The Division of Pediatric Cardiology provides comprehensive care for children with heart disease, conducts seminal research, promotes innovation, facilitates quality science initiatives, and oversees an internationally recognized training program.

Under the direction of Nicolas Madsen, M.D., M.P.H, the Division provides services at Children’s Medical Center Dallas, Children’s Medical Center Plano, and across Texas in:

- Outpatient clinics (around 12,000 visits per year)
- A 22-bed dedicated Acute Care Cardiology Unit
- A 32-bed dedicated Cardiac Intensive Care Unit
- Three comprehensive Dallas-based, and one Plano-based, catheterization laboratories for diagnostic and interventional procedures
- A 1.5T dedicated cardiac magnetic resonance imaging (MRI) scanner in immediate proximity to the cardiac catheterization laboratory allows for combined MRI – cardiac catheterization procedures (XMRI)
- All imaging facilities are in close proximity to the operating room, allowing intra- and periprocedural collaboration
- An echocardiography suite, including specified areas for fetal echocardiography, as well as a complete non-invasive monitoring laboratory

Division Faculty

The Division has 34 pediatric cardiologists, each with unique expertise, including critical care medicine, interventional catheterization, electrophysiology, advanced imaging, including echocardiography and fetal echocardiography, cardiac MRI and computed tomography (CT), cardiac transplantation, heart failure, prevention, and adult congenital heart disease. Six faculty joined the Division in 2022.

Megan Griffiths, M.D.
Assistant Professor

M.D.
University of Colorado School of Medicine, Denver, CO, 2013

Postdoctoral Training

Residency, Pediatrics
Chief Resident
Connecticut Children’s Medical Center/University of Connecticut, Farmington, CT, 2016 – 2017
Fellowship, Pediatric Cardiology
Bloomberg Children’s Center/Johns Hopkins University, Baltimore, MD, 2017–2021
Advanced Fellowship, Pulmonary Hypertension
Columbia University, New York, New York, 2021-2022

Interests: Dr. Griffiths has unique clinical and academic expertise in pulmonary hypertension, which enables her to care for some of the most vulnerable patients in the Heart Center. Dr. Griffiths is the Medical Director of the Pulmonary Hypertension service line.
Mehreen Iqbal, M.D.
Assistant Professor

M.D.
Medical College of Georgia at Georgia Regents University, Augusta, GA, 2014

Postdoctoral Training
  Residency, Pediatrics
  Stanford Health Care/Stanford University, Stanford, CA, 2014 – 2017
  Fellowship, Pediatric Cardiology
  Stanford Hospital & Clinics, Palo Alto, CA, 2017-2020
  Advanced Fellowship, Pediatric Heart Failure/Transplant
  Stanford Hospital & Clinics, Palo Alto, CA 2020-2033

Interests: Dr. Iqbal has a unique clinical and academic expertise in Advanced Heart Failure management including cardiac transplantation and ventricular assist device. She is particularly invested in how outcomes are impacted by health disparities.

Javier Lasa, M.D.
Associate Professor

M.D.
Johns Hopkins University School of Medicine, Baltimore, MD, 2005

Postdoctoral Training
  Residency, Pediatrics
  Residency, Pediatrics Cardiology
  Fellowship, Pediatric Cardiology
  Fellowship, Pediatric Critical Care

Interests: Dr. Lasa has unique clinical and academic expertise in cardiac critical care. He is also one of the leading experts in resuscitative sciences in the critical care environment. In addition, Dr. Lasa is the Director of Informatics and Data Science for the Heart Center.

Sonali Patel, M.D., Ph.D.
Associate Professor

M.D.
University of Iowa, Iowa City, IA, 2003

Ph.D.
University of Iowa, Iowa City, IA, 2010

Postdoctoral Training
  Residency, Pediatrics
  University of Iowa, Iowa City, IA, 2003 – 2006
  Fellowship, Pediatric Cardiology
  University of Iowa, Iowa City, IA, 2006 – 2009
  Research Fellowship, Pediatric Cardiology
  University of Iowa, Iowa City, IA, 2009 – 2010

Interests Dr. Patel has unique clinical and academic expertise in the care of children hospitalized with cardiac disease. She maintains several national acute care cardiology leadership positions. In addition, Dr. Patel is the Director of Education for the Heart Center.
Sonia Voleti, M.D.
Assistant Professor

M.D.
Drexel University College of Medicine, Philadelphia, PA, 2014

Postdoctoral Training
Residency, Pediatrics
New York-Presbyterian/Weill Cornell Medical Center, New York, NY, 2014 – 2017
Fellowship, Pediatric Cardiology
Children’s National Medical Center, Washington, DC, 2017-2020

Interests: Dr. Voleti has unique clinical and academic expertise in outpatient cardiology and cardiac echocardiography.

Qin Zou, Ph.D.
Assistant Professor

Ph.D.
University of Iowa, Iowa City, IA, 2021

Postdoctoral Training
Cardiac MRI
University of Iowa, Iowa City, IA, 2021 – 2022

Interests: Dr. Zou has unique academic expertise in artificial intelligence and cardiac MRI. He utilizes his sub-specialty training to discover and innovate new approaches to advanced cardiac imaging.

Honors / Awards

Best Pediatric Specialists in Dallas, D Magazine
- Ryan Butts
- Catherine Ikemba
- Matthew Lemler
- Claudio Ramaciotti
- William Scott
- Thomas Zellers

Texas Super Doctors, Texas Monthly
- Catherine Ikemba
- Colin Kane
- Javier Lasa
- Matthew Lemler
- Claudio Ramaciotti
- William Scott
- Surendranath Veeram Reddy
- Thomas Zeller

Javier Lasa
- Clinical Informatics: Certified 1/1/23; American Board of Preventive Medicine

Nicolas Madsen
- William Gallen Lecturer Award – Herma Heart Institute, Children’s Wisconsin
- D CEO Magazine Innovation Award, Innovation in Hospital Practice
- Tob Abstract (CVDY) – American Heart Association, Scientific Sessions, 2022
Thomas Zellers
- Castle Connolly’s Top Doctors
- Best Doctors in America

**Invited Lectures/Conference Presentations**

**Ryan Butts**
- 7th International Congress of the Mexican Academy for Cerebral Palsy and Neurodevelopmental Disorders, Virtual, March 2022
  - “The role of the cardiologist in the care of pediatric neuromuscular disorder”
- American Academy of Pediatrics National Conference and Exhibition, Anaheim, CA, October 2022
  - “What Every Pediatrician Should Know About Myocarditis”

**Radomir Chabiniok**
- World Congress of Biomechanics, Taipei, Taiwan, July 2022
  - “Heart biomechanics to predict the effect of intervention in valvular heart diseases”
- Ecole Polytechnique, Biomedical Engineering Seminar, Palaiseau, France, April 2022
  - “Modeling Biomaterials in Clinical Problems of Cardiology”
- Laboratoire Imagerie Biomedicale (LIBM), Sorbonne Université, Paris, France, April 2022
  - “Medical Image data and biomedical modeling in translational cardiovascular research”

**Mansi Gaitonde**
- Society for Cardiovascular Magnetic Resonance Scientific Sessions, Virtual, February 2022
  - “Imaging after Coarctation Repair”

**Catherine Ikemba**
- Grand Rounds, University of Washington/Seattle Children’s Hospital, Seattle, WA, January 2022
  - “Difficult Discussions and Matters of the Heart”

**Jenna Keelan**
- Fetal Cardiology Lectures for Categorical Fellows, UT Southwestern/Children’s Health, Dallas, TX 2022
  - “Fetal Counseling of Congenital Heart Disease, Fetal Circulation and Fetal Presentation, Fetal Diagnosis – a Patient’s Perspective, Standard Views and Biometry, Hemodynamic Parameters in Fetal Echo”
- Fetal Cardiology Research Meeting, UT Southwestern Medical Center, Dallas, TX 2022
  - “Single Ventricle Outcomes”
- The American Society of Echocardiography 2022 Scientific Sessions, April 2022
  - “The Role of Fetal Echocardiography in Predicting Postnatal Pulmonary Venous Obstruction in Neonates with Total Anomalous Pulmonary Venous Return: A Single Center Experience.”

**Nicolas Madsen**
- Cardiac Networks United (CNU) Quality Improvement Series, Ann Arbor, MI, January 2022
  - “Introduction to Learning Networks”
- Cardiac Networks United (CNU) Quality Improvement Series, Ann Arbor, MI, February 2022
  - “Intro to QI Sustainability”
• American College of Cardiology Annual Meeting, Washington, DC, April 2022  
  o “Characterizing acute care cardiology central venous catheter use and associated complications.”
• Cardiac Networks United (CNU), New York, NY, May 2022  
  o “Collaborative Research in Pediatric Cardiology”
• Grand Rounds, UT Southwestern Department of Cardiology, Dallas, TX, May 2022  
  o “Long-term Outcomes of Congenital Heart Disease”
• Multi-disciplinary Conference, UT Southwestern/Children’s Health, Dallas, TX May 2022  
  o “Heterotaxy and Outcomes”
• William Gallen Lecture, Children’s Wisconsin Herma Heart Institute, Milwaukee, WI, July 2022  
  o “Performance Rounds and Congenital Heart Disease Outcomes”
• Grand Rounds, Children’s Wisconsin Department of Pediatrics, Milwaukee, WI, July 2022  
  o “Are Learning Networks the Future of Pediatric Research”
• Pediatric & Congenital Cardiovascular Disease Conference, Huntington Beach, CA, August 2022  
  o “Optimizing Chest Tube Management Variation and Association to Hospital Length of Stay”
• Pediatric & Congenital Cardiovascular Disease Conference, Huntington Beach, CA, September 2022  
  o “Optimizing Discharge Efficiency form the Acute Care Cardiology Unity”
  o “Out of the CICU and On Track to Go Home: The Cardiac Care Unit”
• Cardiac Neurodevelopmental Outcomes Collaborative, Montreal, Canada, October 2022  
  o Moderator, “Congenital Heart Disease Outcomes and Health Disparities”
• Cardiac Neurodevelopmental Outcomes Collaborative (CNOC), Montreal, Canada, October 2022  
  o “Pediatric Acute Care Cardiology Collaborative and CNOC Opportunities,”
• Pediatric Cardiac Intensive Care Society, Miami, FL, December 2022  
  o Moderator, “Risk and Benefits of Social Media Use in Critical Care”
• Aarhus University Doctoral Thesis Committee, Aarhus, Denmark, 2022  
  o Invited Panelist, "Morbidity and Mortality in Adults with Atrial Septal Defects"

Sonali Patel

• Pediatric Acute Care Cardiology Collaborative (PAC³) Annual Fall Meeting, Virtual, November 2022  
  o “PAC³ Scientific Review Committee Update”
• PC4/ PAC³ Annual Spring Meeting, Atlanta, Georgia, May 2022  
  o “Risk Adjustment in the PAC³ Registry”
  o “Biggest Challenge in Acute Care Cardiology – Maximizing Value: Care Plans That Optimize the Balance Between Education, Family Experience and Medical Care”

Kavita Sharma

• Grand Rounds, UT Southwestern Department of Pediatrics/Children’s Health, Dallas, TX, February 2022  
  o “The Evolution of Kawasaki Disease Treatment”

Surendranath Veeram Reddy

• Society for Cardiovascular Magnetic Resonance Scientific Sessions, Virtual, February 2022  
  o Moderator, “Interventional CMR”
  o “Enhancement of the Lymphatic System Following Intravenous Administration of Ferumoxytol”
• Pediatric Grand Rounds, UT Health San Antonio, Joe R and Teresa Lozano Long School of Medicine, San Antonio, TX, September 2022  
  o “Lymphatic Imaging and Interventions in Single Ventricle Patients”
• Pediatric and Adult Interventional Cardiac Symposium (PICS-ACIS, Chicago, IL, September 2022  
  o “Lymphatic Session Debate Thoracic Duct Embolization vs. Selective Lymphatic Duct Embolization”
  o Moderator, “Champagne Glass Sign” – The Door to Retrograde Transvenous Thoracic Duct Cannulation Technique for Lymphatic Evaluation and Interventions
• 33rd Annual Conference of the Saudi Heart Association, Riyadh, Saudi Arabia, October 2022
  ◦ “Contemporary Lymphatic Circulation Intervention in Patients with Congenital Heart Disease”

American Heart Association Scientific Sessions, Chicago, IL, November 2022

Madsen N, Patel S

Presentation, “Impact of race and ethnicity on hospital morbidity and resource utilization in acute care pediatric cardiology patients.”

American Society of Echocardiography Annual Conference, Seattle, WA, June 2022

Fares M, Gaitonde M, Kane C


The International Society for Heart and Lung Transplantation (ISHLT), Boston MA, April 2022

Baez Hernandez N, Bano M

Oral Presentation, “Pre-Operative Planning to Mitigate Risk in Complex Single Ventricular Assist Devices”

Bano M

Poster Presentation, “Worsening Mental Health in Adolescent Heart Failure and Transplant Patients During the COVID-19 Pandemic.”

Butts R

Poster Presentation, “Worsening Mental Health in Adolescent Heart Failure and Transplant Patients During the COVID-19 Pandemic.”

Western Thoracic Surgical Association Annual Meeting, Koloa, HI, June 2022

Zellers T, Divekar A, Reddy Veeram S, Arar Y

Oral Presentation, “Clinical Algorithm for Establishing Ductal-Dependent Pulmonary Blood Flow in Congenital Heart Disease: PDA Stenting vs Traditional PTFE Shunt vs Dilatable exGraft™ Shunt.”

Education and Training: The Division is dedicated to the training of fellows, residents, and medical students.

Cardiology Fellows: The Pediatric Cardiology fellowship program currently accepts four trainees per year in the categorical program. Many fellows choose to complete a fourth year to pursue a specialized clinical interest. All pediatric cardiology faculty are actively involved in the fellows’ training. In addition to the standard three-year fellowship program, we offer up
to seven additional fourth-year training programs, including cardiac critical care, interventional cardiology, advanced cardiac imaging, fetal cardiology, electrophysiology, heart transplantation, preventive cardiology, and prospective clinical and basic research. Categorical fellows rotate through cardiac outpatient, acute care, critical care, preventive cardiology, adult congenital heart disease, cardiac catheterization, electrophysiology, echocardiography, MRI, and cardiac transplantation. They also spend up to one year participating in clinical, translational, or basic science research. The program provides fellows with the training, tools, and philosophy necessary to advance the field of pediatric cardiology within their areas of choice.

1st Year
- Sara Alhousseiny, M.D.
- Mohammed Mehdi, M.B.B.S.
- Sarah Zoretic, D.O.

2nd Year
- Pezad Doctor, M.B.B.S.
- Heidi Kim, M.D.

3rd Year
- Manal Alqahtani, M.B.B.S.
- Vidhi Makanji, M.D., M.P.H.
- Dristhi Tolani, M.B.B.S.

4th Year
- Stephen Spurgin, M.D.
- Austin Mercadante, M.D.
- Laura Radel, M.D.
- Sanja Dzelebdzic, M.D.
- Maher Abadeer, M.D.
- Maria Ossa Galvis, M.D.

Residents: The Division of Pediatric Cardiology plays a major role in the training of pediatric residents. Training occurs at many levels.

- Inpatient Training:
  - Three interns and one senior resident typically participate on the acute care cardiology inpatient service, caring for patients on a 22-bed cardiology floor with the supervision of the attending cardiologist.
  - An elective is available for residents to rotate in the Cardiac Intensive Care Unit and the transplant/heart failure service.
- Outpatient Training:
  - One or two second- or third-year residents are able to do an elective in the Cardiology Outpatient Clinic under the supervision of the attending cardiologists.
Medical Students

- Third-Year Pediatric Rotations:
  - Cardiology Inpatient Rotations
  - Pediatric Cardiology Clinic
- Fourth-Year Electives in Pediatric Cardiology:
  - Cardiac Outpatient Clinic
  - Cardiac Intensive Care Unit
  - Cardiac Imaging Rotation (MRI, CT, echocardiography)

Research Activities

Members of the Division of Pediatric Cardiology are engaged in multiple research projects to advance the care of children with heart disease.

Basic Science

An exciting new area of investigation is the study of pulmonary arteriovenous malformations. This line of research could result in personalized care to support those patients impacted by these malformations, as well as develop tools to prevent their formation in others. Using mouse models, an investigation is underway to evaluate proteins responsible for injury.

Another new area of investigation is to optimize cardiovascular support therapy for pediatric patients with end stage heart failure. Currently, the effect of ventricular assist devices on muscle cellular function is unknown. Work is underway to understand muscle regeneration and remodeling in the setting of ventricular assist devices.

One additional pre-clinical research area is the optimization of technologies for imaging for cardiovascular and lymphatic intervention. In close cooperation with the Department of Radiology, faculty have access to the Advanced Imaging Research Center at UT Southwestern. This gives staff members access to novel cardiovascular research technology to drive discovery.

Clinical Sciences

The Pediatric Cardiology Division participates in many multicenter trials. These trials include those in partnership with the National Institute of Health and the Pediatric Heart Network examining the use of patent ductus arteriosus (PDA) stenting technology in single ventricle anatomy, the use of growth promoting medical management in interstage patients, and the investigation of the long-term outcomes of multisystem inflammatory syndrome in children MIS-C due to COVID-19. In addition, other ongoing trials include those that are assessing various devices, including the use of novel pulmonary valves and devices for closure of the patent ductus arteriosus in small infants.

The Division is both leading and contributing to many multicenter initiatives, including the Pediatric Acute Care Cardiology Collaborative (PAC3), the Pediatric Cardiac Critical Care Consortium (PC4), the Cardiac Neurodevelopmental Outcome Collaborative (CNOC), the National Pediatric Cardiology Quality Improvement Collaborative, the Fontan Outcomes Network, and the Congenital Heart Research Collaborative. In particular, the Division is the primary sponsor of PAC3, a collaborative of over 40 international children’s hospitals. Our focus on these collaboratives allows for the rapid translation of best practices to the bedside to optimize outcomes on behalf of our patients.

Multicenter efforts are also underway by our surgical and anesthesia teams to evaluate the use of ventricular assist devices in the pediatric population and the use of cold-stored platelets for improved performance in the operating room.
Collaborative studies within the Department of Pediatrics include protocols to evaluate stroke, feeding optimization and complications of sickle cell disease, and childhood cancer.

Ongoing areas of research interest include epidemiologic studies of congenital heart disease, particularly within the state of Texas; non-invasive imaging markers for cardiac transplant rejection; the development of new techniques for pediatric cardiovascular MRI; 3D printing and modeling of congenital heart disease; and using innovative artificial intelligence, machine learning, and computational modeling techniques to improve monitoring of children with heart disease.

**Clinical Activities**

The Pediatric Cardiology Division offers a comprehensive program of specialized care at the Heart Center at Children’s Health™ for children and adults with congenital and acquired heart diseases. The Heart Center’s team of professionals includes cardiologists, cardiac surgeons, cardiac intensivists, neonatologists, cardiac anesthesiologists, and psychologists. In addition to providing the highest quality clinical and surgical care, our faculty members are committed to improving the health of children everywhere by inspiring innovation and research.

**Inpatient Services**

The inpatient service is divided between the Cardiac Intensive Care Unit, Acute Care Cardiology, and Cardiac Consultation services. The Acute Care Cardiology and Cardiac Intensive Care Units are highly specialized areas that provide advanced care for post-surgical, post-transplant, and post-cardiac catheterization patients. In addition, the units provide progressive care for medical patients with cardiovascular issues. We are expanding our inpatient programs at the Children’s Health Plano campus to include cardiac catheterizations, telemetry, and the ability to care for cardiac patients with medical needs. The typical combined daily census for both inpatient units is 45+ patients, while the consultation service follows approximately 20+ patients across several centers.

**Outpatient Services**

More than 12,000 cardiology outpatients are seen each year across the Heart Center clinics. Subspecialty cardiology clinics, including those for heart transplantation, heart failure, muscular dystrophy, arrhythmia, pacemaker, preventive cardiology, Safe-at-Home (for post-op single ventricle and infants), aortopathy, cardiac genetics, Fontan, and adult congenital heart disease, provide unique venues for subspecialty referrals from throughout the region, state, and nationally. Fetal echocardiography clinics continue to expand their services and clinic locations to provide best-in-class services.

**Preventive Cardiology**

The preventive cardiology clinic serves children with hyperlipidemia and hypercholesterolemia and children with metabolic syndrome (i.e., obesity, insulin resistance, increased triglycerides, decreased high-density lipoprotein, and hypertension) and sees an average of 1,500 patients per year. A team of physicians, dietitians, and nurses provides comprehensive physical assessments and dietary evaluations for patients and their families, with the development of individualized programs including diet, lifestyle modification, treatments (including natural as well as prescription medications).

**Pediatric Echocardiography Laboratory**

The pediatric echocardiography laboratory at Children’s Health is Intersocietal Accreditation Commission (IAC) accredited for pediatric transthoracic, transesophageal, and fetal echocardiography. Dedicated sub-specialty-trained physicians staff the laboratory and provide coverage 24/7. The team consists of highly trained pediatric sonographers who perform more than
12,500 studies a year and provides direct services for three primary hospitals and several outpatient sites. In addition, we provide support services for tele-echocardiography at many additional sites.

The laboratory offers the latest technology, including fetal echocardiography, stress imaging, three-dimensional and strain imaging, and provides imaging support for the cardiac operating rooms, extracorporeal membrane oxygenation cannulation, and catheterization laboratory.

**Fetal Heart Program**

Our fetal echocardiography program is IAC-certified and performed more than 400 fetal echocardiograms and consultations in 2022. In concert with Pediatric Heart Specialists, the Heart Center’s outreach, and community focused cardiologists, the Division continues to expand accessibility. The fetal heart program expertly coordinates prenatal cardiac evaluation and counseling, as well as pre- and post-natal cardiac care to ensure critical congenital heart conditions receive the care they need at precisely the right time. Comprehensive multidisciplinary consultations may include an imaging cardiologist, cardiac nurse, cardiothoracic surgeon, social work, intensive care cardiologist, electrophysiology nurse, neurodevelopmental psychologist, and introduction to our Safe-at-Home program for interstage single ventricle monitoring program.

Parental education and family support are our priorities. We support the Fetal Heart Society, whose mission is to advance the field of fetal cardiovascular care and science through collaborative research, education, and mentorship, as well as participating in the National Pediatric Cardiology Quality Improvement Collaborative, whose mission is to decrease mortality and improve quality of life for all infants with single ventricle congenital heart disease. By supporting and engaging in multi-institutional research and quality improvement projects, we continually strive to improve the quality of our counseling and outcomes.

**Patient Statistics**

The following statistics include patient visits for Children’s Medical Center Dallas and Children’s Medical Center Plano, as well as our many outreach clinics, as well as our Telemedicine program.

**Cardiology Patient Procedures by Specialization and by Type by Year.**

**Surgical Procedures**

<table>
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<tr>
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<tbody>
<tr>
<td>Cardiac Operations (Total)</td>
<td>519</td>
<td>730</td>
<td>845</td>
<td>618</td>
<td>519</td>
<td>542</td>
</tr>
<tr>
<td>ACHD Operations</td>
<td>30</td>
<td>46</td>
<td>48</td>
<td>31</td>
<td>26</td>
<td>39</td>
</tr>
<tr>
<td>Heart Transplant</td>
<td>18</td>
<td>26</td>
<td>20</td>
<td>24</td>
<td>19</td>
<td>17</td>
</tr>
</tbody>
</table>

**Diagnostic Testing and Card Imaging**

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<tr>
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</thead>
<tbody>
<tr>
<td>Electrocardiograms</td>
<td>16,684</td>
<td>12,584</td>
<td>18,511</td>
<td>19,957</td>
<td>22,421</td>
<td>22,329</td>
</tr>
<tr>
<td>Telemedicine EKGS</td>
<td>665</td>
<td>2,908</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Echocardiograms (CMC, CUH, Parkland)</td>
<td>11,741</td>
<td>11,997</td>
<td>13,179</td>
<td>11,159</td>
<td>12,305</td>
<td>12,975</td>
</tr>
<tr>
<td>Telemedicine ECHOS</td>
<td>880</td>
<td>250</td>
<td>166</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fetal ECHO (total)</td>
<td>514</td>
<td>466</td>
<td>472</td>
<td>308</td>
<td>393</td>
<td>504</td>
</tr>
<tr>
<td>Fetal Echo – Dallas</td>
<td>215</td>
<td>250</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fetal Echo – Plano</td>
<td>178</td>
<td>232</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holters</td>
<td>867</td>
<td>866</td>
<td>935</td>
<td>825</td>
<td>1,011</td>
<td>1,236</td>
</tr>
<tr>
<td>Telemedicine Holters</td>
<td>11</td>
<td>44</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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*UT Southwestern Medical Center*
Cardiac MRIs | 497 | 757 | 897 | 841 | 1,056 | 1,256
Cardiac CT | 398 | 524
Stress Tests | 168 | 201 | 173 | 160 | 236 | 292

Cardiac Catheterization Procedures

<table>
<thead>
<tr>
<th>Procedure Type</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interventional Cardiac Caths</td>
<td>499</td>
<td>471</td>
<td>430</td>
<td>413</td>
<td>436</td>
<td>453</td>
</tr>
<tr>
<td>Biopsy Cardiac Caths</td>
<td>133</td>
<td>94</td>
<td>68</td>
<td>97</td>
<td>94</td>
<td>81</td>
</tr>
<tr>
<td>Diagnostic Cases</td>
<td>124</td>
<td>138</td>
<td>136</td>
<td>151</td>
<td>117</td>
<td>120</td>
</tr>
<tr>
<td>Cath/MRI Hybrid Cases</td>
<td>5</td>
<td>26</td>
<td>25</td>
<td>15</td>
<td>30</td>
<td>pending</td>
</tr>
<tr>
<td>EP Studies &amp; Ablation Procedures</td>
<td>80</td>
<td>75</td>
<td>89</td>
<td>65</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>Pacemaker, Event Recorder &amp; Defibrillators</td>
<td>26</td>
<td>25</td>
<td>29</td>
<td>24</td>
<td>23</td>
<td>19</td>
</tr>
</tbody>
</table>

Outpatient Clinic Patient Encounters

<table>
<thead>
<tr>
<th>Location</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dallas</td>
<td>9,108</td>
<td>9,260</td>
<td>9,376</td>
<td>8,268</td>
<td>9,154</td>
<td>10,465</td>
</tr>
<tr>
<td>Plano</td>
<td>2,462</td>
<td>2,806</td>
<td>3,090</td>
<td>2,379</td>
<td>2,830</td>
<td>2,671</td>
</tr>
<tr>
<td>Presbyterian-Dallas</td>
<td>106</td>
<td>173</td>
<td>186</td>
<td>129</td>
<td>152</td>
<td>pending</td>
</tr>
</tbody>
</table>

Current Grant Support

**Maria Bano**

*Grantor:* University of Michigan/Enduring Hearts Inc.

*Title of Project:* The impact of Fontan circulatory failure, frailty, and resilience on heart failure and transplant outcomes

*Role:* Principal Investigator

*Dates:* 01/2021 – 12/2022

**Nicolas Madsen**

*Grantor:* NIH Grant No. U24HL135691 (7/2022-6/2024)

*Title of Project:* Impact of Race and Ethnicity on Hospital Morbidity, Mortality and Resource Utilization in Acute Care Pediatric Cardiology Patients

*Role:* Senior Investigator

*Dates:* 07/2022 – 06/2024

**Ryan Butts**

*Grantor:* Boston Children’s Hospital

*Title of Project:* Multicenter Randomized Trial of Everolimus in Pediatric Heart Transplantation

*Role:* Principal Investigator

*Dates:* 09/2017 – 09/2023

*Grantor:* Duke University/NIH-National Center For Advncng Trnsltnl

*Title of Project:* Butts_STeroids to REduce Systemic inflammation after neonatal heart Surgery (STRESS trial) Study

*Role:* Principal Investigator

*Dates:* 07/2017 – 06/2022

*Grantor:* Hospital For Sick Children

*Title of Project:* Butts - SickKids - Development of a Risk Calculator to Predict Sudden Cardiac Death in Children with Hypertrophic Cardiomyopathy

*Role:* Principal Investigator

*Dates:* 04/2017 – 03/2025
Grantor: Stanford University/Enduring Hearts Inc.
Title of Project: Evaluation of contribution of HLA type and HLA antibodies in Survival after Pediatric Heart Transplantation
Role: Principal Investigator
Dates: 01/2021 – 12/2022

Grantor: American Heart Assoc Inc.
Title of Project: Effect of Carvedilol on Exercise Performance in Fontan Patients
Role: Principal Investigator
Dates: 07/2016 – 03/2022

Radomir Chabiniok

Grantor: The Czech Science Foundation
Title of Project: Development of reliable computational tools adequate for the study of fluid-structure interactions, with special relevance to cardiovascular problems
Role: Collaborator
Dates: 2023-2025

Grantor: Czech Ministry of Health
Title of Project: Analysis of flow character and prediction of evolution in endovascular treated arteries by magnetic resonance imaging coupled with mathematical modeling
Role: Collaborator/mentor
Dates: 2018-2023

Jenna Keelan

Grantor: New England Research Institutes/NIH-National Heart, Lung and Blood Institute
Title of Project: Oxandrelone to Promote Growth in Single Ventricle Interstage Patients
Role: Site Principle Investigator
Dates: 10/2022 – 07/2025

Tarique Hussain

Grantor: Communities Foundation of Texas
Title of Project: Computational Modeling for Tetralogy of Fallot
Role: Principal Investigator (Co-Investigators: G. Greil, A. Tandon, S. Reddy, R. Jaquiss)
Dates: 09/2020 – 09/2023

Grantor: National Science Foundation
Title of Project: Virtual Reality System to Plan Cardiovascular Interventions
Role: Principal Investigator (Co-Investigators: A. Tandon, B. Lang)
Dates: 09/2018 – 02/2022

Grantor: W. B. & Ellen Gordon Stuart Trust
Title of Project: Improving Treatment and Outcomes for Childhood Survivors of Tetralogy of Fallot: Computational Modeling in Preventive Cardiology
Role: Principal Investigator (Co-Investigators: G. Greil, A. Tandon, S. Reddy, R. Jaquiss)
Dates: 09/2020 – 09/2023

Grantor: Emory University School Of Medicine\ NIH-National Heart, Lung And Blood Inst
Title of Project: Long-term Outcomes after interventions for CHD Pulse Yr3 Amend2_8.1.21-7.31.22
Role: Principal Investigator
Dates: 08/2021 – 07/2022
Lynn Mahony

**Grantor:** New England Research Institutes/ NIH-National Institutes of Health  
**Title of Project:** Pediatric Heart Disease Research Network  
**Role:** Principle Investigator; Steering Committee Chair  
**Dates:** 01/2022 – 12/2022

Kavita Sharma

**Grantor:** New England Research Institutes/NIH-National Heart, Lung and Blood Institute  
**Title of Project:** The NIH Longitudinal Study for Multisystem Inflammatory Syndrome (MUSIC)  
**Role:** Site Principle Investigator  
**Dates:** 10/2020 – 07/2025

Surendranath Veeram Reddy

**Grantor:** NIH-National Institute of DDK Diseases  
**Title of Project:** Consequences of Elevated Fibroblast Growth Factor 23 in the Presence and Absence of Kidney Disease  
**Role:** Co-Investigator  
**Dates:** 07/2018 – 06/2023

**Grantor:** Pediatric Scientist Development Program (K12)  
**Title of Project:** Genesis of Pulmonary Arteriovenous Malformations After Diversion of Hepatic Venous Flow: “Identifying the Role of Hepatic BMPs”  
**Role:** Faculty Sponsor/Mentor (PI-Steve Spurgin, MD)  
**Dates:** 07/2021 – 06/2023

Peer-Reviewed Publications


Invited Reviews/
