



The
Academy
NEWSLETTER

THE AMERICAN ACADEMY
OF
CARDIOVASCULAR PERFUSION
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SPRING 2016

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2016 Annual Meeting



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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 Savannah.

Fellows

Adams, Deborah
 Deptula, Joseph
 Fung, Kenmond
 Hageman, Molly
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 Rosenthal, Tami

Members

Aquino, Allyson
 Allen, Mikaela
 Beckman, Zachary
 Bienstock, Jared
 Brown, Charles
 Fults, Gaven
 Jarvis, Blake
 Kulat, Bradley
 Nikolic, Juliana
 Palmer, David
 Petterson, Craig
 Shade, Brandon
 Stammers, Alfred
 Walczak, Richard
 Wang, Andy

Student Members

Ackerman, Justin
 Arvidson, Eric
 Carter, Stephen
 Chidaushe, Kevin
 Clinch, Jestin
 Corsino, Anthony
 Crosslin, Natalie
 Crumpler, Meredith
 Davis, Mercede
 DiTrani, Thomas
 Dominy, Janah
 Fortenberry, Margaret
 Fredieu, Brett
 Goldstein, Jamison
 Gonzalez, Mayra
 Green, Stephanie
 Hulbert, Kevin
 Jones, Lauren
 Kienlen, Laura
 Knepper, Kate
 Koeper, Alyssa
 LaCerte, Jonathan
 Lawson, Chad
 Lepore, Anthony
 Luzadre, Amanda
 Lynch, Andrew
 McMan, Allison
 Mettenburg, Kathryn
 Monroe, Melanie

Nash, Benjamin
 Naughgle, Christin
 Nightingale, Adrienne
 O'Hearn, Timothy
 Orgel, Patrick
 Palsis, Stephanie
 Phelps, Aimee
 Predella, Megan
 Ramsdell, Danielle
 Ross, Logan
 Rosten, Kellen
 Rowden, Allison
 Salazar, Cristina
 Schlesinger, Andrew
 Sperry, Brad
 Steffan, Mary
 Stewart, Nicholas
 Talley, Dusty
 Tran, Thuy Nhu
 Varghese, Mariah
 Waller, Chelsey
 Welch, Marshall
 Zimmerman, Jason

The Student

Section

Historic Perspective and Future Considerations for Del Nido Cardioplegia

Doctor Del Nido

Dr. Del Nido received his MD degree from the University of Wisconsin Medical School. He completed his training at Boston University Medical Center, Toronto General Hospital, and the Hospital for Sick Children in Toronto. Pedro Del Nido's basic research is directed at understanding the metabolic and structural changes due to left ventricular hypertrophy.

His clinical goal is to apply minimally invasive robotic surgery and other cutting-edge techniques to enhance cardiac surgery. Alongside his research, Dr. Del Nido treats a wide variety of conditions ranging from aortic aneurysms, arrhythmias, cardiomegaly, coarctation of the aorta, Ebstein's anomaly, mitral valve disease, congestive heart failure, pericardial disease, pulmonary valve disease, septal defects and vascular diseases.

Over the years, Del Nido had developed and implemented the use of Del Nido cardioplegia in his work. Cardioplegia is a method of myocardial protection for patients of all ages requiring cardiac surgery in which cardiac arrest must be achieved. Numerous cardioplegia solutions and delivery methods have been developed. The Del Nido cardioplegia solution has been in use for 18 years at Boston Children's Hospital. A distinctive concept that separates the Del Nido solution from other cardioplegia solutions is the 1:4 blood to crystalloid composition. Usually only a single dose delivered results in adequate myocardial protection for 60-90 minutes.

Statement of the Problem

The term Del Nido seems to be loosely used in today's common practice. What are the true benefits of the Del Nido solution? Why is it mostly crystalloid? What is the concept behind the solution? What is it actually composed of? Answers to these questions seem vague from discussions with perfusionists relative to a standardized method of use of Del Nido cardioplegia as well as a standardized Del Nido solution. There are a variations of the "DelNido" from institution to institution. Different forms of "Del Nido" solutions are being used and techniques including delivery are individualized.

The Facts

A summary and analysis, base upon extensive literature search, provide rationale and concepts on the original Del Nido. Shown on the next page is a table describing the compositions of all the components in the original Del Nido formula retrieved directly from a publication from the Boston Children's Hospital.

Ingredients such as magnesium and lidocaine included in Del Nido are not always found in other blood cardioplegia solutions. Why is magnesium and lidocaine important? Understanding of myocardial cell physiology would be important and this communication will provide the effects of the ingredients and a general overview of the functions of the myocardial cells.

Myocardial function is very much dependent on intracellular calcium concentration. Higher intracellular cal-

**Emad Ahmed and
Richard Chan**

*North Shore University –
LIU Post School of
Cardiovascular Perfusion*

Great Neck, NY

Crystalloid component of del Nido cardioplegia solution.

1 L Plasma-Lyte A base solution to which the following are added:

Mannitol 20%, 16.3 mL

Magnesium sulfate 50%, 4 mL

Sodium bicarbonate 8.4%, 13 mL

Potassium chloride (2 mEq/mL), 13 mL

Lidocaine 1%, 13 mL

cium concentrations lead to increase contraction of the muscle as lower levels lead to more relaxation. This will reflect the level of oxygen utilization. If calcium is allowed to accumulate in the myocytes, the heart may be prone to spontaneously beat. Magnesium is a calcium channel blocker and therefore its addition to the solution increases blockage from any calcium-stimulated contraction thus decreasing the myocardial oxygen demand. Magnesium is also part of Plasma-Lyte A solution.

Lidocaine is classified as a sodium channel blocker and is a frequently used in practice as an antiarrhythmic. The sodium channel blockade helps counteract the negative effects of a hyperkalemic depolarized arrest by polarizing the cell membrane to some degree and preventing sodium and calcium accumulation within the cell. A depolarized arrest can result in calcium and sodium accumulation within the cell so blocking the sodium channel prevents this. This concept indicates that Del Nido is truly a depolarizing agent due to the addition of lidocaine and magnesium.

With all of the aforesaid information given it should be clear that Del Nido is truly advanced in its composition. The key is a low calcium concentration solution which results in decreased oxygen consumption due to the reduced excitability of the cells. Individual myocyte excitability is not reflective on the EKG. Why is it a crystalloid solution? Why not use a 4:1 blood to crystalloid composition including the key ingredients like lidocaine and magnesium. One of the more over looked factors is that blood contains calci-

um. Using a 4:1 blood to crystalloid cardioplegia means a higher level of calcium as compared to a mostly crystalloid solution. The dilution and control of calcium is a key factor in DelNido.

It is important that we considered all these factors in formulating a very detailed concept so that it may be implemented correctly in everyday practice. To further enhance this concept to improve patient care, comparison of methods of delivery and standardize the different modalities of the delivery should be accomplished as part of our efforts in developing "Evidence Base Practice" for our profession.

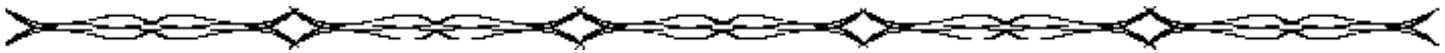
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Chambers DJ, Hearse DJ. Developments in cardioprotection: "polarized" arrest as an alternative to "depolarized" arrest. *Ann Thorac Surg* 1999 Nov;68 (5):1960-6.

Charette K, Gerrah R, Quaegebeur J, Chen J, Riley D, Mongero L, et al. Single dose myocardial protection technique utilizing del Nido cardioplegia solution during congenital heart surgery procedures. *Perfusion* 2012 Mar; 27(2):98-103.

Matte, Gregory, del Nido, Pedro. History and Use of del Nido Cardioplegia Solution at Boston Children's Hospital. *J ExtraCorpor Technol* 2012; 44, 98-103.



2017 Annual Academy Meeting



**San Diego, California
January 19-22, 2017**

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Awards Committee Selects Winning Paper Presentations



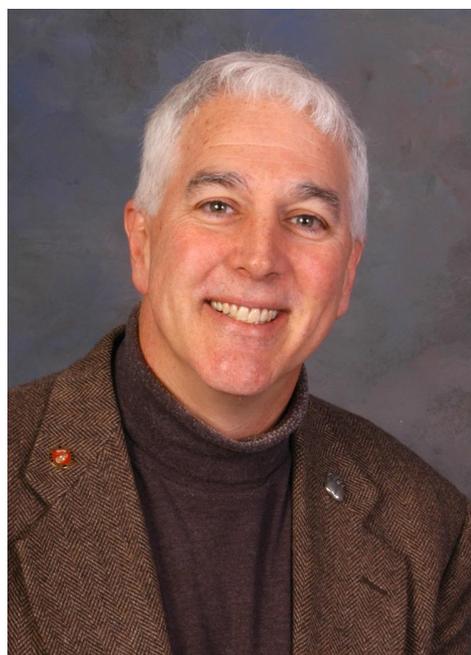
Two students received **Lawrence Awards** for their paper presentations at the Annual Seminar in Savannah.

Allison Rowden - Assessing the Culture of Safety in Cardiovascular Perfusion: Attitudes and Perceptions

Anthony Corsino - Immersive High-Fidelity Simulation As A Complimentary Teaching Method In Perfusion Education: Student Perspective On Pre-Clinical Skill Development



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



In addition, *Al Stammers* was awarded the **Best Paper of the Conference** - a \$750 cash award funded by the journal *Perfusion* for his presentation entitled, "Comparative Clinical Effectiveness Of Intraoperative Autotransfusion During Cardiac Surgery: Does The Type Of Device Make A Difference?"

ON BYPASS

“Every Human Heartbeat is a Gift”: Herold D. Kletschka, M.D.

The heroic life of Dr. Harold Kletschka and his relentless pursuit of idea to find a treatment for heart failure is an amazing story of innovation and perseverance.

Dr. Kletschka and his partner, Edson Rafferty invented the Kletschka-Rafferty pump based on their constrained force-vortex principle. This pump was atraumatic to the blood, which later came to be known as the Bio-Pump. They founded Bio-Medicus, the first publicly traded company in the United States that was solely a biomedical device company.

But, as with any visionary who has carved out a new technology and business; there were others who also played an important role. The company's shareholders and the US Securities and Exchange Commission created more turmoil for Dr. Kletschka that could have prevented him from meeting the pump's full potential. The FDA was getting ready to adopt new rules set to be approved by the Congress in 1976, and it would require an additional battery of new trials. The company's financials were drying up, and if the Bio Pump was not grandfathered in before the new regulations, they would have to spend a significant amount of more money, as well as it would add up many years before they could market the pump.

One way to be grandfathered in with the new FDA regulations was to test the device on a human to prove its safety *in vivo*, on humans. Although the pump had been shown to be completely harmless to dogs in the laboratory, and did not harm horse blood, Dr. Kletschka still had to show that the pump had been safely tested in a healthy person before it could be im-

planted in a patient. Dr. Kletschka could not test it on himself, as Werner Frossmann had tested heart catheters on himself. He needed a volunteer to “go on pump”. He was unable to find one at the company, but his sister, Barbara Kletschka, bravely volunteered. She had faith in her brother and his device. On July 16, 1975 Barbara Kletschka became the first human to go on partial, V-V bypass, with a Bio-Pump. She did well, and to this day, she loves to tell the story of her pioneer, maverick brother.

Dr. Kletschka still faced another big hurdle. The pump had to be used in an actual patient. That required a cardiac team with a valiant surgeon and a courageous perfusionist to use this new device that had never before been used to support a patient on cardiopulmonary bypass. Both, the surgeon and the perfusionist had to be ready to save the patient from any harm if the device were to fail. Dr. Cooley and his perfusionists, Charles C. Reed and Terry Crane, agreed to use this new technology on their patients. On August 14, 1975, Dr. Cooley performed left ventricle to abdominal conduit using the Bio-Pump on a ten-year-old Jehovah's Witness patient. This was truly a landmark operation for two reasons. This procedure was never done before and, this was the first use of the Bio-Pump. Let me reiterate this. This team used the Bio-Pump for the first time ever, on a JHW, redo patient, and, in an operation that had never been done before. Dr. Kletschka's relentless pursuit, the gifted hands of Dr. Cooley and fortitude of Charlie Reed made this an epic day in the history of cardiac surgery.

The device performed just as it was

Sanjay Patel, MS, CCP, LP

CHI St. Luke's Health at Baylor
St. Luke's Medical Center

Houston, Texas

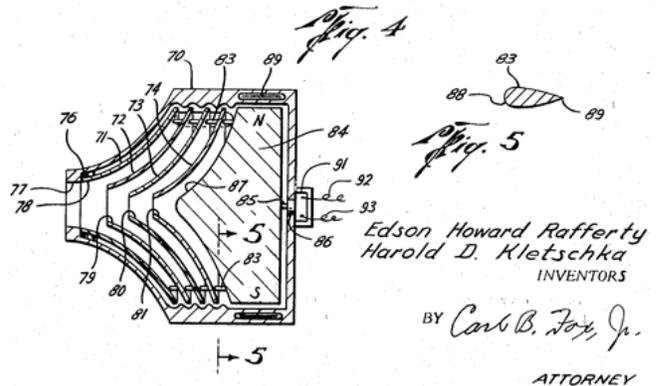
supposed to, and the patient had an uneventful recovery. We know the rest of the story. So far, more than four million Bio Pump's have been used worldwide, and it is still the pump to which all other pumps are being compared.

References

Dave Racer. To Change the Heart of Man: The Life of Harold D. Kletschka, M.D., Father of the Artificial Heart.

Cooley DA, Norman JC, Mullins CE, Grace RR. Left Ventricle to Abdominal Aorta Conduit for Relief of Aortic Stenosis. Cardiovascular Diseases, Bulletin of the Texas Heart Institute, Vol. 2, Number 3, 975 pages 376-383.

US 3647324 A -- filed Dec 18, 1969



Non-pulsatile, centrifugal constrained forced vortex pumping principle

Important Academy Dates

The ACADEMY ANNUAL MEETING DEADLINES

ABSTRACT DEADLINE	October 15, 2016
MEMBERSHIP DEADLINE	November 19, 2016
PRE-REGISTRATION	December 19, 2016
HOTEL REGISTRATION	December 19, 2016
2017 ANNUAL MEETING	January 19-22, 2017

Others Meetings

Sanibel Symposium 2016

April 20 – 23, 2016
 Sanibel Harbor Resort & Spa
 Fort Myers, FL
 Contact Name: Marco Polizzi
 Contact Phone: 239-243-9171 ext. 105
 Contact Email: symposium@perfusion.com
 Website: <http://www.perfusion.com/symposium>

Pennsylvania State Perfusion Society Spring Conference

April 29 – 30, 2016
 Omni William Penn Hotel
 Pittsburgh, Pennsylvania
 Contact Name: Farrah Kanczes
 Contact Phone: 412-527-5166
 Contact Email: fkanczes@gmail.com
 Website: <http://www.omnihotels.com/hotels/pittsburgh-william-penn> or www.pennperf.org/meetings

12th International Conference on Pediatric Mechanical Circulatory Support Systems & Pediatric Cardiopulmonary Perfusion

Columbia University Medical Center
 New York – Presbyterian Morgan Stanley Children's Hospital
 May 18-21, 2016
 New York, NY
 Contact: Annmarie Tarleton
 Contact Phone: 212.304.7813
 Contact Fax: 212-304-7811
 Contact Email: at3004@cumc.columbia.edu
 Website: http://columbiasurgery.org/sites/default/files/event_pediatric_cme_agenda_2016.pdf

17th European Congress on Extracorporeal Circulation Technology

Marseille, France
 June 14-17, 2017
 Website: www.fecect.org/invitation

ON BYPASS

Assessing the Culture of Safety in Cardiovascular Perfusion: Attitudes and Perceptions

Chad Lawson, Allison Rowden, Megan Predella, Jamie Goldstein, Joseph J. Sistino, David Fitzgerald

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Medical University of South Carolina
151B Rutledge Ave MSC962
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Patient safety is defined as “the prevention of errors and adverse effects to patients associated with health care”.¹ In a culture of safety, health care providers are encouraged to identify unsafe circumstances and take action to prevent these adverse events. Many research studies discuss the culture of safety in varying areas of healthcare. However, the majority of these studies do not identify or assess the perceived patient safety culture specific to cardiovascular perfusion. The purpose of this research is to identify key elements associated with a conducive culture of safety for practicing clinical perfusionists. To accomplish this task, a survey containing 37 questions utilizing a Likert scale (strongly disagree, disagree, neither, agree, strongly agree) along with demographic inquiries was distributed to practicing perfusionists via *Perflist*, *Perfmail*, and *LinkedIn*.

There were 202 respondents that completed the Culture of Safety Survey for Perfusionists. An odds ratio was calculated by logistic regression with the dichotomous outcome variable “work unit overall grade on patient safety”. The responses of “excellent” and “very good” were coded as a “1” and “acceptable”, “poor” and “failing” as a “0”. Four responses were found to have a significant predictive level of the perceived safety of one’s unit; (a)

“It is just by chance that more serious mistakes don’t happen around here” (OR = -3.0, $p < .01$); (b) “In this unit, people treat each other with respect” (OR = 2.4, $p < .05$); (c) “Mistakes have led to positive changes here” (OR=2.2, $p < .01$); (d) “Staff are afraid to ask questions when something does not seem right” (OR = -1.9, $p < .05$).

In comparison to a study completed regarding the culture of safety in cardiac surgical teams using a similar version of the AHRQ survey (Marsteller), perfusionists that completed the survey have a higher positive overall perception of their culture of safety environment than other reported medical disciplines.

The results from this pilot survey seem to indicate that effective communication secondary to both incident and near-miss reporting are associated with a higher perceived culture of safety. Opportunities should be explored to expand the survey population to obtain a better understanding of perceptions across practicing perfusionists. Direct beneficiaries of this information sharing include hospitals, academic training programs, and professional organizations. Educational curriculum can be tailored to address specific behaviors and non-technical skills at the entry level. Professional standards and guidelines can be enhanced to support

safe workplace policies. Lastly, post-professional educational conferences and resources can integrate safety initiatives in the program curriculum to continually inform active clinicians on safety developments. Fostering a culture of safety is not incidental. It must be continuously nurtured and evaluated by all key stakeholders. It takes a long time to change to culture. Leaders must support this change by demonstrating their own commitment to

provide the focus and resolve for long-term success.

This was presented at the 37th Annual Seminar of The American Academy of Cardiovascular Perfusion in Savannah, Georgia. The full manuscript has been submitted to the journal Perfusion for possible publication.

New Committees Created

The Academy created the three following new committees at its meeting in Savannah.

Video Committee

Role of this committee is to fill all open spots in the program and webcast with instructional videos. This committee reports bimonthly to the Council.

Information Technology Committee

Goals of this committee include:
Proposed redesign to the Academy website,
Setup and use of social media,
Create a financial plan for advertising,
Proposed face of perfusion,
Contact information for Council and Committee members will be on the website,
List of all members with their contact information will be added to the website.
This committee will report monthly to the Council.

Exhibitors/Sponsors Committee

This committee will:
Evaluate and define levels of exhibitors & sponsors,
Increase exhibitors at all levels,
Establish a value list for exhibitors and sponsors,
Define proposed changes to the annual meeting structure on feedback from exhibitors and sponsors.
This committee will report monthly to the Council.
The Co-Chairpersons of this committee will be the Vice President and the Executive Director.

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2017 Annual Academy Meeting Host Hotel



The Westin San Diego Hotel San Diego, California

Single/Double Occupancy - \$209.00 per night
Reservations: 888-627-9033

Experience The Westin San Diego Hotel's 15 million dollar transformation, introducing the brand's new modern design. The hotel now has a distinctly upscale, contemporary feel, inspired by soothing elements of nature. With a complete revitalization of guestrooms, restaurant, lobby, public areas, meeting space, two new Legal War Rooms, Tangent and a new WestinWORKOUT® Fitness Studio, the newly refurbished urban retreat will transform every aspect of a stay into a revitalizing experience.