Science, Medicine and Industry
Innovating for the Future.

PROGRAM
ASAIO 64th Annual Conference – Washington, DC
“Turning Ideas Into Solutions Through Innovation”
June 13 – 16, 2018
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CME ACCREDITATION STATEMENT
This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the Joint Providership of The University of Massachusetts Medical School and ASAIO. The University of Massachusetts Medical School is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

ASAIO DESIGNATION STATEMENT
The University of Massachusetts Medical School designates this live educational activity for a maximum of 24.5 AMA PRA Category 1 Credits™. Physicians should claim only credit commensurate with the extent of their participation in the activity.

Nursing
This activity meets the requirements for 29.4 contact hours for nurses as specified by the Massachusetts Board of Registration in Nursing (244-CMR 5.04). Each nurse should claim only those hours of credit that he/she actually spent in the educational activity.

Pediatric Medical Device Day DESIGNATION STATEMENT
The University of Massachusetts Medical School designates this live educational activity for a maximum of 5.5 AMA PRA Category 1 Credits™. Physicians should claim only credit commensurate with the extent of their participation in the activity.

Nursing
This activity meets the requirements for 6.6 contact hours for nurses as specified by the Massachusetts Board of Registration in Nursing (244-CMR 5.04). Each nurse should claim only those hours of credit that he/she actually spent in the educational activity.

MCS/VAD University DESIGNATION STATEMENT
The University of Massachusetts Medical School designates this live educational activity for a maximum of 9 AMA PRA Category 1 Credits™. Physicians should claim only credit commensurate with the extent of their participation in the activity.

Nursing
This activity meets the requirements for 10.8 contact hours for nurses as specified by the Massachusetts Board of Registration in Nursing (244-CMR 5.04). Each nurse should claim only those hours of credit that he/she actually spent in the educational activity.

ASAIO-ELSO ECMO Workshop DESIGNATION STATEMENT
The University of Massachusetts Medical School designates this live educational activity for a maximum of 4.25 AMA PRA Category 1 Credits™. Physicians should claim only credit commensurate with the extent of their participation in the activity.

Nursing
This activity meets the requirements for 5.1 contact hours for nurses as specified by the Massachusetts Board of Registration in Nursing (244-CMR 5.04). Each nurse should claim only those hours of credit that he/she actually spent in the educational activity.

ICCAC MCS Proficiency Verification DESIGNATION STATEMENT
The University of Massachusetts Medical School designates this live educational activity for a maximum of 5 AMA PRA Category 1 Credits™. Physicians should claim only credit commensurate with the extent of their participation in the activity.

Nursing
This activity meets the requirements for 6 contact hours for nurses as specified by the Massachusetts Board of Registration in Nursing (244-CMR 5.04). Each nurse should claim only those hours of credit that he/she actually spent in the educational activity.

ACCREDITATION FOR PERFUSIONISTS
The American Board of Cardiovascular Perfusion will allot Category 1 CEUs to those Perfusionists who attend the Conference with a Total Possible of 31.7.

Participants must sign in once daily to verify attendance. A photo ID is required for participants to obtain registration materials. On the first day, pick up a Session Evaluation Worksheet. Keep this Evaluation Worksheet for the duration of the Conference and fill it in for every session you attend. Return your completed Session Evaluation Worksheet to the ASAIO Registration Desk on the last day of your attendance.

For more information or questions, please contact the UMMS-OCME via email at ConEd@Umassmed.edu .
ASAIO Y Nosé International Fellowship
*Sponsored by the Y Nosé Fellowship Fund*

Thomas Schloeglhofer, BSc
Medical University of Vienna, Vienna, Austria
Driveline Infections Following Left Ventricular Assist Device Implantation: Differences Between Three Contemporary Device Types
Page 15

ASAIOfyi – *for young innovators*
Fellowships
*Sponsored by the Paul S Malchesky Fellowship Fund*

Andre Critsinelis, BS, BA
Baylor College of Medicine, Houston, TX
Effects of Continuous Flow Left Ventricular Assist Devices On Long-Term Kidney Function
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Rei Ukita, BSBE
Carnegie Mellon University, Pittsburgh, PA
A Low-Cost, High-Throughput Methodology for Assessing Anticoagulants and Surface Coatings for Artificial Lungs
Page 27
The above individuals constitute the ASAIO Executive Board

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ASAIO 64th Annual Conference
Washington Hilton

Exhibits | Posters | Refreshment Breaks | Welcome Reception

ASAIO
Refreshment Breaks

Thursday
9:45 - 10:30am
3:00 - 3:45pm

Friday
10:00 - 10:45am
3:00 - 3:45pm
At Abbott, we’re committed to helping you live your best possible life through the power of health. For more than 125 years, we’ve brought new products and technologies to the world — in nutrition, diagnostics, medical devices and branded generic pharmaceuticals — that create more possibilities for more people at all stages of life. Today, 94,000 of us are working to help people live not just longer, but better, in the more than 150 countries we serve.

Connect with us at www.abbott.com, on Facebook at www.facebook.com/Abbott and on Twitter @AbbottNews and @AbbottGlobal.

ActiCare Health offers the only VAD+transplant tele-health and advanced monitoring platform with 24x7 support, empowering patients and clinicians to achieve remarkable outcomes with reduced stress. In response to the immense administrative and operational challenges faced by VAD and transplant departments, we’ve designed the only program recognized by accrediting organizations to provide enhanced visibility into patients’ health status, completely modernize patient safety and patient-provider communication, optimize discharge plan adherence, and minimize adverse clinical and financial events. Our program is designed to positively affect health outcomes and quality of life, improve care coordination and staff efficiency, and reduce costs.

The comprehensive Alere VADCare® Program helps you carefully and efficiently manage your patients after discharge to reduce the risk of hospital readmission. Alere fully supports the transition of VAD patients from hospital to home. Patients receive all of the necessary equipment and wound care supplies they need to take care of their VAD equipment and driveline exit site. Additional services through the Alere VADWatch® program include home INR monitoring; weight and blood pressure management; and tracking of VAD metrics in the Alere VADWatch® Data Management application.

Berlin Heart, the only company worldwide, that develops, manufactures and distributes VADs for patients of every age and body size. EXCOR® Pediatric provides medium to long-term circulatory support specifically for infants and children awaiting heart transplants. EXCOR Pediatric is approved for use in the USA under HDE regulations by FDA.

Wolters Kluwer is a leading global provider of information and point of care solutions for the healthcare industry. Our solutions are designed to help professionals build clinical competency and improve practice so they can make important decisions on patient care. We offer evidence-based medical, nursing and allied health content and clinical decision support tools; drug information and patient surveillance; structured documentation and coding; precision medical research tools; and continuing medical education solutions. Our leading product brands include Audio-Digest, Lippincott, Ovid®, UpToDate®, and others.
Getinge Group  
Wayne, New Jersey  
Booth 113

Getinge is a leading global provider of innovative solutions for operating rooms, intensive-care units, hospital wards, sterilization departments and for life science companies and institutions. From now on, names you already know like Maquet, Lancer, Atrium, Pulsion, Datascpe, Steritec, Getinge, Stericool and Trans will be working even closer together under one brand, Getinge. Our job is to simplify your workflow and raise the bar in terms of how efficient, safe and productive you and your colleagues can be. Getinge offers innovative healthcare solutions that improve everyday life for people, today and tomorrow.

Jarvik Heart, Inc.  
New York, New York  
Booth 102

Jarvik Heart, Inc. is a privately held, New York City based company that develops, manufactures and sells unique cardiac assist devices for the treatment of severe heart failure. The Jarvik 2000 is a battery-powered axial-flow left ventricular assist device (LVAD). It is the smallest implantable blood pump available* for the long-term treatment of Heart Failure. The New Jarvik 15mm VAD has been designed for pediatric and small patients and will enter clinical trials in the USA and EU in 2018.

*Jarvik 2000 available, in US, only in FDA clinical trial.

NxStage Medical  
Lawrence, Massachusetts  
Booth 117

NxStage is changing the face of Renal Replacement Therapy in the ICU. Our Device is used for patients requiring Renal Replacement Therapy in the ICU:

- CRRT
- Transitional patients
- In lieu of Intermittent Hemodialysis

We will have our device as well as disposables in the booth.

Medtronic  
Framingham, Massachusetts  
Booth 111

Medtronic MCS is committed to continuous learning and innovation, to further advance the treatment of end-stage heart failure. We strive to improve patient outcomes and the clinical experience of your practice. Stop by the Medtronic booth to learn more and to see the latest HeartWare™ HVAD™ System enhancements.

Orthodynamics Company, Inc.  
Noblesville, Indiana  
Booth 119

Orthodynamics Company Inc. (ODI) ODI is an industry leader in outsourcing of Mechanical Circulatory Support (MCS) outpatient equipment and supplies. We represent all three FDA approved VAD/MCS devices as well as all major wound care suppliers. This offering, accompanied with our VADTrac™ Solution (proprietary equipment management software), has allowed ODI, to develop a national network built on strategic alliances with insurance carriers, hospitals, and clinicians, providing VAD/MCS Coordinators and hospitals a solution so they can focus on what they do best! Providing patients with a high level of care and service, while getting them the equipment and supplies they need, when they need it, is our strength and what we do best! For more information, visit http://www.od-inc.com

Haemonetics  
Braintree, Massachusetts  
Booth 115

Haemonetics THE Global Leader in Blood Management Solutions. Our comprehensive portfolio of devices, information management, and consulting services offers blood management solutions for each facet of the blood supply chain — from plasma and blood collectors to hospitals. We believe that through proper blood management, our portfolio of products and services helps to prevent a transfusion for the patient who doesn’t need one and provides the right blood product, at the right time, in the right dose to the right patient who does.

Medtronic  
Framingham, Massachusetts  
Booth 111
SynCardia Systems, LLC  
Tucson, Arizona  
Booth 106

The SynCardia temporary Total Artificial Heart (TAH-t), the world's most used artificial heart, is now available in two sizes to serve more patients. The 70cc TAH-t is FDA, Health Canada and CE approved as a bridge to transplant for patients with end-stage biventricular failure. The smaller 50cc TAH-t, approved in Europe and Canada and undergoing an Investigational Device Exemption clinical study in the U.S., is designed for patients of smaller stature, including women and adolescents. Stable patients can be discharged to wait for a matching donor heart at home using the Freedom™ portable driver. Visit our booth to learn more.

Transonic  
Ithaca, New York  
Booth 107

Cutting Edge Clinical Systems for:
- Recirculation and Oxygenator Clotting Measurements during ECMO
- Cardiac Output and Blood Volumes in Infants
- Gold Standard Vascular Access Surveillance Tools for Hemodialysis
- Direct Flow Measurement for Anastomotic Patency

Gold Standard Life Science Research Solutions for:
- Perivascular & Tubing Flow Measurements for Every Application
- Pressure Volume Measurements with Admittance Technology
- Implantable Telemetry for Flow, Pressure & ECG

Transonic Inside OEM Products for:
- Custom flow solutions integrated into medical devices
- VADs
- Organ Perfusion and Preservation
- Artificial Hearts
- And so much more…

ICAOT  
Painesville, Ohio

The International Center for Artificial Organs & Transplantation is organized to maintain and operate an educational center. It supports the International Center for Medical Technologies Museum, manages the publication of Artificial Organs and Therapeutic Apheresis & Dialysis. It disseminates information on the historical development, current state of the art and future development of artificial organs.

TandemLife  
Pittsburgh, Pennsylvania  
Booth 121

One Pump. Massive Potential. TandemLife (formerly, CardiacAssist, Inc.) exists to deliver Life Support Simplified, with one small pump enabling any type of extracorporeal circulatory support your patients may need. The TandemHeart pump was the driving force behind the world’s first percutaneous left heart support system. We’ve added on to this legacy of innovation by developing three new product lines with the same reliability you’ve come to expect; TandemLife, TandemLung, and Protek Duo. Visit us to learn how we can empower your program to deliver breakthrough performance in extracorporeal support.

ICAOT  
Painesville, Ohio

The International Center for Artificial Organs & Transplantation is organized to maintain and operate an educational center. It supports the International Center for Medical Technologies Museum, manages the publication of Artificial Organs and Therapeutic Apheresis & Dialysis. It disseminates information on the historical development, current state of the art and future development of artificial organs.

VentriFlo™ True Pulse Pumps  
Design Mentor, Inc.  
Pelham, New Hampshire  
Booth 101

Research demonstrates that physiologic blood flow improves systemic perfusion while reducing complication frequency and severity. Pulsatile blood flow improves microcirculation and better supports renal, ventricular, and end-organ function leading to superior patient outcomes. In 2017, researchers concluded: “The VentriFlo... is the first blood pump designed to mimic the human heartbeat by recreating adjustable pulse waveforms, ... provid[ing] a biomimetic heartbeat.” With applications in extracorporeal support including ECMO and CPB, the VentriFlo True Pulse Pump, (in development), is poised to replace current continuous flow pumps, improve perfusion, reduce complications, shorten patient stays, and save hospitals money by reducing readmissions.
## ASAIO PROGRAM OUTLINE

### WEDNESDAY, JUNE 13, 2018

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:30am – 4:30pm</td>
<td>ASAIO 7th Annual Pediatric Medical Device Day – Columbia Hall 7 – Terrace Level</td>
</tr>
<tr>
<td>8:00am – 5:00pm</td>
<td>MCS / VAD University – Columbia Hall 5 – Terrace Level</td>
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<tr>
<td>6:00 – 9:00pm</td>
<td>ICCAC 11th Annual Meeting – Cabinet Room – Concourse Level</td>
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### THURSDAY, JUNE 14, 2018

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:45am – 12:30pm</td>
<td>General Session 1 – Columbia Hall 5-8 – Terrace Level</td>
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<tr>
<td>12:30 – 1:30pm</td>
<td>Lunch Break</td>
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<tr>
<td>1:30pm – 3:00pm</td>
<td>Cardiac 1 – Acute Heart Failure… – Columbia Hall 5-8 – Terrace Level</td>
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<tr>
<td></td>
<td>Bioengineering 1 – Design Innovation and Optimization – Columbia Hall 9-12 – Terrace Level</td>
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<tr>
<td></td>
<td>Pulmonary 1 – Advances in Surgical Treatment of Respiratory Failure – IBR East – Concourse Level</td>
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<tr>
<td></td>
<td>Renal 1 – KHI Update – Fairchild – Terrace Level</td>
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<tr>
<td></td>
<td>Nursing Abstracts – Gunston – Terrace Level</td>
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<tr>
<td>3:00 – 3:45pm</td>
<td>Visit Exhibits &amp; Posters – Enjoy Refreshments – Columbia – Terrace Level</td>
</tr>
<tr>
<td>3:45 – 5:00pm</td>
<td>Cardiac 2 – Rise of the Machines… – Columbia Hall 5-8 – Terrace Level</td>
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<tr>
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<td>Bioengineering 2 – Hemolysis and Thrombosis – Columbia Hall 9-12 – Terrace Level</td>
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<td>VAD 1 – Lessons from the Wizard of Oz – Monroe – Concourse Level</td>
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<td>Pulmonary 2 – The Value of Pulmonary Extracorporeal Support – IBR East – Concourse Level</td>
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<td></td>
<td>Renal 2 – Traditional Technology Applied in Novel Ways – Fairchild – Terrace Level</td>
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<tr>
<td></td>
<td>Pediatric 1 – …When All Organs Fail, What Do We Do? – Gunston – Terrace Level</td>
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<tr>
<td>6:00 – 7:00pm</td>
<td>ASAIO Welcome Reception – Columbia Hall</td>
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### FRIDAY, JUNE 15, 2018

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<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:00am – 12:30pm</td>
<td>General Session 2 – Columbia Hall 5-8 – Terrace Level</td>
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<tr>
<td>12:30 – 1:30pm</td>
<td>Lunch Break</td>
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<tr>
<td>1:30 – 3:00pm</td>
<td>Cardiac 3 – Optimizing Outcomes in Patients with Durable … – Columbia Hall 5-8 – Terrace Level</td>
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<tr>
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<td>Bioengineering 3 – Sensors and Pump Control… – Columbia Hall 9-12 – Terrace Level</td>
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<td>VAD 2 – Shark Tank – Monroe – Concourse Level</td>
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<td>Pulmonary 3 – Epidemiology of ECMO for Respiratory Support – Lincoln East – Concourse Level</td>
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<td>Renal 3 – Blood Vessel Innovation – Fairchild – Terrace Level</td>
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<td>Pediatric 2 – Overcoming the Limits of Design – Gunston – Terrace Level</td>
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<tr>
<td>1:30 – 2:30pm</td>
<td>IFAO Session – Shaw – First Floor</td>
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<tr>
<td>3:00 – 3:45pm</td>
<td>Visit Exhibits &amp; Posters – Enjoy Refreshments – Columbia – Terrace Level</td>
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<tr>
<td>3:45 – 5:00pm</td>
<td>Cardiac 4 – The Future of MCS Therapy… – Columbia Hall 5-8 – Terrace Level</td>
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<td>Bioengineering 4 – Bleeding and von Willebrand Factor – Columbia Hall 9-12 – Terrace Level</td>
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<td>Pulmonary 4 – Permanently Implantable Respiratory Support – Lincoln East – Concourse Level</td>
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<tr>
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<td>Renal 4 – Minimally Invasive Techniques – Fairchild – Terrace Level</td>
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<td>Pediatric 3 – Pearls and Perils of Supporting Single Ventricles – Gunston – Terrace Level</td>
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<tr>
<td>5:15 – 5:45pm</td>
<td>ASAIO Member Business Meeting – Kalorama - Lobby Level</td>
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SATURDAY, JUNE 16, 2018

8:00am – 12:30pm  **ELSO Course** – Columbia Hall 1-2 – Terrace Level

8:00am – 1:00pm  **ASAIO/ICCAC MCS Proficiency Verification Courses (MPV)** – See page 26 for individual meeting rooms

8:30 – 10:00am  **Cardiac 5** – MCS vs. Heart Transplantation in the Current Era… – Columbia Hall 5-8 – Terrace Level
  **Bioengineering 5** – Tissue Engineering and Regenerative Medicine – Columbia Hall 9-12 – Terrace Level
  **Pulmonary 5** – Temporary Respiratory Support Advances – Columbia Hall 3-4 – Terrace Level
  **Renal 5** – Abstract Session – Fairchild – Terrace Level
  **Pediatric 4** – …Optimizing the Life and Death of Children Supported … – Gunston – Terrace Level

10:00 – 10:45am  Visit Exhibits & Posters – Enjoy Refreshments – Columbia - Terrace Level

10:45am – 12:00pm  **Cardiac 6** – What about the RIGHT? … – Columbia Hall 5-8 – Terrace Level
  **Bioengineering 6** – Additive Manufacturing for Artificial Organs – Columbia 9-12 – Terrace Level
  **Renal 6** – The Business of ESRD Care – Fairchild – Terrace Level
ASAIO 7th ANNUAL PEDIATRIC MEDICAL DEVICE DAY

WEDNESDAY, JUNE 13

ASAIO PROGRAM 2018

8:30am - 4:30pm Columbia Hall 7 - Terrace Level

Dr. Christina VanderPluym

Pediatric Day Co-Chairs:
Christina VanderPluym, MD, Boston Children's Hospital, Boston, MA
Angela Lorts, MD, Cincinnati Children's Hospital Med Ctr, Cincinnati, OH
Iki Adachi, MD, Texas Children's Hospital, Houston, TX

8:35 - 10:05am Pediatric Day Session 1: From Heroic to Standard of Care: The Rise of Artificial Organs in Children

Co-Chairs
Richard Wampler, MD, Oregon Health Sciences University, Loomis, CA
Iki Adachi, MD, Texas Children's Hospital, Houston, TX

8:35 - 8:55am The industrial Revolution of Artificial Organs: Historical Perspective in Children
Kurt Dasse, PhD, University of Louisville, Louisville, KY

9:00 - 9:20am The Current Landscape of Pediatric Mechanical Circulatory Support
Robert Jaquiss, MD, UT Southwestern/Children's Health, Dallas, TX

9:20 - 9:45am What is the Rate Limiting Step for the Future of Pediatric Artificial Organs?
Peter Wearden, MD, PhD, Nemours Children's Hospital, Orlando, FL

9:45 - 10:05am From Micro to Macro - Advances in Artificial Cardiac Support
Antonio Amodeo, DMCCP Professor, Bambino Gesu Hospital, Rome, Italy

10:05 - 10:30am PEDIATRIC REFRESHMENT BREAK 1

10:30am - 12:00pm Pediatric Day Session 2: The “Complication Cascade” - Approaches to Addressing Frequent Adverse Events Related to Artificial Support (Bleeding, Thrombosis, Infection)

Co-chairs
Angela Lorts, MD, Cincinnati Children's Hospital Med Ctr, Cincinnati, OH
Joshua Sparks, MD, University of Louisville, Louisville, KY

10:30 - 10:50am Bleeding
Bioengineering/Research Perspective
Trevor Snyder, PhD, VADovations, Oklahoma City, OK
Clinician Perspective
David Sutcliffe, MD, Dallas Children’s Hospital, Dallas, TX

10:50 - 11:10am Thrombosis
Bioengineering/Research Perspective
Richard Wampler, MD, Oregon Health Sciences, University, Loomis, CA
Clinician Perspective
Jennifer Conway, MD, Stollery Children’s Hospital, Alberta, Canada

11:10 - 11:30am Infection
Bioengineering/Research Perspective
Joshua Woolley, PhD, NuPulseCV, Raleigh, NC
Clinician Perspective
Scott Auerbach, MD, Colorado Children’s Hospital, Aurora, CO

11:30am - 12:00pm PEDIATRIC ABSTRACTS

11:30 - 11:40am Hepatic Effects After Support on the Artificial Placenta
Jennifer McLeod, MD, University of Michigan, Ann Arbor, MI

11:40 - 11:50am Extended Support with Berlin Heart Can be Achieved in Children with Low Rates of Significant Neurologic Events
W. Hampton Gray, MD, University of Southern California, Los Angeles, CA

11:50am - 12:00pm Berlin Heart Excor Thrombosis Behavior
Susan Shea, PhD, Georgia Institute of Technology, Atlanta, GA

12:00 - 1:30pm LUNCH BREAK

1:30 - 2:30pm Pediatric Day Session 3: Lessons from Innovators, Industry and Executives

Co-Chairs
Eric Chen, MS, Food and Drug Administration, Silver Spring, MD
Robert Kroslowitz, CCP, Berlin Heart, The Woodlands, TX

1:30 - 1:45pm OrthoPediatrics - Establishing and Sustaining a Pediatric Focused Medical Device Company
David Bailey, BS, Executive Vice President, Orthopediatrics LLC, Warsaw, IN

1:45 - 2:00pm Physiologic Support for Extreme Prematurity via Pumpless Extracorporeal Technology
Marcus Davey, MD, PhD, Children’s Hospital of Philadelphia, Philadelphia, PA

2:00 - 2:30pm Innovators Forum - Show us your Best:

2:30 - 3:00pm PEDIATRIC REFRESHMENT BREAK 2

3:00 - 4:30pm Pediatric Day Session 4: Novel Use of Devices and Data

Co-Chairs
Francis Fynn-Thompson, MD, Boston Children’s Hospital, Boston, MA
Christopher Almond, MD, MPH, Stanford University, Palo Alto, CA

3:00 - 3:15pm Cardiomems: A Game Changer in Management of Heart Failure
Maya Guglin, MD, PhD, University of Kentucky, Lexington, KY
3:15 - 3:30pm  
**Application of Ultrafiltration in Children**  
David Kwiatkowski, MD, Stanford University, Palo Alto, CA

3:30 - 3:45pm  
**Use of Real World Data for Pediatric Medical Devices**  
FDA Representatives to be announced

3:45 - 4:00pm  
**ACTION Network: Big Data for a Small Population**  
Angela Lorts, MD, MBA, Cincinnati Children's Medical Center, Cincinnati, OH

4:00 - 4:30pm  
**PEDIATRIC ABSTRACTS**

4:00 - 4:10pm  
**The Artificial Placenta: Echocardiographic Evaluation in a Premature Lamb Model**  
Matias Caceres Quinones, MD, University of Michigan, Ann Arbor, MI

4:10 - 4:20pm  
**Alternative Veno-Venous ECMO Cannulation Strategy on Children for Long-Term Ambulatory Support**  
Katsuhide Maeda, MD, PhD, Stanford University Medical Center, Stanford, CA

4:20 - 4:30pm  
**Direct Measurement of Neonatal Cardiac Output Utilizing the Costatus Monitor**  
Simranjeet Sran, MD, Children's National Health System, Washington DC

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**MCS/VAD UNIVERSITY**

8:00am - 5:00pm  
*Columbia Hall 5 - Terrace Level*

8:00 - 8:05am  
**Welcome**

Course Director:  
Pramod Bonde, MD, Yale University, New Haven, CT

8:05 - 10:00am  
**SESSION 1: From a Drawing on a Napkin to Market**  
Design, Development, Testing and Commercialization of a MCS Device  
Steven Koenig, PhD, University of Louisville, Louisville, KY  
Heinrich Schima, PhD, Medical University Vienna, Vienna, Austria  
Tim Kaufmann, Prof. Dr., RWTH Aachen University, Aachen, Germany  
Daniel Timms, PhD, BiVACOR, Cerritos, CA  
Kevin Bourque, PhD, Abbott, Burlington, MA  
Jeffrey LaRose, MSMB, Raleigh, NC

10:00 - 11:00am  
**SESSION 2: Clinical Need and Demand for MCS Support**  
Potential Patient Pool, Indications, Contraindications and Unserved Patient Population  
Mark Slaughter, MD, University of Louisville, Louisville, KY  
Jonathan Haft, MD, University of Michigan, Ann Arbor, MI

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11:00am - 12:00pm  
**SESSION 3: How to Build a Successful MCS Program**  
CMS, Joint Commission Guidelines and Rules, Staffing Needs and Programmatic Aspects  
Pramod Bonde, MD, Yale University, New Haven, CT

12:00 - 1:00pm  
**SESSION 4: Technical Aspects of MCS Implantation**  
Approaching a Crashing and Burning Patient  
Jeffrey Morgan, MD, Baylor College of Med - St. Luke's Med Ctr, Houston, TX  
Technique of a Durable LVAD Implant  
Pramod Bonde, MD, Yale University, New Haven, CT

1:00 - 2:00pm  
**Mock Loop / Prototype Challenge Presentations**  
Concentric Heart Retains Natural Atria And Valves  
Arnold Lande, MD, Northport Navigable Waters, Northport, MI  
Versatile Hybrid Mock Circulation for Testing Active and Passive Cardiovascular Implants Under Dynamically Changing Pathophysiological Conditions  
Marianne Schmid Danders, PhD, ETH Zürich, Zürich, Switzerland  
Embedded Magnet Printing for Ventricular Assist Devices  
Kai Van Peterdorn-Campen, MSc, ETH Zürich, Zürich, Switzerland

1:00 - 2:00pm  
**LUNCH BREAK**

2:00 - 3:00 pm  
**SESSION 5: Total Artificial Heart**  
Indications, Technique and Complications  
Daniel Tang, MD, VCU Medical Center, Richmond, VA  
Devices in the Pipeline  
Daniel Timms, PhD, BiVACOR, Cerritos, CA

3:00 - 4:00pm  
**SESSION 6: Complications and Survivial in MCS Therapy**  
A Physician's Perspective  
William Holman, MD, University of Alabama, Birmingham, AL  
A VAD Professional's Perspective  
Pamela Combs, PhD, RN, The Univ of Chicago Biological Sciences, Chicago, IL

4:00 - 5:00pm  
**SESSION 7: Controversies in MCS Therapy**  
Pulse or No Pulse  
Egemen Tuzun, MD, PhD, Texas A&M University, College Station, TX  
Tethered or Totally Implantable  
Pramod Bonde, MD, Yale University, New Haven, CT  
Partial or Total Support  
Tim Kaufmann, Prof. Dr., RWTH Aachen University, Aachen, Germany  
Devices for Temporary Support  
Jeffrey LaRose, MSMB, RT Cardiac Systems Inc, Raleigh, NC
WEDNESDAY, JUNE 13 (continued)

**ICCAC 11TH ANNUAL MEETING**

6:00-9:00pm *Cabinet Room - Concourse Level*

Chair:
Peggy Blood, MSN, RN, University of Alabama, Birmingham, AL

The International Consortium of Circulatory Clinicians (ICCAC) will be hosting their 11th Annual Meeting which includes time for networking with MCS colleagues, information about ICCAC, and educational resources that help positively impact the MCS team in order to enhance care of our MCS patients.

THURSDAY, JUNE 14

**GENERAL SESSION 1**

7:45am - 12:30pm *Columbia Hall 5-8 - Terrace Level*

Co-Chairs:
Jonathan Haft, MD, University of Michigan, Ann Arbor, MI
Joseph Zwischenberger, MD, University of Kentucky, Lexington, KY

7:45 - 8:00am
**Introduction and Welcome**

Joseph Zwischenberger, MD, Univ of Kentucky, Lexington, KY

8:00 - 9:15am
**TOP ABSTRACTS**

8:00 - 8:10am
LVAD Patients With Chronic Kidney Disease: Are Two Organs Better Than One?
Megan Kamath, MD, University of California, Los Angeles, CA

8:10 - 8:20am
A Risk-Informed Credibility Assessment Framework Applied to a Centrifugal Blood Pump
Tina Morrison, PhD, US Food and Drug Administration, Silver Spring, MD

8:20 - 8:30am
Current Status of the Penn State Infant VAD
Branka Lukic, MS, Penn State College of Medicine, Hershey, PA

8:30 - 8:40am
Acute in Vivo Performance of a Pediatric Ambulatory Artificial Lung
Alexandra May, BS, University of Pittsburgh, Pittsburgh, PA

8:40 - 8:50am
Combining Cation and Anion Exchange Sorbents to Remove Uremic Toxins
Stephen Ash, MD, HemoCleanse Technologies LLC, Lafayette, IN

8:50 - 9:00am
ECMO Transport in Rural Appalachia: Improving Access through a Nurse-Led Transport Team
Sherry Griggs, RN, University of Kentucky, Lexington, KY

9:00 - 9:15am
Discussion

9:15 - 9:45am
President’s Address: Where Do We Go from Here?
Jonathan Haft, MD, University of Michigan, Ann Arbor, MI

9:45 - 10:30am
**POSTER SESSIONS - EXHIBITS**

ENJOY REFRESHMENTS

10:30am-12:30pm *Columbia Hall - Terrace Level*

**GENERAL SESSION 1 - CONTINUED**

10:30 - 11:15am
From the Kidney Health Initiative to Kidney-X: A Call to Action for Kidney Disease!
Prabir Roy-Chaudhury, MD, PhD, University of Arizona, Tucson, AZ

11:15am - 12:15pm
Medical Device Entrepreneur's Forum

Chairman:
H. David Humes, MD, University of Michigan, Ann Arbor, MI

Panelists
Edward Berger, PhD, Larchmont Strategic Advisors, Chestnut Hill, MA
Eric Chen, MS, Food & Drug Administration, Silver Spring, MD

11:15 - 11:35am
Handi
Michael Hemati, MTM, Perikinetics, San Francisco, CA

11:35 - 11:55am
Uniti Sutureless Connection System
Landon Tompkins, MEng, University of Louisville, Louisville, KY

11:55am - 12:15pm
Exatherm: Whole Body Hyperthermia System for Cancer Treatment
Scott Merz, PhD, MC3 Cardiopulmonary Inc, Dexter, MI

12:15 - 12:30pm
Fellowship Award Announcements

12:30 - 1:30pm  LUNCH BREAK

**CARDCIAL 1: Acute Heart Failure - Cardiogenic Shock: Patient/Device Selection**

1:30 - 3:00pm *Columbia Hall 5-8 - Terrace Level*

Co-Chairs:
William Cotts, MD, MS, Advocate Christ Medical Center, Oak Lawn, IL
Jonathan Haft, MD, University of Michigan, Ann Arbor, MI
1:30 - 2:30pm
CARDIAC ABSTRACTS
Cardiohepatic Syndrome Correlates with Mortality Among Patients with Cardiogenic Shock Requiring Acute Mechanical Circulatory Support
Kevin Morine, MD, Tufts Medical Center, Boston, MA

1:40 - 1:50pm
Management of Cardiac Standstill on VA-ECMO Using a High Flow Strategy
Nicholas Cavarocchi, MD, Thomas Jefferson University, Philadelphia, PA

1:50 - 2:00pm
Congestive Profiles Correlate with Clinical Outcomes Among Patients Requiring Acute Mechanical Circulatory Support for Cardiogenic Shock
Kevin Morine, MD, Tufts Medical Center, Boston, MA

2:00 - 2:10pm
Acute Mechanical Unloading Prior to Reperfusion Is Cardioprotective and Limits the Development of Heart Failure After Myocardial Infarction
Michele Esposito, MD, Tufts Medical Center, Boston, MA

2:10 - 2:20pm
Clinical Outcomes Among Patients Requiring Acute Mechanical Circulatory Support for Cardiogenic Shock Supported by Impella or VA-ECMO
Kevin Morine, MD, Tufts Medical Center, Boston, MA

2:20 - 2:30pm
Vasoactive Agent Exposure Prior to Acute Mechanical Circulatory Support for Cardiogenic Shock is Associated with End Organ Dysfunction and Mortality
Kevin Morine, MD, Tufts Medical Center, Boston, MA

INVITED PRESENTATION

2:30 - 2:50pm
Tying It All Together: Choosing the Best Device
Navin Kapur, MD, Tufts Medical Center, Boston, MA

2:50 - 3:00pm
Discussion

BIOENGINEERING 1: Design Innovation and Optimization
1:30 - 3:00pm Columbia Hall 9-12 - Terrace Level
Co-Chairs:
Choon-Sik Jhun, PhD, Penn State College of Medicine, Hershey, PA
Amy Throckmorton, PhD, Drexel University, Philadelphia, PA

1:30 - 1:50pm
Improved Blood Pumps Through Innovation and Optimization
Gerson Rosenberg, PhD, Penn State College of Medicine, Hershey, PA

1:50 - 3:00pm BIOENGINEERING ABSTRACTS

1:50 - 2:00pm
Modified Cavopulmonary Assist Device Implemented in the Inferior Vena Cava Can Improve Fontan Hemodynamics
Masoud Farahmand, Clemson University, Clemson, SC

2:00 - 2:10pm
Safety and Efficacy of a Long-Term Intravascular Ventricular Assist System (Ivas) in Animals
Sonna Patel-Raman, PhD, NuPulseCV, Apex, NC

2:10 - 2:30pm
VA ECMO Restores Systemic Circulation In Severe Cardiogenic Shock But Exacerbates LV Distension: A Numerical Simulation Study
Po-Lin Hsu, PhD, Soochow University, Jiangsu, China

2:20 - 2:30pm
Preclinical Surgical Experience with an Intravascular Hemofilter for Organ Replacement Therapy
Jarrett Moyer, MD, University of California, San Francisco, San Francisco, CA

2:30 - 2:40pm
Inventive Knowledge Flow: Tracking the Progress of Biomedical Innovation
Michael DiCaro, BS, University of Arizona, Tucson, AZ

1:30 - 3:00pm IBR East - Concourse Level
Co-Chairs:
Hari Mallidi, MD, Brigham and Womens, Boston, MA
Jeffery Javidfar, MD, Emory University, Atlanta, GA

1:30 - 1:45pm
Contemporary Surgical Therapies for Respiratory Failure
Mani A. Daneshmand, MD, Duke University, Durham, NC

1:45 - 1:50pm
Discussion and Questions

1:50 - 2:05pm
Prevention of White Lung in VA ECMO
Ping Li, MD, Wuhan Union Hospital, Wuhan, China

2:05 - 2:10pm
Discussion and Questions

2:10 - 2:25pm
Refractory Respiratory Failure on ECMO: A Growing Indication for Lung Transplantation in Children
Don Hayes, MD, MS, NationWide Children's Hospital

2:25 - 2:30pm
Discussion and Questions

2:30 - 3:00pm PULMONARY ABSTRACTS

2:30 - 2:40pm
Successful 30-Day Sheep Studies of a Wearable Pumping Artificial Lung
Ryan Orizondo, PhD, BS, University of Pittsburgh, Pittsburgh, PA

2:40 - 2:50pm
An Advanced Lumped Parameter Model for the Simulation of ECMO Therapy
Kristen Hugenroth, RWTH Aachen University, Aachen, Germany

2:50 - 3:00pm
Technical Indicators to Evaluate the Degree of Large Clot Formation Inside the Membrane Fiber Bundle of An Artificial Lung in an in Vitro Setup
Andreas Kaeeler, Dipl. Ing, RWTH Aachen University, Aachen, Germany
RENAL 1: KHI Update
1:30 - 3:00pm Fairchild - Terrace Level
Co-Chairs:
  Alexander Yevzlin, MD, University of Michigan, Ann Arbor, MI
  Matthew McGuire, MD, University of Michigan Health System, Ann Arbor, MI

1:30 - 1:40pm
RENAL ABSTRACT
  Developments Within KHI from the European Side
  Fokko Wieringa, PhD, imec, Eindhoven, Netherlands

INVITED PRESENTATIONS
1:40 - 2:20pm
  Kidney Health Initiative - Defining the Purpose and Mission
  Melissa West, Kidney Health Initiative, Washington, DC

2:20 - 3:00pm
FDA Perspective
  Murray Sheldon, MD, FDA, Silver Spring, MD

NURSING ABSTRACTS
1:30 - 3:00pm Gunston - Terrace Level
Co-Chairs:
  Pamela S. Combs, PhD, RN, The Univ of Chicago Biological Sciences, Chicago, IL
  Jesus Casida, PhD, RN, APN-C, University of Michigan, Ann Arbor, MI

1:30 - 1:40pm
  Driveline Infections Following Left Ventricular Assist Device Implantation: Differences Between Three Contemporary Device Types
  Thomas Schlöglhofer, BSc, Medical University of Vienna, Vienna, Austria

1:40 - 1:50pm
  Impact of Substance Abuse on Left Ventricular Assist Device Outcomes
  Heather Moody, APRN, ACNP, University of Louisville, Louisville, KY

1:50 - 2:00pm
  The Safety and Efficacy of Vitamin K Administration in Left Ventricular Assist Device Supported Patients with Elevated INR Levels
  Erin Davis, RN, BSN, University of Utah Hospital, Salt Lake City, UT

2:00 - 2:10pm
  A National Study of Bedside Nurse VAD Competencies
  Jesus Casida, PhD, RN, APN-C, University of Michigan, Ann Arbor, MI

2:10 - 2:20pm
  Sleep Quality and Daytime Function Among Adults Implanted with Long-Term Left-Ventricular Assist Devices (LVADS)
  Zachary Chornoby, BS, University of Michigan, Ann Arbor, MI

2:20 - 2:30pm
  Correlates of Caregiving Characteristics in Left Ventricular Assist Devices
  Ashley Jingzhi Xu, PhD Candidate, Johns Hopkins University, Baltimore, MD

2:30 - 2:40pm
  Depression is Associated with Poor Sleep Quality and Daytime Sleepiness in Advanced Heart Failure Patients Implanted with Left Ventricular Assist Devices (LVADS)
  Jonah Kazmierski, BS, University of Michigan, Ann Arbor, MI

2:40 - 2:50pm
  Surgical and Nursing Management in the Care of Patients Post LVAD Implant without the Use of Blood Products
  Colleen LaBuhn, RN, University of Chicago Medical Center, Chicago, IL

2:50 - 3:00pm
  Women and Mechanical Circulatory Support: A Large Volume, Single Center Experience
  Karen Meehan, MSN, Advocate Christ Medical Center, Oak Lawn, IL

POSTER SESSIONS - EXHIBITS ENJOY REFRESHMENTS
3:00 - 3:45pm Columbia Hall - Terrace Level
CARDIAC 2: Rise of the Machines: Ethical Issues, Difficult Decisions, and Resource Utilization in MCS Therapy
3:45 - 5:00pm Columbia Hall 5-8 - Terrace Level
Co-Chairs:
  Jacob Strand, MD, Mayo Clinic, Rochester, MN
  Jennifer Beckman, MSN, ARNP, FNP, University of Washington, Seattle, WA

3:45 - 4:05pm CARDIAC ABSTRACTS
3:45 - 3:55pm
  Major Orthopedic Surgical Intervention Post Left Ventricular Assist Device (LVAD) Implantation: A 10 Year Single Center Review
  Sarah Schettler, PA-C, Mayo Clinic, Rochester, MN

3:55 - 4:05pm
  The Effectiveness of Cardiac Rehabilitation in Patients with Left Ventricular Assist Devices (LVADS): A Systematic Review and Meta-Analysis
  Sek Chair, PhD, The Chinese University of Hong Kong, Hong Kong, China

4:05 - 4:15pm
  Should a History of Illicit Drug Use be an Absolute Contraindication for LVAVD Implantation?
  Felixnando Rubio, BS, Baylor College of Medicine at Texas Heart Inst, Houston, TX

4:15 - 4:25pm
  Psychosocial Characteristics of Patients Selected for Left Ventricular Assist Device Implantation
  Alexander Rodriguez, BS, Northwestern University, Chicago, IL

4:30 - 4:50pm
  To VAD or NOT to VAD: Defining a Global Perspective
  Simon Maltais, MD, PhD, Mayo Clinic, Rochester, MN

4:50 - 5:00pm
  Discussion

BIOENGINEERING 2: Hemolysis and Thrombosis
3:45 - 5:00pm Columbia Hall 9-12 - Terrace Level
Co-Chairs:
  Brent Craven, PhD, Food & Drug Administration, Silver Spring, MD
  Heinrich Schima, PhD, Medical University of Vienna, Vienna, Austria
3:45 - 4:05pm  
**Developing a Material-Sensitive Computational Thrombosis Model**  
Keefe Manning, PhD, The Pennsylvania State University, University Park, PA

4:05 - 4:25pm  
**Subclinical Hemolysis Contributes to LVAD Thrombosis**  
Carlo Bartoli, MD, PhD, University of Pennsylvania, Philadelphia, PA

4:25 - 4:45pm  
**Reevaluating Scaling Parameters for Continuum-based Hemolysis Prediction**  
Keith Sharp, PhD, University of Louisville, Louisville, KY

4:45 - 5:00pm  
**BIOENGINEERING ABSTRACT**  

4:45 - 4:55pm  
**Platelet Membrane Fluidity: A Mechanistic Component of Shear-Mediated Platelet Activation**  
Alice Sweedo, University of Arizona, Tucson, AZ

VAD 1: Lessons from the Wizard of Oz!

3:45 - 5:00pm  
**Monroe - Concours Level**

Co-Chairs:  
Dawn Christensen, MS, FNP-BC, Innovation Program Solutions LLC, Pine Grove, PA  
Erin Davis, BSN, RN, University of Utah, Salt Lake City, UT

3:45 - 4:05pm  
**The Scarecrow & The Lion: Courage to Think & Act - Ideas & Tools to improve Team Efficiency and Honor the VAD Coordinator Role**  
Nancy Richards, MSN, RN, Univ of Kansas Health System, Kansas City, KS

4:05 - 4:30pm  
Coordinator Panel:  
Brigette Marciniak-Bednar, BSN, Jackson Memorial Hospital, Miami, FL  
Beth Hawkins, RN, MSN, FNP-C, Boston Children’s Hospital, Boston, MA  
Krista Marz, RN, CCRN, Ochsner Medical Center, New Orleans, LA

4:30 - 5:00pm  
**The Tin Man: “I Know I’ve Got a Heart Because it is Breaking” - What Can be Done when the Right Side Goes Down?**  
Two Case Studies:  
Sarah Schettle, PA-C, Mayo Clinic, Rochester, MN

PULMONARY 2: The Value of Pulmonary Extracorporeal Support

3:45 - 5:00pm  
**IBR East - Concours Level**

Co-Chairs:  
James M. Blum, MD, Emory University, Atlanta, GA  
Jonathan Haft, MD, University of Michigan, Ann Arbor, MI

3:45 - 4:00pm  
**ECLS Fiscal Considerations, Outcomes and Reimbursements**  
Simont Maltais, MD, PhD, Mayo Clinic, Rochester, MN

4:00 - 4:05pm  
Discussion and Questions
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<td>In Vitro Hemolysis Evaluation of CH-VAD, an Ultra-Compact Fully Magnetically Suspended Left Ventricular Assist Device</td>
<td>Liudi Zhang, PhD, Soochow University, Jiangsu, China</td>
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<td>148</td>
<td>Numerical Simulation for Thrombosis under Non-Newtonian, Pulsatile Blood Flow</td>
<td>Ling Yang, BS, The Pennsylvania State University, University Park, PA</td>
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<td>149</td>
<td>High Hydrostatic Pressure (Hhp) Engineering-Based Acellular Scaffolds for Airways Reconstruction in Porcine Model</td>
<td>Tetsuji Yamaoka, PhD, National Cerebral and Cardiovascular Center Research Institute, Japan</td>
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<td>150</td>
<td>Blood Pump Rotor Eccentricity And Hemolysis Evaluation</td>
<td>Zhongwei Qi, MS, Abiomed Inc., Danvers, MA</td>
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<td>151</td>
<td>A Surrogate Modeling Approach to Predict Device-Specific Hemolysis Power Law Coefficients in Blood Contacting Medical Devices</td>
<td>Brent Craven, PhD, US Food and Drug Administration, Silver Spring, MD</td>
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<td>152</td>
<td>Virtual Reality in Medical Education: Responses to Innovative Learning Methods</td>
<td>Michael D’icaro, BS, University of Arizona, Tucson, AZ</td>
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<td>153</td>
<td>How Well Understood Is the Mechanism of Plasma-Free Hemoglobin Mediated Vasocostriction?</td>
<td>Jan Stanley Simoni, DVM, PhD, TX HemoBio Therapeutics &amp; Bioinnovation Ctr, Lubbock, TX</td>
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<td>154</td>
<td>“Digital Reflexes”: Quantitation and Signatures of Superficial Reflexes via Stretchable Electronic Wearable Sensors</td>
<td>Rebecca Slepian, University of Arizona, Tucson, AZ</td>
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<td>155</td>
<td>Surface Characterization of Implantable Long-Term Use Fontan Pump Materials</td>
<td>Clare McHugh, The Pennslyvania State University, University Park, PA</td>
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<td>156</td>
<td>Computational Fluid Dynamics Estimation of Blood Damage In Spiral Groove Bearing</td>
<td>Qing Han, PhD, University of Jinan, Jinan, China</td>
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<td>157</td>
<td>Revisiting the Definition of Surplus Hemodynamic Energy (She) - Are We Using the Right Pulsatility Index?</td>
<td>Po-Lin Hsu, PhD, Soochow University, Soochow, China</td>
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<td>158</td>
<td>Assessment of VAD Hydraulic and Blood Damage Performances By Means of Dynamic Pressure Simulations</td>
<td>Alessandra Molteni, Calon Cardio – Technology, Swansea, United Kingdom</td>
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159 On the Estimation of Hemodynamic Parameters Using Dilution Protocol and Relative Blood Volume
Hamed Samandari, PhD, Miami University, Miami, FL

160 An Automated Aortic Graft Replacement for Aortic Aneurysmal Disease
Pramod Bonde, MD, Yale University, New Haven, CT

161 Virtual Anatomic Fitting of a Centrifugal LVAD: An Inlet Cannula Study
Bruno Utiyama da Silva, PhD, Sao Paulo, Brazil

162 Relationship of Platelet Adhesion with Surface Topography in the Penn State PVAD
Cecilia Richardson, The Pennsylvania State University, State College, PA

Nursing Posters

163 Work Related Burnout Is a Predictor of the Quality of Work Life among Nurse Practitioners in Mechanical Circulatory Support Programs
Jesus Casida, PhD, RN, APN-C, University of Michigan, Ann Arbor, MI

164 LVAD Self-Efficacy and Caregiver Dependency Do Not Mediate the Relationship between Anxiety, Depression, and Quality of Life
Jesus Casida, PhD, RN, APN-C, University of Michigan, Ann Arbor, MI

165 Survival Post Heart Transplant by Era in Recipients ≥ 65y Bridged with Mechanical Circulatory Support
Anthony Dan Paul Salimbangon, RN, BSN, CCRN, UCLA Medical Center, Los Angeles, CA

166 Reduction of VAD Coordinator Time Burden and Empowerment of HVAD Patients without Compromising Care
Thomas Schlaghofer, BSc, Medical University of Vienna, Vienna, Austria

167 Feasibility of Supporting Heartmate II Patients on an Ungrounded Cable to Prevent the Short-To-Shield Phenomenon
Laura Coyle, MSN, ACNP-BC, Advocate Christ Medical Center, Oak Lawn, IL

168 How to Improve Homecare after VAD Implantation a Patients’ Perspective
Thomas Berg, MD, University Hospital RWTH Aachen, Aachen, Germany

169 Bridging VA ECMO to Durable LVAD: Keys to Success
Brazil Jassman, RN, BSN, INTEGRIS Baptist Medical Center, Oklahoma City, OK

170 The Lived Experiences of Caregivers Transitioning Home With Persons with a Ventricular Assist Device
Pamela Combs, PhD, RN, The University of Chicago Biological Sciences, Chicago, IL

171 Language of the Heart: Revising Consent for Improved LVAD Outcomes
Adriane Edlund, RN, University of Rochester Medical Center, Rochester, NY

172 Emergency Preparedness for Centrimag VAD Patients in the CTICU
Marita Nell-Daniels, RN, BSN, CCRN, New York Presbyterian Columbia University Medical Center, New York, NY

173 Standardized Mechanical Circulatory Support Guidelines: The Perspective from Coordinators
Andrew Lundstrom, BSN, RN, Bryan Heart, Lincoln, NE

174 The Inner Workings of Femoral VA ECMO
Monika Tukacs, RN, BSN, New York Presbyterian Hosp Columbia University, New York, NY

175 Changes in the Clinical Characteristics of LVAD Patients
Kathleen Hickey, PhD, Columbia University at CUMC, New York, NYF

176 When Indecision Is the Decision
Jill Giordano, Newark Beth Israel Medical Center, Newark, NJ

177 Improving Venticular Assist Device VAD Patient Education Through Teach Back
Penny Messner, APRN, CNS, DNP, Mayo Clinic, Rochester, MN

178 Bedside Nurses Perceived Challenges of VAD Patient Care: A Qualitative Analysis
Pamela Combs, PhD, RN, The University of Chicago Biological Sciences, Chicago, IL

FRIDAY, JUNE 15

GENERAL SESSION 2

8:00am - 12:30pm Columbia Hall 5-8 - Terrace Level

Co-Chairs:
Steven Koenig, PhD, University of Louisville, Louisville, KY
Egemen Tuzun, MD, PhD, Texas A&M University, College Station, TX

8:00 - 8:30am ASAIOfyi - for Young Innovators Rapid Fire Presentations

8:00 - 8:05am Transmission Electron Microscopy of Explanted Intravascular Medical Devices
Staci Jessen, PhD, CV Pathology Lab Texas A&M University, College Station, TX

8:05 - 8:10am Fluid Dynamics of the Pulsatile Penn State Pediatric Ventricular Assist Device at Elevated Beat Rate Conditions
Sailahari Ponnaluri, Pennsylvania State University, State College, PA

8:10 - 8:15am Asymptomatic Moderate Aortic Insufficiency with a Left Ventricular Assist Device Portends a Worse Long-Term Survival
Bryan Auvil, University of Pennsylvania, Philadelphia, PA

8:15 - 8:20am Comparison of HMII and HVAD Outcomes in Patients Supported for Over Two Years
Harveen Lamba, MD, Baylor College of Medicine, Houston, TX

8:20 - 8:25am Hemodynamic Speed Optimization in VAD Support
Venkat Chivukula, PhD, University of Washington, Seattle, WA
8:25 - 8:30am
Maintaining VAD Competency for a Growing Program: One Centers Experience
Andrew Lundstrom, MSN, RN, Bryan Heart, Lincoln, NE

8:30 - 9:30am
ASAIOfyi - for Young Innovators Student Design Competition
Final Design of Pediatric Artificial Urinary Sphincter
Sonali Mahendran, BS, Rice University, Houston, TX
Saheba Bhatnagar, BS, Rice University, Houston, TX

Device for At-Home Monitoring of Jugular Venous Pressure
Nicholas Calafat, BS, Rice University, Houston, TX

Implantable Port for the Localization and Sustainment of Implanted Cells for Cellular Therapies
Lucas Tatem, Clemson University, Clemson, SC
William Scammon, Clemson University, Clemson, SC
Alex Ormerod, Clemson University, Clemson, SC

Wireless Leadless Multisite Pacemaker Prototype
Yohey Maguire, Rice University, Houston, TX

Development of an Acute Ischemic Stroke Hemodynamic Flow Model
Thomas Donnelly, Pennsylvania State University, State College, PA

Fixtula
Bibhav Poudel, BS, Johns Hopkins University, Baltimore, MD
Nicholas Zhang, BS, Johns Hopkins University, Baltimore, MD

Development of a Non-Blood Contacting Pediatric Heart Augmentation Device
Jordan Verner, Texas A&M University, College Station, TX

Influence of compliant Sinuses of Valsalva on Poli-valve Hydrodynamic Performance
Davide Dell’Oca, Politecnico di Milano, Milan, Italy

9:30 - 10:00am
Keynote Address: Innovations in Communication
Ralph Weickel, BA, President, Corporation for Positive Change, Lexington, KY

POSTER SESSIONS - EXHIBITS
ENJOY REFRESHMENTS
10:00 - 10:45am Columbia Hall - Terrace Level

GENERAL SESSION 2 - CONTINUED
10:45 - 11:15am
ASAIO Hastings Lecture
Steven Phillips, MD, NIH retired, Urbandale, IA

11:15 - 11:35am
Open Discussion with Two ASAIO Pioneers
Jean Kantrowitz, MPH, Viaderm LLC, Plymouth, MI
Edward Leonard, PhD, Columbia University, Columbia, NY

11:35am - 12:20pm
KEYNOTE SPEAKER - FIRESIDE CHAT

The Evolution of Cardiac Surgery Over 4 Decades from a Surgeon, Innovator, Clinical Trials Director, Service Line and CEO Perspective
Delos Cosgrove, MD, CEO, Cleveland Clinic, Cleveland OH

12:30 - 1:30pm LUNCH BREAK

CARDB 3: Optimizing Outcomes in Patients with Durable Mechanical Support: How to Make the Best of It?
1:30 - 3:00pm Columbia Hall 5-8 - Terrace Level
Chair:
Claudius Mahr, DO, University of Washington, Seattle, WA

1:30 - 2:30pm CARDIAC ABSTRACTS
1:30 - 1:40pm
Sequences of Adverse Events In Left Ventricular Assist Device (Lvad) Patients Experiencing Episodes of Neurological Dysfunction
Faezeh Movahedi, PhD, University of Pittsburgh, Pittsburgh, PA

1:40 - 1:50pm
Effects of Continuous Flow Left Ventricular Assist Devices on Long-Term Kidney Function
Harveen Lamba MD, Baylor College of Medicine, Houston, TX

1:50 - 2:00pm
Correlation of Doppler Opening Blood Pressure to Invasive Mean Arterial Pressure In Continuous Flow VADS
Claudius Mahr, DO, University of Washington, Seattle, WA

2:00 - 2:10pm
Effectiveness of Time in Therapeutic Range (Ttr) in Predicting Adverse Outcomes in Left Ventricular Assist Device (Lvad) Patients
Elizabeth Einarson, Intermountain Medical Center, Murray, UT

2:10 - 2:20pm
Atrial Fibrillation Increases Thrombogenicity of Lvad Support Via Increased Platelet Shear Exposure and Residence Time
Jennifer Beckman, MSN, ARNP, FNP, University of Washington, Seattle, WA

2:20 - 3:30pm
Predictors of Long-Term Survival of Patients on Left Ventricular Assist Device Support
Sriram Nathan, MD, The University of Texas Health Science Center, Houston, TX
**INVITED PRESENTATION**

2:30 - 2:50pm
*What Does the Ideal VAD Look Like?*
John M. Stulak, MD, Mayo Clinic Hospital, Rochester, MN

2:50 - 3:00pm
*Discussion*

**BIOENGINEERING 3: Sensors and Pump Control (Physiological Control and Speed Modulation)**

1:30 - 3:00pm *Columbia Hall 9-12 - Terrace Level*

Co-Chairs:
Joshua P. Cysyk, PhD, Penn State College of Medicine, Hershey, PA
Kevin Soucy, PhD, University of Louisville, Louisville, KY

1:30 - 2:00pm
*Pump Flow Adaptation to Physiological Needs - Challenges, Implementations in Software and Hardware, Validation Steps*
Marianne Schmid Daners, PhD, ETH Zurich, Switzerland

2:00 - 3:00pm
*BIOENGINEERING ABSTRACTS*

2:00 - 2:10pm
*Physiological Control with a Synchronous Positive Displacement Rotary Piston Pump*
Jeffrey Gohean, MSME, Windmill Cardiovascular Systems Inc, Austin, TX

2:10 - 2:20pm
*Portable Pneumatic Driver for Long-Term Counterpulsation Support*
Joshua Woolley, PhD, NuPulseCV, Raleigh, NC

2:20 - 2:30pm
*The Six-Minute Walk Test Revisited: A Human Motion Study of Heart Failure Patients*
Hailey Swanson, University of Arizona, Tucson, AZ

2:30 - 2:40pm
*A Modified Definition of Ejection Fraction for Continuous Flow Left Ventricular Assist Devices as a Determinant for Heart Recovery*
Viswajith Siruvallar Vasudevan, University of Central Florida, Orlando, FL

2:40 - 2:50pm
*Effect of Driving Pressure on VAD Flow Fields*
John Woodard, PhD, Berlin Heart GmbH, Berlin, Germany

2:50 - 3:00pm
*Evaluation of Flow Modulation Approaches in Ventricular Assist Devices (VADS) Using an In-Vitro Endothelial Cell Culture Model (ECCM)*
Palaniappan Sethu, PhD, University of Alabama at Birmingham, Birmingham, AL

**VAD 2: Shark Tank - “Nobody has a monopoly on good ideas.” - Kevin O’Leary**

1:30 - 3:00pm *Monroe - Concourse Level*

Co-Chairs:
Dawn Christensen, MS, FNP-BC, Innovation Program Solutions LLC, Prine Grove, PA
Erin Davis, BSN, RN, University of Utah, Salt Lake City, UT

1:30 - 2:00pm
*Topic 1: Expanding a Program without Adding New Personnel*
"Tough times never last; tough people always do." - Robert Herjavec
Roger Swayze, RN, BSN, MBA, CHI St. Vincent, Little Rock, AR
Thomas Berg, MA, University Hospital RWTH Aachen, Aachen, Germany

2:00 - 2:30pm
*Topic 2: Simplifying Significant & Essential Education Needs*
"It comes down to finding something you love to do and then just trying to be great at it." - Mark Cuban
Mike McCull, BME, University of Pittsburgh Medical Center, Pittsburgh, PA
Cheryl Bittel, MSN, APRN, Northeast Georgia Medical Center, Gainesville, GA

2:30 - 3:00pm
*Topic 3: Excellent Driveline Care: Say YES to the dressing!*
"Everyone has an idea, but it’s taking those first steps toward turning that idea into a reality that are always the toughest." - Daymond John
Brazil Jassman, RN, BSN, INTEGRIS Baptist Medical Center, Oklahoma City, OK
Anthony Dan Paul Salimbangon, RN, BSN, UCLA Medical Center, Buena Park, CA

**PULMONARY 3: Epidemiology of ECMO for Respiratory Support**

1:30 - 3:00pm *Lincoln East - Concourse Level*

Chair:
Raquel Bartz, MD, Duke University, Durham, NC

1:30 - 1:45pm
*Present and Future Directions of ECMO Centers*
Michael J. Stentz, MD, MS, Emory University, Atlanta, GA

1:45 - 1:50pm
*Discussion and Questions*

1:50 - 2:05pm
*The Explosive Growth of Adult ECMO in the United States*
Jacob T. Gutsche, MD, University of Pennsylvania, Philadelphia, PA

2:05 - 2:10pm
*Discussion and Questions*

2:10 - 2:25pm
*The Changing Landscape of Extracorporeal CPR*
Steven Conrad, MD, PhD, Louisiana State University HCS, Shreveport, LA

2:25 - 2:30pm
*Discussion and Questions*
2:30 - 3:00pm  PULMONARY ABSTRACTS

2:30 - 2:40pm
OCS Ex-Vivo Lung Perfusion Maintains Endothelial Integrity Associated with Reduced Severe PGD Grade
Bettina Wiegmann, MD, Hannover Medical School, Hannover, Germany

2:40 - 2:50pm
In Vitro Characterization of a Modular Pump Lung Capable of Multiple Respiratory Assist Applications
Ryan Orizondo, PhD, BS, University of Pittsburgh, Pittsburgh, PA

2:50 - 3:00pm
Development of an Ultra Compact Durable ECMO System with Built-In Monitors and Long-Term Evaluation in Chronic Animal Experiments for four Weeks
Nobumasa Katagiri, PhD, National Cerebral & CV Ctr Research Inst Osaka, Japan

RENA 3: Blood Vessel Innovation
1:30 - 3:00pm Fairchild - Terrace Level

Co-Chairs:
Alexander Yevzlin, MD, University of Michigan, Ann Arbor, MI
Matthew McGuire, MD, University of Michigan Health System, Ann Arbor, MI

RENA ABSTRACT
1:30 - 1:40pm
Intergaft Pivotal Trial: A Novel AVG Minimally Invasive Anastomotic Device for AVG Creation
Alexander Yevzlin, MD, University of Michigan, Ann Arbor, MI

INVITED PRESENTATION
1:40 - 2:00pm
Bioengineered Blood Vessel for Hemodialysis Access and Vascular Repair
Jeffrey Lawson, MD, PhD, Humacyte Inc, Durham, NC

2:20 - 3:00pm
Vascular Elasticity in Hemodialysis Access
William Weitzel, MD, University of Michigan Health System, Ann Arbor, MI

PEDIATRIC 2: Overcoming the Limits of Design: Minituarization, Portability and Affordability in Children
1:30 - 3:10pm Gunston - Terrace Level

Co-Chairs:
Robert Niebler, MD, Medical College of Wisconsin, Milwaukee, WI
Angela Lorts, MD, Cincinnati Children's Hospital Med Ctr, Cincinnati, OH

1:30 - 1:50pm
Adapting Big Devices to Small Children: Virtual Fit Technology
David Morales, MD, Univ of Cincinnati College of Medicine, Cincinnati, OH

1:50 - 2:10pm
Adapting Big Devices to Small Children: Human Factor Testing and Modifications
Jenna Murray, NP, Stanford Children's Hospital, Palo Alto, CA

2:10 - 2:30pm
Downsizing: The future is Small
Charles Dague, MSEE, Abbott, Burlington, MA

2:30 - 2:50pm
Examing the Affordability of Advanced Support in Children
Joseph Rossano, MD, Children's Hospital of Philadelphia, Philadelphia, PA

2:50 - 3:10pm
ABSTRACT PRESENTATIONS

2:50 - 3:00pm
A Pediatric Heart Valve Designed for Adaptation to Growth
Corin Williams, PhD, Draper University, Cambridge, MA

3:00 - 3:10pm
Impella CP Use for Left Heart Decompression While on ECMO in a Pediatric Patient
Ashish Ankola, MD, Morgan Stanley Children's Hospital of New York Presbyterian, New York, NY

IFAO SESSION
1:30 - 2:30pm Shaw - First Floor

Co-Chairs:
Jonathan Haft, MD, University of Michigan, Ann Arbor, MI
Toru Masuzawa, PhD, Ibaraki University, Ibaraki, Japan

1:30 - 1:50pm
Current Topics and Future Perspectives of Surgery for Valve Disease in Japan
Koichi Toda, MD, PhD, Osaka University, Osaka, Japan

1:50 - 2:10pm
SAVR, TAVR, SMVR, TMVR, etc: Technologies and Trends for Heart Valve Repair and Replacement
Ulrich Steinseifer, PhD, Monash University, Clayton, Australia

2:10 - 2:30pm
Aortic Valve Replacement Trends in the US: The Future Role of Surgical Replacement
Mark Slaughter, MD, University of Louisville, Louisville, KY

POSTER SESSIONS - EXHIBITS
ENJOY REFRESHMENTS
3:00 - 3:45 Columbia Hall - Terrace Level

CARDIAC 4: The Future of MCS Therapy: Innovative and Novel Bioengineered Approaches to Advanced Heart Failure
3:45 - 5:00pm Columbia Hall 5-8 - Terrace Level

Co-Chairs:
Maya Guglin, MD, PhD, University of Kentucky, Lexington, KY
Thomas Schlöglhofer, BSc, Medical University of Vienna, Vienna, Austria

3:45 - 4:30pm
CARDIAC ABSTRACTS

3:45 - 3:55pm
Electrocardiogram-Synchronized Rotational Speed Modulation System Can Reduce the Recirculation Due to Aortic Insufficiency In LVAD Support
Kei Lizuka, MD, Tokyo Women's Medical University, Tokyo, Japan

3:55 - 4:05pm
Case Report First-in-Human (Fih) Studies of Ch-VAD in China
Haibo Chen, MD, Fuwai Hospital, Beijing, China
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<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker/Institution</th>
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<tbody>
<tr>
<td>4:05 - 4:15pm</td>
<td>In-Vivo Validation of Totally Implantable Ventricular Assist Device Support Using Contactless Wireless Power</td>
<td>Jiheum Park, PhD, Yale University, New Haven, CT</td>
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<tr>
<td>4:15 - 4:25pm</td>
<td>PVAD: A Linear, Pulsatile, Peristaltic Ventricular Assist Device Mechanism</td>
<td>Zachary Frankman, BS, University of Arizona, Tucson, AZ</td>
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<td>4:30 - 4:50pm</td>
<td>Funding the Future of MCS - NIH and Other Opportunities</td>
<td>Timothy Baldwin, PhD, NHLBI - NIH, Bethesda, MD</td>
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<td>4:50 - 5:00pm</td>
<td>Discussion</td>
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<td>4:05 - 4:20pm</td>
<td>Pump Integrated Artificial Lung</td>
<td>Bartley Griffith, MD, University of Maryland, Baltimore, MD</td>
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<td>4:20 - 4:25pm</td>
<td>Discussion and Questions</td>
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<tr>
<td>4:25 - 4:40pm</td>
<td>Pulsatile Flow Pump Integrated Gas Exchanger</td>
<td>Cherry Croft, PhD, University of Kentucky, Lexington, KY</td>
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<td>4:40 - 4:45pm</td>
<td>Discussion and Questions</td>
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<td>4:45 - 4:55pm</td>
<td>Chronic In-Vivo Study of a Lung Support Device with Incorporated RAS-Q Technology</td>
<td>Ralf Borchardt, Dr Ing, enmodes GmbH, Aachen, Germany</td>
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<td>4:55 - 5:00pm</td>
<td>Discussion and Questions</td>
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<td>4:15 - 4:20pm</td>
<td>Bench Top Models of vWF Multimer Distribution in Flow</td>
<td>Christopher Siedlecki, PhD, Penn State College of Medicine, Hershey, PA</td>
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<tr>
<td>4:20 - 4:55pm</td>
<td>Minimally Invasive AVG Insertion</td>
<td>Alexander Yevzlin, MD, University of Michigan, Ann Arbor, MI</td>
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<td>4:40 - 4:55pm</td>
<td>Improving Oxygenation and Circulation in Glenn Physiology with Modified ECMO</td>
<td>David Hoganson, MD, Boston Children's Hospital, Boston, MA</td>
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<td>4:50 - 5:00pm</td>
<td>Support Strategies for the Fontan</td>
<td>Mark Bleiweis, MD University of Florida, Gainesville, FL</td>
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<td>4:25 - 4:40pm</td>
<td>Combined Action of Biochemical Agonists and VWF-Mediated Shear Activation in Stenosis</td>
<td>Mansur Zhussupbekov, Cornell University, Ithaca, NY</td>
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<td>4:35 - 4:45pm</td>
<td>Disruption of Von Willebrand Factor in Turbulent Flow</td>
<td>Choon-Sik Jhun, PhD, Penn State College of Medicine, Hershey, PA</td>
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<td>4:45 - 4:55pm</td>
<td>The “Molecular Signature” of Dynamic Shear-Mediated Platelet Activation in Mechanical Circulatory Support</td>
<td>Yana Roka Moia, PhD, Saver Heart Center, University of Arizona, Tucson, AZ</td>
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<td>4:50 - 5:00pm</td>
<td>The Biomimetic Modification with Surface Texturing and Nitric Oxide Release to Improve Hemocompatibility of Biomaterials for Blood-Contacting Medical Devices</td>
<td>Christopher Siedlecki, PhD, Penn State College of Medicine, Hershey, PA</td>
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<td>4:30 - 4:40pm</td>
<td>Effect of Age on Hemodynamics in 1 and 1/2 Ventricle Sheep Model</td>
<td>Hitoshi Kanamitsu, MD, Stanford University, Stanford, CA</td>
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<td>4:40 - 4:50pm</td>
<td>Conversion of Failed Single Ventricle Palliation to In Series Circulation and Total Artificial Heart</td>
<td>Robert Niebler, MD, Medical College of Wisconsin, Milwaukee, WI</td>
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<td>4:50 - 5:00pm</td>
<td>Stent Angioplasty of the Ductus Arteriosus as an Early Palliative Procedure for Pulmonary Atresia: Single Institution Experience</td>
<td>Juan Carlos Briceño, PhD, Universidad de los Andes, Bogota, Colombia</td>
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ASAIO MEMBER BUSINESS MEETING
5:15 - 5:45pm Kalorama - Lobby Level
8:00am-5:00pm Poster Presentations in Columbia Hall

Cardiac Posters

**Poster Numbers**

179  Respiratory Failure Requiring Tracheostomy after Continuous Flow Left Ventricular Assist Device Implantation
Harveen Lamba, MD, Baylor College of Medicine at Texas Heart Institute, Houston, TX

180  New Tool for Left Intraventricular Visualization and Bloodless LVAD Insertion
Jamshid Karimov, MD, PhD, Cleveland Clinic, Cleveland, OH

181  Significant Decrease in Hgb1c Levels in Diabetics after Continuous-Flow Left Ventricular Assist Device Implantation
Harveen Lamba, MD, Baylor College of Medicine at Texas Heart Institute, Houston, TX

182  Morphologic Patterns of Aortic Valve Regurgitation Following Continuous-Flow Left Ventricular Assist Device Implantation
Keshava Rajagopal, MD, PhD, University of Texas Health Science Center, Houston, TX

183  Rejection in Heart Transplant Patients is Correlated with Hla Epitope Matching and Not with LVAD-Bridging
Matthew Cusick, PhD, Baylor College of Medicine at Texas Heart Institute, Houston, TX

184  Delayed Sternal Closure in Heart Transplant Patients Bridged with Continuous Flow Left Ventricular Assist Devices
Harveen Lamba, MD, Baylor College of Medicine at Texas Heart Institute, Houston, TX

185  Chronic In Vivo Test of A Mechanical Circulatory Assist Device for Failed Fontan Circulation
Joshua Cysyk, PhD, Penn State College of Medicine, Hershey, PA

186  Intracorporeal Heat Distribution from Fully Implantable Energy Sources for Mechanical Circulatory Support: A Computational Proof-of-Concept Study
Presentation Cancelled
Jacopo Biasetti, PhD, Johns Hopkins University, Baltimore, MD

187  Influence of VAD Pressure-Flow Characteristics on Exercise Physiology: Hemodynamic and Energetic Evaluation with a Computational Model
Libera Fresiello, PhD, KU Leuven, Leuven, Belgium

188  Simulated Performance of Cleveland Clinic Continuous-Flow Total Artificial Heart Using the Virtual Mock Loop
Takuma Miyamoto, MD, PhD, Cleveland Clinic, Cleveland, OH

189  Inter-Laboratory Particle Image Velocity (Piv) Measurements in the FDA Blood Pump Model
Prasanna Hariharan, PhD, US Food and Drug Administration, Silver Spring, MD

190  A Multimodal Approach to a Partial Outflow Graft Obstruction Diagnosis in LVAD Patients
Kelly Mesa, Providence Sacred Heart Medical Center, Spokane, WA

191  Hemodynamic and Echo Measurements during Weaning of VA ECMO Suggest Acceptable LV Unloading
Ahmed Elbanayosy, MD, INTEGRIS Baptist Medical Center, Oklahoma City, OK

Abdominal, Not Thoracic, Positioning of A Novel Intra-Aortic Micro-Axial Fluid Entrainment Pump (Aortix)
Provides Superior Hemodynamic Effects in A Swine Model of Ischemic Heart Failure
Shiva Annamalai, MD, Tufts Medical Center, Boston, MA

Is Platelet Aggregation Different In Arterial Vs. Venous Blood?
Jan Stanley Simoni, DVM, PhD, TX HemoBio Therapeutics, Lubbock, TX

Comprehensive Shear Stress Analysis in CH-VAD - An Ultra-Compact Fully Magnetically Suspended Implantable LVAD
Po-Lin Hsu, PhD, Soochow University, Jiangsu, China

Implantation of Left Ventricular Assist Device after Descending Aortic Stent Graft for Mural Thrombus
Aakash Shah, MD, University of Maryland School of Medicine, Baltimore, MD

Simulation Study Exploring the Potential of Acoustic Resonance to Measure Left Ventricular Volume
Seraina Dual, ETH Zurich, Zurich, Switzerland

VAD Displayed Flow Frequently Fails to Accurately Predict Cardiac Output Measured by Right Heart Catheterization
Jennifer Beckman, MSN, ARNP FNP, University of Washington, Seattle, WA

Hospital Readmissions for Patients with Left Ventricular Assist Devices (Lvad)
Bibin Varghese, BS, Baylor College of Medicine at Texas Heart Institute, Houston, TX

Modeling of Virtual Mechanical Circulatory Support Hemodynamics for Biventricular Heart Failure
Jamshid Karimov, MD, PhD, Cleveland Clinic, Cleveland, OH

End Organ Recovery and Survival in Adults on Veno-Arterial Extracorporeal Membrane Oxygenation
Natalia Bahatyrevich, BS, Thomas Jefferson University, Philadelphia, PA

Implementation of a Physiologic Coronary Circulation in a Mock Circulatory Loop to Evaluate Rotary Blood Pump Support Strategies
Eric Wu, BS, Innovative CV Engineering and Technology Laboratory, Brisbane, Australia

Using Salt to Treat Driveline Site Hyper-Granulation Tissue in Patients with Left Ventricular Assist Devices
Rebecca Price, BSN, RN, CCRN, Sharp Memorial, San Diego, CA

In Vivo Simulation of Partial Left Ventricular Assist in an Adult
George Pantalos, PhD, University of Louisville, Louisville, TX

A Shift in Paradigm: Transitioning from Surgical to a Medical Multidisciplinary Approach to Inpatient Management of Patients with Ventricular Assist Devices
Michael Marcos, MD, University of Washington, Seattle, WA

The Association of Peak Lactate Levels with Length of Stay and In-Hospital Mortality after LVAD Implantation
Mohamed Hassanein, MD, MedStar Washington Hospital Center, Washington DC

The Incidence, Risk Factors, and Outcome of Gastrointestinal Bleeding In Patients with Left Ventricular Assist Device: Japanese Single Center Cohort Study
Masatoshi Akiyama, MD, PhD, Tohoku University Hospital, Miyagi, Japan
Evaluation of Gastrointestinal Bleeds in Left Ventricular Assist Device Patients Receiving Phosphodiesterase 5 Inhibitors
George Gavrilos, Pharm D, MA, Advocate Christ Medical Center, Oak Lawn, IL

A Novel Self-Sealing, Fixation Enabled, Endovascular Stent Delivery Design for Type A Aortic Dissection
Pramod Bonde, MD, Yale University, New Haven, CT

A Mechanized Valve Sparing Aortic Root Remodeling with Annular Stabilization
Pramod Bonde, MD, Yale University, New Haven, CT

Progression of Driveline Failure in a Heartmate II LVAD Patient
Harrison Smith, Providence Sacred Heart Medical Center, Spokane, WA

Leadless Pacemaker Implantation in an LVAD Patient
Sujeen Adhikari, UIC-Christ, Oak Lawn, IL

“Temporary” VAD Anticoagulation Management and Positive Outcomes
Chet Villa, MD, Cincinnati Children’s Hospital Medical Center, Cincinnati, OH

Proposed a In-Vitro Test Jig to Improve the Availability of Vads in Patients Suffering from Severe Heart Failure
Jefferson Dias, MD, University of São Paulo, São Paulo, Brazil

Concentric Heart Retains Natural Atria and Valves
Arnold Lande, MD, Northport, MI

Implantable Cardioverter Defibrillators In Patients With Continuous Flow Left Ventricular Assist Devices: Use, Procedures And Outcomes
Paulino Alvarez, MD, University of Iowa, Iowa City, IA

Minor Geometric Details Significantly Affect Hemodynamics and Hemocompatibility of a Miniature Ventricular Assist Device: A CFD Study
Jingchun Wu, PhD, Advanced Design Optimization LLC, Irvine, CA

Validation of Bayesian Models for LVAD Mortality at Single Implant Center
Faezeh Movahedi, PhD, University of Pittsburgh, Pittsburgh, PA

Modeling and Optimization of a Pediatric Artificial Lung Based on Circular Blood Flow Paths
Alex Thompson, PhD, University of Michigan - ECMO Lab, Ann Arbor, MI

Effects of Animal Blood Type on In Vitro Dynamic Thrombogenicity Tests of Biomaterials
Megan Jamiołkowski, PhD, U.S. Food and Drug Administration, Silver Spring, MD

An Experimental Study of the Embolus Trapping Efficiency of the FDA Generic Inferior Vena Cava Filter
Joshua Riley, BS, The Pennsylvania State University, State College, PA

CFD Integrated Optimization Platform for a Fontan Circulatory Assist Device
Christopher Scheib, BS, Penn State College of Medicine, Hershey, PA

Simulation in Surgery: Models for Ventricular Assist Device Implant Training
Ann-Marie Ginn, BS, Texas A&M University, College Station, TX

Prediction of Thrombus Formation by Cfd with Considering Transport Equations and Aggregations on High Shear Flows and Observation of the Process by Optical Systems
Masaaki Tamagawa, Dr Eng, Kyushu Institute of Technology, Fukuoka, Japan

3d Printed Mock Ventricular Assist Device for Benchtop Testing
Liana Polikaitis, BS, Texas A&M University, College Station, TX

Assessment of Healing Response to Intravascular Devices Using Transmission Electron Microscopy
Molly Friedemann, DVM, Texas A&M University, College Station, TX

Continuous Estimation of Dynamic Differential Pump Pressure with a Rotary Piston Pump
Jeffrey Gohean, MSME, Windmill Cardiovascular Systems Inc, Austin, TX

A Comprehensive Platform for Enhanced Islet Cell Delivery: Update from the Drive Consortium
Scott Robinson, MD, National University of Ireland Galway, Ireland

An Algorithm for Coupling Multi-Outlet Experimental Sections to Numerical Physiology Simulations for a Hybrid Cardiovascular Ehsan Mirzaei, Clemson University, Clemson, NC

An Alternative Production Method for Collagen to Obtain Scaffolds
Irem Deniz Derman, BS, Bahçeşehir University, Istanbul, Turkey

Quantification of Flow and Thrombus Development Using Micro-Particle Image Velocimetry
Tice Harkins, The Pennsylvania State University, State College, PA

Ex Vivo Culture Platform to Characterize and Monitor the Onset, Progression and Treatment of Vascular Pathologies
Noemi Vanerio, LifeTec Group BV, Eindhoven, Netherlands

Contact Activation of Blood Plasma Coagulation
Christopher Siedlecki, PhD, Penn State College of Medicine, Hershey, PA

Fabrication of Hollow Fiber Bioreactor for Functional Bioartificial Organs
Sooeongmi Song, MD, Asan Medical Center, Seoul, South Korea
**FRIDAY, JUNE 15 (continued)**

**Pulmonary Posters**

**239** Benchtop Model for Examining Ventricular Assist Device Response to Embolic Particles  
Maci Billiot, Texas A&M University, College Station, TX

**240** Novel Tissue-Engineered Heart Valve without Any Foreign Bodies  
Yoshiaki Takewa, MD, PhD, National Cerebral & Cardiovascular Center, Osaka, Japan

**241** Tethered Liquid Perfluorocarbon Coating Prevents Thrombus Formation During 6 Hour Heparin Free Extracorporeal Circulation  
Teryn Roberts, The Geneva Foundation, Tacoma, WA

**242** Refractory Hypoxemia During Vv ECMO: Are 2 ECMO Circuits Better Than One?  
Andriy Batchinsky, MD, US Army Institute of Surgical Research, Fort Sam Houston, TX

**243** A Successful Bridge to Lung Transplantation Record  
Presenter to be announced

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**ASAIO-ELSO ECMO Workshop**

8:00am - 12:30pm  
*Columbia Hall 1-2 - Terrace Level*

**Co-Chairs:**  
Christian Bermudez, MD, Hosp of the Univ of Pennsylvania, Philadelphia, PA  
Robert Bartlett, MD, University of Michigan, Ann Arbor, MI

**8:00 - 8:15am**  
**History**  
Robert Bartlett, MD, University of Michigan, Ann Arbor, MI

**8:15 - 9:00am**  
**Current Status of ECLS**  
Christian Bermudez, MD, Hospital of the University of Pennsylvania, Philadelphia, PA

**9:00 - 10:00am**  
**Patient Management**  
Steven Conrad, MD, PhD, Louisiana State University HCS, Shreveport, LA

**10:00 - 10:15am**  
**BREAK**

**10:15 - 10:45am**  
**Industry and Regulation**  
Scott Mez, PhD, MC3 Cardiopulmonary, Inc., Dexter, MI

**10:45am - 12:00pm**  
**Devices and Techniques**  
William Lynch, MD, MS, University of Michigan, Ann Arbor, MI

**12:00 - 12:30pm**  
**Case Examples: Bridge to Lung Transplant - ECPR - Panel Discussion**  
Robert Bartlett, MD, University of Michigan, Ann Arbor, MI  
Christian Bermudez, MD, Hospital of the University of Pennsylvania, Philadelphia, PA

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**ASAIO/ICCAC MCS Proficiency Verification Course (MPV)**

8:00am - 1:00pm

**Co-Chairs:**  
Thomas Schloeghoffer, BSc, Medical University of Vienna, Vienna Austria  
Jennifer Beckman, MSN, ARNP, FNP, University of Washington, Seattle, WA

**Medtronic - HVAD**  
*Kalorama Lobby Level*

**Abbott - HeartMate II and HeartMate 3**  
*Holmead Lobby Level*

**Abbott - CentriMag**  
*Jay Lobby Level*

**Abiomed - Impella**  
*Oak Lawn Lobby Level*

**Berlin Heart - EXCOR**  
*Morgan Lobby Level*

**SynCardia - TAH**  
*Northwest Lobby Level*

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**CARDIAC 5: Mechanical Circulatory Support vs. Heart Transplantation in the Current Era: Man vs. Machine**

8:30 - 10:00am  
*Columbia Hall 5-8 - Terrace Level*

**Co-Chairs:**  
Simon Maltais, MD, Mayo Clinic, Rochester, MN  
Marvin Slepian, MD, University of Arizona, Tucson, AZ

**8:30 - 9:30am**  
**CARDIAC ABSTRACTS**

**8:30 - 8:40am**  
**Self-Driving Cars: Should the Transplant Community be Worried?**  
Farhan Zafar, MD, MS, Cincinnati Children's Hosp Med Center, Cincinnati, OH

**8:40 - 8:50am**  
**Survival and Functional Status After Bridge-to-Transplant with a Left Ventricular Assist Device**  
Alejandro Suarez-Pierre, MD, Johns Hopkins University, Baltimore, MD

**8:50 - 9:00am**  
**Successful Treatment of Rvad Thrombosis with TPA in a Bivad Supported Patient After Heparin and Tirofiban Failure**  
George Gavrilos, Pharm D, MA, Advocate Christ Medical Center, Oak Lawn, IL

**9:00 - 9:10am**  
**Continuous-Flow Left Ventricular Assist Device Decommissioning as Compared to Explantation for Ventricular Recovery: A Systematic Review and Meta-Analysis**  
Jae Hwan Choi, MD, Thomas Jefferson University, Philadelphia, PA

**INVITED PRESENTATION**

**9:10 - 9:30am**  
**VAD Outcomes are Approaching Transplantation - for Some or for All?**  
Mary Keebler, MD, Vanderbilt University, Nashville, TN

**9:30 - 10:00am**  
**Discussion**
BIOENGINEERING 5: Tissue Engineering and Regenerative Medicine (Recovery, Vascular Grafts, Multiscale Mechanics)
8:30 - 10:00am Columbia Hall 9-12 - Terrace Level
Co-Chairs: John Criscione, MD, PhD, Texas A&M University, College Station, TX
William Weiss, PhD, Penn State College of Medicine, Hershey, PA

8:30 - 9:00am
Biologically-Engineered Vascular Grafts and Heart Valves that Reanimate
Robert Tranquillo, PhD, University of Minnesota, Minneapolis, MN

9:00 - 9:30am
Driving Medical Innovation through Regenerative Engineering
Martha Lundberg, PhD, National Heart, Lung, and Blood Inst, Bethesda, MD

9:30 - 10:00am
BIOENGINEERING ABSTRACTS
9:30 - 9:40am
Development of a Collagen-Based Angiogenic Growth Factor Delivery System for Use in Tissue-Engineered Specimens
Nicole Mehta, Texas A&M University, College Station, TX

9:40 - 9:50am
Galvanotaxis: An Electroceutical Strategy for Modulating Cell-Selective Migration
Kaitlyn Ammann, BS, University of Arizona, Tuscon, AZ

9:50 - 10:00am
Discussion

PULMONARY 5: Temporary Respiratory Support Advances
8:30 - 10:00am Columbia Hall 3-4 - Terrace Level
Co-Chairs: Raquel Bartz, MD, Duke University, Durham, NC
Craig Jabaley, MD, Emory University, Atlanta, GA

8:30 - 8:45am
Epidemiology of ECMO for Respiratory Support
Raquel Bartz, MD, Duke University, Durham, NC

8:45 - 8:50am
Discussion and Questions

8:50 - 9:05am
Current Research Focus and Future Ambitions Towards Artificial Lungs
Jutta Arens, Dr.-Ing, RWTH Aachen University, Aachen, Germany

9:05 - 9:10am
Discussion and Questions

9:10 - 9:20am
Development of a Multi-Ring Type Roller Pump Unit Equipped to a Compact and Convenient Ascites Purification Machine for Cell-Free and Concentrated Ascites Reinfusion Therapy (Cart)
Toshiya Okahisa, MD, PhD, Tokushima Univ Graduate School, Tokushima, Japan

9:20 - 9:30am
Blood Access is Key to Kidney Health Initiative (KHI) Priority
Arnold Lande, MD, Northport, MI

9:30 - 9:40am
New IEC Standards On PD & HD, As Well As AAMI TIR On Sorbent-Based HD
Fokko Wieringa, PhD, IMEC Eindhoven, Netherlands

9:40 - 9:50am
Discussion and Questions

PEDIATRIC 4 - “We Can Keep Them Alive, But Can We Let Them Live?” Optimizing the Life and Death of Children Supported with Artificial Organs
8:30 - 10:00am Gunston - Terrace Level
Co-Chair: Christina VanderPluym, MD, Boston Children's Hospital, Boston, MA

8:30 - 8:50am
Pulmonary (Lung Assist Devices, Ambulatory ECMO)
David Hoganson, MD Boston Children's Hospital, Boston, MA

8:50 - 9:10am
DT MCS in Children: Who and How
Rachele Adorisio, MD, Bambino Gesu Hospital, Rome, Italy
9:10 - 9:30am  The Interface of Palliative Care and Artificial Support
Seth Hollander, Stanford Lucile Packard Hospital, Stanford, CA

9:30 - 10:00am  PEDIATRIC ABSTRACTS

9:30 - 9:40am  Consider Kidney When Accepting Hearts: Impact of Donor Renal Dysfunction on One-Year Survival In Children
Ambika Sood, BS, Cincinnati Children's Hospital Medical Center, Cincinnati, OH

9:40 - 9:50am  Peri: Infant Phantom for Pericardial Access with Direct Visualization
Paige Mass, BS, Children's National Medical Center, Washington DC

9:50 - 10:00am  Kardiokid Infant Mannequin for Hands-On Training and Simulation
George Pantalos, PhD, University of Louisville, Louisville, KY

10:00 - 10:45am  ENJOY REFRESHMENTS
Columbia Hall - Terrace Level

CARDIAC 6: What about the RIGHT? Support for Right and Bi-Ventricular Failure
10:45 - 12:00pm  Columbia Hall 5-8 - Terrace Level
Chair: Steven Koenig, PhD, University of Louisville, Louisville, KY

10:45 - 11:30am  CARDIAC ABSTRACTS

10:45 - 10:55am  Excessive LVAD Speed Causes Right Heart Pressure / Volume Overload and Precipitates RV Failure
Alberto Aliseda, PhD, University of Washington, Seattle, WA

10:55 - 11:05am  Upgrade to Biventricular Support Using Two Separate Heartmate 3 Ventricular Assist Devices - A Proof of Concept
Jens Garbade, MD, PhD, University Leipzig Heart Center, Leipzig, Germany

11:05 - 11:15am  Analyzing the Value of the Pulmonary Artery Pulsatility Index Beyond Predicting Right Heart Failure
Salvatore Podd, MD, Mayo Clinic, Rochester, MN

11:15 - 11:25am  Real-Time, Continuous Measurement of Right Ventricular Free Wall Strain Using an Implantable, Stretchable Sensor
Nikolay Vasilyev, MD, Boston Children's Hospital, Boston, MA

11:25 - 11:35am  Overcoming the Limits of Design: Magnet 3d Printing for Rapid Development of Turbodynamic Ventricular Assist Devices
Kai von Petersdorff-Campen, ETH Zürich, Zürich, Switzerland

11:35 - 11:45am  Packaging Considerations for an Implantable Hemofilter Based on Silicon Nanopore Membranes (Snm)
Jimmy Ly, PhD, University of California, San Francisco, CA

11:45 - 11:55am  The Effects of Different Blood Sampling Sites of a Closed-Loop Artificial Endocrine Pancreas in Critically Patients
Hideo Iwasaka, PhD, Almeida Memorial Hospital, Oita, Japan

10:45 - 11:15am  Advanced 3D Biofabrication for Rebuilding the Heart
Adam Feinberg, PhD, Carnegie Mellon University, Pittsburgh, PA

11:15 - 12:00pm  BIOENGINEERING ABSTRACTS

11:15 - 11:25am  Evaluation of the Potential of 3d-Membranes for Artificial Lungs
Felix Hesselmann, Dipl.-Ing, Inst of Applied Medical Engineering, Aachen, Germany

11:25 - 11:35am  Overcoming the Limits of Design: Magnet 3d Printing for Rapid Development of Turbodynamic Ventricular Assist Devices
Kai von Petersdorff-Campen, ETH Zürich, Zürich, Switzerland

11:35 - 11:45am  Packaging Considerations for an Implantable Hemofilter Based on Silicon Nanopore Membranes (Snm)
Jimmy Ly, PhD, University of California, San Francisco, CA

11:45 - 12:00pm  Discussion

BIOENGINEERING 6: Additive Manufacturing for Artificial Organs
10:45am - 12:00pm  Columbia Hall 9-12 - Terrace Level
Co-Chairs:
Zhongjun Wu, PhD, University of Maryland, Baltimore, MD
Joshua Cysyk, PhD, Penn State College of Medicine, Hershey, PA

RENAL 6: The Business of ESRD Care
10:45am - 12:00pm  Fairchild - Terrace Level
Co-Chairs:
Alexander Yevzlin, MD, University of Michigan, Ann Arbor, MI
Matthew McGuire, MD, University of Michigan Health System, Ann Arbor, MI

Applications and Opportunities for IT in Renal Disease Health Care
Blake Marggraff, BS, Epharmix, St. Louis, MO

The Future of ESRD Payment Systems
Tim Pflederer, MD, Renal Care Associates, Peoria, IL
CAUTION: Investigational Device not approved for Commercial Sale. Limited by Federal (or United States) law to Investigational Use