

# Academy NEWSLETTER

THE AMERICAN ACADEMY OF CARDIOVASCULAR PERFUSION 515A EAST MAIN STREET ANNVILLE, PA 17003 (717) 867-1485 PHONE OR FAX OFFICEAACP@AOL.COM HTTP://WWW.THEAACP.COM

#### SPRING 2014

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#### **Inside This Issue**

2014 Annual Meeting	1
New Members	4
Cooley Induction	5
Peer Review	6
On Bypass (1)	8
Winning Paper Presentations	10
On Bypass (2)	11
Sponsoring Partner	12
Student Experiences	14
Sponsoring Members	15
Important Dates	15

### **2014 Annual Meeting**



Continued on Page 2

Spring 2014

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Continued from Page 1

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### **Welcome to New Members**

The American Academy of Cardiovascular Perfusion would like to welcome the following individuals whom were voted into membership at the Closing Business Meeting of our annual meeting in Orlando.

#### **Honorary Membership**

Denton A. Cooley, MD Jay B. Denman

#### **Fellow Membership**

Kathleen Kibler Dennis Long Allison Weinberg

#### **Member Membership**

Jarved Aswani Dafne Chianella Brian Forsberg Krysta Gleeson David Jalanivich Kris Latousek Judith May Daniel Nauen James Pezzuto Cody Trowbridge Raymond Wong

#### **Student Membership**

Jennifer Arriola Gina Bassett Kailin Bellows Alexander Bennatan Amanda Best Stephanie Bland Shane Buel Christopher Carter John Dean Casey Deer Amanda Deyo Laurie DiJoy Matthew Douds Yusuf Faraj Zac Ferguson Kayla Gardner Molly Hageman Geoff Hall Dannerly Hall, Jr Blake Jarvis Tvlar Kalb Andrew Kent Ok Kim Kathy Kopec Cameron Kroll Jessica Lance Jessica Lei Jau Lin Philip Mann, Jr. Morgan McGrath Michelle McLean Amanda Morgason Antigone Morrison Alison Murphy Peter Nelson Jessica Ortiz Kelly Patterson Amanda Pinkerman Malea Proeschel Heather Radin Murphy Rayle Eldis Rivera Michael Robertson Kalee Sewell Angela Stokes **Emory Straub Trevor Swyers** Kiley Thompson **Courtney Thurman** Jennifer Tounshendeaux Michael Tran Devyn Yarborough Dessa Yates

# Denton A. Cooley, M.D. Is Inducted As A Honorary Member Of The Academy



Steven Sutton, Steven Raskin, D. Scott Lawson and Terry Crane represented The Academy at the induction of Dr. Denton Cooley as an Honorary Member of The Academy in Houston.

On December 16, 2013, Dr. Denton A. Cooley was inducted into the Academy at a small ceremony in Houston. Below are excepts from Terry Crane's presentation.

Pioneering surgeon Dr. Denton A. Cooley performed the first human heart transplant in the United States in 1968 and astounded the world in 1969 when he was the first surgeon to successfully implant a total artificial heart in a human being. Over the course of his career, Dr. Cooley and his associates have performed more than 100,000 open heart operations, and have been forerunners in implementing new surgical procedures. (On a special note, my calculations from last week indicate we have completed over 120,000 open hearts at Texas Heart Institute.)

Of all his achievements, however, Dr. Cooley is most proud of the Texas Heart Institute, which he founded in 1962, in Houston, with the mission to further cardiovascular research and education, and to improve patient care by decreasing the devastating effect of cardiovascular disease.

I want to point out to all of the perfusionists, that in his earlier years as a pioneering cardiac surgeon, Dr. Cooley trained a small group of perfusionists, or at that time were called Pump Technicians, how to assemble and operate the heart lung machine at St. Luke's Episcopal Hospital.

Dr. Cooley also realized, from those early days in cardiac surgery there would be a need for formally trained perfusionists, and he started the Texas Heart Institute School of Perfusion in 1972. Charlie Reed was the 1<sup>st</sup> program director, and since that time we have had over 825 graduates and staff perfusionists represent THI around the world.

Today we would like to present Dr. Denton A. Cooley with a medallion as an Honorary Member of the American Academy of Cardiovascular Perfusion; for his pioneering work in not only surgical techniques, and technology, but also for his work in perfusion research and education, and his continued support for the Texas Heart Institute School of Perfusion Technology.

Dr. Cooley: Thank you for providing us with the educational training to become perfusionists, so we can continue perfusion research and education, and be significant contributing members of the cardiac team to improved patient outcomes. I would like to close by saying thank you also for encouraging us to follow your motto: Modify, Simplify, and Apply.

# PEER REVIEW IS YOUR CHANCE TO LEARN AND PROMOTE THE PROFESSION

sent to the journal Perfusion whereby they undergo peer review before being accepted for publication. This is a wellestablished process used by journals to reasonably ensure what is being published meets certain standards and can be trusted as reliable. In the medical field, peer review has added importance because clinical practice may be influenced by articles appearing in the scientific literature. The peer review process can be daunting, particularly to those with little or no authorship experience, but the ultimate result in most cases is an improved manuscript that will serve the profession.<sup>1</sup> An additional benefit is that virtually all reviewers learn something useful by participating in the process.

For nearly 20 years, papers presented at the Academy's annual meeting have been

Academy members are often invited to review papers submitted for publication to Perfusion. In fact, Academy members are encouraged to participate. There is a wellfunctioning system established by the publisher SAGE and the journal's editorial offices in London that allows peer review to be conducted electronically. Perfusion maintains a database of potential reviewers drawn from a list of authors who have either published or been reviewers in the past. The editor may also solicit the opinion of an outside expert. Each reviewer describes their area(s) of expertise and a grading system is maintained internally that helps the editor to decide who to invite for any given manuscript. The reviewers' identities are not known to the authors whose papers are undergoing peer review; similarly, the authors' names on papers are de-identified to the reviewers. Both of these aspects of the process are intended to eliminate or minimize bias as a paper is objectively judged by its merits.

A good reviewer should approach every paper with some skepticism. It is the authors' job to convince the reviewer and editors that the paper deserves to be published. Questions that should be answered include: Is the paper well written in simple, understandable language and does it "flow" logically and clearly? Did the authors follow the journal instructions for things such as formatting the references in the required journal style? Are the references pertinent to the topic and up-to-date? Have they been cited properly in the text? Does the paper appear to have been proofread to eliminate typographical errors or problems with syntax? More important, have the authors provided enough detail for the reader to understand what is being presented so a logical conclusion can be made? For example, if the study involved an experiment, could one replicate the conditions and perform a similar study? Similarly, if the paper is describing a perfusion technique or device, is there sufficient detail for the reader to make a judgment on the validity and reliability of what is being reported that might someday be used in their own clinical setting? Does the paper have a scientific or a marketing tone?---the latter is not appropriate for a medical journal. If the paper is a case study, is there sufficient background information to put the case in context with other similar cases that may have been published before? Are the conclusions supported by the methodology and results described? Finally, has the author made a worthwhile contribution to the body of knowledge?

These are a few of the considerations

# Mark Kurusz and John M. Toomasian

Perfusion Section Editors



reviewers should be looking for when invited to review a paper. It may take two or more readings to arrive at an assessment as to its acceptability. No one person is an expert on all aspects of perfusion. However, any perfusionist can critique a paper based on his or her training and experience, and that is the main objective that the editor asks from each reviewer.

A reviewer has a few obligations when accepting the responsibility to review a paper: confidential comments are made to the editor that include a recommendation for four possibilities: (1) accept as is; (2) accept pending minor revision; (3) do not accept without major revision; and (4) reject. As one might expect, very few papers are accepted without any request for either a minor or major revision. Those papers having serious deficiencies generate specific comments and questions that are conveyed to the author who is asked to revise the manuscript or to clarify a point. One of the benefits of peer review is to improve the final version that eventually is published. Papers are not usually rejected unless there are egregious or non-salvageable flaws. The reviewer does not make a recommendation as to acceptability directly to the author-that is the editor's role.

The time to do a review typically takes a few hours not always easy to fit into a schedule for busy perfusionists. However, there are some rewards such as seeing new work in the field before it appears in print. A second reward is being able to view your review in the context of other de-identified reviews, which serves as a sort of benchmark and certainly affords a reviewer to consider the paper from a different perspective. Often the perspectives and opinions of different reviewers can be quite diverse. Another reward is intangible but no less important: you have promoted both the profession and your peers so that the larger body of clinicians worldwide may gain important insights that should improve patient care. Another important benefit of being a reviewer is that it is quite likely you will learn something you may not have known. Being a reviewer also provides great experience in the peer review process, especially if one chooses to author their own work.

Someone once wrote that most writing is the art of persuasion. Edward R. Murrow, who was a master at communication, wrote "To be persuasive we must be believable, to be believable we must be credible, and to be credible we must be truthful." Think about it, and when invited to be a reviewer you will reap rewards far beyond the time entailed to do a credible job.

#### Reference

Toomasian JM. Editorial: The gauntlet of peer review. *Perfusion* 2013;28:376.

In future issues of the AACP Newsletter there will be a series of articles with details on research and reading the literature, preparing a presentation, and publishing a paper.

# **2015 Annual Academy Meeting**



San Antonio, Texas February 5-8, 2014



#### Seana Hall MS, CP Kayla Gardner Ray Wong PhD, CCP Douglas Larson PhD, CP Richard Smith MSEE, CCE

Perfusion Science Graduate Program College of Medicine The University of Arizona *Tucson, AZ* 

### Safety Comparison of the HeartMate II and HeartWare Devices

This study aimed to compare the safety and efficacy of the HeartMate II and HeartWare Left Ventricular Assist Devices (LVAD) based on previous case reports of device thrombosis of the HeartMate II (System Controller Software V4.16) without the presence of alarms on the display monitor. The HeartMate II and the HeartWare were incorporated into a Donovan Mock Circulation Tank along with a Syncardia Total Artificial Heart to simulate the hemodynamics within a heart failure patient with a LVAD. The devices were occluded with clamps at 25, 50, 75, and 100% occlusion to simulate device thrombosis while recording changes of hemodynamics, pump power, and flow rate on the display monitors.

The HeartMate II device, when occluded to any degree, began to show inaccuracies of the displayed flow compared to actual flow measured by a separate flow probe. Alarms presented at 75% occlusion when display flow was lower than 2.5 L/min (the preset threshold). Actual flow at this occlusion was 1.8 L/min through the LVAD. Once 100% occlusion was obtained however the device failed to produce any alarms or any accurate measurement of change in flow rate, displaying a flow of 2.8 L/min even though no flow was going through the device. The HeartMate Il display module also showed very minimal decreases in pump power during gradual occlusion. This is counterintuitive, as it is expected that a clot would cause an increase in work needed to maintain a set RPM. With an axial rotor pump however the opposite happens. When an occlusion occurs in an axial rotor pumps inflow or outflow tract, flow decreases and less work is done (work = force x distance). Less work is needed to thrust less fluid, since the volume is static. Understanding this concept may help members of the patient care team better at recognizing signs that device thrombosis is occurring, even with lack of alarms.

The HeartWare device did not show any major discrepancies in displayed flow compared to the actual flow. Occlusion always led to the presentation of alarms if the device registered a flow below the set threshold. Complete occlusion of the device caused low flow alarms. This device uses a different algorithm to estimate flow which incorporates pump power, RPM, and hematocrit, however it is important to remember that it is still an estimation and malfunction is possible.

While the safety and efficiency of mechanical assist devices such as the HeartMate II and the HeartWare have improved, there are still issues that require the attention and awareness of the members of the patient's care team. Complete device thrombosis without any significant recognition from the HeartMate II System Controller (V4.16) may result in the hemodynamic decline and possible death of a patient. Rapid recognition of this malfunction is essential in providing necessary patient care. It is important that clinicians rely more so on the trends of the device Display Module rather than trusting in the measurements at face value.

This was presented at the 35th Annual Seminar of The American Academy of Cardiovascular Perfusion in Orlando, Florida. The full manuscript has been submitted to the journal Perfusion for possible publication.

Spring 2014



# AACP 2014 Officers and Council

**President** Steven Sutton *Dallas, TX* 

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#### **Council Members**

D. Scott Lawson Past President Aurora, CO James Beck Massapequa Park, NY

Philip Fernandes London, Ontario, CANADA

Karen Smith Churchville, NY

Richard Melchior Woodbury, NJ

### Awards Committee Selects Winning Paper Presentations

Three students received **Lawrence Awards** for their paper presentations at the Annual Seminar in Orlando.

Molly Hageman - ABO Incompatible Heart Transplants

Philip Mann, Jr. - Ascending Aorta to Carotid and Bilateral Axillary Artery Bypass Graft, Carotid Endarterectomy, and CABG: A Unique Case Study Requiring Advanced Perfusion Techniques

Jessica Ortiz - The Effect Of Isoflurane On Vascular Stiffness

The Lawrence Award is a \$500 cash award for the best student papers.





In addition, Kathleen Kibler was awarded the **Best Paper of the Conference** a \$750 cash award funded by the journal *Perfusion* for her presentation entitled, "Autoregulation Disturbances Do Not Lateralize To The Side Of Stroke During Cardiopulmonary Bypass"



The C. N. Lee Pediatric Presentation Award was given to Trevor Swyers for his paper entitled, "Nanoparticle oxygen delivery to the ischemic heart." This \$500 award is supported by a generous grant from the New Foundation For Perfusion Education.





#### Jennifer Arriola MS Daniella Boros BS Douglas F. Larson, PhD, CCP Sreekumar Subramanian, MD

Sarver Heart Center College of Medicine The University of Arizona *Tucson, AZ* 

This was presented at the 35th Annual Seminar of The American Academy of Cardiovascular Perfusion in Orlando, Florida. The full manuscript will be submitted to the journal Perfusion for possible publication.

### COMPARISON OF MYOCARDIAL PROTECTION WITH CUSTODIOL WITH BLOOD CARDIOPLEGIA IN ADULT CARDIAC CASES

When used as a cardioplegic solution, Custodiol® HTK solution is typically administered in a single-dose, allowing the operation to be performed continuously. This is an advantage over alternative cardioplegic solutions that may have to be re-administered every 20-30 minutes. Custodiol is an intracellular solution which contains low sodium levels and a high content of Histidine buffers which is effective under low temperatures and at a wide range of pHs. Although Custodiol is widely used as a cardioplegic solution in Europe, its use for myocardial protection remains an off-label indication in the United States. Thus, the aim of this study was to compare the efficacy of Custodiol to standard 4:1 blood cardioplegia in adult cardiac cases.

This study was a single-center retrospective review of prospectively collected data from the STS database. Adult cardiac cases performed between November 2011 and August 2013 using Custodiol<sup>®</sup> were compared to cases using standard Plegisol<sup>®</sup> 4:1 blood cardioplegia. Twenty-two primary intra-operative and post-operative endpoints were compared including; 30-day hospital readmission, prolonged mechanical ventilation time, and renal failure.

Of the 229 cases identified, 63 cases used Custodiol and 166 used 4:1 blood cardioplegia. Demographics were similar in both groups with a mean patient age of 65±15 for Custodiol and 67±13 for blood 4:1. The average cardiopulmonary bypass time for Custodiol and blood 4:1 cardiople-gia was 100.0±37.5 and 120.2±44.3 respectively. We found only one signif-

icant difference in the twenty-two endpoints when comparing the Custodiol with the 4:1 cardioplegia group. Within the intra-operative characteristics evaluated, Custodiol had a higher requirement for Fresh Frozen Plasma (FFP) in 44% of patients compared to only 25% of patients in the 4:1 Blood Cardioplegia group.

The results showed few differences in clinical outcomes measured. Our data suggests that these two modes of myocardial protection are equivalent with the distinct advantage of Custodiol not requiring multiple administrations during operative procedures in contrast with blood cardioplegia. Although our results indicate an increase of FFP usage in the Custodiol group, this increase could be attributable to the differences in case mix and re-do status of the data collected. It is important to add that when evaluating Custodiol for myocardial protection, there are a few other potential disadvantages that should be considered. Custodiol contains low sodium content and this often causes hyponatremia after delivery. The prolonged time between doses may contribute to myocardial re-warming which has been associated with right ventricle dysfunction. Lastly, the use of Custodial in patients with renal failure needs to be examined. In summary, even though the measured clinical outcome parameters demonstrated equivalency between Custodiol and 4:1 blood cardioplegia, there are concerns regarding hemodilution, hyponatremia and myocardial re-warming related with Custodiol use.



The Academy welcomes XVIVO Perfusion as a new sponsor.

# **XVIVO Perfusion**

XVIVO Perfusion is a medical technology company focused on developing optimized solutions for organ, tissue and cell preservation in connection with transplantation.

Our mission is to increase the survival rates of patients in need of transplantation. We are dedicated to providing more effective, clinically proven and innovative products that both increase the availability of acceptable donor organs and improve survival after transplantation.

We were founded in 1998 and have more than 15 years of experience within the transplant industry. Our CEO and founder of the company, Dr. Magnus Nilsson, had a vision that nobody should have to die waiting for a transplant.

Driven by his vision and with his genuine interest in science he started collaboration and cooperation with scientist and researchers at leading clinics world-wide to find a solution that could help more patients in need.

We are committed to provide our customers with solutions and systems that can

- improve the transplant process outcome
- facilitate the work for the transplant team and
- enhance the long-term outcomes and quality of life of the transplant recipient.

#### Ideal solution for preservation introduced

In line with this ambition we introduced Perfadex<sup>®</sup> in 2000 and it is now the gold standard for lung preservation. Perfadex<sup>®</sup> was specifically formulated to preserve the function and integrity of organs rich in endothelium during flushing and cold ischemic storage prior to transplantation and reperfusion.



Its colloid component, dextran 40, particularly protects the microvasculare against postischemic reperfusion injury, primarily by preventing pathological leukocyte-endothelial interaction. It also prevents edema and counteracts thrombosis. Perfadex<sup>®</sup> is thus an ideal solution for the preservation of lungs. It may also be used as a base or 'carrier' solution for other organ-specific electrolytes or active components such as scavengers, immunosuppressant or gene therapy.

#### **Current problem in lung transplantation - Organ shortage**

Since the first successful lung transplantation performed in Toronto 1983, lung transplantation has become a lifesaving procedure for patients suffering from end-stage lung diseases. However, there are still major problems to be solved.

The demand for acceptable lungs has risen constantly yet the supply of acceptable donor organs has remained almost unchanged.

The ongoing search for new options to increase the availability of acceptable organ donors, including the use of lungs from older donors, lungs donated after cardiac arrest (DCD) and other sub-optimal/marginal lungs currently rejected for use.

### EVLP - New technique expanding the pool of acceptable organs

After preclinical and clinical research for lung preservation a new concept for lung transplantation was developed with the aim of reaching a new group of donors (non-heart beating) using a warm perfusion solution, STEEN Solution<sup>™</sup>, ex vivo.

The aim of EVLP is to reproduce the in vivo environment of the donor lung, using ventilation and perfusion. The function of marginal lungs can now be assessed by the normothermic ex vivo lung perfusion (EVLP) technique, thus further expanding the pool of acceptable donor lungs.

The method is now an established clinical routine in most major lung transplant centers in Europe, Canada and Australia and more close to 300 transplants have been performed using this technique. EVLP is not only the ideal setting for donor evaluation it also opens up the possibility for lung treatment.



evaluation and promote stability of isolated lungs ex vivo. FDA application is pending in the US.

STEEN Solution<sup>m</sup> is a buffered extracellular solution that includes human albumin to provide an optimal colloid osmotic pressure and dextran 40 to coat and protect the endothelium from excessive leucocyte interaction. STEEN Solution<sup>m</sup> is designed to facilitate prolonged

The STEEN Solution<sup>™</sup> perfusate and methodology permits:

- a more refined functional ex-vivo evaluation of accept/reject criteria
- Normothermic functional evaluation of without edema formation
- More rational allocation and use of donor lungs
- Extended preservation time

#### Continued from Page 13

### Introducing XPS<sup>™</sup> – Flexible and comprehensive platform for EVLP

The XPS<sup>™</sup> which was developed in contact with Toronto General Hospital has been used for two years at leading transplant centers in the USA within the framework of the NOVEL study. The XPS<sup>™</sup> is based on innovative technology from leading companies such as MAQUET (Getinge) and Hamilton Medical. The system is planned to receive CE mark during the first quarter of 2014. FDA application is pending in the US.



#### **XVIVO in brief**



and office in Denver, USA

#### **XVIVO Timeline**

1998 Company founded

**1998/1999** Cooperation with leading researchers and surgeons

**2000** The first human transplantation with the warm perfusion method ex vivo was performed in Lund.

2001 Perfadex obtains FDA approval

2006 STEEN Solution CE-marked

**2007** First international breakthrough for Ex vivo lung perfusion (EVLP) using STEEN Solution.

**2008** The Canadian authorities approve start of clinical trial in Canada

2009 STEEN Solution is approved for sales in Australia

2010 The clinical study in Canada is finished

**2011** Positive results from Toronto on 1-year survival data are published in the New England Journal of Medicine

Important Study published on STEEN Solution

**2012** In April all patients in the US clinical study on STEEN Solution<sup>™</sup> are included

In July an application for market approval of STEEN Solution  $\ensuremath{^{\rm M}}$  in the USA is submitted to the FDA

In October 2012 XVIVO Perfusion AB was spun off from Vitrolife and introduced at the stock exchange First North.

**2013** In July all patients are included in the NOVEL trial in the USA

In October Dr. Joel Cooper becomes the Medical Advisor to XVIVO Perfusion

In November the NOVEL study is expanded with more centers



### **Student Experiences From The Annual Meeting**

The 2014 American Academy of Cardiovascular Perfusion Conference in Orlando, Florida saw a record number of students in attendance (47), which brought what we hope, is a new dynamic to the Academy. This being the second year of the student council we came in with the goal of building on last year's successes, and develop a stronger student presence within the Academy. We believe we achieved that goal! The AACP perfusion community welcomed all the students with open arms and produced an experience that we all viewed as a great privilege. The opportunities we had to interact with professionals in our field and establish these connections early in our careers served as an invaluable asset and we want to thank all of you who were a part of creating this experience! -Amanda Best

I had a wonderful experience at the Academy Meeting. Everyone always uses the phrase "perfusion is a small society". The Academy meeting really felt like a small community. Everyone was so friendly and welcoming. I've been to some meetings where students are shoved off to the side since we are students. The Academy meeting was so inviting to students. Fellows, vendors, and retiring Perfusionists seemed to love talking to students and wanted to hear what we had to say. It is definitely a meeting I would like to come to for vears and I will recommend to everyone. Thank you for putting on such a great meeting that allowed for great interactions between the new generation of Perfusionists and those who are wise and experienced. See you all next year! -Molly Hageman

As my first large perfusion conference experience, I thought the AACP meeting was GREAT! I very much appreciated the opportunity to interact with and hear from many different Perfusionists, presenters, and vendors, everyone was so welcoming to students! My favorite part, though, was meeting other students from other programs in Orlando and finding out one of them was working at the hospital right across the street from the one I was working at in Omaha! I know I gained a lot of valuable knowledge from this meeting and cannot wait until the next one!

Many thanks to all those who dedicated their time and effort to planning this event! -Kailin Bellows

This years AACP conference was truly an amazing experience. Myself and the other students learned and were able to gain more knowledge in the perfusion field from the interesting presentations given. We were able to converse with students and Perfusionists during the extremely student friendly fireside chats. Last, but not least, I was able and honored to meet so many amazing Perfusionists and students. Everyone being so warm and accepting made this educational experience even more amazing. These are relationships I will keep forever and I cannot wait to continue attending and being a part of the AACP conferences.

-Rosanna Falco



### **Contact Information for Our Sponsoring Partners**

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#### THORATEC CORPORATION

Phone: 800-456-1477 Fax: 925-847-8514 Website: www.thoratec.com

#### **XVIVO PERFUSION INC**

Phone: 303-395-9171 Website: www.xvivoperfusion.com



#### The ACADEMY ANNUAL MEETING DEADLINES

ABSTRACT DEADLINE	October 30, 2014
MEMBERSHIP DEADLINE	December 5, 2014
PRE-REGISTRATION	January 9, 2015
HOTEL REGISTRATION	January 9, 2015
2015 ANNUAL MEETING	February 5—8, 2015

#### **Others Meetings**

Pennsylvania State Perfusion Society Spring Conference Wyndham Grand Hotel Pittsburgh, PA April 4-6, 2014 Phone: 412-391-4600 Fax: 412-467-3474 Website: http://wyndham.com

10th International Conference Pediatric Mechanical Circulatory Support Systems and Pediatric Cardiopulmonary Perfusion The Hall of Flags University of Pennsylvania, Philadelphia, PA, USA May 28 - 31, 2014 Website: http://www.pennstatehershey.org/web/pedscpb/ home