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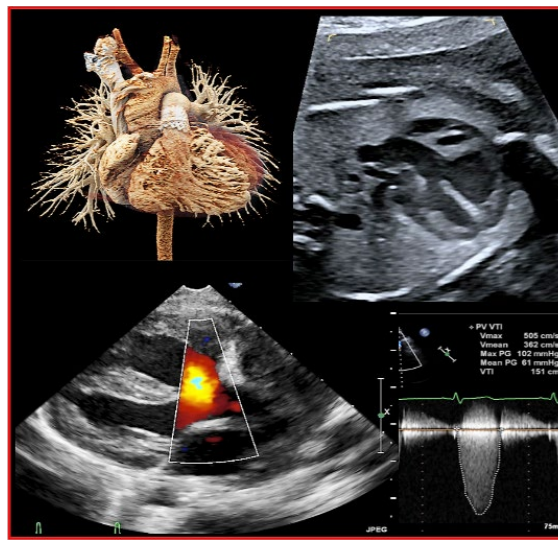
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Issue
2021

Cardiovascular Imaging Research Core (CIRC)

A Decade of Innovation and Service



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What is CIRC?

The Cardiovascular Imaging Research Core (CIRC) opened in January 2011 at Children's Healthcare of Atlanta, Egleston Campus. The CIRC core lab provides high quality, non-invasive cardiac imaging support for investigators involved in clinical research involving infants, children and adolescents in a dedicated research setting. Dedicated staff have experience transcending innovation by developing and utilizing imaging modalities and techniques not typically seen in the clinical arena. CIRC's dedicated laboratory space is located in the Children's Healthcare of Atlanta, Egleston and Scottish Rite campuses.

How to Access the CIRC Lab

CIRC is located at
Children's Healthcare of Atlanta at Egleston in
Outpatient Cardiac Services,
Tower 1, 2nd floor

Phone: (404) 785-CIRC (2472)

CIRC@choa.org

<http://www.pedsresearch.org/cores/detail/cardiovascular-imaging-research-core-circ>

What we do

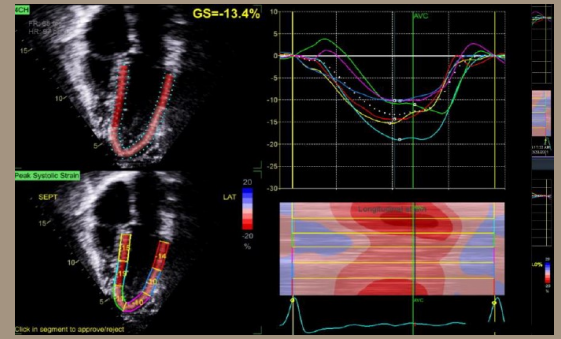
Our Services Include:

- **Echocardiograms**

- **Transthoracic Echocardiography**
 - 2-dimensional (2-D) echocardiography
 - Color and spectral Doppler echocardiography
 - M-Mode echocardiography
 - Tissue Doppler Velocity Imaging
 - Real-time 3-D Imaging
 - Strain and Strain rate imaging
- **Transesophageal Echocardiography**
- **Fetal Echocardiography**
- **Stress Echocardiography**

- **Exercise Stress Testing**
- **Electrocardiograms**
- **Vascular Function Assessments**

- **Carotid Intimal Medial Thickness (cIMT)**
- **Brachial Flow Mediated dilation (FMD)**
- **Applanation tonometry**
- **Cardiac Magnetic Resonance Imaging (cMRI)**
 - Cardiac function quantification
 - Phase-contrast velocity mapping
 - Coronary imaging
 - Scar imaging and quantification
 - Cycle Ergometer exercise MRI
 - Strain analysis (feature tracking)



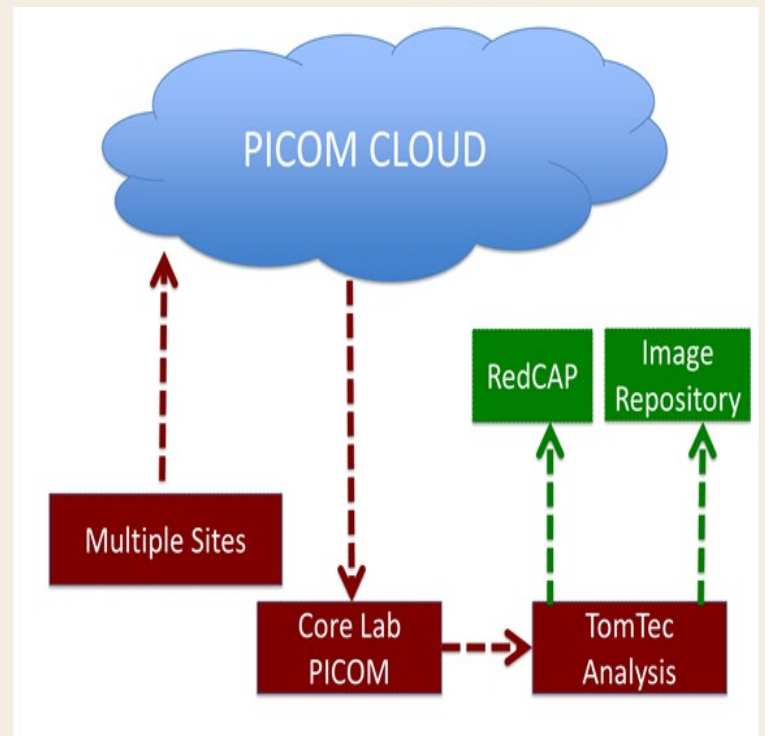
- **Data Core Site Capabilities**

- Data Storage
- Data Management
- Data Analysis
- **Cardiac Magnetic Resonance Imaging (cMRI)**

How it works

Multicenter Core Lab

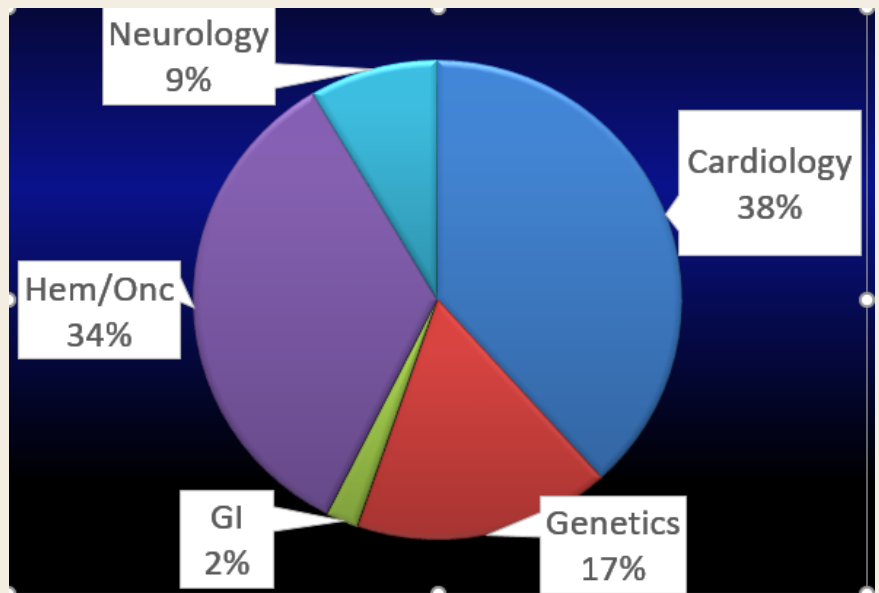
CIRC is a multicenter core lab, but how exactly does it work? As a multicenter research project involving analysis of cardiac imaging is developing, a core lab for those analyses is selected. After project initiation, participating sites de-identify images and burn CDs. Those images are then uploaded to PICOM, an enterprise picture archiving and communication system (PACS). Once images are uploaded to PICOM, our core site can access those images for analysis. The images are downloaded from PICOM and pushed into a vendor-neutral software analysis package, TomTec. CIRC staff are responsible for measuring images and gathering data based on parameters outlined in the study protocol. These results are entered into a REDCap® database, an electronic data capture system used for research. To ensure the most precise results, data is analyzed for outliers and possible anomalies are reassessed. Once data cleaning is complete, the entire data set is sent back to the main study site to be statistically analyzed. CIRC then maintains the images in an image repository.



CIRC Services Beyond Cardiology at CHOA

- CT Surgery
- Nephrology
- Hematology/Oncology
- Infectious disease
- Neurology
- Marcus Center
- Genetics
- Gastroenterology

Primary CIRC Users 2019-2020



CIRC Participation in National Collaboratives & Registries

- **Pediatric Heart Network (PHN)**

- Echo Z-score
- SVR Trial
- DO IT Trial
- FUEL and FUEL OLE Trials

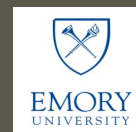
- **Fetal Heart Society**

- **Cardiac Genetics Registry**

- **FORCE (Fontan collaborative)**

- **American College of Cardiology (ACC) QNET**

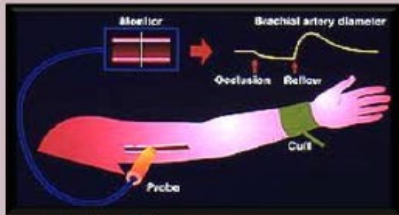
- **Society of Pediatric Echocardiography (SOPE)**



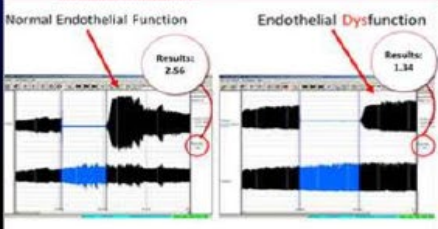
Vascular Function Tests

Endothelial function

- Brachial flow mediated dilation



- EndoPAT



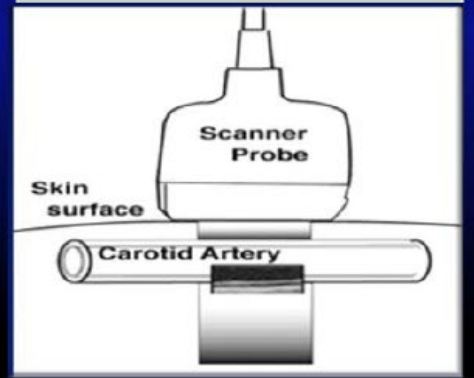
Arterial stiffness

- Pulse wave velocity
- Pulse wave analysis



Structural arterial changes

- Intimal-medial thickness Carotid

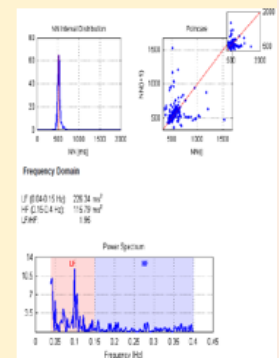


Current Studies Using Vascular Program

- Cardiology
 - PHN DO IT Trial (NIH)
- Nephrology
 - PRIDE (NIH)
 - T-Cell Signaling in CKD (NIH)
- Oncology
 - PREDICT (Aflac)
 - LETKI (Aflac)
- Surgery
 - Adolescent obesity

EndoPAT

- A non-invasive device intended for use as a diagnostic aid in the detection of coronary artery Endothelial Dysfunction (positive or negative) using a reactive hyperemia procedure.



Recent Presentations/Publications

Our team is committed to research and has had the opportunity to contribute to medical science through abstract presentations and publications. Below is a list of selected abstracts presented within the last year at various national and regional meetings through research supported by CIRC.

2020-present

Current Practice and Barriers to the Implementation of Strain Imaging in Pediatric Echo Labs: A National Survey. Ziebell, Daniel, Erika Bettermann, Amy Park, Joan Lipinski, Brian Schlosser, William Border, and Ritu Sachdeva. *Journal of the American Society of Echocardiography* 33, no. 6 (2020).

Factors Influencing Temporal Trends in Pediatric Inpatient Imaging Utilization. Anderson S, Figueroa J, McCracken CE, Cochran C, Slesnick TC, Border WL, Sachdeva R. *J Am Soc Echocardiogram*. 2020 Dec;33(12):1517-1525. doi: 10.1016/j.echo.2020.06.019. Epub 2020 Sep 9. PMID: 32919851.

Risk Factors for Mortality and Circulatory Outcome Among Neonates Prenatally Diagnosed With Ebstein Anomaly or Tricuspid Valve Dysplasia: A Multicenter Study. Freud LR, McElhinney DB, Kalish BT, Escobar-Diaz MC, Komarlu R, Puchalski MD, Jaeggi ET, Szwaast AL, Freire G, Levasseur SM, Kavanaugh-McHugh A, Michelfelder EC, Moon-Grady AJ, Donofrio MT, Howley LW, Selamet Tierney ES, Cuneo BF, Morris SA, Pruetz JD, van der Velde ME, Kovalchin JP, Ikemba CM, Vernon MM, Samai C, Satou GM, Gotteiner NL, Phoon CK, Silverman NH, Tworetzky W. *J Am Heart Assoc*. 2020 Nov 3;9(21):e016684. doi: 10.1161/JAHA.120.016684. Epub 2020 Oct 20. PMID: 33076749; PMCID: PMC7763426.

Traditional Cardiovascular Risk Factors and Individual Prediction of Cardiovascular Events in Childhood Cancer Survivors. Chen Y, Chow EJ, Oeffinger KC, Border WL, Leisenring WM, Meacham LR, Mulrooney DA, Sklar CA, Stovall M, Robison LL, Armstrong GT, Yasui Y. *J Natl Cancer Inst*. 2020 Mar 1;112(3):256-265. doi: 10.1093/jnci/djz108. PMID: 31161223; PMCID: PMC7073918.

Pediatric Heart Network Echocardiographic Z Scores: Comparison with Other Published Models. Lopez, L., Frommelt, P. C., Colan, S. D., Trachtenberg, F. L., Gongwer, R., Stylianou, M., Bhat, A., Burns, K. M., Cohen, M. S., Dragulescu, A., Freud, L. R., Frommelt, M. A., Lytrivi, I. D., Mahgerefteh, J., McCrindle, B. W., Pignatelli, R., Prakash, A., Sachdeva, R., Soslow, J. H., Spurney, C., ... Pediatric Heart Network Investigators (2021). *Journal of the American Society of Echocardiography* : official publication of the American Society of Echocardiography, 34(2), 185–192. <https://doi.org/10.1016/j.echo.2020.09.019>

Longitudinal Follow-up of Echocardiographic Abnormalities Including Strain in Multisystem Inflammatory Syndrome in Children (MIS-C). Gaitonde M, Kelleman M, Cox D, Border W, Sachdeva R.

Implementation of Appropriate Use Criteria for Transthoracic Echocardiography in Follow up Care of Pediatric Patients with Congenital Heart Disease. Trisha Patel, MD, Michael Kelleman, MSPH, Sarah Pickard, MD, MPH, Jamison Miller, MD, Divya Suthar, MD, Ritu Sachdeva, MBBS

Impact of the COVID Pandemic on Quality Measures in a Pediatric Echocardiography Lab. Anna-Claire Marrone, MD, Gemma Morrow, RDCS, Michael Kelleman, MSPH, Joan Lipinski, RDCS, MHS, William L Border, MBChB, MPH, Ritu Sachdeva, MBBS

Educational Intervention Improves Performance and Reporting of Global Longitudinal Strain in Pediatric Clinical Echocardiogram Studies. Falon McGaughy RDCS, David Cox, RDCS, Ritu Sachdeva, MBBS, William Border, MBChB, MPH, Amy Park, MPH, Deanna Hill, CCRP, Guadalupe Izaguirre, Joan Lipinski, MHS

Challenges associated with retrospective analysis of left ventricular function using clinical echocardiograms from a multicenter research study. Sachdeva, R., Stratton, K. L., Cox, D. E., Armenian, S. H., Bhat, A., Border, W. L., Leger, K. J., Leisenring, W. M., Meacham, L. R., Sadak, K. T., Narasimhan, S., Chow, E. J., & Nathan, P. C. (2021). *Echocardiography (Mount Kisco, N.Y.)*, 38(2), 296–303. <https://doi.org/10.1111/echo.14983>



Meet *The Team*



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Medical Director



Deanna Hill, CCRP
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Imaging Scientist



Brian Schlosser, BS, RDCS, RDMS, FASE
Clinical Educator



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Senior Cardiac Sonographer



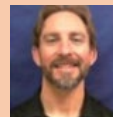
Jaimee Housey, RDCS
Cardiac Sonographer



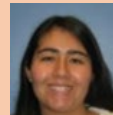
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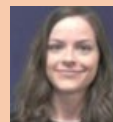
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