

## PRESIDENT'S MESSAGE



**Kathryn E. Glas**  
MD, MBA, FASE

*President  
Society of  
Cardiovascular  
Anesthesiologists*

### Greetings SCA Members!

It was wonderful seeing so many of you in Portland last month, and I am looking forward to seeing even more of you in Toronto next year when we have our first ever joint meeting with our surgical colleagues from AATS. My first task as President is to thank the Scientific Planning Committee for an excellent meeting. Our stellar team leaders, Dr. Mary Beth Brady, Dr. Jonathan Ho and Dr. Stephanie Ibekwe created an excellent program. TAS and COR-PM had successful meetings on Friday, and our congratulations go out to Dr. Randy Blank and Dr. Karsten Bartels for their efforts as well. The meetings provided 62 hours of CME content for in person and enduring participants. 22.5 hours of credit qualify for MOCA CME patient safety credit. Next year, we will also designate echocardiography hours for individuals seeking renewal of board certification.



**"Thank you  
to our stellar  
Scientific  
Sessions  
team leaders  
who created  
an excellent  
program."**

It is my hope each of you and your families have successfully navigated the global pandemic and are healthy and enjoying the 'new normal'. Creation of virtual content is now ubiquitous, and we have learned how to successfully plan hybrid meetings. SCA University is thriving, and our colleagues continue to generate excellent content for members. Be on the lookout for Board Review materials from the Program Directors group as you begin studying for the ACTA exam in December. All the content on SCA University, including CME materials, are free for society members.

The gavel was passed, literally, to the next Executive Committee at our Business Meeting on May 8. Thank you to Dr. Stan Shernan for your many years of service to the Society, and congratulations for the much-deserved Lifetime Achievement Award. He steps away from his role as Immediate Past President, and I am grateful he has agreed to remain active in the Society as a member of the International Council. Thank you to Dr. Shaw for two years of leadership of our Society, we look forward to your ongoing role as Immediate Past President. Dr. Amanda Fox has been selected as President-Elect, and we welcome Dr. Doug Shook to the team as Secretary Treasurer. I foresee a bright future for our Society with this intelligent, strategic, and thoughtful team leading the way. We welcome your feedback on how the leadership team can improve the Society for you as members. You can reach me at [president@scahq.org](mailto:president@scahq.org).

Congratulations to Chris Troianos, MD as he received the Distinguished Service Award. After completing his term as President and Immediate Past President, his service to the Society and our specialty continues with his roles at the NBE and ABA. He is largely responsible for recognition of Cardiac Anesthesia with a board certification process through the ABA. We are fortunate he has agreed to remain active in our Society as a member of the Endowment Council.

*continued...*

**"I foresee a  
bright future  
for our society  
with this  
intelligent,  
strategic, and  
thoughtful  
team leading  
the way."**

We could not function as well as we do without our management company, Veritas. Sue O'Sullivan, Donna Kelly, Jim Pavletich, Denise Herdrich, and Mary Lunn have been supporting us for almost 3 years. They have helped achieve the success of SCA University and the excellent organization of our educational meetings and content. They also support all our research mission through committee and post award support. We have added a new team member to support the growing education mission of the Society. Nicole Cranston joined us most recently as the Director of Education for the Society. She oversees all aspects of our education mission, and her experience in ACCME accreditation will guide us through our upcoming reaccreditation cycle.

The Society is in excellent financial health. Superb investment managers and our Society treasurer, Executive Committee and Board of Directors have ensured long-term viability through use of thoughtful and strategic investment strategies. We have used these monies to fund multiple research grants, DEI grants, SCA University and CME meetings. We now can further expand funding of strategic priorities, and the Board of Directors will meet to discuss next steps at our next meeting. You are welcome to reach out with suggestions for funding priorities.

Dr. Shaw created a History Task Force, and they are responsible for the timeline that was in the registration area at the meeting. The timeline will be greatly expanded as online content soon! Thanks to Drs. Gravlee, Ramsay, Reeves and Sladen for their efforts. Thanks to Drs. Wahr, Nussmeier and Reich, and the entire Endowment Council, for a successful Gala Event that raised over \$100,000 for the Endowment fund. This fund has supported research and leadership grants over many years. Dr. Reich is stepping away from his leadership role and we welcome Dr. Bel Russell as Chair.

Recognizing the changing landscape of education, we have convened an Education Task Force, led by Dr. Annemarie Thompson, charged with assessing current and future state of CME offerings and recommending solutions to keep us ahead of the curve on excellence in education well into the future.

**As President my priorities for the next two years are to use our 45th anniversary as a Society as a springboard towards planning success into the next 45 years, and beyond.**

**Member Engagement:** We are graduating approximately 240 Cardiac Anesthesiologists per year and ACTA has been an accredited fellowship since 2006. How can the Society better engage our colleagues? The Education Task Force, Member Engagement Committee and Board have been asked to identify mechanisms to increase participation by both academic and community practice colleagues who will identify SCA as their 'go to' source for their specialty. I encourage community practice colleagues to volunteer on committees and share your knowledge.

**Research:** Continuing our strong support of knowledge acquisition around how we can improve patient care throughout the perioperative period. Our keynote speaker provided key insights into the role of health equity in improving care. My goal is to continue Dr. Shaw's perioperative medicine work through funding opportunities, including study of the impact of outreach to at risk communities and mechanisms to improve preoperative status to decrease perioperative morbidity.

**International collaboration:** As the pandemic comes to an end and global travel resumes, we are ready to re-invigorate our international collaborations for education and research across the globe. We will be exploring numerous international collaboration opportunities to further the goals of Drs. Shernan and Shaw that were delayed by COVID.

**Diversity:** We are fortunate to have WICTA and their great work towards support of women in cardiac anesthesiology. The DEI Committee sponsored excellent sessions and our keynote

*continued...*

speaker, and they have been charged with creating content around implicit bias for all SCA leaders to ensure we maintain an eye towards diversity, equity, and inclusion in all components of our work.

It is my great honor to lead this Society that has given me so much since I first attended, as a fellow, in 1997. My goal is to secure the success of the Society for many years to come through dedicated focus on strategic planning for the future, including development of our teams and use of our new leadership organization structure to offer longitudinal growth opportunities for anyone interested in serving the Society. Dr. Shaw's vision around professional development started us along the path towards continued excellence and it is my honor to guide the journey into the future.

Sincerely,

*Kathy*





## Andrew Shaw

MB, FCCM, FFICM, FRCA

*Immediate Past-President  
Society of Cardiovascular  
Anesthesiologists*

# OUTGOING PRESIDENT MESSAGE

As my term as President ends, I wanted to take a moment to express my deep gratitude and admiration for each one of you. It has been an honor and privilege to serve as SCA president for the past two years, representing our distinguished Society both at home and abroad.

Over the past few years, we have faced numerous challenges and witnessed remarkable achievements. Despite the unprecedented circumstances that tested our resilience, I am incredibly proud of how our Society has come together, adapting, and evolving to meet the needs of our patients and the cardiovascular community.

Together, we have fostered a spirit of collaboration and knowledge-sharing, which has propelled us forward in advancing the frontiers of our specialty. Through our conferences, symposiums, and educational initiatives, we have provided a platform for groundbreaking research, innovative techniques, and the dissemination of invaluable clinical insights.

Our dedication to patient care remains unwavering. We have championed patient safety, advocated for excellence in perioperative management, and pushed the boundaries of science to improve outcomes for those entrusted to our care. By embracing cutting-edge technologies and embracing multidisciplinary collaboration, we have transformed the landscape of cardiovascular anesthesiology.

I would like to express my deepest appreciation to the exceptional individuals who have served on the Board of Directors, Committees, and Task Forces. Your commitment, expertise, and tireless efforts have been instrumental in driving our Society's progress. Your dedication to advancing the field and supporting your fellow members is truly commendable.

To the young professionals and trainees within our Society, I encourage you to embrace every opportunity for growth and learning. You are the future of cardiovascular anesthesiology, and your passion and enthusiasm are the catalysts for innovation and progress. As you embark on your careers, please know that the Society of Cardiovascular Anesthesiologists will continue to be a steadfast resource and a nurturing community for your professional development.

Lastly, I extend my heartfelt thanks to each member of our Society. Your engagement, collaboration, and unwavering commitment to excellence have made my tenure as President an incredibly rewarding experience. I am humbled by your trust and support, and I am confident that under the leadership of Dr. Kathy Glas, our new President, our Society will continue to flourish and push the boundaries of cardiovascular anesthesiology.

As I conclude my term, I leave you with a resounding call to action. Let us remain united in our pursuit of excellence, unwavering in our dedication to patient care, and committed to advancing the frontiers of cardiovascular anesthesiology. Together, we will shape the future of our specialty and continue making a profound impact on the lives of our patients.

Thank you once again for the honor to serve as your President. I wish you all continued success, fulfillment, and great achievements in the years to come.

With sincere appreciation and warm regards,

*Andy*

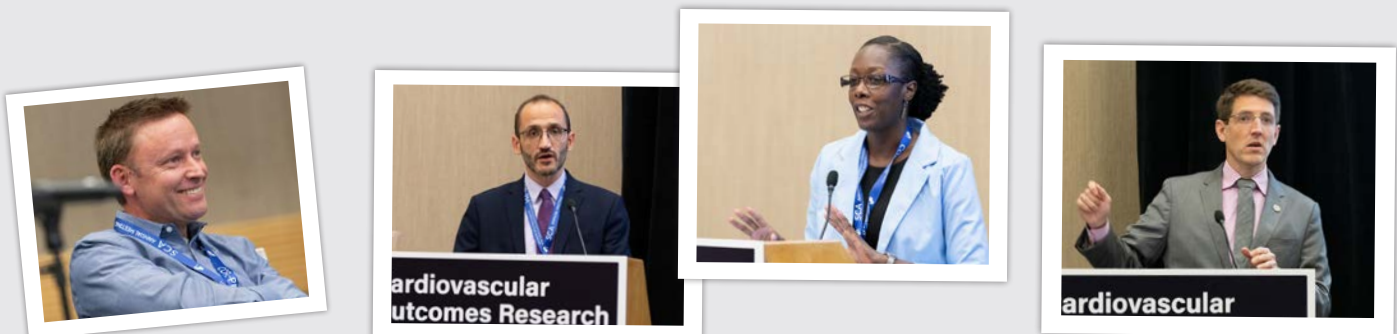
## Thank You to All Who Attended In-Person and Virtually!

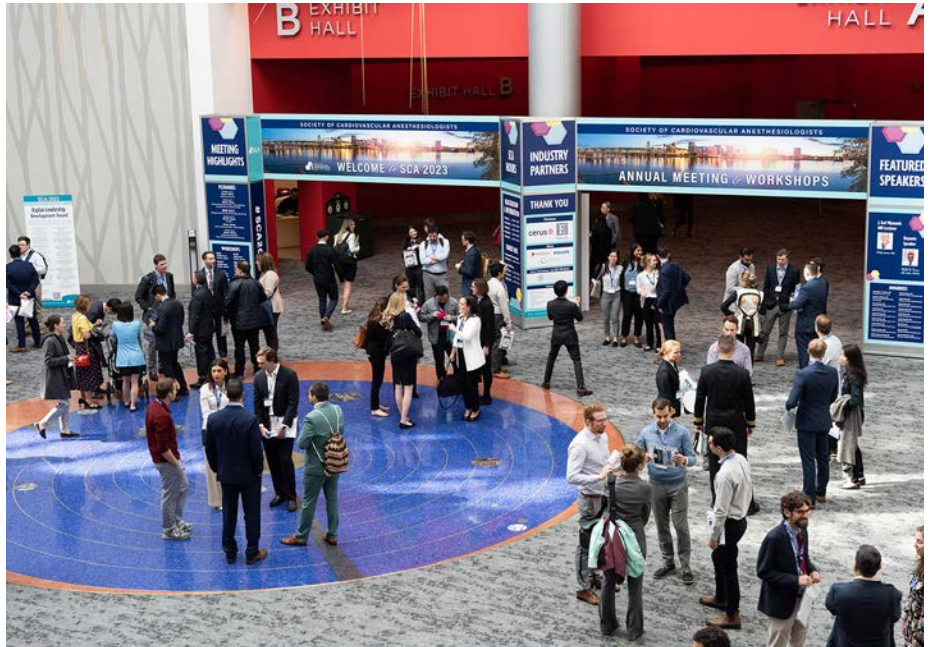
On behalf of the Program Planning Committees, THANK YOU to the attendees and faculty for making the 2023 Meetings such a huge success! We hope you enjoyed the meetings as much as we did!

### TAS



### COR-PM







## Past, Present and Future: SCA Presidents Gather at the SCA Annual Meeting



Back Left to Right – Drs. Fox, Davis, Reves, Shernan, Gravlee, Ramsay, Troianos, Shore-Lesserson  
Front Left to Right – Drs. Waller, Shaw, Thys, Wynands, Burgess, Glas



### Do Not Forget to Claim Your CME!

#### MEETING ATTENDEES –

Have you claimed your CME credits yet?

CME credits are available through November 9, 2023.



**SAVE THE  
DATE**

## SCA Echo Week 2024

2024 Annual Echo Week will be held February 16-18, 2024, in Atlanta, Georgia, 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.

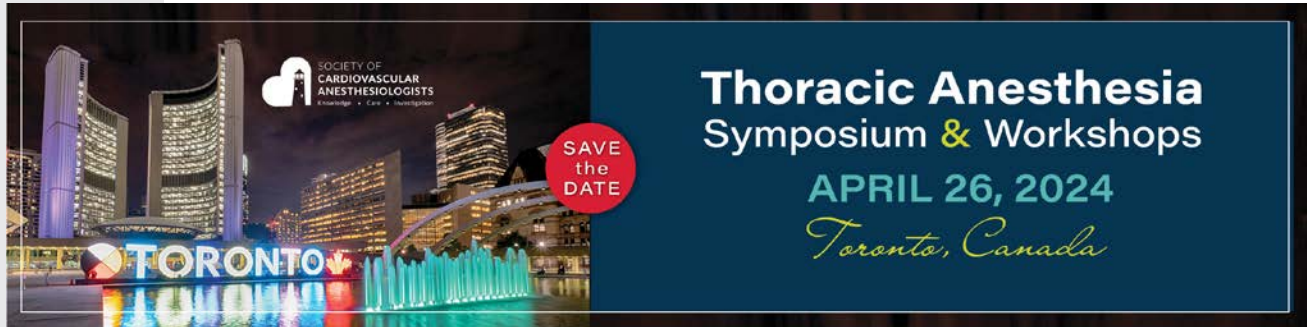


**SAVE THE  
DATE**

## SCA COR-PM 2024

Join us for the Annual Cardiovascular Outcomes Research in Perioperative Medicine (COR-PM) conference to be held April 26, 2024, in Toronto, Canada, Hyatt Regency Toronto.

More details forth coming in the coming months.



**SAVE THE  
DATE**

## SCA Thoracic Anesthesia Symposium 2024

SCA and the TAS Planning Committee will hold its Annual Thoracic Anesthesia Symposium in Toronto, Canada, April 26, 2024, Hyatt Regency Toronto.

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

More details forth coming in the coming months.

### TAS Abstracts – Don't Miss Out on Your Chance to Present 2024

You are invited to submit a scientific abstract or complex case for consideration for the 2024 Thoracic Anesthesia Symposium!

**Call Opens: September 2024**

SCA website will be updated as more information becomes available.

SCA

## SCA 2024 ANNUAL MEETING & WORKSHOPS



IN COLLABORATION WITH



April 27-30, 2024 • Toronto, Canada



**SAVE THE  
DATE**

## SCA 46th Annual Meeting is in Toronto, Canada

SCA and the Scientific Program Committee invite you to join us in Toronto, Canada for the 46th Annual Meeting and Workshops, April 27-30, 2024, Hyatt Regency Toronto in conjunction with the American Association of Thoracic Surgeons (AATS).

**Mark your calendar NOW** to join us for the 46th Annual Meeting and Workshops in Toronto, Canada. More details forthcoming in the coming months.

### PBLD Submissions for the 2024 Annual Meeting

Submit your 2024 Problem Based Learning Discussion for the Annual Meeting & Workshops.

When submitting a PBLD, you will be asked to complete the following information:

- Primary Moderator Information\*
- Co-Moderator Information (optional)
  - Full Name (including all credentials)
  - Email
- PBLD Title\*
- Session Objectives\*
- Overview of the Case Presentation\*
- Case Questions (optional)

**Call for submissions will open in July 2024.**

Only one submission per person will be considered.

SCA website will be updated as more information becomes available.

**OPEN  
SOON!**

### Submit an Abstract for the 2024 Annual Meeting

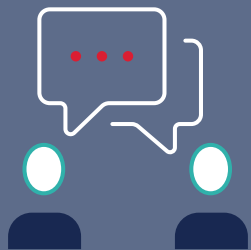
Get ready to submit your scientific abstract or complex case to be considered for presentation at the 2024 Annual Meeting & Workshops!

Submissions will be accepted for the following calls:

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

**Call opens: September 2024**

SCA website will be updated as more information becomes available.



## Thank You for Your Service

### SCA Outgoing Leaders

SCA would like to recognize the 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.



**Stanton K. Shernan, MD, FAHA, FASE**

Brigham and Women's Hospital  
*Immediate Past-President, 2021-2023*



**James Ramsay, MD**

University of California San Francisco  
*Founding Officer Successor, 2017-2023*



**Kenichi "Ken" Tanaka, MD**

University of Oklahoma Health Sciences Center  
*Board Director, 2020-2023*



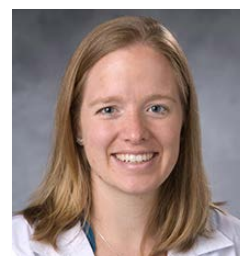
**Ludmil Mitrev, MD**

Cooper University Hospital  
*Board Director, 2021-2023*



**David L. Reich, MD**

Mount Sinai Hospital  
*Endowment Council Representative, 2021-2023*



**Brandi Bottiger, MD**

Duke University  
*CME Committee, 2019-2023*



**Rebecca Ann Aron, MD**

The University of Nebraska Medical Center  
*Nominating Committee, 2021-2023*



**Abimbola O. Faloye, MD**

Emory University  
*Nominating Committee, 2021-2023*



# Meet SCA'S 2023-2024 LEADERSHIP TEAM

## SCA 2023-2024 Executive Committee



**President**  
Kathryn E. Glas  
MD, MBA, FASE



**President-Elect**  
Amanda A. Fox  
MD, MPH



**Secretary/  
Treasurer**  
Douglas C. Shook  
MD, FASE



**Immediate  
Past-President**  
Andrew D. Shaw  
MB, FCCM, FFICM, FRCA

## SCA BOARD OF DIRECTORS

### Directors-at-Large



James H. Abernathy  
MD, MPH



Tara R. Brakke  
MD, FASE



Andra E. Duncan  
MD, MS



Danny Muehlschlegel  
MD, MMSC, FAHA



Daryl Oakes  
MD



Annemarie Thompson  
MD

### Early Career Directors



Jessica Brodt  
MD



Stephanie Ibekwe  
MD



Linda Shore-Lesserson  
MD



Scott Reeves  
MD



**Chair**  
Mary Beth Brady  
MD



**Vice-Chair**  
Jonathan Ho  
MD

### Founding Officer Successor

### Scientific Program Committee

### Appointed by President



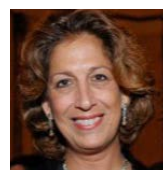
Lisa Rong, MD

### Appointed Canadian Representative



Hilary Grocott  
MD, FASE, FRCPC

### Endowment Oversight Council Representative



Isobel A. Russell, MD

### EACTAIC Liaison



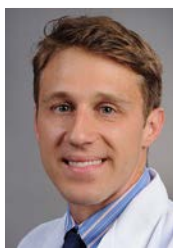
Patrick Wouters, MD



Congratulations  
to SCA's  
2023 Grant  
Recipients!

## 2023 Award Recipients

SCA is excited to announce the following 2023 grant winners and award winners.



### SCA/IARS Mid-Career Research Grant

\$50,000 per year for 2 years

**Grant Title:** Hemodynamic Profiles of Cardiovascular Dysfunction and Risk of Cardiac Surgery Associated Kidney Injury in Patients with Preserved Ejection Fraction.

**Lee Goeddel, MD**

Johns Hopkins School of Medicine



### SCA/IARS Starter/Diversity & Inclusion Research Grant

\$25,000 per year for 2 years

**Grant Title:** Bilateral Paravertebral Blockade for Improvement of Quality of Recovery Following Cardiac Surgery: A Randomized Controlled Trial.

**Terri Sun, MD**

University of British Columbia



### SCA/IARS Starter/Diversity Research Grant

\$25,000 per year for 2 years

**Grant Title:** Machine Learning of Physiological Waveforms and Electronic Health Record Data: Towards Predicting Hemodynamic Instability in Adult Congenital Heart Disease Surgical Patients.

**Tiffany Williams, MD**

University of California - Los Angeles - UCLA



### SCA In-Training Grant

\$15,000 for 1 year

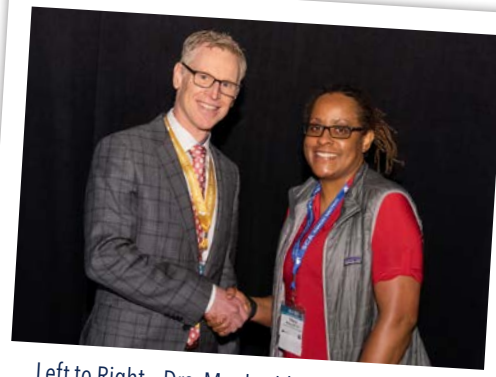
**Grant Title:** Morbidity and Mortality after High-Dose Hydroxocobalamin Refractory Vasoplegia: A Retrospective Propensity Score Analysis of Safety and Efficacy.

**Luai Zakaria, MD**

Cleveland Clinic



Left to Right - Drs. Muehschlegel and Sun



Left to Right - Drs. Muehschlegel and Williams



## SCA KAPLAN LEADERSHIP DEVELOPMENT AWARD WINNER



*Leadership Project Title: **Brigham Leadership Program***

Congratulations to Sergey Karamnov, MD, who has been named the 2023 Kaplan Leadership Development Award recipient.

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.

This \$10,000 grant consists of \$5,000 from the SCA Endowment with \$5,000 matched from the applicant's institution to fund a leadership education strategy.

**Sergey Karamnov, MD**  
*Brigham and Women's Hospital*

## SCA 2023 EARLY CAREER INVESTIGATOR AWARD WINNERS



*Abstract Title:*  
***Hemodynamic Effect of Norepinephrine Versus Vasopressin on the Pulmonary Circulation in Cardiac Surgery Patients***

**Abey Abraham, MD**  
*Cleveland Clinic*



Left to Right – Drs. Ho, Abraham, Rong



*Abstract Title:*  
***Right Ventriculo-Arterial Coupling Assessment by High-fidelity Hemodynamic Measurements in Patients Undergoing Left Ventricular Assist Device Implantation***

**Crosby Culp, MD**  
*Duke University School of Medicine*



Left to Right – Drs. Rong, Culp, Ho



*Abstract Title:*  
***Effectiveness of Erector Spinae Plan Block in Perioperative Pain Control in Minimally Invasive Cardiac Surgical Patients***

**Mohamed Fayed, MD**  
*Henry Ford Hospital*



## SCA 2023 EARLY CAREER INVESTIGATOR AWARD WINNERS

*Abstract Title:*

***Pulmonary Artery to Aorta Diameter Ratio as A Marker of Inotropic Support After Left Ventricular Assist Device Implantation***

**Renan Ferrufino, MD**  
Tufts Medical Center



Left to Right – Drs. Rong, Ferrufino, Ho



*Abstract Title:*

***The Impact of Anesthetic Agents on Regional Cerebral Blood Flow During Carotid Artery Clamping in patients with Debranching Thoracic Endovascular Aortic Repair***

**Yusuke Nakano, MD**  
Iwate Medical University

## Congratulations to SCA's 2023 Early Career Recipients



Left to Right – Drs. Rong, Culp, Ferrufino, Fayed, Abraham, Nakano, Muehlschlegel, Ho

# AWARDS



## 2023 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.*

**Christopher A. Troianos, MD, FASE, FASA**  
Cleveland Clinic



Left to Right – Drs. Shaw and Troianos



## 2023 PRESIDENTIAL LIFETIME OUTSTANDING SERVICE AWARD WINNER

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

**Stanton K. Shernan, MD, FAHA, FASE**  
Brigham and Women's Hospital



Left to Right – Drs. Shaw and Shernan

# AWARDS

## 2023 SCA Junior Resident Scholar Grant Recipients

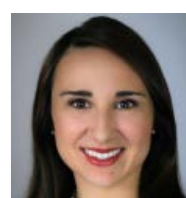
SCA's Diversity, Equity and Inclusion Committee (DEI) awarded ten junior residents with the first annual Junior Resident Scholarship Grant. The winners were announced during the SCA Annual Meeting in Portland, Oregon.



**Belle Benanzea-Fontem, MD**  
*University of California  
Los Angeles (UCLA)*



**Renan Ferrufino, MD**  
*Tufts Medical Center*



**Megan Hunt, MD**  
*Brigham and Women's  
Hospital*



**Zulqar Islam, MD**  
*Medical College of Georgia  
Augusta University*



**Lawrence Jones, MD**  
*Virginia Commonwealth  
University*



**Kelsei Keene, MD**  
*Vanderbilt University  
Medical Center*



**Rachel Reindorf, MD**  
*University of Maryland*



**Kyra Rodi, MD**  
*University of Colorado*



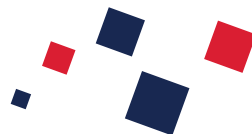
**Okola Tull, MD**  
*Medical College of Georgia  
Augusta University*



**Andres Zorrilla-Vaca, MD**  
*Brigham and Women's  
Hospital*

# Special Thank You

to Our Keynote Speaker, Dr. Clyde Yancy



Drs. Glas, Shaw, Yancy



Dr. Yancy



Drs. Shaw, Glas, Yancy, Brady, Sileshi



DEI Committee with Dr. Yancy



Drs. Glas, Yancy

# And

to Our J. Earl Wynands, MD Lecturer, Dr. Philip Jones



Dr. Philip Jones talking with an SCA member.



Dr. Philip Jones



# Gala

## Thank You for Making Our 2023 Gala a Night to Remember!

It's been years since SCA held its last Gala, and yet, leadership is humbled by the number of people who showed up to support the SCA Endowment. On May 6, 2023, we had a record of over 400 guests!

During the gala, you generously donated more than \$50,000, helping us exceed our goal of raising more than \$115,000 for research and programs of SCA.

Whether you donated or attended the Gala, you helped us reach our goal and work toward our mission.

The commitment from the Board of Directors and the Endowment Council made the night a great success.

If you would like to donate, the SCA Endowment Fund online donation page is available. Making an online donation is quick, easy, and secure. To complete the online donation form:

[DONATE HERE](#)



# Gala





# Gala

## Special Thank you to the Research Committee!

Thank you to the SCA Research Committee whose mission is to encourage and support research that focuses on cardiovascular and thoracic anesthesia. To assess the scientific validity/merit of research grants submitted for funding from the SCA Endowment fund.

Thank you to Dr. Danny Muehlschlegel for your time, direction, and dedication for the past six years as the Research Committee Chair. Congratulations on your new position as a Board member and the Board liaison to the Research Committee.



Get Your  
Online  
Content  
Today!

### 2023 TAS and Annual Meeting Online Content — Still Available

The SCA 2023 Annual Meeting and Workshop lectures will be available for purchase. If you still need to purchase the content, please watch for the announcement in your email.



## We'd Like to Hear from YOU!

Please participate in this important survey, "Global Cardiac Anesthesia Workforce Assessment". The aim of this first-ever on such a large scale, truly international global survey is to assess who we are as a specialty and as individuals practicing #cardiac #anesthesia.

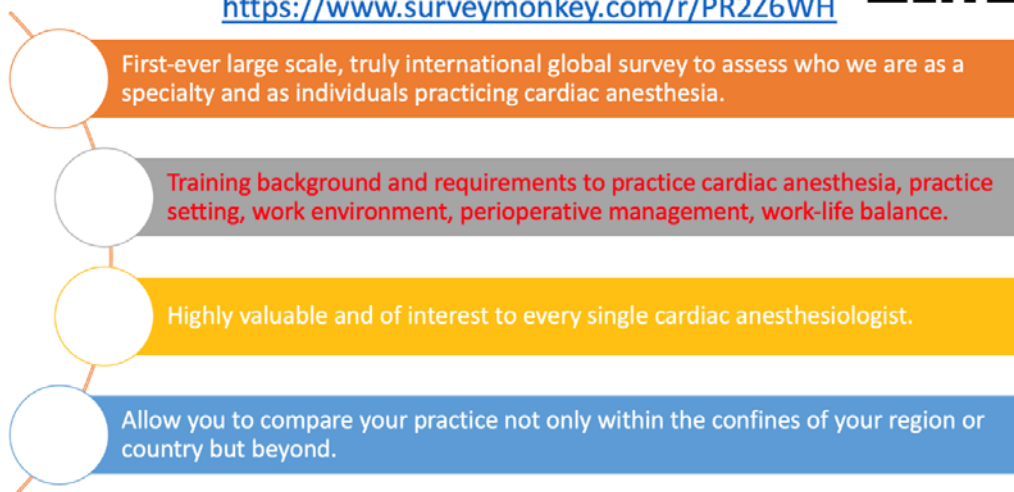
<https://www.surveymonkey.com/r/PR2Z6WH>



## Global Cardiac Anesthesia Workforce Assessment



<https://www.surveymonkey.com/r/PR2Z6WH>



## 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 two Directors-at-Large, two Early Career Directors and one member to the Continuing Education Committee (CME).

The CME Committee is an elected position.

More details are forthcoming in the next month.

## The Call for Volunteers is Opening Soon!

The Call for Volunteers, which is the process in which SCA committees are populated, will take place in October for the 2024-2025 term.

Watch your in-box and future issues of the Newsletter for more details.



**Seema P. Deshpande, MBBS**

*Fellowship Director,  
Cardiothoracic  
Anesthesiology  
University of Maryland  
School of Medicine,  
Baltimore (on behalf  
of the SCA DEI  
Committee)*

# DEI COMMITTEE

## DEI COMMITTEE EDITORIAL

### A Call for Diversity: Underrepresented Minorities and Cardiothoracic Anesthesiology Fellowship Education

The need to improve diversity, equity and inclusion in our profession is very much at the forefront these days, especially in academic medicine. This is particularly challenging since there are many barriers to it, starting with issues at the pipeline into anesthesiology and cardiac anesthesiology; to the retention of and opportunities for under-represented minority (URM) physicians. While there are challenges, the benefits of improving diversity are undeniable.

In the first of this 4-part special article series published in the Journal of Cardiothoracic and Vascular Anesthesia in Jan 2022, Dr. Sumler and co-authors address the issue of diversity of the Adult Cardiothoracic Anesthesiology (ACTA) fellowship-the pipeline issue.<sup>1</sup> The article examines the constraints faced by URM physicians during their training and details some concrete action plans which can be implemented by programs and institutions to create a more diverse, equitable, and inclusive healthcare workforce in cardiovascular and thoracic anesthesiology.

URM physicians are a minority in training programs nationwide, with the ACTA fellowship being no exception. The 2019-2020 Accreditation Council for Graduate Medical Education (ACGME) program data presented by Sumler et al demonstrates the lack of racial and ethnic diversity in our subspecialty. This is further confirmed in the recent 2021-2022 ACGME program information. Despite the increase in number of ACTA trainees from 220 (2019-2020) to 238 (2021-2022), the number of trainees identified as Hispanic, Black/African American, and Native American stayed low at 7.9, 5.4 and 0% respectively. Clearly, much work remains to be done.

Healthcare disparity has been identified in various areas for a long time, including obstetrics, pain, and neonatal outcomes. The coronavirus disease 2019 (COVID-19) pandemic even more put this issue at spotlight. Meanwhile, the benefits of diverse healthcare providers have been long established. Patient-physician racial concordance has been shown to improve outcomes, lead to better communication, and higher satisfaction scores with minority patients.<sup>3,4</sup> Organizations also benefit by investing in diversity, with improvement in patient care quality, satisfaction, and financial results.<sup>5,6</sup>

For meaningful change to occur with the goal of improving diversity in the profession, the pipeline into the specialty must be well developed. While the traditional focus of pipeline improvement has been at the medical school recruitment level, it has become increasingly obvious that it is just as important to invest at all levels of medical school training.

There are many potential barriers for recruitment of URM into anesthesiology, as listed by Sumler et al. Among them are the fact that a significant number of medical schools do not have Anesthesiology as a required clinical rotation in their curriculum and the historical use of the United States Medical Licensing Exam (USMLE) Step 1 scores, which should be addressed by the transition to the Pass/Fail scoring system. Secondly, since the number of URM entering Anesthesiology, itself is small, the applicant pool for the ACTA fellowship is very limited. With the current, extremely competitive job market due to workforce attrition, the pool has shrunk even further. As a result, programs must be thoughtful and strategic in their efforts to recruit URM.

Various strategies have been proposed to improve the issue of lack of diversity in our future workforce. At an organizational level, the ACGME actively emphasizes the importance of diversity and inclusion at all levels-trainee, faculty, departmental and institutional. This is borne out in the ACGME program requirements and questions related to diversity and education on healthcare disparities in the annual ACGME survey. Secondly, efforts should be emphasized to address issues related to pipeline, recruitment, training program environment, work environment, mentorship, as well as the role of non-URM colleagues. Among which are the emphasis on diversity in the program composition and efforts to highlight during recruitment, a diverse pool of interviewers and holistic application review. Importantly, this investment must come from specialty and subspecialty groups, such as Cardiothoracic Anesthesiology, in the form of early exposure to



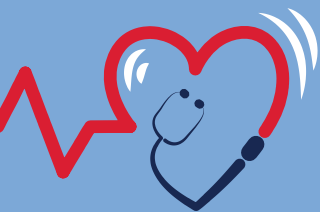
specialty fields, as well as providing mentors and role models-all of which can have a powerful impact.

A new and successfully implemented pipeline effort of introducing Anesthesiology residents to the subspecialty of ACTA is the Society of Cardiovascular Anesthesiologists (SCA) Diversity, Equity, and Inclusion (DEI) Committee Junior Resident Scholar Program. The SCA has invested resources into the recruitment of talented URM residents into the field of Cardiothoracic Anesthesiology through this program. This was well inaugurated at the recent May 2023 SCA Annual Meeting in Portland, Oregon. Ten selected URM resident scholars at the Clinical Anesthesiology Year One (CA-1) level were awarded grants of \$1000 each to attend the SCA Annual Meeting. They were presented at the meeting under the guidance of mentors, as well as interacted with other cardiothoracic anesthesiologists and leaders in the field.<sup>6</sup>

In conclusion, this timely article by Sumler and colleagues addresses a very important relevant subject- the need to improve diversity in our subspecialty workforce, which can be accomplished by improving the diversity of Cardiothoracic Anesthesiology fellowship pipeline. One important step forward as a society is the successful creation of the Junior Resident Scholar Program. We look forward to the maturation of this program and other important endeavors the Society will take on in the near future!

### References

1. Sumler ML, Capdeville M, Ngai J, Cormican D, Oakes D. A Call for Diversity: Underrepresented Minorities and Cardiothoracic Anesthesiology Fellowship Education. *J Cardiothorac Vasc Anesth*. 2022 Jan;36(1):58-65. doi: 10.1053/j.jvca.2021.09.028. Epub 2021 Sep 24. PMID: 34696968.
2. Accessed May 31, 2023.
3. Osseo-Asare A, Balasuriya L, Huot SJ, Keene D, Berg D, Nunez-Smith M, Genao I, Latimore D, Boatright D. Minority Resident Physicians' Views on the Role of Race/Ethnicity in Their Training Experiences in the Workplace. *JAMA Netw Open*. 2018 Sep 7;1(5):e182723. doi: 10.1001/jamanetworkopen.2018.2723. PMID: 30646179; PMCID: PMC6324489.
4. Street RL Jr, O'Malley KJ, Cooper LA, Haidet P. Understanding concordance in patient-physician relationships: personal and ethnic dimensions of shared identity. *Ann Fam Med*. 2008 May-Jun;6(3):198-205. doi: 10.1370/afm.821. PMID: 18474881; PMCID: PMC2384992.
5. Gomez LE, Bernet P. Diversity improves performance and outcomes. *J Natl Med Assoc*. 2019 Aug;111(4):383-392. doi: 10.1016/j.jnma.2019.01.006. Epub 2019 Feb 11. PMID: 30765101.
6. Arthur ME. The SCA Junior Resident Scholar Grant: Addressing the Pipeline Issue. Accessed May 31, 2023.



# Is Early Extubation after Esophagectomy Safe? A Systematic Review and Meta-Analysis

Serafim MCA, Orlandini MF, Datrino LN, Tavares G, Tristão LS, Dos Santos CL, Pinheiro Filho JEL, Bernardo WM, Tustumi F. *J Surg Oncol*. 2022 Jul;126(1):68-75. doi: 10.1002/jso.26821. PMID: 35689581.

## Reviewer:

Melissa Burtoft, MD  
Division of Cardiovascular Anesthesiology  
University of Pittsburgh Medical Center, Pittsburgh, PA

## Background

Enhanced Recovery After Surgery (ERAS) protocols are increasing in popularity because of their many benefits including reductions in the incidence and severity of postoperative adverse events.<sup>1</sup> One goal of ERAS is to facilitate early extubation and patient mobilization which reduces hospital length of stay.<sup>2</sup> Traditionally, esophagectomy patients have remained intubated with admission to the ICU and planned extubation on postop day (POD) 1 or later. One explanation for this is that aggressive intraoperative fluid administration frequently leads to pulmonary edema postoperatively. Additionally, intubation decreases aspiration risk, and reintubation or accidental esophageal intubation can damage the new esophageal anastomosis. As ERAS is applied to esophagectomy surgeries, it becomes important to discuss the safety of early extubation.

## Methods

This is a systematic review and meta-analysis of studies comparing “early” to “late” extubation following esophagectomy. Early extubation was defined as patients who were extubated shortly or immediately after surgery; and late extubation was POD 1 or later. The primary outcome evaluated was reintubation. Secondary outcomes included mortality, pulmonary complications, pneumonia, anastomotic fistula, length of hospital stay, length of ICU stay, time to ambulation, and catecholamine use.

## Results

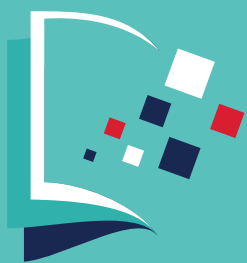
The total number of patients included in the analysis was 566. 327 patients were categorized as early extubation and 239 were categorized as late extubation. Patients were obtained from five observational studies which took place from 1996-2018. The rate of reintubation and all secondary outcomes were not significantly different between the two groups. The risk of bias was assessed as high due to patient selection bias and missing data between the groups. Overall, the certainty of the evidence was graded as very low or low since the risk of bias was significant.

## Discussion

There was no discernable difference between the two groups regarding reintubation or other postoperative complications. Since there was no increased risk of morbidity or mortality, it appears as though early extubation is safe and could be included in ERAS protocols. However, this review analyzed only observational studies and is at high risk of bias. There are currently no randomized control trials which compare early extubation to delayed extubation. In conclusion, early extubation can be considered for ERAS protocols as we aim to improve postoperative care of these complex patients, but clinical judgment should not be ignored in order to maintain patient safety.

## References

1. Low DE, Allum W, De Manzoni G, Ferri L, Immanuel A, Kuppusamy M, Law S, Lindblad M, Maynard N, Neal J, Pramesh CS, Scott M, Mark Smithers B, Addor V, Ljungqvist O. Guidelines for Perioperative Care in Esophagectomy: Enhanced Recovery After Surgery (ERAS®) Society Recommendations. *World J Surg*. 2019 Feb;43(2):299-330. doi: 10.1007/s00268-018-4786-4. PMID: 30276441..
2. Markar SR, Naik R, Malietzis G, Halliday L, Athanasiou T, Moorthy K. Component analysis of enhanced recovery pathways for esophagectomy. *Dis Esophagus*. 2017 Oct 1;30(10):1-10. doi: 10.1093/dote/dox090. PMID: 28859398.
3. Lanuti M, de Delva PE, Maher A, Wright CD, Gaissert HA, Wain JC, Donahue DM, Mathisen DJ. Feasibility and outcomes of an early extubation policy after esophagectomy. *Ann Thorac Surg*. 2006 Dec;82(6):2037-41. doi: 10.1016/j.athoracsur.2006.07.024. PMID: 17126107.



# Association of Echocardiographic Parameter E/e' with Cardiovascular Events in a Diverse Population of Inpatients and Outpatients with and Without Cardiac Diseases and Risk Factors

Victor Chien-Chia Wu, MD, Yi-Chun Huang, MD, Chun-Li Wang, MD, Ya-Chi Huang, MS, Yu-Sheng Lin, MD, Chang-Fu Kuo, MD, PhD, Shao-Wei Chen, MD, PhD, Michael Wu, MD, Ming-Shien Wen, MD, Yu-Tung Huang, PhD, and Shang-Hung Chang, MD, PhD, Taoyuan City, Taiwan; Nottingham, United Kingdom; and Providence, Rhode Island  
(*J Am Soc Echocardiogr* 2023;36:284-94).

## Reviewer:

Stavroula Nikolaidis MD  
Clinical Associate Professor Texas A&M  
Scott and White Medical Center  
Baylor Scott and White Health  
Division of Cardiac Anesthesiology

## Background

Left ventricular (LV) diastolic dysfunction has been associated with adverse cardiac outcomes. LV diastolic dysfunction, as classified by echocardiographic imaging, was found to correlate with increased mortality.<sup>1</sup> However, with the current methodology of echocardiographic assessment of diastolic dysfunction, taking into consideration multiple measurements and parameters, several patients would fall into the “indeterminant” category,<sup>2</sup> and there is significant variability among readers. E/e' ratio is a highly reproducible<sup>4-7</sup> measurement based on simple methodology.<sup>3</sup> It is measured as the ratio of the E wave of the mitral inflow velocity divided by the e' wave of the mitral annular tissue doppler velocity tracings. E/e' ratio values correlate well with LV filling pressure, as shown from comparison of right heart catheterization measurements,<sup>8</sup> not only in sinus rhythm but in the presence of arrhythmia such as tachycardia or atrial fibrillation.<sup>9-11</sup> Average (average e' of the septal and lateral mitral valve annulus) E/e' ratio <8 indicates normal left ventricular end diastolic pressure (LVEDP) and normal pulmonary capillary wedge pressure. In several cardiac conditions such as severe aortic stenosis, cardiomyopathy, prior myocardial infarction, hypertension, heart failure or atrial fibrillation, an elevated E/e' ratio has been shown to correlate with increased risk of cardiac events and death and has been used as a prognostic factor.<sup>12-18</sup>

The investigators in this retrospective review looked whether the E/e' ratio, as a simple measurement indicative of diastolic dysfunction, is associated with cardiac events in a diverse population, regardless of the presence of cardiac disease or risk factors.

## Study Design and Methods

In this cohort the investigators collected information from the database of the largest health care provider in Taiwan, the Chang Gung Memorial Hospital System retrospectively, between 1/1/2001 and 1/31/2019. From the 75,393 patients identified that did not have atrial fibrillation (AF) and had the average E/e' ratio measurement available, patients with mitral valve disease were excluded. The remaining 70,819 patients were included in protocol 1. From this group, after excluding all patients with cardiovascular (CV) disease, hypertension, diabetes, hyperlipidemia, prior CV events or surgeries, LVEF<50% or missing LVEF, the remaining 14,665 patients (without CV disease or risk factors) were included in protocol 2. Patients in each protocol were divided in 3 groups based on the average E/e' ratio: <8, 8-15 and >15. Patients were followed for a maximum of 5 years or until primary outcome occurred, whichever came first. Primary outcome was defined as a major CV event (MACE) including MI, AF, ischemic and hemorrhagic stroke (IHS), hospitalization for heart failure (HHF) or cardiac death.

Commercial software was used for the statistical analysis (SAS 9.4, SAS Institute, Cary, NC). Risk comparison among the 3 groups was done with the Kaplan-Meier method. In protocol 2 (no CV disease or risk factors) Cox proportional hazard ratio (HR) and adjusted HR (aHR) for age,



sex, COPD, chronic kidney disease, chronic liver disease and cancer were calculated. Same was calculated for protocol 1 but also aHR for diabetes, hypertension, and hyperlipidemia.

## Results

Protocol 1 (diverse group, no mitral disease)

Significantly increased risk of MACE, MI, AF, IHS, HHF and cardiac death was found in patients with E/e' ratio >8 (8-15 and >15).

Protocol 2 (patients without CV disease or risk factors)

Significantly increased risk of MACE, MI, IHS, HHF and cardiac death was found in patients with E/e' ratio >8 (8-15 and >15).

Significantly increased risk of AF in the absence of CV disease or risk factors was found only in patients with E/e' ratio >15.

## Conclusions and Discussion

E/e' ratio, one of the indexes of diastolic dysfunction, is a simple and reproducible measurement. It correlates well with LV filling pressures and has been found to be a prognostic factor for outcomes in several cardiac conditions. In this retrospective cohort of 70,819 patients, a significantly higher incidence of cardiac adverse events and cardiac death was observed in patients with E/e' ratio >8, regardless of preexisting cardiac disease or risk factors. Because of the limitations related to the retrospective nature of the study, further research is needed for the use of E/e' ratio as a predictor of cardiovascular events regardless of the presence of cardiac disease or risk factors.

## Limitations of the Study

Selection bias due to unavailability of echocardiographic data in some patients.

Direct comparison of E/e' ratio with other measurements of diastolic dysfunction as predictors of adverse outcomes was not done.

Missing or inaccurate information if the conditions in the database were not coded correctly. Non standardized echocardiographic technique.

## References

1. Health Insurance Research Database in Taiwan. *Int J Cardiol* 2015;201: 96-101. 27. Playford D, Strange G, Celermajer DS, et al., On behalf of the NEDA Investigators. Diastolic dysfunction and mortality in 436 360 men and women: the National Echo Database Australia (NEDA). *Eur Heart J Cardiovasc Imaging* 2020;22:505-15.
2. Oh JK, Appleton CP, Hatle LK, et al. The noninvasive assessment of left ventricular diastolic function with two-dimensional and Doppler echocardiography. *J Am Soc Echocardiogr* 1997;10:246-70.
3. Ommen SR, Nishimura RA. A clinical approach to the assessment of left ventricular diastolic function by Doppler echocardiography: update 2003. *Heart* 2003;89 (Suppl 3):iii18-23.
4. De Sutter J, De Backer J, Van de Veire N, et al. Effects of age, gender, and left ventricular mass on septal mitral annulus velocity (e') and the ratio of transmitral early peak velocity to e' (E/E'). *Am J Cardiol* 2005;95: 1020-3.
5. Kuwaki H, Takeuchi M, Wu VC, et al. Redefining diastolic dysfunction grading: combination of E/A #0.75 and deceleration time >140 ms and E/ ' \$10. *JACC Cardiovasc Imaging* 2014;7:749-58.
6. Caballero L, Kou S, Dulgheru R, et al. Echocardiographic reference ranges for normal cardiac Doppler data: Results from the NORRE study. *Eur Heart J Cardiovasc Imaging* 2015;16:1031-41.



7. Marwick TH, Gillebert TC, Aurigemma G, et al. Recommendations on the use of echocardiography in adult hypertension: A report from the European Association of Cardiovascular Imaging (EACVI) and the American Society of Echocardiography (ASE). *J Am Soc Echocardiogr* 2015;28:727-54.
8. O. Nagueh SF, Middleton KJ, Kopelen HA, et al. Doppler tissue imaging: a noninvasive technique for evaluation of left ventricular relaxation and estimation of filling pressures. *J Am Coll Cardiol* 1997;30:1527-33.
9. Ommen SR, Nishimura RA, Appleton CP, et al. Clinical utility of Doppler echocardiography and tissue Doppler imaging in the estimation of left ventricular filling pressures: a comparative simultaneous Dopplercatheterization study. *Circulation* 2000;102:1788-94.
10. Nagueh SF, Mikati I, Kopelen HA, et al. Doppler estimation of left ventricular filling pressure in sinus tachycardia. A new application of tissue doppler imaging. *Circulation* 1998;98:1644-50.
11. Nagueh SF, Kopelen HA, Quinones MA. Assessment of Left Ventricular ~ Filling Pressures by Doppler in the Presence of Atrial Fibrillation. *Circulation* 1996;94:2138-45.
12. Sharp ASP, Tapp RJ, Thom SAM, et al., ASCOT Investigators. Tissue Doppler E/E' ratio is a powerful predictor of primary cardiac events in a hypertensive population: an ASCOT substudy. *Eur Heart J* 2010;31: 747-52.
13. Møller JE, Pellikka PA, Hillis GS, et al. Prognostic importance of diastolic function and filling pressure in patients with acute myocardial infarction. *Circulation* 2006;114:438-44.
14. Gillebert TC. Prediction of filling pressures and outcome in heart failure: can we improve E/e. *Eur Heart J Cardiovasc Imaging* 2019;20:655-7.
15. Lu DY, Haileselassie B, Ventoulis I, et al. E/e' ratio and outcome prediction in hypertrophic cardiomyopathy: the influence of outflow tract obstruction. *Eur Heart J Cardiovasc Imaging* 2018;19:101-7.
16. Okura H, Takada Y, Kubo T, et al. Tissue Doppler-derived index of left ventricular filling pressure, E/E', predicts survival of patients with nonvalvular atrial fibrillation. *Heart* 2006;92:1248.
17. Okura H, Kubo T, Asawa K, et al. Elevated E/E' predicts prognosis in congestive heart failure patients with preserved systolic function. *Circ J* 2009;73:86-91.
18. Biner S, Rafique AM, Goykhman P, et al. Prognostic value of E/E' ratio in patients with unoperated severe aortic stenosis. *JACC Cardiovasc Imaging* 2010;3:899-907.



## Prevalence and Prognostic Implications of Moderate or Severe Mitral Regurgitation in Patients with Bicuspid Aortic Valve

Steele C. Butcher, MD, MPhil, Francesca Prevedello, MD, Federico Fortuni, MD, William K. F. Kong, MD, Gurpreet K. Singh, MD, Arnold C. T. Ng, MBBS, PhD, Rebecca Perry, BSc, PhD, Kian Keong Poh, MD,

Ana G. Almeida, MD, PhD, Ariana Gonz\_alez, MD, Myl\_ene Shen, MSc, Tiong Cheng Yeo, MBBS, Miriam Shanks, MD, PhD, Bogdan A. Popescu, MD, PhD, Laura Galian Gay, MD, PhD,

Marcin Fijałkowski, MD, PhD, Michael Liang, MBChB, Edgar Tay, MBBS, Nina Ajmone Marsan, MD, PhD,

Joseph B. Selvanayagam, MBBS, DPhil, Fausto Pinto, MD, PhD, Jose L. Zamorano, MD,

Philippe Pibarot, DVM, PhD, Arturo Evangelista, MD, PhD, Jeroen J. Bax, MD, PhD, and Victoria Delgado, MD, PhD.

### Reviewer:

Margo Hoyler, MD

Assistant Professor of Clinical Anesthesiology

Divisions of Cardiac Anesthesiology and Critical Care Medicine

Department of Anesthesiology

Weill Cornell Medical Center – New York Presbyterian Hospital

### Background

Bicuspid aortic valve (BAV) is the most common congenital cardiac defect.<sup>1</sup> In addition to a possible association with primary mitral regurgitation (MR), BAV may contribute to secondary MR through AV dysfunction (stenosis or insufficiency) and LV remodeling.<sup>1</sup> In turn, secondary MR may accelerate LV impairment and lead to earlier symptom onset and poorer clinical outcomes.<sup>2</sup> While significant MR is associated with increased mortality risk in the general population,<sup>3</sup> the prognostic implications of MR in the setting of BAV have yet to be demonstrated. The aims of this study were 1) to determine the prevalence of “significant” (moderate or severe) primary and secondary MR in BAV patients and 2) to explore the association between significant MR and all-cause mortality and event-free survival in this patient population.

### Methods

This paper describes a retrospective cohort study of adult BAV patients with concomitant moderate or severe MR, as identified in a multicenter, international BAV patient registry. The primary end point was all-cause mortality from the time of BAV diagnosis. The secondary end point was event-free survival, defined as a composite of AV repair or replacement and all-cause mortality.

The aforementioned database was queried for demographic, clinical and cardiovascular variables at the time of BAV diagnosis, as well as the results of serial echocardiograms, evaluated retrospectively by clinical experts at each center. BAV phenotype and disease profile (stenosis [AS] or insufficiency [AI]; severity of each) were noted. MR was classified as primary or secondary and was graded according to standard guidelines incorporating quantitative and qualitative metrics.

Univariable and multivariable Cox regressions were utilized to evaluate the relationship between MR and the primary and secondary endpoints across the entire cohort, in pre-specified subgroups (moderate/severe AI, moderate/severe AS, no significant AV disease), and according to MR etiology (caused or not caused by AV disease). Multivariable analyses incorporated patient age, smoking status, diabetes mellitus (DM), hypertension, dyslipidemia, coronary artery disease, LV end-diastolic volume (LVEDD) and LVEF; subgroup multivariable analyses included only age, DM, LVEDD and LVEF.

### Results

2,932 patients were included in the study. 148 patients (5%) had moderate or severe MR, of



which 44 (1.5%) primary and 104 (3.5%) secondary. 78% of patients were male. Mean age was 48 +/- 18 years. The most common etiology of secondary MR was AV disease (n=76, 75%).

## **Echocardiographic Characteristics**

The mean LVEF was 60.8 % (+/-11.8%). Patients with significant secondary MR had lower LVEFs and larger LV dimensions than those without and were more likely to have moderate or severe AI (45.2% vs 27.3%,  $P < .001$ ) and AS (54.8% vs 35.4%,  $P < .001$ ).

## **Survival Analysis**

Overall mortality was 7.6% (n=223) over a median follow-up time of 51 months (IQR 18 - 95). One- and 5-year cumulative survival rates were 97% and 93%, respectively, with reduced survival among patients with significant MR (Kaplan-Meier 1-year survival 91% v 97%, 5-year survival 81% v 93%,  $p < 0.001$ ).

On univariable analysis, significant MR was associated with all-cause mortality (hazard ratio [HR] 2.8, 95% CI 1.91 - 4.11;  $p < 0.001$ ). Multivariable analysis demonstrated no association with the primary endpoint (HR 1.33; 95% CI 0.85 - 2.07,  $p = 0.21$ ).

Univariable analysis also showed an association between MR and event-free survival (secondary endpoint). No association was observed following multivariable risk-adjustment (HR 1.10; 95% CI 0.85 - 1.42,  $p = 0.49$ ).

Significant MR not attributable to AV disease was independently associated with increased mortality (adjusted HR, 1.81; 95% CI, 1.04 - 3.15;  $P = .037$ ). In AV subgroup analyses, significant MR was independently associated with all-cause mortality only among patients with moderate or severe AI (adjusted HR, 2.037; 95% CI, 1.025-4.049;  $P = .042$ ); no independent associations with event-free survival were observed.

## **Discussion**

In this study of 2,932 BAV patients, moderate or severe MR was rare (5%), and was not independently related to all-cause mortality or event-free survival. These findings conflict with prior studies linking MR to inferior clinical outcomes in the broader population.<sup>3</sup> These results may be explained in part by the BAV cohort's relatively young age, limited comorbid disease burden and predominantly AV-related etiology of secondary MR, in addition to robust risk-adjustment for confounding variables.

In the current study, the presence of significant MR not attributable to AV disease was associated with all-cause mortality. This finding is consistent with prior literature.<sup>4</sup> Possible explanations include increased mortality risk associated with non-AV etiologies of secondary MR (e.g. heart failure, ischemic cardiomyopathy)<sup>4</sup> as well as improvement in MR and LV function following AV intervention among patients with MR caused by AV disease.<sup>2</sup>

In addition, significant MR in patients with moderate to severe AI was independently associated with all-cause mortality. This finding might be explained by reduced LV function and impaired recovery in the setting of chronic volume overload, LV dilatation and eccentric hypertrophy mediated by both MR and AI.<sup>2</sup>

Strengths of this study included sample size and availability of granular, clinically relevant variables for risk adjustment. Limitations of this study include its retrospective nature and possible selection bias due to patient enrollment through referral centers and associated higher rates of AV dysfunction.

## **Conclusion**

In a retrospective study of 2,932 BAV patients, moderate or severe MR was not independently related to mortality or survival outcomes. Significant MR that was not attributable to AV disease was associated with all-cause mortality, as was significant MR in the setting of moderate or severe AI.



## References

1. Siu SC and Silversides CK. Bicuspid aortic valve disease. *J Am Coll Cardiol* 2010; 55: 2789-2800. 2010/06/29. DOI: 10.1016/j.jacc.2009.12.068.
2. Patel KM, Desai RG and Krishnan S. Mitral Regurgitation in Patients With Coexisting Chronic Aortic Regurgitation: An Evidence-Based Narrative Review. *J Cardiothorac Vasc Anesth* 2021; 35: 3404-3415. 2021/02/10. DOI: 10.1053/j.jvca.2021.01.003.
3. Dziadzko V, Clavel MA, Dziadzko M, et al. Outcome and undertreatment of mitral regurgitation: a community cohort study. *Lancet* 2018; 391: 960-969. 2018/03/15. DOI: 10.1016/S0140-6736(18)30473-2.
4. Asgar AW, Mack MJ and Stone GW. Secondary mitral regurgitation in heart failure: pathophysiology, prognosis, and therapeutic considerations. *J Am Coll Cardiol* 2015; 65: 1231-1248. 2015/03/31. DOI: 10.1016/j.jacc.2015.02.009.