HIV and Kidney Disease

WHAT IS KIDNEY DISEASE?

Chronic kidney disease, also called chronic kidney failure, describes the gradual loss of kidney function. The kidneys filter wastes and excess fluids from the blood, which are then excreted in urine. When chronic kidney disease reaches an advanced stage, dangerous levels of fluid, electrolytes, and wastes can build up in the body.

In the early stages of chronic kidney disease, people may have few signs or symptoms. Chronic kidney disease may not become apparent until kidney function is significantly impaired.

Treatment for chronic kidney disease focuses on slowing the progression of kidney damage, usually by controlling the underlying cause. Chronic kidney disease can progress to end-stage renal disease (ESRD) or kidney failure, which is fatal without artificial filtering (dialysis) or a kidney transplant.

WHY SHOULD PEOPLE WITH HIV CARE ABOUT KIDNEY DISEASE?

HIV infection can cause kidney failure due to HIV infection of kidney cells. This is known as HIV-Associated Nephropathy (HIVAN). Other causes of kidney disease include diabetes and high blood pressure. These problems, especially HIVAN, are much more common in African-Americans.

Taking antiretroviral medications (ARVs) used to treat HIV infections or related health issues can also cause kidney disease. Kidney problems can lead to ESRD or kidney failure.

The rate of kidney disease in people with HIV has gone down significantly since the introduction of modern antiretroviral therapy (ART). However, about 30% of people with HIV may have kidney disease. If kidney disease advances, it can cause heart disease and bone disease.

WHAT IS NORMAL KIDNEY FUNCTION?

The main job of the kidneys is to filter out waste products. They reabsorb what is needed and remove the waste in urine. The most important waste products are excess sodium and water. Each kidney contains about a million filtering units called nephrons. They:

- Eliminate wastes from the body,
- Regulate the volume and pressure of blood, and
- Control levels of electrolytes and blood acidity.

HOW DO I KNOW IF THERE ARE PROBLEMS WITH MY KIDNEYS?

Unfortunately, most symptoms of kidney disease only show up when a large part of kidney function has already been lost. Swelling of the legs or face or changes in urination may occur. Other symptoms, such as fatigue and loss of appetite, can be confused with other health problems.

Your healthcare provider should monitor your kidney function, even if you have no symptoms. The most common test of kidney function is a urine test. A simple dipstick is used to check levels of protein, sugar, ketones, blood, nitrites, and red and white blood cells. Small amounts of protein in the urine show up before kidney disease has caused a loss of kidney function.

Nearly one-third of all people with HIV have high levels of protein in their urine. This is a sign of possible kidney trouble.

Other kidney function tests include blood urea nitrogen (BUN), blood creatinine level, and rate of creatinine clearance.

- **Blood Urea Nitrogen (BUN)**: waste product normally filtered out of the blood by the kidneys. As kidney function decreases, BUN level rises. High BUN levels can be due to a high-protein diet, dehydration, or kidney or heart failure. High BUN levels should trigger a search for kidney disease.
- **Creatinine:** waste product produced in the muscles and normally filtered out of the blood by the kidneys. Blood levels are a good indication of how well the kidneys are working. High levels are usually due to kidney problems. Healthcare providers use the creatinine level as the most direct sign of how well the kidneys are removing waste products from the body.

Normal laboratory levels of creatinine have to be adjusted for race, age, weight, and biological sex. The most common formula for adjusting creatinine values is the Cockcroft-Gault formula. Another adjustment formula is the Modification in Diet in Renal Disease (MDRD) equation. These provide a measure called glomerular filtration rate (GFR).

Healthcare providers use the GFR to get a better picture of what your creatinine level really means. People without kidney disease have a GFR of about 100. As kidney disease takes away kidney function, the GFR falls. People need a kidney transplant or dialysis when GFR falls to about 15 or less.

The simple screening test of a urine exam for protein is the most sensitive way to diagnose kidney disease. People at risk for kidney disease should have this exam performed at least yearly.

WHAT ARE THE RISK FACTORS FOR KIDNEY DISEASE?

Kidney disease is more likely in people who:

- Are African-American
- Have diabetes
- Have high blood pressure
- Are older
- Have a lower CD4 cell count
- Have a higher viral load
- Have hepatitis B virus (HBV) or hepatitis C virus (HCV)

People with HIV should be carefully screened for signs of diabetes or high blood pressure. They should control their blood sugar and their blood pressure as much as possible.

ART AND THE KIDNEYS

Several ARVs used to treat HIV are hard on the kidneys. This includes ARVs and some medications used to treat HIV-related opportunistic infections (OIs). Tenofovir is known to cause kidney problems. If you are taking tenofovir, your healthcare provider may want to monitor your creatinine levels regularly.

The dosages of several medications that are cleared through the kidneys need to be reduced for people with kidney problems. Be sure your healthcare provider knows if you have any kidney problems.

DIALYSIS AND KIDNEY TRANSPLANTATION

Some people with HIV need dialysis and some have received a kidney transplant. There are concerns about suppressing the immune system following transplant, so most transplant centers only accept people with a CD4 cell count of at least 200 cells/mm^3 and an undetectable viral load. The outcomes for these people appear to be the same as for other people getting kidney transplants.

THE BOTTOM LINE

HIV infection can cause kidney problems that may become serious. Also, people with kidney problems may need to lower the amount of some medications that they take.

Kidney problems don't really show up as symptoms of disease. It's important to get urine checked regularly for signs of trouble.

MORE INFORMATION

National Kidney Foundation: HIV and Chronic Kidney Disease: What You Need to Know

DaVita Kidney Care: HIV/AIDS and Chronic Kidney Disease

nam aidsmap: Chronic kidney disease and HIV

POZ: HIV and Your Kidneys

Reviewed June 2025