



The Kidneys:

Picture, Function, Conditions and Tests

The kidneys are a pair of bean-shaped organs on either side of your spine, below your ribs and behind your belly. Each kidney is about 4 or 5 inches long, roughly the size of a large fist.

The kidneys' job is to filter your blood. They remove wastes, control the body's fluid balance, and keep the right levels of electrolytes. All of the blood in your body passes through them several times a day.

Blood comes into the kidney, waste gets removed, and salt, water, and minerals are adjusted, if needed. The filtered blood goes back into the body. Waste gets turned into urine, which collects in the kidney's pelvis -- a funnel-shaped structure that drains down a tube called the ureter

to the bladder.

Each kidney has around a million tiny filters called nephrons. You could have only 10% of your kidneys working, and you may not notice any symptoms or problems.

If blood stops flowing into a kidney, part or all of it could die. That can lead to kidney failure.

Kidney Conditions

- **Pyelonephritis (infection of kidney pelvis):** Bacteria may infect the kidney, usually causing back pain and fever. A spread of bacteria from an untreated bladder infection is the most common cause of pyelonephritis.

- **Glomerulonephritis:** An overactive immune system may attack the kidney, causing inflammation and some damage. Blood and protein in the urine are common problems that occur with glomerulonephritis. It can also result in kidney failure.

- **Kidney stones (nephrolithiasis):** Minerals in urine form crystals (stones), which may grow large enough to block urine flow. It's considered one of the most painful conditions. Most kidney stones pass on their own, but some are too large and need to be treated.

- **Nephrotic syndrome:** Damage to the kidneys causes them to spill large

amounts of protein into the urine. Leg swelling (edema) may be a symptom.

- **Polycystic kidney disease:** A genetic condition resulting in large cysts in both kidneys that hinder their work.

- **Acute renal failure (kidney failure):** A sudden worsening in how well your kidneys work. Dehydration, a blockage in the urinary tract, or kidney damage can cause acute renal failure, which may be reversible.

- **Chronic renal failure:** A permanent partial loss of how well your kidneys work. Diabetes and high blood pressure are the most common causes.

- **End-stage renal disease (ESRD):** Complete loss of kidney strength, usually due to progressive chronic kidney disease. People with ESRD require regular dialysis for survival.

- **Papillary necrosis:** Severe damage to the kidneys can cause chunks of kidney tissue to break off internally and clog the kidneys. If untreated, the resulting damage can lead to total kidney failure.

- **Diabetic nephropathy:** High blood sugar from diabetes progressively damages the kidneys, eventually causing chronic kidney disease. Protein in the urine (nephrotic syndrome) may also result.

- **Hypertensive nephropathy:** Kidney damage caused by high blood pressure. Chronic renal failure may eventually result.

- **Kidney cancer:** Renal cell carcinoma is the most common cancer affecting the kidney. Smoking is the most common cause of kidney cancer.

- **Interstitial nephritis:** Inflammation of the connective tissue inside the kidney, often causing acute renal failure. Allergic reactions and drug side effects are the usual causes.

- **Minimal change disease:** A form of nephrotic syndrome in which kidney

cells look almost normal under the microscope. The disease can cause significant leg swelling (edema). Steroids are used to treat minimal change disease.

- **Nephrogenic diabetes insipidus:** The kidneys lose the ability to concentrate the urine, usually due to a drug reaction. Although it's rarely dangerous, diabetes insipidus causes constant thirst and frequent urination.

- **Renal cyst:** A hollowed-out space in the kidney. Isolated kidney cysts often happen as people age, and they almost never cause a problem. Complex cysts and masses can be cancerous.

- **Urinalysis:** A routine test of the urine by a machine and often by a person looking through a microscope. Urinalysis can help detect infections, inflammation, microscopic bleeding, and kidney damage.

- **Kidney ultrasound:** A probe placed on the skin reflects sound waves off the kidneys, creating images on a screen. Ultrasound can reveal blockages in urine flow, stones, cysts, or suspicious masses in the kidneys.

- **Computed tomography (CT) scan:** A CT scanner takes a series of X-rays, and a computer creates detailed images of the kidneys.

- **Magnetic resonance imaging (MRI) scan:** A scanner uses radio waves in a magnetic field to make high-resolution images of the kidneys.

- **Urine and blood cultures:** If an infection is suspected, cultures of the blood and urine may identify the bacteria responsible. This can help target antibiotic therapy.

- **Ureteroscopy:** An endoscope (flexible tube with a camera on its end) is passed through the urethra into the bladder and ureters. Ureteroscopy generally cannot reach the kidneys themselves, but can help treat conditions that also affect the ureters.

- **Kidney biopsy:** Using a needle inserted into the back, a small piece of kidney tissue is removed. Examining the kidney tissue under a microscope may help diagnose a kidney problem.

Kidney Treatments

- **Antibiotics:** Kidney infections caused by bacteria are treated with antibiotics. Often, cultures of the blood or urine can help guide the choice of antibiotic therapy.

- **Nephrostomy:** A tube (catheter) is placed through the skin into the kidney. Urine then drains directly from the kidney, bypassing any blockages in urine flow.

- **Lithotripsy:** Some kidney stones may be shattered into small pieces that can pass in the urine. Most often, lithotripsy is done by a machine that projects ultrasound shock waves through the body.

- **Nephrectomy:** Surgery to remove a kidney. Nephrectomy is performed for kidney cancer or severe kidney damage.

- **Dialysis:** Artificial filtering of the blood to replace the work that damaged kidneys can't do.

- **Hemodialysis:** A person with complete kidney failure is connected to a dialysis machine, which filters the blood and returns it to the body. Hemodialysis is typically done 3 days per week in people with ESRD.

- **Peritoneal dialysis:** Placing large amounts of a special fluid in the abdomen through a catheter allows the body to filter the blood using the natural membrane lining the abdomen. After a while, the fluid with the waste is drained and discarded.

- **Kidney transplant:** Transplanting a kidney into a person with ESRD can restore kidney function. A kidney may be transplanted from a living donor, or from a recently deceased organ donor.

Source: /www.webmd.com