



VA research on **KIDNEY DISEASE**

VA has a comprehensive research portfolio aimed at prevention and improving treatment for both acute and chronic kidney diseases.

ABOUT KIDNEY DISEASE

- The kidneys are a pair of fist-sized organs located on either side of the spine. Kidneys remove waste products, toxins, and excess fluids that build up in the body. They are essential for maintaining a safe level of chemicals in the bloodstream, and also help control blood pressure.
- Kidney diseases are the ninth leading cause of death in the United States.
- Kidney disease or injury can happen suddenly and may get better over time. This condition is called acute kidney disease (AKI), and happens most often in critically ill people who are hospitalized.
- About 37 million American adults are estimated to have chronic kidney disease (CKD), a condition that develops slowly over time. In CKD, the kidneys become damaged and cannot filter blood adequately. People are at greater risk of developing CKD if they have diabetes, high blood pressure, or heart disease. African Americans, Hispanic Americans, and American Indians also have a greater risk of developing CKD. Most people who have CKD are unaware that they have it.
- Early kidney disease has few symptoms. As the disease progresses, people can

experience swelling, fatigue, dry skin, and nausea, among other symptoms. Complications of advanced kidney disease can include high blood pressure, arteriosclerosis, anemia, and weakened bones. Advanced disease can also result in kidney failure.

VA RESEARCH ON KIDNEY DISEASE: OVERVIEW

- VA kidney specialists are dedicated to expanding the understanding of kidney disease and its impact on Veterans. They also contribute to the development of new treatments to help patients manage kidney disease symptoms.
- The [VHA National Kidney Program's](#) mission is to improve the quality of health care services delivered to Veterans with kidney disease. The program supplies kidney-related services to VA dialysis centers and provides health care providers with education, research, and informatics resources.
- VA offers free web-based education on kidney disease and treatment through the VA [eKidney Clinic](#), the [VA Mobile Kidney App](#) (currently in beta testing), and the [Veterans Health Library](#).

SELECTED MILESTONES AND MAJOR EVENTS

- 1962** – VA surgeon Dr. Thomas E. Starzl [conducted](#) the first in a series of successful kidney transplants
- 1998** – [Learned](#) that smaller doses of the medication erythropoietin can be used to treat end-stage renal disease if injected under the skin
- 2008** – [Determined](#) that high-intensity renal therapy is no better than less intensive therapy in patients with AKI
- 2015** – [Found](#) that patients with CKD were more likely to have vascular disease, diabetes, hypertension, and cancer
- 2019** – [Learned](#) that proton pump inhibitors are associated with an increase in mortality due to CKD, cardiovascular disease, and cancer
- 2019** – [Identified](#) L-ornithine, an amino acid, that may reverse kidney damage in humans
- 2019** – [Developed](#) an artificial intelligence tool to predict the presence of AKI in patients

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RECENT STUDIES: SELECTED HIGHLIGHTS

• **COVID-19 survivors have increased risk of kidney problems**, found a VA St. Louis study. VA patients had higher risk of AKI and worse scores on measures of kidney function 30 days after recovering from COVID-19, compared with patients who did not have COVID-19. Severity of infection increased the odds of AKI. AKI risk was elevated even in patients with mild or asymptomatic COVID-19. ([Journal of the American Society of Nephrology](#), Sept. 1, 2021)

• **Kidney stones are linked with bone problems**, according to a VA Palo Alto and Stanford University study. Approximately 24% of Veterans treated in VA for kidney stones during a nine-year period also had osteoporosis or bone fracture. The results suggest that kidney stone patients should be screened for bone mineral density, say the researchers. ([Journal of Bone and Mineral Research](#), May 2021)

• **Researchers at the VA Calcium Signaling Laboratory identified one cause of kidney stones**. Using a mouse model, they learned that a region of the kidney called the proximal tubule helps control the balance between acids and bases in the blood. When this structure does not function properly, the urine becomes alkaline, causing a buildup of

calcium ions that can form into stones. Improper function of the proximal tubule can also cause cellular damage, which can lead to stones. ([International Journal of Molecular Sciences](#), March 17, 2021)

• **Risk of death after kidney transplant is significantly lower in patients whose post-surgery care is through VA**, compared with those receiving care outside VA, found a Pittsburgh VA study. Patients who used only non-VA post-transplant care were more than twice as likely to die within five years of their surgery, compared with patients who only used VA. Patients who used both VA and Medicare were 1.5 times more likely to die within five years compared with VA-only patients. ([Clinical Journal of the American Society of Nephrology](#), March 8, 2021)

• **AKI is common in Veterans hospitalized with COVID-19**, according to a study by VA St. Louis researchers and colleagues. Out of 5,000 Veterans admitted for COVID-19 in 2020, 23% had AKI. Those with AKI were 6.5 times more likely than those without to require mechanical ventilation, and they stayed in the hospital an average of 5.6 days longer. They were also 6.7 times more likely to die from their illness. The link was particularly strong for Black

patients. ([Clinical Journal of the American Society of Nephrology](#), Dec. 31, 2020)

• **Phone-based kidney care is effective for Black patients with diabetes**, found a study by Durham VA and Duke University researchers. Pharmacists delivered a phone-based intervention to patients with diabetic kidney disease that used behavioral modification and medication management. Among African American patients, those who received telehealth saw better improvements in measures of kidney function than patients who received education only. The difference was more pronounced in African Americans than in other groups. ([Medical Care](#), November 2020)

• **A common HIV drug may increase kidney disease and fractures**, found a study by W.J.B. Dorn VA Medical Center researchers. Among 5,000 VA patients, those taking tenofovir disoproxil fumarate (sold as Viread) had 48% higher odds of developing CKD than those not taking the drug. They also had more than twice the risk of bone fracture due to deterioration or low bone mass. ([Current Medical Research and Opinion](#), October 2020)

For more information on VA studies on kidney disease and other key topics relating to Veterans' health, please visit www.research.va.gov/topics

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