

[diabetes basics] BY SHAUNA S. ROBERTS, PHD

All About Your Kidneys

Keep them safe, and they will keep you going

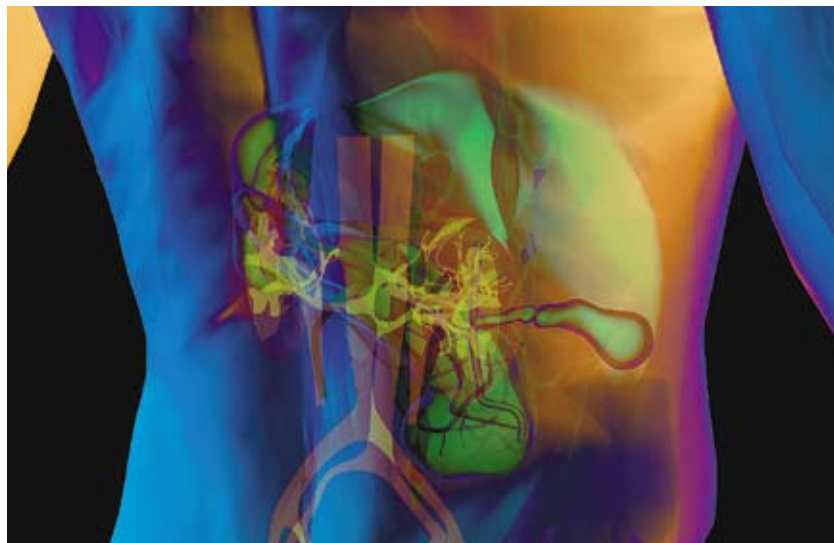
They're two little bean-shaped organs nestled inside your back—and they are among the most important parts of the body. The kidneys keep your blood clean by filtering out waste and excess water, sending them to the bladder to be excreted as urine. They also put proteins and other useful chemicals back into circulation.

Kidney disease, also known as *nephropathy*, occurs when this filtering process isn't working. High blood glucose levels over time, as well as high blood pressure, can cause nephropathy. It's estimated that more than 40 percent of people with diabetes have lost at least some kidney function.

Symptoms and Screening

Sometimes kidney disease causes symptoms (swelling, sleeplessness, tiredness, vomiting, itchiness, darkened skin, muscle cramps, and weakness). But often, people have no symptoms until their kidney disease is advanced. That's why regular kidney screening is so important for all people with diabetes.

Tests for kidney disease check how well the kidneys are filtering by looking for wastes



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in the blood that should have been excreted in urine, or proteins in the urine that should have been retained in the body. The American Diabetes Association recommends three tests to screen for kidney disease:

■ **Blood pressure measurement.** High blood pressure can be a sign of kidney damage—as well as a cause of it. Normal blood pressure is less than 120/80 millimeters of mercury. People with diabetes should have their blood pressure checked at every doctor visit.

■ **Urine albumin test.** Damaged kidneys leak a protein called albumin into the urine. A special urine test, done at the doctor's office, can detect even slightly elevated amounts of albumin in the urine. A healthy

person's urine contains little or no protein. A urine albumin test should be done once a year.

■ **Estimated glomerular filtration rate (eGFR) blood test.** Damaged kidneys do not do a good job of removing the waste product creatinine from the blood. Doctors can estimate how well the kidneys are filtering by performing a calculation that takes account of blood creatinine levels, weight, age, sex, and race. Many laboratories now do this automatically and report the eGFR at the same time as the blood creatinine. A normal GFR is about 90 ml/min/1.73 m² or above. Like the urine albumin test, the blood test for eGFR should be done at least once per year in everyone with diabetes.

Prevention

Several factors make some people prone to kidney disease. Some you can do nothing about. These include aging, family history of the disease, and African ancestry. Still, everyone can take steps to prevent or slow kidney disease. The two most important are:

- Keeping your blood glucose under good control.
- Keeping your blood pressure under control.

Two other significant steps are:

- Don't smoke or spend time around people who do.
- Take nonprescription painkillers sparingly. (Some studies have linked heavier use with a higher risk of kidney disease.)

Treatment

In the early stages of kidney disease, you need to continue the above preventive steps. In addition, before taking any over-the-counter or prescription medicine or having any medical test that involves injection of a dye, you should check with your doctor.

Your doctor will likely put you on an angiotensin-converting enzyme (ACE) inhibitor or an angiotensin-receptor blocker (ARB). These blood-pressure-lowering drugs also slow the progression of diabetic kidney disease, even in patients who have early kidney disease (such as slightly increased urine albumin) but normal blood pressure. You may also be advised to avoid a high-protein diet. Other dietary changes may include

eating less saturated fat, less sodium (salt), or less potassium. If you develop anemia, your doctor may prescribe a medication to stimulate your bones to make more red blood cells.

If kidney failure occurs, there are two options: dialysis and transplant. In dialysis, the kidneys' work of cleaning the blood is performed artificially, in one of two ways. In *hemodialysis*, blood is taken from the arm, filtered, and returned to the body. This is usually performed at a dialysis center, at least three times a week. In *peritoneal dialysis*, fluid is pumped into the abdomen to capture waste products from the blood. Then the fluid is removed, and the procedure is repeated for several hours. Peritoneal dialysis can be done at home.

In a kidney transplant, someone donates a normal kidney to a person whose kidneys have failed. The donor kidney must be a good match for the recipient, although it need not come from a relative. Donors may be living or deceased. A kidney transplant cures kidney disease, although recipients need to make sure high blood glucose or high blood pressure does not damage the new kidney over time. It is a major operation, requiring strong drugs to prevent the body from rejecting the new organ, so there are some risks. However, most people with diabetes do well after a kidney transplant.

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