



Early Evaluation Increases Transplant Success

Here's How We Can Help



**NATIONWIDE
CHILDREN'S®**

When your child needs a hospital, everything matters.



About The Lung and Heart-Lung Transplant Programs

The Lung and Heart-Lung Transplant programs are part of a multi-organ transplant center at Nationwide Children's Hospital having received its initial United Network of Organ Sharing (UNOS) accreditation in 2005. Through the collaboration of the Heart Failure and Transplant Program in The Heart Center and the Advanced Lung Disease Program within the Section of Pulmonary Medicine, our thoracic transplant team provides hope for patients with end-stage advanced pulmonary and cardiopulmonary diseases.

Dr. Hayes, the medical director of the Lung and Heart-Lung Transplant Programs, has participated in more than 250 lung transplants during his career. With our experiences, the Nationwide Children's Cardiothoracic (CT) Intensive Care Unit (ICU) has developed a depth of knowledge in the ambulation of children and young adults on extracorporeal membrane oxygenation (ECMO) and to our knowledge have ambulated the youngest child in the world on ECMO.

Under Co-Directors Timothy Feltes, MD, FACC, and Mark Galantowicz, MD, FACS, The Heart Center consolidates all cardiology and cardiothoracic surgery services into a comprehensive model for family-centered care and convenience treating patients from fetus to adult. Under the direction of Dr. Patrick McConnell, Program Surgical Director, the Heart Failure and Heart Transplant program at Nationwide Children's received national accreditation from the United Network for Organ Sharing (UNOS) in December 2002 to perform heart transplants.

Our comprehensive team is dedicated to quality improvement, scientific and outcomes research, and family-centered care to ensure the best possible care for the most fragile patients. Our patients are able to see all of their physician experts and health care team members including nurse coordinators, social workers, pharmacists and dietitians at one location. Our team of experts provides comprehensive support for our patients and their families while maintaining a collaborative relationship with the referring physicians.



Specialized Programs

Advanced Lung Disease Program

The Lung and Heart-Lung Transplant Programs at Nationwide Children’s serve as complementary components of our Advanced Lung Disease Program that centers on treating patients with cystic fibrosis, pulmonary vascular disease, interstitial lung disease, neonatal lung disease, and genetic lung disease. Physicians see patients throughout all stages of care from early to late-stage diagnosis.

The goal of the program is to collaborate with physicians in medically managing their patients. The work-up and treatment of advanced lung diseases follows along a continuum. At some point, the dyspnea reaches levels refractory to typical medical management and may limit the patients’ ability to participate in activities of daily living. At that time, we can evaluate a patient for lung or heart-lung transplantation; however, when needed, we will expedite a patient’s evaluation for transplantation.

If transplantation is deemed necessary, the team at Nationwide Children’s Hospital has a “toolbox” containing a full spectrum of mechanical assist devices, designed for short- to long-term use, in order to reduce morbidity and improve patient survival. Devices used to bridge pediatric patients to transplant include ambulatory ECMO and artificial lung technology for the lung and ventricular assist devices for those patients with cardiopulmonary failure.



CTICU

Our dedicated cardiothoracic intensive care unit (CTICU) and separate cardiac step-down unit are staffed 24 hours a day, 7 days a week by intensivists, CTICU APNs, attendings, nurses, respiratory therapists and other specialists for complete coverage. These units are designed to be the optimum environment to care for the complex and unique needs of patients with cardiopulmonary failure. There are 20 beds in our CTICU and 24 beds in our step-down unit. Our team is specially trained and equipped to provide the highest level of care to patients of all ages, ranging from neonates to adults.

Cardiopulmonary Rehab

The Cardiopulmonary Rehabilitation Program at Nationwide Children’s Hospital is a medically supervised, individually tailored program consisting of exercise and education to help patients feel better, increase endurance and improve their overall quality of life. Conveniently located on Nationwide Children’s main campus, we will provide your patient with their own individually tailored cardiopulmonary rehabilitation plan of care. Depending upon their needs, your patient may receive services from any or all members of our multidisciplinary team:

- Physical therapist
- Exercise physiologist
- Dietician
- Psychologist
- Respiratory therapist
- Massage therapist
- Recreation therapist
- Occupational therapist

Patients will also receive education to help them make healthy lifestyle choices and find community resources to aid in their progress.

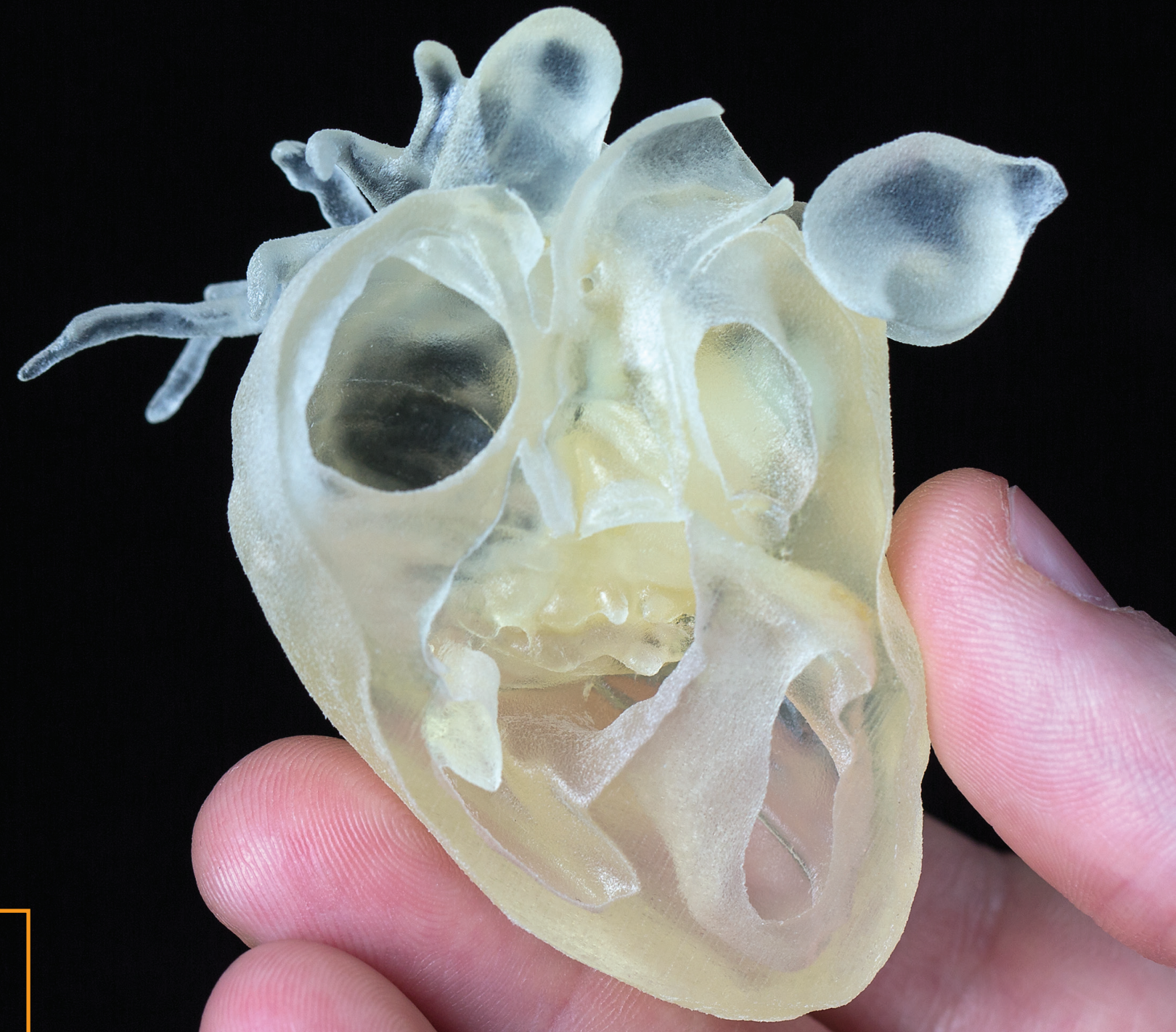


Mechanical Cardiovascular Assist Program and Cardiothoracic Surgery

Dedicated to the treatment of all patients, regardless of age, our Cardiothoracic Surgical Program treats those who are suffering from congenital disorders of the thorax including heart, lung, mediastinum and chest wall. The cardiothoracic surgeons at Nationwide Children's Hospital use a variety of surgical techniques to repair congenital and acquired heart defects ranging from the most straightforward to the extremely complex. Our surgeons have a "toolbox" containing a full spectrum of mechanical devices designed for short- to long-term use in order to reduce morbidity and improve patient survival. These devices include Extracorporeal VAD/PediMag, Paracorporeal VAD/Berlin Heart, Intracorporeal VAD/HeartMater II and ECMV/NovaLung/Ambulatory ECMO. As the developer and leader of hybrid procedures, Nationwide Children's is one of the only pediatric hospitals to use 3-D Video Assisted Thoracoscopy. The Heart Center continues to be a pioneer in the development of novel treatment strategies allowing us to expand the use of minimally invasive techniques.

The Department of Cardiothoracic Surgery is renowned for innovative surgical approaches to congenital heart disease and thoracic diseases, which include:

- Hybrid procedure for the treatment of hypoplastic left heart syndrome
- Lateral thoracic expansion for Jeune's Syndrome
- Blood conservation techniques, which allow open heart surgery to be performed without a blood transfusion




Radiology and 3D Printing

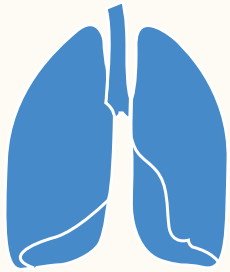
The 3D Printing Lab is part of the Pediatric Advanced Imaging Resource in the Department of Radiology at Nationwide Children's. The high-quality printer is capable of 16-micron layers. Multicolor and multi-material capabilities allow for variation of material properties within a single print, depending on the needs of the given application. A team of physicians, image analysts, digital modelers, coordinators and others use the CONNEX-3 OBJET 350 3D printer, in addition to a full complement of image processing and 3D modeling and printing software, to convert 2D CT and MRI images to 3D physical models. The computer models and 3D printed models that the team produces are used for presurgical planning, education and research.

Lung and Heart-Lung Transplant Programs

5 months old




Youngest patient to receive a heart-lung transplant




1,400 pediatric patients with advanced lung disease treated at Nationwide Children’s in 2017

8 months old



Youngest patient to receive a lung transplant

8 years old



Youngest patient on ambulatory ECMO

100%

1-year survival rate for pediatric lung transplant

Trends / Conditions We Treat

Acute Respiratory Distress Syndrome (ARDS)

Severe acute respiratory distress syndrome (ARDS) is a life-threatening condition with a high mortality rate, and continues to have few therapies available. For pediatric patients with refractory ARDS, including those on ECMO, a potential need for consideration for lung transplantation is increasing and would require transfer to a few select centers in the United States. At our institution, we have had a significant increase in calls by pediatric intensivists to transfer these critically ill children. Published findings and our expertise indicate that clinicians caring for children with ARDS unresponsive to supportive measures or deteriorating on ECMO should consider lung transplantation as a potential treatment option. Based on recent trends, it appears 2 weeks into the ECMO run is the time frame when to consider lung transplant in this patient population. Although some patients may recover from ARDS without need for transplantation, earlier referral may give those who will not recover the opportunity to be considered for lung transplantation. Our multidisciplinary team of a critical care physician, critical care nurse and a cardiovascular perfusionist are available via our ECMO compatible helicopter to transport patients on ECMO to our facility for evaluation for lung and heart-lung transplant.

Cystic Fibrosis

Due to advancements in the care of patients with cystic fibrosis there has been a changing trend in pediatric lung transplantation across the country. These trends suggest that pediatric patients with cystic fibrosis are requiring lung transplant later in life and not in childhood. Regardless of age, Nationwide Children’s will consider performing lung transplantation in a patient with cystic fibrosis due to their significant experience in the care of this patient population.

Genetic Pediatric Lung Disease

With expertise in several genetic lung diseases of childhood, the team at Nationwide Children’s will individualize care based on patient and family needs. The team is dedicated to the care of these patients and is also performing innovative translational research to advance our understanding of the pathophysiology of these diseases and the impact of abnormal recipient genetics on lung allografts.

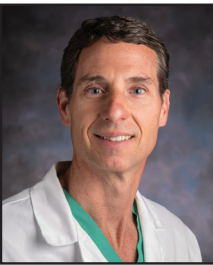
Our Team

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The Heart Center Co-director The Heart Center
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Heart Failure and Heart Transplant Program
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Tissue Engineering Program Co-Director



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Collaboration/Referral Process

Nationally, only 10-20% of referred patients are appropriate for transplantation. Early referral is key. Because it is our philosophy to try to do all we can for every child, Dr. Hayes and Dr. Kirkby have accepted invitations to provide CME-based lectures throughout the region to increase awareness about trends and innovative care. They also provide on-site consultations for high-risk and critically ill patients to help guide care and facilitate the transfer to Nationwide Children’s Hospital including by our multidisciplinary transport team via our ECMO compatible helicopter.



TRANSPORT

Nationwide Children’s Transport program provides 24-hour pediatric and neonatal critical care transport services via mobile ICU, helicopter, and jet aircraft to over 1,800 patients each year, with more than half of those being newborns. The helicopter is ECMO compatible, and the staff is trained to support ECMO during transport. In addition to providing transport for transplant patients, the lung transplant team at Nationwide Children’s offers on-site consultations.

Our highly skilled ECMO perfusion team and transport team are critical to our success. — Dr. Hayes

Referrals and Consultations

Online: [NationwideChildrens.org/Lung-Heart-Transplant](https://www.nationwidechildrens.org/Lung-Heart-Transplant)

Physician Direct Connect Line for 24-hour urgent physician consultations:

(614) 355-0221 or **(877) 355-0221**

Mailing address:

Nationwide Children's Hospital, 700 Children's Drive Columbus, Ohio 43205



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