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Cardiology 2010
Feb. 10-14, 2010; Lake Buena Vista, FL USA
www.chop.edu/cardiology2010

8th Utah Conference on Congenital Cardiovascular Disease
Feb. 21-24, 2010; Snow Bird, UT USA
www.primarychildrens.com/pedscardioidisease

Recruitment Ads

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The National Pediatric Cardiology Quality Improvement Collaborative

By Robert H. Beekman, III, MD and Carole Lannon, MD, MPH

The Joint Council on Congenital Heart Disease (JCCHD) National Pediatric Cardiology Quality Improvement Collaborative (NPC-QIC) held its first face-to-face Learning Session at Cincinnati

Children's Hospital on September 11th and 12th, 2009. Clinical teams from 29 pediatric cardiology programs (Table 1) came together with a shared goal of working together to improve care for infants with complex congenital heart disease. The 87 attendees of the Learning Session included parents, pediatric cardiologists, nurses and nurse practitioners, dietitians, and



Figure 1. Michael Katchman, parent of a child with a uni-ventricular heart, addressing the Learning Session.

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Table 1. Programs Attending Learning Session #1 <i>September 11-12, 2009</i>
Arizona Pediatric Cardiology Consultants
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Children's Hospital Los Angeles - USC
Children's Hospital of Wisconsin
Children's Memorial Hospital
Children's National Medical Center
Cincinnati Children's Hospital Medical Center
Duke University Medical Center
Johns Hopkins University School of Medicine
Mayo Clinic - Rochester
Nationwide Children's Hospital
NYU Medical Center
Oklahoma Children's Heart Center
Oregon Health Sciences University
Pediatric Heart Institute at Vanderbilt Children's
Penn State Hershey Children's Hospital
Primary Children's Medical Center
Riley Hospital for Children
Seattle Children's Heart Center
Stanford Children's
Texas Children's Hospital
UC Davis Children's Hospital
UCLA - Mattel Children's Hospital
University of Chicago Comer Children's Hospital
University of Texas Health Science Center
University of Virginia Children's Hospital

other health professionals (Figure 1). They attended plenary sessions and breakout sessions, some led by parents and all focused on ways to improve clinical care processes and



Figure 2. NPC-QIC Collaborative Director Divvie Powell, MSN, RN discusses the structure of the Learning Collaborative.

patient outcomes (Figure 2). The plenary talks included a moving presentation by Michael Katchman, parent of a son with a univentricular heart, and an enlightening discussion on medical home and care coordination for children with complex healthcare needs led by Chris J. Stille, MD (University of Massachusetts Medical School) and W. Carl Cooley, MD (Crotched Mountain Foundation, New Hampshire). An in-depth plenary talk on methods to optimize nutritional status of infants with complex heart disease was presented by Karen Uzark, RN, PhD (Cincinnati Children's Hospital). Nancy Rudd, MS, RN, CPNP-QC, Medical College of Wisconsin, led breakout sessions on interstage surveillance.

What is the NPC-QIC?

The JCCHD National Pediatric Cardiology Quality Improvement Collaborative (NPC-QIC) is a multi-center research and improvement network intended to improve care processes and outcomes for children with complex congenital heart disease.¹ The NPC-QIC is led by a taskforce of pediatric cardiologists (Table 2) working closely with the Center for Health Care Quality, which has a track record of success

organizing other pediatric improvement networks.

In 2006 the NPC-QIC taskforce agreed on a set of Guiding Principles for the initiative (Table 3). Subsequently, the taskforce defined the key criteria for an initial improvement project:

1. clinically important;
2. potential for improvement;
3. under the purview of pediatric cardiology;
4. specific and measurable; and
5. generates enthusiasm in the field.

Using these criteria, the initial project selected by the taskforce is focused on improving the care of infants during the "interstage" period following a Norwood procedure.

The Initial Improvement Project

The Aim of the NPC-QIC initial project is:

"To improve survival and optimize quality of life for infants between discharge after stage I Norwood and admission for bidirectional Glenn (i.e., during the "interstage" period)."

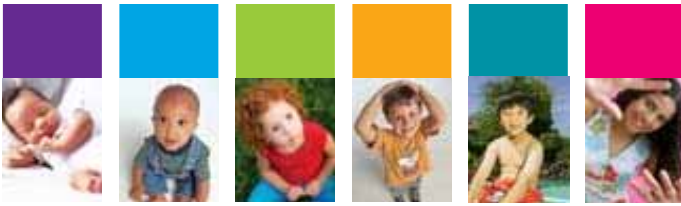


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Dr. Robert Beekman	Cincinnati Children's Hospital Medical Center, Cincinnati, OH
Dr. Kathy Jenkins	Children's Hospital Boston, Boston, MA
Dr. Tom Klitzner	Mattel Children's Hospital at UCLA, Los Angeles, CA
Dr. John Kugler	Children's Hospital & Medical Center, Omaha, NE
Dr. Gerard Martin	Children's National Medical Center, Washington, DC
Dr. Steven Neish	Texas Children's Hospital, Houston, TX
Dr. Geoffrey Rosenthal	University of Maryland Hospital for Children

The project has two components:

1. A patient registry for clinical and population management, as well as research; and
2. A quality initiative focused on improving care and outcomes.

The Registry

The registry will capture data from participating pediatric cardiology centers on all infants in the "interstage" period after discharge from the Norwood or Norwood-variant procedure and prior to admission for the bidirectional Glenn shunt. Registry data are collected and managed using REDCap (Research Electronic Data Capture developed by Vanderbilt University) electronic data capture tools. Information on "interstage" clinical processes and outcomes for each infant is collected in seven data entry forms: enrollment; neonatal surgery and hospital course; discharge after Norwood; clinic visits; readmissions; Glenn surgery; death. This database is designed to provide robust information that will be valuable for both clinical research, population management and quality improvement projects.

The Quality Improvement Initiative

The project's quality improvement initiative aims to improve care and outcomes for infants with a Norwood procedure during the

"Benefits of this collaborative project are likely to extend well beyond the care of infants with a Norwood. It is expected that many of the clinical improvements identified during this project will be generalizable to the care of other infants and children with congenital heart disease."

The National Pediatric Cardiology Quality Improvement Collaborative
KEY DRIVER DIAGRAM

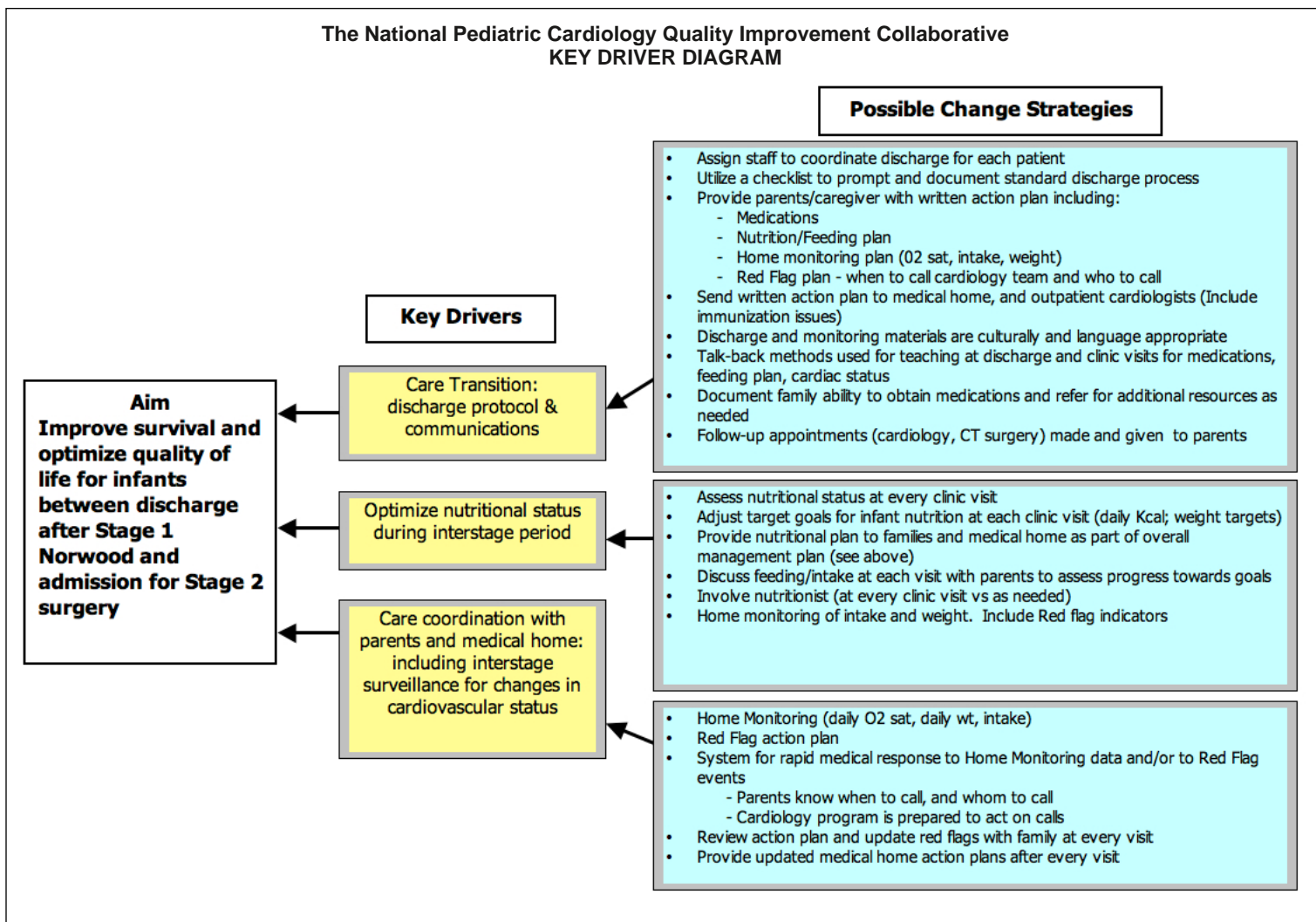


Figure 3. The Key Driver Diagram used to guide the NPC-QIC Quality Improvement efforts.

“interstage” period. Because there are no formal published care guidelines for this population, the project team reviewed the medical literature, interviewed parents of these infants, considered expert (Task Force) consensus, and assessed variation to develop a Key Driver Diagram (Figure 3). A key driver diagram is typically used in a quality improvement project to provide a framework for the proposed changes that focuses on the factors most likely to lead to the goal of improved outcomes for these infants.

The key drivers are:

- Assuring Safe Care Transitions
When an infant is discharged home after a Norwood, a number of important

care transitions occur. The patient transitions from a highly technical inpatient environment to the home setting; responsibility for most aspects of care shifts from the inpatient team to the family, and a hand-off occurs from the pediatric cardiology subspecialist to a primary caregiver.

- Optimizing Interstage Nutrition
Infants with a Norwood procedure fail to grow normally during the interstage period, prior to the Glenn shunt. A recent retrospective study documented poor interstage weight gain in infants with a single ventricle prior to the Glenn, and demonstrated that infants with the poorest pre-op weight gain had worse early post-Glenn outcomes.²

- Facilitating Care Coordination with Parents and the Medical Home

Interstage care for these infants is complex, with a clear need for improved care coordination among the families, cardiologists, primary care providers and the medical home.

Participating teams are engaging in a series of face-to-face workshops, webinars and a listserv as part of a modified learning collaborative based on the Institute for Healthcare Improvement Breakthrough Series Model. This model involves a 12-month longitudinal learning community that is based in improvement science theory and evidence about continuing education methods.

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It is expected that additional useful clinical process changes will be identified through this collaborative network of cardiology centers. Quality improvement control charts documenting clinical processes and patient outcomes will be provided to each center on a secure, password-protected site. These charts will display data from individual



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The Research Fellowship Award is made possible by an educational grant from the Helen and Will Webster Foundation.

**Table 3: JCCHD NATIONAL QUALITY IMPROVEMENT INITIATIVE
Guiding Principles**

Adopted September 18, 2006

1. The goal of the QI Initiative is to improve care and outcomes for children with cardiovascular disease.
2. The JCCHD will determine the major directions in the development of this QI Initiative through its delegation to the QI Initiative Steering Committee. A strategy will be developed and implemented to facilitate communication about the Initiative with the larger pediatric cardiology community.
3. The QI Initiative, through multiple improvement projects, will address the spectrum of pediatric cardiovascular inpatient and outpatient care: including case finding, diagnosis, treatment, recovery, discharge and follow-up (including handoffs). The initiative will begin with an initial well-focused project.
4. A national, multi-institutional database for the purpose of supporting quality-improvement projects will be a part of this initiative. Where related databases exist that may be beneficial to the QI Initiative, they will be utilized to the extent possible.
5. The QI Initiative will seek to involve all Pediatric Cardiology programs and practices, from small to large. We will make an effort to emphasize inclusion of all programs with Pediatric Cardiology Fellowships because they are our future.
6. Quality improvement science, emphasizing the Model for Improvement, will be the preferred approach taken by these projects.
7. An emphasis will be placed on including: patients, parents and families in the design and implementation of projects. We will strive to be inclusive of diverse cultures and values.
8. The QI Initiative will take a collegial approach to the involvement of important related specialties, including Cardiothoracic Surgery, Pediatric Critical Care Medicine, Anesthesia, Nursing, Social Work and Child Life.

centers to enable them to track their improvements, and to allow comparison against aggregate collaborative data.

Benefits of this collaborative project are likely to extend well beyond the care of infants with a Norwood. It is expected that many of the clinical improvements identified during this project will be generalizable to the care of other infants and children with congenital heart disease. As an added bonus, NPC-QIC will allow cardiologists participating in this project to satisfy the American Board of Pediatrics Part 4 "Maintenance Of Certification" requirements.

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CCT

For more information about the JCCHD QI Collaborative, and to learn how your program can join, visit the website at:

www.jcchdqi.org

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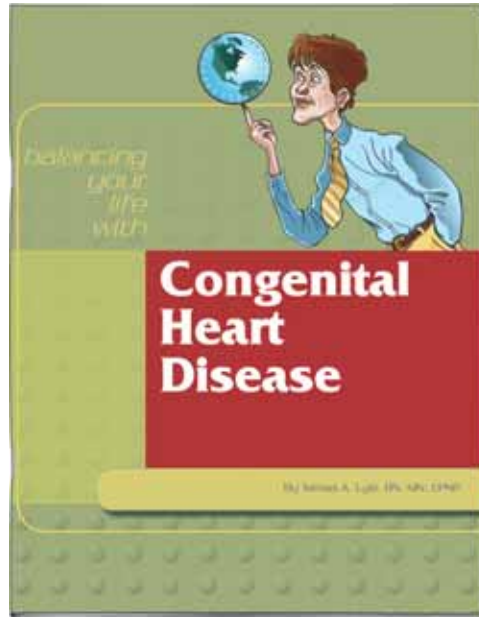
BOOK REVIEW: "Balancing Your Life with Congenital Heart Disease" by Teresa Lyle, RN, MN, CPNP- Published by Pritchett & Hull Associates, Inc., Atlanta, GA; 2009

By John W. Moore, MD, FACC

This 56 page pamphlet provides a comprehensive guide for teenagers and adults living with congenital heart disease. It is written at the 9th grade reading level, and it received a superior "Suitability Assessment of Materials" (SAM) score of 93%.

The SAM score was derived from a method of evaluating health care instructions devised by Cecilia C. Doak, Leonard G. Doak and Jane H. Rook, in their book, *Teaching Patients with Low Literacy Skills*, 2nd edition, 1996. The score assesses 6 areas of development including: content, layout and typography, literacy demand, learning stimulation/motivation, graphics and cultural appropriateness. The SAM score is widely accepted among education professionals as an assessment tool for health educational materials of low-literacy patients.)

In my view, this guide provides materials which will help patients understand their condition, and it provides safe guidelines to help them make healthy choices. It contains well-written sections with adequate content covering important health issues to be aware of (e.g. arrhythmia, endocarditis, heart failure, chest pain, and chronic cyanosis); Planning the future (e.g. healthy personal habits, diet, exercise); and Making good choices (e.g. intimacy, family planning, pregnancy, career, health insurance, disability insurance and benefits, advance directives, and end-of-life considerations). In addition, there are diagrams which illustrate all of the common lesions and surgical corrections. These diagrams are constructed so that the patient may take notes about the most important issues related to their particular lesion(s). For example, Tricuspid Atresia has four diagrams including: the lesion itself, the classic Fontan repair, the lateral baffle repair and the extra-cardiac conduit repair. Opposite the page with these diagrams is a page for notes about potential long-term problems including: arrhythmias, ventricular failure, elevated venous pressure, liver and/or kidney failure, varicose veins, and protein losing enteropathy for pregnancy recommendations. The pamphlet is illustrated with many tri-colored cartoon-type pictures that are upbeat and supportive of the written material and diagrams



Book Cover: "Balancing Your Life with Congenital Heart Disease" by Teresa Lyle, RN, MN, CPNP. Photo provided by Pritchett & Hull Associates, Inc.

This guide is inexpensive and could be purchased by a congenital practice or program for distribution to appropriate patients, families, etc. It is also available for direct purchase by the public. More information can be found at www.p-h.com.

I recommend that you take a good look at it and consider incorporating it into your practice.

CCT

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Medical News, Products and Information

Toshiba Enters Ultra-Portable Ultrasound Market with Laptop System

Many hand-carried ultrasound systems offer better access to patients when space is compromised, but cannot provide all of the advanced radiology capabilities required to perform exams in today's demanding ultrasound environment.

Designed to meet the needs of today's hospitals by combining portability with high-end radiology features, Toshiba America Medical Systems, Inc. has introduced the new Viamo™ laptop ultrasound system (works-in-progress), the industry's no-compromise ultrasound system with advanced radiology capabilities, previously unavailable on hand-carried systems. Toshiba showcased the Viamo at last Fall's Radiological Society of North America (RSNA) annual meeting, in Chicago.

The Viamo combines the portability of a laptop system with advanced radiology features to deliver outstanding image quality, enhance diagnostic confidence and improve ease of use. Developed from a radiology foundation, Toshiba's Viamo provides the confidence to image patients at bedside, which generally requires larger, more expensive cart-based systems. When an immobile patient needs a high-end ultrasound exam, the portable Viamo laptop ultrasound is brought to the patient to improve the patient's comfort without compromising exam quality. It is also ideal for a variety of patient exams, including traditional radiology, pediatric, emergency, OB/GYN, vascular and bariatric.

"The Viamo provides the best value in the hand-carried class by offering a feature-rich, portable system at a reasonable price point," said Girish Hagan, VP Marketing, Toshiba. "With the ability to perform high-end radiology exams using a portable laptop system, Viamo rounds out Toshiba's ultrasound product line, delivering function and value in the hand-carried segment, along with the exceptional image quality and clinical accuracy Toshiba is known for."

The new Toshiba Viamo laptop ultrasound system offers:

- Best-in-class imaging capabilities in a laptop size, making it ideal for high-end radiology, vascular, emergency, bariatric and OB/GYN exams, even at bedside. For example, Viamo is beneficial during liver transplants when medical personnel must image the anastomoses to assess blood flow through the vessels.
- Excellent image quality and color flow comparable to those of larger, more expensive cart-based systems.
- Ease of use with a simple touch-screen interface that is programmable in panel or tablet modes.
- Ability to interchange Toshiba transducers while using the Viamo's transportation pole, thus improving productivity and flexibility while saving health care costs by reducing the need to purchase multiple transducers. This unique feature improves productivity and saves money for current customers by using their existing Toshiba transducers on the Viamo. Additionally, new customers are able to use Viamo transducers with other Toshiba ultrasound systems they may purchase in the future.

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CLINICAL TRIAL ALERT: US Clinical Trial Seeks Patients with Congenital Heart Valve Disease for Minimally-Invasive Pulmonic Valve Replacement

Children born with congenital heart valve disease typically face the burden of multiple open-heart surgeries throughout their lives, either to replace their "native" diseased valves or, as they age, their prosthetic replacement valves. This creates a number of challenges for them and their families, as they face repeated exposure to anesthesia and cardiopulmonary bypass, scar tissue that can result from multiple open-chest surgeries, increased risk for infection or illness and the disruption that the many surgeries and recovery periods can have on their lives.

A new alternative for people with a congenital defect in the valve between the heart's right ventricle and the pulmonary artery is currently being explored. Transcatheter heart valve replacement, in which a prosthetic heart valve is delivered to the heart via a catheter, is making headlines around the world. According to a recent article in the *New York Times*, the new valves are the "next big thing in heart surgery" because they "make it possible to repair the heart without the rigors of chest-opening surgery."

Patients are currently being sought for participation in a US clinical trial that will assess the safety and effectiveness of a transcatheter heart valve replacement in patients with a failing pulmonary valve conduit.

This clinical study will enable doctors to offer a far less-traumatic treatment option, giving patients the opportunity to remove at least one open-chest surgery from their course of treatment, experience a quicker recovery and more easily resume their normal activities.

About the procedure: The valve – the Edwards SAPIEN transcatheter heart valve – is compressed to the approximate diameter of a pencil and threaded via a catheter through the circulatory system from a small incision in the leg. The valve is then deployed in the pulmonary valve conduit. This is accomplished as a "beating heart" procedure that does not require cardiopulmonary bypass or an open-chest incision.

Additional information: Patients suffering from moderate to severe pulmonary regurgitation due to a congenital defect are encouraged to review the study criteria located here, and contact one of the clinical trial locations for additional information: <http://www.clinicaltrials.gov/ct2/show/NCT00676689>.

The study is known as COMPASSION: COngenital Multicenter Trial of Pulmonic VALve Regurgitation Studying the SAPIEN InterventIOal THV.

New Genetic Cause of Cardiac Failure Discovered

Over the course of a lifetime, the heart pumps some 250 million liters of blood through the body. In the order to do this, the muscle fibers of the heart have to be extremely durable. The research group headed by Dr. Wolfgang Rottbauer, Vice Chair of the Department of Medicine III at Heidelberg University Hospital (Chairman: Prof. Dr. H. A. Katus), has discovered a protein that is responsible for the stability of



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The Department of Pediatrics of the University Of Illinois College Of Medicine at Peoria (UICOMP) and Children's Hospital of Illinois (CHOI) seeks Pediatric ECHO Cardiology candidates who are board-certified or board-eligible in pediatric cardiology. Join a team of 7 pediatric cardiologists with 30 plus years of success in the region. Professional efforts will be bolstered by the support of 2 pediatric cardiovascular surgeons and a fully staffed cardiac intensive care unit with cardiac intensivists. In addition to general pediatric cardiology, opportunities focus on echocardiography, fetal echocardiography, and adult congenital disease.

Other highlights:

- 5,000 echocardiograms (including transesophageal and fetal echos) last year.
- 200 catheterizations (60% interventional) and 175 pediatric cardiovascular surgeries last year.
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- Call of 1:6.
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CHOI is the primary pediatric teaching facility for UICOMP and is a 127-bed facility that offers over 100 pediatric programs and services. CHOI is the only full service tertiary hospital for children in central Illinois with a designated Level I Trauma Center, a Regional Perinatal Center, and a Level III neonatal intensive care unit.

Please contact or send CV to: Marie Noeth at Ph: (309) 683-8350; Fax: (309) 683-8353;

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Candidates with strong clinical skills, particularly in fetal echo are strongly preferred. Additional training or expertise in electrophysiology, post-operative care, and/or echocardiography preferred. Research interests in any of these areas a plus.

This position includes responsibilities for teaching students, residents and fellows. Outpatient and inpatient venues are included.

Interested candidates should submit a curriculum vitae, letter of interest and names of three references to our academic website:
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the smallest muscular unit, the sarcomere. In cooperation with other researchers within the National Genome Research Network (NGFN) which is funded by the German Federal Ministry of Education and Research, especially Prof. Dr. H. Schunkert from the University of Lübeck and Prof. Dr. M. Stoll from the University of Münster, they proved that mutations of this protein are the cause of a new type of heart failure. The results were published in the November 2009 issue of *Nature Medicine*.

Primary heart muscle disease with decreased cardiac pump function leading to enlargement of the heart chambers (dilated cardiomyopathy) is one of the most frequent causes of chronic heart failure. Six new cases per 100,000 people occur each year; 20% of these cases are genetic. The heart disease weakens cardiac cells and the heart can no longer pump efficiently which leads to dilation of the cardiac chambers.

Muscle activity takes place in the smallest unit of muscle fiber, the sarcomere. In the presence of an appropriate stimulus, actin and myosin filaments interact and contract the muscle. These movable elements are anchored in what are known as Z-disks. With every heartbeat, enormous forces act on the Z-disks.

"In our studies of zebrafish, we discovered a protein that is needed to stabilize the Z-disk. If this protein (nexilin) is mutated, the movable muscle elements are no longer anchored firmly enough. The muscles then lose strength and the heart is weakened," explains Dr. Tillman Dahme, resident and co-author of the study. The researchers examined the genetic material of affected patients and verified a mutated Z-disk protein in 9 of 1000 participants. They showed that in these patients, the defective nexilin was the major cause of heart disease. "The nexilin dilated cardiomyopathy allowed us for the first time to describe a new form of heart muscle dilatation and define the mechanism causing it, namely destabilization of the Z-disk," says Dahme.

The studies also showed that the extent of the damage to the Z-disk is directly related to the workload. This insight has an influence on clinical therapy. "Patients with a nexilin mutation might benefit from early treatment with medications that reduce cardiac stress. This could lower the mechanical stress on the Z-disks and prevent progressive damage to the heart," said Dr. Rottbauer.

Toshiba introduces New Hybrid Catheterization Table, for its Five-Axis Cardiovascular X-Ray Line

Toshiba America Medical Systems, Inc. has introduced the CAT-880B, a new hybrid catheterization table, for its five-axis Infinix™-i cardiovascular X-ray line. Toshiba featured the new hybrid table at last year's Radiological Society of North America (RSNA) annual meeting in Chicago.

The new integrated hybrid catheterization table offers head-to-toe tilting and side-to-side cradling to meet the needs of both interventionalists and surgeons during hybrid intervention. Combining the new table with the unparalleled patient access and coverage achieved by Toshiba's Infinix-i five-axis X-ray systems creates a "best-in-class" hybrid lab unmatched in the industry today.

Drs. John Cheatham, Director, Cardiac Catheterization and Interventional Therapy, and Mark Galantowicz, Chief, Cardiothoracic Surgery, both of The Heart Center of Nationwide Children's Hospital, are recognized for pioneering the hybrid approach to treat congenital heart conditions. Both physicians worked with Toshiba engineers to design the new table, and evaluated the prototype to ensure it met their needs in a real-life hybrid setting. Today, Nationwide Children's is the first site with this hybrid catheterization table in use at its hybrid cath lab.

"Using this new hybrid catheterization table in conjunction with Toshiba's bi-plane five-axis cath lab is the final piece in creating a premium hybrid suite," explains Dr. Cheatham. "The table is uniquely designed to meet the individual needs of both interventionalists and surgeons. It allows them to perform the same functions used in their respective home environments – the operating room and the cath lab – together in a single hybrid suite without any sacrifice in patient access, ergonomics or efficiency."

When working on patients in a hybrid setting, it is critical the imaging system provides outstanding image quality, as well as the flexibility to reach ancillary equipment and the patient quickly and easily. The new hybrid catheterization table features a 550-pound table weight limit, making this table ideal for a range of patients, from pediatric to bariatric. It also allows for angulations of up to 16 degrees in all four directions and offers the lowest table-top height of any catheterization table in the industry. The 75-cm table height is



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particularly important for open surgical procedures, as it provides ultimate patient access and physician comfort, regardless of the procedure being performed. With the new table, Toshiba's Infinix-i five-axis X-ray systems are designed to accommodate endovascular catheter based techniques, open surgical settings or a combined hybrid approach, for procedures including Hypoplastic Left Heart Syndrome and intraoperative stent therapy.

"Patient access is critical for endovascular, open surgical or hybrid cath lab procedures because it allows physicians to complete the exam more easily and more comfortably," said Robert Micer, Director, X-ray Vascular Business Unit, Toshiba. "The CAT-880B hybrid catheterization table is designed to create the ideal hybrid cath lab when combined with our Infinix-i five-axis X-ray systems."

The table is currently available on all five-axis Infinix-i systems and will be available for other Infinix-i configurations in the near future.

New Tool for Helping Pediatric Heart Surgery

A team of researchers at the University of California, San Diego and Stanford University has developed a way to simulate blood flow on the computer to optimize surgical designs. It is the basis of a new tool that may help surgeons plan for a life-saving operation called the "Fontan" surgery, which is performed on babies born with severe congenital heart defects. The researchers presented their findings at the 62nd Annual Meeting of the American Physical Society's (APS) Division of Fluid Dynamics, Fall 2009 in Minneapolis, MN.

Babies who get this surgery have a developmental disease where one of the chambers -- or ventricles -- of the heart fails to grow properly. This leaves their hearts unable to properly circulate blood through their lungs and starves their bodies of oxygen. The lack of oxygen turns their skin blue, a condition sometimes referred to as "Blue Baby Syndrome" for that reason.

The Fontan surgery is one of three surgeries performed immediately after birth to replumb the circulation of children born missing their left ventricles. The operation essentially connects the veins that would normally bring blood into the right side of the heart with the pulmonary arteries. The aim is to redirect the blood flow so that it becomes properly oxygenated, allowing the patient to survive with only one functional pumping chamber. Before the advent of this type of surgery in the early 1970's, these sorts of heart conditions were uniformly fatal.

There are still risks, including exercise intolerance, blood clot formation, and eventual heart failure requiring transplantation. Doctors mitigate this risk by carefully planning the surgery, starting with images of a baby's heart and then sketching out their plans. UCSD's Alison Marsden has been working with surgeons at Rady Children's Hospital and Stanford University to develop a new computational tool to assist in this process. In addition, Dr. Marsden and cardiologist Jeff Feinstein have developed a new Y-graft design for the Fontan surgery that is expected to be put into clinical use within a few months.

"Our ultimate goal is to optimize surgeries that are tailored for individual patients so that we don't have to rely on a "one-size fits all" solution," says Marsden.

The tool first uses imaging data to construct a model of an individual baby's heart and then allows doctors to input their surgical designs. The computer can then systematically explore different potential designs using powerful optimization algorithms, similar to those used in the aerospace industry for aircraft design. It then applies fluid dynamics to simulate the blood flow after reconstruction. This way, says Marsden, surgeons can test their plans and evaluate blood flow patterns before operating.

NIH Award Brings Together Pediatric, Adult Heart Disease Research and Training

The National Institutes of Health, National Heart, Lung and Blood Institute, recently awarded researchers at Nationwide Children's Hospital and The Ohio State University Medical Center (OSUMC) a five-year, \$1.4 million grant to provide in-depth training to clinicians and basic scientists in congenital and acquired heart disease.



The University of Maryland Hospital for Children is developing a comprehensive Children's Heart Center to meet the cardiovascular healthcare needs of the children of Maryland. We are currently recruiting for a variety of faculty positions. Sub-specialty board certification or equivalent work experience is required for each position. Clinical duties will focus primarily in the respective field of each position and participate to varying degrees in the general pediatric cardiology and outpatient practices. The Children's Heart Center supports integrated quality enhancement and clinical research practices to improve patient outcomes and patient/family experience.

The successful candidates will have faculty appointments in the Department of Pediatrics of the University of Maryland School of Medicine at academic levels to be determined by experience. The University of Maryland Medical Center is a major academic tertiary care center serving Baltimore, the state of Maryland, and the mid-Atlantic region. As the oldest public medical school in the United States, the University of Maryland School of Medicine has an established tradition of outstanding clinical care, education, and research. The Department of Pediatrics is deeply committed to promoting children's health in the community and across the state, while supporting innovative clinical programs and expanding research initiatives.

Located on the modern and urban campus of the University of Maryland at Baltimore, The School of Medicine is one of seven professional schools within the University of Maryland system. The campus is ideally located within walking distance to the Baltimore Inner Harbor, National Aquarium, Baltimore Convention Center, Hippodrome Theatre, Orioles Park at Camden Yards and Baltimore Ravens M & T Bank Stadium. The University of Maryland Hospital for Children is also close to Historic Annapolis, the Chesapeake Bay, Washington DC, and many residential communities with outstanding public and private schools. The area offers rich cultural fabric and many unique recreational opportunities. The University of Maryland is an EOE/AA/ADA and encourages minorities to apply.

Interested applicants should send CV to:

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This training program is the first in the country that focuses on cardiovascular disease as a continuum from fetal life to senescence, allowing Nationwide Children's and Ohio State to be well-positioned to have a measurable impact on cardiovascular disease, and to foster new collaborative opportunities between the institutions.

Pamela A. Lucchesi, PhD, Director of the Center for Cardiovascular and Pulmonary Research at Nationwide Children's Hospital, and Terry S. Elton, PhD, Interim Director of the Dorothy M. Davis Heart and Lung Research Institute at OSUMC, are co-principal investigators for the grant.

"Cardiovascular disease does not begin in adulthood. One of our research priorities is to discover more about how and why adult cardiac disease starts in childhood," explained Dr. Lucchesi. "Learning about adult heart disease predictors in the pediatric population will lead us to more options for early intervention with pediatric patients and prevention of adult heart disease later in life."

"This grant represents an exciting opportunity to provide training for the next generation of translational scientists," said Dr. Elton. "Translational medicine, the newer approach to improve human health, incorporates scientific discoveries that must be translated into practical applications. Such discoveries usually originate at 'the bench' from basic research, in which scientists investigate disease at the molecular or cellular level, then progress to the clinical level, or the patient's 'bedside.' Scientists realize that this bench-to-bedside approach to translational research is necessary to advance patient care. Basic scientists provide clinicians with innovative ideas for use in patients, and clinical researchers make novel observations about the nature and progression of disease at the molecular or cellular level that often stimulate basic investigations."

While the award expands the opportunities for training, it also fosters collaboration among the area's pediatric and adult care clinicians.

"This grant further enhances the excellent cardiology fellowship programs at both institutions and encompasses our overall mission of being able to train the next generation of physicians who can advance the field for patients with heart disease of all ages. Our programs – pediatric, adult, and combined adult congenital heart disease – benefit greatly from this grant as we train future academic leaders while providing state-of-the-art care," explained Timothy Hoffman, MD, Cardiology Fellowship director at Nationwide Children's.

Alex Auseon, DO, Associate Director of the Cardiovascular Training Program at OSUMC, added, "As two nationally recognized training centers in cardiology located within minutes of each other, Ohio State and Nationwide Children's have a long history of cooperation in clinical training of residents and fellows, but we've only just begun to realize the potential of collaboration in the research arena. This grant will allow for a formal, structured relationship that will foster research innovation and productivity, benefiting patients of all ages with cardiovascular disease."

"As the needs of these pediatric and adult cardiac populations increase, a partnership between pediatric and adult hospitals and research institutes will provide a more comprehensive approach toward treating and preventing this prevalent health problem," said Dr. Lucchesi.



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Children's HeartLink's Second Medical Mission to Malaysia Strengthens Cross-Cultural Partnership

By Carrie Ellis and Bistra Zheleva

The statistics vary, but for physicians, nurses, researchers and others covering pediatric cardiac issues, they are all too familiar. Approximately one in 120 children around the world is born with congenital heart disease. It is the most common birth defect across the globe, yet close to 90% of children in developing countries are left untreated. This year alone, up to 15 million children will face death, shortened lifespans or difficult adaptations to physical limitations, not for a lack of knowledge, but for a lack of access to the cardiac care they need. Children's HeartLink, a Minneapolis-based international non-profit organization, helps build sustainable pediatric cardiac programs in the developing world, giving thousands of children access to treatment. The organization works in partnership with hospitals in underserved countries to provide education and training

for medical professionals, targeted technical assistance, treatment for needy children, rheumatic fever and Chagas disease prevention programs, and donated equipment and supplies.

On October 4 – 9, 2009, Children's HeartLink sent a team of volunteers on a cardiac medical mission to Kuala Lumpur, Malaysia, to participate in a week of lifesaving activities in partnership with local pediatric cardiac professionals. The mission to National Heart Institute (IJN - Institut Jantung Negara), a regional center of excellence in cardiac care, included a group of seven volunteer physicians, nurses and technicians from Birmingham Children's Hospital in the United Kingdom. They were led by pediatric cardiac surgeon David Barron, MD. The visit was Children's HeartLink's second sponsored mission of the Birmingham Children's team to IJN. During this visit, the main objectives were to continue collaboration with IJN to advance its pediatric cardiac program, and to help improve the diagnosis and treatment of complex cases, particularly those in infants. In addition to providing advanced training to the local cardiac medical staff, led by Mohd Azhari Yakub, MD, the team provided patient screening and treatment.



Patient Profile: Nurain

One of the patients treated was Nurain, a four-month old girl from the state of Johor in Malaysia. Nurain had transposition of the great arteries and a ventricular septal defect. She has spent much of her short life in hospitals. When she was two months old, Nurain's parents took her to a regional hospital in Johor because she was having difficulty breathing. She was diagnosed with pneumonia, and also tested positive for the H1N1 virus. It wasn't until she was receiving treatment for the pneumonia and H1N1 flu that her congenital heart defect was discovered.

Working together, the medical teams from the UK and IJN performed her operation on October 6; two days later she was transferred out of the intensive care unit in stable condition. After a couple of weeks, she was discharged from the hospital, and is now home with her family.

Mission Achievements

The Malaysia medical mission was a success, as well as a testament to the benefits that can result from cross-cultural information sharing, mentoring, and more broadly—medical diplomacy.

Including Nurain, seven patients received operations—two of which were arterial switch procedures.

The Birmingham Children's team provided important training and education to the IJN staff through lectures, bedside training, tutorials, ward rounds, case-based discussion and strategic leadership. Approximately 100 clinical IJN staff members, as well as visiting staff from Vietnam, attended lectures given by Fiona Reynolds, MD, an intensivist from Birmingham Children's. Dr. Reynolds lectured on several topics, including hemofiltration and dialysis and the management of low cardiac output state.

Both medical teams reviewed the status of patients treated during the first Children's HeartLink mission to IJN in April 2008, not only providing continuity of patient care, but reinforcing the relationship bonds between the Birmingham Children's and IJN medical teams. At the end of the week, several of those patients paid a visit to the team; all of them were healthy and doing well.



Top: Dr. John Wright from Birmingham Children's Hospital demonstrating a postoperative echo on a patient to the intensive care staff.

Bottom: Dr. David Barron, cardiac surgeon from Birmingham Children's, and Dr. Sivakumar, cardiac surgeon from IJN, perform an operation while a visiting cardiac surgeon from Vietnam observes.

On each of their medical missions, Children's HeartLink team members help build bonds of friendship across cultures



Four-month old Nurain, who received an operation for TGA, with mother, Rosnaini, in the ward after ICU discharge.



Four-month old Sufi with mother, Nor Faizura, operated for pulmonary atresia and VSD.



ICU nurse Marie Fewtrell from Birmingham Children's Hospital with patient Nurain.



ICU nurses Marie Fewtrell and Sophie Jones from Birmingham Children's Hospital demonstrate ICU techniques to the IJN nursing staff.

and between patients, doctors, nurses and families. Children's HeartLink cherishes and recognizes its responsibility of fostering medical diplomacy, bringing education, training and sustainable improvements in cardiac services to parts of the world that need it most.

"Children's HeartLink is committed to improving the lives of children suffering from heart disease around the world," said Estelle Brouwer, Vice President and International Programs Director of Children's HeartLink. "With this partnership, Dr. Barron and his team, together with Dr. Azhari and his team, were able to treat children in need while sharing knowledge and skills for the benefit of more children in the future. The contributions of our dedicated medical volunteers and the support we receive from corporate and individual donors are wonderful examples of how through collaboration, we can help save the lives of many more children."

About Children's HeartLink

Children's HeartLink, founded in Minneapolis in 1969, is an international medical NGO dedicated to the treatment and prevention of heart disease in needy children. The goal of Children's HeartLink is to improve existing cardiac programs in underserved countries and to empower local hospitals to care for children in their own region with consistent, high-quality, sustainable services. Children's HeartLink currently works with partners in Brazil, China, Ecuador, India, Kenya, Malaysia, South Africa, Ukraine and Vietnam. For more information, or to support Children's HeartLink, visit the website www.childrensheartlink.org.

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