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OUTCOMES OF THE FIFTH INTERNATIONAL CONFERENCE ON PEDIATRIC MECHANICAL CIRCULATORY SUPPORT SYSTEMS AND PEDIATRIC CARDIOPULMONARY PERFUSION

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Abstract

The overall objective of the Conference was to bring together internationally known clinicians, bioengineers, and basic scientists involved in research on pediatric mechanical cardiac support systems and pediatric cardiopulmonary bypass procedures. The primary focus was to *explicitly describe the problems with current pediatric mechanical circulatory support systems, methods, and techniques during acute and chronic support*. The organizers were able to bring together respected international scholars from over 25 different countries at past conferences that has already made a significant impact on the treatment of pediatric cardiac patients during the past three years. Over 1,300 participants (250–300 participants each year) from many countries, including Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Finland, France, Germany, Greece, Ireland, Italy, Japan, Kuwait, Netherlands, New Zealand, Poland, South Korea, Saudi Arabia, Scotland, Spain, Switzerland, Taiwan, Turkey, the United Kingdom, and the United States, have participated in the 2005, 2006, 2007, 2008, and 2009 events.

To date, *The Fifth International Conference on Pediatric Mechanical Circulatory Support Systems and Pediatric Cardiopulmonary Perfusion* is the only conference solely dedicated to pediatric cardiac devices used during acute and chronic mechanical circulatory support. There is no other national or international conference to precisely define the problems with pediatric cardiac patients, and to suggest solutions with new methodologies and devices for pediatric patients, but specifically for neonates and infants.

Introduction

The *Fifth International Conference on Pediatric Mechanical Circulatory Support Systems and Pediatric Cardiopulmonary Perfusion* was held in conjunction with the *Joint Congress of the American Society for Artificial Internal Organs (ASAIO) 55th Annual Conference & the International Federation for Artificial Organs (IFAO)* at the Hilton Anatole Dallas Hotel, Dallas, Texas, May 27–30, 2009 (1).

The scientific program for the *Fifth International Conference on Pediatric Mechanical Circulatory Support Systems and Pediatric Cardiopulmonary Perfusion* was both a productive and highly informative experience for its guests participating from institutions around the globe. More than 500 participants from over two dozen countries attended this joint event and

enjoyed the scientific programs of both events, with approximately 160 participants registered the pediatric conference. The scientific co-chairs of the pediatric event were Elizabeth D. Blume, MD, Boston, MA, USA, John L. Myers, MD, Hershey, PA, USA, Sabine H. Daebritz, MD, *Germany*, Gerson Rosenberg, PhD, USA, Shunji Sano, MD, PhD, Okayama, Japan, Brian Duncan, MD, Cleveland, OH, USA, and Ross and Ungerleider, MD, MBA, *USA*.

The first event of the conference on Wednesday, May 27th, showcased the Pediatric Conference Wet Labs. Offered to conference participants since 2007, the Wet Labs provides the latest in perfusion technology and patient monitoring techniques for pediatric patients. This year's presentation was co chaired by Tami Rosenthal, CCP, MBA (Philadelphia, PA) and Karl Woitas, CCP (Hershey, PA). Following the wet labs was the Pediatric Conference Surgical Video session. Co-Chairs John L. Myers, MD (Hershey, PA) and V. Mohan Reddy, MD (Stanford, CA) led participants through several videos highlighting advanced surgical techniques in congenital heart repair.

Thursday, May 28th, began with a joint welcoming and combined general session of the ASAIO, IFAO and Pediatric organizations. Formal presentations, including several invited lectures and regular slide and poster presentations began Thursday morning and continued through Saturday, May 30th. This year, conference participants had the distinct pleasure of hearing Dr. William I. Norwood Jr. speak as the opening key note lecturer (Picture 1). In his presentation, Dr. Norwood addressed the historical perspectives of cardiopulmonary bypass while touching on his own personal experiences.

Plenary sessions held throughout the conference structured the event by focusing on key topics including *Clinical Heart Failure and Mechanical Support in Children* (led by Co-Chairs Elizabeth Blume, MD and Anne Dipchand, MD), *Minimizing Adverse Effects of CPB* (led by Co-Chairs J. William Gaynor, MD and V. Mohan Reddy, MD (Stanford, CA)), and *Engineering Applications in Pediatric Cardiac Surgery* (led by Co-Chairs Gerson Rosenberg, PhD and Ulrich Steinseifer, PhD). The final plenary session, *National Heart, Lung, and Blood Institute Pediatric Grant Awardees* (led by Co-Chairs Tim Baldwin, PhD, and William Pierce, MD) discussed the five year review of current NHLBI pediatric blood pump contracts. In addition, a presentation on the FDA's perceptive of clinical trial design and patient evaluation for pediatric MCS/D's was led by FDA representative Eric Chen, MS.

More than 100 presentations, including invited lectures, slides, and posters were presented at the *Fifth Event*. The co-chairs and moderators for each partition of the scientific program served as leading experts in their respective fields of study, and ensured a wealth of applicable knowledge for participants. All of the details including a final scientific program can be found at the conference web site (<http://www.hmc.psu.edu/childrens/pedscpb/>).

Conference awards

The conference continues to recognize young investigators for their contributions to the advancement of cardiopulmonary bypass and mechanical circulatory support systems for pediatric patients. Conference awardees are considered for recognition based on full manuscripts that detail their work (Picture 2). Conference awardees for the *Fifth Event* can be found in Table 1.

Special issue of the Artificial Organs

This special November 2009 issue of *Artificial Organs* was dedicated to manuscripts collected and peer-reviewed during the Fifth Conference. Over 40 manuscripts were submitted for possible publication. The following manuscripts passed the peer-review process, with several others currently pending. These published manuscripts cover all areas of pediatric

cardiopulmonary bypass and mechanical circulatory support systems in terms of engineering, basic science, and clinical applications.

This special issue could not be possible without the help of the following dedicated reviewers. Most of the faculty listed have reviewed an average of three manuscripts or more for this special issue.

Reviewers for the special issue

Atif Akcevin, MD, Tijen Alkan, MD, Christopher Almond, MD, Elizabeth D. Blume, MD, Elizabeth L. Carney, DVM, J. Brian Clark, MD, Oguz Coskun, MD, Sabine H. Daebritz, MD, Anne Dipchand, MD, Pirooz Eghtesady, MD, PhD, Aly El-Banayosy, MD, Yasuhiro Fujii, MD, Yulong Guan, MD, Tilman Humpl, MD, PhD, Choon Hak Lim, MD, Cun Long, MD, Giovanni Battista Luciani, MD, Paul S. Malchesky, DEng, M. Patricia Massicotte, MSc, MD, FRCPC, MHSc, David L. S. Morales, MD, John Myers, MD, Meena Nathan, MD, Richard Owens, CCP, Linda Pauliks, MD, Kerem Pekkan, PhD, William Pierce, MD, Gerson Rosenberg, PhD, Tami Rosenthal, CPP, MBA, Joerg S. Sachweh, MD, Shunji Sano, MD, PhD, Heike Schnoering, MD, Joanne Starr, MD, Ulrich Steinseifer, PhD, Kyung Sun, MD, PhD, Amy Throckmorton, PhD, Akif Ündar, PhD, Shigang Wang, MD, Wei Wang, MD, PhD

In addition, our special thanks goes to Angela T. Hadsell, *Executive Editor*, Traci Cross, *Editorial Assistant*, and Paul S. Malchesky, DEng, *Editor-in-Chief*, for making this possible.

Formal conference evaluations

Participants of the *Fifth Event* were asked to evaluate multiple aspects of the conference, including the scientific program, invited speakers, location, and social program. Overall, 85% of participants were highly satisfied with the educational quality of the conference. More than half (55%) of the conference participants noted considerable changes in knowledge and attitude for particular topics discussed in the scientific program. Most importantly, over one third (37%) of the surveyed participants claimed they would make significant changes in their practice as a result of participation in the conference.

Financial Support

In addition to the Penn State Hershey Children's Hospital and Penn State Hershey College of Medicine, the *National Heart, Lung, and Blood Institute*, the *Office of Rare Diseases at the National Institutes of Health R13 grant support*, and the *National Institute of Child Health & Human Development* (NICHD), we received funds from companies including Baxter Healthcare Corporation, Berlin Heart, Impulse Monitoring, Jarvik Heart, Luna innovations, Levitronix, MAQUET Cardiovascular, Medos, Sorin Group USA, St. Jude Medical, and Terumo Corporation.

Future conference

The *Sixth International Conference on Pediatric Mechanical Circulatory Support Systems and Pediatric Cardiopulmonary Perfusion* will be held at the *Joseph B. Martin Conference Center at Harvard Medical School* in Boston Massachusetts, May 6–10, 2010. All of the details regarding the 6th international event and our previous five conferences can be found at our conference web site <http://www.hmc.psu.edu/childrens/pedscpb/>

Once again, the fifth international conference was made a great success by the dedication of several clinicians, scientists, and engineers who make each and every event a unique and insightful learning experience. Our motto continues to be: *If the course of just one child's life is improved as a result of this event, we have reached our goal.*

Acknowledgments

The *Fifth Conference* was supported in part by *the National Heart, Lung and Blood Institute (NHLBI) R13 grant (1 R13 HL096358), the Office of Rare Diseases at the National Institutes of Health, and National Institute of Child Health & Human Development (NICHD)*.

I would personally like to thank Julie Graham for her assistance in all aspects of managing this event (Picture 3). In addition, Alan Rider and Dr. Yulong Guan have helped significantly by dedicating their time and effort during and after the conference. Finally, without the continuous support and understanding of my wife, Pinar, it would not be possible to spend such a significant amount of my time to organize this event (Picture 4). Pinar and I now consider this event our third child after our children, Damla and Akifcan.

References

1. Ündar A. Fifth international conference on pediatric mechanical circulatory support systems and pediatric cardiopulmonary perfusion. *Artificial Organs* 2009;33(5):405–406.

Picture 1.
William I. Norwood Jr. MD, (middle), John L. Myers, MD (right) and Akif Ündar, PhD (left)

Picture 2.

Top row From left to right- Elizabeth L. Carney, DVM, Nikkole M. Haines, BS, Sonya S. Bhavsar, MS Candidate, Yasuhiro Fujii, MD, Hideshi Itoh, CCP, MS, **Bottom row** From left to right - Todd M. Umstead, BS, Lawrence A. Sasso, PhD Candidate, Kasin Oğuz Coşkun, MD, Heike Schnoering, MD,

Picture 3.
Julie Graham, Akif Ündar, and Alan Rider

Picture 4.
Pinar and Akif Ündar

Table 1

Fifth International Conference Awards

Award	Awardee	Title of Manuscript
John A. Waldhausen, MD, Young Investigator Award	Yasuhiro Fujii, MD	The Benefits of High-Flow Management in Children with Pulmonary Atresia with or without Major Aortopulmonary Collateral Arteries
William S. Pierce, MD, Young Investigator Award	Heike Schnoering, MD	The Aachen MiniHLM – First Results in a Small Animal Model
Helmut Reul, PhD, Young Investigator Award	Nikkole M. Haines, BS	Comparison of two types of Neonatal Extracorporeal Life Support Systems with Pulsatile and Nonpulsatile Flow
Aydin Aytac, MD, Young Investigator Award	Kasin Oguz Coşkun, MD	Aortic Valve Surgery in Congenital Heart Disease: A Single Center Experience
William Williams, MD, Young Investigator Award	Hideshi Itoh, CCP, MS	The Rewarming Index Formula for Pediatric Cardiopulmonary Perfusion
Penn State Children's Hospital, Young Investigator Award	Elizabeth L. Camey, DVM	Animal Model Development for the Penn State Pediatric Ventricular Assist Device
Basic Science Award	Todd M. Umstead, BS	A Dual-Platform Proteomics Study of Plasma Biomarkers in Pediatric Patients Undergoing Cardiopulmonary Bypass
Biomedical Engineering Graduate Student Award	Lawrance A. Sasso, PhD Candidate	A Microfluidic Immunosensor to Monitor Systemic Inflammation During CPB
Biomedical Engineering Graduate Student Award	Sonya S. Bhavsar, MS Candidate	Intravascular Mechanical Cavopulmonary Assistance for Patients with Failing Fontan Physiology