertion of a donated healthy kidney into the patient's body,

which then would clean the patient's blood in the same way his/her kidneys once did when they were working fine.

### CAUSES OF CKD

Two of the most common causes of CKD are diabetes and high blood pressure (hypertension). Other causes include different types of kidney inflammation and assorted miscellaneous causes.

Diabetes occurs when the blood sugar level is too high, causing damage to the body's major organs, such as the heart, brain, eyes, blood vessels and the kidneys. Hypertension occurs when blood pressure increases against the walls of the blood vessels. When poorly controlled, hypertension can lead to strokes, heart attacks, vision problems and CKD.



Inflammation of the kidneys – also known as glomerulonephritis – typically presents with protein and blood leakage in the urine. There are multiple causes of glomerulonephritis. Many of them are silent, and are usually discovered incidentally or through screening tests. They can cause acute or chronic kidney failure.

Other risk factors for chronic kidney failure include obesity, smoking, high cholesterol and a family history of kidney disease.

### SYMPOMTS OF CKD

Kidney disease symptoms typically only manifest when the disease is at a serious stage. This is why it is crucial to be aware of conditions that may predispose you to kidney disease. The best way to know if you have kidney disease is to perform blood tests for kidney function and have your urine examined as well.

Common symptoms of chronic kidney failure may include:

- Darker (or more concentrated) urine
- Blood in urine
- Protein in urine
- Decreased urine output (but occasionally the opposite)
- More frequent urination, especially at night
- Persistent itching
- Chest pain
- Fatigue
- Loss of appetite and malnutrition
- High blood pressure
- Decreased mental alertness
- Anaemia
- Sleeplessness
- Muscle cramps
- Nausea
- Shortness of breath
- Swelling of feet and ankles
- Pain on the side, mid to lower back (may indicate urinary stones)



is suspected. Regular health screening will help to detect kidney disease earlier. This helps to prevent progression of kidney disease to total kidney failure.

### Diagnosing CKD

People who are at greater risk of kidney disease or end-stage renal failure include those with:

- Diabetes
- History of stroke
- High blood pressure
- Family history of kidney disease
- Congestive or coronary heart disease
- Prolonged use of non-prescription drugs like NSAIDs
- History of certain autoimmune disorders
- Urinary or urological problems.

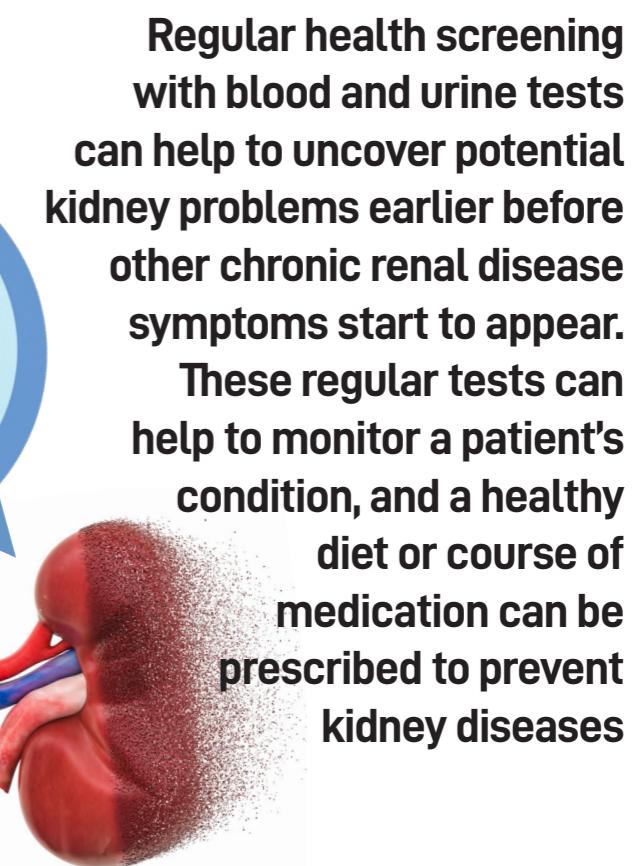
If you have the above risk factors, be sure to go for regular checkups and report any unusual symptoms to your doctor. Managing these underlying diseases and health issues well can help you to slow down the progression of kidney damage.

### PRELIMINARY PHYSICAL EXAMINATION

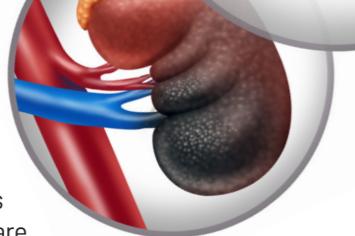
Kidney failure may cause fluids to fill up in your heart and/or lungs. Your doctor will usually examine these major organs by listening to them with a stethoscope to check your condition. There may also be swelling in your legs and around your eyes. Occasionally, the kidneys may be enlarged as well.

### BLOOD & URINE TESTS

If your kidney specialist suspects that you may have CKD, the next step usually involves taking blood and urine tests, before diagnostic or therapeutic decisions are made.



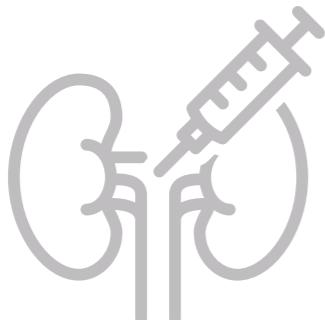
**Acute kidney failure can be severe enough to cause significant kidney dysfunction very quickly. This can be reversible in many instances, if identified promptly and treated adequately. However, some patients with acute kidney failure can develop permanent damage to the kidneys or even total kidney failure with no recovery. These patients will need dialysis thereafter. In contrast, CKD tends to progress gradually**



Blood tests for kidney function measure the levels of electrolytes and waste products in your blood, which are excreted when your kidneys are working optimally. These will build up in your blood when your kidneys do not work well. Urine tests are carried out to check for abnormalities in the protein level of your urine (a finding that usually emerges before other symptoms of CKD). Usually, there are only trace amounts of protein in our urine. However, these levels can get significant in the case of kidney disease. The urine sediment and cells will also be examined in a laboratory, usually looking for blood in the urine, or signs of infection and inflammation.

#### IMAGING TESTS AND BIOPSY

A nephrologist will make use of some imaging tests, such as ultrasound, CT scan or MRI scan to check the structural details of your kidneys and make a more complete assessment of your condition. In cases where the renal specialist needs further confirmation on the cause of the symptoms, where the cause is not very obvious or where there is suspicion of inflammation of the kidneys, you may need to go through a kidney biopsy. A kidney biopsy provides detailed and valuable information that will help the nephrologist to arrive at a diagnosis. He/she will then be able to recommend the best treatment options and prognosis of your kidney disease.



#### STAGES OF CKD

Early stages of CKD usually do not show obvious signs and symptoms as our bodies can normally cope with mild reductions in kidney function. This is why we can donate one kidney to someone and still live a normal life as our remaining kidney works harder to compensate for the absent kidney.

Regular health screening with blood and urine tests can help to uncover potential kidney problems earlier before other chronic renal disease symptoms start to appear. These regular tests can help to monitor a patient's condition, and a healthy diet or course of medication can be prescribed to prevent the patient's kidney problem from deteriorating or progressing to kidney disease.



A kidney biopsy is typically performed using a needle which pierces the skin all the way to the kidneys.

A couple of tiny samples of the kidneys are then taken for examination under a microscope. This is done under ultrasound guidance and using local anaesthesia. Only rarely does a biopsy need to be performed through an incision with general anaesthesia to collect a sample of kidney tissue.

It is important to note that kidney biopsy is not suitable for certain people, such as those who are taking blood thinners like aspirin (this can be suspended temporarily in some cases), those who have a bleeding tendency, patients whose kidneys are too small, severely debilitated patients, and occasionally, very elderly patients.

Should your test results suggest that you may have CKD, you will need to be further assessed by a kidney specialist who will advise you on the need for extra confirmatory blood or urine tests, imaging tests or a kidney biopsy. Thereafter, he/she will prescribe the most suitable treatment for your condition. Do remember that adopting a healthier lifestyle and a holistic healthy renal diet are crucial in the management of CKD.

People with more advanced kidney disease may experience undesirable symptoms such as blood and/or protein in the urine, increased frequency or urination, muscle cramps, poor appetite, itch, fatigue, weight loss, nausea, vomiting, fluid retention, and inability to sleep or concentrate, etc.

#### CLASSIFYING STAGES OF CKD

Changes in the GFR (Glomerular Filtration Rate) can be used to assess how advanced a patient's kidney disease is. The stages of CKD are classified as follows:

##### STAGE 1

Kidney damage with normal or increased GFR ( $>90 \text{ mL/min}/1.73 \text{ m}^2$ )

##### STAGE 2

Mild reduction in GFR ( $60-89 \text{ mL/min}/1.73 \text{ m}^2$ )

##### STAGE 3a

Moderate reduction in GFR ( $45-59 \text{ mL/min}/1.73 \text{ m}^2$ )

##### STAGE 3b

Moderately advanced reduction in GFR ( $30-44 \text{ mL/min}/1.73 \text{ m}^2$ )

##### STAGE 4

Severe reduction in GFR ( $15-29 \text{ mL/min}/1.73 \text{ m}^2$ )

##### STAGE 5

Total renal failure or end-stage kidney disease ( $\text{GFR} < 15 \text{ mL/min}/1.73 \text{ m}^2$  or dialysis)

It is crucial for kidney disease to be diagnosed and treated as early as possible to avoid irreversible damage to the kidneys, especially in patients with progressive diseases like diabetes and glomerulonephritis.

Diabetic nephropathy is the chronic loss of kidney function occurring in those with diabetes mellitus. Diabetes patients should go for a microalbuminuria test at least once a year and have their kidney function checked to detect diabetic nephropathy early.

#### TREATMENT FOR CKD

Unfortunately, there is no actual cure for CKD. There is no medication that can make the kidneys heal and restore previous kidney function. The focus of CKD treatment is improvement of symptoms; retardation of kidney disease progression, delaying the outcome of total kidney failure and the imminent need for dialysis or kidney transplant; avoidance of developing new health issues that can further damage the kidneys; and minimisation of complications

Upon total kidney failure, the only true solution is a successful kidney transplant - for patients who are medically suitable for the procedure. Otherwise, once the kidneys are no longer able to remove excess fluid and toxins from the body properly, kidney patients will need to go for dialysis treatment to partially replace the cleansing function of their kidneys.

There are two main types of dialysis treatment: blood dialysis (or haemodialysis) and tummy/water dialysis (or peritoneal dialysis). For haemodialysis, a kidney machine removes the extra fluids and waste products from your blood, while

peritoneal dialysis uses the abdomen lining (the peritoneum) for the blood filtering process.

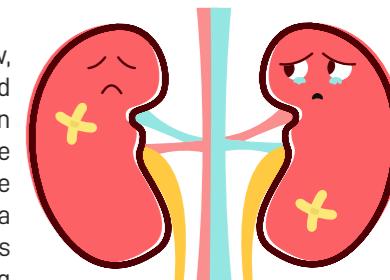
If you are suited for kidney transplant, you can receive a healthy kidney from a suitable (living or deceased) donor. Kidney transplantation trumps dialysis in improving a patient's quality of life. It offers the best chances for rehabilitation closer to a normal life than what dialysis can offer. In most cases of kidney transplant, the damaged kidneys are left in place and the transplanted kidney is placed in the lower belly on the front side of the body. However, there are rare cases where the diseased kidney may need to be removed.

After the kidney transplant procedure, the patient will need to take immunosuppressants, or anti-rejection medicines to ensure that his/her immune system does not reject the new kidney. However, these medications will weaken a patient's immune system, so certain precautions will need to be taken.

#### PREVENTION OF CKD

If you have diabetes or hypertension, which are the most common causes of CKD, the first step is to work with your doctor to keep your blood sugar and blood pressure under control. You may also be advised to act preemptively by living a healthy lifestyle, if there are early signs of CKD or you have strong family risk factors.

Even if you seem healthy now, living a healthy lifestyle and adopting a healthy diet can help you to prevent CKD. These lifestyle changes may include exercising regularly, adopting a low fat, low carb/refined sugars and low salt diet, not smoking or drinking excessive alcohol, having a positive outlook to life, minimising stress and sleeping well, and going for regular health check-ups. The latter may help to detect a silent kidney problem and early detection can help to save your kidneys.



#### PERSONALISED APPROACH

Battling CKD can be a daunting and exhausting journey. The treatment for kidney diseases varies for everyone, based on their medical history, current medical conditions, lifestyle and diet. This is why a personalised approach is crucial. **PRIME**

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