

Chronic Kidney Disease

The kidneys make urine, filter substances from the bloodstream, and are important in maintaining body chemistry. Permanent damage to the kidneys is called **chronic kidney disease (CKD)**. Some common medical conditions that can cause CKD are diabetes, **hypertension** (high blood pressure), inherited kidney diseases, diseases of the kidney tissue itself, and chronic obstruction of the bladder. Some medications can have adverse effects that damage the kidneys. The kidneys also may be permanently impaired by a severe illness, such as heart failure or sepsis. Chronic kidney disease can progress to complete loss of kidney function, known as **end-stage renal disease (ESRD)**. The September 12, 2007, issue of *JAMA* includes an article about CKD and ESRD.

RISK FACTORS FOR CKD

- Diabetes
- Hypertension
- Vascular (blood vessel) disease
- Family history of kidney problems
- Bladder obstruction

DIAGNOSIS AND TESTING

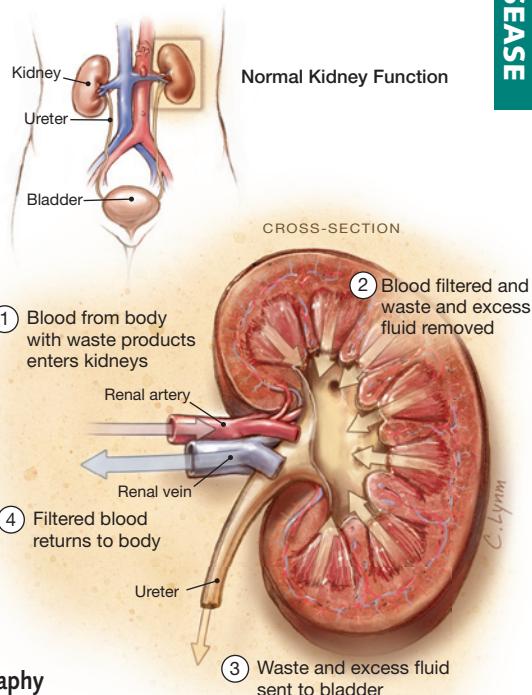
- Physical examination, including blood pressure measurement
- Blood tests, including complete blood count and chemistries
- Urine testing
- X-ray studies, including **computed tomography (CT)** scan, intravenous **pyelography** (an x-ray dye study of the kidney and its drainage system), and **angiography** (dye injected to outline the blood supply of the kidney)
- Ultrasound of the abdomen
- Cardiac and blood vessel testing may be recommended in persons at risk of heart disease or vascular disease.

TREATMENT

Controlling high blood pressure is important to limit further damage to the kidney as well as to protect against heart attack and stroke. Managing blood sugar in individuals with diabetes is important. Modification of diet, such as limiting protein and salt intake, can be helpful to reduce symptoms of kidney failure. Since **anemia** (low red blood cell number) is common in persons with CKD or ESRD, medications that increase the red blood cell count may be prescribed.

Dialysis is a process that substitutes for the kidneys in filtering the blood and removing waste products. Persons with ESRD need dialysis to survive. **Hemodialysis** is filtration of the blood using blood vessel access through an **arteriovenous access graft** (material that is surgically placed, usually in the arm) or an **arteriovenous fistula** (a surgically created connection between an artery and a vein, also usually in the arm). **Peritoneal dialysis** may be prescribed for some patients and involves a tube placed into the abdominal cavity. Fluids introduced through this tube enable the removal of waste products.

Kidney transplantation is the ideal treatment for many patients with ESRD but the shortage of donor organs limits its availability. After surgery, the patient is required to take medications to prevent the body from rejecting the transplanted kidney.



FOR MORE INFORMATION

- National Kidney and Urologic Diseases Information Clearinghouse
www.kidney.niddk.nih.gov
- National Kidney Foundation
www.kidney.org

INFORM YOURSELF

To find this and previous JAMA Patient Pages, go to the Patient Page link on JAMA's Web site at www.jama.com. Many are available in English and Spanish. A Patient Page on hypertensive kidney disease was published in the November 20, 2002, issue; one on kidney transplantation was published in the December 7, 2005, issue; and one on diabetes and the kidney was published in the June 25, 2003, issue.

Sources: National Institute of Diabetes and Digestive and Kidney Disease, American Diabetes Association, National Kidney Foundation

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