

First robot-assisted liver transplant in U.S. has been performed

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A surgical team from Washington University's School of Medicine has successfully performed the first robot-assisted whole-liver transplant in the U.S.—and the patient was cleared to get back on the golf course just a month later.

The [surgery](#) took place in May at Barnes-Jewish Hospital, and the patient—a man in his 60s with [liver cancer](#) and cirrhosis due to a hepatitis C infection—has recovered swiftly, according to his doctors.

"We're trying to maximize all of the technologies that we have to be safe and to do what's best for the patients," said Dr. Maria Majella Doyle, director of WUSM's [liver transplant](#) program. "This is a huge innovation in [liver transplants](#)—something that really has not changed for many years."

During robotic surgeries, a surgeon uses joystick-like controls to operate robotic arms equipped with surgical tools that allow for extremely precise movements. This takes place at a nearby console, while other medical professionals remain at the patient's bedside.

Previous robotic [liver](#) transplants involved transplanting partial livers from living donors, or performing part of the surgery robotically and the rest traditionally. The robotic surgery team at WUSM, for example, has performed previous surgeries in which they removed the diseased liver robotically, then made a slightly bigger incision to implant the donated liver without the robot.

"This was the first time where we did both parts together," said Dr. Adeel Khan, [transplant surgeon](#) and leader of the team that conducted the surgery.

The liver recipient was cleared to resume some exercise only a month after the procedure, when most patients recovering from an open liver [transplant](#) require double or triple that time before feeling well enough to undertake any physical activity.

"To have somebody come in just a month after receiving a liver transplant and his only concern is that he wants to get back to playing

golf and swimming, then I think that speaks for itself that this definitely does help with the recovery," Khan said.

A traditional liver transplant usually involves a surgeon making a large horizontal incision, between 12 and 16 inches, just beneath the rib cage, as well as a vertical incision that's about 3-4 inches, Khan said. The extent to which the incision size can be reduced is limited by the size of the liver—the largest solid internal organ in the body.

The incision for this robotic surgery was along the patient's midline and avoided cutting through any abdominal muscle. The surgeons involved said it was only about 6 to 7 inches long.

"Liver transplanting has traditionally been considered a maximally invasive procedure," Khan said. "It's pretty much as big of an incision as it gets. And often a large portion of the recovery is dependent on the pain from the incision, so by doing it robotically, it allows you to make the [incision](#) a lot smaller."

The robotic surgery team began about five years ago with similar kidney operations; they started by removing the organ from living donors robotically and then advanced to complete robotic kidney transplants.

"We have been very happy with the results that we have seen," Khan said. "We have a lot of centers across the country that came to observe operations with us and to have us help them build their own robotic programs and get them off the ground."

"And we also do a number of non-transplant surgeries related to the liver and the pancreas and the kidney; we've been doing more and more of those robotically as well," he said. "So improvement in one area has definitely helped us in all areas and has allowed us to grow where we can offer a lot more services in a lesser invasive way to our patients—not

just in Missouri but also beyond."

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