



ISHLT

A Society that Includes Basic Science, the Failing Heart, & Advanced Lung Disease

Future of Xenotransplantation is Nearly Here

10 April, 2024, Prague, Czech Republic—Speaking today at the Annual Meeting and Scientific Sessions of the International Society for Heart and Lung Transplantation (ISHLT) in Prague, Muhammad Mohiuddin, MBBS, said xenotransplantation, hailed as the future of organ transplantation, is poised to become a clinical reality within the next several years.

In January 2022, the University of Maryland School of Medicine (UMSOM) became the first institution in the world to implant a genetically modified pig heart into a human patient. A second patient underwent heart xenotransplantation at UMSOM in 2023.

“Every 80 minutes, a person on the waiting list for a new heart dies worldwide,” said Dr. Mohiuddin, professor of surgery and program director of UMSOM’s Cardiac Xenotransplantation Program. “Not everyone is going to get a heart transplant.”

Dr. Mohiuddin has implanted several hundred genetically modified pig hearts in animals throughout his three-decade career, helping to prepare for the first genetically modified xenotransplant in a living patient. Advances in cloning, gene editing, and infection control paved the way for the breakthrough in human xenotransplantation, which was performed under the US FDA’s expanded access program.

“Using this option, we hope to eventually save millions of lives,” Dr. Mohiuddin said. “Genetically modified pig hearts could expand the pool of donor organs available for transplantation.”

Pig organs are anatomically similar to humans, and pig heart valves have been used for decades to replace diseased human heart valves. A one-year-old genetically modified pig can support a human weighing up to 200 pounds. The pig’s lifespan is 20 years.

The two human patients who received modified pig hearts at UMSOM lived approximately 40-60 days following their procedures.

“We had the opportunity to learn a lot from our human patients,” Mohiuddin told attendees. “We found additional obstacles that we are hopeful we can overcome.”

During his presentation, Mohiuddin shared a roadmap for the future of xenotransplantation and meeting the growing need for organs.

“We want to get to the point that the same immunosuppression used in human heart transplants can also prolong the pig heart,” he said. “The advantage of using genetic modification is that we can modify the donor, which, of course, can’t be done with a human donor heart.”

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About ISHLT

[The International Society for Heart and Lung Transplantation](#) (ISHLT) is a not-for-profit, multidisciplinary, professional organization dedicated to improving the care of patients with advanced heart or lung disease through transplantation, mechanical support, and innovative therapies via research, education, and advocacy. ISHLT members focus on transplantation and a range of interventions and therapies related to advanced heart and lung disease.

The ISHLT Annual Meeting and Scientific Sessions will be held 10-13 April at the Prague Congress Centre in Prague, Czech Republic.

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