The Proceedings of the
Fourth International Conference on
PEDIATRIC MECHANICAL
CIRCULATORY SUPPORT SYSTEMS
& PEDIATRIC
CARDIOPULMONARY PERFUSION

HONORARY CHAIRS
William S. Pierce, MD • John A. Waldhausen, MD

PROGRAM CO-CHAIRS
Brian W. Duncan, MD • John L. Myers, MD • Gerson Rosenberg, PhD
Carmen Giacomuzzi, BSN, CCP • Akif Ündar, PhD • Ross M. Ungerleider, MD, MBA

A continuing education service of Oregon Health & Science University
and Penn State College of Medicine
Fourth International Conference on **Pediatric Mechanical Circulatory Support Systems and Pediatric Cardiopulmonary Perfusion**

#### Educational Grants

Bayer Healthcare  
National Heart, Lung, and Blood Institute  
Office of Rare Diseases at the National Institutes of Health

#### Conference Exhibitors

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<th>Company Name</th>
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<td>Baxter Healthcare Corp.</td>
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<td>Berlin Heart</td>
<td>Medtronic Cardiac Surgery</td>
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<td>CorMatrix Cardiovascular, Inc.</td>
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<td>Luna Innovations, Inc.</td>
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Final Scientific Program

WEDNESDAY, MAY 21, 2008

2 p.m.  
**PERFUSION HANDS-ON WORKSHOP**  
Chair: Carmen Giacomuzzi, CCP (Portland, OR)  
Instructors/Facilitators: Chris Brabant, CCP (Milwaukee, WI), Carmen Giacomuzzi, CCP (Portland, OR), Brian Mejak, CCP (Portland, OR), Steve Moss, CCP (Chicago, IL), Stuart Sheppard, PhD (Southampton, UK), Shigang Wang, MD (Hershey, PA), Karl Woitas, CCP (Hershey, PA)

Perfusionists representing four different institutions will be demonstrating various extra-corporeal systems. Participants will rotate through workstations followed by an open discussion forum. Stations will include devices such as the MAQUET MECC™ System, neonatal circuit utilizing the Terumo System 1, a hybrid ECMO/VAD circuit, and the MEDOS Delta Stream Blood Pump DP1 and Console. In addition, participants will experiment with pulsatile perfusion and learn how the EDAC™ Quantifier can impact your perfusion practice.

5 p.m.  
**VIEWING OF SELECTED SURGICAL VIDEOS**  
TOF with Limited Ventriculotomy  
Paul Chai, MD (Tampa, FL)  
Anomalous Coronary Artery  
James Jaggers, MD (Durham, NC)  
Truncus Arteriosus with IAA  
James Tweddell, MD (Milwaukee, WI)  
Modified Ross Procedure  
Ross Ungerleider, MD (Portland, OR)  
Arch Reconstruction  
Kristine Guleserian, MD (Dallas, TX)  
Insertion of the Berlin Heart Followed by Transplant  
Robert Jaquiss, MD (Little Rock, AR)  
Nikaidoh on a 3.5-Month-Old  
Christian Pizarro, MD (Wilmington, DE)

THURSDAY, MAY 22, 2008

Opening Session  
7 a.m.  
Registration/Speaker Ready Room Open

7:50 a.m.  
Welcome
Fourth International Conference on **Pediatric Mechanical Circulatory Support Systems** and Pediatric Cardiopulmonary Perfusion

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**PLENARY SESSION #1: Advances in CPB that Benefit the Patient**

Moderators: Ross Ungerleider, MD (Portland, OR); John L. Myers, MD (Hershey, PA)

- **Circuit Miniaturization—Advantages of Asanguineous Prime**
  Ed Hickey, MD (Toronto, Canada)

- **MECC May Create Useable Miniaturized Circuitry**
  Steve Langley, MD (Portland, OR)

- **Cardioplegia to Minimize Blood Prime**
  Kristine Guleserian, MD (Dallas, TX)

- **Microdevices for Measuring Systemic Inflammation**
  Jeffrey D. Zahn, MD (Piscataway, NJ)

- **Plasma Proteomics in Infants Undergoing Cardiopulmonary Bypass Procedure**
  David S. Phelps, PhD (Hershey, PA)

- **Intraoperative Techniques to Assess Cardiac Function**
  Linda Pauliks, MD (Hershey, PA)

- **What We Know and Don’t Know About NIRS**
  Jennifer Hirsch, MD (Ann Arbor, MI)

- **Cardiac Cath for Patients on Mechanical Assist**
  Laurie Armsby, MD (Portland, OR)

10 a.m.

Break/Exhibits/Posters

**Invited Lectures**

10:40 a.m.

**Novel Micromachined Ultrasound Transducers for Cardiac Imaging**

David Sahn, MD (Portland, OR)

11 a.m.

**How Do We Normalize Outcome Measures So That We Can Comprehend Results?**

Karl Welke, MD (Portland, OR)

11:20 a.m.

**From Experimentation to Innovation to Standard of Care: How Do We Demystify Dogma and Create Progress?**

Ross Ungerleider, MD (Portland, OR)

12 p.m.

LUNCH

1 p.m.

**PLENARY SESSION #2: CONQUERING COAGULATION**

Moderators: Aubyn Marath, MD (Portland, OR); James Jaggers, MD (Durham, NC)

- **Aprotinin Has a Role in Pediatric Cardiac Surgery**
  James Tweddell, MD (Milwaukee, WI)

- **HIT Happens**
Fourth International Conference on Pediatric Mechanical Circulatory Support Systems and Pediatric Cardiopulmonary Perfusion

Lynn Boshkov, MD (Portland, OR)

**New Anticoagulation Strategies**
Andras Gruber, MD, PhD (Portland, OR)

**CPB as a Procoagulant State**
James Jaggers, MD (Durham, NC)

**Outcomes for Children with Congenital Heart Disease Requiring ECMO**
Ravi Thiagarajan, MD (Boston, MA)

**Coagulation Issues in the Fontan Circulation**
Kirsten Odegard, MD (Boston, MA)

Aprotinin and the Brain
Nobu Ishibashi, MD (Washington, DC)

3 p.m.  
**INVITED GUEST LECTURER**

New Strategies for Preservation of Small Diameter Grafts
Steve Hanson, PhD (Portland, OR)

3:20 p.m.  
Break/Exhibits/Posters

3:45 p.m.  
**REGULAR SLIDE PRESENTATIONS: SESSION #1**

Moderator: Akif Ündar, PhD (Hershey, PA)

**S.1. Current Status of Blood Transfusion-Free Open Heart Surgery in Infants and Small Children**
Yasuhiro Kotani, MD, Osami Honjo, MD, Mahito Nakakura, CE, Yasuhiro Fujii, MD, Shinya Ugaki, MD, Yu Oshima, MD, Ko Yoshizumi, MD, Shingo Kasahara, MD, Shunji Sano, MD
Department of Cardiovascular Surgery, Okayama University Hospital, Japan

**S.2. Efficiency of Miniaturized Circuit and Vacuum-Assisted Venous Drainage in Decreasing Blood Transfusion**
Yves Durandy MD. Institut Jacques Cartier, Massy- France

**S.3. Why Do We Cool to 18°C?**
Jamie You, CCP, Brian Mejak, CCP, Carmen Giacomuzzi, CCP, Eileen Heller, CCP, Ross Ungerleider, MD. Karl Welke, MD
Division of Pediatric Surgery, Doernbecher Children's Hospital, Oregon Health & Science University Portland, Oregon

**S.4. Results with All Blood Retrograde Microplegia as a Myocardial Protection Strategy for Complex Neonatal Arch Reconstruction**
Richard N Gates, MD, Brian A Palafox, MD, Beth Parker, CCP
Division of Cardiothoracic Surgery, Children’s Hospital of Orange County, Orange, California, USA
S.5. **Pulsatile Perfusion on Vital Organ Recovery During and After Pediatric Open-Heart Surgery in Ventricular Septal Defects**
Alkan-Bozkaya T., Akcevin A., Ündar A*., Türkoğlu H., Paker T, Aytaç A.
V.K.V. American Hospital, Dept. of Cardiovascular Surgery, Istanbul, Turkey and *Penn State University, Children’s Hospital, Hershey, PA, USA

S.6. **Operative Risk and Outcome of Surgery in Adults with Congenital Valve Disease**
Giovanni Battista Luciani, MD, Francesca Viscardi, MD, Mara Pilati, MD, Luca Barozzi, MD, Giuseppe Faggian, MD, Alessandro Mazzucco, MD.
Divisions of Cardiac Surgery and Cardiology, University of Verona, Verona, Italy

S.7. **“Stolen” Blood Flow: The Effect of an Open Arterial Filter Purge Line in a Simulated Neonatal CPB Model**
Shigang Wang, MD, Akemi Miller, BA, John L. Myers, MD, Akif Ündar, PhD
Departments of Pediatrics, Surgery, and Bioengineering
Penn State College of Medicine, Penn State Children’s Hospital, Hershey, Pennsylvania, USA

S.8. **Development of a Miniaturized Heart-Lung Machine for Neonates with Congenital Heart Defect**
Jutta Arens\(^1\), MSc; Heike Schnöring\(^2\), MD; Jaime Vázquez-Jiménez\(^2\), MD; Thomas Schmitz-Rode\(^1\), MD; Ulrich Steinseifer\(^1\), PhD
\(^1\) Applied Medical Engineering, Helmholtz Institute, RWTH Aachen, Germany
\(^2\) Pediatric Cardiac Surgery, University Clinic Aachen, Germany

S.9. **Extracorporeal Circulation (ECC) in the Rat Model Using a New Miniaturized Hollow Fiber Oxygenator**
Rungatscher A\(^1\), Cresce GD\(^2\), Tessari M\(^1\), Walpoth BH2, Faggian G\(^1\)
\(^1\) Cardiovascular Surgery, University of Verona Medical School, Italy
\(^2\) Cardiovascular Research, University Hospital of Geneva, Geneva, Switzerland

S.10. **Feasibility of Ultrafiltration of Blood for Priming Before Cardiopulmonary Bypass in Neonatal Piglets**
Shinya Ugaki, Shingo Kasahara, Osami Honjo, Yasuhiro Kotani, Yu Oshima, Ko Yoshizumi and Shunji Sano
Department of Cardiovascular Surgery, Okayama University, Okayama, Japan

S.11. **The Effects of Vasopressor and Vasodilator on Hemodynamic Energy in Terms of Surplus Hemodynamic Energy**
Choon Hak Lim MD, Jae Soon Choi PhD, Ho Sung Son MD, Jung Joo Lee PhD, Hye Won Lee MD, Kyung Sun MD, PhD
Department of Anesthesiology and Pain Medicine, Thoracic and Cardiovascular Surgery, Korea Artificial Organ Center, Korea University, Seoul, Korea
S.12.  Detection and Classification of Gaseous Microemboli in a Simulated Pediatric CPB Circuit: Effect of Flow Rate and Perfusion Mode on Microemboli Delivery
Akemi Miller, Shigang Wang, MD, John L. Myers, MD, Akif Ündar, PhD
Departments of Pediatrics, Surgery, and Bioengineering, Penn State College of Medicine, Penn State Children’s Hospital, Hershey, Pennsylvania, USA

S.13.  Computational Fluid Dynamics for Pediatric Surgical Planning and Fetal Hemodynamics
Kerem Pekkan, PhD
Department of Biomedical Engineering, Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

6 p.m.

MODERATED POSTER PRESENTATIONS: SESSION #1
Moderators:  Pirooz Eghtesady, MD (Cincinnati, Ohio); Carmen Giacomuzzi, CCP, Portland, Oregon

P.1.  The Influence of Neurologic Monitoring on the Management of Pediatric Cardiopulmonary Bypass
S. Kimatian MD, FAAP, K Saliba DO, X. Soler MD, E. Valentine MD, M. Coleman, A. Kunselman, G. Schuler, MSc, CCRC, J. Myers MD
Departments of Anesthesiology, Surgery, and Public Evaluation Sciences, Penn State College of Medicine, Hershey, Pennsylvania, USA

P.2.  The Myocardial Protection of Histidine-Ketoglutarate-Tryptophan (HTK) Cardioplegic Solution on the Long-Term Ischemic Period in Pediatric Heart Surgery
Jinping Liu, M.D, Zhengyi Feng, M.D, Ju Zhao, M.D, Bo Li, Cun Long, M.D
Department of Cardiopulmonary Bypass, Fuwai Hospital, CAMD & PUMS, Beijing, China

P.3.  Surgical Repair of Tetralogy of Fallot with Absent Pulmonary Valve in an Infant with Sickle Cell Anemia
Joanne P. Starr* MD, Meena Nathan* MD, Joel Hardin* MD, Peri Kamalakar* MD, Wondwessen Bekele* MD, Moshe Bell* MD, Srikanth Patankar* MD, Elizabeth Cortez* CCP, Stacey Rifkin* DO
*Children’s Heart Center, #Pediatric Hematology and Oncology, Children’s Hospital of New Jersey at Newark Beth Israel Medical Center, Newark, NJ

P.4.  Thyroid Hormones Homeostasis in Pediatric Patients During and After Cardiopulmonary Bypass: Is There a Difference Between the Pulsatile and Nonpulsatile Perfusion Modes?
V.K.V. American Hospital, Dept. of Cardiovascular Surgery, Istanbul, Turkey and Penn State University, Children’s Hospital, Hershey, PA, USA
P.5. **Routine Mechanical Ventricular Assist Following the Norwood Procedure**  
Improved Cerebral Perfusion  
Jamie You, CCP, Brian Mejak, CCP, Carmen Giacomuzzi, CCP, Eileen Heller,  
CCP, Ross Ungerleider, MD, Karl Welke, MD  
Division of Pediatric Surgery, Doernbecher Children's Hospital, Oregon Health &  
Science University Portland, Oregon

P.6. **Development of an Ultra-Durable Heparin-Free Pediatric ECMO System at the National Cardiovascular Center of Japan**  
Eisuke Tatsumi, MD, Nobumasa Katagiri, MS, Toshihide Mizuno, DVM,  
Yoshiaki Takewa, MD, Tomohiro Tsukiya, PhD, Akihiko Homma, PhD,  
Yoshiyuki Taenaka, MD, Teruyuki Hayashi, CCP, Toshikatsu Yagihara, MD  
Departments of Artificial Organs, Department of Surgery, National  
Cardiovascular Center, Suita, Osaka, Japan

P.7. **Coagulation Times and Heparin Management for Pediatric Patients Requiring Extracorporeal Membrane Oxygenator Support**  
Timothy M. Maul, PhD, Erin L. Wacker, BS, Kent, Kelly, CCP, Victor O. Morell, MD, Peter D. Wearden, MD, PhD  
Departments of Cardiac Surgery, Children’s Hospital of UPMC, Bioengineering,  
University of Pittsburgh, and the McGowan Institute for Regenerative Medicine, Pittsburgh, Pennsylvania, USA

P.8. **Different Albumin Concentration in Extracorporeal Circuit Prime on Perioperative Fluid Status in Young Children**  
Kun Yu, Yinglong Liu, Feilong Hei, Jingping Liu, Zhengyi Feng, Jingwen Li,  
Cun Long  
Division of Cardiothoracic Surgery, Extracorporeal Circulation, Cardiovascular  
Institute and Fuwai Hospital CAMS and PUMS Beijing, China

Alan R. Rider, Bingyang Ji, MD, Allen Kunselman, MA, William J. Weiss, PhD,  
John L. Myers, MD, Akif Ündar, PhD  
Departments of Pediatrics, Surgery, Bioengineering, and Health Evaluation  
Sciences, Penn State College of Medicine, Penn State Children’s Hospital,  
Hershey, Pennsylvania, USA

P.10. **Postoperative Hemodynamics After Cardiopulmonary Bypass in Newborn Piglets**  
Theodor Tirilomis, PhD, Lars Nolte, Oliver J. Liakopoulos, PhD, Carola Ballat,  
Katja Steinke, MD, Marc Bensch, PhD, Friedrich A. Schoendube, PhD  
Department for Thoracic, Cardiac, and Vascular Surgery, University of  
Goettingen, Goettingen, Germany
P.11. **Reducing Gaseous Microemboli During Pediatric Perfusion: Case Studies with the EDACT™ QUANTIFIER**
Ted Lynch, PhD
Luna Innovations Incorporated, Hampton, Virginia, USA

P.12. **Comparison of Two Different Blood Pumps on Delivery of Gaseous Microemboli During Pulsatile and Non-Pulsatile Perfusion in a Simulated Infant CPB Model**
Shigang Wang, MD, John L. Myers, MD, Akif Ündar, PhD
Departments of Pediatrics, Surgery, and Bioengineering, Penn State College of Medicine, Penn State Children’s Hospital, Hershey, Pennsylvania, USA

P.13. **The Capability of Trapping Gaseous Microemboli of Two Pediatric Arterial Filters with Pulsatile and Non-pulsatile Flow in Simulated Infant CPB Model**
Shigang Wang, MD, Khin N. Win, BS, Woitas, K., CCP, John L. Myers, MD, Akif Ündar, PhD
Departments of Pediatrics, Surgery, and Bioengineering, Penn State College of Medicine, Penn State Children’s Hospital, Hershey, Pennsylvania, USA

P.14. **Fetal Surgical Management of Congenital Heart Block in a Hydropic Fetus: Lessons Learned from a Clinical Experience**
Pirooz Eghtesady, MD, PhD, Erik Michelfelder, MD, Timothy K. Knilans, MD, Jeffrey Livingston, MD Peter B. Manning, MD, and Timothy Crombleholme, MD, PhD
Pediatric Cardiac Surgery, Pediatric Cardiology and The Fetal Care Center of Cincinnati, Cincinnati Children's Hospital, Cincinnati, OH

P.15. **Enteroviral Sepsis and Ischemic Cardiomyopathy in a Neonate**
Meena Nathan MD, Rowan Walsh MD, Joel Hardin MD, Stanley Einzig MD, Brian O Connor MD, Duraisamy Balaguru MD, Rajiv Verma MD, Joanne Starr MD
Division of Pediatric Cardiac Surgery, Division of Pediatric Cardiology, Children’s Hospital of New Jersey at Newark Beth Israel Medical Center, Newark, NJ

P.16. **An Implementation of Sensor-Based Force-Feedback in a Compact Laparoscopic Surgery Robot**

1Jaesoon Choi, PhD, 2Duk H. Lee, MA, 3Jun W. Park, PhD, 3Doo J. Bach, MA, 1Seung J. Song, MA, 1Yoon H. Kim, MA, 2Yungho Jo, PhD, 1Kyung Sun, MD, PhD, MBA
1Korea Artificial Organ Center, College of Medicine, Korea University, Seoul, Korea
2Biomedical Engineering Branch, Research Institute, National Cancer Center, Gyeonggi, Korea
P.17. Delivery of Gaseous Microemboli with Vacuum-Assisted Venous Drainage During Pulsatile and Non-Pulsatile Perfusion in a Simulated Infant CPB Model
Shigang Wang, MD, Larry Baer, CCP, Allen R. Kunselman, MA, John L. Myers, MD, Akif Ündar, PhD
Departments of Pediatrics, Surgery, Bioengineering, and Health Evaluation Sciences, Penn State College of Medicine, Penn State Children’s Hospital, Hershey, Pennsylvania, USA

P.18. Microemboli Detection and Classification by Innovative Ultrasound Technology During Simulated Neonatal CPB at Different Flow Rates, Perfusion Modes and Perfusate Temperatures
Robert S. Schreiner, Alan R. Rider, John W. Myers, Bingyang Ji, MD, Allen R. Kunselman, MA, John L. Myers, MD, Akif Ündar, PhD
Departments of Pediatrics, Surgery, Bioengineering, and Health Evaluation Sciences, Penn State College of Medicine, Penn State Children’s Hospital, Hershey, Pennsylvania, USA

7:30 p.m.
ALL-ATTENDEE DINNER
Awards Recognition—Moderators: John L. Myers, MD, Akif Ündar, PhD, Ross Ungerleider, MD
FRIDAY, MAY 23, 2008

7 a.m.  Breakfast/Speaker Ready Room Open

8 a.m.  PLENARY SESSION #3: MECHANICAL DEVICES
Moderators: Shunji Sano, MD (Okayama, Japan); William S. Pierce, MD (Hershey, PA); Gerson Rosenberg, PhD (Hershey, PA)

Impella Device in Pediatric Patients
Thorsten Siess, PhD (Aachen, Germany)

Levitronix Centrifugal Pumps in Pediatric Patients
Kurt A. Dasse, PhD (Waltham, MA)

Emboli—Strategies to Reduce Incidence and Impact
Timothy Jones, MD, FRCS (Birmingham, UK)

Ventricular Assist Device Implementation in the Pediatric Population: Does Pump Size Selection and Associated Hemodynamics Impact Outcomes?
S. Adil Husain, MD (Gainesville, FL)

NATIONAL HEART, LUNG, AND BLOOD INSTITUTE PEDIATRIC GRANT Awardees:
PediPump
Brian Duncan, MD (Cleveland, OH)

Penn State Pulsatile VAD
William Weiss, PhD (Hershey, PA)

Pediaflow VAD
Peter Wearden, MD (Pittsburgh, PA)

10 a.m.  Break/Exhibits/Posters

Invited Lectures
10:40 a.m.  Interagency Registry for Mechanical Circulatory Support
Christopher Almond, MD (Boston, MA)

11 a.m.  Single Ventricle – What Does the Future Hold?
Tom Spray, MD (Philadelphia, PA)

11:30 a.m.  Hypoplastic Left Heart Syndrome with Post-Op Support
Shunji Sano, MD (Okayama, Japan)

12 p.m.  LUNCH
1 p.m. **PLENARY SESSION #4: OPTIMIZING CONGENITAL HEART SURGERY**  
Moderators: Tara Karamlou, MD (Portland, OR); Gordon Cohen, MD (Seattle, WA)  
**Novel Approaches to ECMO Following Cardiac Surgery**  
Gordon Cohen, MD (Seattle, WA)  
**Mechanical Assist Following Stage I Palliation**  
Mark Rodefeld, MD (Indianapolis, IN)  
**Mobile ECMO**  
Robert Jaquiss, MD (Little Rock, AR)  
**Adult Congenital Heart Surgery is Best Performed by Congenital Heart Surgeons**  
Tara Karamlou, MD (Portland, OR)  
**Fetal Cardiac Surgery: Mission Impossible?**  
Pirooz Eghtesady, MD, PhD (Cincinnati, OH)  
**ECMO for Single Ventricle**  
Chitra Ravishankar, MD (Philadelphia, PA)  

2:30 p.m. **REGULAR SLIDE PRESENTATIONS: SESSION #2**  
Moderators: Akif Ündar, PhD (Hershey, PA); Brian Duncan, MD (Cleveland, OH)  
S.14 **Preliminary Single Center North American Experience with the Berlin Heart Pediatric EXCOR Device**  
Division of Pediatric Cardiothoracic Surgery, University of Arkansas for Health Sciences and Arkansas Children’s Hospital, Little Rock, Arkansas, USA  

S.15. **Initial Experience with the TandemHeart Circulatory Support System in Pediatric Patients**  
Marco Ricci, MD, Colleen B. Gaughan, MD, Courtney Novello, CCP, Michael Rossi, DO, Fotios M. Andreopoulos, PhD, Tomas A. Salerno, MD, Anthony L. Panos, MD  
From the Division of Cardiothoracic Surgery, Holtz Children’s Hospital/Jackson Memorial Hospital, University of Miami Miller School of Medicine, Miami, FL  

S.16. **Evolving Practice with the Use of Mechanical Support for End-Stage Dilated Cardiomyopathy in Children: A Three-Year Experience from a Large Pediatric Transplant Centre**  
Jef Willems, Carin van Doorn, Aparna Hoskote, Allan Goldman, Liz Smith, Nigel Cross, Ann Karimova  
Cardiac Critical Care Unit, Cardiothoracic Surgery, Perfusion Dept, Great Ormond Street Hospital London, UK
S.17. Antithrombotic Therapy During Mechanical Circulatory Support in Pediatric Patients
Ulrich Schweigmann and Werner Streif
Department Pediatrics, Innsbruck Medical University, Austria

S.18. ECMO vs. Berlin Heart: Support Mode Affects Cerebral and Somatic NIRS Saturation During Bridge to Transplantation for Cardiac Failure in Children
Michael E. Mitchell, MD, James S. Tweddell, MD, Nancy S. Ghanayem, MD, Ndidi Musa, MD, Richard J. Berens, MD, Kimberly L. Gandy, MD, Kathleen Mussatto, RN, and George M. Hoffman, MD
Departments of Pediatrics, Surgery, Cardiothoracic Surgery, Medical College of Wisconsin, Children’s Hospital of Wisconsin, Milwaukee, Wisconsin, USA

S.19. Use of Pulsatile Ventricular Assist Device (Berlin Heart EXCOR®) and Intervventional Lung Assist Device (NovaLung®) in an Animal Model
Tilman Humpl, MD, PhD; Julius Z. Wermelt, MD; Osami Honjo, MD; Glen van Arsdell, MD; Coleen Gruenwald, RRT; Johannes Müller, MD; Ali Kilic BioMed Engineer
Department of Critical Care Medicine, Department of Cardiovascular Surgery, The Hospital for Sick Children, 555 University Avenue, Toronto, ON, M5G 1X8, Canada; Berlin Heart GmbH, Wiesenweg 10, 12247 Berlin, Germany

George M. Pantalos, Ph.D., Tracy Merkley, M.S., Jeffrey Speakman, Gregory Johnson, Ph.D., Mark J. Gartner, Ph.D.
University of Louisville, Cardiovascular Innovation Institute, Louisville, KY & Ension, Inc., Pittsburgh, PA

3:45 p.m. Break

4:15 p.m. DEBATE: “PULSATILE VS. NON-PULSATILE FLOW”
Moderator: Peer M. Portner, PhD (Palo Alto, CA)
Pro: Akif Ündar, PhD (Hershey, PA)
Con: Yukihiko Nose, MD (Houston, TX)

4:50 p.m. Break

5 p.m. AUDIENCE RESPONSE—All Participants
Moderator: Ross Ungerleider, MD (Portland, OR)

6:30 p.m. MODERATED POSTER PRESENTATIONS: SESSION #2
Moderators: Akif Ündar, PhD (Hershey, PA); J. Brian Clark, MD (Hershey, PA)
P.19. **An Axial Flow Turbo Pump with Hydrodynamic Bearings as a Ventricular Assist Device Applicable to Pediatric Patients**
Y.Taenaka¹, T.Tsukiya¹, T.Mizuno¹, H.Tanaka³, E.Tatsumi¹
Y.Kakiuchi², T.Hidaka², T.Okubo², T.Osada², R.Kosaka³, O.Maruyama³,
M.Nishida³, T.Yamane³,
National Cardiovascular Center, Osaka, Japan¹, Mitsubishi Heavy Industries Ltd., Hyogo, Japan², National Institute of Advanced Industrial Science and Technology (AIST), Ibaraki, Japan³

P.20. **In Vivo Performance of the Percutaneous Transhepatic Transseptal TandemHeart® Circulatory Support System**
D. Scott Lim¹, MD, Cory J. Cortese², BS, Amber N. Loree², BS, David A. Dean², MD, Robert G. Svitek³, PhD
¹Department of Pediatrics, Division of Pediatric Cardiology, University of Virginia, Charlottesville, Va.
²R&D and Engineering Department, CardiacAssist, Inc., Pittsburgh, Pa.
³Allegheny-Singer Research Institute, Pittsburgh, Pa.

P.21. **A Novel, Low Cost, Disposable Pediatric Pulsatile Rotary Ventricular Pump (PRVP) for Cardiac Surgery that Provides a Physiological Flow Pattern**
Daniel E. Mazur, Kathryn Osterholzer, PhD, Scott I. Merz, PhD
MC3 Corp., Ann Arbor, Michigan, USA

P.22. **Management of a Pediatric Patient on the Berlin EXCOR® Ventricular Assist Device with Argatroban After Heparin-Induced Thrombocytopenia**
Michael L. Schmitz, MD, Sherry C. Faulkner, CCP., Adnan T. Bhutta, MD, Paul M. Seib, MD, Elizabeth A. Frazier, MD, Michiaki Imamura, MD, PhD, Robert D. B. Jaquiss, MD, The University of Arkansas for Medical Sciences, College of Medicine, and Arkansas Children’s Hospital

P.23. **Berlin Heart in Congenital Heart Disease: Crossing the Border of Septated Hearts**
Davide F. Calvaruso, MD, Antonio Rubino, MD, Salvatore Ocello, MD, David F. Petruccelli, MD, Diego Guardi, MD, Nicoletta Salviato, MD, Salvo Colletto, CCP, Adriano Cipriani, MD, Carlo F. Marcelletti, MD
Department of Pediatric Cardiac Surgery, ARNAS Ospedale Civico, Palermo, Italy

P.24. **A New Dressing Technique to Prevent Cannula Infection After Berlin Heart EXCOR® Pediatric Implantation**
Jodi Conway, BScN, Holger Buchholz, MD, Laurence Lequier, MD, David Ross MD, Bev Wiwchar BCcN, Patti Massicotte, MD, Mary Bauman, MScN NP, David Darlington, CPC CCP, Ivan Rebeyka, MD
Pediatric Ventricular Assist Device Program and the Departments of Pediatrics and Surgery, Stollery Children’s Hospital and the University of Alberta, Edmonton, Alberta, Canada
P.25. Development of an Interprofessional Pediatric Ventricular Assist Device Support Team
Sarah Furness RN, Cecilia Hyslop-St. George, RN Med., Barbara Pound RN, Misty Earle, RN, Andrea Maurich RN, Danika Rice RN, Tilman Humpl MD, PhD

P.26. Prolonged But Successful Weaning from LVAD After Cardiac Decompensation Due to Late-Recognized Coarctation of the Aorta in a Toddler
Christian Meierhofer, MD1, Ludwig Mueller, MD2, Herwig Antretter, MD2, Guenther Laufer, MD2, Peter Mair, MD3, Corinna Velik-Salchner, MD3, Martin Fruehwirth, MD4, Nikolaus Neu, MD5, Elisabeth Schermer, MD5, Jorrit Brunnenmann, MD5, Ralf Geiger, MD5, Joerg-Ingolf Stein, MD5, Ulrich Schweigmann, MD5
1. Department of Pediatrics, Division of Pediatric Cardiology, Pneumology, Allergology and Cystic Fibrosis
2. Department of Cardiac Surgery
3. Department Anaesthsea and Intensive Care Medicine
4. Department of Pediatrics, Pediatric Intensive Care Unit
Medical University Innsbruck, Austria

P.27. Rapidly Deployed ECMO as an Extension of CPR: Sigle Center Results
Peter Wearden MD, Ana Manrique, MD, Margarita Arroyo, MD, Kent Kelly CCP, Ricardo Munoz MD, Victor Morell MD
Departments of Pediatrics, Heart Center - Cardiothoracic Surgery, University of Pittsburgh, Children’s Hospital of Pittsburgh-UPMC, Pittsburgh, Pennsylvania, USA

P.28. Mock Circulation Simulation of Pediatric Extracorporeal Membrane Oxygenation (ECMO) in the Presence of a Congenital Heart Defect
George M. Pantalos, PhD, Tracy Merkley, MS, Erle H. Austin, III, MD, Christopher Mascio, MD
University of Louisville, Department of Surgery and the Cardiovascular Innovation Institute, Louisville, Kentucky

P.29. Extracorporeal Membrane Oxygenation Circulatory Support After Congenital Cardiac Surgery
Yasuyuki Suzuki,MD, Sanae Yamauchi,MD, Kazuyuki Daitoku, MD, Kozo Fukui, MD, Ikou Fukuda, MD
Department of Thoracic and Cardiovascular Surgery, Hirosaki University School of Medicine, 5 Zaifucho, Hirosaki, Aomori, 036-8562, Japan
P.30. **Acute Lung Failure During Mechanical Circulatory Support**
Ulrich Schweigmann \(^1\), Birgit Schwarz \(^3\), Corinna Velik-Salchner \(^3\), Herbert Hangler \(^4\), Jorrit Brunnemann \(^1\), Ralf Geiger \(^1\), Jörg-Ingolf Stein \(^1\), Martin Frühwirth \(^2\), Nikolaus Neu \(^2\), Elisabeth Schermer \(^1\)
\(^1\) Dept. Pediatrics, Pediatric Cardiology
\(^2\) Dept. Pediatrics, Pediatric Intensive Care
\(^3\) Dept. Anaesthesia and Intensive Care Medicine
\(^4\) Dept. Cardiac Surgery
Innsbruck Medical University, Austria

P.31. **Hematological Testing in Animal Implant Studies**
Kathryn E Richards \(^1\), Thomas P Nifong \(^3\), Tigran Khalapyan \(^2\), William J Weiss \(^2\), Gerson Rosenberg \(^2\), Christopher A Siedlecki \(^2\)
\(^1\) Department of Bioengineering, The Pennsylvania State University, Hershey, PA, USA,
\(^2\) Department of Surgery, Penn State College of Medicine, Hershey, PA, USA,
\(^3\) Department of Pathology, Penn State College of Medicine, Hershey, PA, USA

P.32. **Treatment with ECMO in a Newborn with Malignant Arrhythmias After Resection of Cardiac Tumor Resulting in Low Cardiac Output Syndrome**
Theodor Tirilomis, PhD, Oguz Coskun, MD, Heike Schneider, PhD, Wolfgang Ruschewski, PhD
Department for Thoracic, Cardiac, and Vascular Surgery, and Department for Pediatric Cardiology, University of Goettingen, Goettingen, Germany

P.33. **Reoperations in Adults After Correction of Tetralogy of Fallot**
S.Tolga Coskun \(^1\), MD, K.Oguz Coskun \(^2\), MD, Aron Popov \(^2\), MD, Kerstin Bockhorst \(^3\), BSc, Ute Blanz \(^1\), MD, Andreas Bairaktaris \(^1\), MD, Reiner Koerfer \(^4\), PhD
\(^1\) Department of Cardiac Surgery, Heart Center North Rhein Westphalia, Bad Oeynhausen, Germany
\(^2\) Department of Thorax and Cardiovascular Surgery, Göttingen University, Germany
\(^3\) Department of Health Sciences Research, University Bielefeld, Germany
Saturday, May 24, 2008

7 a.m.  Breakfast/Speaker Ready Room Open

8 a.m.  **PLENARY SESSION #5: PERFUSION**
Moderators: Carmen Giacomuzzi, CCP (Portland, OR); Brian Mejak, CCP (Portland, OR)

**Should ACTs Still Be Used During Heart Surgery?**
Colleen Gruenwald, CCP (Toronto, Canada)

**Vacuum-Assisted Venous Drainage**
Chris Brabant, CCP (Milwaukee, WI)

**Experience with the Levitronix Pump**
Ron Angona, CCP (Rochester, NY)

**Berlin Heart in Neonates and Infants**
Johannes Müller, MD (Berlin, Germany)

**Experience with Intermittent Perfusion for Neonatal Heart Surgery**
Christian Pizarro, MD (Wilmington, DE)

**MECC from the Perfusion Perspective**
Stuart Sheppard, PhD (Southampton, UK)

**DEBATE: “CIRCUIT MINIATURIZATION WILL ADD RISK FOR THE PATIENT”**
Moderator: Brian Mejak, CCP (Portland, OR)
Pro: Rich Ginther, CCP (Dallas, TX)
Con: Ed Darling, CCP (Syracuse, NY)

10 a.m.  Break

**Invited Lectures**
10:30 a.m.  **Tell Me What You Need and I Will Tell You How to Get By Without It: CPB in Underdeveloped Countries**
Aubyn Marath, MD (Portland, OR)

10:50 a.m.  **How Do We Help When Our Help No Longer Works?**
Carmen Giacomuzzi, CCP (Portland, OR)

11:15 a.m.  **Human Factors and CPB**
Thor Sundt, MD (Rochester, NY)