

# CARDIOVASCULAR IMAGING RESEARCH CORE

ADVANCING NON-INVASIVE CARDIAC IMAGING RESEARCH FOR 12 YEARS

## CONTACT CIRC

### LOCATION:

Children's Healthcare of Atlanta at Egleston in Outpatient Cardiac Services, 2nd floor, Room 21.104A

### PHONE:

(404) 785-CIRC (2472)

### EMAIL:

[CIRC@choa.org](mailto:CIRC@choa.org)

### WEBSITE:

[www.pedsresearch.org/cores/detail/cardiovascular-imaging-research-core-circ](http://www.pedsresearch.org/cores/detail/cardiovascular-imaging-research-core-circ)

## IN THIS ISSUE

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## WHAT IS CIRC?

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.

## MEET THE TEAM

Ritu Sachdeva, MD

Medical Director

Tara Edwards, MBA, RDCS, RCCS, RVS

Manager of Noninvasive Cardiology

Deanna Hill, CCRP

Senior Research Coordinator

[deanna.hill@choa.org](mailto:deanna.hill@choa.org)

Tyler Harrison, MPH

Research Coordinator

[tyler.harrison@choa.org](mailto:tyler.harrison@choa.org)

Sassan Hashemi, MD

Image Processing Scientist

Adrian Wedderburn

Cardiac IT Support Specialist

## RESEARCH SONOGRAPHERS

Brian Schlosser, RDCS

Gemma Morrow, RDCS

Amanda Harding, RDCS

Jaimee Housey, RDCS

Anna Kate Shaw, RDCS

Tori Bermudez, RDCS



# WHAT WE DO

## SERVICES OFFERED

### - ECHOCARDIOGRAMS:

- Transthoracic echocardiography
- Transesophageal echocardiography
- Fetal echocardiography
- Stress echocardiogram
  - Upright bicycle
  - VO2 analysis

### - EXERCISE STRESS TESTING

### - ELECTROCARDIOGRAMS

### - VASCULAR FUNCTION ASSESSMENT:

- Carotid intimal medial thickness (cIMT)
- Brachial flow mediated dilation (FMD)
- Applanation tonometry

### - POST-PROCESSING AND ANALYSIS

- Previously Acquired Images

### - CARDIAC MAGNETIC RESONANCE IMAGING

- Cardiac function quantification
- Phase-contrast velocity mapping
- Coronary imaging
- Scar imaging and quantification
- Cycle ergometer exercise MRI
- Strain analysis (feature tracking)
- 4-dimensional (4-D) flow analysis

### - CONSULTATIVE EXPERTISE FOR PROTOCOL

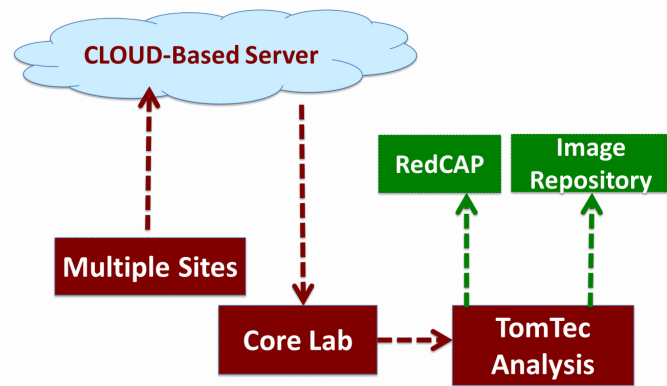
- IRB Development and Submission
- Protocol & ICF Drafting

### - IMAGE MANAGEMENT AND STORAGE

- Import, Export, and Archival of DICOM and Non-DICOM Images via IBM iConnect©

## DATA MANAGEMENT

Data entry services are provided for the imaging related research projects. Password protected data pertaining to specific projects are entered into a Microsoft excel database or password-protected in REDCap. This ensures that access is exclusively granted to the individuals assigned to the project. A dedicated database contains all identifying information, which is kept separate from research echocardiogram data. A unique identifier is created and contains no personal information. Data security is also complemented by a quality assurance program for CIRC technicians to ensure the most accurate and high quality images.



## DATA MANAGEMENT PROCESS

## THIS YEAR CIRC HAS:

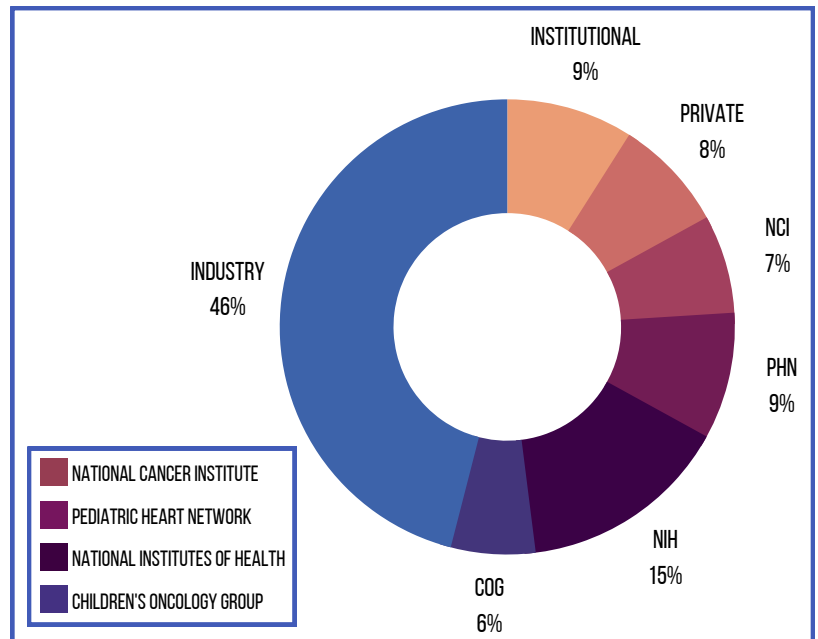
- Supported 30 active studies
- Served as a Multicenter Echo Core Lab
- Served as a Multicenter MRI Core Lab
- Provided Research Support and Opportunities for:
  - Fellows, Faculty, Sonographers & Coordinators

# CIRC IN COLLABORATION

EXTENDING BEYOND CARDIOLOGY

## PARTNERSHIPS WITHIN CHILDREN'S

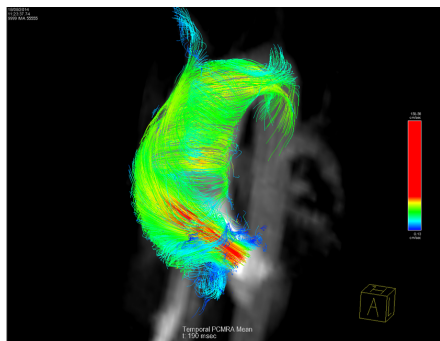
- Nephrology
- CT Surgery
- Hem-Onc
- Neurology
- Infectious Disease
- Marcus Center
- Genetics
- Surgery
- Cardiology



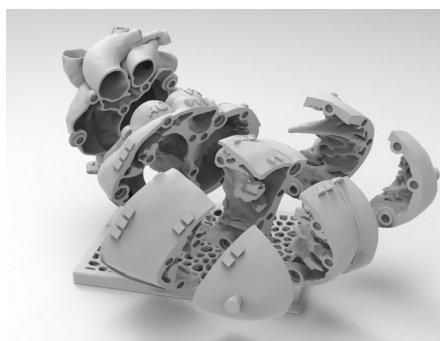
## NATIONAL COLLABORATIVES AND REGISTRIES

- Pediatric Heart Network
  - Echo Z-score
  - SVR Trial
  - DO IT Trial
  - FUEL and FUEL OLE Trials
- Fetal Heart Society
- Cardiac Genetics Registry
- Society of Pediatric Echo (SOPE)
- FORCE (Fontan collaborative)
- Children's Oncology Group





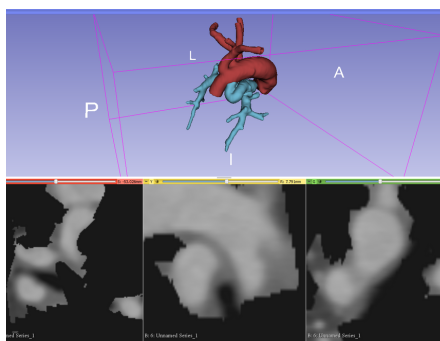
4D Flow Visualization



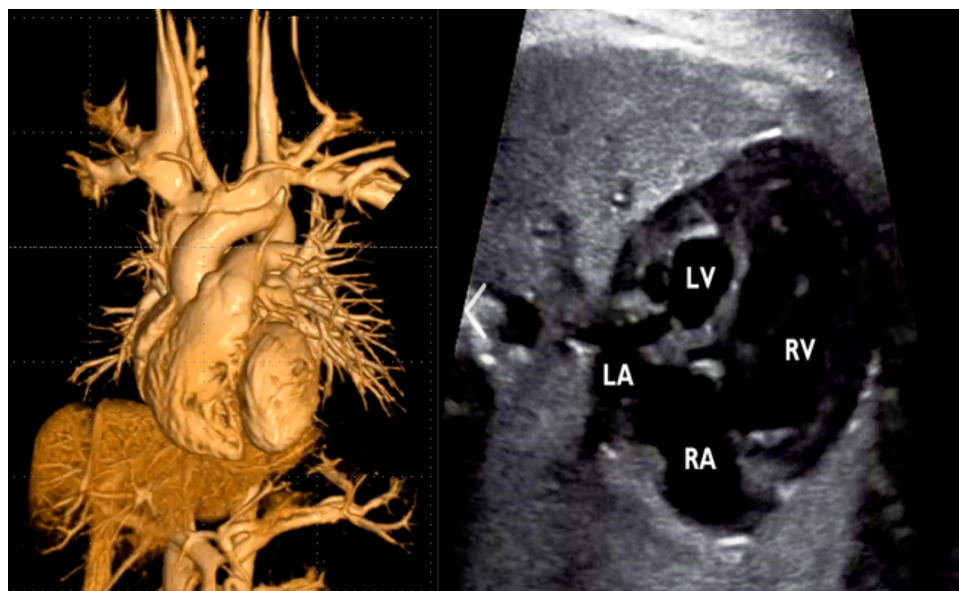
3D Print Complex DORV



Digital 3D Modeling



PDA Segmentation



MRI - 3D Heart Reconstruction

Fetal Echo

## RECENT PUBLICATIONS

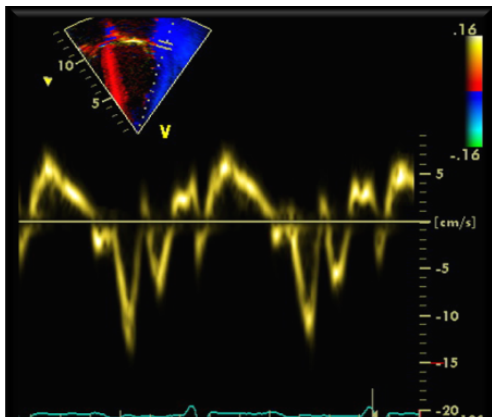
Dove, M. L., Oster, M. E., Hashemi, S. & Slesnick, T. C. (2022). Cardiac magnetic resonance findings after multisystem inflammatory syndrome in children. *The Journal of Pediatrics*, 245, 95–101

Kaushal, S., Hare, J. M., Shah, A. M., Pietris, N. P., Bettencourt, J. L., Piller, L. B., Khan, A., Snyder, A., Boyd, R. M., Abdullah, M., Mishra, R., Sharma, S., Slesnick, T. C., Si, M. S., Chai, P. J., Davis, B. R., Lai, D., Davis, M. E. & Mahle, W. T. (2022). Autologous cardiac stem cell injection in patients with hypoplastic left heart syndrome (CHILD Study). (2022). *Pediatric Cardiology*, 10.1007/s00246-022-02872-6.

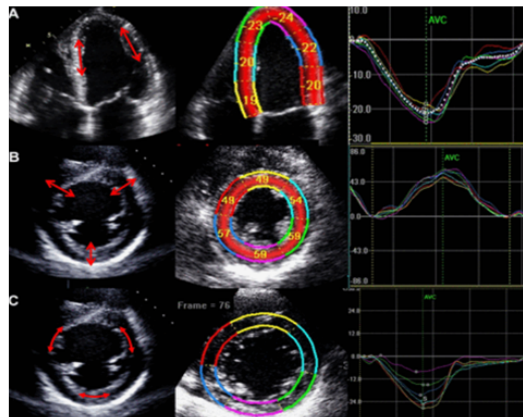
Marrone, A. C., Morrow, G., Kelleman, M. S., Lipinski, J., Border, W., & Sachdeva, R. (2022). Impact of the COVID pandemic on quality measures in a pediatric echocardiography lab. *Progress in Pediatric Cardiology*, 101549.

Patel, T., Kelleman, M., Pickard, S., Miller, J., Suthar, D., & Sachdeva, R. (2022). Implementation of Appropriate Use Criteria for Transthoracic Echocardiography in Follow-Up Care of Pediatric Patients with Congenital Heart Disease. *Journal of the American Society of Echocardiography*, 35(10), 1084–1090.e19.

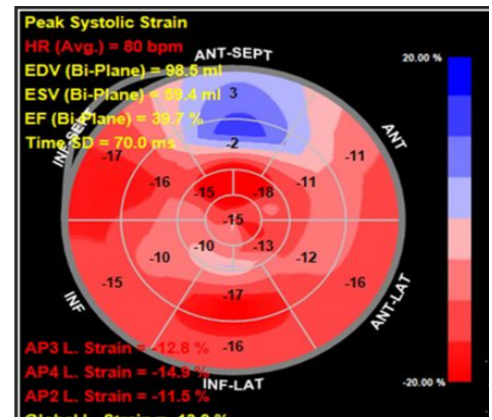
Gaitonde, M., Kreeger, J., Border, W., Roberts, J., Elshenawy, S., Geary, F., & Michelfelder, E. (2021). Fetal Diagnosis in a Unique Case of Vascular and Cardiac Interdependence in Omphaloischiopagus Conjoined Twins. (2021). *CASE*, 5(3), 196–199.



Tissue-Doppler Imaging



Strain Imaging

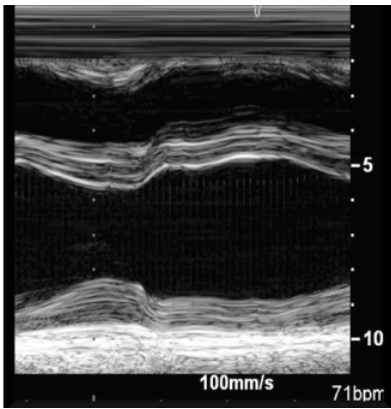


Strain Imaging

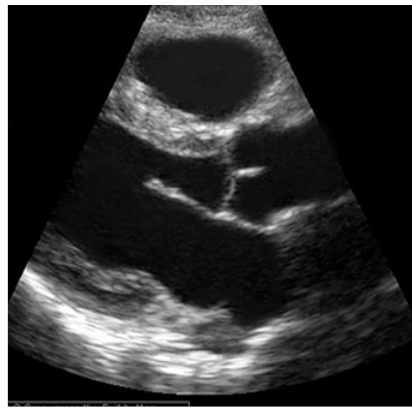
## CONFERENCE

## ABSTRACT PRESENTATIONS

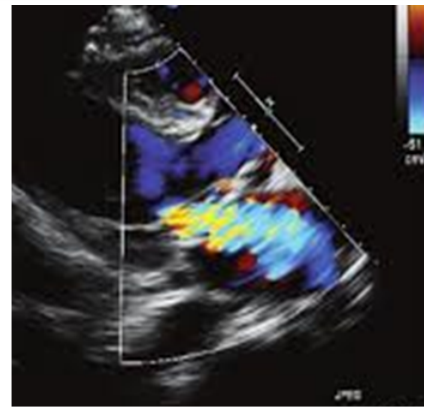
<p>AMERICAN SOCIETY OF ECHOCARDIOGRAPHY 2022 Arthur E. Weyman Young Investigators Award Winner</p>	<p>Suh Ro, S., Milligan, I., Kreeger, J., Porter, A., Border, W., Ferguson, E., Sachdeva, R., Michelfelder, E. (2022). "YIA-2: Association of Prenatal Level of Care Assignments with Postnatal Clinical Outcomes in Fetuses Diagnosed with Congenital Heart Disease."</p>
<p>AMERICAN SOCIETY OF ECHOCARDIOGRAPHY 2022</p>	<p>Cohen, J., Arya, B., Caplan, R., Donofrio, M.T., Harrington, J.K., Ho, D.Y., Hogan, W., Hornberger, L.K., Jhaveri, S., Killen, S., Lindblade, C.L., Michelfelder, E., Moon-Grady, A., Patel, S., Quezada, E., Ronai, C., Sanchez Mejia, A., Schidlow, D., Stiver, C., Thakur, V., Srivastava, S. (2022). "Fetal Congenitally Corrected Transposition of the Great Arteries: Heart Block Occurs More Frequently in Fetuses without Associated Cardiac Defects. A Fetal Heart Society Research Collaborative Study."</p>
<p>AMERICAN SOCIETY OF ECHOCARDIOGRAPHY 2022</p>	<p>Milligan, I., Border, W., Sachdeva, R., Michelfelder, E. (2022). "Contemporary Outcomes in Fetuses Diagnosed with Vascular Rings."</p>
<p>AMERICAN SOCIETY OF ECHOCARDIOGRAPHY 2022</p>	<p>Mosgrove, M.J., Border, W.L., Sachdeva, R., Stratton, K.L., Armenian, S.H., Bhat, A.H., Cox, D.E., Leger, K.J., Yang, C., Leisenring, W.M., Meacham, L.R., Sadak, K.T., Narasimhan, S., Nathan, P.C., Chow, E.J. (2022). "Utility of Apical Four-Chamber Longitudinal Strain as a Surrogate Measure of Global Longitudinal Strain in the Assessment of Childhood Cancer Survivors: A Multicenter Comparative Study."</p>
<p>AMERICAN SOCIETY OF ECHOCARDIOGRAPHY 2022</p>	<p>Natarajan, S.S., Chaszczewski, K., Ansah, D., Balasubramanian, S., Beattie, M., Bhat, A.H., Brewer, C., Campbell, M.J., Carney, M., T.L., Dhanantwari, P., Jone, P., Kong, G., Kwon, E.N., Lipinski, J., Madan, N., Nelson, J., Olsen, R., Parthiban, A., Prospero, C., Rajagopal, H., Sachdeva, R., Sanandajifar, H., Sanchez Mejia, A., Srivastava, S., Stern, K., Taylor, C., Tierney, S., Cohen, M.S. (2022). "Rationale and Design of the First Multicenter Pediatric Echocardiography Quality Improvement Collaborative: Decreasing Pre-Operative Imaging Discrepancies in Patients Prior Congenital Heart Defect Surgery."</p>
<p>AMERICAN SOCIETY OF ECHOCARDIOGRAPHY 2022</p>	<p>Patel, T., Kreeger, J., Sachdeva, R., Border, W., Michelfelder, E. (2022). "Accuracy of Anatomic and Physiologic Diagnosis in Fetuses with Single Ventricle Congenital Heart Disease: Assessment in a Contemporary Cohort."</p>
<p>AMERICAN SOCIETY OF ECHOCARDIOGRAPHY 2022</p>	<p>Sganga, D., Sachdeva, R., Natarajan, S., Lopez, C., Benavidez, O., Parra, D.A., Srivastava, S., Balasubramanian, S., Selamet Tierney, E.S. (2022). "Identification of Diagnostic Errors in a Pediatric Echocardiography Laboratory."</p>
<p>AMERICAN SOCIETY OF ECHOCARDIOGRAPHY 2022</p>	<p>Studer, M.A., Young, L.T., Parthiban, A., Sachdeva, R., Buddhe, S. (2022). "3D Echocardiographic Imaging in Pediatric Echo Labs: A National Survey of Use, Barriers, and Strategies for Success."</p>



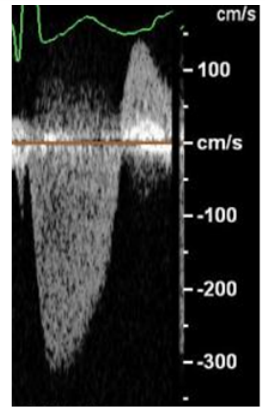
M-Mode



2-D Echocardiogram



Color-Doppler Echocardiogram



Speckled Doppler

## CONFERENCE

## ABSTRACT PRESENTATIONS

<p><b>AMERICAN SOCIETY OF ECHOCARDIOGRAPHY 2022</b></p>	<p>Suh Ro, S., Housey, J., Bermudez, T., Ferguson, E., Sachdeva, R., Border, W. (2022). "P2-13: Comprehensive Assessment of Pediatric Echo Discrepancy Rates Using Real-Time Adjudicated Quality Assurance: A Ten-Year Experience."</p>
<p><b>AMERICAN SOCIETY OF ECHOCARDIOGRAPHY 2022</b></p>	<p>Suthar, D., Watson, T., Sachdeva, R., Michelfelder, E. (2022). "Evaluation of Fetal Risk Stratification Tools in the Postnatal Prediction of Coarctation of Aorta."</p>
<p><b>AMERICAN ACADEMY OF PEDIATRICS 2022</b></p>	<p>Dove, M., Slesnick, T., Oster, M. (2022). "Intermediate MRI Outcomes in Vaccine-Associated Myocarditis vs. Other Types of Myocarditis."</p>
<p><b>AMERICAN ACADEMY OF PEDIATRICS 2022</b></p>	<p>Milligan, I., Hashemi, S., Sallee, D., Sachdeva, R., Michelfelder, E. (2022). "Evaluation of Imaging Findings and Clinical Outcomes Among Patients Referred for Ambulatory CMR Evaluation for Left Ventricular Compaction Cardiomyopathy."</p>
<p><b>AMERICAN ACADEMY OF PEDIATRICS 2022</b></p>	<p>Patel, T., Sachdeva, R., Wilson, H., Suthar, D. (2022). "Appropriateness of Echocardiograms and Resource Utilization in Outpatient Management of Small Muscular Ventricular Septal Defects."</p>
<p><b>AMERICAN ACADEMY OF PEDIATRICS 2021</b></p>	<p>Milligan, I., Hashemi, S., Sallee, D., Sachdeva, R., Michelfelder, E. (2022). "Prevalence of Pulmonary Hypertension and Relation to Disease Severity in Children with Obstructive Sleep Apnea."</p>
<p><b>AMERICAN ACADEMY OF PEDIATRICS 2021</b></p>	<p>Miller, J. C., Kelleman, M.S., Patel, T., Bermudez, T., Cox, D., Smith, C. A., Sachdeva, R., Border, W. L., Butto, A. (2022). "The Utility of Left Atrial Strain in Predicting Outcome in Pediatric Restrictive Cardiomyopathy."</p>
<p><b>25TH ANNUAL UPDATE ON PEDIATRIC AND CONGENITAL CARDIOVASCULAR DISEASE 2022</b></p>	<p>Izaguirre, G., Hill, D., Lipinski, J. (2022). "Perceived Barriers with Interpreting Services in Research Subjects with Limited English Proficiency "</p>

# CIRC SPOTLIGHT

NEW

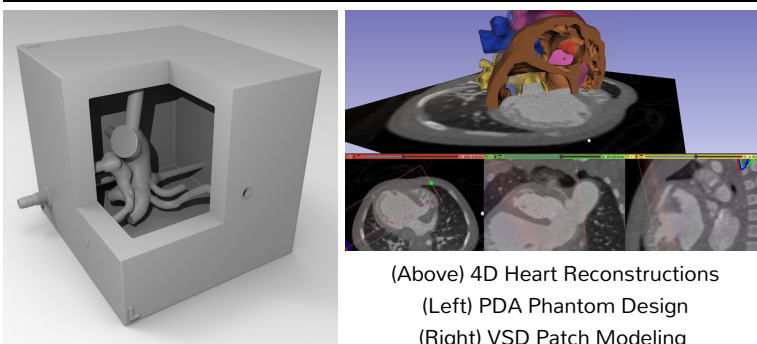
## DR. SANGHEE SUH RO RECIEVES THE 2022 ARTHUR E. WEYMAN YOUNG INVESTIGATORS AWARD AT ASE 2022 CONFERENCE

Dr. Sanghee Suh Ro was named the Arthur E. Weyman Young Investigators Award Winner at the 2022 American Society of Echocardiography Conference. This award is reserved for young clinical researchers who are under the age of 40 and are 5 years or less from the completion of their training. She received this honor for her research, "Association of Prenatal Level of Care Assignments with Postnatal Clinical Outcomes in Fetuses Diagnosed with Congenital Heart Disease." Dr. Ro conducted this research during her time as an advanced imaging fellow at Children's, and is now an attending physician her. Her career focus is fetal cardiology.



## DR. SASSAN HASHEMI

Bringing 2-D Scans to Life



(Above) 4D Heart Reconstructions  
(Left) PDA Phantom Design  
(Right) VSD Patch Modeling

Dr. Sassan Hashemi is a cardiac imaging scientist with experience in cardiac image processing including: phantom designs, MRI strain analysis, image segmentation, and 3D model printing. These images and 3D models are utilized by clinicians for surgical planning. In addition, patients and their families gain a better understanding of their conditions by seeing 2D images come to life.



# OUR TEAM IN ACTION

The CIRC team members share a deep commitment to advances in medicine, specifically those related to cardiac imaging. Our physicians are established national and international experts in the field of pediatric cardiac imaging. They actively collaborate with other subspecialists as well as mentor, medical students, residents, cardiology fellows, nurses, sonographers, and coordinators. CIRC invites sonographers to join after they have demonstrated consistent high quality imaging on clinically ordered studies. Throughout the research process, sonographers work closely with research coordinators to ensure high quality imaging and accurate data collection. In addition to managing and securing data, the coordinators draft protocols, compose budgetary reports, facilitate quality assurance measures, maintain records of all research publications and presentations, and schedule research procedures.



# MEET THE TEAM

## New Arrivals



### TARA EDWARDS

MANAGER OF NONINVASIVE CARDIOLOGY

Tara Edwards was recruited for the position of Manager of Noninvasive Cardiology at Children's Healthcare of Atlanta in June 2022. She is a certified Pediatric Cardiac Sonographer with over sixteen years of clinical experience as an adult vascular sonographer. Along with her clinical and administrative experience, she is also an Adjunct Instructor at Gwinnett Technical College. In her role as manager, Tara invests actively in the professional growth and development of each employee. Professional collaboration is important to her, and she believes that cultivating a learning environment increases productivity at work. Aside from her professional pursuits, Tara enjoys spending time with her daughters, going to the gym, and traveling.

### TYLER HARRISON

RESEARCH COORDINATOR

Tyler Harrison is a graduate of Morehouse School of Medicine where she obtained her Master of Public Health, and a proud Howard University alumna where she obtained her Bachelor's of Science in Sports Medicine. Tyler's interest in research blossomed during her time at Morehouse School of Medicine. Through various projects she began to see how research could be used as a tool of healing, empowerment, and evolution. Tyler is motivated by her passion for the community, the pursuit of health equity, and her general love for people.

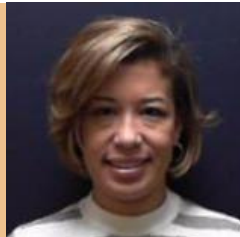


# MEET THE TEAM



**RITU SACHDEVA, MD**  
MEDICAL DIRECTOR

**TARA EDWARDS, MBA, RDCS**  
MANAGER OF NONINVASIVE CARDIOLOGY



**DEANNA HILL, CCRP**  
SENIOR RESEARCH COORDINATOR

**TYLER HARRISON, MPH**  
RESEARCH COORDINATOR



**SASSAN HASHEMI, MD**  
IMAGE PROCESSING SCIENTIST

**ADRIAN WEDDERBURN**  
SENIOR APPLICATIONS ANALYST



**GEMMA MORROW, RDCS**  
CARDIAC SONOGRAPHER SUPERVISOR

**BRIAN SCHLOSSER, RDCS**  
CLINICAL EDUCATOR - ECHOCARDIOGRAPHY



**AMANDA HARDING, RDCS**  
SENIOR CARDIAC SONOGRAPHER

**JAIMEE HOUSEY, RDCS**  
SENIOR CARDIAC SONOGRAPHER



**TORI BERMUDEZ, RDCS**  
CARDIAC SONOGRAPHER

**ANNA KATE SHAW, RDCS**  
CARDIAC SONOGRAPHER

