SCA NEWS

SOCIETY OF CARDIOVASCULAR ANESTHESIOLOGISTS
Knowledge • Care • Investigation

Volume 43, Number 26
June 2024

PRESIDENT'S MESSAGE

Kathryn E. Glas
MD, MBA, FASE
President
Society of Cardiovascular Anesthesiologists

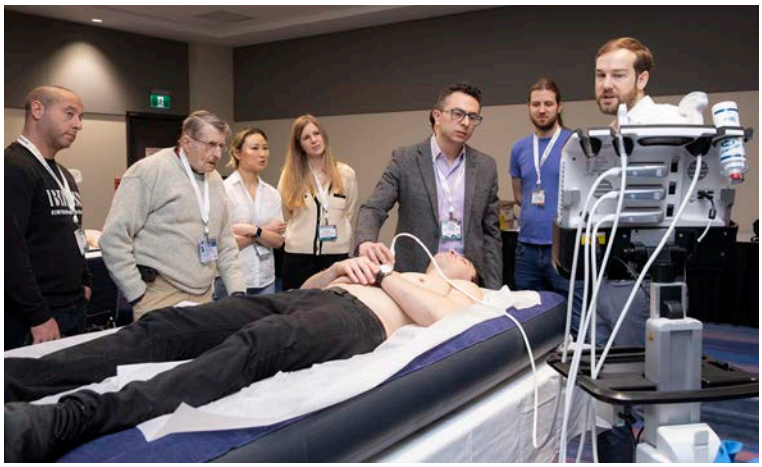
A HUGE *Thank You* to All Who Attended the 2024 Annual Meeting and Thoracic Anesthesia Symposium in Toronto, Canada!

SCA 2024 ANNUAL MEETING & WORKSHOPS

On behalf of the Program Planning Committees and myself, **THANK YOU** to the attendees and faculty for making the 2024 Meetings a huge success! We hope you enjoyed the meetings as much as we did!

Kathryn E. Glas MD

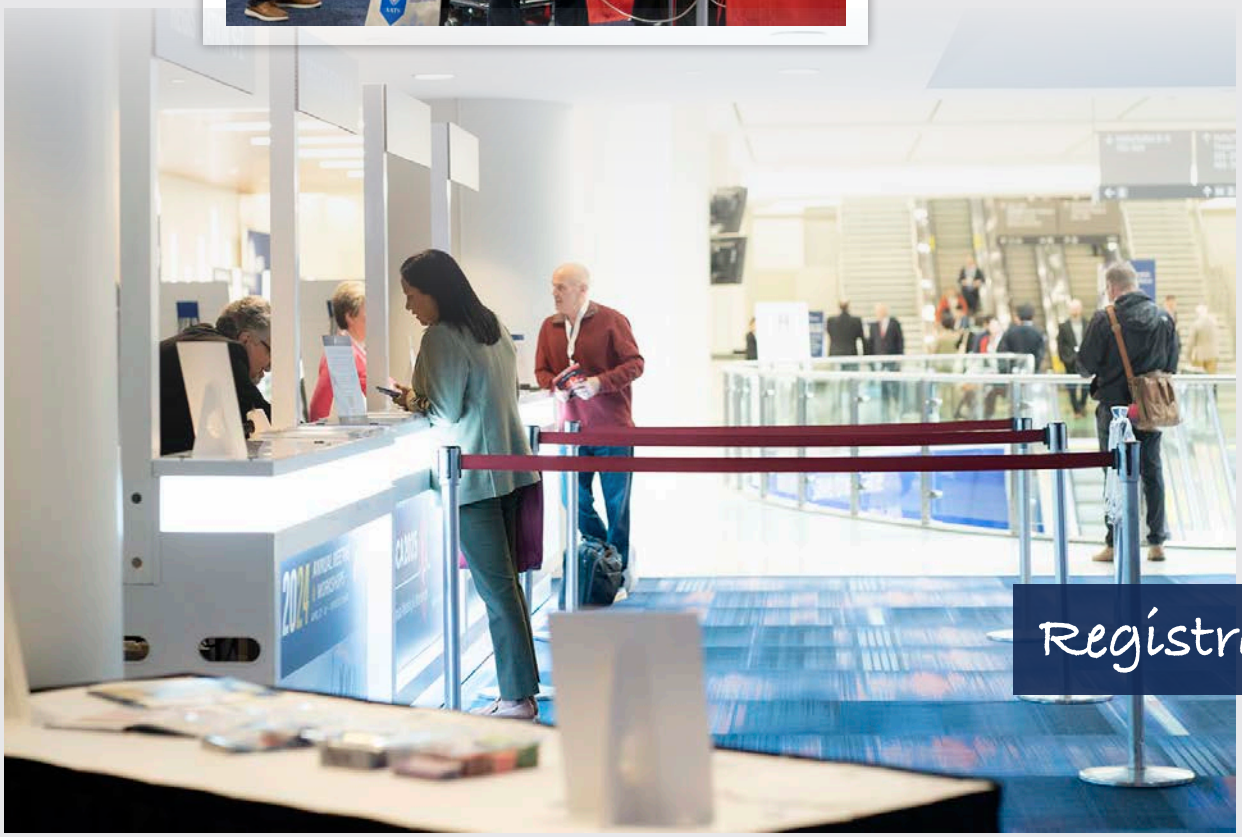
Workshops



Dr. Randal Blank, Chair

SCA 2024 HIGHLIGHTS

Exhibitors



Registration

SCA 2024 HIGHLIGHTS

Workshops

Poster Sessions

SCA Timeline

SCA SPECIAL EVENTS

Hockey Hall of Fame

CME Credits Available July 31st!

Do Not Forget to Claim Your CME!

Meeting attendees - have you claimed your CME credits yet?

CME credits are available July 31, 2024.

Save *the* Date

2025 Annual Echo Week will be held February 20 - 23, 2025, in Atlanta, GA, at the Loews Atlanta Hotel.

Join us in Atlanta, GA, to meet, learn from, and connect with cardiovascular anesthesiologists from around the world. Registration is scheduled to open early fall.

Watch your email for more details in the coming months.

Save *the* Date

The TAS Planning Committee will hold its Annual Thoracic Anesthesia Symposium in Montreal, Canada, April 25, 2025, Montreal Convention Center.

Mark your calendars for this is a 1-day event focused entirely on thoracic anesthesia for academics and private practitioners.

Registration is scheduled to open in December 2024.

More details forth coming in the coming months.

2025 Thoracic Anesthesia Symposium PBLDs

Submission Deadline — Friday, July 26, 2024, 11:59 PM ET

SUBMIT NOW

TAS Abstracts — Call for Abstracts

You are invited to submit a scientific abstract or complex case for consideration for the 2025 Thoracic Anesthesia Symposium!

Call opens: September 2025

SCA website will be updated as more information becomes available.

Save *the* Date

SCA 47th Annual Meeting is in Montreal, Canada

SCA and the Scientific Program Committee invite you to join us in Montreal, Canada for the 47th Annual Meeting and Workshops, April 26-29, 2025, Montreal Convention Center.

Mark your calendar NOW to join us for the 47th Annual Meeting and Workshops in Toronto, Canada.

Registration is scheduled to open in December 2024. More details forth coming in the coming months.

Call for PBLDs Is Now Open!

Submission Deadline — Friday, July 26, 2024, 11:59 PM ET

SUBMIT NOW

Problem-based learning discussions (PBLDs) are designed to be intimate or small group sessions that provide solutions to real-world challenges by introducing concepts derived from troubleshooting an initial problem to inform, direct, and inspire student learning.

Effective PBLDs are participant-led learning experiences in a collegial environment guided by the moderator. The discussion is bolstered by advance review and preparation of the material by participants, and by analytical, probing, or reflective questions by the moderator(s). Discussion should include all participants and should not be dominated by one or a few individuals.

For more information, please click the submissions link above.

Opening Soon!

Submit an Abstract for the 2025 Annual Meeting

Get ready to submit your scientific abstract or complex case to be considered for presentation at the 2025 Annual Meeting & Workshops!

Submissions will be accepted for the following calls:

- Scientific Program
- Fellow and Resident Complex Cases
- Super Echo

Call opens: September 2025

SCA website will be updated as more information becomes available.

SCA Outgoing Leaders

Thank You

SCA would like to recognize the elected leaders whose terms of office have concluded. We greatly appreciate all their hard work towards improving our society, and we thank them for their involvement.

Director-at-Large 2021-2024

James (Jake) H. Abernathy III MD, MPH

Director-at-Large 2021-2024

Tara R. Brakke MD, FASE

Scientific Program Committee Chair 2022-2024

Mary Beth Brady, MD

Early Career Director 2022-2024

Stephanie Ibekwe, MD

Early Career Director 2022-2024

Jessica Brodt, MD

CME Committee 2020-2024

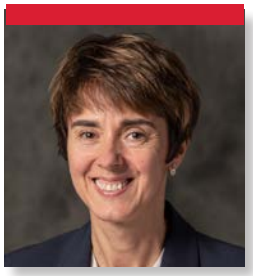
Elvera L. Baron MD, PhD

EACTAIC Liaison

Patrick Wouters, MD

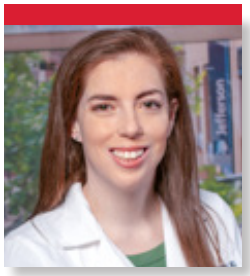
2024-2025 BOD

Meet SCA's 2024-2025 Board of Directors

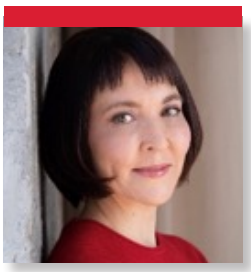


Director-at-large 2024-2027
Alina Nicoara , MD

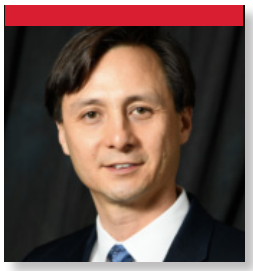
Director-at-large 2024-2027
Abimbola (Bola) Faloye
MD, FASA, FASE



Early Career Director 2024-2026
Regina (Gina) Linganna, MD



Early Career Director 2024-2026
Jessica Spence
MD, PhD, FRCPC



Scientific Program Committee Chair 2024-2026
Jonathan Ho, MD

Scientific Program Committee Vice-Chair 2024-2026
Stephanie Ibekwe, MD

EACTAIC Liaison 2024-2025
Chirojit Mukherjee
MD, PhD, FASE

Outgoing and Incoming SCA Board Members

AWARDS

SCA Kaplan Leadership Development Award Winners

The award is designed to assist cardiothoracic and vascular anesthesiologists in their career by granting funding to further their leadership development through coursework and leadership-specific studies. The Kaplan Leadership Award will be adjusted accordingly to offer an aggregate of $5,000 to either one recipient or divided among two.

Leadership Project Title:
Developing an Evidence-Based Perioperative Curriculum for Cardiac Residents

Sarah Cotter, MD
Duke University Medical Center

Leadership Project Title:
Stanford Physicians Leadership Training Certificate

Ashley Oliver, MD, MA
The Regents of the University of California, Los Angeles

Drs. Cherry and Oliver

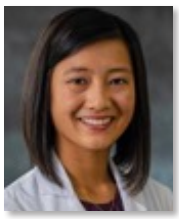
SCA 2024 Early Career Investigator Award Winners

Christian O'Donnell, MD
Stanford University School of Medicine

Abstract Title: *Time-specific Mortality Benefit of Surgical versus Percutaneous Revascularization for Severe Coronary Artery Disease*

Stephen Raithel, MD
Brigham and Women's Hospital

Abstract Title: *The Association of Income and Long-Term Survival in Patients with Post-Operative Atrial Fibrillation After Cardiac Surgery*



Katherine Sun, MD
Duke University

Abstract Title: *Right Ventricle-Pulmonary Artery Coupling as Predictor of Major Organ Morbidity and Mortality after Cardiac Surgery*

Andres Zorrilla Vaca, MD
Brigham and Women's Hospital

Abstract Title: *Association of Tidal Volume During One-Lung Ventilation and Postoperative Acute Kidney Injury*

Abstract Title: *Preoperative Risk Stratification Model for Intraoperative Hypoxemia During One-Lung Ventilation*

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GRANTS

2024 Award Recipients

SCA is excited to announce the following 2024 grant winners and award winners.

SCA/IARS Mid-Career Research Grant

$50,000 per year for 2 years

Nadia Hensley, MD
Johns Hopkins School of Medicine

Grant Title: *Acute Normovolemic Hemodilution: A Prospective, Observational Study of the Volume Effect on Transfusions, Coagulation Mechanisms, and Safety Outcomes*

SCA Starter Research Grant

$25,000 per year for 2 years

Mark J. Robitaille, MD
Beth Israel Deaconess Medical Center

Grant Title: *Impaired Liver-heart Cross Talk in Metabolic Syndrome Leading to Cardiac Dysfunction: The Role of FGF-21*

SCA In-Training Grant

$15,000 for 1 year

Serena Dasani, MD, MBA
Brigham and Women's Hospital

Grant Title: *Quantifying the Cost of Rescue Transesophageal Echocardiogram: An Emergency Diagnostic Provided by Cardiovascular Anesthesiologists*

Megan L. Rolfzen, MD
University of Nebraska Medical Center

Grant Title: *Association of Mental Illness and Rurality with Adverse Outcomes in Cardiothoracic Surgerys*

Sungsoo (Danny) Kim, MD
University of California, Los Angeles (UCLA)

Grant Title: *Intraoperative Deep Learning model for Imputation of the continuous Central Venous Pressure (CVP) and Pulmonary Arterial Pressure (PAP) Waveforms from Minimally Invasive Measurements*

Congrats SCA 2024 Grant Recipients!

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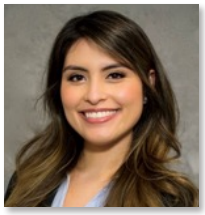
AWARDS

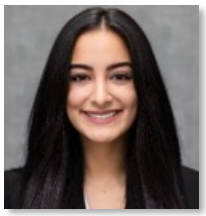
2024 SCA Junior Resident Scholar Grant Recipients

SCA's Diversity, Equity and Inclusion Committee (DEI) awarded ten junior residents with the first annual Junior Resident Scholarship Grant. The winners were announced during the SCA Annual Meeting in Portland, Oregon.

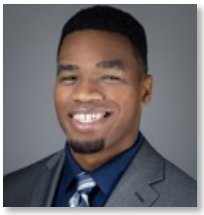


Vanessa Hernandez, MD
Baylor College of Medicine

Ashton Huey, MD
Cleveland Clinic Florida



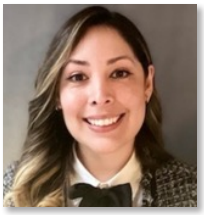
Karla Objio, MD
Johns Hopkins Medicine



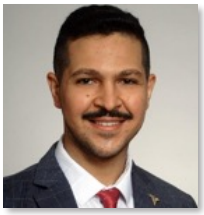
Obinna Ome Irondi, MD
UW Medicine

Jose Luis Rios, MD
Stanford Medicine

Ume Rumana, MD
University of Central Florida



Laura Santa Cruz Mercado, MD
Beth Israel Deaconess Medical Center



Ammar Toubasi, MD
Augusta University

Areli Valencia, MD
Brigham and Women's Hospital

Dominque Wreh, MD
Baylor College of Medicine

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KEYNOTE SPEAKER

SPECIAL THANK YOU

to Our Keynote Speaker Dr. Jerome Adams

Dr. Jerome Adams

Dr. Glas and Dr. Jerome Adams

Dr. Adams Speech

DEI Scholarship Winners and DEI Committee with Dr. Adams and Dr. Glas

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J. EARL WYNANDS, MD LECTURER

SPECIAL THANK YOU

to Our J. Earl Wynands
MD Lecturer
Dr. Louise Sun

Dr. Louise Sun

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Bruce Bollen MD

2024 Distinguished Service Award Winner

The Distinguished Service Award is given to an individual who has made significant contributions to the specialty of cardiovascular anesthesiology through research, education, service, or any combination of these activities.

Left to Right – Drs. Bollen and Glas

Nancy A. Nussmeier MD, FAHA

2024 Presidential Lifetime Outstanding Award Winner

The Presidential Lifetime Outstanding Service Award is given to an anesthesiologist who has made outstanding long-term contributions to the Society.

Left to Right – Drs. Nussmeier and Glas

Anne Cherry MD

2024 Presidential Citation Award Winner

The Presidential Citation Award is given at the discretion of the President (and/or Executive Committee) to an individual who has made an important contribution to the field of cardiovascular anesthesia through
1) an early career accomplishment;
2) research contribution;
3) education contribution;
4) DEI contribution through advancement of minority interests; and/or 5) service to the SCA.
This award would be given by the President at his/her discretion.

Left to Right – Drs. Glas and Cherry

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SCA UNIVERSITY

An Online Learning Management System

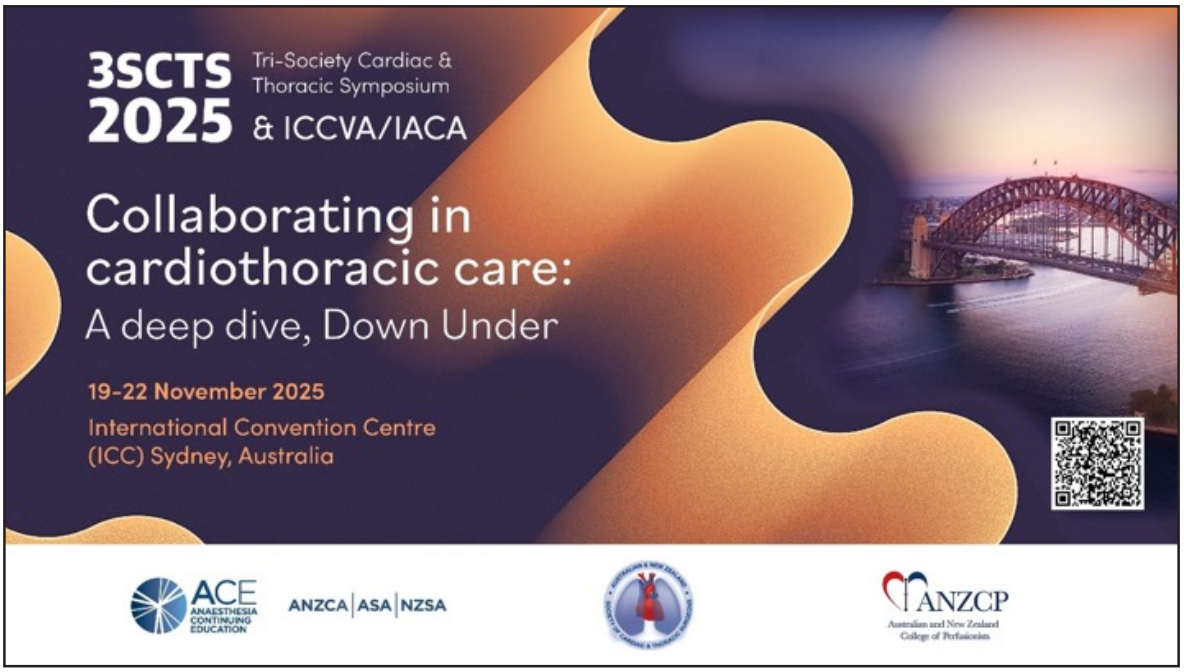
NEW! Anesthesia for Lung Transplantation

Do Not Miss the Chance to Earn CME Credits

This module was designed to discuss the different aspects in the care of the patient undergoing lung transplantation. This includes the preoperative assessment and optimization of the recipient, the management and optimization of the donor, the intraoperative management, including the use of extracorporeal membrane oxygenation, and the postoperative care of these patients.

CLICK HERE

TO ACCESS THE COURSES



SAVE THE DATE!

ICCVA/IACA Meeting
Sydney, Australia
November 19 -22, 2025

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CALL FOR VOLUNTEERS COMING THIS FALL!

April 2025 – April 2027 Term Selection

Support your Society's strategic goals and initiatives by serving on one of its 40-plus committees and sub-committees! The Call for Volunteers will be open this October to fulfill the 2025-2027 term. Watch your in-box later this summer for details.

For questions related to the Call for Volunteers, please email committees@scahq.org.

The following committees are anticipated to have openings for the 2025-2027 Term:

- Abstract Review Committee
- Acute Kidney Injury (AKI) Sub-Committee
- Atrial Fibrillation Sub-Committee
- Blood Management Sub-Committee
- Bylaws Committee
- Clinical Practice Improvement Committee
- Diversity, Equity, and Inclusion Committee
- Echo Week Program Planning Committee
- Economics and Gov. Affairs Sub-Committee
- Enhanced Recovery After Cardiac Surgery Sub-Committee
- Enhanced Recovery After Thoracic Surgery Sub-Committee
- Ethics Committee
- Guidelines and Standards Sub-Committee
- Kaplan Leadership Development Award Sub-Committee
- Mechanical Circulatory Support Sub-Committee
- Member Engagement Committee
- Mobile App Sub-Committee
- Newsletter Sub-Committee
- Online Education Sub-committee
- Quality, Safety and Value Committee
- Research Committee
- Scientific Planning Committee (SCA Annual Meeting)
- Thoracic Anesthesia Symposium Planning Committee

40+ Committees Represented

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Announcement Regarding ACCME Rules/Guidelines

The ACCME rules for disclosure of financial relationships changed at the beginning of 2022.

The new rules exclude owners or employees of ineligible companies (https://www.accme.org/faq/what-accmes-definition-ineligible-company), from controlling content or participating as planners or faculty in accredited education. There are three exceptions to this exclusion – employees of ineligible companies can participate as planners or faculty in these specific situations:

a. When the content of the activity is not related to the business lines or products of their employer/company.

b. When the content of the accredited activity is limited to basic science research, such as preclinical research and drug discovery, or the methodologies of research, and they do not make care recommendations.

c. When they are participating as technicians to teach the safe and proper use of medical devices, and do not recommend whether or when a device is used.

The SCA, as an ACCME accredited provider, would like all its members to be aware of this rule as it may impact your participation on planning committees as well as involvement in educational activities as faculty/speaker.

For questions, please contact Nicole Cranston (SCA Director, Education), at ncranston@veritasamc.com.

The Call for Nominations for the SCA Board of Directors Opening Soon!

Show your commitment to the value of the Society of Cardiovascular Anesthesiologists to shape its future! You may nominate yourself or a committed SCA colleague. This year we will elect President-Elect, Secretary/Treasurer, two Directors-at-Large, one member to the Continuing Education Committee (CME).

The CME Committee is an elected position.

More details are forthcoming in the next month.

2025 Annual Society Awards Call for Recommendations Opening August 1st

The SCA encourages its members to honor those who have made a significant impact within the Society and the sub-specialty of cardiovascular anesthesiology by recommending them for one of its annual awards. The call will be open August 1 – September 23, 2024.
Watch your in-box and the SCA Website for details.

The Distinguished Service Award

- Honors an individual who has made a meaningful contribution to the ***field of cardiovascular anesthesiology*** through research, education, or service that has produced a significant impact in the field.
- This individual does not have to be an anesthesiologist but must be a member of the SCA.

The Presidential Outstanding Service Award

- Honors an individual who has made outstanding, long-term contributions to the ***Society of Cardiovascular Anesthesiologists*** (SCA).
- This individual must be an anesthesiologist and a member of the SCA.

The John Hinckley Outstanding Service Award

- Honors an individual who has contributed to or advanced the ***field of cardiovascular anesthesiology*** through education, research, or innovative clinical work.
- This individual must be a ***non-physician***. Membership in the SCA is ***not*** required.
  - Examples of possible recipients include perfusionists, blood bank personnel, etc.

A listing of past Society awardees may be found on the SCA website: https://scahq.org/our-history/

2025 Kaplan Leadership Development Award

The award is designed to assist cardiothoracic and vascular anesthesiologists in their career by granting funding to further their leadership development through coursework and leadership-specific studies. The Kaplan Leadership Award will be adjusted accordingly to offer an aggregate of $5,000 to either one recipient or divided among two.

- **$5,000/$2,500 from the SCA Endowment, with a $5,000/$2,500 match from the applicant's institution to fund a leadership education strategy.**

Click here for more information on this award. Applications will be accepted this fall.

Questions? Please contact us at operations@scahq.org.

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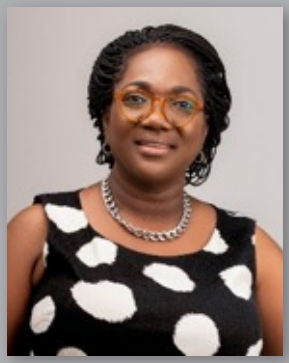

SPOTLIGHT

AWEsome Woman Interview

Mary E. Arthur, MD

Core Residency Program Director
Medical College of Georgia (WellStar MCG)

I am truly honored and thrilled to be featured as the AWEsome Woman in the SCA June 2024 Newsletter. My name is Mary Arthur, and I have the privilege of serving as the Core Residency Program Director for the Anesthesiology Residency at the Medical College of Georgia (MCG), home to the Southeast's oldest anesthesia residency training program. My journey in medicine began in Ghana, where I completed my medical education at the University of Ghana and earned a diploma in anesthesia while working at the main teaching hospital in the capital. My passion for anesthesia led me to the United States, where I completed my training at the University of Massachusetts Chan Medical School and served as chief resident.

My final year focused extensively on cardiothoracic anesthesia, preparing me to join the cardiothoracic team at MCG twenty-one years ago. My experiences from Ghana to the United States have shaped my approach to anesthesia, blending my unique, diverse perspectives and innovative practices.

1. What led you to become a Cardiovascular/Thoracic Anesthesiologist?
Before emigrating to the United States, I had the privilege of contributing significantly to the department of Anesthesia in my home country. My deep commitment to medical education and patient care was always at the forefront of my professional journey. However, during my first clinical anesthesia year in the United States, I found myself yearning for a greater challenge. The routine procedures no longer sparked my enthusiasm.

This changed dramatically when we started our subspecialty rotations. The cardiac and thoracic operating rooms, in particular, were a natural draw for me. In this environment, I found the complexity and dynamism I was seeking. I was captivated by the ability to perform intricate procedures and utilize information from advanced invasive monitors to make critical decisions. In the cardiac OR, I discovered a perfect blend of intellectual stimulation and the opportunity to have a profound impact on patient outcomes.

The delicate balance of managing high-risk patients and the satisfaction of contributing to life-saving surgeries solidified my decision. This subspecialty challenged me and allowed me to apply my skills and knowledge most effectively, ensuring I could provide my patients with the highest level of care.

2. How did you hear about the SCA?
During my early days on faculty, my mentor encouraged me to join the Society of Cardiovascular Anesthesiologists (SCA) as I prepared for my Advanced Perioperative Transesophageal Echocardiography exam and would need the CME credits to satisfy the board requirements. Attending the SCA annual meeting for the first time was a transformative experience. I immediately fell in love with the energy, the camaraderie, and the high level of academic exchange. From then on, the SCA annual meeting became my go-to event for submitting and presenting my research. The invaluable feedback from these presentations helped me refine my work and decide whether an abstract could be developed into a full manuscript.

The SCA has since become a cornerstone of my professional journey, offering a platform to share ideas, learn from peers, and grow as a cardiovascular anesthesiologist.

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3. What roles have you held for the society?

Since 2005, I have been peripherally involved with the Society of Cardiovascular Anesthesiologists (SCA). However, my active engagement began when I self-nominated for the Diversity, Equity, and Inclusion (DEI) committee. With my extensive experience on the ASA Professional Diversity Committee and diversity initiatives at my home institution, I felt poised to make a meaningful contribution.

As a member of the mentorship subcommittee, I spearheaded the proposal to initiate the DEI Scholar Program and was entrusted with leading this initiative. In the two years since its inception, the program has attracted talented minority residents to consider cardiothoracic anesthesia as a career. Remarkably, seven of the ten scholars in the first year chose to pursue a cardiothoracic fellowship.

We have made significant strides in dispelling myths surrounding a career in cardiothoracic anesthesia, demonstrating that it is inclusive and welcoming to all. One resident, who initially believed she could not balance a family and a career in cardiothoracic anesthesia, found clarity and joy in this path. She returned to speak to this year's scholars' program during the 2024 annual meeting, inspiring them with her story.

The quality of posters at this year's meeting was exceptional, making it difficult to distinguish between the presentations of CA1s and more experienced residents. Their excellence made us all very proud.

When our outgoing vice chair was asked to lead another committee, I was invited to step in as the vice chair of the DEI Committee. This opportunity has been incredibly fulfilling and will allow me to help shape and promote diversity and inclusion within our society and the broader medical community.

4. What is one of your greatest achievements as a Cardiovascular/Thoracic Anesthesiologist?

One of my greatest achievements as a cardiovascular/thoracic anesthesiologist is the number of residents I have mentored and inspired to pursue careers in cardiothoracic anesthesiology. Mentorship has been a cornerstone of my career, and seeing my mentees succeed brings me immense satisfaction.

A former resident recently reminded me of my impact on his career. He recalled the first time I allowed him to float a Swan-Ganz catheter during his CA1 year. That experience, he said, stayed with him throughout his training and into his practice, shaping his approach to cardiothoracic anesthesia.

Another profound moment occurred when the relative of our chief anesthesia technician was diagnosed with an aortic dissection and needed to be airlifted to Emory University. Due to the patient's unstable condition, they were rerouted to MCG, and I was on call that evening. A resident on his way home saw us transporting the patient from the ER to the OR and decided to join us despite not being on call. He stayed and assisted until the case was successfully completed. A few days later, he walked into my office and informed me that he had decided to apply for a cardiothoracic fellowship. What makes this so remarkable is that anesthesia was his second profession; he was already a practicing hospitalist before choosing to pursue a second residency. Opting for a cardiothoracic fellowship meant another year of training, but that night's experience convinced him it was all worth it.

These experiences underscore why I am so devoted to the success of the Junior Scholars Program. We all aim to have an impact on the future of our subspecialty. Seeing the spark of passion in a resident's eyes and knowing I played a part in their decision to pursue cardiothoracic anesthesiology is truly one of my greatest achievements.

5. Do you have any advice for fellows and residents?
Given the current shortage of anesthesiologists, it is understandable that many are tempted by the prospect of quickly transitioning from residency to a lucrative salary. However, I urge fellows and residents to consider the immense value of pursuing an additional year of training in cardiothoracic anesthesia.

While the allure of immediate financial rewards is strong, the extra year of fellowship training is incredibly worthwhile. Specializing in cardiothoracic anesthesia will provide you with a unique skill set and experiences that set you apart. This field offers unparalleled opportunities to make a significant impact on patients' lives. While some days may be long and stressful, the satisfaction and fulfillment you gain from your work is unmatched.

Investing in this extra year of training will enhance your skills and expertise and position you at the forefront of providing exceptional care in a specialized and highly rewarding field. The depth of knowledge and specialized skills you acquire will be invaluable, ensuring you can provide your patients with the highest level of care.

6. Have you experienced any difficulties as a woman in the field?
As a woman in a traditionally male-dominated field, I have faced my share of challenges. However, I have seen significant improvements over the years, with more women joining our ranks, which is very encouraging.

In the operating room, staying focused and demonstrating your competence is essential. Early in my career, male colleagues often volunteered to handle my procedures, assuming I was not capable. I always politely refused and completed the tasks myself, proving my abilities. Surgeons sometimes enter the OR with preconceived notions about working with a female attending, but the key is to show them that you are capable and excel at your job.

The cardiothoracic OR can be a tough environment; to thrive, you must be assertive. Once you demonstrate your skills and assertiveness, respect follows quickly. Think about those who look up to you and consider the message it sends if you give up easily.

While challenges exist, focusing on your abilities and staying resilient will help you overcome them and earn the respect you deserve.

7. Do you have any advice for other women in the field?
Of course. It is essential to be thoroughly prepared for your cases. Be assertive and communicate your points clearly and confidently without allowing yourself to be intimidated. Stay focused, ignore distractions, and consistently demonstrate your competence.

Do not hesitate to ask for help from your male colleagues when needed. This is not a sign of weakness but a demonstration of your openness to collaborate and work effectively within a multidisciplinary team. Your resilience, preparation, and willingness to engage with your colleagues will help you excel and thrive in this challenging yet rewarding field.

8. How do you balance work and personal life?
Finding a balance between work and personal life can be challenging but achievable. Initially, I struggled with this balance, often bringing work home and continuing to respond to emails and complete paperwork late into the evening. However, I have learned the importance of setting boundaries and creating a structured routine.

Having a great and efficient assistant has significantly improved my work-life balance. I now have more time to enjoy my personal life. It is essential to outline your goals for each day and not take on too much at work. Remember, it is okay to say no sometimes.

When you get home, make a conscious effort to leave work behind. Respect your

assistants' time by not contacting them after hours. Spend quality time with family and friends, engage in activities you enjoy, and take time to relax.

By creating a structured routine and respecting personal boundaries, you can achieve a healthy and fulfilling balance between your professional and personal life.

9. What is something you enjoy doing outside of work?
Outside of work, I enjoy playing tennis—it is a fun and invigorating sport. I also dabble in interior decorating, which I find incredibly rewarding. I plan to attend interior decorating school after completing my MPH this fall.

10. Would you change anything about the path you took to get to where you are now?
The answer to that question is both yes and no. In the beginning, I prioritized my family, especially since I had just had my son when I became an attending. This meant my career progression took longer than usual, but it also allowed me to grow wiser and gain invaluable experience along the way.

I had a great mentor who consistently offered opportunities and guidance, which was instrumental in my development. After joining the SCA, I formed invaluable friendships and received advice that significantly enhanced my career. While there were delays and detours, the journey has been enriching and rewarding.

11. What was the best piece of advice you received?
The best advice I received was simple yet profound: "Stay calm and composed, especially in the most stressful situations. Your demeanor sets the tone for the entire team and can significantly impact patient outcomes." This guidance has been invaluable throughout my career, helping me navigate the challenges of the operating room with confidence and poise.

Racial and Ethnic Disparities in Perioperative Healthcare Among Patients Undergoing Cardiac Surgery

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Although many specialties in medicine have made progress as it pertains to healthcare disparities in underrepresented racial and ethnic minority (UREM) groups, there is still much work to do especially in the perioperative period for patients undergoing cardiac surgery. Research shows that despite this patient population having a higher burden of cardiovascular disease (CVD), there is suboptimal access to cardiac specialists as well poorer outcomes with cardiac surgical interventions.[1-2] Solving this dilemma is exceptionally challenging given the systemic barriers that are in place and individual patient factors that also contribute to disparities.

In the State-of-the-Art review published in the Journal of the American College of Cardiology in January 2024, Milam and colleagues highlight the disparities encountered by UREM groups in perioperative cardiovascular (CV) care.[3-4] The article summarizes existing literature pertaining to these issues and proposes actionable solutions through a multidisciplinary approach, with the goal being to achieve equitable cardiovascular surgical and perioperative healthcare outcomes.

About 50% of U.S. adults have CVD, with a higher prevalence in UREM individuals when compared to non-Hispanic White (NHW) individuals.[5] Traditional risk factors for CVD are overrepresented among UREM groups and less likely to be accurately diagnosed, treated, and controlled when compared to NHW patients.[6] Furthermore, research demonstrates that both Black men and women experience a disproportionate morbidity as well as overrepresented risk factors for CVD. These trends and gaps in disparities will increase if not addressed.[5] There are a multitude of barriers for combating these disparities in cardiovascular perioperative care, as described by Milam et al.

One significant barrier is limited access to equitable healthcare among UREM patients.[7] For instance, UREM patients are more likely to be uninsured or underinsured and not receive care from a cardiologist, instead being more likely to seek care in emergency departments when compared to their NHW counterparts.[8] This leads to a decline in routine care, proper diagnostic testing, optimal CV treatment and follow-up. Potential policy level barriers include the Hospital Readmissions Reduction Program, which may disproportionately penalize safety net hospitals that disproportionately serve UREM and socioeconomically disadvantaged patients, with payment penalties.[3-4]

Another barrier described are clinician-related factors contributing to healthcare disparities. This includes inefficient referral pathways for UREM groups leading to delays in care and patients presenting at later stages of a disease process. There is also concern for clinical decision-making being influenced by stereotypes of UREM individuals. These biased practices have been evidenced by lower rates of LVAD implantation for Black patients when compared to White patients in the setting of advanced heart failure, even after accounting for social determinants of health (SDoH) and clinical factors.[3-4] Risk aversion among healthcare providers may also contribute to witnessed disparities, such as not providing cardiac surgery among high-risk patients, with UREM patients being often characterized as high-risk surgical patients.[3-4]

Furthermore, patient-related factors are described which include deficiencies in health literacy, cultural beliefs, and financial burden associated with healthcare. These patient factors may result in patients refusing invasive diagnostic testing and surgical procedures, poor engagement or distrust during clinical encounters, or delayed/late presentation for cardiac surgery due to financial stressors.[3-4]

Milam et al., summarize how these aforementioned barriers may be contributing to the disparities seen in CV surgical care and outcomes. Examples including higher post-CABG mortality for UREM groups, greater risk of death or retransplant in Black patients following heart transplant, and the lower rate of valve surgery observed in Black and Hispanic patients with valvular heart disease (VHD) compared to NHW.[9-10]

Physicians and the healthcare team have both a moral and ethical responsibility to address these CV perioperative health disparities. The review proposes various potential solutions to address these gaps. It is Imperative to take a deeper dive and research the origins of these disparities and how decisions made within the perioperative process may contribute. There exists a lack of quality data on SDoH, race, ethnicity, among others, for segments of the population--health data disparities. By refining patient-clinician communication and reducing the distrust that these patient populations experience regarding the healthcare-system, we can improve the self-reported data to improve resources and decrease disparities. Improvements in research such as enrolling more patients from UREM groups in clinical trials and involving more racially diverse cohorts in prospective studies will help identify ways to eliminate disparities.

Other proposed systemic solutions include diversifying the medical and surgical workforce by investing in all levels of education and training, especially with a focus on the CV workforce. The article provides evidence that shows the potential positive impact this will have on improving perioperative outcomes for UREM groups. Authors of this paper also place emphasis on addressing implicit and explicit biases.

Recognizing that solely undergoing 4-8 hours of training that focuses on implicit bias is not enough to combat these deeply rooted psychological principles. Rather using evidence-based strategies such as extensive multifaceted training, standardization, and decision aids have been shown to be effective at minimizing these disparities. In addition, advocating to increase awareness of the impact of SDoH on patient care, as well as emphasizing the importance of policy and legislative changes, are other proposed solutions to aid in the improvement of quality and access to CV surgical care.

In conclusion, this article by Milam and colleagues addresses the significant disparities faced by UREM in cardiac surgical outcomes and the factors at the systemic, clinician, and patient level that may contribute to them. This is an ongoing issue that is projected to worsen if action is not taken. Improvement requires that a variety of barriers be addressed and overcome. A thorough and comprehensive approach needs to be taken that brings awareness and implements the solutions proposed.

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Dexmedetomidine Improves Pulmonary Outcomes in Thoracic Surgery Under One-Lung Ventilation: A Meta-Analysis

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Background

Several mitigation strategies are used to optimize ventilation during thoracic surgery, requiring one lung ventilation, and to decrease postoperative complications. These include surgical techniques with sparing of lung parenchyma,[1] lung protective ventilation strategies[2,3] (low tidal volume, peep, and periodic lung recruitment), pharmacologic[4] strategies (narcotic sparing analgesia for minimal effect on respiratory drive,[5] preservation of hypoxic pulmonary vasoconstriction to decrease shunt and improve oxygenation, anti-inflammatory, and antioxidant benefits to minimize lung injury[6]) and fluid management.

There has been a recent increase in the use of Dexmedetomidine, an alpha-2 agonist, as an analgesic and sedative, for the narcotic sparing effects,[7] and other benefits. The use of Dexmedetomidine in cardiothoracic patients was found to decrease the incidence of post-operative delirium,[8,9] AKI,[10] and may be protective against myocardial ischemia.[11,12]

There is increasing evidence that Dexmedetomidine may be beneficial in thoracic surgery for improving perioperative outcomes. Intraoperative use of Dexmedetomidine has been shown to improve pulmonary mechanics and enhance recovery of pulmonary function.[13,14,15]

Dexmedetomidine enhances hypoxic pulmonary vasoconstriction, increases nitric oxide in the pulmonary circulation and improves oxygenation during one lung ventilation.[16] It inhibits acetylcholine release in the trachea which potentiates relaxation of airway smooth muscles[17] and has anti-inflammatory properties, most likely through inhibition of cytokines[14] (TNF, IL-1, IL-6, IL-8), and lipid peroxidation[18] (which contributes to lung injury). Cellular studies have shown decreased alveolar damage and ischemia reperfusion injury[19,20,21] possibly due to the above-mentioned anti-inflammatory mechanisms but also the sympatholytic effect of alpha-2 agonism and the preservation of glycocalyx.

Within the growing volume of literature suggesting the potential clinical benefits of Dexmedetomidine in thoracic surgery patients, requiring one lung ventilation, there are several problems related to statistical power and the lack of large, randomized trials.

The authors of this meta-analysis, after extensive literature review, identified 12 prospective randomized trials[22-33] that compared intraoperative use of Dexmedetomidine vs placebo. They hypothesized that dexmedetomidine may improve outcomes after thoracic surgery with one lung ventilation and conducted analysis of the existing trials.

Methods

Meta-analysis was performed according to the PRISMA and Cochrane guidelines.

Two authors conducted independent search in 5 major databases (Pub Med, Embase, Web o Science, Google Scholar, and China National Knowledge Infrastructure), for prospective trials, that analyzed the intraoperative effects and postoperative outcomes, of intraoperative use of Dexmedetomidine vs placebo, in thoracic surgery patients, that required one lung ventilation. A third author was consulted to resolve possible inclusion disagreements. No language was excluded. Observational studies, absence of pulmonary outcomes, cardiac surgery, use of inhaled Dexmedetomidine or use of other anesthetic adjuncts (e.g., nitric oxide, ketamine) were excluded.

Primary outcome: Postoperative atelectasis within 7 days from surgery and other postoperative pulmonary complications (PPCs) e.g., pneumonia, hypoxia, ARDS within 7 days after surgery.

Secondary outcome: intraoperative respiratory mechanics (compliance Cdyn) 30 minutes after one

lung ventilation, and postoperative lung function (FEV1) on days 1 and 2 after surgery.

Quality assessment was performed on seven domains of potential bias and the trials were classified as high, low, or moderate risk. Certainty of evidence assessment with classification high, moderate, low, and very low quality of evidence was performed. Data heterogenicity between studies was quantified.

Sub- group analysis by type of anesthetic (inhalation vs TIVA), lung protective strategy or surgical technique, open vs minimally invasive was performed.

Results

Of the 747 articles selected initially from literature search only 12 trials met inclusion criteria. Total number of patients in the Dexmedetomidine group: 365 vs 359 in the placebo group. In 10 of the trials, 1mcg/kg bolus and 0.3-0.5 mcg/kg/h infusion of dexmedetomidine was administered. Infusion only was administered in the remaining two trials. All trials were conducted in Asian countries (China 8, 1 India, 2 Korea and 1 Taiwan) and only in 6 of the trials the use of lung protective ventilation strategy was documented.

Comparing patients that received Dexmedetomidine vs placebo for the primary outcomes:

In patients that received Dexmedetomidine

- There was significantly lower incidence of postoperative atelectasis and hypoxemia (3.4% vs 11.7% $p<0.04$ and 2.3% vs 6.8% $p<0.01$, respectively) and,
- There was lower, but not statistically significant, incidence of postoperative ARDS and pneumonia (OR 0.39 $p< 0.27$ and 3.2% vs 5.8% $p<0.17$ respectively)

Sensitivity analysis of the summary estimates, conducted with sequential removal of each trial, did not significantly affect the results.

There was significant evidence of publication bias.

Comparing patients that received Dexmedetomidine vs placebo for the secondary outcomes:

In patients that received Dexmedetomidine

- Cdyn 30 minutes after one lung ventilation was significantly higher and plateau pressures significantly lower (only 5 trials measured intraoperative pulmonary mechanics)
- Postoperative lung function measured with FEV1, was slightly better in POD1 and 2 (only 2 trials analyzed postoperative lung function)
- Hospital length of stay was shorter but not statistically significant (only 5 trials reported length of stay data compared to placebo)

Subgroup analysis for the type of anesthetic, inhalation vs TIVA showed no effects among the groups for the primary outcome.

Subgroup analysis for the surgical technique or the secondary outcomes was not performed because of the small number of trials and cases.

The protective effect of Dexmedetomidine against postoperative atelectasis was maintained in the subgroup of trials that used protective lung ventilation but lost statistical significance when larger tidal volumes of more than 6ml/kg were used.

Assessment of the risk of bias showed low to moderate risk for bias.

The certainty of evidence was low for atelectasis and moderate for other pulmonary outcomes.

Discussion

There is a growing body of literature highlighting the favorable effects of dexmedetomidine such as enhanced pulmonary function recovery, improvement in lung mechanics, decrease of intrapulmonary shunt during one lung ventilation and anti-inflammatory properties. The authors of this meta-analysis aimed to determine whether Dexmedetomidine reduces the incidence of postoperative pulmonary complications in patients undergoing thoracic surgery. They concluded that intraoperative administration of Dexmedetomidine reduces atelectasis and improves oxygenation in the postoperative period.

There is insufficient evidence whether Dexmedetomidine decreases the incidence of pneumonia or other pulmonary complications. A large prospective randomized trial is needed.

Study Limitations

1. The studies analyzed had a small sample size and small event number.
2. Definitions of outcomes were not clearly stated, with the potential to vary between studies.
3. Heterogenicity of different parameters in the trials analyzed such as type and duration of surgery and technique, fluid management, ventilatory management or dose of Dexmedetomidine.
4. The prospective randomized trials analyzed were performed in Asia. Will the results apply for other places?
5. The certainty of evidence was moderate for pneumonia, ARDS, hypoxia but low for atelectasis most likely due to bias, which underscores the need for larger trial.

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Prevalence and Characteristics of Persistent Postoperative Pain After Thoracic Surgery: A Systematic Review and Meta-Analysis.

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Epub 2023 Jun 16. PMID: 37326863. Wang L, Yang M, Meng W.

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Wang et al a systematic review and meta-analysis of 90 studies including 19,001 patients who underwent thoracic surgical procedures requiring general anesthesia.[1] The authors sought to discover the occurrence of postoperative pain (PPP), which was defined as pain lasting > 3 months which was absent before the operation, and...localized at the surgical site'. Patients would have no other causes of this pain e.g., infection.

Methods

The authors performed a meta-analysis of 90 studies including 19,001 patients to assess the incidence of PPP after thoracic surgery. The studies included retrospective, prospective cohort studies, 22 randomized studies, and 1 case-control study. 56 and 11 studies focused on patients undergoing thoracotomy and video assisted thoracoscopy, and 13 did not differentiate between the two.[1] From these data, the authors assessed the incidence of PPP and contributing variables.

Results

Follow-up ranged from 3-93 months with a median of 12 months. Among the studies, PPP ranged from 4.8% to 74.6% with a pooled incidence of PPP of 38.1%. From 34 studies (2136 patients) 40.6% reported moderate-to-severe (rating scale ≥4/10) and from 22 studies (1428 patients) 10.1% of patients reported severe (rating scale ≥7/10) PPP. Also, 56.5% of patients with PPP required opioid analgesic use, and 33.0% showed a neuropathic component.

Subgroup analysis reported a lower incidence of PPP for VATS (25.6%) compared to open thoracotomy (40.2%). From 24 studies (2400 patients) pain at 3 months ranged from 20-71.4% with a prevalence of 45%. From 22 studies (2223 patients) pain at 6 months ranged from 8-74.6% with a prevalence of 38%. From 9 studies (921 patients) PPP at 12 months ranged from 7.5-49.3% with a prevalence of 24.7%. From 19 studies, more than 50% reported still using opioids.

The authors do not describe how neuropathic pain was defined and/or differentiated from nociceptive pain. Typically, nociceptive pain is described as relating to tissue trauma causing sharp, throbbing, or aching, while neuropathic pain arises from central or peripheral nervous system dysfunction and described as is shooting, stabbing, or burning. Nine studies (547 patients) reported an overall incidence of neuropathic pain in 33% of those experiencing PPP.

Conclusions

Wang et al concluded that there is need for improved 'prevention and treatment of PPP after thoracic surgery.[1]

The authors present a robust amount of data describing the incidence of PPP at 3,6 and 12 months after thoracic surgery and differentiating between thoracotomy and VATS. Other authors have performed meta-analyses and similarly reported a high prevalence of PPP at 3 months (57%; 17 studies; 1439 patients) and at 6 months (47% ;15 studies; 1354 patients) after thoracotomy.[2] The same authors presented data from a prospective observational including 30 thoracotomies and 69 VATS/Thoracoscopy cases and reported a statistically similar PPP of 33% and 25% respectively at 6 months.[3] In other data, PPP was reported in 17% 36 months after surgery, with 3% of cases diagnosed after 6 months.[4]

Disappointingly, among these thousands of patients there is little reported on predictive variables or on solutions. Other data report risk factors for PPP including a larger incision and a longer procedure,[4,5] while others report gender and psychosocial issues.[4,5,6]

The strength of the study by Wang et al is in its numbers.[1] Although the range of PPP among the

90 studies is large, there is no denying that postoperative pain beyond the hospital stay remains significant,[1] and that morbidity, mortality, and costs are increased as a result of it.[7] Wang et al differentiated between neuropathic and nociceptive pain.[1] While the latter should decline with time and is more readily managed, the former suggests nerve trauma/injury and possibly a more prolonged condition. One third of those with PPP experience symptoms consistent with neuropathic pain.

What can the anesthesiologist do to reduce its incidence? There are many reports of different techniques reducing early postoperative pain however, how these impacts on patients after discharge from the hospital is less known.[8,9,10] Most agree that regional techniques improve early postoperative pain control, their benefits are limited in duration.[11] Despite is limitations, Okmen et al reported that regional analgesic techniques can reduce chronic pain from 37% to 18% with benefits seen in both thoracotomy and VATS cases.[12]

However, the shift toward robotic surgery may be associated with a reduced application of regional analgesia techniques, especially single injection techniques, in favor of a multi-modal medical approach.[9,10] How these impacts on chronic pain are less well established?

Generally, nociceptive pain is expected to decline, while neuropathic pain may persist beyond 3-12 months after surgery. Algorithms to address neuropathic pain have been described.[13,14] These therapies are mainly reactionary after the diagnosis of neuropathic pain instead of being proactive. Reported response rates describe that 50% of patients have a 30-50% reduction in pain.[14]

- First-line treatments: Gabapentin/Pregabalin (Gabapentinoids) tricyclic antidepressants, and serotonin and norepinephrine reuptake inhibitors (SNRIs), topical agents (lidocaine; capsaicin), non-steroidal anti-inflammatory drugs (NSAIDs)
- Second-line treatments: Tramadol with first line medications
- Third-line treatments: Specialist referral; NMDA antagonists (ketamine, magnesium), Anticonvulsants, selective serotonin reuptake inhibitors
- Fourth-line treatments: Neuromodulation/Neurostimulation; Epidural or Spinal cord stimulation
- Fifth-line treatments: Low dose opioids
- Behavioral therapies can be introduced at any time

A multi-modal preventive approach would include initiating one or combinations of these medications prior to incision. Although mentioned as a topical agent, intravenous lidocaine improves pain management after various surgical procedures however, the duration is limited to the hospital period when patients have intravenous access.[15,16,17,18] Oral mexiletine has been given alone or in conjunction with regional analgesia.[19,20] Although pain control was improved and narcotic use reduced, there was no impact on PPP at 3 months. The limited benefit of these medications is that administration was limited to the hospital stay.[19,20] Future study might explore the benefits of continuing combinations of non-narcotic analgesia medications described for neuropathic patient beyond the hospital stay.

Cryoanalgesia of the intercostal space and nerves is a technique that can be performed at the time of surgery and improves both early postoperative pain control and reduces postoperative pain beyond the hospital stay.[21,22] Its modern-day application had gained prominence with the publication by Lloyd et al who successfully treated intractable pain in 52 of 64 patients with pain relief lasting 11-224 days.[23]

More recently Sepsas et al reported benefits of intercostal cryoanalgesia after thoracotomies that lasted up to two months postop.[22] Wallerian degeneration occurs in temperatures between –20°C to –100°C causing reversible destruction of the axon.[24] Since axonal regeneration occurs at a rate of approximately 1–2 mm per day sensory receptor, and conduction can start again and the block resolves causing the pain sensation to return within months.[24] However, cryoneurolysis can be repeated and without negative sequelae.[25]

The article by Wang et al highlights the persistent reporting of chronic pain that remains an issue over decades of time despite advances in thinking and the invoking of newer techniques and approaches.[1] A part of the problem may be the absence of attention to prevention and perhaps the absence of continued prophylactic therapies beyond the hospital stays. Pain

management is currently reactionary instead of being proactive. Perhaps there is an opportunity to combine multiple therapies including those medications targeting neuropathic pain along with cryoanalgesia.

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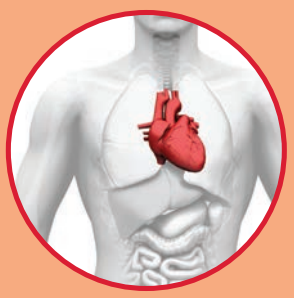

ECHO REVIEWS

In Situ Transesophageal Echocardiography During Electrical Cardioversion in Patients with Atrial Fibrillation – Safety and Echocardiographic Findings

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In Situ Transesophageal Echocardiography During Electrical Cardioversion in Patients with Atrial Fibrillation addresses the integration of transesophageal echocardiography (TEE) in the cardioversion process of patients undergoing atrial fibrillation (A-fib) ablation. This novel approach aims to enhance procedural safety and efficacy by providing real-time imaging and monitoring.

The study involved a cohort of patients with atrial fibrillation who underwent cardioversion, and the TEE probe was left in situ for various reasons to help with diagnosis and clinical management of the patients post procedure. The researchers utilized in situ TEE to guide the cardioversion process and to evaluate cardiac and valvular abnormalities both before and after cardioversion.

The use of TEE to evaluate for LAA thrombus before cardioversion has become routine practice especially with the advent of DOACS and shorter anticoagulation duration in patients.

However, the probe is not routinely left in situ after cardioversion to assess for success of the procedure. Key metrics evaluated included the success rate of cardioversion, LV function and severity of mitral regurgitation post procedure, complication rates and procedural efficiency.

The incorporation of in situ TEE during cardioversion provided several notable benefits:

1. **Enhanced Visualization:** Real-time imaging allowed for precise identification of thrombi in the left atrium and left atrial appendage, reducing the risk of embolic events during cardioversion
2. **Improved Safety:** Assessment for LA stunning and spontaneous echo contrast immediately post conversion helps to prevent embolic complications and evaluation of cardiac function and quantifying valvular regurgitation immediately post cardioversion when the patient is in normal sinus rhythm has diagnostic and therapeutic advantages.
3. **Efficacy:** Leaving the probe in situ and performing a comprehensive exam post ECV, could potentially eliminate the need for patients with low EF and moderate to severe MR to have another TEE procedure at the later date and avoid the risks and complications associated with probe placement and sedation.
4. **Procedure Time:** Although the integration of TEE added a minor increase in overall procedural time, this could be offset by avoiding the need for another TEE eval in the future.

The study highlights the significant advantages of using in situ TEE during cardioversion in the context of A-fib ablation. By ensuring that no thrombi are present before delivering the shock, the risk of stroke and other embolic complications is markedly decreased. Additionally, the ability to continuously monitor cardiac structures and function during the procedure allows for more precise and effective cardioversion.

The article also addresses potential limitations, such as the need for specialized equipment and training to perform TEE, as well as the slight increase in procedural time. However, the authors claim that these are outweighed by the benefits of enhanced safety and efficacy.

Conclusion

The integration of in situ TEE during cardioversion for patients undergoing A-fib ablation represents a significant advancement in electrophysiological procedures. This approach offers improved visualization, enhanced safety, and higher success rates, making it a valuable addition to the standard cardioversion protocol. Future research should focus on larger, multicenter studies to validate these findings and explore the cost-effectiveness of widespread implementation.

Characterization of Tricuspid Valve Anatomy and Coaptation Gap in Subjects Receiving Tricuspid Transcatheter Edge-To-Edge Repair: Observations from the bRIGHT TriClip Study

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Reviewer:
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Background

In 2019 it was estimated that within the US roughly 1.6 million people had moderate to severe tricuspid regurgitation (TR).[1] The etiology of which is usually secondary or functional. There are data demonstrating TR is independently associated with a worse prognosis regardless of the left ventricular function.[2-5] Despite the incidence of severe TR and poor prognosis, there is a disproportionate number of isolated tricuspid valve surgeries performed in the United States.[6]

The increased mortality with TR combined with the high risk of surgery makes percutaneous procedures a favorable alternative.[1,7-9] Among the various repair techniques tricuspid transcatheter edge to edge repair (T-TEER) is gaining popularity with the first case reports published in 2016.[7-9]

The T-TEER procedure produces a result like known surgical repair techniques such as modified Kay bicuspidization and the Clover technique1. In a small retrospective study in 69 patients the triple orifice technique resulted in 93% procedural success and bicuspidization resulted in 84% success.[10] The most common clip delivery systems are TriClip (Abbott) and PASCAL (Edwards Lifesciences). T-TEER has been demonstrated to be safe, reduce TR to moderate or less, improve 6-minute walk test, and resulted in higher Kansas City Cardiomyopathy Questionaire scores.[11-14]

TEER is validated in the treatment of mitral regurgitation most commonly with the MitraClip system (Abbott).[1] Unlike TEER of the mitral valve, there is a lack of standardized patient selection criteria and guideline-based recommendations in T-TEER15. Anatomic characteristics that aid in patient selection are not as well established in the population undergoing T-TEER.[1,15,16]

However certain characteristics that have been described can make for a favorable or unfavorable procedure. Criteria that are favorable for T-TEER are coaptation gap < or = 7 mm, anteroseptal jet location, confined prolapse or flail, TAPSE 13-17 mm, and a trileaflet valve morphology.[1,15]

Anatomic considerations that make leaflet grasping unlikely includes EROA >1.5 cm2, large septolateral coaptation gap > 8.5 mm, leaflet thickening/shortening resulting in tethering, leaflet perforation, anteroposterior jet location, limited echocardiographic visualization of the leaflets, and leaflet restriction due to the presence of a right ventricular lead.[1,15,16]

Utilizing data from the bRIGHT registry (NCT04483089)[14], Donal et al. describe tricuspid valve characteristics, such as coaptation gap, and effectiveness of the TriClip device (Abbott).

Methods

The bRIGHT (an Observational Real – World Study Evaluating Severe Tricuspid Regurgitation Patients Treated with the Abbott TriClipTM Device post approval study) is a prospective, multicenter, single arm registry evaluating the effectiveness and safety of the TriClip device (Abbott) in a post market setting (NCT04483089).

The registry was developed in 2020 between 26 participating sites in Europe with 511 subjects currently enrolled. Subjects were required to have severe symptomatic TR despite medical therapy, be at least 18 years of age, and be eligible for T-TEER based on currently approved

intended use14. Subjects TR was treated with the TriClip or TriClip G4 device. Subjects with treated NYHA functional class II or above at higher surgical risk were eligible for enrollment.

Results are based on the first 200 subjects with transgastric echocardiography. 135 of the 200 patients had acquisitions that were included in the analysis. Ethics committees at each of the participating sites approved the study. Funding is provided by Abbott.

Echocardiographic Data Included

Imaging from each subject was used to determine the coaptation gap and to anatomically describe the tricuspid valve, assess leaflet motion, and grade the regurgitation. Pre procedural transesophageal echocardiography was used for measurement. No intraoperative images were used. Coaptation gap was assessed across the anterior, mid, and posterior aspects of the RV inflow outflow view.

The TG SAX view was used for measurements in the mid and central regions of the posterior-septal (PS) and anterior-septal (AS) coaptation lines. The largest measurement in either the AS or PS mid/central regions defined the maximum coaptation gap. Only 22 of the patients had concurrent ME RV inflow outflow views with biplane. Inter-observer variability in gap measurements was assessed with 2 expert echocardiographers from 2 centers, on average the absolute difference in measurements was 1.2 ± 1.2 mm.

Of all TG SAX coaptation gap measurements 52% were < 1 mm different and 82% were < 2 mm different. RV inflow outflow views with biplane were lacking in most patients. The inter-observer difference was < 1 mm in 64% and < 2 mm in 91%.

All measurements performed by echocardiography core lab (INSERM 1099, CHU Rennes).

Statistical Analysisd

Data were summarized using SPSS (IBM, ver. 26). Data presented as mean +/- SD.

Outcomes

Clipping strategy, implant success, acute procedural success, and TR severity were used to confirm the population being selected for TEER is appropriate. Implant success was defined by deployment of at least 1 TriClip device at the time of the procedure.

Acute procedural success was defined as successful deployment of the TriClip with a TR reduction by 1 grade by the time of discharge. 30-day echocardiograms were performed if discharge echo was not performed or uninterpretable. 30 days major adverse events were based on a composite of cardiovascular mortality, myocardial infarction, stroke, new-onset renal failure, endocarditis requiring surgical intervention, and nonselective cardiovascular surgery for TriClip device related adverse events.

Results

Study group: 135 patients, female (50%), male (50%)

Age: 78 ± 9 years

Comorbidities: multiple, most common hypertension (83%), atrial fibrillation (82%), renal disease (41%)

Other conditions: Most subjects symptomatic, normal LVEF, normal TAPSE

Echocardiographic Outcomes

Tricuspid valve morphology: 72% trileaflet, 15% four leaflets (Type IIIB), 7% two leaflets
TR: Functional (91%), mixed (7%), lead induced (2%)
Annulus diameter 4.7 ± 0.7 cm
Tenting area and height: 1.8 ± 1.2cm2, 0.7 ± 0.3 cm respectively
Coaptation gap (anterior-septal coaptation line) TG SAX: 8.1 ± 3.1 mm (central), 5.2 ± 2.3 mm (mid)
Coaptation gap (septal-posterior coaptation line) TG SAX: 6.6 ± 3.2 mm (central), 3.8 ± 2.1 mm (mid)
Coaptation gap (anterior, mid, posterior ME RV inflow/outflow): 4.7 ± 2.4 mm (anterior), 5.2 ± 2.4 mm (mid), and 4.6 ± 3.0 mm (posterior)

Procedural Outcomes

Implant success excluded from 4 patients who were withdrawn prior to index procedure
TriClip (118/135)
TriClip G4 (17/135)
Implant success/acute procedural success for TriClip: 99% of cases (130/131)
Implant success/acute procedural success for TriClip G4: 91% of cases (111/122)
Acute procedural success was similar across gap sizes: 91% (gap < 7 mm), 89% (gap 7-10 mm), 95% (gap >10mm)
Average of 2.0 ± 0.8 clips
Clips placed: anterior-septal (AS) coaptation lines (71%)
Moderate or less TR at 30 days: 73.1% (gap < 7 mm), 78.6% (gap 7-10 mm), and 59.3% (gap >10mm)
Small sample sizes limited conclusions on percentage of subjects achieving moderate or less TR at 30 days with various TV morphologies

Conclusion

T-TEER is becoming more common for the treatment of TR. Anatomic variation, morphology, and coaptation gap of the TV may play a role in the success of the procedure. Clipping strategies can be influenced by the variation of the coaptation gap across the TV. Studies have given recommendations for the upper limits of coaptation gap to achieve procedure success.[1,15,16]

This post market study demonstrates success of T-TEER in the acute procedure phase and at 30 days at various coaptation gap lengths. Though at coaptation gaps > 10 mm moderate or less TR was observed in 59.3% of the cohort at 30 days.

Based on the findings of this study the ME RV inflow outflow view with biplane may be the ideal view to completely scan (anterior to posterior) the TV and measure the varying coaptation gaps along its length.

Further investigation is warranted to determine if there is an ideal coaptation gap for procedure success. Additionally, the echocardiographic views for measurement of the TV coaptation gap need to be standardized.

Study Limitations

Most subjects did not have both TG SAX and ME RV inflow outflow views. Increased sample size of various tricuspid valve morphologies would allow for further investigation regarding favorable anatomic features for T-TEER. Inter-observer variabilities exist. The majority of patient were treated with TriClip, which does not allow for independent leaflet grasping like the TriClip G4.

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Preoperative Anemia and Postoperative Outcomes in Cardiac Surgery: A Mediation Analysis Evaluating Intraoperative Transfusion Exposures

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Background

Several studies have shown that preoperative anemia may predispose patients to adverse outcomes after cardiac surgery[1-5] such as acute kidney injury (AKI), increased hospital length of stay, and is associated with perioperative red blood cell (RBC) transfusion. Anemia leads to organ damage from decreased tissue oxygen delivery resulting in tissue ischemia, release of proinflammatory cytokines, resulting in inflammation induced injury. If the above anemia-ischemia-inflammation mechanism of injury adds to the sequala of exposure to CPB (including inflammation, neurohormonal activation, microembolization, exposure to free hemoglobin from native RBC injury or transfusion, ischemia-reperfusion injury, and oxidative stress) the potential for organ damage increases. Correction of anemia before cardiac surgery has been shown to decrease intraoperative transfusion[6,7] and may improve outcomes.

However, exposure to RBC has also been found to increase adverse outcomes.[8-13] The relationship between preoperative anemia and RBC, in terms of their contribution to adverse outcomes, is not well understood. The authors of this study are addressing the question of: if and to what proportion, exposure to RBC mediates the adverse postoperative outcomes, such as AKI, that are associated with preoperative anemia.

Methods

This is a retrospective cohort, performed in a single large academic medical center, in accordance with the guidelines for Strengthening and Reporting of Observational Studies in Epidemiology. Study period: 5/1/2008-5/1/2018.

Inclusion criteria: Adults who underwent elective cardiac surgery requiring cardiopulmonary bypass (CPB), including coronary bypass (CABG), single and multivessel, valvular surgery, single and multivalve, smaller procedures such as surgical closure of patent foramen ovale (PFO) or ligation of left atrial appendage combined with a primary procedure.

Exclusion criteria: Robotic procedures, off pump procedures, combined CABG/Valve surgery, pulmonary valve procedures, preoperative IABP, ECMO, ventricular support devices, prior inclusion in the study or prior denial of use of medical records.

The WHO definition of anemia was used; women Hgb<12g/dL and men Hgb<13g/dL.
Institutional transfusion trigger: Hgb<8 or any hemoglobin in the presence of active bleeding.
Preoperative hemoglobin: the last value prior to surgery within the last 30 days
Primary outcome: postoperative AKI (presence or absence, stages 1-3)

Secondary outcome: mortality, hospital length of stay, reoperation or vascular complications within 7 days, pulmonary embolism, stroke, myocardial infarction.

Statistical analysis: Univariate and multivariate linear regression analysis was used to assess the associations between exposure (anemia) and mediator (intraop RBCs), mediator and outcome (eg. AKI), as well as exposure and outcome.

Mediation analysis[14-16] was performed to estimate the total and direct effects of exposure on outcome as well as the mediation effect and proportion of total effect attributed to the mediator.

Results

From the 4117 patients included in the cohort, 1234 (30%) had preoperative anemia.

	Preoperative anemia	No Preoperative anemia
Age	72 [64-79] years	69 [59-76] years
Male / Female	65% / 35%	53% / 47%
Charlson Comorbid. index	6 [4-8]	4 [3-6]
RBCs intraop	62%	23%
RBCs periop	80%	40%
AKI postop	17.7% (more severe)	7.6% (less severe)
Hospital stay	6.7 [5.7-8.5] days	5.8 [4.9-7.5] days
Return to OR	18.8%	15.2%
Vascular complications	5.4%	3.4%
Mortality	0.3%	0.1%

Multivariable analysis showed an association between preoperative anemia and intraoperative RBCs and both were associated with postop AKI and increased hospital length of stay.

The mediation analysis showed 6.4% [4.2%-8.7%] increase in the postoperative AKI in the presence of preoperative anemia. The lower the preoperative hemoglobin the higher the increase in postoperative AKI.

The increase in postoperative AKI in the presence of preoperative anemia was primarily from direct association, only 7.5% [-4.3% to 21.1%] of the total effect was mediated through intraoperative RBC transfusion. There was an incremental increase in the hospital length of stay in association with the incremental decrease in hemoglobin.

The association found between preoperative anemia and increased length of hospital stay was mediated by 37.9% [22.4%-61.6%] of total effect by intraoperative RBCs. Preoperative anemia was not associated with reoperation or vascular complications. In women, the presence of preoperative anemia was associated with a 6.1% [1.8-10.5%] increase in probability of reoperation, without mediation effect from RBCs. No association between preoperative anemia and reoperation was found among men.

In secondary analysis, performed to assess for potential mediation effect of the lowest intraoperative hemoglobin, postoperative AKI and postoperative length of stay were primarily direct effects of preoperative hemoglobin, with the nadir intraoperative hemoglobin offering only small mediation effect.

Discussion

Both preoperative anemia and intraoperative blood transfusion have been associated with adverse outcomes such as AKI and prolonged hospital stay. In this single center retrospective cohort of 4117 patients, the relationship of exposure with outcome and possible mediation of intraoperative RBCs was assessed.

Postoperative AKI was mostly attributed to preoperative anemia, but length of hospital stays to both, preoperative anemia, and intraoperative RBCs, showing that the attributable effects of anemia and RBCs vary across outcomes.

This neither describes causality nor undervalues the adverse effects of low intraoperative hemoglobin on outcomes but rather describes the direct effects and proportional mediation of anemia and RBCs on outcomes.

Study Limitations

1. The observational nature of the study does not exclude possible residual confounders despite the adjustments.
2. Proportional mediation describes the association but does not imply causality.
3. Differences in the complexity of the procedure and the exclusion of certain procedures limits application.
4. Retrospective nature of the study, e.g., not all information is available like the cause of anemia, results may differ per cause.

5. Implementation of anemia corrective strategies and how this will affect the results was not studied.
6. Post operative RBCs as mediator was not studied.

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Preoperative Anemia and Postoperative Outcomes in Cardiac Surgery: A Mediation Analysis Evaluating Intraoperative Transfusion Exposures

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Background

Preoperative anemia is common in patients undergoing elective cardiac surgery, with an estimated prevalence of up to 54%1. Ample literature describes the association of preoperative anemia with adverse outcomes in cardiac surgery, including increased risk of death, stroke, acute kidney injury (AKI), infection and prolonged hospital length of stay (LOS).[1-3]

Several mechanisms may place anemic patients at increased risk of these complications. Anemia may predispose to inadequate delivery of oxygen to tissues, leading to organ dysfunction such as AKI.[4] Preoperative anemia is also associated with comorbidities including reduced left ventricular ejection fraction and impaired renal function, which may predispose to postoperative organ dysfunction.[5]

Moreover, preoperative anemia is an important risk factor for perioperative red blood cell (RBC) transfusions, which are independently associated with postoperative morbidity and mortality.[3,6] This may be the result of alterations in red cell function and structure or the accumulation of pro-inflammatory cytokines in stored blood, which may be exacerbated by cardiopulmonary bypass and contribute to organ injury.[3]

However, it is unclear whether the observed complications of preoperative anemia are direct effects of the anemia itself, are mediated through perioperative RBC transfusions, or both.[7] Elucidating this relationship can help to define the primary goal of preoperative blood management, whether it be optimization of preoperative hemoglobin concentrations, reducing RBC transfusion rates, or a combination of the two.

The authors of this retrospective cohort study assessed the associations between perioperative anemia and postoperative outcomes in patients undergoing cardiac surgery, with an emphasis on the mediation of these relationships by RBC transfusion exposures.

Methods

This retrospective observational cohort study examined adults undergoing isolated coronary artery bypass grafting (CABG) or single or double valve surgeries on cardiopulmonary bypass at the Mayo Clinic between May 1, 2008, and May 1, 2018. Patients undergoing off-pump procedures, robotic procedures, combined CABG and valve surgeries, pulmonary value surgeries and those with preoperative use of mechanical support were excluded.

The primary exposure of interest was preoperative anemia as defined by the World Health Organization (WHO) criteria of hemoglobin concentration < 12 g/dL in men and < 13 g/dL in women. Intraoperative allogenic RBC transfusion volume (units) was evaluated as a potential mediator of the association between preoperative anemia and primary and secondary outcomes.

The primary outcome was postoperative AKI, defined by the Kidney Disease Improving Global Outcomes (KDIGO) creatinine criteria.

Secondary outcomes included hospital length of stay, hospital mortality, reoperation within 7 days, and vascular complications, defined as a composite of pulmonary embolism, stroke or myocardial infarction within 7 days.

Of note, institutional guidelines recommended intraoperative blood transfusion for a hemoglobin concentration < 8 g/dL or in the presence of rapid bleeding.

The authors utilized both unadjusted and mediation analyses to estimate the total and direct effects of preoperative anemia on postoperative AKI and secondary outcomes, as well as the mediation effect and proportion of total effect mediated by intraoperative RBC transfusion.

Results

A total of 4117 patients were included, 30% (1234 patients) of which experienced preoperative anemia. 11% of patients (437/4117) developed AKI, with higher rates observed in anemic versus non-anemic patients (17.6% v. 7.6%). On multivariable analysis, preoperative anemia was associated with increased rates of postoperative AKI (6.4% [4.2%-8.7%], P < .001) and longer hospital LOS (1.07 [1.05-1.10], P < .001). Preoperative anemia was also associated with increased intraoperative PRBC transfusion (OR 3.11 [2.88 – 3.35], p < 0.001), and both exposures were associated with AKI and increased hospital LOS.

In mediation analyses, the association between preoperative anemia and postoperative AKI was primarily due to direct effects of preoperative anemia (5.9% [3.6%-8.3%] absolute difference, P < .001) rather than mediated through intraoperative RBC transfusions (7.5% [-4.3% to 21.1%] of the total effect mediated by transfusions, P = .220). Preoperative anemia was associated with longer hospital LOS (1.07 [10.5 – 1.10] ratio of geometric means, p<0.001), with an estimated 38% (22.4% - 61.6%) of the total effect mediated through intraoperative RBC transfusion.

Incremental decreases in preoperative hemoglobin levels were associated with further increased risk of postoperative AKI and prolonged hospital LOS. Preoperative anemia was not associated with reoperation or vascular complications.

Discussion

The results of this study indicate that the association between preoperative anemia and AKI may be primarily related to direct effects of preoperative anemia rather than mediated through intraoperative PRBC transfusions. Although the underlying mechanisms remain unclear, the findings of this study are consistent with prior literature demonstrating preoperative anemia as a clinically significant and potentially modifiable risk factor for AKI after cardiac surgery.[1,4]

In addition, the association between preoperative anemia and prolonged hospitalization may be both a direct effect of preoperative hemoglobin concentration and mediated through transfusion exposures. This suggests that different outcomes may be variably affected by preoperative anemia and/or intraoperative PRBC transfusion.

Limitations of Study

Several limitations of this study exist. First, the data are observational, and the possibility of residual confounding variables persists. This study highlights a mediation framework and does not establish any form of causality.

Moreover, both single and double valve surgeries were included, which may have different outcomes based on the inherent difference in complexity of these procedures. Generalizability is limited as off pump CABG procedures and combined CABG-valve procedures were excluded, and because the study was performed at a single academic center.

Finally, this study failed to present the causes of preoperative anemia, or the effect of postoperative blood transfusions, such that postoperative outcomes could have been influenced by the underlying causes of anemia or transfusions at other time periods.

Conclusion

Overall, the associations between preoperative anemia and adverse outcomes in cardiac surgery are not completely attributable to the effects of transfusion, and the relative contribution of anemia and PRBC transfusion may vary depending on the outcome of interest.

However, it is possible that augmentation of preoperative hemoglobin, in the absence of transfusion, may improve postoperative outcomes such as AKI.

Further studies are needed to evaluate the impact of anemia and transfusion on other complications following cardiac surgery, to elucidate the mechanisms of anemia-associated postoperative organ dysfunction and to enhance preoperative optimization strategies in cardiac surgery patients.

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