

# Surgeons implant pig kidney into first living human patient

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For the first time ever, doctors have transplanted a genetically edited pig kidney into a human suffering from advanced kidney failure.

Such pig kidneys, altered to lower the risk of rejection and disease, have been successfully placed into monkeys and brain-dead human donor bodies.

But Rick Slayman, 62, is the first living patient to receive a gene-edited pig kidney, in an operation last weekend that took four hours, according to his doctors at Massachusetts General Hospital (MGH) in Boston.

The Weymouth, Mass., resident is recovering well and is expected to be discharged soon, his doctors said.

Slayman said he agreed to the transplant after MGH doctors suggested it, "Carefully explaining the pros and cons of this procedure."

"I saw it not only as a way to help me, but a way to provide hope for the thousands of people who need a transplant to survive," Slayman said in a hospital news release.

Dr. Winfred Williams, associate chief of the nephrology division at MGH and the patient's primary kidney doctor, hailed Slayman's "courageousness in becoming a trailblazer in the field of transplantation."

The pig kidney came from eGenesis, a Cambridge, Mass., company that has been experimenting with genetic alterations to make pig organs transplantable to humans.

Last year, eGenesis [reported](#) in the journal *Nature* that a monkey had been living with one of its transplanted pig kidneys for two years.

The kidney Slayman received had 69 genetic edits that removed harmful pig genes and added helpful human genes, researchers said. Scientists also inactivated retroviruses in the pig donor to eliminate any risk of

infection in humans.

Slayman is Black, and Black patients tend to suffer high rates of end-stage kidney disease, *The New York Times* reported.

These genetically altered pig kidneys represent a "potential breakthrough in solving one of the more intractable problems in our field, that being unequal access for ethnic minority patients to the opportunity for kidney transplants due to the extreme donor organ shortage and other system-based barriers," Williams said.

Slayman has been living with type 2 diabetes and [high blood pressure](#) for many years, doctors said. He received a kidney transplant from a human donor in December 2018, but the organ began to fail after five years and he resumed dialysis in May 2023.

He's since been in and out of the hospital regularly, due to complications stemming from his dialysis, doctors said.

More than 100,000 people in the United States are awaiting an organ for transplant, according to the United Network for Organ Sharing. About 17 people die each day for want of a donor organ.

Kidneys are the most common organs needed for transplant, doctors said. End-stage kidney disease rates are expected to increase from 29% to 68% in the United States by 2030.

"At MGH alone, there are over 1,400 patients on the waiting list for a [kidney transplant](#). Some of these patients will unfortunately die or get too sick to be transplanted due to the long waiting time on dialysis. I am firmly convinced that xenotransplantation represents a promising solution to the organ shortage crisis," said Dr. Leonardo Riella, MGH medical director for kidney transplantation.

Last weekend's procedure was performed under a compassionate use waiver granted by the U.S. Food and Drug Administration in February, doctors said.

To help Slayman avoid rejection, he also received an infusion of two new immunosuppressant drugs—tegoprubart, provided by Eledon Pharmaceuticals Inc., and ravulizumab, provided by Alexion Pharmaceuticals Inc.

**More information:** The U.S. National Institutes of Health has more about [kidney transplantation](#).

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