Cardiovascular Imaging Research Core

2024 Newsletter

The Cardiovascular Imaging Research Core (CIRC) was launched in January 2011 at Children's Healthcare of Atlanta, Egleston Campus. It serves as a solely research-focused center, independent from the standard clinical operations and is supported by the Cardiac Service line. The CIRC lab provides high quality, non-invasive cardiac imaging support for investigators involved in clinical research involving infants, children, and adolescents in a dedicated research environment. This includes space, equipment, and personnel that are experienced in using imaging modalities and techniques not typically employed in the clinical arena. CIRC is one of the few pediatric labs in the country that conducts vascular imaging in children. In 2015, CIRC extended its services to the Children's Scottish Rite Campus to make access convenient for investigators and patients at that location.

This Year in CIRC:

- Supported 48 active studies

- Served as a multicenter echo core lab

- Served as a Multicenter MRI Core LAB

-Provided research support and opportunities for fellows, faculty, sonographers & coordinators

Our New Location

Arthur M. Blank Hospital

2220 North Druid Hills Road NE

4th Floor South Tower

Rm # CL.04420.D

Atlanta, GA 30329

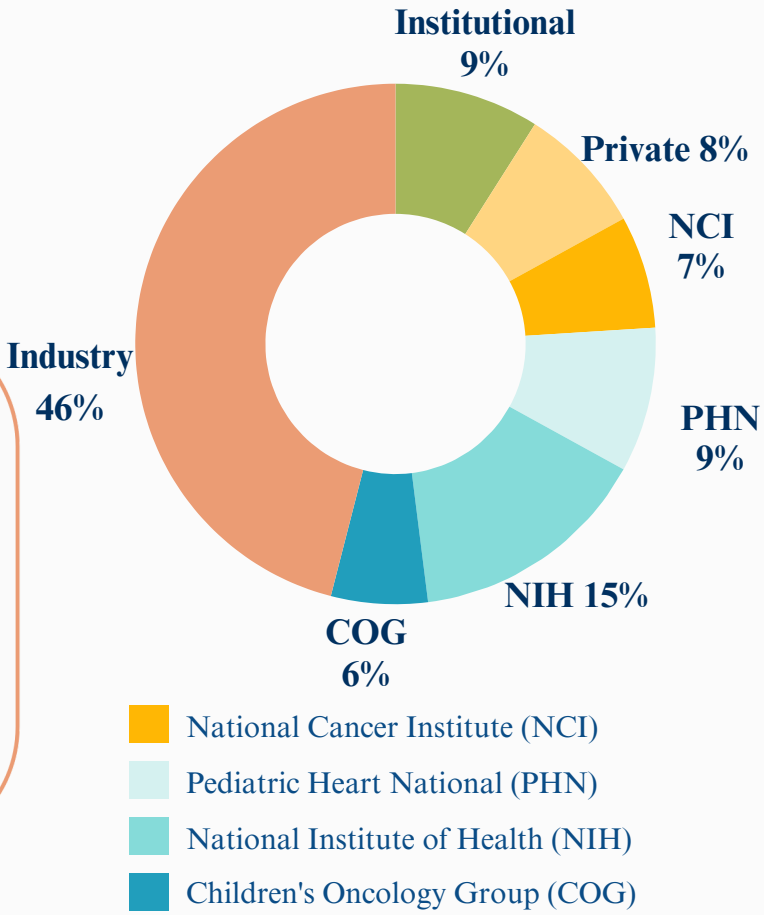
404-785-2472

CIRC in Collaboration

EXTENDING BEYOND CARDIOLOGY

Partnerships within Children's

-Nephrology
- CT Surgery
- Hem-Onc
- Neurology
- Marcus Center
- Genetics
- Surgery
- Cardiology
- Infectious Disease



National Collaboratives and Registries

- Pediatric Heart Network
  - CAMP
  - COMPASS
- Fetal Heart Society - Cardiac Genetics Registry
- Society of Pediatric Echo (SOPE)
- FORCE (Fontan collaborative)
- Children's Oncology Group

CIRC Welcomes:

Dongngan T. Truong, MD, MSCI
Associate Professor of Pediatrics

Dr. Truong recently joined us from the University of Utah, where she had been on faculty for 10 years. She completed her Pediatric Cardiology Fellowship and obtained her Masters of Science in Clinical Investigation at the University of Utah, and completed a 4th year Fellowship in 2D and 3D Echocardiography at the University of Alberta in Edmonton, Canada. Her clinical and research interests include Kawasaki disease, pediatric COVID-related heart disease, and 2D and 3D echocardiography. She developed the 3D echocardiography program while at Utah and led the Kawasaki disease program there. She co-leads 2 multicenter Pediatric Heart Network studies: Long-terM Outcomes after the MUltisystem Inflammatory Syndrome In Children (MUSIC) study and the COVID Vaccine-Associated Myocarditis/Pericarditis (CAMP) study. She works collaboratively with a multidisciplinary group of pediatricians as one of the hub PIs representing the MUSIC study group within Researching COVID to Enhance Recovery (RECOVER) study, NIH's multicenter initiative to study post-acute sequelae of COVID-19 (i.e, "long-COVID") in both children and adults. She also has published on implications of using different coronary artery echocardiographic Z-score models in Kawasaki disease and outcomes in congenital heart disease using echocardiography.

She joins the Heart Center as an echocardiographer and the Director of Innovative Imaging. She is excited to further develop and expand the 3D echocardiography program, help bring newer imaging tools into clinical use, and to continue her ongoing research projects.

CIRC Welcomes:

Barbara Nutall

Senior Research Coordinator

Barbara, an extensively experienced research specialist with over two decades of expertise, holds a Master of Arts in Organizational Leadership and various clinical research certifications. Her proficiency shines in roles such as Research Coordinator and Clinical Trial Manager, highlighting her exceptional skills, creativity, and mentorship abilities. Barbara is devoted to promoting education, community engagement, and advancing research endeavors.

Her dedication to excellence is evident in her meticulous planning and management of intricate clinical trials, ensuring that every detail is handled with precision. Her colleagues often speak highly of her ability to navigate complex regulatory landscapes with ease, ensuring compliance and ethical standards are consistently upheld. Barbara's passion for continuous learning drives her to stay abreast of the latest advancements in the field, integrating innovative strategies into her projects to enhance outcomes and streamline processes.

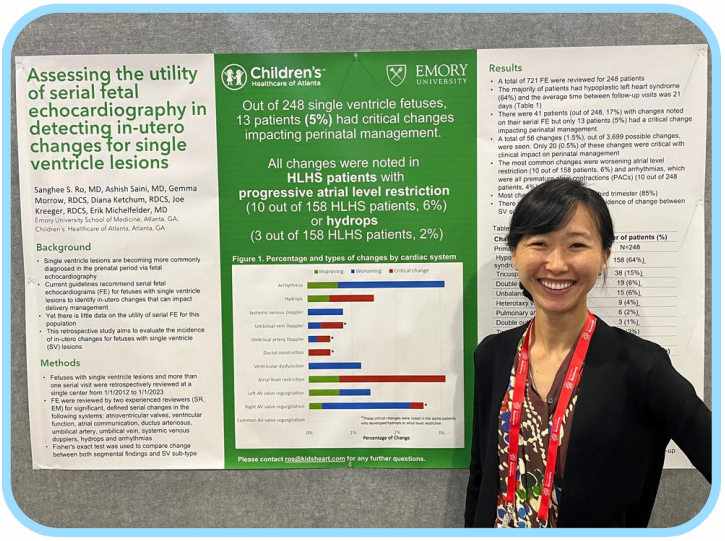
Sandra Pernetz

Echocardiography Clinical Educator

Sandra Pernetz, a cardiac sonographer, brings over 36 years of sonography and 30 years of research experience. In August 2023, she became an Echocardiography Clinical Educator at Children's Healthcare of Atlanta Heart Center. Before joining Children's, Sandra was the technical director at the Emory University echocardiography lab and the adult congenital heart program.

Sandra is passionate about advancing the field of echocardiography and is committed to nurturing the next generation of sonographers. Her role as an educator allows her to blend her extensive clinical experience with her love for teaching, creating a dynamic learning environment. In addition to her clinical and educational responsibilities, Sandra is actively involved in ongoing research projects at Children's Healthcare of Atlanta. She collaborates to explore new diagnostic tools and methods to improve patient outcomes in pediatric cardiology.

CIRC SPOTLIGHT



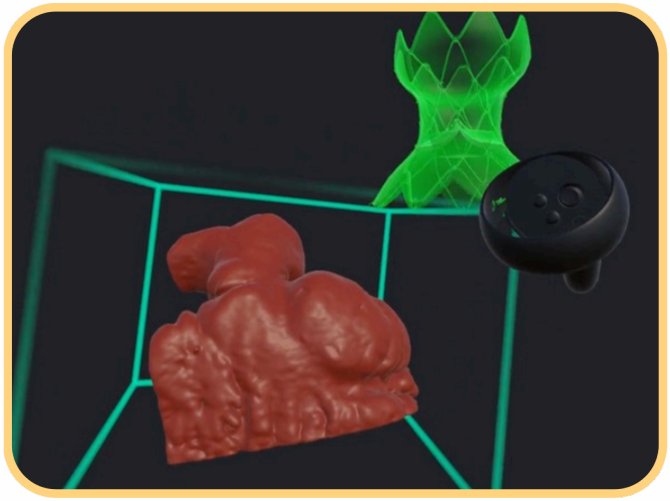
Time is of the Essence

Sanghee S. Ro, M.D.

My primary research focus over the past year has focused on quality improvement, non-invasive imaging and fetal cardiology. After completing the Quality Academy course offered by the Children's Healthcare of Atlanta, I have made efforts at shortening the time between referral and first fetal cardiac visit for families with suspected congenital heart disease. This has allowed us to bring families effectively and quickly in for a fetal cardiac visit with our growing fetal volume. Within non-invasive imaging, we have been able to publish a decade's worth of quality assurance data on discrepancy rates between pre-operative and transesophageal imaging compared to surgical findings in congenital heart disease. Lastly, within fetal cardiology, I have had the opportunity to present my work on cost-effectiveness of serial fetal echocardiography in single ventricle lesions at the American Heart Association Scientific Sessions.

I have also had the pleasure of being able to support fellows and residents in their research endeavors to allow them to present on national platforms. These have included fetal studies evaluating the clinical significance of tricuspid regurgitation and the outcomes of fetuses diagnosed with d-transposition of the great arteries. We have also been able to collaborate with other centers through the Fetal Heart Society on several multi-center projects. This has included contributing to national databases looking at fetal cardiomyopathy and fetal coarctation of the aorta. Most recently, I have been able to collaborate with the Emory Biomedical Informatics Department to test a novel portable fetal ECG monitor which detects fetal arrhythmias. The utilization of machine learning has been an interest of mine and has allowed us to better evaluate fetal cardiac rhythms using this new technology. I hope to continue collaborating with Emory to explore ways we can apply artificial intelligence to our expanding field.

CIRC SPOTLIGHT



Virtual reality model of a right ventricular outflow tract (red) generated using a patient-specific dataset. A virtual model of a Harmony valve (green) created by Sassan Hashemi, MD was imported into the virtual reality space allowing exploration of the interface between the valve and the anatomy.

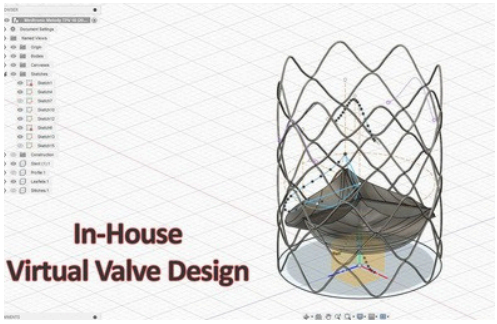
The VR Revolution

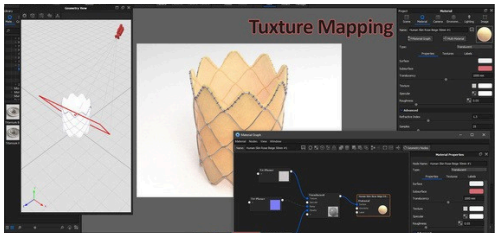
Hunter C. Wilson, M.D.

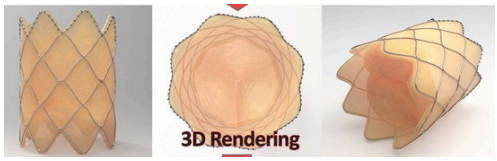
Over the past year, I have worked with several collaborators on clinical projects centered on echocardiography and cross-sectional imaging. I helped develop and distribute a survey on transesophageal echocardiography (TEE) practices in North America. I have also partnered with Marissa Adamson, MD to evaluate how post-operative TEE assessment of atrioventricular valve regurgitation compares to post-operative transthoracic echocardiography findings. Extramural efforts include completion of a partnership with colleagues at the University of Michigan seeking to evaluate echocardiographic and clinical findings of patients with hypoplastic left heart syndrome; the findings were recently published in Journal of the American Society of Echocardiography.

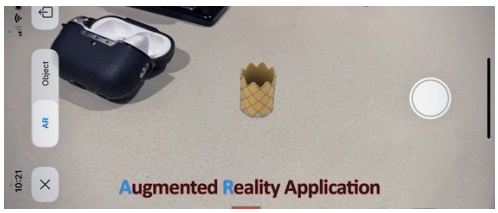
I also maintain an interest in cross-sectional imaging. I have worked with several team members at CHOA to evaluate how our cardiac CT and MRI data compare for purposes of transcatheter pulmonary valve replacement. I have also helped with presentation of a scientific abstract from our center at the 2024 Society for Cardiovascular Magnetic Resonance Scientific Sessions.

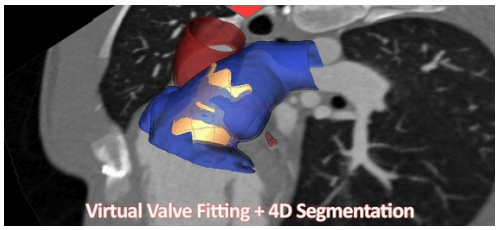
Ongoing and future efforts include advancing our center's means of using 3-dimensional data to support clinical decision-making and educational efforts. We have used virtual reality software funded by the 1998 Society to support clinical efforts. For example, our team was able to complete 4-dimensional segmentation of a right ventricular outflow tract which was used along with a virtual valve model built by CIRC's own Sassan Hashemi, MD to inform procedural planning for transcatheter pulmonary valve replacement using a new generation valve. This case was completed live by Allen Ligon, MD and projected to over 100 members of the cardiology community. The software has also been used to capture and distribute videos of 3-dimensional patient-specific heart models built by Sassan who has broad expertise in segmentation and model generation. I hope to continue to work in this space going forward and expand novel visualization capabilities to other clinical and educational efforts.











Steps of the Virtual Valve Model Process
Images Courtesy of Sassan Hashemi, MD

Recent Publications

Adamson, M., Bermudez, T., Rosenblum, J., Wilson, H. C. “Comparison of Post-operative Transesophageal and Transthoracic Echocardiogramm Findings Following Atrioventricular Septal Defect Repair.” 2024. Cardiol Young. In Press.

Milligan, I., Hashemi, S., Sallee III, D., Sachdeva, R., Michelfelder, E., Slesnick, T., Wilson, H. C. “Evaluation of the Extent of Left Ventricular Trabeculations and Association with Imaging Findings and Clinical Outcomes in Pediatric Patients with Possible Left Ventricular Noncompaction Cardiomyopathy.” 2024. Prog Pediatr Cardiol. In Press.

Wilson, H. C., Sook, V., Romano, J. C., Zampi, J. D., Lu, J. C., Yu, S. Lowery, R. E., Kleeman, K., Balasubramanian, S. “Hypoplastic Left Heart Syndrome with Mitral Stenosis and Aortic Atresia – Echocardiographic Findings and Early Outcomes”. 2024. J Am Soc Echocardiogr. In Press.

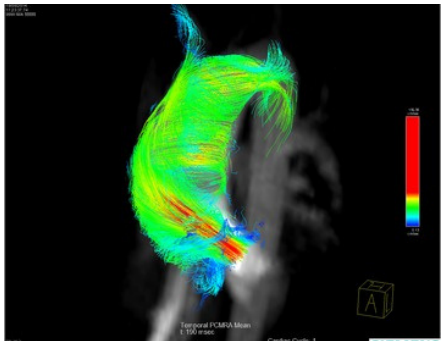
Sachdeva R, Armstrong AK, Arnaout R, Grosse-Wortmann L, Han BK, Mertens L, Moore RA, Olivieri LJ, Parthiban A, Powell AJ. Novel Techniques in Imaging Congenital Heart Disease: JACC Scientific Statement. J Am Coll Cardiol. 2024 Jan.

Ro SS, Housey J, Bermudez T, Ferguson E, Sachdeva R, Border W. Comprehensive Assessment of Pediatric Echocardiographic Discrepancy Rates Using Real-Time Adjudicated Quality Assurance: A Ten-Year Experience. J Am Soc Echocardiogr. 2024 Apr.

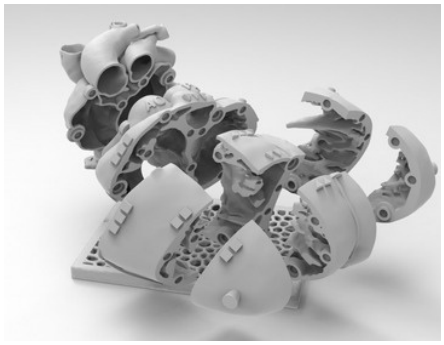
Wilson HC, Ferguson ME, Border WL, Sachdeva R. Contemporary transesophageal echocardiography practice patterns among paediatric cardiology centres in the United States and Canada. Cardiol Young. 2024 Apr.

Balasubramanian S, Yu S, Behera SK, Bhat AH, Camarda JA, Choueiter NF, Jone PN, Lopez L, Natarajan SS, Parra DA, Parthiban A, Sachdeva R, Srivastava S, Tierney ESS. Consensus-Based Development of a Pediatric Echocardiography Complexity Score: Design, Rationale, and Results of a Quality Improvement Collaborative. J Am Heart Assoc. 2024 Mar.

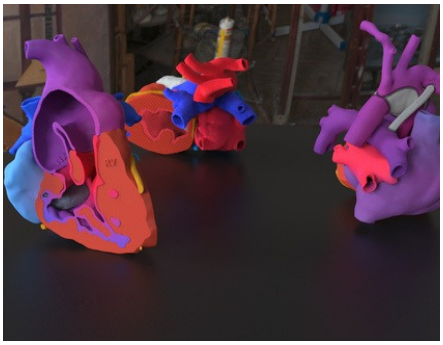
Mosgrove MJ, Sachdeva R, Stratton KL, Armenian SH, Bhat A, Leger KJ, Yang C, Leisenring WM, Meacham LR, Sadak KT, Narasimhan SL, Nathan PC, Chow EJ, Border WL. Utility of apical four-chamber longitudinal strain in the assessment of childhood cancer survivors: A multicenter study. Echocardiography. 2024 Feb.



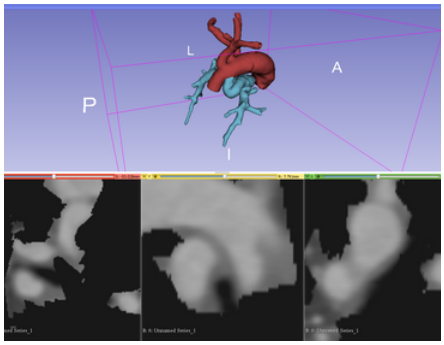
4D Flow Visualization



3D Print Complex DORV

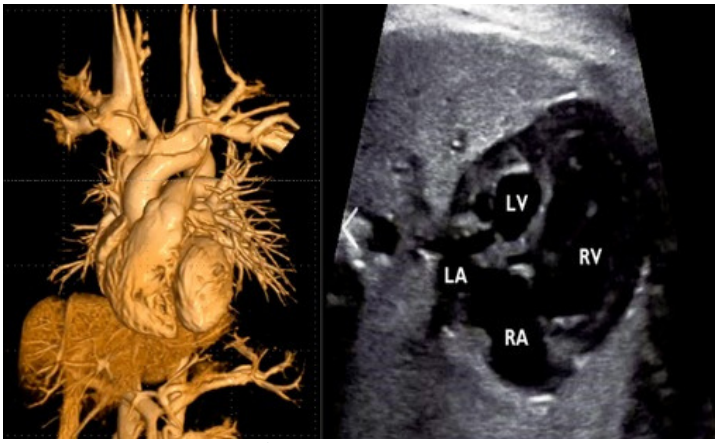


Digital 3D Modeling



PDA Segmentation

Images Courtesy of Sassan Hashemi, MD



MRI - 3D Heart Reconstruction

Fetal Echo

Recent Publications

Leger KJ, Robison N, Narayan HK, Smith AM, Tsega T, Chung J, Daniels A, Chen Z, Englefield V, Demissei BG, Lefebvre B, Morrow G, Dizon I, Gerbing RB, Pabari R, Getz KD, Aplenc R, Pollard JA, Chow EJ, Tang WHW, Border WL, Sachdeva R, Alonzo TA, Kolb EA, Cooper TM, Ky B. Rationale and design of the Children's Oncology Group study AAML1831 integrated cardiac substudies in pediatric acute myeloid leukemia therapy. Front Cardiovasc Med. 2023 Dec 1

Hoffmann C, Morris A, Timmins L, Cui X, Sachdeva R, Walsh S, Wulkan M, Brewster L. Sleeve gastrectomy may improve arterial health in obese adolescents. Nutr Metab Cardiovasc Dis. 2023 Oct.

Patel T, Wallace M, Smith C, Sachdeva R. Contemporary Utilization of Cardiac Imaging in Patients With Single Ventricle Congenital Heart Disease and Association With Change in Clinical Management. Am J Cardiol. 2023 Aug.

Milligan I, Border W, Sachdeva R, Michelfelder E. Contemporary Outcomes in Fetuses Diagnosed with Vascular Rings. Pediatr Cardiol. 2023 Jun.

Sachdeva R. Complexities of Normative Database for Neonatal Echocardiography: The Quest for Perfection Continues. J Am Coll Cardiol. 2023 Jun.

Pickard SS, Armstrong AK, Balasubramanian S, Buddhe S, Crum K, Kong G, Lang SM, Lee MV, Lopez L, Natarajan SS, Norris MD, Parra DA, Parthiban A, Powell AJ, Priromprintr B, Rogers LS, Sachdeva S, Shah SS, Smith CA, Stern KWD, Xiang Y, Young LT, Sachdeva R. Appropriateness of cardiovascular computed tomography and magnetic resonance imaging in patients with conotruncal defects. J Cardiovasc Comput Tomogr. 2023 May-Jun.

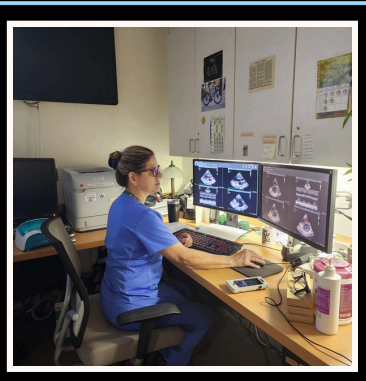
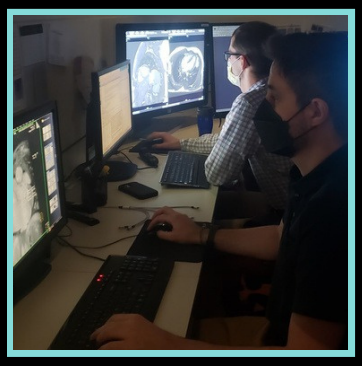
ABSTRACT PRESENTATIONS 2024

CONFERENCE	TITLE
American Society of Echocardiography 2024	O'Meara D., Michelfelder E.C., Jergel A, Ro S.S. "The Clinical Significance of Non-Ebstenoid Fetal Tricuspid Valve Regurgitation". The American Society of Echocardiography 35th Annual Scientific Sessions. Portland, OR (June 2024). Oral presentation.
American Society of Echocardiography 2024	Hunter W., Maher K., Sachdeva R., Mills M. "Cardiac Point of Care Ultrasound in the Pediatric Cardiac Intensive Care Unit: Assessment of Imaging Quality and Interpretation". The American Society of Echocardiography 35th Annual Scientific Sessions. Portland, OR (June 2024). Poster presentation.
American Society of Echocardiography 2024	Peter A., Jergel A., Ferguson M.E. "Stress Echocardiography Differentiates Nonpathologic Mild Left Ventricular Hypertrophy from Hypertrophic Cardiomyopathy in the Young". The American Society of Echocardiography 35th Annual Scientific Sessions. Portland, OR (June 2024). Poster presentation.
American Society of Echocardiography 2024	Shaw A.K., Schlosser B., Norman, J., Samai C., Hashemi S., Shashidharan S., Wilson H.C. "Total Anomalous Systemic Venous Drainage to the Left Atrium in the Setting of Atrial Situs Solitus and Leftward Juxtaposition of the Right Atrial Appendage". The American Society of Echocardiography 35th Annual Scientific Sessions. Portland, OR (June 2024). Poster presentation.
American Society of Echocardiography 2024	Nguyen C.P., Sachdeva R., Hashemi S., Ligon R.A., Rosenblum J.M., Wilson H.C. "Hypoxemia Following Biventricular Repair of Pulmonary Atresia with Ventricular Septal Defect: Heart, Lungs, or Something in Between?". The American Society of Echocardiography 35th Annual Scientific Sessions. Portland, OR (June 2024). Poster presentation.
American Society of Echocardiography 2024	Adamson M., Pernetz M., Sachdeva R., Border W. "Cherry-on-top Myocardial Strain Pattern in a Pediatric Patient with Systemic Lupus". The American Society of Echocardiography 35th Annual Scientific Sessions. Portland, OR (June 2024). Poster presentation.
American Society of Echocardiography 2024	Hill G.D., Hahn E., Block J.R., Chaves A.H., Cumbermack K., Lipinski J., Natarajan S., Parra D.A., Robinson J.D., Soriano B.D., Walsh M.J., Seo J., Frommelt P. "Identifying Factors that Influence Pediatric Echo Lab Image Quality: Development and Validation of a New Assessment Tool". The American Society of Echocardiography 35th Annual Scientific Sessions. Portland, OR (June 2024). Poster presentation.

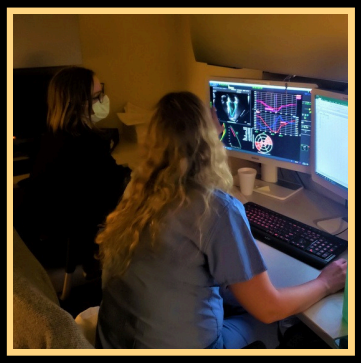
ABSTRACT PRESENTATIONS 2024

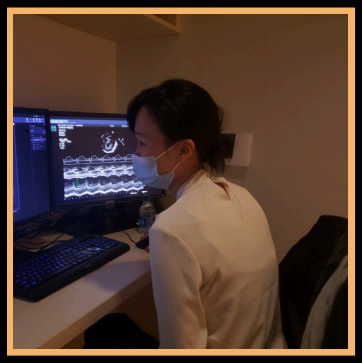
CONFERENCE	TITLE
Society for Cardiovascular Magnetic Resonance 2024	Hashemi S., Watson T., Wilson HC., Sallee III D., Slesnick TC. "Cardiac Presentation of Rosai-Dorfman Disease in a Pediatric Patient". Society for Cardiovascular Magnetic Resonance 27th Annual Scientific Sessions. London, United Kingdom (January 2024). Poster presentation.
Society for Cardiovascular Magnetic Resonance2024	Wilson, H. C., Hashemia, S., Sallee III, D., Smith, C. T., Slesnick, T. C. Comparison of Parametric Mapping Indices in Systole versus Diastole Among a Cohort of Children Undergoing Sedated CMR. Society for Cardiovascular Magnetic Resonance 27th Annual Scientific Sessions. London, United Kingdom (January 2024). Poster presentation.
Society for Cardiovascular Magnetic Resonance 2024	Wilson, H. C. Hashemi, S., Ligon, R. A., Wagner, J., Kanaan, U., Slesnick, T. C. Not Too Late: CMR for Determination of Operative Candidacy for a 7—Year-old with Unrepaired Truncus Arteriosus. Society for Cardiovascular Magnetic Resonance 27th Annual Scientific Sessions. London, United Kingdom (January 2024). Poster presentation.
Society for Cardiovascular Magnetic Resonance 2024	Wilson, H. C. Hashemi, S., Ligon, R. A., Wagner, J., Kanaan, U., Slesnick, T. C. Not Too Late: CMR for Determination of Operative Candidacy for a 7—Year-old with Unrepaired Truncus Arteriosus. Society for Cardiovascular Magnetic Resonance 27th Annual Scientific Sessions. London, United Kingdom (January 2024). Poster presentation.
Society for Cardiovascular Magnetic Resonance 2024	Wolfe NK, Schiff M, Olivieri LJ, Christopher A, Fogel M, Slesnick T, Krishnamurthy R, Muthurangu V, Dorfman AL, Lam CZ, Weigand J, Robinson JD, Cordina R, Rathod RH, Alsaied T and the FORCE Investigators. Predictors of Sudden Cardiac Arrest in Fontan Patients. Early Career Award Oral Presentation. CMR International Meeting. London UK 2024.
Society for Cardiovascular Magnetic Resonance 2024	Alsaied T, Li R, Christopher A, Fogel M, Slesnick T, Krishnamurthy R, Muthurangu V, Dorfman AL, Lam CZ, Weigand J, Robinson JD, Cordina R, Olivieri LJ, Rathod RH, and the FORCE Investigators. Predictors of Supranormal Exercise Capacity in Fontan Patients (high-performing Fontan). A Fontan Outcomes Registry Using CMR Examination (FORCE) Registry Study. CMR International Meeting. London UK 2024.

Our Team in Action



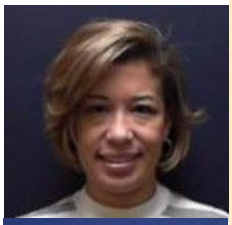




The CIRC team members are deeply dedicated to advancements in medicine, particularly in the field of cardiac imaging. Our physicians are renowned experts nationally and internationally in pediatric cardiac imaging. They actively engage in collaborations with other specialists, provide mentorship to various healthcare professionals, including medical students, residents, cardiology fellows, nurses, sonographers, and coordinators. Sonographers are welcomed to join CIRC after demonstrating consistent high-quality imaging in clinically ordered studies. During the research phase, sonographers closely collaborate with research coordinators to ensure precise data collection and top-notch imaging. Apart from overseeing and safeguarding data, coordinators develop protocols, prepare budget reports, facilitate quality control procedures, document all research publications and presentations, and coordinate research activities.

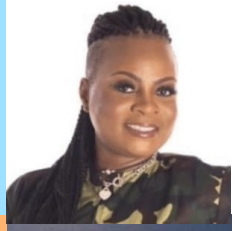
MEET THE TEAM

Ritu Sachdeva
MD
Medical Director



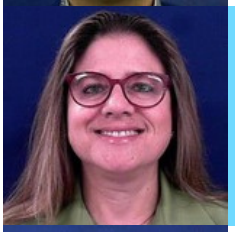
Tara Edwards,
MBA, RDCS, FASE
Manager of Non-Invasive Cardiology

Barbara Nutall,
MA
Senior Research Coordinator



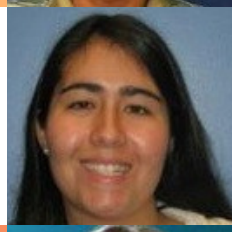
Sassan Hashemi,
MD
Image Processing Scientist

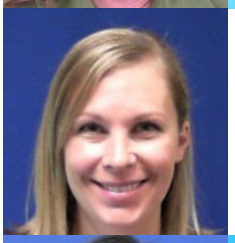
Brian Schlosser,
RDCS, FASE
Clinical Educator -
Echocardiography



Sandra Pernetz,
RDCS, FASE
Clinical Educator -
Echocardiography

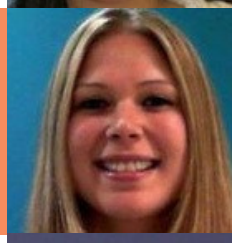
Gemma Morrow,
RDCS
Cardiac Sonographer Supervisor

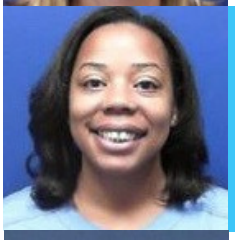




Tori Bermudez,
RDCS
Senior Cardiac Sonographer

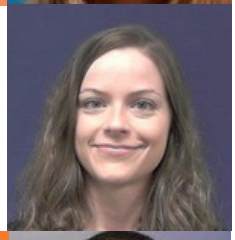
Amanda Harding,
RDCS
Senior Cardiac Sonographer





Jaimee Housey,
RDCS
Senior Cardiac Sonographer

Anna Kate Shaw,
RDCS
Senior Cardiac Sonographer



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