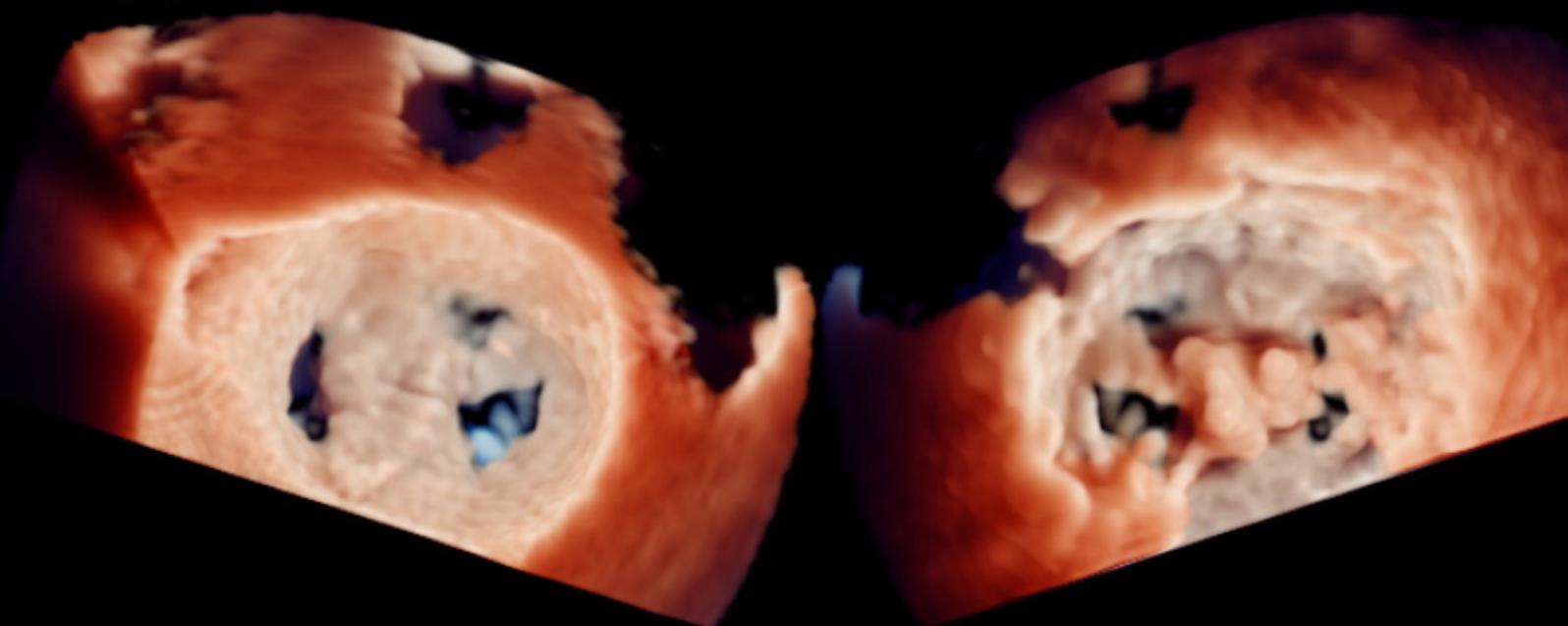


# ECHO



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***The Longer You Wait, the Harder It Gets: A Case for Adoption of Strain Imaging in Cardio-Oncology***

*President's Message*

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*Be an Ace in Hypertrophic Phenotypes Using EchoGuide™*

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**2022**

# EDUCATION CALENDAR

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Featuring the best content from Echo Hawaii and State-of-the-Art Echocardiography

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## JUNE

### 33rd Annual Scientific Sessions

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This text also appears in the June *JASE*.  
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## OCTOBER

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*October 8-10, 2022*

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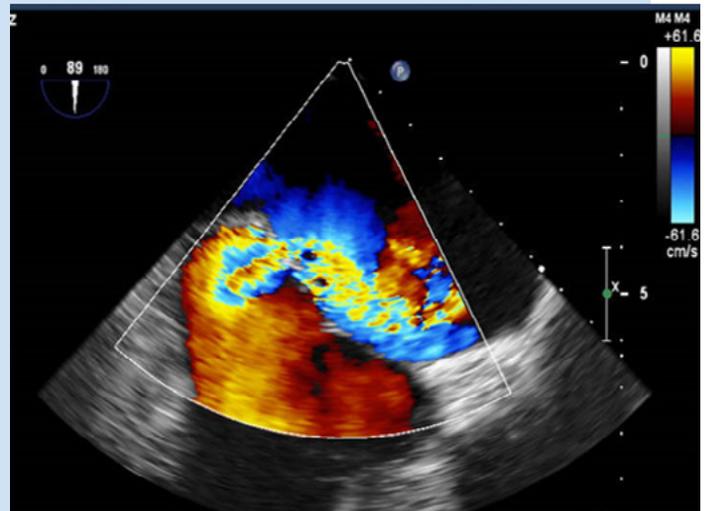
## NOVEMBER

### Critical Care Echocardiography Review Course

*SAVE THE DATE:*

*November 7-9, 2022*

Provided in partnership with ASE and the Society for Critical Care Medicine



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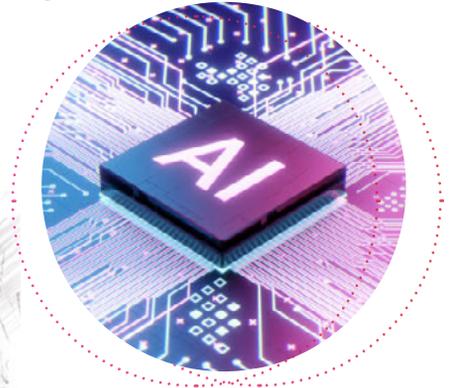
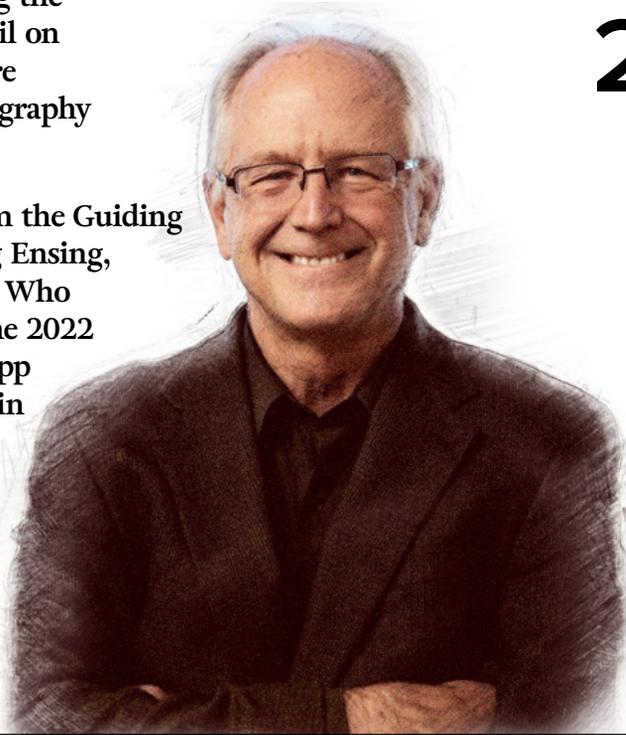
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of Echocardiography

Cover art: "It Takes Two! Clips, That Is!"  
Mary Beth Brady, MD, FASE, The Johns  
Hopkins Hospital, Baltimore, Maryland

## EDITORS' NOTE

ASE is very grateful to our members who contribute to *Echo* magazine and values their willingness to share personal insights and experiences with the ASE community, even if they may not be in total alignment with ASE's viewpoint.

# FINAL PRESIDENT'S MESSAGE- STATE OF THE ASE

Contributed by **Raymond Stainback, MD, FASE**, Chief of Non-invasive Cardiology at the Texas Heart Institute at Baylor St. Luke's Medical Center in Houston, Texas and associate professor of Medicine at Baylor College of Medicine.

“

Through resilience, ASE has been a port in the storm for members and a source for innovative ideas to manage and shape a changing landscape.”

The state of the ASE is exceptionally strong. Over the past year, our Society has strengthened operations by updating governance, improving standing committee interactions, and refining our work groups, task forces, and forums. At ASE's annual February Board Retreat in Scottsdale, Arizona, we revised the 2020 strategic goals to ensure their ongoing relevance during a time of unprecedented change. We have honed our experience with digital learning and launched conversations and action plans around the current healthcare worker shortage, which has profoundly affected sonographers. Through resilience, ASE has been a port in the storm for members and a source for innovative ideas to manage and shape a changing landscape. Signs that we remain highly relevant are our strong finances and a growing (both U.S. and international) and more diverse membership. Our Specialty Interest Groups (SIGs) and Councils have grown. With growth and complexity comes the risk for overreach and reduced efficiency. I am confident that we are continuing to stream-

line operations, decrease redundancy, and increase communications across the component parts of ASE's multifaceted ecosystem.

Enjoying our lives: I often hear how much personal enjoyment our members derive from volunteering for ASE. Volunteer members find an extended and welcoming family within ASE, not just colleagues; and I am happy to see this ASE tradition endures as we recognize the ASE's founders and luminaries while fostering our early career members. During the past year, I have used the monthly President's Page as a platform for updating ASE members on various current Societal new items. Where are we changing or growing right now? In this final message, I will continue this practice by listing several of ASE's recent accomplishments with shout outs to some who help make things happen — regretting inevitable omissions! Some of these bulleted items are completed; others are either works in progress with defined endpoints or have the potential to become enduring features of ASE.

**AI Forum: Echo Lab Workflow of the Future, New York City, March 25, 2022.** This spectacular one-day event drew together luminary speakers, industry partners, and ASE leaders to focus upon ways in which the various aspects of artificial intelligence (AI) will affect our field. Special thanks go to Dr. Ted Abraham for his stellar work putting together the event including luminary speakers, I. Glenn Cohen, JD (Harvard Law School), Dr. Daniel Kraft (physician visionary), and Michael D. Abramoff, MD, PhD (Digital Diagnostics). Additional panels of AI forum ASE leaders, including

Judy Hung, Stephen Little, Keith Collins, Vera Rigolin, Koko Parks, Steve Lester, Susan Mayer, Rima Arnaut, and Patty Pellikka conveyed important messages on behalf of clinicians and researchers. Some take home vocabulary words: digital natives, big data, healthcare vs. sickcare, ambient intelligence, wearables, digital exhaust, appification, gameify, homespital, digital health, digital twin. The event was such a success that we are planning a follow-up AI forum in the spring of 2023 so that ASE remains a key participant in this quickly changing arena. Congratulations to Meredith Morovati along with Dana Hanson and Kelly Joy for expert staff organization and support.

**Industry Round Table (IRT):** Drs. Patty Pellikka and Burkhard Mackensen, Chair and Co-chair of the Industry Relations Committee, pushed our IRT program to new highs with 14 members — incorporating pharma, device, AI, and other vendors into our fold and managing two IRT retreats during my presidency. The latest March IRT weekend think tank meeting in New York City immediately followed the AI Forum, mentioned above. This brilliant programing proved to be a fertile ground for discussion and collaborations to come. I want to thank Dr. Pellikka for her enormous dedication and welcome Dr. Mackensen as the new Industry Relations Committee Chair.

**Critical Care Echocardiography (CCE) Steering Committee Retreat, Georgetown, Washington, D.C.** This first and pivotal face-to-face meeting between ASE leadership and the CCE Specialty Interest Group (SIG) leaders recently took place on March 31, 2022. This planning meeting will ensure a smooth SIG-to-Council transition with a go-live date of July 1, 2022. Critical Care Echocardiography will be the first new ASE Council in over 14 years — since development of the longstanding four ASE Councils: Sonography, Pediatric, Vascular, and Perioperative. Council status provides representation on the ASE Board, monthly publication opportunities in Echo magazine, guaranteed positions on key ASE standing committees, and other privileges. Special thanks go to the CCE SIG co-chairs, Drs. Art Labovitz and Jim Kirkpatrick, for their leadership in building bridges. This council is remarkably multidisciplinary, including leadership by Dr. Jose Diaz-Gomez (Anesthesia CC),

Drs. Paul Mayo and Seth Koenig (Pulmonary CC), Dr. Nova Panebianco (Emergency Medicine) along with cardiology-based members Merri Bremer, Vince Sorrell, Sharon Mulvagh, Edwin Tucaç, and many others.

**Interventional Echo SIG.** Next up for a SIG-to-Council transition (for a new total of six ASE Councils) is Interventional Echo. Groundwork is already in place for this transition to occur in January of 2023. Therefore, ASE will have two new Councils in place (critical care echocardiography and interventional echo), in time for the 2023 ASE Scientific Sessions. Also happening in this space is development of an Interventional Echo Training Document with aspirations for eventually achieving specialty designation for this area of practice. Space does not allow for me to thank at this time all of the many individuals who have been coordinating this effort, although their accomplishments will be highlighted many times in the coming months to be sure.

**Veterinary Specialty Interest Group (aka Vet SIG).** Veterinary ASE members' collaborative efforts were rewarded with SIG designation after Board approval of their application in December 2021. Vet SIG joins the other existing ASE SIGs: Cardio-Oncology, Emerging Echo Enthusiasts (E3) and Neonatal Hemodynamics TnECHO. The Vet SIG steering committee chairs are Drs. Etienne Côté and Philippe Pibarot, both Canadian ASE members. Dr. Côté noted that their group's SIG designation is a "truly rewarding step forward for human-veterinary collaboration in echocardiography." Through the VetSIG we learned of many veterinary cardiovascular organizations around the world, including the Veterinary Cardiovascular Society of Thailand with 300 members.

**ASE Forums — a Growing Platform.** Dr. Ritu Thamman has led ASE's successful "Women in Echo Forum" for two years. Thank you, Ritu! Dr. Judy Hung,



Enjoying our lives: I often hear how much personal enjoyment our members derive from volunteering for ASE.”

ASE Past-President, launched the “Echo Lab Medical & Technical Directors Leadership Forum” this past February to great effect. What makes a forum distinct from other ASE gatherings? ASE Forums are available to members and non-members alike. The online virtual format allows easy access through a link on the ASE’s website (see “initiatives” [www.asecho.org/ase-forums/](http://www.asecho.org/ase-forums/)). Forums uniquely enable a direct line of communication between all in the cardiovascular community—ASE member or not—and ASE leadership, and this exchange is enormously valuable. Are we addressing the cardiovascular community’s actual needs and how do we push out information about the ASE? Forums help. We anticipate the organization of an additional AI forum in the future.

**Publications Committee.** ASE’s three major publications have flourished. 1) JASE begins a new phase with Dr. Patricia Pellikka named incoming JASE Editor-in-Chief in 2022. This follows what will be an incredibly successful five-year Michael Picard, MD, JASE Editor-in-Chief legacy. Drs. Picard and Pellikka will be working together in transition beginning in July. 2) CASE, led by Editor-in-Chief Dr. Vince Sorrell, began monthly publication last month. 3) Echo magazine also began monthly publication in 2022 (from a yearly publication) under the guidance of Co-Editors, Drs. Meryl Cohen and Ben Eidem. A publications committee will allow editors to more easily develop thematic and coordinated publications if desired, to better communicate with the ASE leadership; and to pool resources for evaluating and potentially implementing some of the rapid changes now occurring in the media and publication space.

**Education:** Through Dr. Carol Mitchell’s vision and Christina LaFuria’s hard work, the ASE rolled out a new Sonographer Curriculum subscription to accredited Sonography schools last August, enabling new learners’ early access to the very latest in ASE’s vast educational offerings. The response has been excellent. In a similar vein, Dr. Mitchell and I are working with a new Physician Curriculum platform, which is being developed by Chair and Co-chair Drs. Peter Rahko and Jayashri Aragam. This project shows enormous potential as we pilot “new learner” material.

**Leadership Academy (LA).** I met the LA’s second cohort in person for their first and only in-person gathering (due to the pandemic) at their Capstone Project proposal presentations in Georgetown, Washington, D.C. on April 1, 2022. Their projects were devoted to ASE member “Wellness” and creating more “Impactful Guidelines.” Our future is bright as these already experienced early career ASE leaders demonstrate that we are all happily forever

students. Congratulations to Dr. Neil Weissman for his LA vision and ongoing mentorship. And, thanks to ASE Past Presidents Drs. Vera Rigolin and Madhav Swaminathan who will head up a new Leadership Academy Committee, a sign that the LA itself has graduated from Task Force status.

**Research Coordination Project.** Research initiatives within ASE have grown in number and type over the last few years. Congratulations to Dr. Sam Siu, Chair of the ASE’s Research Committee, for heading up both a large stakeholder group and a smaller working group (Marielle Scherrer-Crosbie, Jordan Strom, Vandana Sachdev, Jeff Hill, and Sarah Beth Bdoyan), as we develop a flexible, workable structure for managing and promoting ASE’s research. We expect a July 1st go-live date for this important endeavor.

**Landmark News:** National Heart Institute (NIH) National Heart, Lung and Blood Institute (NHLBI) – ASE Partnership. Many thanks to Dr. Vandana Sachdev, ASE Board Member, and director of the NIH Echo Lab, for opening a dialogue between ASE leadership and the Foundation for the National Institute of Health (FNIH) to participate in their new and ambitious five-year Accelerating Medicines Partnership® for Heart Failure (AMP® HF) project (<https://fnih.org/our-programs/amp/about>). This project will tackle the enormous problem of heart failure with preserved ejection fraction (HFpEF) by evaluating diverse clinical phenotypes of HFpEF; performing deep phenotyping with imaging, genetic, other tissue and novel biomarkers; applying advanced analytics, including image repository development, network analysis, machine learning, and artificial intelligence, to determine HFpEF phenotypes clusters that may be amenable to certain therapeutic interventions. Echo will play a large role in all stages of the project’s development and results. In April, the ASE Board approved a five-year letter of agreement with the FNIH for a seat on the AMP® HF Steering Committee. This position, while a significant financial commitment, will be invaluable for the project success, for helping the ASE develop best practices for internal research efforts and to secure our status as the lead organization for cardiovascular ultrasound. ASE Past-President, Dr. Judy Hung, will represent ASE in this steering committee position at the 2022 launch. Thank you, Judy, and the ASE Board.

**ASE Scientific Sessions 2022.** I am very excited about the upcoming 33rd annual ASE Scientific Sessions (June 10-13) – Sound Waves in Seattle: Connecting the World with a hybrid format. We expect a large in-person attendance, and this event will continue to be available around the

world, virtually. The content is amazing! The ASE Foundation Gala theme honors our great history of ASE luminaries. Dr. Harvey Feigenbaum will personally deliver the Feigenbaum Lecture during the Sessions, and he will be honored with a named Harvey Feigenbaum Founder's Table at the ASEF Awards Gala Dinner, where Dr. Liv Hatle will be also honored with the named Liv Hatle International Table. We are indebted to the Scientific Sessions Planning Committee Chair, Dr. Sharon Mulvagh, and Co-Chair, Dr. Carol Mitchell, for their enormous dedication along with the large numbers of volunteers and Staff members who worked diligently all year.

It has been an honor to experience in detail, the dynamic ASE ecosystem, comprised of some 16,000 members and more than 1,400 volunteers serving in over 25 standing committees, several work groups, task forces, and now forums. Each ASE member develops a unique window on where ASE is heading. One's personal ASE mental construct is built over time from many different unique engagement experiences. This is powerful. How does one's mental construct remain accurate and current? The ASE President, and its CEO, must consider how all of the many ASE components are performing right now and strive for coordination, efficiency, and communications throughout the entire Society at all times. I hope that I have been able to message current events on a regular basis through this column and at other times. In closing, I want to extend a special thanks to Robin Wiegink, ASE CEO, for her incredible diligence and ability. She and her entire team of our wonderful Staff makes the ASE President's position both possible and a great honor. A very special thank you to Deborah Meyer for her expert assistance in all things publication-related. And, finally, I thank the entire ASE Board of Directors and in particular the Executive Committee members: Judy Hung, Steve Little, Ben Eidem, Meryl Cohen, Cynthia Taub, and Matt Umland — I treasure your wisdom and friendship and the many hours we deliberated on innumerable subjects. Soon, I will pass the ASE President's baton to Dr. Steve Little, and I know he and the ASE will flourish thereafter.

“

It has been an honor to experience in detail, the dynamic ASE ecosystem, comprised of some 16,000 members and more than 1,400 volunteers serving in over 25 standing committees, several work groups, task forces, and now forums.”

Raymond Stainback,  
MD, FASE  
*ASE President*



The Longer You Wait, the Harder It Gets:

# A Case for Adoption of Strain Imaging in Cardio-Oncology

Contributed by **Alexandra Gardner, RDCS (AE, PE), FASE**, co-founder of the ASE Cardio-Oncology Special Interest Group, Sarasota Memorial Hospital and **Amber Taylor, MBA, ACS, RCS, RVS**, leader in the ASE Cardio-Oncology Special Interest Group, Sarasota Memorial Hospital



*It is important to emphasize that standard echocardiographic quality improvement, training, and competency assessment strategies should be applied to strain imaging to reduce variability.*

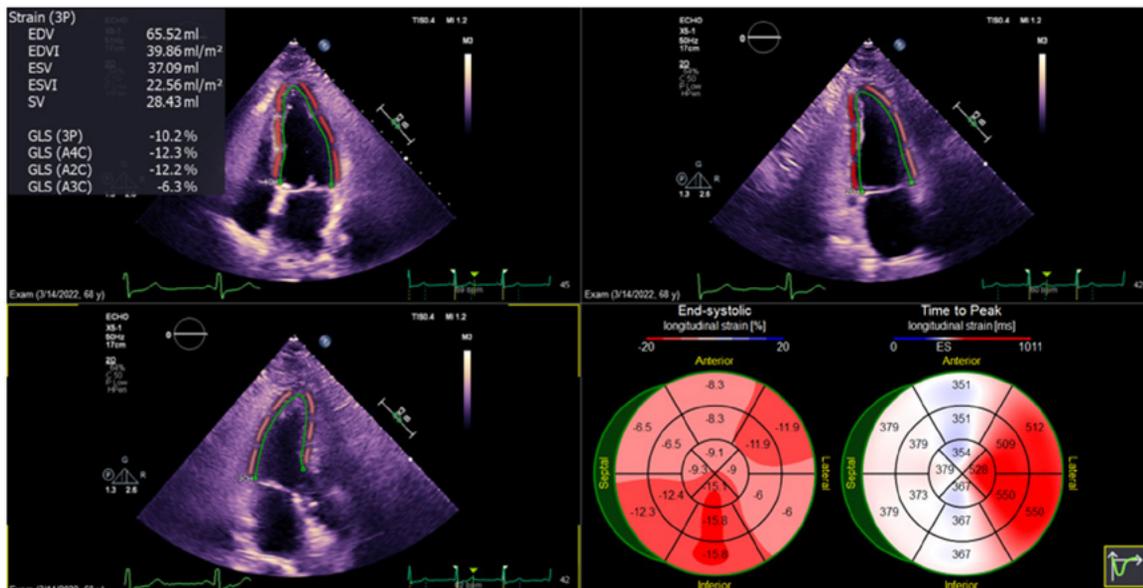
## The Strength and Resistance of Cardio-Oncology

**T**HE EXPERT CONSENSUS for Multimodality Imaging Evaluation of Adult Patients During and After Cancer Therapy was published in JASE in 2014 and highlighted the value of strain imaging in cardio-oncology.<sup>1</sup> However, adoption of the echocardiographic strain assessment outside of major cancer centers has been slow. Sonographers and physicians can still be heard saying anecdotes like “strain imaging doesn’t have any evidence for it” and “strain is completely subjective.” It is important to emphasize that standard echocardiographic quality improvement, training, and competency assessment strategies should be applied to strain imaging to reduce variability. When a technology is new and developing, there is little evidence proving its efficacy. However, data over the last years continue to support the role of strain in managing patients undergoing cancer therapy,<sup>2-4</sup> and it is time for sonographers, cardiologists, and oncologists to become accustomed with its indications and use to optimize the care of a vulnerable patient population already suffering a devastating diagnosis. For those of you still on the fence, allow us the privilege of sharing two case scenarios with very different outcomes as an expository example.

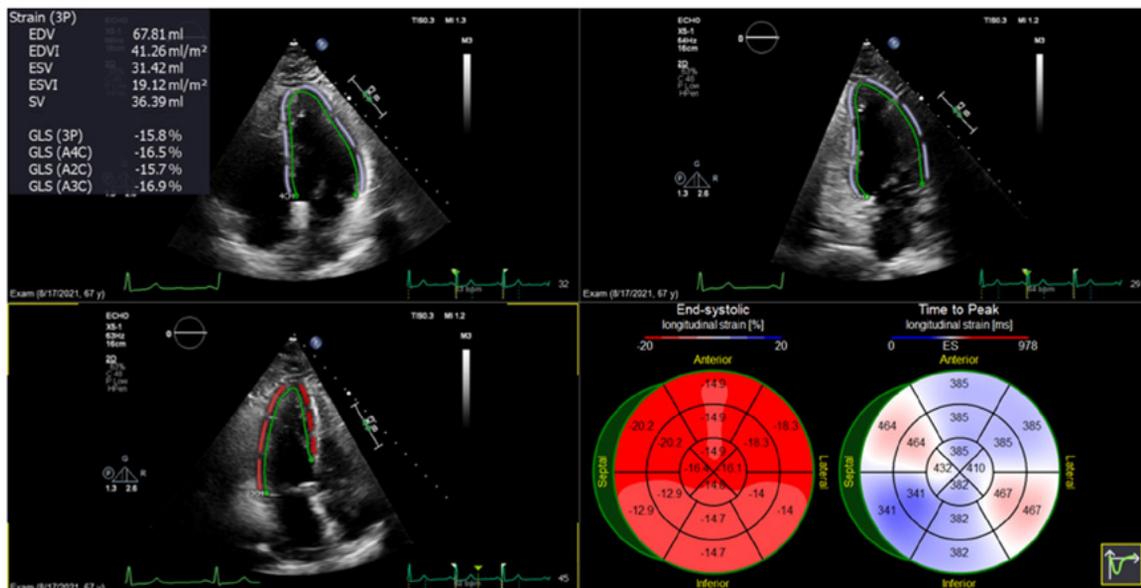
## Case 1

The first is a female patient in her 60's with breast cancer. The first echocardiogram prior to chemotherapy revealed normal wall thickness, a left ventricular ejection fraction of 55% and a strain of -15.8%, a mildly abnormal strain. Three months later, the patient underwent her routine follow-up echocardiogram; her ejection fraction was 53%, and her strain decreased to -13.4%. As the ejection fraction was in the low normal values, the clinical team decided not to intervene. The patient returned for her next echocardiogram three months later. Unfortunately, her ejection fraction had decreased to 44% with a global longitudinal strain of -10.2%. These were clear markers of left ventricular dysfunction, and the patient was referred to cardiology. She was scheduled for another echocardiogram approximately 30 days after starting her cardiac medication in the hopes that her ejection fraction would improve or, at the very least, remain stable.

### Case 1: Initial Strain



### Case 1: Follow Up Decreased Strain





at -17.2%. At this point, the two sonographers are thinking very differently of the same patient. Sonographer A sees a normal ejection fraction and by published standards a normal strain measurement. They are preparing to send the patient home without any concerns raised in their mind. Sonographer B, which has additional training specific to cardio-oncology, is more concerned: the strain is now in the borderline range, with a decrease of more than 15%, and there is a 10-point drop in ejection fraction, suggesting possible cardiotoxicity. The reading cardiologist and oncologist agreed and referred the patient to optimize cardiac care.

### The Difference

These are two similar cases with very different, life-altering outcomes. The difference in outcomes can be attributed to education, proper training, and high-level collaboration amongst the entire cardio-oncology team. It is vital that every member of the team to establish multidisciplinary communication. The sonographer needs to not only to be accountable for accurate and high-quality strain but also to know when to notify the physicians. It is important to adjust the understanding in what constitutes normal values in patients undergoing cancer therapy. The cardiologist must have a good understanding of global longitudinal strain and how it relates to cardio-oncology, as well as a good working relationship with the sonographer to have trust in the measurements and skillset. The oncologist is the final piece of the puzzle and education in cardio-oncology and strain is useful. Oncology patients are living longer lives than ever before, making quality of life an imperative consideration in their oncological decision-making process.

### It's Time to Make a Change

It is through this interdisciplinary collaboration that we can all provide these patients with the best possible care for the best possible outcomes. In the vein of non-maleficence, it is our responsibility as healthcare providers to endorse the cardio-oncology guidelines for cancer therapy management in our echo practice to prevent further suffering in this sensitive patient population.

#### References

1. Plana, J. C., Galderisi, M., Barac, A., Ewer, M., Ky, B., Scherrer-Crosbie, M., et al. Expert Consensus for Multimodality Imaging Evaluation of Adult Patients during and after Cancer Therapy: A Report from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. *Journal of American Society of Echocardiography*. 2014;27:911-39.
2. Esmailzadeh M, Fresno CMU, Somerset E, Shalmon T, Amir E, Fan C-PS, et al. A Combined Echocardiography Approach for the Diagnosis of Cancer Therapy-Related Cardiac Dysfunction in Women With Early-Stage Breast Cancer. *Jama Cardiol*. 2022;7:330-340.
3. Thavendiranathan P, Negishi T, Somerset E, Negishi K, Penicka M, Lemieux J, et al. Strain-Guided Management of Potentially Cardiotoxic Cancer Therapy. *J Am Coll Cardiol*. 2021;77:392-401.
4. Liu JE, Barac A, Thavendiranathan P, & Scherrer-Crosbie M. Strain Imaging in Cardio-Oncology. *Jacc Cardiooncology*. 2020;2:677-689.

*The sonographer needs to not only to be accountable for accurate and high-quality strain but also to know when to notify the physicians.*

## Introducing the ASE Council on

# Critical Care Echocardiography

**T**HE CRITICAL CARE Echocardiography (CCE) Special Interest Group (SIG) is thrilled it will become an ASE Council on July 1, 2022. ASE Councils bring together ASE members with similar professional interests and areas of expertise, providing a forum for networking, knowledge sharing, and provision of guidance to the ASE Board of Directors regarding subspecialty areas, while also helping to create educational offerings and guidance on standards of care to the ASE Board and, specifically, to the Guidelines and Standards Committee.

We would like to introduce ourselves to you, and reach out and encourage you all to join us in this exciting and evolving multidisciplinary area of echocardiography! We were excited to meet many CCE colleagues and enthusiasts at the 2022 ASE Scientific Sessions in Seattle, and look forward to working together collectively. If your interests are in the realm of CCE, we sincerely hope that you will choose to be a member of the CCE Council! Please feel free to reach out and contact any or all of us if you have questions and/or suggestions. This is a rapidly evolving area, and your input is highly desired and valued.



**Merri Bremer, EdD, RN,  
ACS, RDCS, FASE**

Member at Large, CCEC  
Steering Committee  
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Dr. Bremer is a nurse, sonographer, and educator, who is the Education and Quality Coordinator at the Mayo Clinic Echocardiography Lab in Rochester, MN, and works clinically as an Advanced Cardiac Sonographer (ACS). In 2020, she received the ASE Cardiovascular Sonographer Distinguished Teacher Award. She is currently Co-Chair of the ASE Governance and Compliance committee as well as Chair of the Intersocietal Accreditation Commission (IAC) Board of Directors. Merri is an accomplished actress, who also loves travel, music, gardening, and doing things with her family.





**Jose Diaz-Gomez, MD, FASE**

Member at Large, CCEC Steering Committee

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Dr. Díaz-Gómez is an intensivist who is Chief of the transplant, cardiovascular, and MCS Critical Care Section; Program Director, anesthesia/critical care fellowship, and Director of Critical Care Echocardiography at Baylor St. Luke’s Medical Center, Texas Heart Institute, Baylor College of Medicine. His clinical, research and educational interests include perioperative care of high-risk patients (pulmonary hypertension, MCS, transplantation), extending to the advanced applications of perioperative TEE and CCE. He is the first Colombian-born anesthesiologist-intensivist serving collaboratively on the Society for Critical Care Medicine (SCCM) as a council member, and represents the anesthesiology membership. He is a soccer (fútbol) fanatic, and his favorite player is his 13-year-old son, who plays at Dynamo Youth Academy in Houston.



**James Kirkpatrick, MD, FASE**

Member at Large, CCEC Steering Committee

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Dr. Kirkpatrick is a cardiologist who is Section Chief of Cardiac Imaging and Director of Echocardiography at the University of Washington in Seattle where he sees patients in the general cardiology and aortopathy clinics, serves as the chair of the Ethics Committee, and rotates on the Ethics Consultation service. He serves on the ImageGuide Echo Registry Oversight Committee, is Chair of the ASE Foundation Board where he has co-lead several ASEF trips to Vietnam, and is the Abstract Chair for ASE 2022 Scientific Sessions. He enjoys attending and chauffeuring his three adolescent children to vocal concerts, swim meets, track meets, basketball and football games, which he also coaches.





**Arthur Labovitz, MD, FASE**

Chair, CCEC Steering Committee  
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Dr. Labovitz is an academic clinical cardiologist and echocardiographer

at the Naples Cardiac and Endovascular Center. He previously served as chairman of the cardiology department at the University of South Florida and St. Louis University Hospital. He has served on numerous ASE committees throughout his illustrious career, and is currently Chair of the ASE Critical Care Council and Chair of the NBE CCE Exam Writing and Certification Committees. He is honored to have been selected to receive the Physician Lifetime Achievement Award at this year’s ASE Scientific Sessions. He enjoys golfing, fishing, gardening, and spending time with his eight grandchildren.

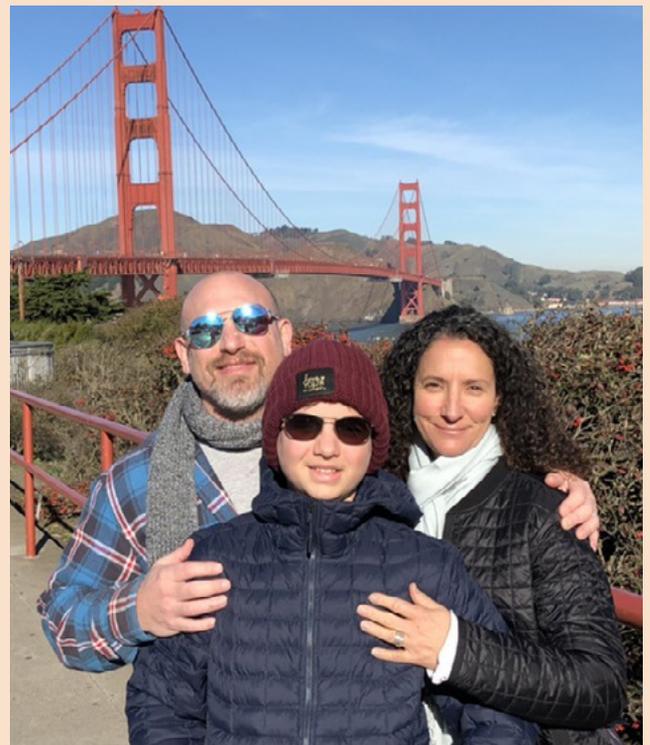


**Seth Koenig, MD**

Education Representative, CCEC Steering Committee  
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Dr. Koenig is an intensivist, Chief of Pulmonary, Critical Care, and Sleep Medicine at Kent Hospital in Rhode Island.

He is “all things point of care ultrasound” and has been involved in promoting the growth of educational opportunities for clinical providers as well as establishing opportunities for clinical research investigators involved in education and application of point of care ultrasound for the intensivist. He is a father, a husband, and a friend, who would not be able to do these things without them. He hopes to retire one day to play acoustic guitar in a small bar he will name “docs.”





**Smadar Kort, MD, FASE, FACC, FAHA**

Guidelines and Standards Representative, CCEC Steering Committee

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Dr. Kort is a cardiologist and Professor of Medicine at Stony Brook

University Renaissance School of Medicine in New York, where she is Director of Echocardiography, Noninvasive Imaging and Co-Director of the Valve Center. She has volunteered on almost every ASE committee as a member or chair including advocacy, membership, public relations, guidelines and standards, CME, Scientific Sessions, FASE, and finance. She has also served on the ASE Board of Directors. She is currently the Co-Chair of the ACC Cross Section Advocacy Work Group, and Co-Chair of the Committee on Accreditation for Education in Advanced Cardiovascular Sonography. She likes to travel, spend time with her boys, and dance.



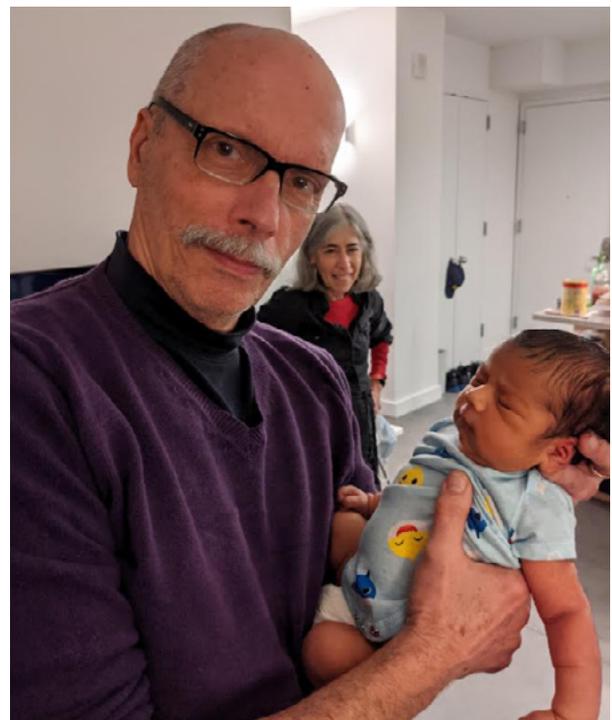
**Paul Mayo, MD**

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Dr. Mayo is an intensivist and Professor of Clinical Medicine at the Hofstra School of Medicine, and the Academic

Director of Critical Care at Northwell Health LIJ/NSUH Medical Center, in New York. When not providing direct clinical care, he is a consummate educator, providing training in critical care ultrasonography. He works with the American College of Chest Physicians to design and implement their national level ultrasonography courses. He enjoys being a grandfather and is a knowledge expert on rare and awesome facts!





**Sharon L. Mulvagh, MD, FRCP, FACC, FAHA, FASE**

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Dr. Mulvagh is a cardiologist and Professor of Medicine at Dalhousie University in Halifax, Nova Scotia, Canada, and Professor Emeritus at Mayo Clinic, Rochester, MN. She specializes in echocardiography with a focus on contrast, stress, and women and cardiovascular disease. She is Director of the Point of Care Ultrasound Curriculum for the Internal Medicine Residency program at Dalhousie, Chair of the ASE 2022 Scientific Sessions, Vice President and incoming President of the Canadian Society of Echocardiography, and has served on the ASE Board of Directors. She enjoys mentoring trainees, running with her dogs, having visits and hiking with her adult kids, doing yoga, and making wine at her vineyard in the Annapolis Valley.



**Nova Panebianco, MD**

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Dr. Nova Panebianco is an emergency medicine physician and Associate Professor in the Department of Emergency Medicine at the University of Pennsylvania in Philadelphia, where she is the Emergency Medicine Clinical Ultrasound Division Director and POCUS-Alliance Chair. Nova is the past president of the American College of Emergency Physicians Ultrasound Section, past president of the Society of Academic Emergency Medicine Academy of Emergency Ultrasound, current president of the Society of Clinical Ultrasound Fellowships, a member of the NBE Board of Directors, and ASE Scientific Sessions 2022 Track Co-Chair for the Critical Care/POCUS. She loves spending time with her three daughters and musician husband, as well as running, knitting, and traveling.





**Vince Sorrell, MD, FASE**

Member at Large, CCEC Steering Committee  
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Dr. Sorrell is a clinical cardiologist with specific expertise in multimodality imaging (Echo, Nuclear, CCT, & CMR) at the University of Kentucky where he holds the Anthony N. DeMaria Chair of Cardiac Imaging and serves as the Acting Chief of the Division of Cardiovascular Medicine. He was the recipient of the 10th Annual ASE Richard Popp Award, currently serves on the ASE Board of Directors, and is the Editor-in-Chief for ASE’s case reports journal, CASE. When not working or volunteering for ASE, he likes to travel the world to unusual locations, especially enjoying diving with Hammerheads in the Galapagos or Whale Sharks in Mexico.



**Edwin Tucay, MD, FPCP, FPCC, FPSE, FASE**

Member at Large, CCEC Steering Committee  
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Dr. Tucay is a cardiologist working at the Philippine Heart Center as director and training officer for the Basic and Advanced Echocardiography Training Programs, and has particular interest in imaging valvular and congenital heart diseases, and in training fellows for critical care echocardiography. He is the past president of the ASEAN Society of Echocardiography and the Philippine Society of Echocardiography (PSE), past chairman of the PSE Board of Examiners for Cardiac Sonography, and currently serves as the International Liaison Officer of PSE. He is actively involved in the World Alliance Societies of Echocardiography, and served as Co-Director of the 3rd Echo ASE-ASEAN and the ASEF Echo Mission in Manila. He enjoys adventurous explorations with his family.



**Note:** Drs. Labovitz, Diaz-Gomez, Koenig, Mayo, Mulvagh, and Panebianco serve on the NBE CCE Exam Writing Committee; Drs. Labovitz, Mayo, Mulvagh, and Panebianco serve on the NBE CCE Certification Committee.

# Words from the Guiding Light, Greg Ensing, MD, FASE, Who Received the 2022 Richard Popp Excellence in Teaching Award.

Interview conducted by **Jennifer Hake, RDCS(PE/AE), RDMS(FE), FASE** with contributions by the other PCHD Member at Large members **Bhawna Arya, MD, FASE, Pei-Ni Jone, MD, FASE, Neha Soni-Patel, MEd, BSME, RCCS, RDCS(AE/PE), and Seda Tierney MD, FASE**



**T**HE RICHARD POPP Excellence in Teaching Award was named in honor of Richard Popp, MD, and recognizes a physician who epitomizes the ideal qualities of a mentor and role model. Honoring someone who demonstrates outstanding teaching characteristics and mentoring, and because of these attributes, has made a major impact on practitioners in the field of cardiovascular ultrasound. ASE created the award to focus our attention on the important role teaching and mentorship play in influencing and improving the echocardiographers of the future.

This year, ASE has awarded this prestigious award to Gregory Ensing, MD, FASE. Dr. Ensing is the first recipient of this award from the Pediatric and Congenital Council (PCHD). Dr. Ensing has been in his current role as Clinical Professor of Pediatric Cardiology at the University of Michigan CS Mott Children's Hospital for the past 24 years. Before that, he was Associate Professor of Pediatric Cardiology at Indiana University

School of Medicine for ten years. He has served on numerous ASE committees and councils over the past 20 years, most recently serving as Chair of the PCHD Steering Committee. Dr. Ensing has a long history of being recognized for his teaching contributions, receiving the Morris Green Pediatric "Teacher of the Year" and the Dennis Crowley MD Teaching Award in Pediatric Cardiology.

When asked what this most recent award from ASE means to him, Dr. Ensing had this to say, "When I heard that I would be receiving it, I was so happy and surprised that I could barely restrain my enthusiasm! It means the world to me. It means so much first, because it comes from ASE, from colleagues that I most respect. Secondly, I learned that those who nominated me were mentees whom I have come to admire as the kindest and the best, and with whom I feel very strong affection. To be honored by those that have built on the base one provides to step beyond is very special indeed. That is what teaching is all about."

Dr. Ensing's professional successes are impressive, and we are so fortunate to have him as an educator and leader in our ASE

*Dr. Ensing's professional successes are impressive, and we are so fortunate to have him as an educator and leader in our ASE community.*

community. Here he generously shares a little about his motivation and gives us insight into the man behind the title.

**Q: If you weren't a cardiologist, what would you be?**

**A:** That is an interesting question... I think being a biomedical engineer would be amazing. Working to improve echo machines would be fascinating. To think you can get any information from the far field with sound waves passing both directions through multiple reasonably bright near field reflectors seems nearly impossible to me. There was also a time when I thought I might become a minister in the church. That would have been a very different life indeed.

**Q: Tell us about one of the most meaningful trips you've ever taken**

**A:** I was part of several trips in Uganda and Kenya helping treat children with congenital heart disease and rheumatic heart disease, with Craig Sable's group from Washington, D.C. and through ASE led by two of the kindest and best leaders I have worked under, Dr. Greg Tatum and Andrea Van Hoever. On these trips, we were blessed with the opportunity to help people who otherwise may not receive it, and to teach very motivated potential caregivers. One can't do something like that without developing a new perspective on most everything. Those visits were at once both satisfying and associated with a real feeling of the guilt of the blessed. The relationships you develop with people going through the same experience are very special.

**Q: What is something that most people would be surprised to learn about you?**

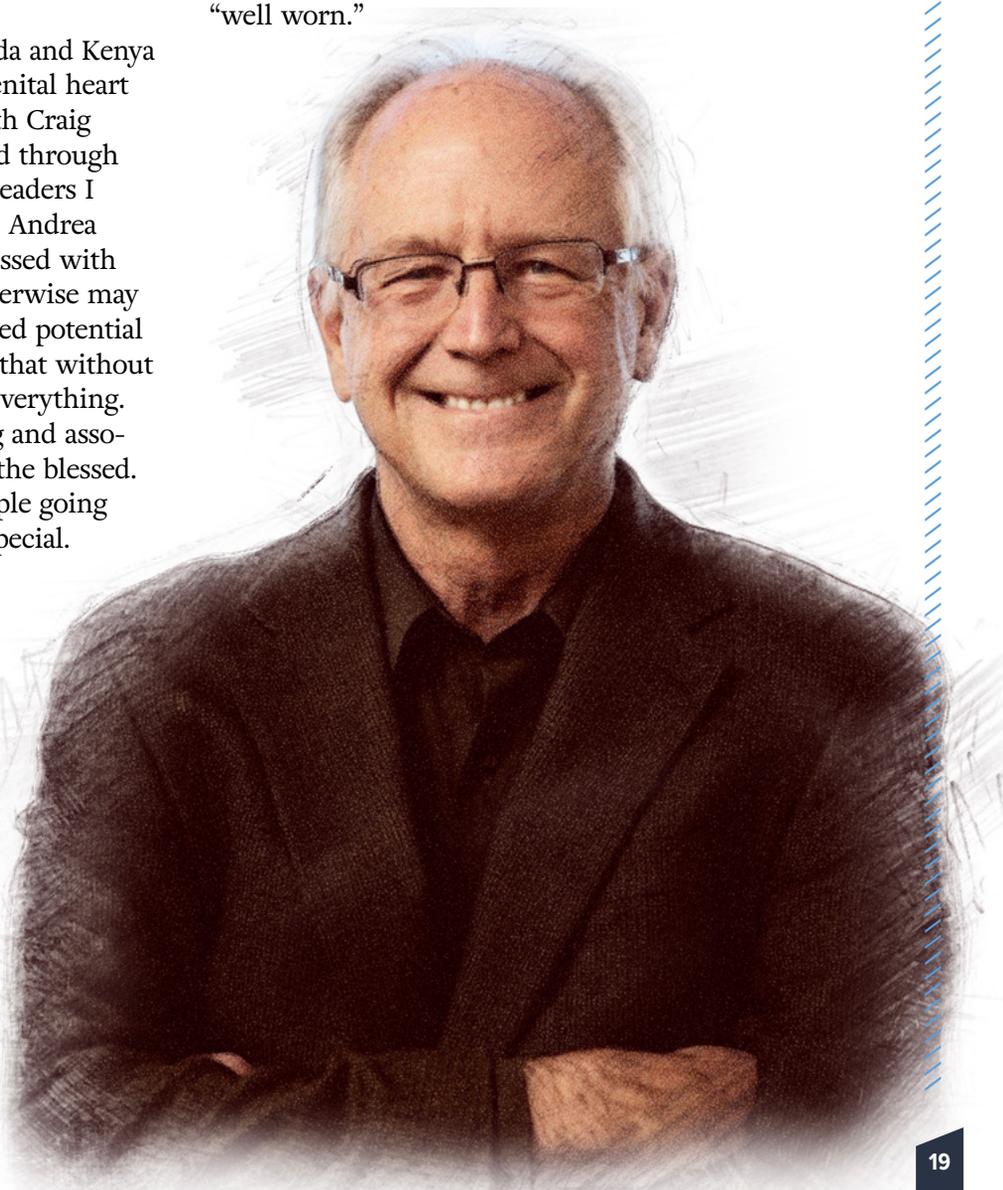
**A:** Most would be very surprised to know that I ever thought about the ministry. Also, they may or may not be surprised to know that I struggled some in medical school. I am not a good test taker and was "one who helped make the top half of the class possible." I have always identified with the hard-working underdog.

**Q: What hobbies do you enjoy outside of work?**

**A:** I play tennis, though not very well, and am a fair landscape photographer especially interested in Great Lake lighthouses. I wonder about the stories they have witnessed.

**Q: Do you have a favorite movie or book? One that you could read/watch over and over?**

**A:** That one is easy. Amor Towles *Gentleman in Moscow* is, I think, the only book I have read more than once. I have read it three times in the last three years. The beautiful prose and the insights into life make me feel at peace. Also, *Life's Little Instruction Book* (H. Jackson Brown) is a compendium of one line advice that has lived on my meeting table for the past 20 years—left for fellows to find. It is "well worn."





**Q:** Was there a moment/event/case that you remember being the pivotal point in your life that led you into cardiology?

**A:** I think the first step was learning the M-mode sweep of the heart from a radiologist as a junior medical student. Afterward, for me, it was a gradual transition from knowing that I liked and enjoyed cardiac physiology, to learning that in pediatrics you could so quickly save so many patient years and enjoy doing it. The physiology and satisfaction from pediatric cardiology and imaging is amazing. The outcome successes for me have almost always outweighed the sadness of loss when things didn't go well.

**Q:** Do you have a favorite quote or saying that you use regularly?

**A:** I have a few: my most said is to emphasize “a belt and suspenders approach” to cardiac physiology or patient care, i.e., use multiple approaches to obtain the same important information (such as TR, septal position, and VSD velocity for RV pressure). Every approach has its own pitfalls but if they all agree, one can be pretty sure the answer is correct. This can be generalized to using multiple imaging modalities or several people reading a preoperative echo to be sure we get it right. Another saying that I find helpful is a reminder to be humble during consultation: “If you disagree with someone, one of you is probably wrong.” Often the person who knows the patient best (perhaps the primary doc/cardiologist) has the advantage.

**Q:** What motivates you?

**A:** Patient care and teaching are unique professions in that they are far from a zero-sum game. When we get it right, everyone benefits—sometimes a lot. The opportunity to do good for a patient, or have the opportunity to multiply it by teaching others is still, for me, a blessed gift. That, and I will always be dazzled by seeing a near perfect 2D or 3D echo picture of a heart.

**Q:** If you could only eat one meal for the rest of your life, what would it be?

**A:** I'm usually a meat and potatoes guy but my daughter makes an Italian pasta fresca and bruschetta meal that is amazing, and it's probably a little healthier too.

**Q:** What three things do you think the most of each day?

**A:** I try to think: "Breathe, gratitude, and work to make my own day and others' better." I wish I could say that it usually happens. I keep trying though.

**Q:** What was your first job?

**A:** I was a moving helper and occasional truck driver for Allied Van Lines. I can still pack a trunk or get a big item up the stairs with the best of them.

**Q:** Do you collect anything? If so, can we see?

**A:** Only pictures of lighthouses that I have had the opportunity to visit, here is a picture from my office wall.

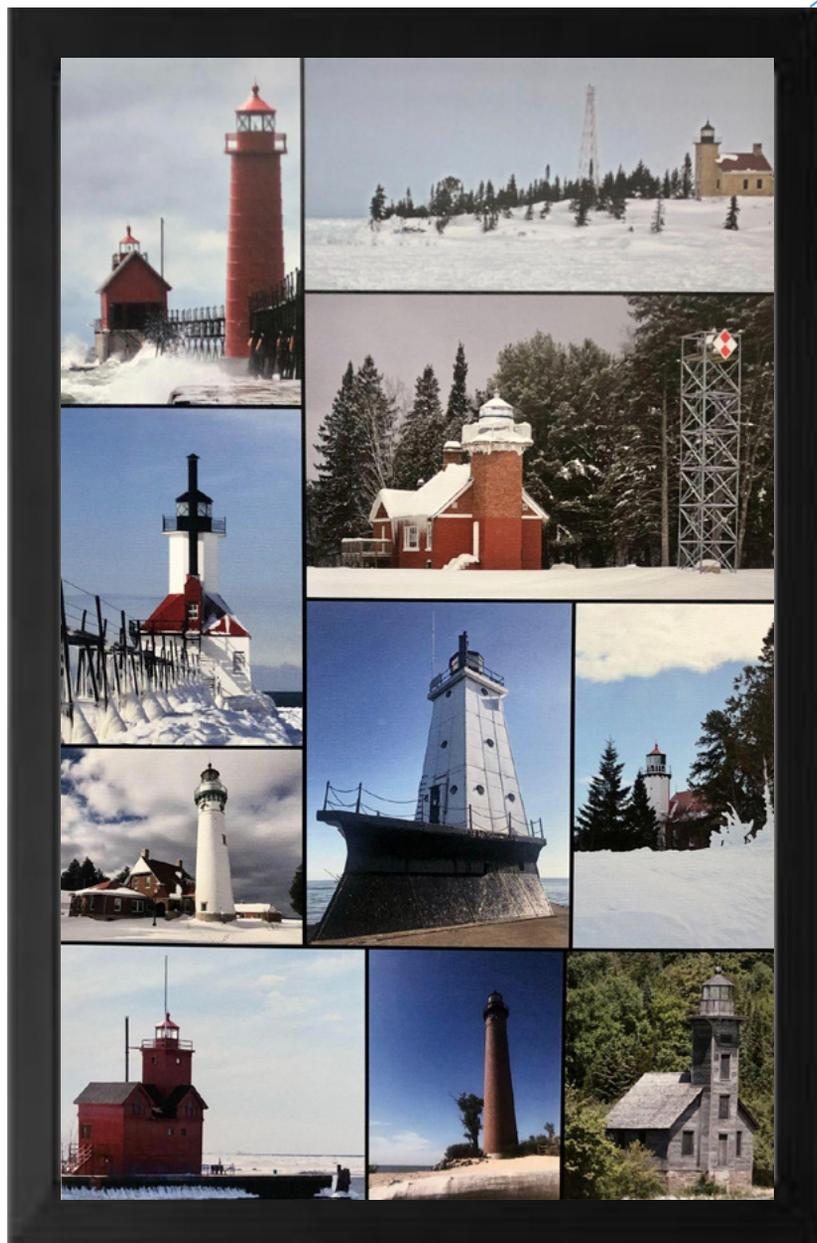
**Q:** What accomplishment are you most proud of in your life?

**A:** It may be trite, but still, it is my family and knowing that my children are good and kind. That being said, being recognized for my teaching efforts has made me feel so special. In addition to my family, I am most proud of those that I have helped train who have become gifted imagers, healers, and who are making the world a better place. It is so cool to see one's efforts multiply through others.

**Speaking of your family, please tell me about them.**

They are so special. My son Michael is now 30 years old, a computer security consultant in Seattle. As a high school and college student, he worked in our cardiology division and

made a flexible pediatric cardiology portal that we are still using today. Through that, he continues to make our care better. Daughter Amy is following in her parents' footsteps as a medical student. I learned that today she is excited to be shadowing a pediatric cardiologist. Who knows...?! My wife Kelly is a gifted dermatologist and teacher in her own right, and was always the one to sacrifice to put the kids first when dad worked late. From *Life's Little Instruction Book*, "Choose your life's mate carefully. From this one decision will come ninety percent of all of your happiness or misery." I got that one right.



# Congrats

to Cohort 2 of the ASE  
Leadership Academy and  
Welcome Prospective  
Members of Cohort 3



Contributed by **Vera H. Rigolin, MD, FASE**, Northwestern Memorial Hospital, Northwestern University's Feinberg School of Medicine, Chicago, IL

**In June 2022**, the second cohort of ASE's Leadership Academy will graduate. Over the past two years, this dynamic group of early to mid-career sonographers and physicians gained the necessary skills to become leaders in ASE and in their own institutions. Despite the challenges of COVID-19 and need for virtual learning platforms, the group developed a strong bond and lasting friendships.



Cohort 2 of the ASE Leadership Academy at their in-person meeting this spring in Washington, D.C.



ASE's Leadership Academy was founded in 2018 by Neil Weissman, MD, FASE, in order to support ASE members with leadership aspirations who have shown commitment to cardiovascular ultrasound. Leadership skills are acquired through educational modules and other reading materials, monthly group discussions, and in-person retreats. Participants are

also assigned a senior advisor to assist with their professional growth. Graduates of Cohort 1 and Cohort 2 have already achieved professional success in ASE as well as in their own institutions.

Here is what a few graduates of the Leadership Academy have to say about their experience:

**“The ASE Leadership Academy has helped me take my knowledge and passion for the field of echo and develop the skills I need to make a difference and lead with purpose in that field. Not only have I come out of the course with new tools in my leadership toolbox, but also with a network of brilliant ASE minds, a compassionate mentor, and new and fast friends.”**

—Madeline Jankowski, RDCS, ACS, FASE (Cohort 2)

**“After being a part of the interactive and dynamic teaching offered by the ASE Leadership Academy, I feel significantly more ready to be a strong leader. Their curriculum covers a multitude of crucial topics that I had not received training on anywhere else. Another benefit of the course has been the ability to bond with the Academy leaders and my classmates, whom I look forward to continuing our work together as we move towards ASE leadership positions. Thank you to the Academy leaders and organizers.”**

—Daniel Forsha, MD, FASE (Cohort 2)

***“I would like to say that the scope and breadth of projects I am prepared to take on and complete both at home and with ASE has increased exponentially because of my participation in the Leadership Academy. The course materials on negotiating and conflict resolution along with the collaborative experiences with ASE committee work have been transformative.”***

—Matthew Parker MD, FASE (Cohort 2)

***I applied to the ASE Leadership Academy thinking it would help guide my journey and involvement within the ASE. What I found is that I apply the knowledge and skills I learned from the Leadership Academy every single day. Whether it's spearheading a new project within my institution, being confident in my decision to say no, or navigating change in workflow and workforce, my ability to manage, resolve conflict, and think strategically is at the forefront of my decisions, and I have learned this all from the ASE Leadership Academy.”***

—Melissa Wasserman, RDCS, RCCS, FASE (Cohort 2)

“*The ASE Leadership Academy has been instrumental in providing me with the leadership skillset needed to manage others, negotiate conflicts, and promote my work. It has been a stepping stone to greater leadership responsibility and roles in a variety of arenas locally within my home institution as well as nationally through my involvement in ASE committees and task forces. Moreover, the network of talented individuals I’ve met through this program, some of whom have become my closest friends, has provided a foundation for a lifetime career of service to the discipline of echocardiography.*”

–Jordan Strom, MD, FASE (Cohort 1)

“

*“Participating in the ASE Leadership Academy was a valuable experience that allowed me to build excellent leadership and management skills that have been instrumental in my day-to-day practice and leadership roles. Furthermore, getting to know the other participants and outstanding ASE faculty creates a collaborative network that extends beyond completing the program.”*

–Enrique Garcia-Sayan, MD, FASE (Cohort 1)

”

“I’ve always been skeptical of people coming back from leadership training, hearing them start to use certain buzzwords and lingo. The best thing about the Leadership Academy was the people we met – others in the cohort and the incredible leaders of each session. They showed us how to not just ‘talk the talk’ but how to ‘walk the walk’ – we got the best mentors and role models for what good, thoughtful leadership looks like. Those relationships and lessons will stick with me the most.”

–Jimmy Lu, MD, FASE (Cohort 1)

It is now time to select Cohort 3 of the Leadership Academy! Applications opened June 1 and close on August 1, 2022. You can find information on how to apply online at [ASEcho.org/LeadershipAcademy](https://ASEcho.org/LeadershipAcademy). The ideal candidate is a Fellow of the American Society of Echocardiography (FASE) (or one who will achieve FASE by completion of the program), who has shown a commitment to cardiovascular ultrasound and ASE, and who will benefit from the Leadership Academy in such a way that their professional growth will include an increasing contribution to ASE over the next 15-20 years. Candidates must be at least two years post training. The Leadership Academy strives for a diverse group of participants that is represen-

tative of ASE’s membership. This includes members from ASE’s Councils (sonography, perioperative, vascular, pediatric/congenital heart disease, and critical care) as well as Specialty Interest Groups. International members are also encouraged to apply. Members employed full or part-time by industry are not eligible for enrollment.

I would like to end by thanking Neil Weissman, MD, FASE, for his creation and support of ASE’s Leadership Academy. His vision and commitment to professional growth of our members assures the successful future of ASE. As I take over as Chair of the Leadership Academy, I hope to continue the work that Neil started. Let’s begin by recruiting a stellar Cohort 3!

# BE AN ACE IN HYPERTROPHIC PHENOTYPES USING ECHOGUIDE™

Contributed by **Mahesh Chandrasekhar, MD**, Cone Health, Greensboro, NC, and **R. Brandon Stacey, MD**, FASE, Atrium- Wake Forest Baptist Medical Center, Winston-Salem, NC



**H**ypertrophic cardiomyopathy (HCM) is a clinical condition for which the diagnosis relies heavily on assessment by echocardiography. In the past, HCM was thought to affect one of every 500 individuals, though recent studies suggest that it may be even more common (1: 200) – with some data showing that the condition is underdiagnosed.<sup>1</sup> Currently, there are a variety of medical, procedural, and surgical strategies that have sustainably lowered morbidity for these patients. In addition, with the above, mortality approaches that of patients without this disease – all of this makes appropriate diagnosis essential. Echocardiography is an important tool in the guidance of these interventions and is a cornerstone study for this disease. As ASE begins to launch its EchoGuide™ app, we are all reminded

that using every tool at one's disposal to make a difference for this patient population is invaluable.

One of the biggest concerns in making this diagnosis in younger, asymptomatic patients can be differentiating HCM from the athlete's heart. Especially with guideline recommendations against strenuous exercise in patients with HCM, making an accurate diagnosis has monumental impact to an athlete's life.<sup>2</sup> In those with a maximal left ventricular thickness of 15 mm or greater, the clinical index of suspicion is significant (**Figure 1**), but a thickness of 13 mm can be diagnostic in patients with a family history, dynamic outflow obstruction, or distinctly abnormal ECG patterns. For groups of patients with an unclear history, and without these other classic findings, prolate ellipsoid geometry may be a useful, additional tool.

Built into ASE's soon-to-be-released EchoGuide app is the ability to easily calculate both the regional wall thickness (RWT) and the left ventricular mass index (LVMI). Using an easy tool to assess the left ventricular prolate ellipsoid geometry can show elevated RWT (> 0.42) or LMVI (115 g/m<sup>2</sup> in males or 95 g/m<sup>2</sup> in females) that requires an extra look for the evaluation of hypertrophic cardiomyopathy<sup>3</sup> (**Figure 2**). Equally important, seeing normal values in this assessment coupled with wall thicknesses of 13 mm or less and an increase left ventricular end diastolic dimension (LVEDD) is more reassuring for the phenotype of the athlete's heart.

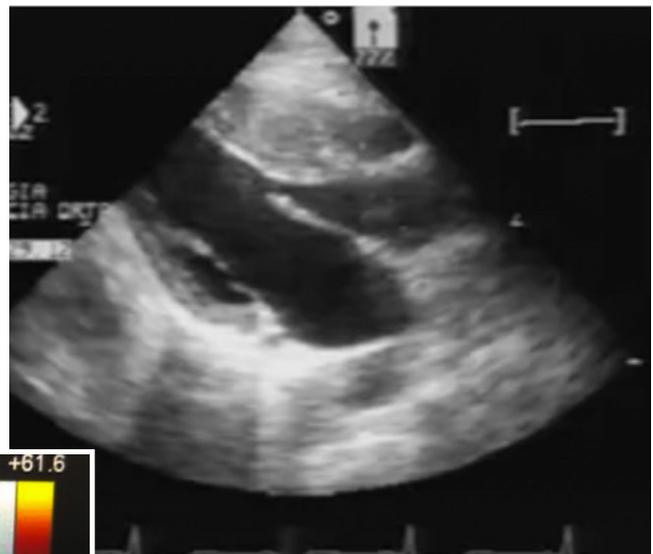
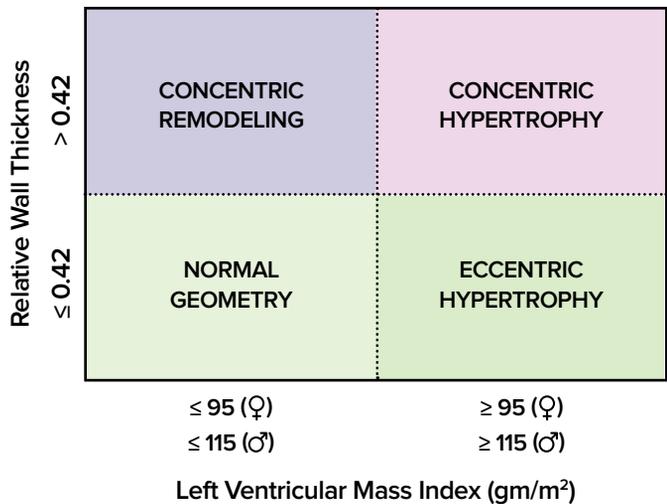
As ASE begins to launch its EchoGuide™ app, we are all reminded that using every tool at one's disposal to make a difference for this patient population is **invaluable**.

To distinguish outflow tract gradients from contamination from the mitral regurgitation envelope, it is important to estimate the gradient by using the peak mitral regurgitation jet (Figure 3). This calculation of

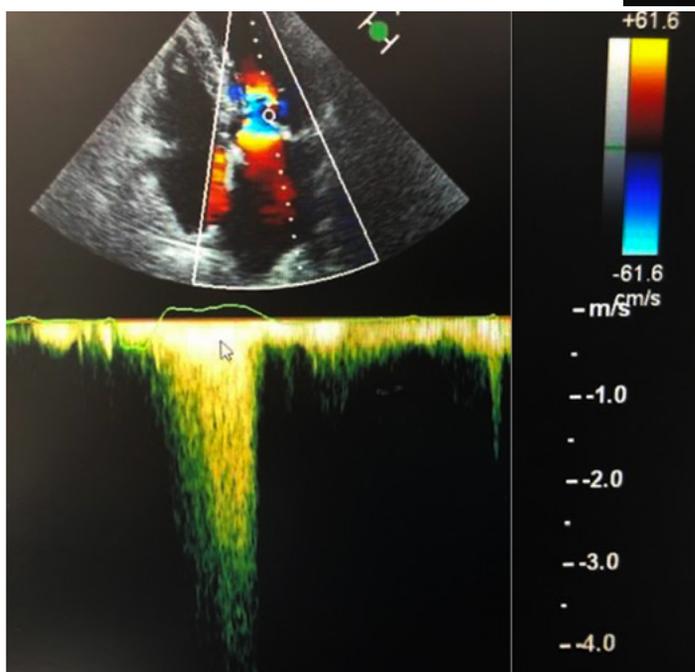
the left ventricular outflow tract gradient as the difference between the systolic blood pressure and left ventricular pressure is easy using EchoGuide.<sup>4</sup> Simply use the modified Bernoulli's equation with the mitral regurgitation signal, the lateral E' signal with the EchoGuide's embedded formula to estimate the patient's left atrial pressure (confirming based on the ASE HCM guidelines), and the patient's systolic blood pressure, and you can calculate the peak gradient. This can be an important safety check (Figure 4).

Echocardiography provides reliable quantitative estimates of peak instantaneous outflow gradient and is often the first imaging test that a patient will have. While the imaging in this patient population is complex; using these techniques (especially using EchoGuide) can make things faster and easier.

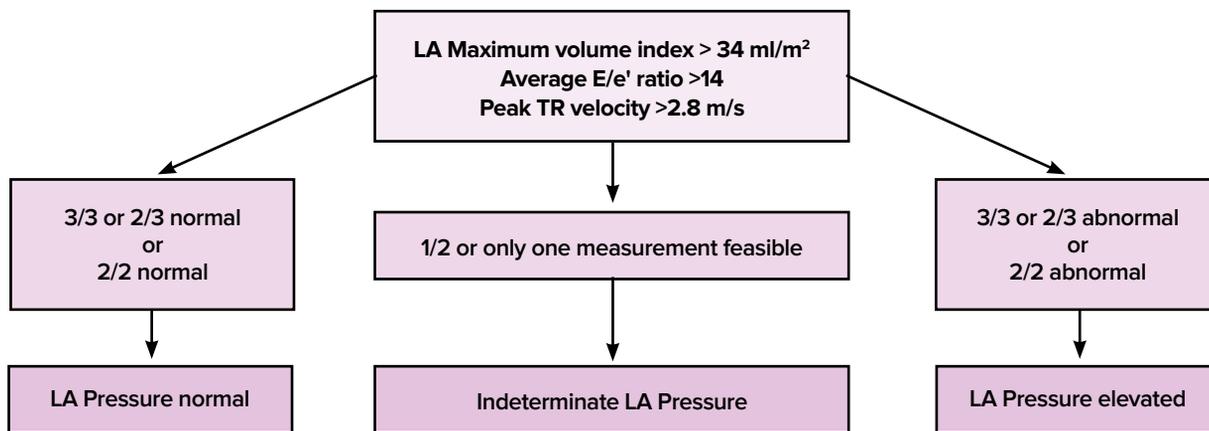
**FIGURE 1:** Classification using relative wall thickness and left ventricular mass index to classify hypertrophy, cited from Lang et al.



**FIGURE 2:** Septal variant hypertrophic cardiomyopathy via parasternal long axis by echocardiography (Creative Commons)



**FIGURE 3:** Doppler Tracing of Late Peaking Mitral Regurgitation Jet using Continuous Wave Doppler



**FIGURE 4:** Algorithm for estimation of mean LA pressure in HCM patients without significant mitral regurgitation- from the ASE Guidelines for the evaluation of HCM

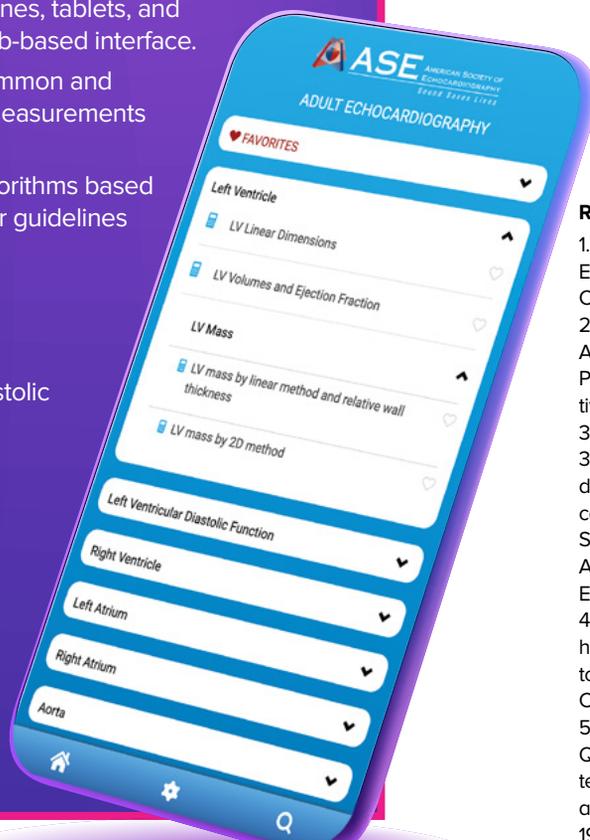
ASE's new guideline calculator and algorithm app EchoGuide™ is in the final beta testing stages and will launch soon.

**HIGHLIGHTS INCLUDE:**

- FREE to download on the Apple and Google Play Stores.
- Works on smartphones, tablets, and even includes a web-based interface.
- Quick access to common and challenging echo measurements and values.
- Calculators and algorithms based on the most popular guidelines published by ASE.

**TOPICS INCLUDE:**

- Left Ventricle
- Left Ventricular Diastolic Function
- Right Ventricle
- Left Atrium
- Right Atrium
- Aorta
- Aortic Valve
- Mitral Valve
- Tricuspid Valve
- Pulmonic Valve
- Prosthetic Valves



*Sign up to be the first to be notified when the app is available.*

**References**

1. Maron B, Desai M, Nishimura R, et al. Diagnosis and Evaluation of Hypertrophic Cardiomyopathy. J Am Coll Cardiol. 2022 Feb, 79 (4) 372–389.
2. Ommen S, Mital S, Burke M, et al. 2020 AHA/ACC Guideline for the Diagnosis and Treatment of Patients With Hypertrophic Cardiomyopathy: Executive Summary. J Am Coll Cardiol. 2020 Dec, 76 (25) 3022–3055.
3. Lang RM, Badano LP, Mor-Avi V, et al. Recommendations for cardiac chamber quantification by echocardiography in adults: an update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. J Am Soc Echocardiogr 2015;28:1-39.e14.
4. Yu E, Omran A, Wigle E, et al. Mitral regurgitation in hypertrophic obstructive cardiomyopathy: relationship to obstruction and relief with myectomy. J Am Coll Cardiol. 2000 Dec, 36 (7) 2219–2225.
5. Nagueh SF, Middleton KJ, Kopelen HA, Zoghbi WA, Quinones MA. Doppler tissue imaging: A non-invasive technique for evaluation of left ventricular relaxation and estimation of filling pressures. J Am Coll Cardiol 1997;30:1527-33.



# ARTIFICIAL INTELLIGENCE **IN** ECHOCARDIOGRAPHY:

A Disruptive Technology for Democratizing  
and Standardizing Health

*Contributed by **Rosy Thachil, MD** and **Dana Hanson, PhD***

Artificial Intelligence (AI) technology has the potential to optimize and revolutionize the practice of echocardiography, providing new opportunities for standardization, accuracy, and efficiency in the echocardiography laboratory workflow. The recent “AI Forum: Echo Workflow for the Future” event, hosted by the American Society of Echocardiography (ASE) on March 25, 2022, in New York City, explored this emerging technology and its promising application in the echocardiography lab.



Theodore Abraham, MD, FASE, Director of the University of California San Francisco (UCSF) Echocardiography Laboratory and AI Forum chair, kicked off the event by calling attention to AI's increasingly ubiquitous presence in daily life – from Apple Face ID to Uber to YouTube's video selection algorithm. He stated,

*ASE believes AI will have a huge impact on the way we practice. This is why ASE brought clinicians, and sonographers as well as industry and technology developers together to discuss how AI can impact our practice and more importantly, what the consequences are for workforce and technology development in the next few years and long term.*

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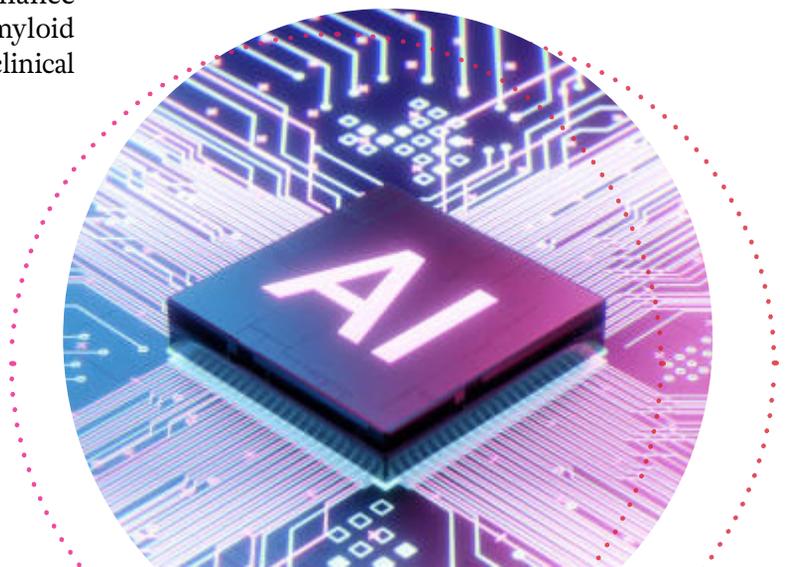
Following his welcome address, Dr. Abraham invited Raymond Stainback, MD, FASE, ASE President and Chief of Non-invasive Cardiology at the Texas Heart Institute at Baylor St. Luke's Medical Center, to the podium. Dr. Stainback shared results from ASE's 2021 Cardiovascular Ultrasound Trends Survey, highlighting findings on widespread favorable views of AI and calls for greater guidance for optimizing AI application. Dr. Stainback stated that ASE provides a crucial link between AI and people and entities who are involved in the practice of echocardiography, citing examples such as ASE's AI Standardization Work Group and the World Alliance Societies of Echocardiography (WASE) amyloid project, a novel disease-centered model for clinical AI research.

## Workflow

In recognition of AI's growing influence on echocardiography lab workflow, Vera Rigolin, MD, FASE, Professor and Echocardiography Lab Director at Northwestern, introduced four key pillars to AI: Education, Image Acquisition, Image Analysis, and Integration with Clinical Data. First, on education, Dr. Rigolin stated that AI integration will require intensive training of cardiologists,

sonographers, and other users of ultrasound. This requires educational resources including skilled teachers, dedicated time, new laboratory protocols, and the update of existing United States (U.S.) equipment and workspaces. Second, she posited that AI will aid in standardizing and expediting image acquisition. In several studies, a novice ultrasound user, with the assistance of AI, was able to obtain image quality comparable to that of

experienced sonographers. AI can also be used to target and address poor ergonomics (AI-assisted transducers), decrease the likelihood of musculoskeletal injury from scanning, and improve accuracy and standardization in conventional measurements (i.e., wall thickness, chamber dimensions, accurate ejection fraction). Third, Dr. Rigolin spoke on AI's potential to standardize image analysis. Echocardiography image analysis has been historically associated with interobserver variability. Echocardiographers, themselves, vary in experience. AI can help minimize variability through automated echocardiography parameters, including left ventricular ejection fraction and



global longitudinal strain, regional wall motion abnormalities, and valvular lesions severity. One of the opportunities for AI Dr. Rigolin pointed to included improving the “fatigue factor” and the “5 PM echo,” referring to an end-of-day influence on image quality by fatigued echo readers in high volume echocardiography labs. The burgeoning growth of patients with cardiovascular disease, coupled with delays in care during COVID, have increased echo imaging demand across the U.S. **AI could be implemented to improve quality and consistency beyond the capacity of an individual human.** That said, AI integration with clinical data will need to be informed by and comply with clinical guidelines – whether toward the goal of differentiating between normal and pathological states or detecting clinical disease states, and, ideally, resulting in the output of a comprehensive “Integrated Echo and Clinical Data” report. While individual laboratory workflows will vary from institution to institution, ASE could serve as a central resource for the development of these protocols throughout the country.

### Ethical Concerns

The adoption of AI within the context of patient care is fraught with ethical concerns. Professor I. Glenn Cohen, James A. Attwood and Leslie Williams Professor of Law and Deputy Dean of Harvard Law School, as well as Faculty Director, Petrie-Flom Center for Health Law Policy, Biotechnology & Bioethics, outlined a four-step process for developing an ethical AI model: (1) acquiring data, (2) building and validating the model, (3) testing the model in real world settings, and (4) broad dissemination with equitable access. Stakeholders in the development of an AI model would include the developer, premarket reviewer (FDA), hospital (purchaser), insurer (payer), and the end user (physician/staff).

One of the cardinal concerns in the adoption of AI is accountability and liability. Professor Cohen’s article in the *Journal of the American Medical*

*Association* (JAMA) titled “Potential Liability for Physicians Using Artificial Intelligence,” serves as a primer on this topic. He reminds us that “if there is no injury, there is no liability.” The physician is held liable when standard of care is not followed and patient injury occurs. The trouble is, the standard of care is forever changing.

The issue of transparency is also problematic. How much do we tell patients regarding the use of AI? Do we have an obligation to tell a patient that their care was AI-assisted? To what extent does it matter? Would this be considered a failure to disclose? These are questions without definitive answers. Physicians have a fiduciary and ethical duty to their patients, but where this transparency line should be drawn is unclear. Furthermore, presently no scripts exist to help convey these nuances to patients.

According to Professor Cohen, the future is likely a “web of AI surrounding every hospital system and room.” The potential use cases for AI are plentiful, for example, choosing cancer therapeutics, ICU bed allocation, handwashing and other quality metrics, and endocardial boundary definition for echocardiography, just to name a few. Successful implementation will require not only appropriate workflows, but also careful navigation of the ethical and legal issues. As such, its use poses unique and unprecedented challenges.

### The Future Is Here

Daniel Kraft, MD, physician-scientist, entrepreneur, and innovator, presented a broad and innovative overview on the applications of AI in medical science. Referring to AI as the “fourth industrial revolution,” Dr. Kraft described how AI will allow us to explore an array of new technologies, for example, personal “omics,” AR/VR technology, predictolytics, wearables, “coughalytics,” “digiceuticals,” and even a medicalized cell phone. Quoting Amara’s Law, which follows, “*We tend to overestimate the effect of technology in the short run, and underestimate the effect in the long run,*”

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Dr. Kraft emphasized that the AI field is rapidly changing the medical practice in many ways. He also stated that he would like to see a change from sick care to healthcare—i.e., not getting episodic data to the clinician but ongoing, continuous care – personalized and proactive. A “check engine light” for people. Ultimately, AI moves us closer to an era of highly quantified, real-time healthcare – one in which through the technology, patients could self-scan and upload a “medical selfie” for automated assessment, diagnosis, and treatment plan. AI has the potential to improve other systemic issues plaguing healthcare, as well, including burnout, inequity, access to care, and telehealth and clinic inefficiencies. According to Dr. Kraft, the bottom line is that while the technology won’t necessarily replace humans, “doctors using AI will replace those who don’t.”

Attendees of the forum pointed out that while digital natives may have some slight advantage in the adoption of new technologies, there will be need for evolving strategies to educate and train all potential users of AI-enabled technologies across a wide range of competencies

### Real World Example

Ophthalmologist Michael Abramoff, MD, PhD, shared his journey developing an automated diabetic retinopathy AI algorithm, IDx-DR, from inception to implementation. Guided by the principle “ethics first, not last,” Dr. Abramoff said that his algorithm was designed to support both care providers and patients and prioritize increased access, improved patient outcomes, and affordability. Dr. Abramoff explained that clinical use of IDxDR required two steps: (1) the physician visit, and (2) AI algorithm application assessment. He also pointed out that use of the application is billable, providing clinics an additional income stream. AI automation also ensures that the company maintains liability - not the clinic.

Dr. Abramoff noted that it helped that their AI had medical merit in getting U.S. government approval. Through this AI intervention, they increased patient compliance and before only 20% were getting screening and people were going blind. Now they have 80% compliance, a game-changer for eye care.

### Crowdsourcing

Patricia Pellikka, MD, FASE, Director of the Echocardiography Laboratory at Mayo Clinic, led the forum in an interactive breakout session focused on the question “How can ASE and industry work together towards a common goal?”

A recurring desire expressed among attendees was that ASE would create the infrastructure and facilitate data sharing across industry, institutions, and other stakeholders. As such, ASE would function as the AI medical home, provide access to the ImageGuideEcho Registry, and serve as quality validator. Partho Sengupta, MD, FASE, Chief of Cardiology at Robert Wood University Hospital, described the collective data similar to “swarm of bees.”

Each bee is a data point or collection of data, all working to support a greater cause. ASE’s role would be one of swarm stewardship, ensuring data integrity and access.

Many in the room noted that the biggest obstacle to AI is formatting of data – facilitating getting large data sets together by having standardized data sets. The panel noted this is something that the ASE and industry can work on together to help the field. ASE leaders reported that Cynthia Taub, MD, FASE, ASE’s Treasurer, is chairing an Echo Data Standardization task force with this aim.

Next on the forum’s agenda was an interdisciplinary panel discussion titled, “AI Applications in the Echo Lab—What is the Future?” Led by Judy Hung, MD, FASE, panelists included Rima Arnaut, MD; Keith Collins, MD, FASE; and

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Margaret Park, BS, ACS, FASE. Opinions varied among panelists on whether the field is ready for widespread automated AI interpretation. Two challenges cited related to software integration and validation and a learning curve that goes with using new technology.

Leaders in the room noted that an additional barrier to AI in the cardiovascular space is that developing AI is difficult given the broader range of variability with heart disease than in eyes and eye disease. Members of the industry noted that it would be helpful to have ASE create validation activities that would be trusted by clinicians to lower barriers to AI adoption. Dr. Hung stated, “We need validation by a body of experts to assure AI is working and tested—create a ‘grey box’ for the AI.”

Some panelists suggested that a more realistic next step was physician-assisted AI rather than autonomous AI. Ms. Park, lead sonographer at the Cleveland Clinic, commented, industry, sonographers, and physicians work together to care for patients. Machine learning is an integral part of what we do on a daily basis in echocardiography. Automated processes can reduce the amount of time for exams. It is important to put this all together to consider the ways to shorten the length of exams, build confidence in diagnosis, and potentially speed up diagnosis.

Ultimately, for widespread adoption, AI will need to be easy, implementable, and automatic. If

leveraged appropriately, AI has great potential to significantly improve workflow for both echocardiographers and sonographers.

The day’s talks concluded with closing remarks by Dr. Abraham, who asked attendee if the day’s sessions had sparked any change in their thinking about AI. Attendees expressed being more open to the opportunities in AI, greater need to consider ethical parameters, and being more adaptable to change in the ever-evolving landscape of healthcare delivery. One attendee emphasized the importance of multi-generational targeted education to better support all levels of echo proficiency. Another attendee remarked on the continued need for collaboration between industry, providers, and the government to reshape echocardiography and expressed hope that ASE would serve as a central resource and hub, bringing together the various stakeholders to promote excellence in the implementation

or standardization of AI.

The AI Forum was the first step towards realizing and harnessing the full power of AI in the echo workspace. Dr. Pellikka noted, “Truly, AI is going to transform echocardiography and what we do in the future. This strategic conference is an opportunity to consider how to advance the field and to plan the future together.”

Echocardiography lends itself exceptionally well to the use and implementation of AI, presenting opportunities to standardize image acquisition and interpretation, increase accuracy, and minimize interobserver variability. Many ethical questions remain regarding liability and implementation. However, if leveraged appropriately, AI has the potential to enhance echocardiography workflow, decrease burnout, and improve patient outcomes. ASE, as the largest cardiovascular imaging Society, is uniquely positioned to be a leader in these developing technologies.

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1. Price, W. N., Gerke, S., & Cohen, I. G. (2019). Potential liability for physicians using artificial intelligence. *Jama*, 322(18), 1765-1766.



# ECHO

## **ASE'S MISSION**

*To advance cardiovascular  
ultrasound and improve lives  
through excellence in education,  
research, innovation, advocacy,  
and service to the profession and  
the public.*