

Scientists identify therapy with potential to eliminate dialysis need

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Scientists at Indiana University have identified a therapy that could help reverse damage from acute kidney injury and eliminate the need for dialysis treatment in the future.

Acute kidney [injury](#) commonly occurs after either cardiac surgery or prolonged vascular surgery procedures, said lead researcher Dr. Robert L. Bacallao, associate professor of medicine at IU School of Medicine. It can also occur with blood loss from trauma, so it's a frequent problem for the military.

"It's almost like a classic cable-TV problem," he said. "If you have a good cable running through your neighborhood, but then the last 10 feet going to your house doesn't work, as far as you're concerned, you have bad cable. That's what we're seeing in [acute kidney injury](#): It's that last little bit that seems to be affected, and this procedure repairs that."

The researchers found that in rat models, delivering hydrodynamic isotonic fluid to the left renal vein within 24 hours after acute kidney injury rapidly restores blood flow in the organ, reduces the accumulation of pro-inflammatory T cells and improves overall kidney function. [Their findings](#) were published in the *Journal of the American Society of Nephrology*.

"We think this procedure reestablishes enough kidney function to get urine made and eliminate some of the immune response adding to [kidney damage](#)," said Bacallao, corresponding author on the study. "So

we envision this as something where you could potentially have a 30-minute procedure done and eliminate the need for [dialysis](#)."

Bacallao also has a personal connection to the research. His mother had to start dialysis after developing acute kidney injury from triple-vessel heart surgery. She died 18 months later.

"To come up with something that could potentially change patient care—particularly in the renal field—is important to me," he said.

Bacallao said people who lose [kidney function](#) have a baseline mortality rate of at least 50 percent in the intensive care unit setting. The current treatment is to put these [patients](#) on dialysis. If the kidney fails to regain function, the patient will require long-term dialysis, which is expensive, time-consuming, and has significant impact on the patient's quality of life.

"Dialysis does not repair the [kidney](#); it supports you and gives your body a chance to repair the injury," Bacallao said. "If the repair doesn't occur, you end up on dialysis for the rest of your life."

Working to help people with [acute kidney failure](#) aligns with a longstanding research goal of Bacallao's: to bridge scientific discovery with patient care.

"I once saw a patient whose life was literally changed by a fundamental discovery," he said. "When I saw that change, it caused me to reflect that for this patient, no one was able to help her as much as that scientist who made that fundamental discovery. That is my hope for my research."

Bacallao is co-founder and chief scientific officer of Rene Medical, which was formed to commercialize the research just published. The company licensed it from the [Indiana University Research and](#)

[Technology Corp.](#) and is a member of IURTC's Spin Up entrepreneurial program.

"We have raised \$100,000 in funding and have conducted a successful proof-of-concept study in a large animal model," Bacallao said. "Our next steps include another large animal study refining our first-generation catheter and creating a proprietary device to perform the procedure reproducibly and safely."

Provided by Indiana University

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