Transforming 5P Pediatric Healthcare Through Trans-Disciplinary Health Informatics

Co-Chairs:

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Time: 1.5-hour session or 3-hour workshop

Intensive care units at Children's Hospitals provide care for the most critically ill infants and children within our health care system. These children are closely monitored by clinical examination and a variety of invasive and non-invasive devices. All of the organ systems are being evaluated on a continuous basis with vital sign monitoring (heart rate, respiratory rate, pulse-oximetry, blood pressure), laboratory studies, radiographic studies, and others, generating massive amounts of data. As an example, in the neonatal ICU, there is a near constant evaluation for compromise of the GI tract, a disease called necrotizing enterocolitis or NEC. Premature children are at risk for this potentially fatal disease; it is difficult to diagnose NEC until relatively late in the disease course. NEC is also a problem for infants with heart failure and postoperative from complex heart surgery. Early treatment of this type of GI compromise may decrease morbidity and mortality associated with this disease. Thus, it is critical to develop data analytics to assist bedside clinicians to provide clinical evidence for decision support.

Participants

Anthony Chang, MD, MBA, MPH, is a pediatric cardiologist and Chief Intelligence and Innovation Officer at CHOC Children's Orange County. He is currently getting his Masters in Bioinformatics/Artificial Intelligence at Stanford, and he is the founder and medical director of the nascent Medical Intelligence and Innovation Institute (MI3) that is supported by the Sharon Disney Lund Foundation. The institute is dedicated to implement data science and artificial intelligence in medicine and is the first institute of its kind in a hospital.

Dr. Chang has been the medical director of several pediatric cardiac intensive care programs (including Children's Hospital of Los Angeles, Miami Children's Hospital, and Texas Children's Hospital). He is the founder of the Pediatric Cardiac Intensive Care Society (PCICS) and the founder of the Asia-Pacific Pediatric Cardiac Society (APPCS). In 2013 Dr. Chang has started a pediatric innovation leadership group whose bi-annual symposium *Pediatrics2040: Emerging Trends and Future Innovations* became a catalyst for the international Society for Pediatric Innovation (iSPI).

Tod Davis is an Enterprise Architect for the Data Innovation Group at Children's Healthcare of Atlanta. He is a veteran full-stack developer with 20 years' experience in pediatric healthcare. He specializes in building user facing clinical applications which integrate multiple data sources to impact patient care and clinicians. In addition, he built behind-the-scenes automation for employee and physician onboarding and credential provisioning.

In 2013, Tod implemented Children's first Big Data (Hadoop) cluster. This cluster now houses traditional healthcare data warehouses as well as all ICU vitals, Environmental Data, patient notes and other novel data sets. His current efforts include development of near time ICU patient stress alerts and Natural Language Processing of all clinical notes.

Sherry Farrugia is the Managing Director for Health Research Partnerships at Georgia Tech's Institute for People and Technology, and the Director of the Children's Healthcare of Atlanta and Georgia Tech partnership. In this duel role she works to build and sustain public-private partnerships, and spends half her time at Georgia Tech and the other half at Children's Healthcare of Atlanta where she manages the $20 million research portfolio. Farrugia has nearly 25 years' experience in the Health IT field, working in data analytics, data visualization, and clinical and financial outcomes. She owned a health IT company that she sold to McKesson HBOC, and was involved in several other successful startup companies. Before coming to Georgia Tech she owned a healthcare consulting company focusing on predictive health and risk mitigation in the area of chronic disease prediction, prevention, and management.

Farrugia is a member of: TAG Health Board, Gwinnett Tech HIT Advisory Board, an active member of the Bioscience HIT council at the Metro Atlanta Chamber of Commerce, Health Connect South Advisory Board, HIT Leadership Summit Innovation Committee, HIMSS, Atlanta Ronald McDonald House Charities Advisory Council, and Emory Board of Visitors. Ms. Farrugia received her B.S. in Chemistry with a minor in Physics from Auburn University.

Lazaros Kochilas, MD, MSCR is an Associate Professor of Pediatrics at Emory University School of Medicine and director of Clinical Research Sibley Heart Center Cardiology at Children's Healthcare of Atlanta leading the clinical research of one of the largest centers for pediatric cardiac care in North America. He is also the Director of the Pediatric Cardiac Care Consortium (PCCC) which is a multi-institutional registry of outcomes of procedures for congenital heart diseases (CHD) from over 130,000 patients and 57 institutions in the US and Canada between 1982 and 2011, which makes it the oldest database since initiation of pediatric cardiac surgery. In these roles, Dr. Kochilas has led and participated in multiple outcome research projects and have been an active member of the planning committees for multicenter academic and

industry trials related to pediatric heart diseases. His research is focused on the long term outcomes of children with repaired or palliated CHD. He is also the PI on a NIH/NHLBI funded study aiming to understand the long term survival and causes of death of patients after interventions for CHD.

In these roles Dr. Kochilas' role is to understand and address risk factors affecting quality of life and life expectancy in patients with CHD, as a way to improve the long term outcomes of this vulnerable population. With this background and vision he serves as the multi-PD/PI for the current application for Emory University to participate in the Pediatric Heart Center Network that provides critical infrastructure for multicenter trials in pediatric heart diseases. His clinical and research training in combination with his prior experience and the resources available at Emory University and Children's Healthcare of Atlanta position him to lead the implementation of multi-center studies for patients with pediatric heart diseases.

Joshua Mandel, MD is a physician and software developer working to fuel an ecosystem of health apps with access to clinical data. After earning an S.B. in computer science and electrical engineering from the Massachusetts Institute of Technology and an M.D. from the Tufts University School of Medicine, he joined the Harvard Medical School Department of Biomedical Informatics. Josh serves as lead architect for SMART Health IT (http://smarthealthit.org) and is a member of the national Health IT Standards Committee. Josh also served as the community lead for the national Blue Button REST API. He has a special interest in tools and interfaces that support software developers who are new to the health domain.

Richard Starr is a research scientist responsible for the Protected Health Data infrastructure at IPaT. He is developing a common infrastructure to work with Health Care data. This secure environment will be able to be employed across campus to house research data to maintain compliance with HIPAA, IRB, and partnership agreements.

Leanne West, MS, is the Chief Engineer for Pediatric Technologies for Georgia Tech and a Principal Research Scientist for the Georgia Tech Research Institute (GTRI). As Chief Engineer, she coordinates all research activities related to pediatrics across campus. She helps manage the formal relationship with Children's Healthcare of Atlanta and is Director of the Quick Wins funding program. Her research background focused on mobile and wireless health system and sensor development, user interfaces, system integration, and diagnostic devices. Ms. West serves on the executive management team of the Parker H. Petit Institute for Bioengineering & Bioscience and is a member of the Institute for People and Technology Health Council, with the goal of creating large-scale, interdisciplinary collaborations across campus in the area of

healthcare. She is author of a book chapter in Technology for Aging, Disability and Independence: Computer and Engineering for Design and Applications (John Wiley & Sons) and has written a number of papers and given several presentations on wireless technology device development and remote sensing systems.

Ms. West has seen her invention of a wireless personal captioning system installed at commercial venues through her start-up Intelligent Access, LLC. She was a GTRI Innovative Research Award team member in 2014 and has received the following awards: Georgia Tech's Outstanding Achievement in Research Enterprise Enhancement Award in 2014, the Woman of the Year by Women in Technology in 2014, and the Optical Society's 2012 Paul Forman Engineering Excellence Award as a Lidar Team member. Ms. West also was named one of Georgia's "40 Under 40" by Georgia Trend magazine in 2004. In addition, she participated in the 2008 class of Leadership Georgia. Ms. West is an active participant at her organization and was twice elected Chair of the Georgia Tech Executive Board, the faculty governance body of Georgia Tech.