

# CONGENITAL CARDIOLOGY TODAY

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## PERCUTANEOUS CLOSURE OF PATENT DUCTUS ARTERIOSUS AT HIGH-ALTITUDE

By Jacek Bialkowski, MD and Malgorzata Szkutnik, MD

We had the pleasure of organizing and conducting the third annual La Paz workshop and course relating to progress in non-surgical treatment of congenital heart malformations, which took place from October 30-31, 2006. In addition to our group, Drs. Jacek Bialkowski and Malgorzata Szkutnik (from Poland), our friends – Dr. Ramon Bermudez Canete (from Spain) and Dr. Luigi Ballerini (from Italy) were involved. All the workshops were organized in the Hospital Obrero – National Insurance Company in La Paz, Bolivia. This town is beautifully situated in the Andes (Altiplano) at about 3800 meters above sea level and is the highest capital city in the world (Figure 1). The previous workshops, also organized by the Polish team, took place in 2004 and 2005. Dr. Ramiro Menacho Delgadillo was the host of this year's meeting, and each workshop and course was attended by 10-30 cardiologists from all over the country. We were the first foreign medical team in this center to organize such an educational-therapeutical-scientific program. In a high altitude environment (as in La Paz) the concentration of oxygen and the barometric pressure are decreased by as much as 40% with respect to

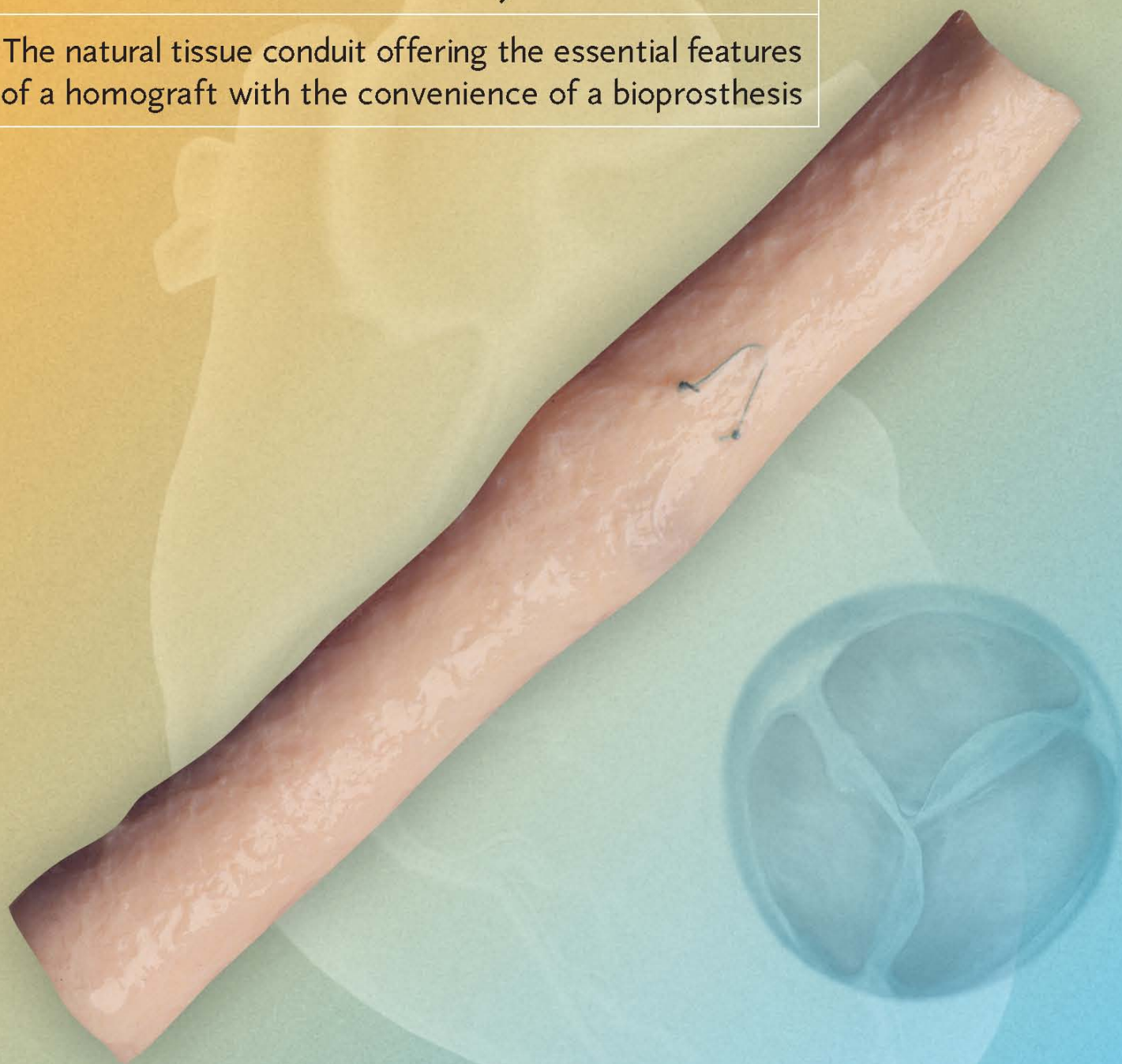
the values at sea level. This results in hypoxia and other pathophysiological changes. The first description of acute mountain sickness (soroche) experienced by lowland natives at high altitude was described in 1590 by the Spanish writer, Jose de Acosta, describing observations made in Peru and Bolivia. The high altitude environmental stress is caused by several factors, such as hypoxia, high solar radiation, cold, disturbances of pulmonary ventilation (respiratory alkalosis), etc. There are multiple effects on the circulatory system including: an increase in heart rate, a decrease of cardiac output, an increase of red blood cell count, the hemoglobin content increases, as well as the viscosity of blood. For the cardiologist, two important physiologic changes connected to a high altitude environment are of interest. One is pulmonary hypertension due to chronic hypoxia. Adults at rest have a mean pulmonary artery pressure of (MPAP) 28 mm Hg [1], and the younger children – 45 mm Hg [2]. The mechanism of this phenomenon is due to hypertrophy of the muscular media of the pulmonary arterioles. The research work by Dante Penalzoa and his coworkers in Peru was most important for the understanding of the fundamental pathogenesis of pulmonary hypertension [3]. The second phenomenon of interest is the high persistence of patent ductus arteriosus (PDA) which is probably also due to chronic hypoxia [4]. Although the latter problem was given less attention previously, it is becoming more important because of the availability of non-surgical closure of PDAs. The high altitude areas located above 3000 meters inhabited by a large human population, include areas of the Andes in South America, the Tibetan Plateau in Asia and the high plains of Ethiopia and Lesotho in Africa. These are developing countries with limited medical resources and few cardiovascular facilities. Hence the experience we gained during the



Figure 1. Town La Paz – The highest situated capital in the world.

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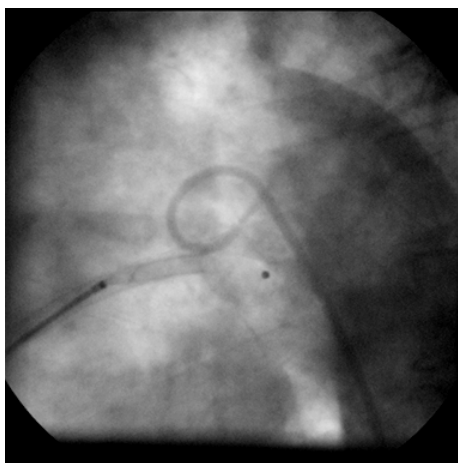


Figure 2. Opened disc of Amplatzer Duct Occluder (arrow) in calcified ampulla of PDA in 50 year old woman. The device is still attached to the delivery system.

transcatheter closure of 10 PDAs in La Paz (Bolivia) is very valuable. Pulmonary hypertension was mostly moderate, but in two cases MPAP values were significantly elevated. The first case, a 2.5 year old child, who had a MPAP close to the systemic pressure, and the second case, a 50 year old woman MPAP, was 75% of systemic pressure. In both of these cases the occlusion balloon test (the temporary closure of the PDA) resulted in a significant (about 50%) reduction of MPAP, which enabled a safe transcatheter closure of the PDA. Our most important observation was the fact that 90% of the patients had a large ductus arteriosus (diameter exceeding 2.5 mm) Krichenko type A [5]. This was important because the best option of treatment was an Amplatzer Duct Occluder (ADO, AGA Medical Corp.). The other possibility, particularly when the PDA coexists with severe pulmonary hypertension, would have been the implantation of an Amplatzer Muscular VSD Occluder [6]. The one exception was a child of 11 kg who had type A PDA of 1.5 mm diameter in which we used a detachable coil 5PDA5 (Cook

Europe). It is worth mentioning, that in our own experience, PDAs of larger than 3mm, requiring an ADO implantation, are only 18.6% (68/365) [7]. A calcified PDA we found in a 50 year old woman with pulmonary hypertension appeared to be the most difficult case. This procedure was performed during the last workshop. Documentary evidence for the importance of percutaneous techniques in PDA closure in adults was supplied by us more than a decade ago [8]. Surgical closure of such an usually calcified PDAs is a challenge for the cardiac surgeon due to the fragility of the ductus tissues. The operation must be performed with extracorporeal circulation. Technically, placement of the device was difficult but finally the device was properly seated (Figure 2).

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***“Our activities attracted the interest of the local mass media. The media exposure had a great impact, resulting in the acceptance of these procedures by the local social insurance system.”***

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During our three workshops and courses in Bolivia, we performed 21 interventional cardiology procedures. Apart from the PDA closures, we also performed aortic and pulmonary balloon valvuloplasties and percutaneous closures of atrial septal defects (the latter during the second and third workshop, when a transesophageal ultrasound transducer was available). Live case



Figures 3 and 4. Cath lab in Hospital Obrero (during procedures).

demonstrations and hands-on workshops in the morning (Figures 3 and 4), and afternoon with evening lectures relating to the progress in interventional cardiology occurred. There were vivid discussions with the participants, which showed their interest in good interventional cardiology. Our activities attracted the interest of the local mass media. The media exposure had a great impact, resulting in the acceptance of these procedures by the local social insurance system.

This information from Bolivia has also resulted in local cardiologists now per-



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Figure 5. Dr. M. Szkutnik after the procedure.



Figure 6. Dr. J. Bialkowski (left) and Dr. R. Menacho-Dellgadillo (right)

forming the procedures, which is most rewarding for us. We expect Dr. Menacho to visit our Center in Poland. We are going to perform a number of procedures. It will be possible due to the "Kurt Amplatz" scholarship founded recently by AGA Medical Corporation, which enables us to train interventional cardiologists in our Center (Silesian Center for Heart Diseases, Zabrze, Poland). The information about this scholarship is on our internet web site [www.sercedziecka.pl](http://www.sercedziecka.pl). A similar scholarship for the cardiologist from

Latin America was founded by the Vatican – details on [www.sclatina.com/noticias](http://www.sclatina.com/noticias). Dr. Rolando Sanchez from Bolivia has just finished a one year scholarship in electrophysiology using these funds.

Shortly after our La Paz workshop, in Lima (Peru), we have participated in a Symposium of the Latin Pediatric Cardiology Society (LPCS) and I Congress of Latin Net of Pediatric Cardiology (November 2-4, 2006). We presented some of our investigations there (including closure of PDAs in altitude). The scientific level of this meeting was extraordinary – congratulations to the organizers!! I (JB) as coordinator of LPCS WG of Interventional Cardiology have discussed with Dr. Pedro Ferrer (President of LPCS) a project whereby our Society performs investigations about incidence, natural history and treatment of PDAs in habitants of highland. All interested persons (especially from Latin America) are very welcome!!!

#### Acknowledgement

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~CCT~

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## CHARLES E. MULLINS, A PIONEER IN INTERVENTIONAL PEDIATRIC CARDIOLOGY, RETIRES

By Virginia Dematatis

On January 26, 2007, Dr. Charles E. Mullins, Professor, Baylor College of Medicine and Chief Emeritus of The Charles E. Mullins Catheterization Laboratory of Texas Children's Hospital in Houston, Texas officially retired. The laboratory was dedicated in 2003 to honor the outstanding contributions Dr. Mullins has made to the field of pediatric interventional catheterization and the wonderful care he provided to tens of thousands of patients, both in Houston and around the world. Retirement festivities included the inaugural Charles E. Mullins Lecture Series, given by Professor Phillip Bonhoeffer, MD, consultant in pediatric cardiology at Great Ormond Street, London, England and a special retirement dinner. The lecture and dinner were attended by Baylor house staff, members of the Mullins Family, and a number of distinguished cardiologists from around the country, many of whom were trained by Dr. Mullins.

Dr. Bonhoeffer, renowned for his work resulting in the world's first percutaneous heart valve implantation, gave a highly entertaining morning lecture. He interspersed pictures of a trip in rural Africa with the early, more "primitive" days in the development of the bovine percutaneous pulmonary heart device. He explained the obstacles he faced with the development of the device and how these obstacles were overcome. He then ended his talk with complimentary remarks about Dr. Mullins, summarizing his illustrious career and pointing out that not only has Dr. Mullins been a

pioneer in the field of cardiac catheterization and an outstanding physician and teacher, he is also the author of *Cardiac Catheterization in Congenital Heart Disease: Pediatric and Adult*, the definitive book written on the subject of invasive cardiac catheterization. Dr. Bonhoeffer concluded his remarks saying, "You can't call him the grandfather of pediatric interventional cardiology because you have two grandfathers. Instead, he must be called the Father of Pediatric Interventional Cardiology because you can have only one father." All heads nodded at the "only one father" remark.

Dr. Mullins' admirers also gathered for a retirement dinner later in the day. The dinner began with a cocktail hour, during which the multi-talented Dr. Bonhoeffer joined a string quartet, playing pieces by Mozart on his violin. During dinner, Dr. Frank Ing, the new director of The Charles E. Mullins Catheterization Laboratory recited an amusing rap about Dr.



Dr. Phillip Bonhoeffer (left) and Dr. Charles Mullins (right).

Mullins and gave a wonderful slide show that celebrated Dr. Mullins as an inventor, physician, teacher, renegade, mentor, husband, award winner and ambassador. According to Dr. Ing, his last slide, taken in the cath lab with a halo of glaring light over Dr. Mullins' head proved he is a "saint" as well. Dr.



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- Intracardiac echocardiography
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- MR imaging

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- Drs. Gil Wernovsky, Paul Weinberg and Tom Spray from the Children's Hospital of Philadelphia
- Prof. Robert Anderson, Drs. Martin Elliott and Andrew Taylor from Great Ormond Street Hospital for Children, London
- Dr. Ziyad Hijazi from the University of Chicago
- Dr. Diane Spicer from the University of Florida

***"Dr. Bonhoeffer concluded his remarks saying, 'You can't call him the grandfather of pediatric interventional cardiology because you have two grandfathers. Instead, he must be called the Father of Pediatric Interventional Cardiology because you can have only one father.'"***

Marty O'Laughlin followed with a few Chuck Mullins stories, including one about a frustrating day in the cath lab when Dr. Mullins, known for his amazing patience with cardiology fellows, finally let loose, saying "Let's not use that needle like a sewing machine. If it didn't work the first 100 times, it won't work the second 100 times." Another anecdote relayed by Dr. Ron Grifka had the crowd laughing about Dr. Mullins' down-to-earth manner, unflappable demeanor and his obliviousness to popular culture (interventional cath being his lifetime preoccupation). According to Dr. Grifka, Dr. Denton Cooley, the renowned heart surgeon, told him a story about Dr. Mullins that began, "I don't think he gets out a lot. I don't think he sees any movies." Dr. Cooley then explained that one day the famous actor Donald Sutherland was shadowing Dr. Cooley as part of his preparation for an upcoming movie role. As Dr. Cooley and Sutherland walked down the hall, they ran into Dr. Mullins. Dr. Cooley introduced Donald Sutherland and Chuck asked him, "What are you? An interventionalist? An echocardiographer?" Donald Sutherland smiled and said, "I make movies." Chuck replied, "I do, too."



Dr. Ing presenting the Dr. Mullins with his bronzed boots.

Dr. Mullins will be remembered for his pioneering work in the field of pediatric and adult interventional cardiac catheterization, his dedication to his patients, his excellent mentoring and as a kind, unpretentious man of exceptional talent and ability. In recognition of the fact that Dr. Mullins' shoes are truly "impossible to fill," Dr. Ing decided to have Dr. Mullins' favorite cowboy boots, worn daily in the cath lab, bronzed. He presented the bronzed boots to Dr. Mullins as a parting gift and a symbol of this Texan's outstanding contribution to pediatric interventional catheterization.

~CCT~



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## CONGENITAL CARDIAC TOPICS AT THE 42ND ANNUAL MEETING OF THE SOCIETY OF THORACIC SURGEONS

By Marshall L. Jacobs, MD

Topics of interest and importance to congenital heart surgeons and pediatric cardiologists alike made up a considerable portion of the total scientific program of the recent STS meeting in Chicago. Among the podium presentations during the plenary sessions was the Maxwell Chamberlain Memorial Award winning paper entitled; "Determinants of Left Ventricular Dysfunction after Anatomic Repair of Congenitally Corrected Transposition of the Great Arteries," presented by Victor Bautista-Hernandez from Children's Hospital Boston. The authors reviewed their experience with anatomic repair of ccTGA since 1992, encompassing 44 patients. All had undergone atrial baffle procedures, which were combined with a Rastelli procedure (23 patients) or an arterial switch procedure (21 patients). Early mortality was 4% (n=2) with one late death. Follow-up was from one week to 12.4 years (median 2.7 years). Left ventricular function tended to deteriorate in patients with pacemakers (p=0.047). Patients with a Rastelli procedure were more likely to have worse postoperative left ventricular function compared to their preoperative state (p=0.046), while those receiving an arterial switch were not. The potential benefit of resynchronization pacing strategies highlighted the discussion.

Marshall Jacobs presented the Report of the 2005 STS Congenital Heart Surgery Practice and Manpower Survey. This study identified 248 congenital heart surgeons at 121 centers in the United States and 15 at eight Canadian

centers. Ultimately, completed survey questionnaires were returned by 217 actively practicing congenital heart surgeons (more than 80% of the target group). Average age of respondents was 48.3±8.3 years; range 33 to 78 years. Ninety-five percent are males. Seventy-nine percent are graduates of American medical schools. Fourteen percent received their congenital heart surgery training outside of the U.S. or Canada. Fifty-nine percent perform exclusively congenital heart surgery. Roughly one third do fewer than 100 congenital cases per year, one third do 100 to 199, and one third do more than 200 cases per year. Eleven are in their first year of practice. Three surgeons anticipated retirement within one year of the survey, 25 within five years, and 40 more within ten years. At the same time, 38 fellows will complete post-graduate training this year at 28 centers, and 19 of them will be seeking positions in North America. While this is admittedly a one-year snapshot of the fellowship training process, it appears that the number of young individuals preparing for careers in congenital heart surgery is, at this point, larger than the number who will be leaving the workforce through retirement. This disparity may in fact be lessened by the steadily increasing number of individuals with congenital heart disease surviving to adulthood and needing life-long care. The discussion focused on the establishment of appropriate plans for the training of congenital heart surgeons, and the establishment of a certificate of sub-specialization.

Cardiologist William T. Mahle of Atlanta was an invited speaker at the

"Congenital Surgical Forum." In a lecture entitled, "A Contemporary Understanding of Neurologic Outcomes after Neonatal Heart Surgery," Dr. Mahle shared his view of the complex interaction of preoperative, operative and postoperative events and their potential impact on neurodevelopmental outcomes of children with congenital heart disease. He emphasized that "neurodevelopmental deficits are the most common long-term morbidity for children and adults with congenital heart disease. While impairments in cognitive function are generally mild, a number of neurodevelopmental domains tend to be disproportionately affected in this population. Children and young adults who have undergone surgery for congenital heart disease have been found to have significant problems with attention, impulsivity, language skills, and visual-motor integration." [1]

He reviewed recent investigations that have helped us to understand the factors that predispose these children to later developmental deficits, pointing out that, "Some of the strongest predictors of later developmental deficits – such as associated genetic anomalies, are not directly related to surgical intervention. In addition, there appears to be a critical period immediately following neonatal surgical intervention where poor hemodynamic status may lead to subsequent developmental deficits." He suggested that, "Efforts to optimize the hemodynamic status following newborn heart surgery may result in improved school-age developmental outcomes." He also discussed ongoing efforts to reduce neurologic injury during cardiac



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*"Topics of interest and importance to congenital heart surgeons and pediatric cardiologists alike made up a considerable portion of the total scientific program of the recent STS meeting in Chicago. Among the podium presentations during the plenary sessions was the Maxwell Chamberlain Memorial Award winning paper entitled; 'Determinants of Left Ventricular Dysfunction after Anatomic Repair of Congenitally Corrected Transposition of the Great Arteries,' presented by Victor Bautista-Hernandez from Children's Hospital Boston."*

surgery by modifying circulatory support and bypass techniques. "Some of these strategies, such as optimizing hematocrit, have been found to be beneficial in randomized trials [2]." He said that other strategies have been proposed as being potentially neuroprotective, though to date they have not been critically evaluated. One such technique, continuous selective cerebral perfusion, is increasingly being utilized in the clinical realm. "While its efficacy has been supported by some animal studies, it has not yet been found to be of benefit in clinical studies." Dr. Mahle briefly cited data from a recent report from Cincinnati Children's Hospital Medical Center, wherein brain magnetic resonance imaging revealed that postoperative cerebral ischemic lesions were frequent, occurring in the majority of infants after the Norwood operation, despite the use of regional cerebral perfusion. In comparison to preoperative studies, postoperative NMR imaging demonstrated new or worsened ischemic lesions in 73% of patients, with periventricular leukomalacia and focal ischemic lesions occurring most commonly. Results were compared with preoperative, intraoperative, and postoperative risk factors to identify predictors of neurologic injury. Prolonged low postoperative cerebral oximetry (<45% for >180 minutes) was associated with the development of new or worsened ischemia on postoperative magnetic resonance imaging ( $P=.029$ ) [3]. In closing, Dr. Mahle advised that, "A critical appraisal of both intraoperative and postoperative interventions is warranted in order to improve long-term developmental outcome for our patient population." These remarks during the first day of the

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**Overview:** The Meeting will dedicate a special "Tribute to Prof. Fergus Macartney" by Douglas D Mair, and a Macartney Lecture "Would Tissue Engineering change the World?" by Sir Magdi Yacoub.

Other main subjects of the Program:

- Systolic Ventricular Function
- Ejection Fraction and regional EF
- Assessment of Diastolic Function
- Echocardiographic exam for Adult Congenital Heart Diseases
- Bicuspid aortic valve
- 3D Echo in Conotruncal malformations, AV Canal Defects, VSD.
- Assessment and quantification of Mitral / Aortic Regurgitation
- Assessment of Prosthetic Valve Function

The Social Program will have its highlights on the Max Mara Gala Dinner, with dinner and music under the sky of Mamiano.

program, were followed during the next two days by several papers that addressed the very same controversy, shedding some new light and raising still more questions.

Later in the Congenital Cardiac Surgical Forum, Dr. Frank Pigula of Children's Hospital Boston presented a paper entitled "Regional Low Flow Perfusion Versus Circulatory Arrest in Neonates: One-Year Neurodevelopmental Outcome." Thirty-one infants with HLHS or related lesions underwent surgery with either Deep Hypothermic Circulatory Arrest or Continuous Regional Low Flow Perfusion as the principle support technique. Neurodevelopmental outcomes were assessed using Bayley Scales of Infant Development. Mental Development Index (MDI) and Psychomotor Development Index (PDI) were similar in the two groups. PDI scores were lower than MDI scores in both groups. Intraoperative hematocrit, Circulatory Arrest time, and duration of ICU stay and hospital stay did not correlate with MDI or PDI. The authors concluded that Regional Low Flow Perfusion is a safe technique, but failed to demonstrate any advantage relative to Hypothermic Circulatory Arrest with regard to neurodevelopmental outcome measured at one year. Discussion of the paper focused on the potential limitations related to sample size, possible selection bias, and the fact that all patients had at least a few minutes of hypothermic circulatory arrest. Dr. Edward Bove of the University of Michigan commented that he will be presenting the interval results of a larger randomized trial comparing the two circulatory support techniques at the upcoming meeting of the American Association for Thoracic Surgery. He indicated that the results that he will be presenting are similar to those reported by Dr. Pigula, with comparable neurodevelopmental outcomes for the two groups.

In a separate session, Dr. Robert L. Hannan of Miami Children's Hospital gave a paper entitled "Complex Neonatal Single Ventricle Palliation Using Antegrade Cerebral Perfusion Instead of Deep Hypothermic Circulatory Arrest." He and his colleagues adopted the use of Antegrade Cerebral Perfusion in 2001. They have observed improved outcomes with respect to 30 day survival and one year survival during this time period, as compared to patients operated between 1995 and 2001. The survival benefit was less evident for patients stratified to a high risk group (weight < 2.5 kg., associated cardiac lesion). No formal assessment of neurodevelopmental outcome was undertaken. The authors conceded that the change in bypass support technique adopted in 2001 was coincident with several additional programmatic changes in the approach to complex neonatal surgery. The authors believe that Antegrade Cerebral Perfusion offers a survival benefit in their institution.

Finally, Dr. Guido Oppido and associates from the Orsola Hospital University of Bologna (Italy) gave a poster presentation entitled, "Moderately Hypothermic Cardiopulmonary Bypass and Low Flow Antegrade Selective Cerebral Perfusion for Neonatal Aortic Arch Surgery." They argued that deep hypothermia could be avoided if selective cerebral perfusion is maintained, and thus performed neonatal aortic arch reconstruction with body temperature at 25 degrees C.

These excellent scientific presentations only emphasized how much more there is to learn concerning the circumstances and determinants of neurologic injury associated with congenital heart disease and congenital heart surgery.

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The Toronto team has assembled a world-class faculty of scientists, physicians, surgeons, and allied professionals to join them in this "state of the art" conference.

The Toronto Symposium aims to be a little different from the usual medical meeting. The title of each lecture, whether addressing issues of basic science or clinical management, is framed as a topical question. Consequently we expect that the answers will be of direct relevance to your practice. This meeting will be suitable for anyone working in the field of congenital heart disease.

Each of the lectures will be recorded, and each participant will receive a DVD shortly after the meeting. Again, this is a little out of the ordinary, showing both a video of the lecturer in real time, and the simultaneous Power-Point presentation.

Copies of the DVD's from previous symposia can be purchased by e-mailing the Symposium organizer at [cardiac.symposium@sickkids.ca](mailto:cardiac.symposium@sickkids.ca).

Course Director: Andrew Redington, MD

Invited International Faculty: Includes: Jose Castillo (Las Cruces, NM); Yiu-Fai Cheung (Aberdeen, Hong Kong); Brian Duncan (Cleveland, OH); Camille Hancock-Friesen (Halifax, NS); Audrey Marshall (Boston, MA); Andrew Powell (Boston, MA); George Sandor (Vancouver, BC); Robert Shaddy (Salt Lake City, UT); Jeffrey Smallhorn (Edmonton, AB); Thomas Spray (Philadelphia, PA); Jeffrey Towbin (Houston, TX); and Katherine Yutzey (Cincinnati, OH).

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This case-based Symposium brings together many of the pioneers and leaders in Hybrid therapy from around the world to discuss how collaboration between interventional cardiology and cardiothoracic surgery can enhance care to thousands of patients with complex congenital heart disease.

"Two Perspectives. Single Focus" is the central theme of ISHAC - the value of interdisciplinary partnerships. The Symposium features lectures and moderated discussions on the latest approaches from an international faculty. Live cases are performed each day by the faculty from the Hybrid Cardiac Catheterization and Surgical Suites at Columbus Children's Hospital or from the University Laboratory Animal Resources Experimental Surgical Suites. A special Skills Workshop will be available to a limited number of Symposium registrants.

Course Directors: John P. Cheatham, MD and Mark Galantowicz, MD

International Faculty: includes: Hakan Akintuerk, MD; Zahid Amin, MD; Kurt A. Amplatz, MD; Renato Assad, MD; Emile Bacha, MD; Lee Benson, MD; Valerie K. Bergdall, DVM; Mark Boucek, MD; Edward L. Bove, MD; Redmond Burke, MD; Christopher Caldarone, MD; Qi-Ling Cao, MD; Mario Carminati, MD; Aldo R. Castañeda, MD; Craig E. Fleishman, MD; Ziyad M. Hijazi, MD; Sharon L. Hill, ACNP; Ralf J. Holzer, MD; Shengshou Hu, MD; Frank F. Ing, MD; Charles S. Kleinman, MD; Larry A. Latson, MD; Jinfen Liu, MD; Achi Ludomirsky, MD; Larry J. Meng, MD; Charles E. Mullins, MD; Carlos Pedra, MD; Simone Fontes Pedra, MD; Alistair Phillips, MD; Shakeel Qureshi, MD; Daniel Rowland, MD; Dietmer Schranz, MD; Michael J. Tynan, MD; Nikolay V. Vasilyev, MD; and Evan Zahn, MD.



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## QUALITY IN ECHOCARDIOGRAPHY – LABORATORY ACCREDITATION AS THE BENCHMARK

By Andrew M. Keller, MD

Today's health care organizations are held to a very high level of accountability -- by peers, by the general public, and by Medicare and other payors. The Intersocietal Commission for the Accreditation of Echocardiography Laboratories ("ICAEL") accredits echocardiography laboratories as a means to encourage and demonstrate performance at an acceptable level in a national venue. Created in 1996, by physicians and sonographers from multiple sponsoring organizations, the ICAEL has published an extensive document defining a set of minimum standards that are to be used by echocardiography laboratories as both a guideline and the foundation to create and achieve realistic quality care goals.

The process of being accredited by ICAEL begins with a comprehensive self-evaluation by laboratory staff. Many laboratories find that they have significant changes to make in order to meet the ICAEL standards. Policies and procedure documents need to be written or enhanced, echo education needs to be strengthened, technical protocols and patient reports need to be standardized and a quality assurance plan, that includes peer review and correlation, needs to be implemented. In addition, completion of the application for accreditation requires information on all aspects of laboratory operation as well as the submission of multiple case studies for review. The task of compiling, and cross tabulating the hundreds of pages of documents, copies of studies, and laboratory policies and procedures has been a major impediment to accrediting labo-

ratories. As a result, over the last three years only 22% of echocardiography laboratories that have purchased the accreditation standards have completed and submitted their application to the ICAEL. Of those, only 40% have been granted outright accreditation by the ICAEL.

### Accreditation linked to reimbursement

As a means to assure quality studies for their patients, payors have begun to require that echocardiography laboratories be accredited by the ICAEL. As an example, United Health Care, which acts as a payor for over 8,000 echocardiography laboratories, recently announced that accreditation is mandatory by June of 2008 as a condition for reimbursement for all outpatient echocardiography examinations. Other payors have also released payment policies. These policies are available on the ICAEL website ([www.ICAEL.org](http://www.ICAEL.org)). The push for accreditation begins in earnest, and laboratories are seeking help and guidance for the task of meeting the standards and submitting the application within the time lines set by payors.

The American Society of Echocardiography developed Echo Tool Box™ to facilitate the accreditation process and to promote excellence in cardiovascular ultrasound.

In June of 2004 the American Society of Echocardiography ("ASE") set out to develop an easy-to-use, web-based, simplified system for facilitating the ICAEL accreditation process. Echo Tool Box™ ("ETB") was formulated at that time to facilitate accreditation by guiding participants through the application process itself. Because of the compli-

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***"The American Society of Echocardiography developed Echo Tool Box™ to facilitate the accreditation process and to promote excellence in cardiovascular ultrasound."***

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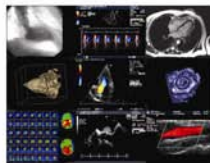
cated nature of the initial accreditation process, as well as the demands for continuous quality improvement in the re-accreditation process (which occurs every three years) many laboratories have hired consultants to facilitate the process and to streamline submission. However, the costs of a consultant can be very high, and, in this period of increased demand for accreditation in an aggressive timeline, qualified consultants may not be readily accessible.

ASE has designed Echo Tool Box™ to facilitate the application process using a web based (Internet) program that is secure and readily accessible. ETB uses the process of continuous quality improvement with visual aids (i.e., "gas gauges") for progress and training, wizards for laboratory policy preparation, a central repository for laboratory demographics, and a simplified application submission process. Because ETB is web based, it facilitates the interaction process for laboratory staff and directors, via email messaging to remind them of omitted policies, expired certificates, sub par volumes, education credits, etc. As a result, the application process is always current – it eliminates the mad rush that can occur weeks and months before the ICAEL deadline.



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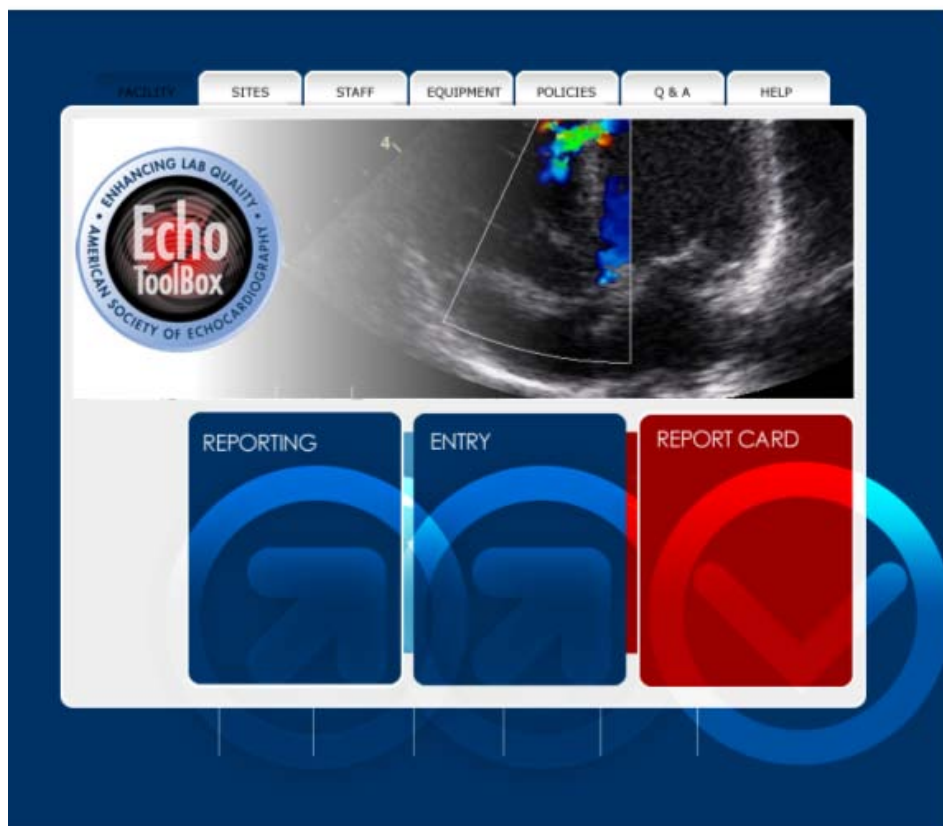
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### Key points about Echo Tool Box™

The annual subscription rate for ETB has not been fixed. However, it will be based on the number of staff (interpreting physicians and cardiac sonographers) in the laboratory. ASE is committed to making ETB a benefit of membership. ETB will be a highly affordable solution for laboratories. Volume and membership-based discounts will be available.

ETB is a web based product - you will be able to access it from any computer that is connected to the internet. There is no costly hardware to buy or software to purchase, download, or install.

ETB will be released at the June ASE meeting in 2007. For more information contact ASE at [www.echotoolbox.com](http://www.echotoolbox.com).

Andrew M. Keller is the author of this editorial. Dr. Keller is the current chair of the ASE information technology committee, the standing committee of the American Society of Echocardiography that is sponsoring the development of Echo Tool Box™. Dr. Keller is the current Chief of Cardiology at Danbury Hospital, in Danbury Connecticut. His laboratory was the first in the state of Connecticut to be accredited in all three disciplines of adult echocardiography.

~CCT~

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### MEDICAL SYMPOSIUMS AND MEETINGS

#### OPBG Cardiovascular International Valvar Heart Disease in Children

April 18-20 2007; Rome, Italy

Email: [congressi@opbg.net](mailto:congressi@opbg.net)

#### 2007 Annual Meeting of the Western Society of Pediatric Cardiology

April 20-22, 2007; Las Vegas, NV USA

[www.wsopc.org/webpages/AnnualMeeting.htm](http://www.wsopc.org/webpages/AnnualMeeting.htm)

#### SCAI 30th Annual Scientific Sessions

May 9-12 2007; Orlando, FL USA

[www.scai.org](http://www.scai.org)

#### 17th Annual Course on Adult Congenital Heart Disease

May 30-June 2, 2007; Philadelphia, PA USA

[www.philachd.org](http://www.philachd.org)

#### ASE- 18th Annual Scientific Sessions (American Society of Echocardiography)

June 3-7, 2007; Seattle, WA USA

[www.aescho.org](http://www.aescho.org)

#### Heart Failure 2007

June 7-9, 2007; Hamburg, Germany

[www.escardio.org](http://www.escardio.org)

#### The 3rd Annual Toronto Symposium: Contemporary Questions in Congenital Cardiology Today

June 10-12, 2007; Toronto, Canada

[www.sickkids.ca/cardicsymposium](http://www.sickkids.ca/cardicsymposium)

#### 5th World Congress on Pediatric Cardiac Care

June 23-28, 2007; Geneva, Switzerland

[www.pcc2007.com](http://www.pcc2007.com)

#### International Parma Echo Meeting

June 27- 29, 2007; Parma, Italy

[www.unipr.it/arpa/echomeet/](http://www.unipr.it/arpa/echomeet/)

#### 2007 International Symposium on the Hybrid Approach to Congenital Heart Disease

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## HIGHLIGHTS OF THE SECOND INTERNATIONAL CONFERENCE ON HEART FAILURE IN CHILDREN AND YOUNG ADULTS

By Anthony C. Chang, MD

The following is a summary of highlights from the *Second International Conference on Heart Failure in Children and Young Adults*, held November 28 - December 2, 2006 at the Ritz-Carlton Resort in Laguna Niguel, California. This five-day conference gathered the

world's leading experts on heart failure with over 400 attendees from more than 20 countries, representing 10 subspecialties.

The five-day program began with an afternoon of clinically relevant topics in heart failure especially for the nursing contingent. Basic aspects of heart failure such as systolic vs. diastolic dysfunction, low cardiac output syndrome, and use of near infrared spec-

troscopy were first presented followed by special topics such as care of the patient on mechanical support including the Berlin Heart, DeBakey VAD, and ECMO as well as quality of life issues with heart failure patients.

The next full day was devoted to the state-of-the-art of pediatric heart transplantation. This special one-day symposium was kindly organized and moderated by Dr. Stephen Webber of



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Pittsburgh Children's Hospital, which also sponsored the day's activities. The day was highlighted by a lecture on the past, present, and future of pediatric heart transplantation by Dr. Leonard Bailey, who also received a special award from the program committee for his lifetime work in children with heart failure.

The scientific program continued the next day with Ms. Amy Verstappen talking about adults with congenital heart disease. She gave a genuine discourse on heart failure from a patient's perspective. Various speakers followed with interesting updates on topics such as diastolic function, single ventricle failure, and assessment methodologies of heart failure. In addition, a special lunch seminar was dedicated to the right heart in heart failure, with Drs. Andrew Redington, Timothy Feltes, and Anthony Chang providing the lectures. A two-part mini-symposium covered the current state-of-the-art on pediatric cardiopulmonary support, including discussions on the Berlin Heart, Thoratec, DeBakey VAD and other ventricular assist devices.

The following day focused on medical therapy, including the current data on carvedilol, natriuretic peptide, levosimendan, and cardiac resynchronization therapy. This session was particularly useful as there have been some controversies with these therapeutic regimens in the adult experience. Other sessions this day included surgical therapies in heart failure, as well as, challenging case discussions with commentary by the panel of experts. One case of restrictive cardiomyopathy lead to a particularly spirited debate regarding timing of transplantation by the panel.

The conference concluded with an excellent dissertation on the important lessons learned about adults with heart failure by Dr. Douglas Mann, a renowned adult cardiologist with expertise in heart failure. An important lesson was to avoid use of catecholamines in heart failure, and to focus less on shortening fraction. A future strategies session covered novel agents and innovations in mechanical devices, and inspired the group to further advances in heart failure in children.

***"A two-part mini-symposium covered the current state-of-the-art on pediatric cardiopulmonary support, including discussions on the Berlin Heart, Thoratec, DeBakey VAD and other ventricular assist devices."***

The conference was rated very high (4.5 on a scale from 1 to 5) for overall content, and the attendees continually raved about the location and the resort in Laguna Niguel, southern California.

~CCT~

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