

**5th International Conference
Pediatric Mechanical Circulatory Support Systems
and Pediatric Cardiopulmonary Perfusion**

Invited Lectures

Epidemiology of Pediatric Heart Failure

Elizabeth D. Blume, MD

Harvard Medical School, Children's Hospital Boston, Boston, MA, USA

Molecular Aspects of Childhood Heart Failure and Targeted Therapies

Jeffrey A. Towbin, MD

Pediatric Cardiology and The Heart Institute, Cincinnati Children's Hospital, Cincinnati, OH, USA

How the Echocardiographer Can Aid in the Management of the Heart Failure Patient on Mechanical Support

Anne I. Dipchand, MD, Labatt Family Heart Centre, Hospital for Sick Children, Toronto, Canada

Clinical Trials in Pediatric Cardiology: The Pediatric Heart Network Experience

Lynn Mahony, MD

Department of Pediatrics, University of Texas Southwestern Medical Center, Dallas, TX, USA

Developmental Hemostasis: The Changing Coagulation System in Neonates, Infants, Teenagers, and Adults

Lisa Bomgaars MD, Departments of Pediatrics, Section of Hematology-Oncology, Baylor College of Medicine, Texas Children's Hospital, Houston, TX, USA

Anticoagulation Medications in Pediatric Patients With Ventricular Assist Devices: How Can We Monitor Their Effect?

Holger Buchholz MD, Clinical Assistant Professor Division of Cardiac Surgery, Department of Surgery, Adult & Pediatric Ventricular Assist Device Program, University of Alberta, Stollery Children's Hospital and Mazankowski Alberta Heart Institute, Edmonton Alberta, Canada

Is a Standardized Anticoagulation Protocol for Pediatric Ventricular Assist Devices Possible?

M. Patricia Massicotte, MSc MD MHSc, Pediatric Thrombosis/VAD Program, Depts. of Pediatric Cardiology/Hematology, Stollery Children's Hospital, Mazankowski Heart Institute, University of Alberta, Edmonton, Alberta Canada

Aortic Arch Reconstruction Using Cardiopulmonary Bypass and Moderate Hypothermia Without Circulatory Arrest

KJ Guleserian, RM Ginther, RM Gorney, SR Leonard, JM Forbess

Children's Medical Center/UT Southwestern Medical Center, Dallas, TX, USA

Warm Perfusion in Pediatric Cardiac Surgery: The European Experience with 8.000 cases

Yves Durandy MD

Department of Intensive Care and Perfusion, Institut Hospitalier Jacques Cartier, Massy, France

Myocardial Protection in Congenital Heart Surgery

Joanne P. Starr MD
Newark, NJ, USA

Intra Operative Neurologic Monitoring During CPB Procedures

STEPHEN J. KIMATIAN,† KENNETH J. SALIBA,* MOLLIE L. BARNES,‡§ J. BRIAN CLARK,¶ AND JOHN L. MYERS¶

Department of †Pediatric Anesthesiology, Cleveland Clinic Foundation, Cleveland, OH, the Department of *Anesthesiology and ‡Neuromonitoring, Penn State College of Medicine, Hershey, PA; §Impulse Monitoring, Inc., Columbia, MD; and the ¶Department of Surgery, Penn State College of Medicine, Hershey, PA, USA

Valve Surgery in Congenital Heart Disease

Giovanni Battista Luciani, MD, Pediatric Cardiac Surgery, University of Verona, Italy

A Dual-Platform Proteomics Study of Plasma Biomarkers in Pediatric Patients Undergoing Cardiopulmonary Bypass

Todd M. Umstead BS¹, Chia-jung K. Lu BA¹, Willard M. Freeman PhD², John L. Myers MD³, J. Brian Clark MD³, Neal J. Thomas MD¹, Vernon M. Chinchilli PhD⁴, Kent E. Vrana PhD², Akif Ündar PhD^{1,3,5} and David S. Phelps PhD¹

Penn State Center for Host defense, Inflammation, and Lung Disease (CHILD)

Research and the Department of Pediatrics¹, and the Departments of Pharmacology², Surgery³, Public Health Sciences⁴ and Bioengineering⁵, Pennsylvania State University College of Medicine, Hershey, PA, USA

Recent Advances of Brain Protection During Cardiac Surgery – From Deep Hypothermia and Circulatory Arrest to Cerebral Perfusion

Shunji Sano, MD

Department of Cardiovascular Surgery, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama, Japan

Determinants of Neurodevelopmental Outcome for Children with Congenital Heart Defects

J. William Gaynor, MD

Children's Hospital of Philadelphia, Philadelphia, PA, USA

Miniaturization of ECMO Systems: Engineering Challenges and Methods

Ulrich Steinseifer, Dr.-Ing.¹; Ali Kashefi, Dr.-Ing.¹; Marcus Hormes, Dipl.-Ing.¹; Mark Schoberer, MD²; Thorsten Orlikowsky, MD², Mehdi Behbahani, Dipl.-Ing.³; Marek Behr, Ph.D.³ and Thomas Schmitz-Rode, MD¹

¹Applied Medical Engineering, Helmholtz Institute, RWTH Aachen University, ²Paediatric and Adolescent Medicine, RWTH Aachen University, ³Computational Analyses of Technical Systems, RWTH Aachen University, Germany

Pediatric Assist Device Development in Brazil

Cestari, IA*, Hayashida SA*, Ferrara E**, Bacht S*, Muramatsu M**, Christensen KT***, Leirner AA*

*Bioengineering Division, Heart Institute, Medical School, University of Sao Paulo, ** Institute of Physics, University of Sao Paulo, Brazil, *** Department of Theoretical and Applied Mechanics, Univ. of Illinois, Champaign-Urbana, IL, USA

Development of a Microdialysis Monitor for Tracking Systemic Inflammation During Cardiopulmonary Bypass

Jeffrey D. Zahn, PhD¹, Kiana Aran, BS¹, Alex Fok, BS², Akif Ündar, PhD²
BioMEMS Laboratory, Department of Biomedical Engineering, Rutgers University, Piscataway, NJ; Pediatric Cardiac Research Laboratory, Departments of Pediatrics, Surgery, and Bioengineering, Penn State College of Medicine, Penn State Children's Hospital, Hershey, PA, USA

Towards Quantitative Hemodynamic Prediction in Challenging Single Ventricle Circuits: Surgical Pathway Designs, pVADs and Adult Fontans

Kerem Pekkan, PhD
Pediatric Cardiovascular Fluid Mechanics Laboratory, Biomedical Engineering Department, Carnegie Mellon University, Pittsburgh, PA, USA

Quantitative Monitoring of Gaseous Microemboli with the EDAC Quantifier

Ted Lynch, PhD
Luna Innovations Incorporated, Roanoke, VA USA

Optimizing the Circuit Design of a Pulsatile ECLS in Terms of EEP and SHE

Kyung Sun, MD, PhD, MBA, Choon Hak Lim, MD
Departments of Thoracic and Cardiovascular Surgery, and Anesthesiology and Pain Medicine, Korea Artificial Organ Center, Korea University, Seoul, Korea

The Penn State Pediatric VAD: Five Year Development Status

William J. Weiss, PhD, Gerson Rosenberg, PhD, J. Brian Clark, MD, Elizabeth Carney, DVM, Christopher A. Siedlecki, PhD, Dennis Hicks, John Reibson, Branka Lukic, MS, Rebecca Peterson, Eric Yeager, Brad Doxtater, Timothy Cooper, DVM, Keefe B. Manning, PhD, Steven Deutsch, PhD, James P. Runt, PhD, John Myers, MD, William S. Pierce, MD
Departments of Surgery, Bioengineering, Pediatrics, Comparative Medicine, and Materials Science and Engineering, The Pennsylvania State University, Hershey and University Park, PA, USA

In Vivo Evaluation of the PediaFlow Pediatric Ventricular Assist Device

Peter D. Wearden, MD, PhD¹, Timothy M. Maul, PhD^{1,2}, Ergin Kocyildirim, MD¹, Amanda R. Daly, BS², Carl A. Johnson Jr., BS², Joshua Woolley, BS², Brad Paden, PhD⁴, Dave Paden, BS⁴, Shaun Snyder, BS⁴, Josiah Verkaik, BS⁴, James F. Antaki, PhD³, Fangjun Shu, PhD², Gil Bearson, PhD⁵, John Kirk, MS⁵, Pratap Khanwilkar, PhD⁵, Marina Kameneva, PhD², William R. Wagner, PhD², Harvey S. Borovetz, PhD², and the PediaFlow Consortium¹⁻⁵
Cardiothoracic Surgery, Children's Hospital of UPMC¹; Bioengineering, University of Pittsburgh² and Carnegie Mellon³; LaunchPoint Technologies Inc.⁴; and WorldHeart Inc⁵, USA

Development Progress of the Ension Pediatric Cardiopulmonary Assist System (pCAS)

Mark Gartner, PhD, Greg Johnson, PhD, Patrick Cahalan, BS, *John Biggerstaff, PhD, **George Pantalos, PhD
Enson, Inc., Pittsburgh, PA, *University of Tennessee, Knoxville, TN, **University of Louisville, Louisville, KY, USA

Summary at Completion of the Jarvik 2000 NIH Pediatric Development Program

Robert Jarvik, MD, Zhongjun Wu, PhD, Craig Sherman, Latha Kavala, and Bartley Griffith, MD
Jarvik Heart, Inc., New York, New York, and the University of Maryland, Baltimore, MD, USA

The PediPump: A Versatile, Implantable Pediatric Ventricular Assist Device—Update IV

Brian W. Duncan, MD, MBA, Kiyotaka Fukamachi, MD, PhD, Lawrence D. Noble, Jr., MS, David T. Dudzinski, BS, Christine R. Flick, BS, Hideyuki Fumoto, MD, Akira Shiose, MD, PhD, Yoko Arakawa, MD, Tohru Takaseya, MD, PhD, Fernando Casas, PhD, William A. Smith, DEng
Biomedical Engineering, Lerner Research Institute, Cleveland Clinic, Cleveland, OH, USA

Animal Model Development for The Penn State Pediatric Ventricular Assist Device

Elizabeth L. Carney, DVM, John L. Myers, MD, J. Brian Clark, MD, Rebecca Peterson, BS, Ronald P. Wilson, VMD, MS, William J. Weiss, PhD
Departments of Comparative Medicine and Surgery, Penn State College of Medicine and Penn State Children's Hospital, Hershey, PA, USA

Advances in Extracorporeal Membrane Oxygenation

Tami Rosenthal CCP, MBA
Children's Hospital of Philadelphia

The Use of Bivalirudin/Angiomax for Pediatric Anticoagulation in HIT

Patients

Richard N Gates, MD, Paul Yost, MD, Beth Parker, CCCP
Divisions of Cardiothoracic Surgery and Anesthesia, CHOC Children's, Orange County, CA, USA

Clinical Real-time Monitoring of Gaseous Microemboli in Pediatric Cardiopulmonary Bypass

Shigang Wang, MD,* Karl Woitas, CCP,† J. Brian Clark, MD, John L. Myers, MD,*† Akif Ündar, PhD*†‡

*Pediatric Cardiac Research Laboratories, Department of Pediatrics, † Surgery, and ‡ Bioengineering, Penn State Milton S. Hershey Medical Center, Penn State College Medicine, Penn State Children's Hospital, Hershey, PA, USA

Pediatric Myocardial Protection and Single Dose Cardioplegia

Richard M. Ginther, Jr., CCP
Division of Pediatric Cardiothoracic Surgery, UT Southwestern Medical Center
Children's Medical Center of Dallas, Dallas, TX, USA

Myocardial Recovery and Retraining of the Ventricular with ECMO after Arterial Switch Operation

FENG Zhengyi , LONG Cun, LIU Jingpin, ZHAO Ju
Department of Extracorporeal Circulation, Fu Wai Hospital, CAMS & PUMC, Beijing, China

Development of Mechanical Circulatory Support Devices in China

Wei Wang, MD, PhD, Deming Zhu, MD, Wenxiang Ding, MD
Shanghai Children's Medical Center, Affiliated by Shanghai Jiaotong University, School of Medicine, China