People born with congenital heart defects often require multiple interventions and lifelong management to ensure their hearts are pumping blood through the body properly. Heart defects can lead to chronic congestion, which can cause problems with both the heart and liver. When these problems progress to liver dysfunction and liver failure, transplant may be the best treatment option.

Congenital cardiac surgeons Jacob Miller, MD, and Dilip Nath, MD, combine clinical expertise and multidisciplinary care to achieve the best outcomes for heart-liver transplant patients.

"These are patients who may have had several previous surgeries to treat their heart defects," says Miller, who completed cardiothoracic and congenital cardiac fellowship training at the School of Medicine. "When their condition has worsened to the extent that they require heart-liver transplant, they need to see a team with the coordination and capability to make them better."

The Heart Center, the first pediatric center in the Midwest to perform over 500 heart transplants, is nationally recognized as a top heart program by U.S. News & World Report. Miller and Nath partner with the Pediatric Liver and Transplant Center team at St. Louis Children’s Hospital, led by Director of Liver Transplant and Mid-America Transplant/Department of Surgery Distinguished Endowed Chair in Abdominal Transplantation Maria B. Majella Doyle, MD, MBA, to coordinate care for heart-liver transplant procedures, which can take 12 or more hours to complete and require a large operating room staff.

“We have seen excellent results in these challenging cases,” says Nath. “We have one of the leading pediatric heart transplant programs in the country. Our patients can see our track record of outstanding outcomes and know that they are in good hands.”

“I consider myself one of the most fortunate people alive to be working with such wonderful, talented individuals. Our team continues to grow and improve the health of our patients. We’ve got heart.”

-Pirooz Eghtesady, MD, PhD

The Heart Center is led by Section Chief of Pediatric Cardiothoracic Surgery Pirooz Eghtesady, MD, PhD, the Cardiothoracic Surgeon-in-Chief at St. Louis Children’s Hospital, who has performed heart transplants in children, teens and adults at the School of Medicine.

“I consider myself one of the most fortunate people alive to be working with such wonderful, talented individuals,” says Eghtesady, who is the Emerson Chair in Pediatric Cardiothoracic Surgery at St. Louis Children’s Hospital. “Our team continues to grow and improve the health of our patients. We’ve got heart.”
Tetralogy of Fallot is a congenital heart defect that affects normal blood flow through the heart. It consists of pulmonary stenosis, ventricular septal defect, overriding aorta and right ventricular hypertrophy. Together, these defects can reduce the amount of oxygen in the blood that flows to the rest of the body. Congenital cardiac surgeons at Washington University School of Medicine combine clinical expertise with innovative research to solve the problems facing patients with congenital heart disease.

Treating tetralogy of Fallot requires surgery to widen or replace the pulmonary valve. Patients treated for the condition require lifelong monitoring. Blood flow may still be restricted after surgery. Deterioration of childhood heart repairs can lead to pulmonary valve regurgitation. Cardiac arrhythmias are common in patients after tetralogy of Fallot surgery. These problems lead many patients to require repeat interventions throughout their lifetime.

Chief of Pediatric Cardiothoracic Surgery Pirooz Eghtesady, MD, PhD, is developing a novel surgical technique using heart tissue to replace the pulmonary valve. Eghtesady, who is Cardiothoracic Surgeon-in-Chief at St. Louis Children’s Hospital, takes tissue from the right atrial appendage and creates a replacement valve.

“I asked myself, ‘Is there something else a surgeon could use that has growth potential?’”

“Surgeons have done valve repairs for decades using other materials,” says Eghtesady, the Emerson Chair in Pediatric Cardiothoracic Surgery. “Specifically, the pericardium has good tensile strength. The problem is that the pericardium degenerates and does not have growth potential. I asked myself, ‘Is there something else a surgeon could use that has growth potential?’”

A replacement valve with the potential to grow with a patient, like a functional valve in a heart without congenital defect, might reduce the number of issues common to patients with tetralogy of Fallot and other congenital heart defects. From this initial idea, Eghtesady began collaborating with Washington University biomedical engineers to test atrial appendage tissue. He has now used the approach in select cases with positive results.

Eghtesady, who leads a research laboratory at the School of Medicine, is developing plans to further study the use of this tissue in valve repair. If proven effective, the technique could revolutionize the treatment of congenital heart disease, including common problems with few current treatment options, such as bicuspid aortic valve.