

## Kidney Failure

Kidney failure, also known as renal failure, is a term used to describe a situation in which the kidneys are no longer able to function effectively. Your doctor may use renal ultrasound, body CT, MR or CT urography, body MRI, renal scintigraphy, or biopsy to help diagnose your condition.

Treatment options vary and depend on the condition's underlying cause, many of which require a hospital stay. Treatments may address the cause of renal failure or focus on replacing renal function using ureteral stenting, nephrostomy, surgery or dialysis.



### What is kidney (renal) failure?

The kidneys are designed to maintain proper fluid balance in the body, remove waste and eliminate toxins from the blood. The kidneys make urine, which carries away those products of elimination and excess fluid. They also make hormones, which stimulate the making of red blood cells in the bone marrow and strengthen the bones. The term kidney (renal) failure describes a situation in which the kidneys have lost the ability to effectively carry out these functions. A build-up of waste levels can cause a chemical imbalance in the blood, which can be fatal if left untreated. Patients with renal failure may develop a low blood count or weak bones over time. Chronic renal failure can be caused by a variety of diseases (such as diabetes) and means failure of kidney function over time.

Other conditions can result in acute kidney failure, such as a drop in blood flow to the kidneys, blockage of urine flow, or damage from infections, certain medications or contrast materials used in imaging. Acute kidney failure can occur quickly and may leave the kidneys with permanent damage. In many cases, it occurs in patients who are already critically ill and require intensive care.

Symptoms may include:

- Fluid retention
- Fatigue
- Blood in your stool
- Shortness of breath
- High blood pressure
- Nausea
- Drowsiness
- Ease of bruising
- Changes in urination, such as decreased, excessive or complete lack of output

### How is kidney failure diagnosed and evaluated?

There are a variety of causes of renal failure, and the suspected or most likely cause determines which test is needed and best suited to prove the cause. In order to diagnose kidney failure, your doctor may order:

- *Renal ultrasound*: This imaging exam uses high-frequency sound waves to view the kidneys in real time, and is often the first test obtained to examine the kidneys.

*For information about ultrasound procedures performed on children, visit the Pediatric Abdominal Ultrasound page (<https://www.radiologyinfo.org/en/info/abdomus-pdi>) .*

- *Body CT* (<https://www.radiologyinfo.org/en/info/bodyct>) : Computed tomography (CT) combines special x-ray equipment with sophisticated computers to produce multiple images or pictures of the inside of the body. This imaging exam is often used to get a broad overview for multiple causes of kidney failure.

*For information on CT scans performed on children, visit the Pediatric CT (<https://www.radiologyinfo.org/en/info/pedia-ct>) page.*

- *MR or CT urography* (<https://www.radiologyinfo.org/en/info/urography>) : This procedure is used to evaluate patients with blood in the urine, to identify issues in patients with frequent urinary tract infections and follow patients with a history of urinary collecting system cancers.
- *Body magnetic resonance imaging (MRI)* (<https://www.radiologyinfo.org/en/info/bodymr>) : This imaging test uses a magnetic field and radio frequency pulses to produce detailed pictures of the kidneys.
- *Renal scintigraphy* (<https://www.radiologyinfo.org/en/info/renal>) : During this nuclear medicine examination, the kidneys are evaluated using a radiotracer and a gamma camera. This test can provide information about both the function of the kidneys by allowing the radiologist or nuclear medicine physician to see how the kidney functions and excretes urine.
- *Biopsy*: (<https://www.radiologyinfo.org/en/info/biopgen>) This procedure involves image-guided removal of a small kidney tissue sample in order to test it for disease. Ultimately this may be required to provide a diagnosis, but there are many non-invasive imaging tests that are usually obtained first.

## How is kidney failure treated?

Treatment options vary widely and depend on the cause of kidney failure, but most require a hospital stay. Options are sorted into two groups: treating the cause of renal failure versus replacing the renal function. They include:

- *Interventional radiology procedures such as ureteral stenting and nephrostomy* (<https://www.radiologyinfo.org/en/info/ureteralnephro>) : This procedure involves inserting either small stents into the ureter(s) or a tube connected to an external drainage bag. Both options are used to unblock the ureters in order to allow proper urine flow from the kidneys if this has been identified as the cause for the renal failure.
- *Surgical treatment such as a urinary stent or kidney stone* (<https://www.radiologyinfo.org/en/info/stones-renal>) removal.
- *Dialysis, including hemodialysis and peritoneal dialysis*: These procedures remove wastes and excess fluid from the blood and therefore replace (some) renal functions. Kidney transplant is the most complete and effective way to replace kidney function but may not be suitable for all patients.

## Which test, procedure, or treatment is best for me?

- *Renal Failure* (<https://www.radiologyinfo.org/en/info/acs-renal-failure>)

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