

THE AMERICAN ACADEMY
OF
CARDIOVASCULAR PERFUSION
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Fall 2019



The Academy Newsletter

STEPPING UP YOUR GAME!

Pioneers in Perfusion: Those Who Inspire



An inspirational soul... driven, dedicated, empathic, educator, spiritual, outspoken advocate, always “dressed to the nines”. This is how co-workers and friends describe Betty Stephens!

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Betty was born in Tyler, Texas in 1935. At the age of 18, she moved to Portland, OR where she lived with her aunt and uncle and helped take care of their children while putting herself through school.

She spend most of career working at Oregon Health & Science University (OHSU), formerly known as the University of Oregon Medical School (UOMS). In 1958, Dr. Albert Starr asked Betty to manage his cardiovascular research laboratory. During this time she also worked as a scrub nurse for the open heart surgery program at UOMS. Betty's contributions in the research lab was instrumental in the development of the first Starr-Edwards mitral prosthetic caged ball valve, which was successfully implanted in a human patient on August 25, 1960. In fact, the stories of Betty hand-sewing the sewing ring to valves after scrubbing in with the patient on the operating room table are true!



"[Albert Starr's research team](#)", published in the [OHSU Historical Image Collection](#), is licensed under [CC-BY 4.0](#) circa 1958, from left to right, top to bottom:

Dr. Alfred Lui, Dr. Fernando Leon, Dr. Albert Starr, Dr. David Blumen, Mary Ellen O'Reilly, **Betty Stephens**, Dr. Colin McCord, Gary Wiss, "Blacky", and Otto Hintz

Betty received her perfusion on-the-job training (OJT) at the UOMS in Portland, OR during 1960 - 1963 and was later certified by AmSECT, July 16, 1973. Betty was both the first female and the first African American, Chief of Perfusion in Oregon. It is likely that she was also the first female African American Chief of Perfusion of a major cardiac surgery program in the US. This was no small feat as this was still a very turbulent time in US history. De facto segregation still existed despite segregation being outlawed by the Civil Rights Act of 1964, the Voting Rights Act of 1965, and the Fair Housing Act of 1968. Betty retired in early 2000 after devoting over 43 years of service to OHSU, first as a scrub nurse, and later as an OJT trained perfusionist. Betty felt as if she had a unique perspective of cardiac surgery as both a perfusionist and as a mother of two children requiring repair of an atrial septal defect. In fact her oldest daughter was the 2000th open heart surgery performed by Dr. Starr!

Betty lost her CCP certification effective January 2003, three years after her retirement. Unfortunate-

ly, her contact information was lost to the board and she failed to receive her letter offering CCP Emeritus status. With the help of many, I was recently able to track down Betty's current address and connect with her. During my visit with her, she relayed many great stories from her pioneering days. I asked if she ever felt discriminated against because of the color of her skin or gender. She emphatically said "no", because she stood up for herself and demanded respect. If she was going to scrub for a surgeon known to raise his voice and cuss, she would tell him or her: "If you want me to scrub for you, please do not swear or scream at me. If you do, I'm going to walk right out of this room! I will not stand here and take that from anyone." "Of course I would not do this if there was a patient on the table because I had too much respect for those patients". Betty's courage is innate. She feels strongly that we have an obligation and a duty to stand up not only for ourselves, but for those who can't fight for themselves. She was a patient and enthusiastic teacher to many nurses and perfusionists during her career, working side by side with the late Jeri Dobbs, a colleague and close personal friend.

Betty was very committed to women empowerment in her personal life. She has been a champion and advocate for African American women in her community. She volunteered with the National Council for Negro Women to help female inmates reintegrate into society. She helped educate young African American teenagers on the importance of "social graces" and proper manners. Growing up in the south, it was the church that played this role for Betty, and as such, it was important to her to pay it forward and mentor others.

When asked what advice she would give to new perfusionists entering the field, her response was "Appreciate what you know and don't know yet. Don't ever think that you're the best. Always continue to learn and pay attention to even the smallest of details and admit to your mistakes. Know that you don't know it all yet, but be confident in what you do know". Betty would like her legacy to be: "Give all you can give; spread as much joy and hope that you possibly can. After that, nothing else really matters. Do not pass anyone by without saying hello. If someone doesn't have a smile on their face and appears to be down, ask them how you can help. Help lift them up. Help them climb the top of the ladder. All it can take is just one kind word or phrase to make a difference in someone's life".

I am happy to say that Betty was finally presented with her long overdue CCP Emeritus Certificate in Sept 2019! So in keeping up with this year's theme of "STEPPING UP YOUR GAME", reach out to someone in need. How can you best help? I challenge you to be that mentor or person who inspires someone else!

Carmen Giacomuzzi,
President AACP

Want to learn more on how you can help? Check out our recruitment flier on the next page!

AACP SEES YOUR VALUE!

Every Perfusionist is valuable and we want to hear from
YOU!

Not big on public speaking? No problem! There are MANY opportunities to fit your level of commitment for both associate and fellow members:

- ♥ Committee members: Fireside Chat, Social Media, Program Planning, Membership, Student Liaison, Awards/Manuscript/epublications, & Sponsor's
- ♥ We aim to give you what you want from a meeting. Let your voice be HEARD! Help us deliver by brainstorming ideas for future meetings.

We are always looking for presenters to keep all levels of experience represented!

- ♥ Do you want to present but don't feel quite comfortable? Let us team you up with one of our veterans to help you cross the threshold!

Benefits:

- ♥ Networking with experienced perfusionists
- ♥ Build your Resume
- ♥ Gain knowledge and experience
- ♥ Volunteering is good for your health! (Really!)



*Interested? Contact giacomuz@ohsu.edu
or office@theaacp.com*

Feeling social? Check us out on Facebook
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and Instagram

[https://www.instagram.com/explore/tags/americanacademyofcardiovascular
perfusion](https://www.instagram.com/explore/tags/americanacademyofcardiovascularperfusion)

Authored by Ashleigh LeBlanc, associate member



"Inside Perfusion" **Webinar Series**

Wednesday May 8, 2019
7PM to 8:15PM EST

"Adult ECMO Patient Management"

Desiree Bonadonna, MPS CCP FPP
Associate Chief, Perfusion Services
ECLS Program
Duke University Medical Center

Wednesday September 18, 2019
7PM to 8:15PM EST

"Strategies to Minimize Acute Kidney Injury During Cardiopulmonary Bypass"

Robert A Baker, PhD, CCP(Aus), Professor
Director Quality and Outcomes,
Director of Perfusion,
Cardiac and Thoracic Surgery Unit,
Flinders Medical Centre and Flinders University
Australia

DECEMBER WEBINAR
COMING SOON!

In the meantime, be sure to download the new
InvoSurg App featuring a DO₂ calculator



NIFEDIPINE MECHANISM OF ACTION AND USES FOR CARDIOVASCULAR THERAPY

With the steady rise of global hypertension, medicine to manage blood pressure has never been more in demand [1]. Hypertension has been known to be a significant contributor to cardiovascular events and kidney disease when left untreated. Nifedipine, an exclusively L-type calcium channel blocker, decreases hypertension by dilating cardiovascular arteries, thus increasing myocardial oxygen supply and decreasing resistance to blood flow within the vascular system [2].

Calcium channel blockers are one of the most important initial monotherapy agents to help control hypertension due to their quick onset [2]. They perform this by directly binding to the α_1 subunit of the voltage-gated calcium channel protein embedded in the endothelial membrane. Once bound, calcium is unable to enter the smooth muscle tissue and the formation of myosin-actin bridges for muscle contraction is inhibited [3]. The structure of nifedipine is based on a pyridine ring, a heterocyclic compound of five carbons and one nitrogen. Other calcium channel blockers with a similar structure are categorized under the dihydropyridines family, which includes nimodipine and nisoldipine [3].

There are two types of voltage-gated calcium channels located within the cardiovascular system, T-types and L-types. T-type calcium channels are transient, low-voltage activated channels that are primarily utilized in the sinoatrial node, atrioventricular nodes and the Purkinje fibers of the heart [4]. These channels regulate the contraction speed of cardiac myocytes during the cardiac cycle. L-type calcium channels are long lasting, high-voltage activated channels that reside in arterial smooth muscle, particularly coronary arteries, in the vascular system. Nifedipine almost exclusively blocks L-type calcium channels in the arteries [2] due to it having a 10-fold more potent binding ability on L-type channels than T-type channels [3]. This allows nifedipine to greatly affect the vascular system while providing little interference to cardiac function. L-type calcium channels have four classes based on their specific subunits; Cav1.1, Cav1.2, Cav1.3, Cav1.4. Only dihydropyridine-sensitive Cav1.2 subunit are expressed in high concentration in the cardiovascular system [5]. Cav1.2 class can be further spliced into two different isoforms. Cav1.2a corresponds to the calcium channels contained in the cardiac muscles and Cav1.2b corresponds to the smooth muscle calcium channels contained in the arterial vessels [3]. Due to the low concentration of Cav1.2a in the heart and high concentration of Cav1.2b in the arterial vessels, nifedipine has a much more potent effect on the arterial smooth muscle.

The therapeutic benefits of nifedipine stems from its ability to selectively dilate coronary and afferent arterial vessels. By decreasing systolic blood pressure via vasodilation, a decrease in afterload (resistance) pressure lowers the force needed to be exerted by the left ventricle [1].

Mark Scullion

Milwaukee School of
Engineering

Master's Program of
Cardiovascular Perfusion

Milwaukee, WI



With the decrease in ventricle exertion, nifedipine has also been utilized as a angina pectoris therapy due to the decreased myocardium oxygen consumption of the left ventricle [4]. Patients with hypertension have shown a significant decrease in blood pressure than patients that were non-hypertensive patients when given 10mg of nifedipine orally[1].

Although nifedipine has been shown to be efficient at managing blood pressure, there are some drawbacks. Nifedipine effectiveness is only for a short period of time. Although recent nifedipine formulas have enabled nifedipine to be utilized for long-term blood pressure management [1], other antihypertensive drugs, such as ACE inhibitors and diuretics, are typically also prescribed along with the calcium channel blocker for more effective long-term management [2]. Also, due to the quick vasodilation and increased sympathetic tone, indirect cardio-stimulation occurs which could result in tachycardia-induced heart failure [2]. In addition, nifedipine trait of binding primarily to L-type channels in afferent arteries results in an elevated glomerular pressure and damage to the kidneys [2]. With continuous nifedipine usage, other side effects include predominant hypotension, cardiodepression and lower extremity edema [4].

Nifedipine is a strong, short-term arterial vasodilator for the cardiovascular system. Its specificity in targeting only L-type Cav1.2 channels in arterial smooth muscles is beneficial by not affect other processes that utilize calcium channels in the cardiovascular system. However, it is not an infallible antihypertensive drug. Its powerful, short-term effects can strain kidney function after prolong usage. Nifedipine is commonly used for first line of defense when lowering blood pressure quickly, but other antihypertensive drugs have been shown to be much more effective for long-term blood pressure management [4].

References

- Snider, Morgan E., Nuzum, Donald S., Veverka Angie. "Long-acting nifedipine in the management of the hypertensive patient." *Vascular Health and Risk Management*. Volume 4, No. 6, pp. 1249-1257. Published 04 December 2008. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2663456/>
- Wang, Angela L., Iadecola, Costantino, Wang, Gang. "New generations of dihydropyridines for treatment of hypertension." *Journal of Geriatric Cardiology*. Volume 14, No. 1, pp. 67-72. Published January 2017. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5329735/>
- Godfraind, Théophile. "Discovery and Development of Calcium Channel Blockers." *Frontiers in Pharmacology*. Volume 8, No. 286. Published 29 May 2017. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5447095>
- Bodi, Ilona, Mikala, Gabor, Koch, Sheryl E., Akhter, Shahab A., Schwartz, Arnold. "The L-type calcium channel in the heart: the beat goes on." *The Journal of Clinical Investigation*. Volume 115, No. 12, pp. 3306-3317. Published 01 December 2005. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1297268/>
- Striessnig, Jörg, Ortner, Nadine J., Pinggera, Alexandra. "Pharmacology of L-type Calcium Channels: Novel Drugs for Old Targets?" *Current Molecular Pharmacology*. Volume 8, No. 2, pp. 110-122. Published August 2015. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5384371/>

AACP Social Media: Part 2: Instagram

Authored by Alex Gum and Molly Bryant

Social media provide perfusionists with incredible opportunities to share, connect, and learn from one another. While meetings and other events give us the chance to share new research and best practices, social media can serve to bridge the gaps between the times we are able to meet face-to-face. Whether we're looking for new techniques, wanting to see what the last meeting was like, or we're just curious about the latest goings-on, social media supply us with a multitude of ways to connect with other perfusionists and organizations.

The three largest social media companies today are Facebook, a full-featured desktop and mobile platform, Instagram, a mobile photo/video-sharing platform, and Twitter, a mobile text/link-sharing platform. This article will focus on Instagram, stay tuned for Part 3 to learn about Twitter! (Facebook was featured in the Summer 2019 AACP Newsletter.)

Instagram



What it's good for

Instagram is a primarily mobile platform that allows you to communicate with others and share photos/videos.

How to sign up

Start the sign-up process by downloading the app onto your mobile device.

Once the app is downloaded and installed, open it.

Depending on your phone's OS, tap either "Sign Up with Email or Phone Number" or "Create New Account".

Enter your email/phone number, and choose a username and password. User names are unique to each user.

Complete profile information and click "Done".

How to engage

Instagram engagement stems largely from posting to your own feed and following others, whether they are individuals or groups. Using hashtags in your posts can help others find you and your content. Searching by keywords can uncover fascinating accounts and help you connect with others in the field of heart surgery. As you use the app, it will get a better idea of what new content to highlight for you in the "explore" tab in the app, making the process even easier.

Hashtags/Tagging

Hashtags serve to organize social media posts. If you tap a hashtag on an Instagram post ("#perfusion" or "#AACP", for example), you will be taken to a screen featuring every post on Instagram that shares that hashtag. Using hashtags in your own posts allows others to more easily access your content. In a small profession like ours, searching by hashtag can reveal new ideas and old friends.

All social media platforms have a way of mentioning another person in a post or comment that notifies them that they've been mentioned - this is known as tagging. Tagging someone in a comment on a social media post serves as a shorthand way of sharing the content with them, especially handy if you are on the move. Tagging is done by typing the "@" symbol followed by someone's username - they will receive a notification that will take them to the post or comment they've been tagged in.

Engaging with the Academy can be as simple as making a post using meeting-related hashtags or tagging attendees in photos from the meeting. Just because the meeting hasn't started yet doesn't mean you can't start doing this now! Instagram is a fast way to

Continued on Page 10

share a memory of a past meetings or share meeting-related content year-round.

Professional Use of Social Media

Working in a medical field often puts us at odds with the main purpose of social media. In general, hospitals craft social media policies to provide employees with a clear understanding of what they can and cannot share - these policies vary among institutions. Some common rules include:

- No HIPAA violations
 - ◊ Posting any kind of information that in any way can be used to identify a patient constitutes a HIPAA violation. This information can be as cursory as a conversation picked up by your phone microphone while you film a short video of the pump.
- No misrepresenting yourself or your organization
 - ◊ When sharing on social media, it can be prudent to make clear that what you share is your own opinion, and does not reflect on your institution in any way. Furthermore, take care to disclose your connection to the organization when discussing where you work and what you do - misrepresentation of what you do can reflect poorly on you and your institution/organization.
- Don't speculate
 - ◊ As a person associated with a hospital, professional organization, and perfusionists everywhere, using social media to engage in speculation or furthering rumors can have unpredictable and often negative effects on you and your associates.

This article is Part 2 of a three article series composed by the AACP Social Media Committee.

THE ACADEMY TO OFFER LIVE WEBCAST

The American Academy of Cardiovascular Perfusion will again be offering a live webcast of our 2020 Annual Meeting in Reno, Nevada. The General Sessions of the meeting and one Fireside Chat each day 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.

DELIVERING MEANINGFUL INNOVATION

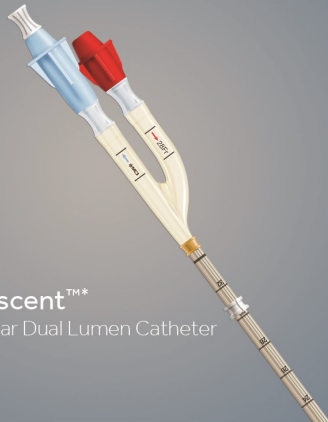
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[†]Bench and animal data on file at MC3 (200769), 21CFR870.4100.
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Medtronic

41st Annual Seminar of The American Academy of Cardiovascular Perfusion

Grand Sierra Resort
2500 East Second Street
Reno, Nevada
February 5-8, 2020

(Tentative Program)

Wednesday, February 5, 2020

9:00 AM – 2:00 PM	REGISTRATION
3:30 PM - 4:00 PM	Opening Business Meeting <i>Fellow, Member, Senior and Honorary Members</i>
4:00 PM – 7:00 PM	Manufacturers' Breakout Rooms

Thursday, February 6, 2020

7:00 AM	REGISTRATION
7:00 AM – 8:00 AM	Video Presentations
8:00 AM – 09:30 AM	Scientific Paper Session
9:30- AM – 11:30 AM	Fireside Chats <i>Clinical Instructor Session</i> <i>ECMO: Starting, Maintaining and Growing a Program (Webcast also)</i> <i>Perfusion Accidents</i> <i>Pump Off: Making the Most of the Last Five Years</i> <i>Student Forum Only</i>
11:30AM - 1:00PM	Lunch (Historical Videos)
1:00 PM – 3:00 PM	Special Scientific Panel Session Hot Topics and Current Trends <i>Moderators: Edward Delaney, TBA</i> <i>Double Lung Transplants: TBA</i> <i>Terumo/Sarns Fellowship Experience: Ashleigh LeBlanc</i> <i>Vasoplegia: Ryan Kleinman</i> <i>Transmedics: TBA</i> <i>Quantum QA/QI Initiatives/Best Practices: TBA</i> Panel Q&A
3:00 PM – 3:30PM	Break

3:30PM – 5:30PM

Special Scientific Panel Session

Extracorporeal Life Support

Moderators: Allison Weinberg, Desiree Bonadonna

Neonatal Pumpless Transport: *TBD*

EROCA Trial / ECPR: *Sage Whitmore, MD*

Simulation Model for ECMO: *Sage Whitmore, MD*

Venting the LV: *TBA*

Cleaning Out the Arterial Cannulas: *Kevin Charette*

06:00PM

Sponsor's Hands-On Workshop & Reception

Friday, February 7, 2020

7:00 AM

REGISTRATION

7:00 AM – 8:00 AM

Video Presentations

8:00 AM – 9:30 AM

Scientific Paper Session

9:30- AM – 11:30 AM

Fireside Chats

Blood Conservation and Transfusion Triggers (Webcast also)

Dealing with Stress, Finding Work/Life Balance, Team Building and Communication

ECMO Scenarios

Myocardial Preservation

Pediatrics

Pump On: The First Five Years

11:30AM - 1:00PM

Lunch (Historical Videos)

1:00 PM – 3:00 PM

Special Scientific Panel Session

Heart Matters: Life Beyond the Pump Run

Moderators: Carmen Giacomuzzi, William Riley

Motivational Speaker: Craig Cunningham

The Heart of the Matter: A parent's perspective on raising a child with HLHS: *Aimee Mooney, OT, Assistant Professor*

How to Create a Healthy Giving Environment for Patients and the Professionals Who Care For Them: *Ross Ungerleider, MD*

Creating Change Instead of Resistance: Conflict Management and Negotiations: *Jamie Dickey Ungerleider, PhD*

Panel Q & A

3:00 PM – 3:30PM

Break

3:30 PM – 5:30 PM

Memorial Session

Charles C. Reed Memorial Lecture (*Ross Ungerleider, MD*)

Thomas G. Wharton Memorial Lecture (*Carmen Giacomuzzi, CCP*)

6:30 PM

Induction Dinner

All Attendees and Guests

Saturday, February 8, 2020

7:00 AM

REGISTRATION

7:00 AM – 8:00 AM

Video Presentations

8:00 AM – 9:30 AM

Scientific Paper Session

9:30 AM – 10:00 AM

Break

10:00 AM – 11:30 AM

Special Scientific Panel Session

Industry Partners: “Past, Present, and Future”

Moderators: TBA

InvoSurg

LivaNova

Medtronic

Spectrum Medical

Terumo

Panel Q&A

11:30 AM – 1:00 PM

Lunch (Historical Videos)

1:00 PM – 3:30 PM

Special Scientific Panel Session

Complex Congenital Heart Surgery

Moderators: Tami Rosenthal, Kevin Charette

Clampless Cardioplegia: *Thomas Klein*

Case Report; Gunshot to the Heart: *D. Brad Sanders*

Circuit Miniaturization; Is it Worth the Effort: *D. Scott Lawson*

Cord Blood: Possibilities and Challenges: *Bharat Datt*

Antifibrinolytics for Pediatrics: *Isaac Chinnappan*

Panel Q & A

3:30 PM – 5:30 PM

Fireside Chats

Evolving Scope of Practice: Past, Present and Future

Low Fidelity Simulation: Buckets, Hoses and Duct Tape: Make the Most of What You've Got

Pediatrics (Webcast also)

Taking the Show on the Road: Transporting VADs and ECMO

Using EMRs, Apps and New Technology to Improve Patient Safety and Standards of Care

5:30 PM

Closing Business Meeting

Fellow, Senior and Honorary Members Only



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The Quantum Smart Occluder is a revolutionary new approach to the management of the perfusion circuit. Using high precision closed loop flow control it allows for sophisticated management under a variety of conditions:

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- Backflow prevention
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INCREASED INCIDENCE OF INFECTIVE ENDOCARDITIS RELATED TO THE OPIOID EPIDEMIC

Introduction

Infective endocarditis (IE) is a life-threatening bacterial infection affecting the cardiac valves. There are several origins of the disease, such as aging and predisposing cardiac lesions, however, an increasing amount of infective endocarditis is attributed to injection of illicit drugs [1,2]. In this paper, the correlation between the rising opioid epidemic and the increasing incidences of intravenous drug user infective endocarditis (IDU-IE) will be discussed.

Infective Endocarditis Pathogenesis

Pathogenesis of infective endocarditis is caused by bacteria entering the bloodstream at the site of injection and adhering to damaged valvular endothelium [2]. The bacteria then colonizes, causing vegetation and infection of the valve (See Figure 1) [2]. The bacteria most attributed to infective endocarditis is *Staphylococcus aureus*, accounting for 15-40% of all IE, and the majority of intravenous drug user associated infective endocarditis. Additionally, in IE resulting from intravenous drug use, it is hypothesized that solid particles are injected within the drugs, and thus cause further

endothelial injury [2]. Further, the more unhygienic the injection site is, the more likely additional bacteria is to enter the blood stream. Infective endocarditis is associated with organ failure, prolonged hospitalizations, high costs and death in about a quarter of all IE patients [3].



Alyssa Ruman

MSOE Masters of
Cardiovascular Perfusion
Program

Milwaukee, WI

Class of 2020

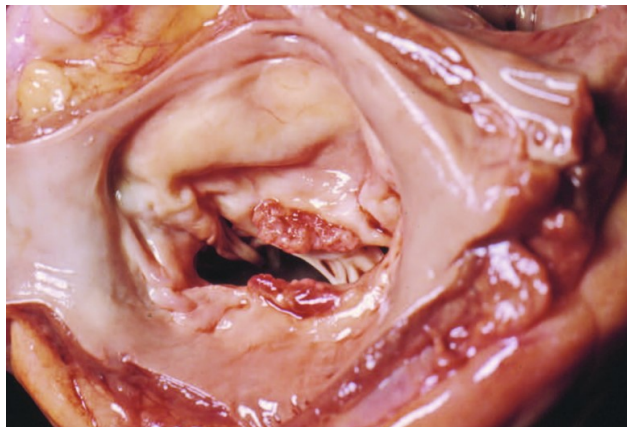


Figure 1. Native mitral valve affected by infective endocarditis resulting in vegetation on both leaflets [4].

Opioid Epidemic

Over the past two decades, the United States has seen a sharp increase in the amount of prescription and illicit opioid abuse, resulting in an increase of intravenous drug user infective endocarditis, overdoses, and even deaths. More than 4% of the adult American population, which equals more than 10 million Americans, misuses prescription opioids. Paired with illicit opioid use, the number

of opioid overdose deaths can be used as a measure of tracking the opioid epidemic (Figure 2) [5].

The opioid epidemic has been attributed to two seemingly unrelated events that occurred in the 1990's: the recognition of pain as the fifth vital sign and the approval of the sustained-release formulation of Oxycodone (OxyContin®) [6]. The American Pain Society introduced pain as the fifth vital sign, which was quickly embraced by both the Veterans Health Administration and the Joint Commission on Accreditation of Healthcare Organizations in 2000 [6]. Although the efforts of these organizations were one of well-intention, intended to stress a patients right to assessment and management of pain, it resulted in the abundance of prescriptions of opioids to chronic pain patients [6]. In 1996, the sustained-release formulation of Oxycodone (OxyContin®) was approved and hit the market, earning \$48 million in sales the first year and rising to \$3.1 billion in 2010 [6]. The establishment of pain as the fifth vital sign drastically increased the prescription of the highly addictive opioid and between 1997 and 2002, OxyContin prescriptions increased 10-fold [6]. Patients who subsequently developed an opioid-tolerance then began crushing and snorting or injecting the drug to result in a more rapid response from the medication [6]. However, with the reformulation of OxyContin, in efforts to decrease the addictiveness, and the increased difficulty for physicians to prescribe the medication, addicted individuals have started to turn to heroin, a more readily available and cheaper option that activates the same receptors (mu receptors) and produces the same desired effect [6].

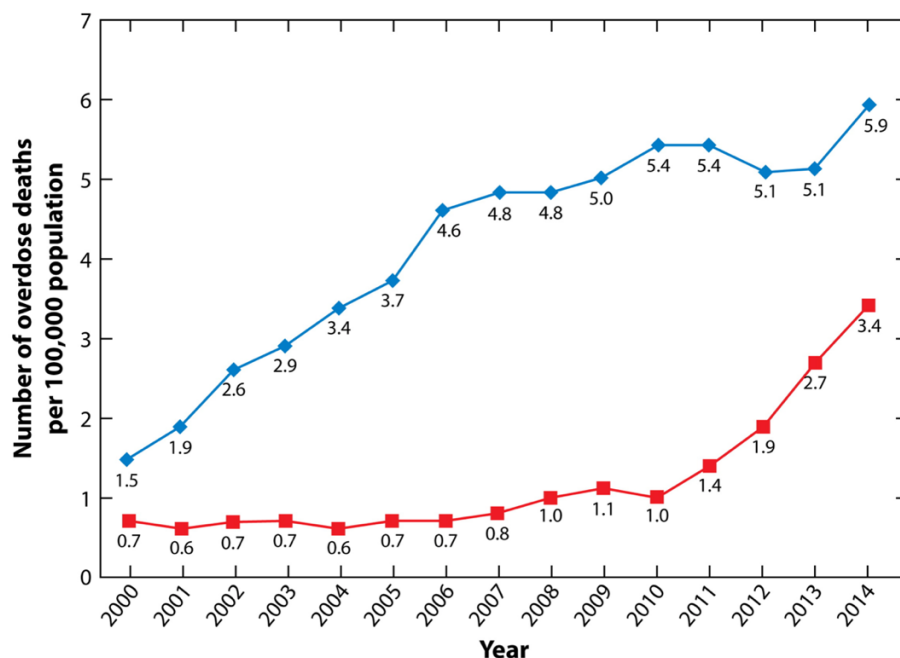


Figure 2. Rate of prescription opioid (blue triangles) and heroin (red squares) overdose deaths in the United States from 2000-2014 [6].

Infective Endocarditis and IV Drug Use

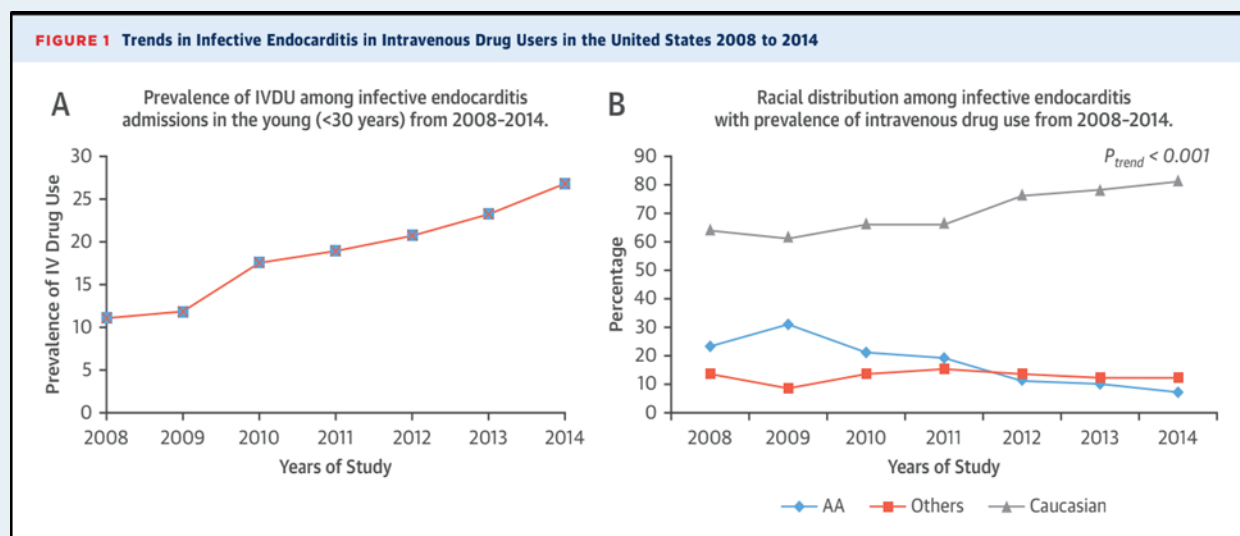
In North Carolina, Asher J Schranz, MD and his colleagues performed an analysis of North Carolina's hospital discharge database from 2007 to 2017 to determine statewide trends for drug use associated infective endocarditis (DUA-IE) hospitalizations [6]. The researchers determined that out of 22,825 infective endocarditis patients, who were 18 or older, 11% (n=2,602) were DUA-IE patients [6]. Additionally, out of those hospitalized for IE, 1,655 of them require valve surgery and 17% of

Continued on Page 18

those requiring valve surgery were DUA-IE patients [6]. Over the period studied, Dr. Schranz and his colleagues found a 12-fold annual increase in DUA-IE hospitalizations from 0.92 to 10.95 per 100,000 persons [6]. Moreover, there was a 13-fold annual increase in DUA-IE patients requiring valve surgery from 0.1 to 1.38 per 100,000 persons [6]. These increases were not observed in patients with infective endocarditis that did not stem from intravenous drug use [6].

Salil V. Deo, MD and colleagues performed a different study analyzing admissions for infective endocarditis from the National Inpatient Sample (NIS) database from 2008 to 2014 [7]. Admission for IE increased from 33,073 (2008) to 39,805 (2014) [7]. Prevalence of drug user associated infective endocarditis increased from $4.3 \pm 0.4\%$ in 2008 to $10.0 \pm 0.3\%$ in 2014 ($p < 0.1$) [7]. Figure 3 summarizes the breakdown of the DUA-IE patient demographics, including the significant difference between races and ages regarding the admitted drug user associated infective endocarditis. Overall, Deo et al. concluded that DUA-IE hospital admissions have doubled in the last few years in the United States. They also concluded that the increased admission, coupled with the high post-operative morbidity and increased resource utilization on these patients, represents a growing health care crisis; one that needs to be addressed at the source before it becomes an epidemic itself.

Figure 3. Infective Endocarditis in Intravenous Drug Users in the United States from 2008 to 2014. (A) For young adults admitted for infective endocarditis, the prevalence of DUA-IE increased significantly during the period studied (from 11% to 27% ($p < 0.001$)). (B) The proportion of Caucasian patients admitted for DUA-IE increased significantly during the study period (from 63% to 73%, $p < 0.001$).



Mechanisms for Dealing with Opioid Abusers

Both of these studies indicate a large increase of drug user associated infective endocarditis in the recent few years. This can be directly correlated with the opioid epidemic that has been occurring since the early 2000's. Multiple controversial solutions to decrease the incidence of infective endocarditis, overdoses, and deaths have been proposed and put into place, such as supervised injection sites, medication-assisted therapies, and Naloxone distribution.

The idea behind supervised injection sites is to supply the drug user with clean needles and supplies to prepare and inject their drugs, while simultaneously having staff nearby to prevent overdoses and offer information about drug treatment and other services. Studies have suggested that safe injection sites are associated with lower overdose mortality (88 fewer overdose deaths per

100,000 person-years), 67% less ambulance calls for treating overdoses, and a decrease in HIV infections [8].

There are several different medication-assisted therapies such as Methadone, and Buprenorphine therapy. Methadone is a full agonist to heroin, meaning that it continues to produce effects on the mu receptors until they are fully saturated, or the maximum effect has been achieved [9]. Buprenorphine, on the other hand, is a partial agonist and does not activate the mu receptors to the same extent as methadone [9]. Its effects increase until a plateau is reached. Methadone has a long half-life of about 8 to 59 hours, Buprenorphine has a half-life of 24 to 60 hours, while heroin has a very short half-life [9]. Medication-assisted therapies are extremely controversial in the sense that one opioid is just being replaced with another, however, for patients who are dependent on prescription opioids, studies have shown that this long-term therapy decreases prescription opioid use and causes better adherence to medication and psychological therapies than opioid tapering or psychological therapy alone [10].

Naloxone is a potent opioid mu receptor antagonist that is FDA approved for emergency treatment of both known and suspected opioid overdoses with respiratory and/or central nervous system depression [11]. Distribution of naloxone paired with education of individuals exposed to opioid use can significantly decrease opioid overdose deaths. A study involving 19 Massachusetts communities found that opioid overdoses were decreased significantly in communities where opioid education and naloxone distribution were implemented [12].

Conclusion

Infective endocarditis is a serious life-threatening condition and its incidences have significantly increased over the past few years in correlation to the rising opioid epidemic. In order to prevent a health care epidemic, society must address the problem at its source and create more resources for individuals who have an opioid abuse problem. Furthermore, the healthcare system must try and prevent any more individuals from becoming addicted to opioid prescription medications by reducing the amounts that they are prescribed, and by reformulating the medications to be less addictive.

References

- [1] A. G. Wurcel *et al.*, "Increasing Infectious Endocarditis Admissions Among Young People Who Inject Drugs," *Open Forum Infect. Dis.*, vol. 3, no. 3, Jul. 2016.
- [2] A. Wright, O. Otome, C. Harvey, S. Bowe, and E. Athan, "The Current Epidemiology of Injecting Drug Use-Associated Infective Endocarditis in Victoria, Australia in the Midst of Increasing Crystal Methamphetamine Use," *Heart Lung Circ.*, vol. 27, no. 4, pp. 484–488, Apr. 2018.
- [3] L. Hartman, E. Barnes, L. Bachmann, K. Schafer, J. Lovato, and D. C. Files, "Opiate Injection-associated Infective Endocarditis in the Southeastern United States," *Am. J. Med. Sci.*, vol. 352, no. 6, pp. 603–608, Dec. 2016.
- [4] "INFECTIVE ENDOCARDITIS," *CThSurgery.com*. [Online]. Available: <http://www.CThSurgery.com/infective-endocarditis.html>. [Accessed: 28-Jan-2019].
- [5] P. Skolnick, "The Opioid Epidemic: Crisis and Solutions," *Annu. Rev. Pharmacol. Toxicol.*, vol. 58, no. 1, pp. 143–159, 2018.
- [6] S. AJ, et al A. I. M. 2018;doi:10 7326/M18-2124 December 3, and 2018, "Opioid epidemic causes surge in infective endocarditis." [Online]. Available: <https://www.healio.com/internal-medicine/cardiology/news/online/%7bb2a5af82-f5f1-409d-8be2-d7dc668f6a9e%7d/opioid-epidemic-causes-surge-in-infective-endocarditis>. [Accessed: 28-Jan-2019].
- [7] S. V. Deo *et al.*, "Admissions for Infective Endocarditis in Intravenous Drug Users," *J. Am. Coll. Cardiol.*, vol. 71, no. 14, pp. 1596–1597, Apr. 2018.

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PRE-REGISTRATION FORM

The 2020 Annual Meeting of
The American Academy of Cardiovascular Perfusion

MEMBER	FEE	Amount	FIRESIDE CHAT REGISTRATION (make your first three choices each day) Thursday Sessions 1) _____ 2) _____ 3) _____ Friday Sessions 1) _____ 2) _____ 3) _____ Saturday Sessions 1) _____ 2) _____ 3) _____
Registration Fee	\$445.00	_____	
2020 Annual Dues	\$155.00	_____	
Guest to Induction Dinner	\$100.00	_____	
Adult Guest to Workshop	\$ 30.00	_____	
NON-MEMBER	FEE	Amount	
Registration Fee	\$495.00	_____	
Guest to Induction Dinner	\$100.00	_____	
Adult Guest to Workshop	\$ 30.00	_____	
STUDENT PERFUSIONIST	FEE	Amount	
Registration Fee	\$100.00*	_____	
Guest to Induction Dinner	\$100.00	_____	
Adult Guest to Workshop	\$ 30.00	_____	
* MUST be a current Student Member of The Academy.			
FELLOW or SENIOR MEMBER	FEE	Amount	
Registration Fee	\$445.00	_____	
2020 Annual Dues	\$180.00	_____	
Guest to Induction Dinner	\$100.00	_____	
Adult Guest to Workshop	\$ 30.00	_____	

PRINT OR TYPE

NAME _____

HOME ADDRESS _____

CITY _____ STATE _____ ZIP _____

HOME PHONE _____ WORK PHONE _____

E-MAIL ADDRESS _____ (Required for confirmation)

ANTICIPATED ARRIVAL DATE IN RENO _____

How long have you been in the perfusion field? _____

Will you be attending the Induction Dinner on Friday evening? YES NO
(Dark Suit and Tie Required / Black Tie Optional)

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 ___ _

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** 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.
- o *All attendees are invited to the Induction Dinner on Friday evening. Attire is dark suit and tie required.*
- o Members must pay their 2020 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 10, 2020--bring it with you to the meeting.
- o No pre-registration will be processed after January 3, 2020
 - **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;
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- 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 10, 2020.
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Visit our website's homepage at www.theAACP.com to view the presentations from the 2019 meeting in Florida.

References from INCREASED INCIDENCE OF INFECTIVE ENDOCARDITIS RELATED TO THE OPIOID EPIDEMIC

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- [8] J. Ng, C. Sutherland, and M. R. Kolber, "Does evidence support supervised injection sites?," *Can. Fam. Physician*, vol. 63, no. 11, p. 866, Nov. 2017.
- [9] "Buprenorphine vs. Methadone – Addiction Treatment Forum." [Online]. Available: <http://atforum.com/2013/02/buprenorphine-vs-methadone/>. [Accessed: 29-Jan-2019].
- [10] S. Nielsen, B. Larance, and N. Lintzeris, "Opioid Agonist Treatment for Patients With Dependence on Prescription Opioids," *JAMA*, vol. 317, no. 9, pp. 967-968, 07 2017.
- [11] T. Kerensky and A. Y. Walley, "Opioid overdose prevention and naloxone rescue kits: what we know and what we don't know," *Addict. Sci. Clin. Pract.*, vol. 12, no. 1, p. 4, Jan. 2017.
- [12] A. Y. Walley *et al.*, "Opioid overdose rates and implementation of overdose education and nasal naloxone distribution in Massachusetts: interrupted time series analysis," *BMJ*, vol. 346, p. f174, Jan. 2013.

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Important Academy Dates

The ACADEMY ANNUAL MEETING DEADLINES

ABSTRACT DEADLINE **October 15, 2019**

MEMBERSHIP DEADLINE **December 5, 2019**

PRE-REGISTRATION **January 9, 2020**

HOTEL REGISTRATION **January 9, 2020**

2019 ANNUAL MEETING **February 5-8, 2020**

Others Meetings

Fall Meeting NYSSP

November 09, 2019

Holiday Inn Plainview- Long Island

215 Sunnyside Blvd

Plainview, NY 11803

516-497-7400

Time: 0700-1630

For additional information contact :

ehiscvp@aol.com or rbahk@northwell.com

**Abstract Deadline
for the
2020 Meeting
October 31, 2019**

2020 Annual Meeting



***Reno, Nevada
February 5-8, 2020***



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***Remember to mention that you will be attending the Annual Conference
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