



The  
**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

**WINTER 2014**

**Editor**

David Palanzo  
Annnville, PA

**Contributing Editors**

Tom Frazier  
Nashville, TN

Kelly Hedlund  
Hays, KS

**Student Section**

Richard Chan  
Oyster Bay, NY

**Inside This Issue**

President's Message 1

2015 Annual Meeting 4

Publishing a Presentation 6

Student Section 9

Paper Presentations 12

Pre-Registration Form 14

Live Webcast 15

Our Host Hotel 16

Sponsoring Members 17

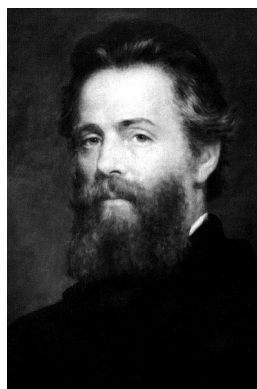
Important Dates 17

## Homeward Bound

**"Life's a voyage that's homeward bound."**

Herman Melville

Celebrated author of several 19th-century novels about the sea. Moby-Dick (1851), the story of the fanatical Captain Ahab and his hunt for the great white whale of the title, is now considered one of the classics of American literature. Melville's other novels include Typee (1846), Omoo (1847), and Billy Budd (published posthumously in 1924).



Herman Melville

Source: Etching of Joseph O. Eaton's portrait.

This image (or other media file) is in the public domain because its copyright has expired.

This title takes on many different meanings as you might guess ranging from safety dogs and pet rescue to social services, reuniting homeless individuals with their families, ministries in addiction, and much more.



Homeward bound, I wish I was, Homeward bound, Home where my thought's escaping,  
Home where my music's playing, Home where my love lies waiting Silently for me.

Source: Simon and Garfunkel Album Cover  
CBS Productions, 1966.

*Continued on Page 2*

*Continued from Page 1*

Simon and Garfunkel scored a major hit song in 1966 with this title. As the holidays approach, many of you will be homeward bound to enjoy family and friends. I want to take this opportunity to wish all of you a safe and a very Merry Christmas and Happy New Year. Happy Holidays to all of you who celebrate in other multicultural settings as well, may your seasons be spiritual and uplifting as we once again close a great year and bring in the new.

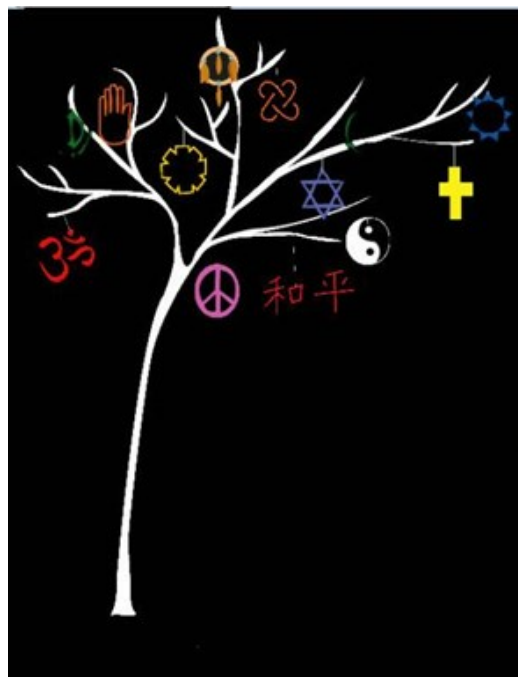


Source: Education World  
December: A Month of Multicultural Holiday Celebrations  
December 06, 2014

Few opportunities present the multicultural "teachable moments" that December does! The following multicultural events and celebrations are among those that will take place this year:

- Diwali (Hindu)
- Ramadan (Muslim)
- Eid al-Fitr (Muslim)
- Saint Nicholas Day (Christian)
- Eid'ul-Adha (Muslim)
- Fiesta of Our Lady of Guadalupe (Mexican)
- St. Lucia Day (Swedish)
- Winter Solstice (Multinational)
- Hanukkah (Jewish)
- Christmas Day (Christian)
- Three Kings Day/Epiphany (Christian)
- Boxing Day (Australian, Canadian, English, Irish)
- Kwanzaa (African American)
- Omisoka (Japanese)
- Chinese New Year (China)

While trimming and decorating your Christmas tree this year, be aware that neighbors down the street may be preparing for Hanukkah while friends across town are fasting for Ramadan. It's the wonderful winter holiday period, a time when many Americans close out the year gathering with relatives, enjoying great food, giving gifts, and sharing to support those who are less fortunate. It's also a great time of year to teach children and adults about the importance of having an open mind about different cultures and traditions. Seize the opportunity, this diversity is powerful and meaningful and can strongly bond us.



Source: Multicultural winter holiday celebrations  
By: Jenn Savedge, Author of parenting books blogs about raising children and health issues.  
Thu, Dec 09, 2010

So, to the point, the homeward bound theme I wish to capture and impart upon you is the final stretch leading to our 2015 Annual Meeting. Like the trimmed and decorated tree awaiting the festivities, our work is almost done – the program and host site are set and it is now time for you to close the deal and register to attend our annual meeting. I hope you have registered and are making plans to attend, we need your support and presence – you are family and our meeting is diminished by your absence. Come join us!

**February 5-8, 2015**  
**Omni La Mansión del Rio**  
**112 College Street**  
**San Antonio, Texas 78205**  
**Reservations: 800-THE-OMNI**

When making your reservations mention that you will be attending  
 The American Academy of Cardiovascular Perfusion (AACP) Conference.

***Hotel Note:*** *The Omni La Mansión del Rio is ideally nestled along the historic River Walk among the banks of the Paseo del Rio in downtown San Antonio, where it is perfectly situated for any visitor seeking to explore all of San Antonio's extensive range of tourist attractions. It is within easy walking distance of the fabled Alamo, El Mercado, La Villita District, Spanish Governors Palace, San Antonio Convention Center and other well-known landmarks. Blending Spanish colonial architecture and European style, the four-diamond Omni La Mansión del Rio surrounds guests with the romance, grace and charm of a grand hacienda. The San Antonio River Walk accommodations provide a haven for guests with graceful service and tranquil surroundings. Built on three levels that descend to San Antonio's festive River Walk, the Las Canarias Restaurant offers a romantic atmosphere of graceful palms, flowing waters and scenic views. This luxury San Antonio hotel located on the San Antonio River Walk, was recognized in the Celebrated Living's Magazine as one of the top hotels in the Nation.*

This has been a great year and one I will always cherish having served as President of The American Academy of Cardiovascular Perfusion. Thanks for the opportunity you have provided.

We have planned a great scientific program for you to enjoy and experience. Some of the highlights are Webcasting our meeting for the first time **(there's no excuse not to attend if you can't be there physically on site, register as a webcast attendee)** along with two Special Scientific Sessions capturing the "How To Approach" in Emerging Roles and current clinical topics of significance, and a Special Scientific Panel on "Perfusion Safety-Simulation-Education into the 21<sup>st</sup> century. We also have a Special Invited Lecture from a surgeon who was Medical Director of NASA and the Astronaut Program who will speak on weightlessness and the impact on the

cardiovascular system. Many of you will perhaps find this enjoyable as you plan your trip into outer space.

Of course, we have filled our program with exciting Fireside Chat topics and with the many abstracts that have been submitted. The Program Committee expresses appreciation to all of you who have accepted the leadership role of presenting and submitting manuscripts to share your knowledge and experience and to those who have agreed to participate as Moderators. Without such support, we are nothing. Thanks to all of you!

I hope you will take time to check out our 2015 program on the AACP website. Mr. Palanzo, Executive Director extraordinaire has retooled and modified our website and he is to be commended for a great product that he has produced, log on – check it out. Thank you David!

There is so much to convey and I risk tiring you and boring you and that certainly is not my mission – so – join us on site at the luxurious host hotel in San Antonio or via webcast and I will continue lauding our accomplishments until you tell me - silence - Steve!

We are on the move and moving in the right direction, thanks to all of you, Fellows-Members-Students -Program Directors and our Sponsors.

Happy Holidays,  
 Steve Sutton, President

**Visit our new  
 website at  
[www.TheAACP.com](http://www.TheAACP.com)**

# 2015 Annual Academy Meeting

**Omni La Mansion del Rio Hotel  
San Antonio, Texas  
February 5-8, 2014**



## Thursday, February 5, 2015

9:00 AM – 1:00 PM	Council Meeting
10:00 AM – 3:00 PM	REGISTRATION
2:30 PM – 4:30 PM	Fireside Chats (Session #1) <b>Aortic Surgery:</b> Are you prepared for the challenge? <b>ECMO:</b> medical, surgical, transport and more <b>Pediatrics,</b> not just little "PEEPS" <b>Simulation:</b> It's not just for new perfusionists. Catch the wave. <b>Students Only Forum</b>
4:30 PM – 5:30 PM	REGISTRATION
5:00 PM	Opening Business Meeting <i>Fellow, Member, Senior and Honorary Members</i>
6:00 PM – 8:30 PM	Sponsor's Hands-On Workshop & Reception

## Friday, February 6, 2015

7:00 AM	REGISTRATION
7:30 AM – 9:30 AM	Scientific Session
9:30 AM – 10:00 AM	Break
10:00 AM – 11:30 PM	Special Scientific Session <b>Perfusion Techniques and the Expanding Role of the Perfusionist: A How To Series (Part I)</b>
11:30 PM – 1:00 PM	Lunch
1:00 PM – 3:30 PM	Special Scientific Session <b>Perfusion Techniques and the Expanding Role of the Perfusionist: A How To Series (Part II)</b>



3:30 PM – 5:30 PM

Fireside Chats (Session #2)

**Competency:** Today's reality. What's necessary? What's overkill? What can we share? No need to reinvent the wheel.

**Computer-assisted Bypass:** It's not just an electronic record

**Myocardial Protection**

**Simulation:** It's not just for new perfusionists. Catch the wave.

**Students Only Forum**

6:30 PM

Induction Dinner

*Fellow, Senior, Honorary Members & Guests*

### Saturday, February 7, 2015

7:00 AM

REGISTRATION

7:30 AM – 9:30 AM

Scientific Session

9:30 AM – 10:00 AM

Break

10:00 AM – 11:30 AM

Memorial Session

*Charles C. Reed Memorial Lecture*

*Earl Lawrence*

*Thomas G. Wharton Memorial Lecture*

*Steven W. Sutton, CCP - President, AACP*

11:30 AM – 1:00 PM

Lunch

1:00 PM – 3:30 PM

Special Scientific Session (Panel)

### **Perfusion Safety / Simulation / Education**

*Perfusion Education and Direction In The 21st Century*

*Safety*

*Evidence-Based Practice*

*Simulation & Intraoperative Behavior*

3:30 PM – 5:30 PM

Fireside Chats (Session #3)

**Closing the gap** between Generations: How do we do it? How do we teach the next generation of Perfusionists?

NIRS, **Cerebral Oximetry**, help me assess adequacy of perfusion!

**Simulation:** It's not just for new perfusionists. Catch the wave.

There were **incidents and accidents**, hints and allegations. Did I meet the standard of care? What are my legal obligations?

**Women in perfusion:** She pumps like a girl!!!!

5:30PM

Closing Business Meeting

*Fellow, Senior and Honorary Members Only*

### Sunday, February 8, 2015

8:00 AM – 10:00 AM

Scientific Session

10:30 AM – 12:30 PM

Fireside Chats (Session #4)

**Anticoagulation:** "To clot or not to clot", that is the question

**Best Practice:** Does your department meet the standard? Are you really doing your best?

**ECMO:** medical, surgical, transport and more

**Simulation:** It's not just for new perfusionists. Catch the wave.

# Publishing a Paper

## Introduction

This article is the third in a series derived from handout material at past Fireside Chats. After the presentation, publication should follow. A study is not completed until it is shared and disseminated with your peers. Publishing can be a daunting experience because your work will usually be subject to peer review. The guidelines below describe some potential pitfalls and a recommended way to write a paper intended to make the process easier.

## Why Publish?

"Publish or perish" really doesn't apply to most perfusionists; instead it might be better described as "publish and prosper" insofar as building your Curriculum Vitae will enhance your marketability when seeking a job or other opportunities. One major reason to publish is the sharing of ideas that can improve perfusion practice, and in some cases, can provide scientific data to contribute to the process of evidence-based perfusion practice. Publish and share your knowledge to help improve patient care and help other clinicians solve clinical problems. Perfusionists and students should use research and publications to question fundamental perfusion beliefs, lore and historic practices through research and publication.

## Authorship

Obviously, the person who writes the paper is an author and most often is the first name listed on the title page. However, the answer as to who else should be named as a co-author seems straightforward but it is not always so because justification depends on their level of contribution. A significant contributor does not simply suggest that a study be done or provide cursory advice or criticism unless the intellectual content of the paper is fundamentally changed. All named authors must be suffi-

ciently familiar with the work or content to defend it if challenged. This usually entails substantially contributing to the hypothesis, reviewing previously published work, helping develop the study design, collecting and analyzing the data, providing explanatory insight, or writing first drafts or critically important revisions. The last author listed on a publication is usually reserved for a senior author or someone who is influential such as a director of the study and/or the main grant recipient.

## Duplicate Publication

This sometimes called "salami" publication and consists of "submission or publication by the same authors of the same or nearly the same information based on one study in more than one scientific journal (without the editor's knowledge) or in the same journal more than once...It is publication more than necessary to meet the needs of the readers or the discipline," according to the Council of Biology Editors. It is frowned upon because it represents a waste of editors', reviewers', and readers' time and is also a waste of valuable journal space, which also prevents other authors from publishing their work. One possible exception is if the work is published in a minor journal or proceedings in a foreign country whose readers typically do not subscribe to a major journal; however, even in this situation the editor must be informed at the time the paper is submitted and it's usually prudent to cite or acknowledge the original publication.

## Plagiarism

According to Wikipedia, plagiarism is defined in dictionaries as the "wrongful appropriation," "close imitation," or "purloining and publication" of another author's "language, thoughts, ideas, or expressions," and the representation of them as one's own original work. Even if an idea is

**Richard Chan,  
Mark Kurusz and  
Jeff Riley**

not written word-for-word in a manuscript, if it not your own it must be properly cited and given due credit. It is recommended to scan your manuscript through a free service that checks for grammar errors and evaluates your text for plagiarism (see [www.grammarly.com](http://www.grammarly.com) ).

### **Conflict of Interest**

Perfusionists are most often at risk of this serious mistake when collaborating with manufacturers on devices they have evaluated. If the author has a financial interest in the company or the product's success, this should be disclosed to the editor when submitting the paper to a journal. Most journals now require such disclosure because of abuses that have introduced bias in study results. A guideline for when to disclose a relationship with a device manufacturer is that it should be made to the journal by the perfusionist if public disclosure would cause embarrassment.

## ***Stages in Writing a Paper***

### **Confirm the Idea**

The idea may come at any time—during a case or a few days (or months) later. You may hear a presentation or read another paper and a question comes to mind that you think should be answered. The emotion most often associated with the idea stage is great enthusiasm, which is usually transient in nature.

### **List the Topics**

Think and write down the various aspects of the question you are trying to answer. This usually is accompanied by feelings of confusion as you focus on the important issues. The topics usually can be listed in a few hours.

### **Gather Facts**

This is the most time-consuming part of writing a paper and may take up to several months. It entails reading all the available relevant literature on a topic and making notes. If one was somewhat confused during the earlier step, the most humbling emotion at this stage is a feeling of ignorance as you discover other authors who have previously written about the topic. Facts most often consist of references you will footnote and list at the end of the paper.

### **Study and Evaluate**

This stage is also time-consuming and can take weeks to months. It is best accomplished by considering the gathered facts in several different sessions. Some facts or papers initially thought to be important will fall away in importance as you learn more about the subject matter. The benefit will be the ability to distinguish good scholarship from mediocre scholarship. The emotion most often associated with this stage is panic, but it gives way to competence in the next stage below.

### **Outline and Draft**

It is rare for a coherent and persuasive paper to be written without the author having prepared an outline. This is your roadmap on how the paper will be structured and can be likened to a feeling of catharsis. The acronym IMRAD is often used for scientific papers to designate an accepted format; it stands for Introduction (this consists of a brief review of the literature, the question to be answered, and the purpose of the paper); Materials and/or Methods (this must have sufficient detail to allow the reader to understand what was done in detail or to be able to independently reproduce what you have done and may include figures to illustrate aspects of the work to be reported); Results (this is usually straightforward and simply reports what you learned during completion of the work, and they may be reported in narrative or tabular form using statistics); and Discussion (this is the section that reiterates your important findings, puts your paper in the context of other published papers on the subject, and contains your conclusions). If the paper is not a study, then section headings should be according to major subjects covered in the paper. To develop an outline and write the first draft typically takes several days to complete.

### **Revise**

After the draft is written it's best to let it simmer for a few days and then come back and re-read what you've written. Sections that are out of place will be rearranged in a logical fashion using the outline. This is the stage where you can "clean up and polish" the writing. The emotion most often associated with this stage is curiosity as you consider the reader by constantly asking yourself, "Have I expressed myself as simply and clearly as possible?" A revision typically

*Continued on Page 8*

*Continued from Page 7*

takes several hours or days to complete.

### **Check and Complete**

This is a necessary step to ensure the paper you are about to submit to a journal conforms to the journal's Instructions for Authors. It also includes the sometimes overlooked proofreading to correct minor errors. The most common shortcoming in submitted manuscripts is not citing references exactly as specified by the journal. There are different ways to do this, and the so-called Vancouver style is the most common and consists of the author[s] last name[s]; author's initials; title of article; journal name; year; volume; and inclusive pagination. The feeling most often associated with this stage is satisfaction that you've done a proper job in writing the paper. This stage typically takes several hours or days to complete.

### **Peer Review**

This is the first feedback you'll receive on your paper. Usually two or more anonymous reviewers will critique your work and inevitably recommend either a minor or a major revision. The critique will be communicated to you by the journal editor. The emotions associated with this stage range from disappointment to gratitude. Sometimes reviewers can be harsh in their judgments, but it's best to consider every point they make, revise the paper according to their recommendations, and resubmit it. If you do not agree with a particular criticism, you are certainly justified in letting the journal editor know this but it must be supported by good reasoning in a cover letter when you resubmit the revision. Remember, one of

the by-products of peer review is to improve the paper for publication, but reviewers are not infallible. This stage typically takes days to weeks while you wait to hear back from the journal editor.

### **Publication**

You can take justifiable pride in your paper appearing in print providing you have done a good job and addressed concerns raised during the peer review process. You should realize that few perfusionists publish, and having your paper cited by others is perhaps the best compliment and reward for the time spent in writing a paper.

### **Note on Time Frame**

There are two basic ways to write a paper—one follows the steps outlined above and may take weeks to months to complete, often with periods of non-activity directly involved in progressing through the stages. The advantage of this orderly process is that your subconscious will be working nonetheless as new insights become evident as the paper evolves first in your mind and then on the document. The other way is less desirable where no work is done after the initial idea comes to mind. At some point there will be a deadline, and all the stages will be compressed and must be completed in a short time. This can cause anxiety and also suffers from lack of the subconscious contributing to the process. The predominant emotion if one chooses this approach is worry that you might not be doing the best job you can and that if the paper is accepted for publication the editors or readers will quickly point out the paper's shortcomings.



**FOR INFORMATION ABOUT ATTRACTIONS IN THE SAN ANTONIO AREA GO TO :  
[HTTP://VISITSANANTONIO.COM/](http://visitsanantonio.com/)**



# The Student Section

## The Use of Hyperoxia As The Standard of Practice?

Hyperoxia is utilized at most institutions as a standard of care during cardiopulmonary bypass, using adjustments of FIO<sub>2</sub> to yield PO<sub>2</sub> over 200 mm Hg; however, there is a wide range that is considered therapeutic. Even the traditional range of PO<sub>2</sub> is between 200-300 mm Hg during Cardiopulmonary Bypass (CPB) is well accepted and is considered as normal, it is hyperoxia. Extreme hyperoxia using FIO<sub>2</sub> of 1.0 or near 1.0 yielding PO<sub>2</sub> well over 500 mm Hg will be considered hyperoxia for this communication. The conceptual drive behind this type of FIO<sub>2</sub> management is to reduce nitrogen gaseous micro bubbles (NGME). Hyperoxia will produce oxygen gaseous micro bubbles (OGME) which is easily dissolved and or defoamed. Many in vitro studies show defoamer and arterial filter have little or no effect in eliminating NGME. The concept behind normoxia (200-300mmHg) is based on maintaining the patient close to their normal physiologic state, while allowing for a bit of excess to accommodate the limitations of the oxygenator. Few institutions utilize hyperoxia adjusting FIO<sub>2</sub> of 1.0 or near 1.0 that yielding PO<sub>2</sub> of 500 mmHg or greater. In recognition of the fact that a membrane oxygenator has the capacity to function at approximately 25% of a patient's native lung in the best of scenarios, it is reasonable to conclude that the partial pressure may be somewhat erroneous and that a higher PO<sub>2</sub> may be required to elicit results resembling that of the native lungs. Also, the patient is anesthetized, and thus, not at their physiologic baseline. Additionally, changes in SVR and flow dynamics may impact oxygenation. Left shifted P50 from hypothermia and low PCO<sub>2</sub>

(non temperature corrected PCO<sub>2</sub>) added additional importance have more oxygen dissolved in the plasma. It is possible more compensation may be necessary to offset these additional factors. One way to demonstrate the validity of hyperoxia may be to do a comparative study examining 150 consecutive cases at various institutions utilizing similar CPB techniques with the exception of FIO<sub>2</sub> management. Analyzing the results of matched controls reducing variability in gender, procedure, and co-morbidities, may yield a clearer understanding of the relationship between FIO<sub>2</sub>, PO<sub>2</sub>, and patient outcomes. For the purposes of this article, the standard of care will be referred to as normoxia, and a PO<sub>2</sub> of 500 mmHg or greater will be considered hyperoxia.

Part of the reason so much variability exists in management of FIO<sub>2</sub> is that the correlational effect of FIO<sub>2</sub> and the patient status has not been established. Currently, no secondary point of reference exists that may be used to confirm adequate oxygenation of the patient. One may argue that the SVO<sub>2</sub> demonstrates our efficiency in perfusing the patient, and this may be the best method to derive our inference; however, venous blood saturation does not conclusively indicate what is utilized by tissue when P50 is left shifted during CPB due to current management techniques for adults. It is difficult to determine if the amount of oxygen in the vital organs is utilizing is adequate when P50 is left shifted and many cases, flow index is dropped reducing flow distribution and shutting down distal micro circulatory beds. We are making relatively educated guesses that are

**Alison May Lancaster and  
Richard Chan, CCP**

*NSUH-Long Island University-  
Post School of Cardiovascular  
Perfusion, Great Neck, NY*



*Continued on Page 10*

*Continued from Page 9*

confirmed by the fact that the patient wakes up, returns to a functional capacity, and hopefully recovers completely. We do not have such a lackadaisical perspective when it comes to management of CO<sub>2</sub> removal. We closely monitored PCO<sub>2</sub> confidently aware that there is a secondary point of reference, the patient's pH. The effects of pCO<sub>2</sub> outside of a specific normal range are not only well researched, but we can check the effects by the alteration of PH, and again, the effects of PH outside normal parameters are well researched.

Current debate regarding hyperoxia pivots around the contributing free radicals and inflammatory responses of the lungs to hyperoxidative states, versus the benefit of potentially facilitating O<sub>2</sub> transfer via higher partial pressures, and the potential for neuroprotection via reduction of NGME.

The neuroprotective concept of utilizing hyperoxia during cardiopulmonary bypass is based on displacement of NGME. NGME have been known to cause platelet aggregation that ultimately leads to a further inflammatory cascade (5). OGME not only attenuate this complication, but also reduced in size with time and small bubbles will dissolve rapidly. NGME is difficult to defoam, filter, does not dissolve and actually will expand in the blood under certain condition (6). Due to the solubility difference between oxygen and nitrogen, OGME are easier for the micro circulation to absorb. A similar theory is used routinely by applying a CO<sub>2</sub> flood to the field in order to displace nitrogen. This is not practical in the CPB circuit due to hypercapnia. Therefore oxygen would be an alternative choice. NGME have been implicated as one of the major factors in post-operative bleeding due to platelet depletion, and activated leukocytes (7). For this reason, we must optimize our ability of reducing NGME in the CPB circuit.

NGME are implicated in a variety of postoperative complications for patients, although a true causal association has not been established in regards to neurocognitive deficits other than large number of emboli and frank stroke. Despite a lack of definitive conclusion on this matter, it is evident that GME create space occupying lesions, wherever they occur, until they are dissolved. Prior to dissolution, the presence of GME disrupt neural pathways, obstruct synapses, and cognitive function may be impaired if the patient is not able to depend upon neural plasticity to circumvent the barriers. This is suspected in

postoperative patients who have minor memory problems, clumsiness, or temperament changes. The mechanism behind these deficits is entirely different from those of stroke, and are often more difficult to identify. If the offended area of the brain impacted is gray matter, then EEG may be used to identify times of electrical-chemical disruption in signal transduction; however, during CPB, the entire brain is impacted, and often the structures at greatest risk are composed of white matter. Neuromonitoring may identify quantifiable lesions, but cannot provide a definitive association between the images and change in behavior. The consistency of these reportings, particularly in older patients, suggest that some change has transpired, although not identified, that has occurred in the course of the operation

In order to analyze electrochemical changes in the white matter, methods such as microdialysis or depth electrodes may be utilized. This is by no means practical for assessing the CPB patient, but we can derive useful information from studies examining TBIs with these methods. It could be argued that CPB may be a form of qualifying TBI on a small scale that could be preemptively treated with hyperoxia. Depth electrodes have been used in the ICU setting to demonstrate subclinical seizures in patients with TBIs that included white matter involvement. The conclusion to this work indicated early intervention improves neurological outcomes (10). Although depth electrodes will not be used on CPB patients, there is wisdom in the advice that early intervention in white matter dysfunction may be crucial to a full recovery is entirely relevant to the CPB patient. Another study investigating hyperoxia effects on TBI patients found a significant reduction in lactate levels in patients treated with normobaric hyperoxia at an FIO<sub>2</sub> of 1.0. Data collection from microdialysis on the contralaterally affected hemisphere and NIRS were analyzed. In addition to reduced lactate levels, the researchers noted a trend of decreasing glucose, although the results were not significant (3). These results indicated an increase in ATP production and aerobic metabolism (2, 3). The authors did not observe the expected vasoconstriction due to increased PO<sub>2</sub>, which they concluded may be due to mildly elevated PCO<sub>2</sub>, or perhaps the compromised state of cerebral metabolism in the patient population. Both of these points are directly relevant for the CPB patient. The typical argument against high PO<sub>2</sub> is the risk of cerebral ischemia that results from vasoconstriction

and the reduction of cerebral perfusion pressure. This risk is relevant for the intensive care patient, but not for the CPB patient, we have the ability to accommodate cerebral autoregulation by manipulating the pCO<sub>2</sub> on the higher side of a normal range to ensure cerebral vasodilation, while ensuring normal cerebral perfusion pressures by supporting the patient with adequate flow and pressure. These factors combined may yield a more optimistic outcome for the patient both neurologically, and metabolically.

One patient population that may benefit the most from the application of hyperoxia is diabetics. We are already aware of the detrimental effects of SCADs for these patients. The presence of microangiopathy increases the risk of neurocognitive deficit secondarily caused by space occupying lesions. They are also at greater risk for surgical site infections. The risk of SSI have been demonstrated to be significantly reduced with the application of hyperoxia (8) The altered dynamics of SVR and cerebral metabolism may also be counteracted by prudent use of hyperoxia, coupled with attentive manipulation of CPB.

Now, we need to demonstrate that use of 1.0 FIO<sub>2</sub> is not detrimental to the patient. It is known that there is an elevation of TNF alpha, IL 10, IL 6, and complement activation believed to be the result of oxidative stress from free radical that may lead to myocardial injury. The greatest risk identified in the use of hyperoxia is the potential damage to the lungs such as pulmonary capillary permeability. Excessive ventilation in the ICU setting has instigated such conditions, resulting in ARDS symptoms in patients(9) These unstable conditions in the postoperative patient may or may not be related CPB techniques, but are likely exacerbated by hyperoxia applied in the critical care environment. Despite these concerns, some studies have demonstrated an initial instability postoperatively, followed by a marked improved recovery compared to controls.

It is possible that hyperoxia alone may not be an adequate solution for improving NGME reduction and preventing neurological sequelae. All studies examine hyperoxia as an adjunct therapy under normobaric conditions. Post-operative studies examine hyperbaric application of 1.0 FIO<sub>2</sub> without convincing evidence of improving outcomes. A more advanced approach incorporates hyperoxia with hypobaric pressure. Gipson's design decreased pressure

to 0.9 ATM by applying vacuum to the gas outlet of the oxygenator. Swine were placed on CPB for 4 hours using hypobaric oxygenation as a means of "denitrogenating arterial blood" that produced dose-dependent reductions of GME loads at a rate of 80% post-oxygenator, 95% post-arterial filter, and almost 100% at the arterial cannula (1). The most impressive aspect of the results from this study was the analysis of sacrificed neural tissue that indicated decreased microvascular injury. The results in the lab experiment were exceptionally efficient in GME elimination and easily concluded to be NGME. This is an area that certainly warrants further research, which will ultimately lead to clinical trials for patient use.

In conclusion, hyperoxia as an adjunct therapy in CPB may provide neurological protection for the CPB. This is a simple manipulation that is strictly within the control of the perfusionist, and considering the current research, it may be wise to err on the side of caution and support our patients with optimized oxygenation.

### Works Cited

1. Gipson KE *et al.* Elimination of gaseous microemboli from cardiopulmonary bypass using hypobaric oxygenation. *Ann Thorac Surg* 2014; **97**(3): 879-886.
2. Fontes MT *et al.* Arterial hyperoxia during cardiopulmonary bypass and postoperative cognitive dysfunction. *J Cardiothorac Vasc Anesth* 08/2013; DOI: 10.1053/j.jvca.2013.03.034.
3. Tisdall M. Normobaric hyperoxia increases cerebral aerobic metabolism after traumatic brain injury. The National Hospital for Neurology and Neurosurgery, Queen Square, London WC1N 3BG, United Kingdom.
4. Jonas R. The effect of extracorporeal life support on the brain: Cardiopulmonary bypass. *Undersea Biomed Res.* 1989; **16**(6): 453-464.
5. Thorsen T, Lie RT, Holmsen H. Induction of platelet aggregation in vitro by microbubbles of nitrogen. *Thromb Haemost* 1991; **65**(4): 399-402.

*Continued on Page 13*

## Schedule of Presentations for the 2015 AACP Meeting

### Friday, February 6, 2015 (07:45 – 9:30 AM)

IN VITRO ELIMINATION OF GASEOUS MICROEMBOLI UTILIZING HYPOBARIC OXYGENATION IN THE TERUMO® FX15 OXYGENATOR

*Sean Clingan*

GASEOUS MICROEMBOLI ELINIATION IN CURRENT MEMBRANE OXYGENATORS

*Mark Henderson*

CLINICAL EVALUATION OF CONTEMPORARY OXYGENATORS

*Roger Stanzel*

COMPUTER-ASSISTED TRACKING OF STUDENTS' PERFORMANCE DURING CLINICAL ROTATIONS

*Joseph Sistino*

MAXIMIZING THE CLINICAL EXPERIENCE THROUGH CLINICAL INSTRUCTOR AND STUDENT TRAINING

*Alain Lamontagne*

CEREBRAL PROTECTION FOR TOTAL AORTIC ARCH REPLACEMENT, CASE REPORT: AXILLARY ARTERY CANNULATION WITH OPEN ARCH TECHNIQUE AND REVIEW OF CEREBRAL PROTECTION STRATEGIES, HOW WE DO IT

*James Beck*

### Saturday, February 7, 2015 (07:45 – 9:30 AM)

ECMO CANNULATION STRATEGY: WHAT'S NEXT? THE FRIDAY NIGHT SPECIAL

*Allison Weinberg*

A UNIQUE CASE IN WHICH A TWO-TIME BLOOD VOLUME EXCHANGE WAS PERFORMED ON A SEVEN-DAY-OLD MALE ON VENO-VENOUS ECMO: A CASE REPORT

*Michalis Varsamis*

TRANS-DIAPHRAGMATIC ACCESS FOR EMERGENCY CARDIOPULMONARY SUPPORT

*Linda Mongero*

THE OPTIMAL NUMBER TO USE WHEN ESTIMATING PATIENT BLOOD VOLUME FOR CARDIOPULMONARY BYPASS

*Michael Colligan*

PRESSURE DROP AND CALCULATED REYNOLDS NUMBER FOR COMMONLY USED PEDIATRIC CARDIOPULMONARY BYPASS EXTRACORPOREAL TUBING SIZES

*Sebastian Diaz*

CASE REPORT: INACCURATE HEARTMATE II LEFT VENTRICULAR ASSIST DEVICE FLOW IN THE PATIENT WITH EXTENSIVE VENTRICLES REPAIR

*Phat Tran*

## Sunday, February 8, 2015 (08:00 – 10:00 AM)

HEMOLYSIS FROM CARDIOTOMY SUCTION RELATED TO SUCTION TIP DESIGN AND EXPOSURE TO PERICARDIAL FLUID

*Jacob Plafker*

RED BLOOD CELL HEMOLYSIS: IS IT A RISK FACTOR OR A RISK MARKER FOR VENTRICULAR ASSIST DEVICE THROMBOSIS?

*Phat Tran*

HYPEROXIA: THE GOOD, THE BAD & THE UGLY

*Jennifer Arriola*

THI – LEADING THE WAY WITH 1,000+ VADS

*Sanjay Patel*

TRANSMYOCARDIAL REVASCULARIZATION AND THE USE OF SURGICAL AND/OR CELL THERAPY TO REMODEL INFARCTED HEARTS

*Jessika Iwanski*

A SINGLE CENTER'S CONVERSION FROM ROLLER PUMP TO CENTRIFUGAL PUMP TECHNOLOGY IN EXTRA CORPOREAL MEMBRANE OXYGENATION

*Brandon Shade*

CASE REPORT: MANAGEMENT OF A PATIENT WITH CABG X 2, ISCHEMIC VSD REPAIR, AND ABOVE THE KNEE AMPUTATION

*Daniel Starita*

VENTRICULAR ASSIST DEVICE ALLOGRAFT SENSITIZATION: THEN AND NOW

*Ashley Risso*

## The Use of Hyperoxia As The Standard of Practice?

*Continued from Page 11*

6. Butler B. Biophysical aspects of gas bubbles in blood. *Med Instrum* 1985; **19**: 59–62.
7. Butler B, Kurusz M. Embolic Events in *Cardio pulmonary Bypass: Principles and Practice*, GP Gravlee, RF Davis, AH Stammers, RM Ungerleider, eds., 2007, Lippincott, Williams and Wilkins.
8. Qadan M, Akca O, Mahid SS, Hornung CA, Polk HC, Jr. Perioperative supplemental oxygen therapy and surgical site infection: a meta-analysis of randomized controlled trials. *Arch Surg* 2009; **144**: 359-366; discussion 366-367.
9. Jackson RM. Pulmonary oxygen toxicity. *Chest* 1985; **88**: 900-905.
10. Hirsch LJ. Nonconvulsive seizures in traumatic brain injury: What you don't see can hurt you. *Epilepsy Curr* 2008; **8**(4): 97–99.





**PRE-REGISTRATION FORM**  
The 2015 Annual Meeting of  
The American Academy of Cardiovascular Perfusion



<b>MEMBER</b> Registration Fee 2015 Annual Dues Adult Guest to Workshop	<b>FEE</b> \$340.00 \$155.00 \$25.00	<b>Amount</b> _____ _____ _____	<b>FIRESIDE CHAT REGISTRATION</b> (make your first three choices each day)  <b>Thursday Sessions</b> 1) _____ 2) _____ 3) _____  <b>Friday Sessions</b> 1) _____ 2) _____ 3) _____  <b>Saturday Sessions</b> 1) _____ 2) _____ 3) _____  <b>Sunday Sessions</b> 1) _____ 2) _____ 3) _____
<b>NON-MEMBER</b> Registration Fee Adult Guest to Workshop	<b>FEE</b> \$400.00 \$25.00	<b>Amount</b> _____ _____	
<b>STUDENT PERFUSIONIST</b> Registration Fee Adult Guest to Workshop <i>*MUST include a letter from the school director with registration.</i>  <i>**To take advantage of the waived Student fee, you must be a current Student Member of The Academy.</i>	<b>FEE</b> \$30.00* \$25.00	<b>Amount</b> Waived** _____	
<b>FELLOW or SENIOR MEMBER</b> Registration Fee 2015 Annual Dues Guest to Induction Dinner Adult Guest to Workshop	<b>FEE</b> \$400.00 \$180.00 \$100.00 \$25.00	<b>Amount</b> _____ _____ _____ _____	

PRINT OR TYPE

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

HOME PHONE \_\_\_\_\_ WORK PHONE \_\_\_\_\_ FAX \_\_\_\_\_

E-MAIL ADDRESS \_\_\_\_\_ (Required for confirmation)

ANTICIPATED ARRIVAL DATE IN SAN ANTONIO \_\_\_\_\_

**Please read all instructions and information before completing this form.**

If you have questions completing this form, please call the national office. Hotel Reservations must be made separately through the hotel directly.

Total Amount of Payment \$ \_\_\_\_\_ METHOD OF PAYMENT: Check\*\* \_\_\_ Money Order \_\_\_ Credit Card \_\_\_

VISA/MasterCard # \_\_\_\_\_ Exp. Date \_\_\_\_\_ 3-digit security code \_\_\_\_\_

*Credit card billing address if different from above.*

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Signature \_\_\_\_\_

**\*\* There will be a \$25.00 service charge for any check returned for insufficient funds.**

## INSTRUCTIONS and INFORMATION

o Complete each appropriate section of this form by printing or typing.

This form may be copied, but must include both pages.

o Members must pay their 2015 Annual Dues along with their registration fees by completing that portion of the form.

o You will receive acknowledgment of your pre-registration by January 15, 2015--bring it with you to the meeting.

o No pre-registration will be processed after January 9, 2015.

-- **After this date you must register at the meeting.**

o Your receipt and meeting credentials will be available for you at the Pre-Registration desk at the meeting.

o There will be **NO ADMISSION to any Fireside Chat without proper admission credentials.**

o If you are joining The Academy with your registration you must:

1) complete appropriate areas of the form;

2) you **MUST INCLUDE** the membership application form;

3) include the \$25 filing fee;

4) include \$155 for the 2015 Annual Dues;

(Your membership begins with the closing business meeting)

o ONLY VISA/MasterCard credit cards are accepted - with VISA/MasterCard you may FAX your registration to (717) 867-1485

o The AACP Federal Tax ID Number: 63-0776991 (for hospital use only)

o Refund policy: Anyone that is pre-registered for this meeting and is unable to attend will receive a full refund minus \$50.00 for handling, mailing, and processing upon written request before January 12, 2015.

o **Make checks payable to AACP (US dollars). Mail completed pre-registration form and check to:**

**AACP  
515A East Main Street  
Annville, PA 17003**

**IF YOU HAVE QUESTIONS FILLING OUT THIS FORM, PLEASE CONTACT THE NATIONAL OFFICE (717) 867-1485.**

o If paying by VISA/MasterCard you may FAX this form to (717) 867-1485 or mail to above address.

# **THE ACADEMY TO OFFER LIVE WEBCAST**

**For the first time, the American Academy of Cardiovascular Perfusion will be offering a live webcast of our 2015 Annual Meeting in San Antonio. The General Sessions of the meeting will be broadcast in high quality streaming video. There will also be an opportunity for attendees to ask questions, thus qualifying for Category I CEUs from the American Board of Cardiovascular Perfusion.**

**More information along with registration details are available on our website ([www.TheAACP.com](http://www.TheAACP.com)).**



## ***Our Host Hotel***



### **The Omni La Mansión del Rio Hotel**

112 College Street  
San Antonio, Texas 78205

\$184.00 Single/Double Occupancy  
Reservations: 800-THE-OMNI

*Please mention that you will be attending the Annual Conference of The American Academy of Cardiovascular Perfusion when making your reservations.*



The Omni La Mansión del Rio is ideally nestled along the historic River Walk among the banks of the Paseo del Rio in downtown San Antonio, where it is perfectly situated for any visitor seeking to explore all of San Antonio's extensive range of tourist attractions. It is within easy walking distance of the fabled Alamo, El Mercado, La Villita District, Spanish Governors Palace, San Antonio Convention Center and other well-known landmarks.



Blending Spanish colonial architecture and European style, the four-diamond Omni La Mansión del Rio surrounds guests with the romance, grace and charm of a grand hacienda. Our San Antonio River Walk accommodations provide a haven for guests with graceful service and tranquil surroundings. Built on three levels that descend to San Antonio's festive River Walk, the Las Canarias Restaurant offers a romantic atmosphere of graceful palms, flowing waters and scenic views. This luxury San Antonio hotel located on the San Antonio River Walk, was recognized in the Celebrated Living's Magazine as one of the top hotels in the Nation.



## Contact Information for Our Sponsoring Partners

### COVIDIEN

Phone: 303-305-2370  
Fax: 303-305-2865  
Website: [www.covidien.com](http://www.covidien.com)

### MAQUET MEDICAL SYSTEMS, USA

Phone: 888-627-8383  
Website: [www.maquet.com](http://www.maquet.com)

### MEDTRONIC PERFUSION SYSTEMS

Phone: 763-391-9000  
Websites: [www.medtronic.com](http://www.medtronic.com)  
[www.perfusionsystems.com](http://www.perfusionsystems.com)

### NONIN MEDICAL INC.

Phone: 763-553-9968  
Fax: 763-553-0363  
Website: [www.nonin.com](http://www.nonin.com)

### QUEST MEDICAL, INC.

Phone: 800-627-0226 or 972-390-9800  
Fax: 972-390-2881  
Website: [www.questmedical.com](http://www.questmedical.com)

### rEVO BIOLOGICS

Phone: 508-620-9700  
Fax: 508-370-3797  
Website: [www.revobiologics.com](http://www.revobiologics.com)

### SORIN GROUP USA, INC.

Phone: 800-221-7943 or 303-467-6517  
Fax: 303-467-6375  
Website: [www.soringroup.com](http://www.soringroup.com)

### SPECTRUM MEDICAL, INC.

Phone: 800-265-2331  
Fax: 803-802-1455  
Website: [www.spectrummedical.com](http://www.spectrummedical.com)

### TERUMO CARDIOVASCULAR SYSTEMS

Phone: 734-663-4145 or 800-521-2818  
Fax: 734-663-7981  
Website: [terumo-cvs.com](http://terumo-cvs.com)

### THORATEC CORPORATION

Phone: 800-456-1477  
Fax: 925-847-8514  
Website: [www.thoratec.com](http://www.thoratec.com)

### XVIVO PERFUSION INC

Phone: 303-395-9171  
Website: [www.xvivoperfusion.com](http://www.xvivoperfusion.com)

## Important Academy Dates

### 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*

#### CALL FOR ABSTRACTS

#### **16th European Congress on Extracorporeal Circulation Technology**

International Convention & Events Centre ICE  
Krakow, Poland  
June 10 – 13, 2015

Sponsored by the Foundation European Congress on Extracorporeal Circulation Technology (FECECT)

*Abstract deadline: 12 January 2015*

Website: <http://www.fecect.org>

Phone: +31 10 452 70 04

Email: [office@fecect.org](mailto:office@fecect.org)

**THE ACADEMY WISHES YOU  
AND YOURS A  
SAFE AND HAPPY  
HOLIDAY SEASON !!!**