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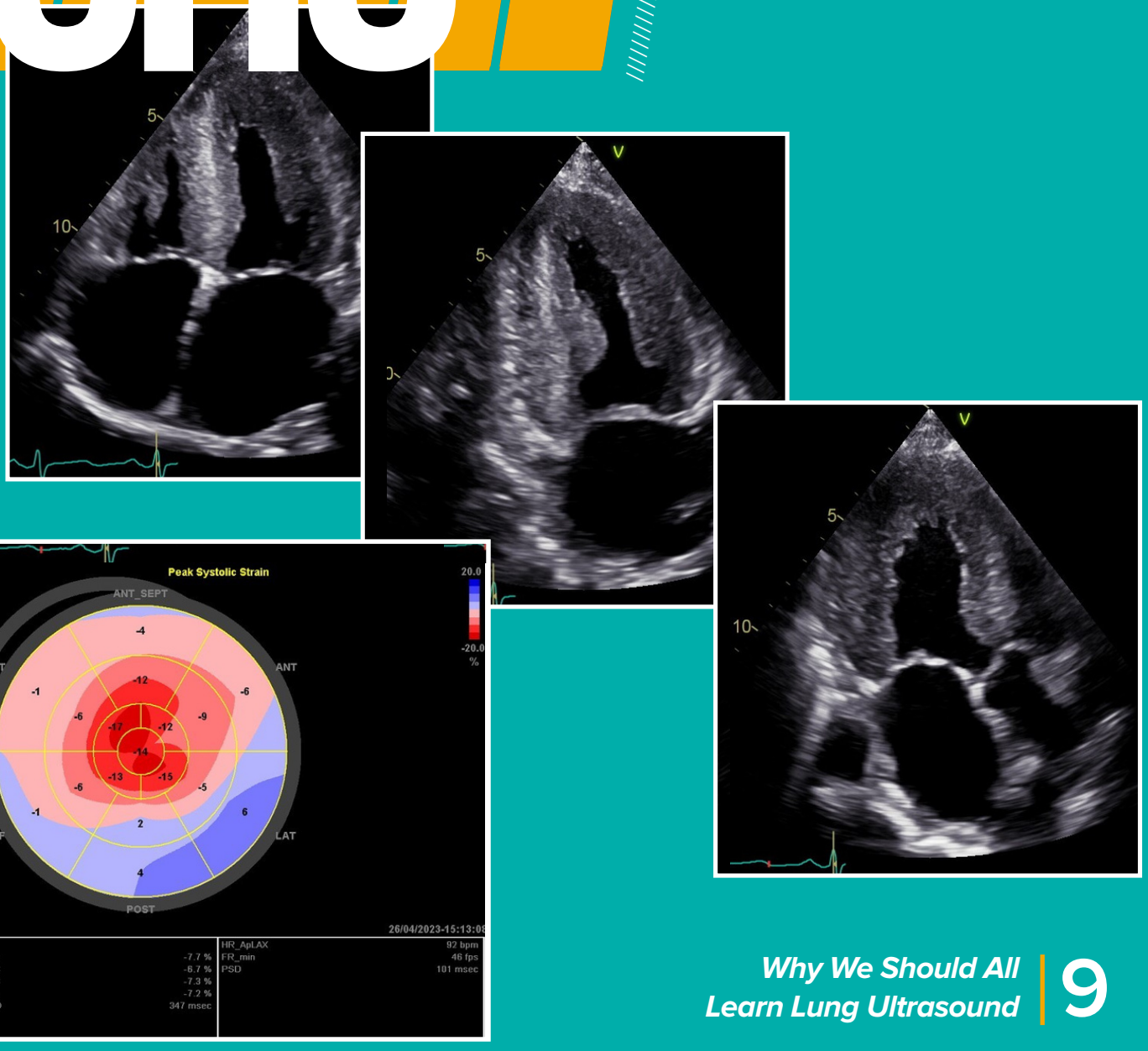

VOLUME 13 ISSUE 5 **MAY 2024**

2024 EDUCATION CALENDAR

CONTENT AVAILABLE NOW

Registered Physician in Vascular Interpretation (RPVI) Online Review Course

An overview of all vascular imaging modalities for board review, introductory learning, or as a review for experienced imaging readers

25th Annual ASCeXAM Review Course Virtual

Jointly provided by ASE and the ASE Foundation

JUNE 2024

35th Annual Scientific Sessions

June 14-16, 2024
Oregon Convention Center
Portland, OR

Jointly provided by ASE and the ASE Foundation

SEPTEMBER 2024

SAVE THE DATE

4th Annual Advanced Imaging Techniques for Sonographers

September 7-8, 2024
Virtual Experience

Jointly provided by ASE and the ASE Foundation

OCTOBER 2024

SAVE THE DATE

12th Annual Echo Florida

October 12-14, 2024
Disney's Grand Floridian Resort & Spa
Orlando, FL

Jointly provided by ASE and the ASE Foundation

SAVE THE DATE

3rd Annual Echo in Pediatric & Congenital Heart Disease

October 26-27, 2024
Virtual Experience

Jointly provided by ASE and the ASE Foundation

Discounted rates for ASE members. *To learn more and register, visit us at **ASEcho.org/Education**.*

This text also appears in the May JASE. ***OnlineJASE.com***

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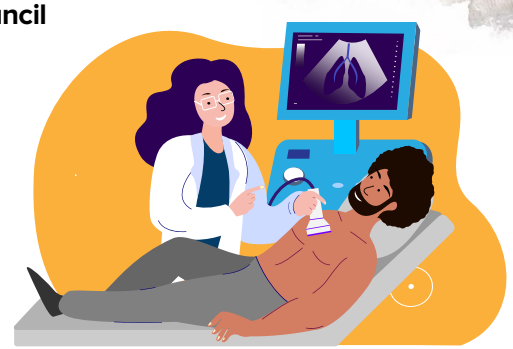

AMERICAN SOCIETY OF ECHOCARDIOGRAPHY

Meridian Corporate Center
2530 Meridian Parkway, Suite 450
Durham, NC 27713

ASEcho.org | ASEFoundation.org

Phone: 919-861-5574

Email: ASE@ASEcho.org

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American Society of Echocardiography

Cover art: "Cherry on Top" Madeline Schiminger, MPH, RDCS (AE, PE), FASE, The Johns Hopkins Hospital, Baltimore, MD

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.

THE AMERICAN SOCIETY OF ECHOCARDIOGRAPHY IS TRULY THE GLOBAL LEADER FOR ALL USERS OF CARDIOVASCULAR ULTRASOUND

Contributed by ***Benjamin W. Eidem, MD, FASE****, Director of Pediatric and Congenital Echocardiography, Mayo Clinic and Professor of Pediatrics and Medicine at Mayo Clinic College of Medicine, Departments of Pediatrics and Cardiology, Rochester, MN*

As I begin to near the end of my year as president of our Society, I cannot help but reflect on the global impact that our Society has in cardiovascular ultrasound. It is truly remarkable how many arenas that ASE impacts on a global scale, and I want to highlight many of these areas for our membership.

First, and foremost, ASE has been and continues to be the largest global organization for cardiovascular ultrasound. Our Society has more than 17,000 members, representing 112 countries. While approximately 80% of our members are US-based, almost 20% of our membership comes from outside the United States, and this number continues to grow.

> “It is truly remarkable how many arenas that ASE impacts on a global scale.”

Our International Alliance Partners Program is one key initiative that aids in our Society’s growth internationally. This program, which is 36 partner programs strong, was developed to create a pathway for collaborations and shared resources among participating membership-based echocardiography and cardiology societies. Benefits to our Society are many, including (1) greater visibility and dissemination of our guideline documents; (2) enhanced support of and interaction with echocardiography researchers through added visibility to the alliance members; (3) increased collaboration & interaction from alliance organization members; and (4) a deepening relationship with potential collaboration partners through a structured alliance program.

ASE’s strategic goals also highlight our Society’s mission to provide global leadership in all areas of our Society (Figure 1). As we, as a Society, transition to our next phase of our strategic priorities, I feel that it is

important to review our current strategic goals and their emphasis on our global priorities in all phases of our Society including research (goal 1), education (goal 2), innovation (goal 3), advocacy (goal 4), and our field (goal 5). Areas of ASE's vision and leadership include standardization, membership, collaboration, innovation, guidelines, diversity, research (including our ImageGuideEcho registry), and education.

ASE is also the voice of cardiovascular ultrasound. Our social media presence continues to significantly grow including @ASE360 on X (>28,000 followers, 30% annual increase), LinkedIn (>53,000 followers, 61% annual increase), Facebook (4% increase in followers), Instagram (>8,000 followers, >53% annual increase), and YouTube@ASE360 (>26,000 subscribers, 2.5 million lifetime views, >5,000 new annual subscribers).

ASE is committed to reaching all users of cardiovascular ultrasound. Our ASE learning hub has >62,000 users with 12 webinars hosted over the past year. Residents of 65 countries attended our webinars. ASE's four live courses (Scientific Sessions, Echo Florida, Echo Hawaii, and State-of-the-Art Echocardiography) and four virtual courses also impacted a significant number of our international colleagues.

ASE's guidelines are one of the foundations of our Society and are truly a global outreach. To date, ASE has over 80 guidelines in circulation and an additional 17 guidelines in the pipeline for future publication. These guidelines serve as a global reference for cardiovascular ultrasound with seven different language translations to date for these guidelines. ASE is committed to modernizing our guideline products because we recognize that our learners seek new content with a novel delivery and faster timelines. As an adjunct to this, ASE has created a mobile option to perform guideline measurements with our EchoGuide app which has impressively had >58,000 downloads to date.

ASE's three flagship journals, JASE, CASE, and Echo magazine, also disseminate ASE's global presence in our diverse publications, including cutting edge research (JASE), informative and illustrative case reports (CASE), and in-depth articles relating to all members of our diverse Society population (Echo magazine). It is difficult to imagine any society or organization with such timely, diverse, and inclusive content for their membership.

Finally, I would be remiss if I did not highlight our ASE Foundation (ASEF) activities in our Society's global outreach emphasis. ASEF has a long-term

commitment to our global dissemination of training, education, and global partnership offerings in both clinical and academic pursuits. ASEF's global pedigree in these efforts is nothing short of amazing with our members' participation in global outreach locations including Vietnam (2013, 2015, 2017, 2023), China (2016, 2017, 2019), Kenya (2016, 2019), Mexico (2018), Cuba (2017), Philippines (2016), Argentina (2015), and India (2012, 2014). ASE's most recent global outreach was to Vietnam in September 2023. This event included a 2-day outreach and research symposia to SaPa, Vietnam as well as a return visit to Hanoi at the Vietnam National Heart Institute at Bach Mai Hospital for a collaborative 2-day echocardiography symposium of lectures and cases presented to over 150 Vietnamese clinicians and sonographers.

Similar previous global outreach visits, to name a few, to China (September 2019 in Yan'an, Guaquan, Zhidan), Kenya (September 2019 in Nairobi, Eldoret), Mexico (August 2018 in Merida, Yucatan), Vietnam (October 2017 in Hanoi and Thanh Hoa City), China (September 2017 in Yinchuan, Guyuan, and Xian), and Cuba (April 2017 in Hauana) also resulted in exemplary interaction and teaching with local clinical personnel.

Finally, our 2024 annual Scientific Sessions will be in Portland, Oregon from June 14-16, 2024, with the overall theme of "Global Echocardiography: Innovations in Diagnosis & Beyond." This iteration promises to be the most interactive meeting to date for our Scientific Sessions and I hope all of our membership is planning to attend.

In summary, ASE is a Society dedicated to the global community of cardiovascular ultrasound. Our DNA as a Society is dedicated to the growth and leadership of our cardiovascular ultrasound modality to our patients, families, and our diverse multimodality colleagues both nationally and around the globe. I sincerely hope that our membership not only embraces this diversity but also will commit with me to be an active and vibrant participant in this effort moving forward.

"Our DNA as a Society is dedicated to the growth and leadership of our cardiovascular ultrasound modality to our patients, families, and our diverse multimodality colleagues both nationally and around the globe."

This article has been adapted from the May JASE article OnlineJASE.com

Benjamin W. Eidem,
MD, FASE
ASE President

Looking Ahead:

ASE Scientific Sessions 2024 and the CAVUS Council

*Contributed by **Rebecca LeLeiko, MD, FASE**, Emory University School of Medicine, Atlanta, GA*

THIS YEAR, THE ASE Scientific Sessions is headed west to Portland, Oregon where the conference will take place from June 14-16. The 2024 Sessions promises a new and exciting format. I hope that if you aren't already committed, I can convince you to attend. If you are booked, I hope to get you excited about the conference, especially the Circulation and Vascular Ultrasound (CAVUS) sessions.

The 2024 Session organizers have worked hard to put together a fresh and exciting conference this year. The conference duration has been shortened to two and half days. This enables more attendees to join, while balancing your time away from work and family life. We aim to make those two and a half days worth it! Gone are the days of sitting through long didactic presentations. The 2024 Sessions will be case based, with each session hosting a panel of experts. In between and after the cases, we will facilitate a discussion between the moderator and expert panel. Our aim is to cover the important teaching points and questions in a fun and dynamic environment. Of course, this includes questions and audience participation - we need you!

The 2024 Sessions will be case based, with each session hosting a panel of experts.

The CAVUS Council is excited to sponsor two main sessions. The first of our sessions is on Friday, June 14, after you have gotten settled in your hotel room and had a chance to look around. Join us at 2:15 PM for *Cutting Edge in Aortic Disease*. We will have three case presentations focused on aortic disease. Our panelists include Dr. Madalina Garbi, an international expert

on echocardiography who is coming from the Royal Papworth Hospital in the United Kingdom. She is joined by Dr. Thais Coutinho, an aortic specialist from the Mayo Clinic in Rochester, Minnesota, and Dr. Fadi Shamoun who is a vascular cardiologist at the Mayo Clinic in Phoenix, Arizona. Other esteemed panelists include Dr. Laura Dobson, a cardiologist and valve specialist at Wythenshawe Hospital in Manchester, UK, as well as Dr. Shaine Morris, pediatric cardiologist at Baylor College of Medicine and Triston Thompson, an advanced cardiac sonographer at Baylor St. Luke's Medical Center, both in Houston, Texas. This session is sure to foster a lively discussion. We will review advanced imaging options for bicuspid aortic valve disease and tools for diagnosing thoracic aortic aneurysm and acute aortic syndromes. This session will answer all your questions about the up-to-date diagnosis of aortic disease.

On Saturday we have a joint session with the critical care group called *Cutting Edge Care for Pulmonary Embolism*. This will be moderated by our own CAVUS member, Dr. Aaron Aday, a vascular cardiologist at Vanderbilt University in Nashville, Tennessee, who will review one clinical case in detail. Dr. Aday is joined by Dr. Amer Johri, a cardiac imaging specialist at Queen's University, Kingston, ON, Canada, as well as several critical care experts on the panel. This is a great opportunity to hear from experts in both vascular and critical care imaging, and learn how they approach this common disease entity.

Finally, our second sponsored session is on Sunday, June 16 at 9:15AM. *Through the Looking Glass: Advanced Imaging in SCAD, FMD and Vasculitis* is an exciting look at advanced imaging in vascular disease. This session is moderated by Dr. Aday. Expert panelists include Dr. Johri; as well as vascular cardiologists Dr. Stanislav Henkin, from Mayo Clinic, in Rochester, Minnesota; Dr. Bryan Wells, from Emory School of Medicine, Atlanta, GA; and Dr. Umberto Campia, from Brigham and Women's Hospital, Boston, MA. These experts will lead a lively discussion regarding imaging tools and techniques, diagnostic criteria, and more to improve our diagnosis and management of these diseases.

> *We hope you will join us for an exciting new ASE Scientific Sessions and look forward to seeing everyone at the CAVUS sessions.*

Please join us for an exciting new ASE Scientific Sessions! We hope to see everyone at the CAVUS sessions.

ASE 2024
PORTLAND
35TH ANNUAL SCIENTIFIC SESSIONS

Why We Should All Learn

Lung Ultrasound

*Contributed by **Sam Orde, MBBS, FASE**, Nepean Hospital Sydney, Sydney, Australia; Michael Lanspa, MD, FASE, Intermountain Healthcare, Salt Lake City, UT; and Ben Gerhardy, MD, FASE, NSW Health - Nepean Hospital, Penrith, Australia*



Lung ultrasound is arguably the most simple and quickest form of clinical ultrasound.

LUNG ULTRASOUND IS ARGUABLY the most simple and quickest form of clinical ultrasound. It is easier to learn than echocardiography. It is more accurate than clinical examination. It is more specific than chest x-rays. It does not have any safety concerns, like radiation exposure. It is faster to acquire and more repeatable than CT. It does not require any ultrasound artifact suppression processing technology and can be done at the bedside with phased array, linear, and curvilinear probes.

First described in 1974 in dog physiological studies, lung ultrasound was used to assess if diagnosis of lung pathology was possible. In 1980 ultrasound was first evaluated in humans to see if it could determine the difference between effusions vs. solid tumors. By 1989, Dr. Daniel Lichtenstein, in Paris, first described lung ultrasound use in critically ill patients to help identify life threatening respiratory pathology such as tension pneumothorax. Since then, its use in the clinical setting has grown and grown, particularly since COVID where it became standard of practice in managing these patients.

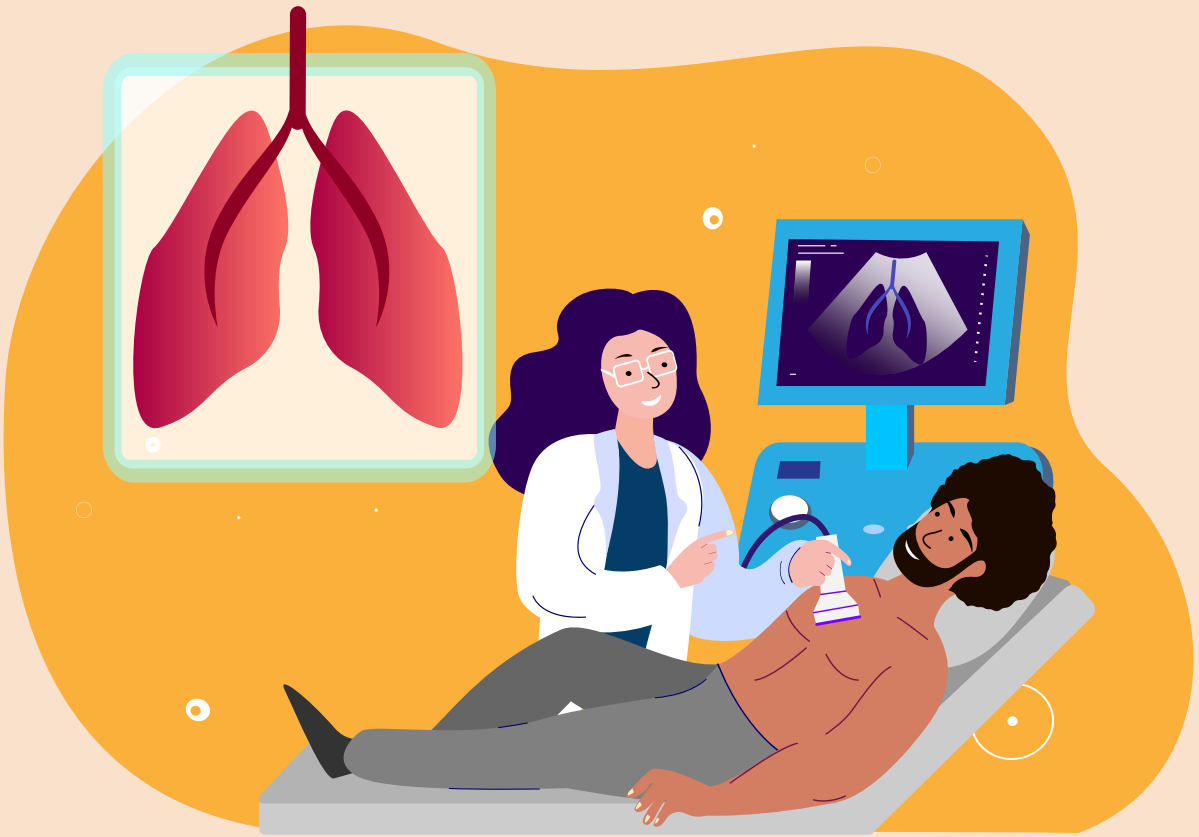
In echocardiography, we are taught to shy away from aerated areas due to low ultrasound transmission. Air has a low acoustic impedance and, if adjacent to an area of muscle which has far higher acoustic impedance; then a huge proportion of the ultrasound wave energy is reflected and little conducted to view structures behind. In addition, we are taught to recognise artifacts which impair our chance to recognise cardiac pathology.

Uniquely, lung ultrasound uses artifacts to determine normal lung parenchyma (A lines) as well as to assess the interstitial space (B lines). A lines are formed by reverberation artifacts between the pleura-lung interface and the skin-probe interface leading to sequential horizontal lines of fading echogenicity. B lines are hyperechoic vertically orientated lines that start at the pleural line, move in concert with respiration, and reach to bottom of the screen. Their presence indicates an interstitial abnormality.

Several imaging techniques for performing lung ultrasound are suggested, and several pathology specific protocols published (e.g., BLUE, RUSH, eFAST and SESAME protocols). In day-to-day clinical practice, most seem to put the ultrasound probe in similar positions to where a stethoscope would be placed: on the left and right chest, in the upper and lower, anterior, and posterior sections of the chest. (i.e., 4 or 6 lung zones on each side). A linear probe is used to image the pleural surface in detail while a curvilinear or phased array probe is used to image deeper structures in thorax.

A range of respiratory pathology can be recognized with lung ultrasound: pleural thickening and inflammation (e.g., from fibrosis), pneumothorax (both small and large), effusions (complex exudative

Several imaging techniques for performing lung ultrasound are suggested, and several pathology specific protocols published (e.g., BLUE, RUSH, eFAST and SESAME protocols).



effusions from infection versus simple transudate effusions from raised left atrial pressure), and consolidation (caused by pneumonia or atelectasis). Pleural abnormalities are often better imaged with a high frequency linear probe. In normal circumstances with no pneumothorax present, the visceral and parietal pleura move one against the other in respirophasic manner to result in a finding termed lung sliding. A or B lines may be seen below this lung sliding. When a pneumothorax is present, there is air between the visceral and parietal pleura hence no lung sliding is present. The visualization of B lines or consolidation rule out the presence of pneumothorax at the site of probe placement on the thorax; multiple sites can be rapidly examined. A pneumothorax can be detected by identification of a lung point, which represents the interface between the pneumothorax space and the partially collapsed lung.

Deeper pathology within the thorax is best imaged with the lower frequency phased array or curvilinear probes. Lung consolidation is readily visualized with ultrasound and appears as a tissue density abnormality in non-translobar of translobar distribution. The presence of mobile air bronchograms within a lung consolidation indicates a high probability of pneumonia as opposed to atelectasis causing the consolidation.

Pleural effusions appear as a relatively hypoechoic space with typical anatomic boundaries (chest wall, diaphragm, surface of atelectatic lung), and associated dynamic findings (lung movement and diaphragmatic movement) most often in dependent position. Their sonographic appearance can help determine the nature of the effusion: an anechoic effusion is likely a transudate while the presence of internal complexity (stranding, septations, homogeneous echogenicity) indicates an exudative.

Integrating clinical history and investigation with echo findings along with lung ultrasound can help to determine pathology. Consider a patient who has acute shortness of breath, tachycardia, and hypoxia with a history of cardiac disease: pathologies such as acute coronary events and pulmonary oedema may be considered as well as pneumonia and pulmonary embolism. A generalized A line pattern indicates normal aeration, so lung ultrasound directs the differential diagnosis away from acute heart failure, as no increased pulmonary interstitial fluid is seen (i.e., no B lines). Diagnoses such as pulmonary embolism, airway disease, or augmentation of respiratory drive due to metabolic disturbance with normal left atrial pressure will therefore be high on the differential list. However, if regional wall motion abnormalities are seen, acute mitral regurgitation, or echo markers of raised left atrial pressure along with multiple B lines in association with a smooth pleural surface; then acute pulmonary oedema is likely present, and further cardiac investigation and diagnostic evaluation are needed.

With its short training time and ease of performance, it complements standard cardiac imaging.

Lung ultrasound is a useful addition to standard echo and can help elucidate associated pathology (e.g., pulmonary oedema) or help identify addition diagnoses (e.g. pneumonia). With its short training time and ease of performance, it complements standard cardiac imaging. It is not without its limitations; and imaging can be challenging due to patient related factors, just as with echocardiography. However, it provides a useful additional method for evaluation of the cardiopulmonary system.

The Pediatric Advanced Cardiac Imaging Match

*Contributed by **Shiraz Maskatia, MD, FASE**, Stanford Medicine Children's Health, Palo Alto, CA*

For decades, pediatric cardiologists have sought out additional training in advanced cardiac imaging.

FOR DECADES, PEDIATRIC CARDIOLOGISTS have sought out additional training in advanced cardiac imaging. The first of these programs was developed in the 1990s, at places such as Boston Children's Hospital and Texas Children's Hospital. In the ensuing decades, dozens of programs around the country began to offer similar training. As our field has matured, these programs have become increasingly formalized, with internal criteria by which fellowship applicants are evaluated, and set curricula and metrics for periodic evaluation. Most programs offer training in transthoracic and transesophageal echocardiography. Many also offer training in fetal cardiology, while others offer training in cardiac MRI and/or CT. Finally, some programs offer training in all of the above modalities. Some programs offer positions as clinical instructors, while others offer positions via the traditional post graduate pathway. Training in clinical research is also a component of most programs, with robust mentorship and opportunities to attend academic conferences.

Currently, the Society of Pediatric Cardiology Training Program Directors has over 30 pediatric advanced cardiac imaging (PACI) programs listed on its website. New this year, categorical fellows in pediatric cardiology who are applying to a PACI 4th year fellowship will be able to apply through a match system. Working with PACI fellowship program directors around the country, the Society of Pediatric Echocardiography (SOPE) is sponsoring a match for 4th year PACI

fellowships for positions to begin in the academic year 2025-2026. This match has been officially endorsed by ASE. These fellowships include those that offer advanced training in echocardiography, fetal cardiology, cardiac MRI, and/or cardiac CT. The goals of the match system are to 1) create a common, standardized process and timeline by which categorical fellows can apply to PACI fellowships, 2) increase transparency in the application process, and 3) make access to applicants more equitable among the fellowship programs and make access to fellowship programs more equitable among the applicants.

The match will be administered through SF Match and will utilize a common application. To be eligible for the PACI match, applicants should have completed, or be scheduled to complete, a categorical fellowship in pediatric cardiology in the U.S, or a comparable international program prior to the start of the advanced cardiac imaging fellowship. Individual training programs may also have additional requirements. The PACI fellowship application period will start in July 2024 and end in November 2024, with rank lists due in December 2024. The match day will be in December 2024 and positions will begin July 2025.

While participating institutions may retain internal applicants outside of the match, the expectation is that all external candidates accepted by participating institutions during the application period will have come through the match. Many programs will elect to consider internal and external candidates as a group and rank them accordingly, similar to the categorical cardiology fellowship match. The cost to applicants is estimated to be a one-time fee of $210 paid to SF Match.

Frequently Asked Questions

Q: Why is this match being created? What is wrong with the previous system?

A: Until the match was formed, candidates had to submit applications, letters of reference, and supporting documentation to each individual training program. A centralized application process reduces the workload of the applicant significantly. Applicants had to contact each individual program in which they were interested and inquire whether they were accepting external candidates. The timeline for the application process was fluid and crept increasingly earlier in the year, forcing applicants to commit earlier in their training to advanced cardiac imaging. Programs would frequently receive inquiries about positions well after they had already selected fellows. A single, transparent, equitable process would ensure that all applicants can apply to all programs in which they are interested, and all programs would have access to all applicants. Applicants would be able to explore all opportunities throughout their second year, before applying in the beginning of their third year. They would not have to decide on a rank list until December of their third year.

A single, transparent, equitable process would ensure that all applicants can apply to all programs in which they are interested, and all programs would have access to all applicants.

Q: How many programs will participate in the match?

A: We have disseminated a survey to all programs listed through the Society of Pediatric Cardiology Training Program Directors (SPCTPD) to assess participation in the upcoming application cycle. Of the 35 active training programs, 34 responded. Of these programs, 19 (56%) responded that they will participate in the match regardless of whether or not they are keeping an internal candidate, 7 (21%) responded that they will participate unless they are keeping an internal candidate, 4 (12%) responded that they will definitely be keeping an internal candidate and therefore are not participating in the match, 2 (6%) programs were undecided, and 2 (6%) programs decided they would not participate in the match. Therefore, we are expecting the vast majority of US training positions in pediatric advanced cardiac imaging open to external applications to be filled through the match.

Q: If a categorical cardiology fellow wants to stay at the same program for a 4th year in advanced cardiac imaging and the program agrees, do they have to enter the match?

A: Many programs will consider all internal and external applicants and rank them accordingly, similar to categorical cardiology fellowship. Other programs will elect to retain an internal applicant without going through the match process. The ability to do so was important to some programs we surveyed. As such, we have a provision to allow programs to accept an internal candidate outside of the match on any given year. If a program and applicant have agreed to this explicitly, that position would not be listed as available in SF Match and the applicant would not apply through SF Match. Once a position is listed as available in SF Match, it must be filled through the match. If a program has multiple positions, they may opt to fill one or more of those positions outside of the match with an internal candidate and only positions into the match for which they are considering external candidates.

Q: Will Canadian programs be participating in the match?

A: The application timeline for Canadian programs is earlier than those of US programs. As such, they cannot participate in the match.

Q: Can prospective trainees apply through the match and then decide to pull out later? For example, can they decide to take a faculty position instead of the 4th year fellowship?

A: There is no obligation to train in a pediatric advanced cardiac imaging fellowship until the applicant submits a rank list. If an applicant ranks a program (rank list due in December), they are committing to attend the fellowship to which they match.

Q: How will the match handle different types of training programs (fetal cardiology, echocardiography, MRI/CT)?

A: The PACI match will include six different tracks: echocardiography alone (including TTE and TEE), fetal cardiology + echocardiography, MRI/CT + echocardiography, fetal cardiology alone (without specific TTE/TEE training), MRI/CT alone (without specific TTE/TEE training), and general PACI training. General PACI training describes programs which offer training in all the above modalities and allow the trainee to tailor the program to suit their needs throughout the year. Programs will specify which imaging track(s) are available at their respective institutions.

Q: Can an applicant apply to more than one PACI track?

A: Yes. Applicants will be able to see which imaging track(s) are offered by which programs and will be able to rank positions on different tracks.

Q: How will interviews be handled?

A: Interviews will be scheduled and managed directly between programs and applicants. Programs will contact applicants directly to schedule interviews. While some programs may elect to offer in-person interviews, many will offer only remote interviews over video conferencing.

Q: What happens if an applicant does not match or if a program does not fill their position?

A: Programs who do not fill a position will have the option to list their program on a post-match vacancy page. That page is public, and all applicants have access to that list regardless of if they applied through the match. Applicants who applied through the match will be able to forward their application materials to those programs through the common application system.

Clinical Excellence: What it Means to be a

Perioperative Echocardiographer in 2024!

*Contributed by **Aditya Mehta, MD**, Inova Schar Heart and Vascular, Falls Church, VA; **Kiran Belani, MD, FASE**, Northwestern Medicine, Feinberg School of Medicine, Chicago, IL; and **Qiong Zhao, MD, PhD, FASE**, Inova Schar Heart and Vascular, Falls Church, VA*

In the rapidly evolving realm of cardiovascular care, precision in perioperative imaging is pivotal in ensuring clinical excellence.

IN THE RAPIDLY EVOLVING realm of cardiovascular care, precision in perioperative imaging is pivotal in ensuring clinical excellence. With advancements continually shaping the landscape of cardiovascular medicine, it is imperative to delve into the state-of-the-art practices of perioperative echocardiography, not just within the operating room (OR) setting but also in preoperative evaluation and technology of post-processing, which has overall revolutionized the care of cardiac surgical patients. Furthermore, this exploration extends beyond technology, emphasizing the collaborative teamwork among cardiologists, cardiac anesthesiologists, cardiovascular surgeons, and sonographers as they strive towards optimizing patient outcomes and advancing the standards of care in cardiovascular medicine. Here, we briefly describe the complexities and intricacies of perioperative imaging, including transthoracic echocardiography (TTE) and transesophageal echocardiography (TEE) in 2024, which help us illuminate the path towards clinical excellence for the cardiac patients.

Perioperative echocardiography today serves as an indispensable tool in ensuring optimal patient outcomes. With its ability to provide real-time, comprehensive assessments of cardiac function and hemodynamics, perioperative echocar-

diography not only aids in preoperative risk stratification but also guides intraoperative decision-making, facilitating timely interventions and improving management strategies. As technology continues to advance, perioperative echocardiographic techniques are becoming increasingly sophisticated, enabling highly precise diagnostics and personalized patient care. Embracing these advancements promises to elevate the standard of care in perioperative cardiovascular medicine, enhancing patient safety and surgical outcomes.

Being a perioperative echocardiographer encompasses far more than simply capturing images. It embodies a multifaceted role at the intersection of technology, clinical expertise, and patient care. This entails not only mastering the technical aspects of imaging equipment but also possessing a deep understanding of cardiovascular anatomy, hemodynamics, dynamic clinical findings, and pathophysiology. Moreover, in the dynamic environment of the operating room (OR), a perioperative echocardiographer must collaborate seamlessly with a multidisciplinary team, including surgeons, anesthesiologists, interventionalists, sonographers, and nurses, to optimize patient outcomes. This role demands adaptability, critical thinking, and the ability to make extremely rapid, informed decisions in high-pressure situations. Beyond the OR, a perioperative echocardiographer plays a vital role in preoperative assessment, surgical planning and postoperative care, contributing to the full continuum of patient management.

The utilization of TTE in perioperative practice has become increasingly integral in the perioperative space, revolutionizing point-of-care hemodynamic diagnosis and management. Subramanian et al. presented a comprehensive framework, delineating the indications and protocols for both basic and advanced TTE imaging, particularly emphasizing its efficacy in preoperative evaluation.[1] The incorporation of advanced imaging not only streamlines workflow and enhances safety but also promotes perioperative efficiency and improves outcomes in both cardiac and non-cardiac settings. The larger component of perioperative echocardiography of the cardiac surgical patient involves TEE, however. Echo modalities can be utilized in each phase of patient care throughout the perioperative period.

The pre-procedural imaging phase serves as a catalyst for fostering open discourse among members of the multidisciplinary team, crucial for optimizing procedural strategies and anticipating potential challenges or complications. Sonographers and cardiologists play pivotal roles in acquiring and deciphering high-fidelity echocardiographic imagery essential for identifying emerging pathologies or evaluating the progression of diseases. Subsequently, interventional/structural cardiologists and cardiac surgeons leverage these diagnostic studies to assess patient suitability and anatomical feasibility, often discerning among a myriad of transcatheter device options, sizes, and procedural approaches. Incorporating concise and precise articulation of TEE findings, as well as thorough explication of the proposed surgical plan and potential concerns, should be integral components of the customary preoperative time-out protocol. This approach not only enhances the facilitation of echocardiographic discourse but also fosters an environment conducive to open dialogue.

As technology continues to advance, perioperative echocardiographic techniques are becoming increasingly sophisticated, enabling highly precise diagnostics and personalized patient care.

During the procedure itself, perioperative echocardiographers, which may include a combination of cardiac anesthesiologists, cardiologists, and sonographers, meticulously capture two- and three-dimensional TEE images to visualize intricate catheter movements within the heart in real-time as well as assess immediate procedural results. Cardiac anesthesiologists also rely on continuous echocardiographic monitoring, complemented by hemodynamic parameters, to ensure the safe management of the patient. Consequently, notwithstanding the complexity of the subject matter, such as instances where the proposed repair may not achieve perfec-

Dr. Kiran Belani and fellows in training doing perioperative echo in the operating room.

tion or where complications such as systolic anterior motion of the mitral valve, paravalvular leaks, or new wall-motion abnormalities arise, the actual exchange should remain characterized by clear, precise, and effective communication. We advocate that the full utilization of the expertise of the perioperative team, comprising of imagers, cardiac anesthesiologists, cardiac surgeons, perfusionists, and OR nursing staff, are critical to the success of the procedure and is the key to improved patient outcomes. This concept of the multidisciplinary team (MDT) is not new and has been fully embraced and recommended for conditions such as heart failure, adult congenital heart disease, and valvular heart disease.[2]

Post-procedure, echocardiographers promptly confirm results, both immediately and during subsequent routine assessments. In addition, the recent explosive growth of transcatheter technologies owes much to the significant contributions of procedural echocardiographers throughout all phases of the intervention process, underscoring their indispensable role in advancing cardiovascular care.

In conclusion, being a perioperative echocardiographer in 2024 requires a blend of technical proficiency, clinical acumen, and a patient-centered approach, all aimed at delivering the highest standard of care in perioperative imaging. As a perioperative imager, one is tasked with employing cutting-edge imaging modalities to provide real-time insights into the cardiovascular system before, during, and after surgical or transcatheter procedures. The strength of the team is each individual member, and the strength of each member is the team itself!

Being a perioperative echocardiographer in 2024 requires a blend of technical proficiency, clinical acumen, and a patient-centered approach.

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The Role of Echocardiographers in Contemporary TEER Procedures:

An Implanter's Perspective

*Contributed by **R. Casey Sullivan, MD**; **Tsuyoshi Kaneko, MD**; **Nishath Quader, MD, FASE**; **Alan Zajarias, MD**, and **Marc Sintek, MD**; Washington University School of Medicine, St. Louis, MO*

If interventional cardiologists and cardiac surgeons are the physical and metaphorical "hands" of the procedure, then the echocardiographer is certainly the "eyes."

"YOU CAN'T CLIP, WHAT YOU CAN'T SEE." While somewhat of a comical oversimplification, this quote highlights one essential aspect of the multifaceted role echocardiographers play in the success of mitral transcatheter edge-to-edge repair (TEER) procedures. If interventional cardiologists and cardiac surgeons are the physical and metaphorical "hands" of the procedure, then the echocardiographer is certainly the "eyes," and complete synergy between the respective operators is necessary to achieve optimal TEER results.

TEER with the Mitraclip device was initially approved for commercial use in the U.S. in 2013 for the treatment of primary degenerative mitral regurgitation (MR) in patients at prohibitive surgical risk.[1,2] In 2019 indications were extended to include patients with severe functional MR, following publication of the pivotal COAPT trial. COAPT demonstrated reduction in mortality and heart failure hospitalizations with TEER over medical therapy alone.[3] Since that time, additional TEER technologies have become available, and there has been a steady rise in the volume of TEER procedures performed annually. With greater experience, we increas-

ingly encounter TEER patients with more complex anatomy and pathologies that demand greater procedural expertise from our echocardiographers. To meet these more specialized demands, the field of interventional echocardiography has emerged with a focus on providing additional training in real-time three-dimensional (3D) imaging, multiplanar reconstruction (MPR) and non-standard views to support a wide variety of structural heart procedures.[4] Furthermore, interventional echocardiographers possess advanced knowledge of structural heart disease and the catheter-based therapies available to treat specific pathologies. Indeed, interventional echocardiographers are now an indispensable part of many successful, high-volume structural heart disease programs.

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The pre-procedural transesophageal echocardiogram (TEE) is perhaps the single most important data point of the TEER evaluation as it tells the story of the type and severity of pathology present, its' specific location within the mitral valve apparatus, and the potential feasibility of significantly impacting MR with a TEER procedure. Advancements in TEE technology including the introduction and refinement of 3D imaging and 3D MPR have allowed for more detailed assessments of mitral valve pathology than ever before. In addition, the introduction of the PASCAL and PASCAL Ace device systems (Edwards LifeSciences) and expansion of the Mitraclip system to include multiple device sizes (XT, XTW, NT and NTW), have added additional complexity and nuance to pre-procedure planning. Each of these TEER devices have unique design attributes which make them more or less well suited to specific clinical scenarios. When the structural echocardiographer synthesizes their imaging skill with knowledge of mitral valve pathologies and available TEER devices, they work more seamlessly with their interventional colleagues to determine the most appropriate device strategy for procedural success.

In addition to pre-procedural imaging, the structural echocardiographer can play a broader role in selecting appropriate patients for TEER by evaluating patients in structural heart disease (SHD) clinics and being a key discussant during multidisciplinary heart team meetings. The disparate results of the MITRA-FR and COAPT studies highlight the need for appropriate patient selection to ensure adequate clinical benefit with TEER.[3,5] At our institution we are fortunate to have outstanding interventional echocardiographers who not only support our TEER procedures but are embedded within our SHD clinics helping evaluate and follow TEER patients longitudinally. Our structural echocardiographers are a key part of all our heart team meetings and participate actively in decisions to pursue TEER. This model has undoubtedly strengthened our structural heart program as a whole and certainly led to improved TEER outcomes.

Peri-procedural image guidance is where an experienced echocardiographer is absolutely crucial to the success of a TEER procedure. Throughout the procedure, we rely on our echocardiographer to provide clear and consistent images to ensure optimal positioning of transeptal puncture, guide clip to the site of pathology and assure correct orientation, visualize grasp of the anterior and posterior leaflets and finally, ensure adequate tissue bridge and reduction of MR. A combination of 2D bi-commissural and long-axis views at various angles as well as real-time 3D and 3D MPR imaging are required to provide the most comprehensive guidance of TEER device implantation. Clear communication between the echocardiographer and interventional operators is paramount to navigate challenges as they arise throughout the procedure. The echocardiographer is also key in determining when optimal MR reduction has been achieved or when additional clips may necessary, and there should be agreement between all members of the team prior releasing a TEER device or terminating a procedure. Finally, quality surveillance transthoracic echocardiography, and TEE if indicated, are key to identifying TEER failure, device-related complications, and recurrent MR.

Having experienced echocardiographers available to review these surveillance echos can allow for prompt recognition of pathology and referral for intervention if necessary.

As the paradigm of structural heart disease management has shifted toward a multidisciplinary team-based approach, the contemporary structural echocardiographer has become even more crucial for the role they play in appropriate patient selection, pre-procedural planning, peri-procedural guidance and post-procedure follow up. You can't clip what you can't see, and perhaps more importantly, you can't clip what you don't understand. Our partnership with echocardiographers allows us to better understand our patients, their underlying pathologies, and the ways in which we can best apply catheter-based therapies to achieve optimal clinical outcomes.

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Peri-procedural image guidance is where an experienced echocardiographer is absolutely crucial to the success of a TEER procedure.

MY EXPERIENCE AS AN ADVANCED CARDIAC SONOGRAPHER MANAGING SPECIALTY CARE

Contributed by **Amber Taylor, MBA, ACS, RCS, RVS, FASE**, CHI Memorial, Chattanooga, TN

In my 14-year tenure as an echocardiographer, I have acted in many roles extending from front line multidisciplinary sonographer, department manager, and most profoundly as a patient and maternal advocate for my children in healthcare. I have registries in vascular ultrasound, adult cardiac sonography, and advanced cardiac sonography. I have experienced vast pathologies and specialties in structural heart, 3D/4D, strain imaging, and adult congenital in my scanning repertoire. As a department manager I was able to experience organizing volunteer events, empowering sonographers to do what made them passionate in this field, built programs I am proud of, applied quality improvement projects, and had many opportunities to build my communication skillset. As a patient and caretaker for children with health needs I have witnessed where healthcare systems can improve, which I have found valuable in my positions at work. I have worked for institutions that hold ample respect for our role and the value we bring to patient care, and I have worked for institutions where physicians never interact with the sonographers. I believe these backgrounds have given me a broad perspective of the healthcare system and shown me how a sonographer, empowered by the administration and cardiologists, can be the paramount connection bridging the patient to the physician.

When that empowered sonographer then gains an Advanced Cardiac Sonographer credential, they can then demonstrate advanced clinical understanding of the patient's overall care and how echocardiograms can either aid or hinder that process. It unfortunately, as many of my peers can attest, has been a vastly underutilized skill set.

Last year, I was entrusted by CHI Memorial Hospital to start a cardio-oncology clinic and an amyloidosis clinic. Historically, managing a specialty cardiac care clinic would be delegated to a nurse, however, organizational leadership trusted me with this opportunity to use my unique experience as an ACS to lead these programs. Cardio-oncology and amyloidosis are both time-sensitive areas of focus and my role allows for the process to be expedited. I ensure the scanning sonographers know how to identify risk factors and how to gain all the information that aids in the diagnosis of cardiac amyloidosis or oncological-induced cardiotoxicity. Along with training and maintaining competencies with sonographers, I provide feedback and education in real time to improve quality. Due to this infrastructure, the cardiologist has a more comprehensive and accurate diagnostic picture of the patient's condition. Using a protocol order, supported by our cardiologists, I can then initiate follow-up tests that are clinically indicated, reducing risk for patient fallout. My additional duties are patient education of their disease and treatment, aiding in facilitation of genetic testing when appropriate, acting as investigator on research trials, and planning outreach opportunities to improve equity of care. I also manage a registry of patient data, and extrapolate and present that data to the cardiologists and administrators to use when making their practice changes and improvement goals.

Instead of focusing on losing excellent sonographers to practitioner roles, we should celebrate the gain in complementary areas. In the long term doing so may help us gain recruits to the field or retain those considering leaving, while simultaneously improving conditions for the cardiologists we work with and improving the patient experience.

My unique role brings together many different specialties, making sure it is easy to schedule the patient correctly and then assuring the results are distributed quickly to aid in their continuity of care. Acting in this advanced practitioner role, I facilitate a healthcare workflow I am proud of; one that I believe we should strive for in all areas of healthcare and one in which I would entrust my loved ones. With the national physician shortage, finding areas for the ACS to improve the quality and efficiency of care could be an answer to all healthcare systems. With the concurrent shortage of sonographers, I understand administrative hesitation in removing a scanning sonographer but I believe this is short sighted. There are many reasons a sonographer leaves the field, including ergonomic injuries, lack of a career ladder and opportunity to grow, and limited pay rates. Using the ACS in elevated roles, such as coordinating cardiac specialty clinics, addresses all of these issues. Instead of focusing on losing excellent sonographers to practitioner roles, we should celebrate the gain in complementary areas. In the long term doing so may help us gain recruits to the field or retain those considering leaving, while simultaneously improving conditions for the cardiologists we work with and improving the patient experience. I see it ultimately as a win for our field and encourage other facilities to find ways to implement these credentials.

ASE 2024 HCM Forum Takes a DEEP DIVE INTO THE NUANCES OF HYPERTROPHIC CARDIOMYOPATHY

Contributed by: **Natalie Costantino**, ASE Communications Project Manager

Today, the term "deep dive" is a popular—and sometimes overused—workplace buzzword meaning a thorough or comprehensive analysis of a subject or issue; however, this phrase precisely describes the American Society of Echocardiography's (ASE) 2024 Hypertrophic Cardiomyopathy (HCM) Forum, which took place in New York City on Friday, March 8.

2024 HCM Forum Chair and ASE President-Elect Theodore Abraham, MD, FASE, addresses nearly 50 industry thought leaders, clinicians, and researchers from 12 societies and organizations during the morning General Session.

One of the goals of the 2024 HCM Forum was to *get to the bottom* of this complex and complicated disease by bringing together a diverse group of experts made up of nearly 50 industry thought leaders, clinicians, and researchers from 12 societies and organizations. These experts joined together for a full day of collaboration and *immersed* themselves in the issues, challenges, and clinical questions surrounding HCM. This chronic, inheritable disease which impacts an estimated 700,000 people in the United States, can lead to serious complications, including increased risk for atrial fibrillation, stroke, heart failure, and in rare cases, sudden cardiac death.

Special Guest Speaker Jonathan Lindner, MD, FASE, delivered a session titled Transformative Approaches to Gene Therapy in HCM, explaining how cardiovascular imaging plays a major role in not just detecting and managing HCM, but also in the identification and testing of new therapies.

However, even in the modern medical environment, 85 percent of those adults may remain undiagnosed (Bristol Myers Squibb, 2022).[1] While it was determined that there is still much to figure out about this disease, one general consensus of the Forum was the value of echocardiography and multimodality imaging in changing the future of diagnosing and managing patients with HCM.

Attendees first gathered on the evening before the start of the Forum for a Welcome Reception to encourage relationship building and camaraderie across specialties. The 2024 HCM Forum then promptly began the next morning with a General Session address from ASE President **Benjamin Eidem, MD, FASE**, and President-Elect and 2024 HCM Forum Chair **Theodore Abraham, MD, FASE**. Both ASE leaders welcomed attendees, explained the significance of this unique event, and shared that its ultimate outcome is to improve patient care by creating a clinical document containing HCM best practices.

One of the goals of the 2024 HCM Forum was to get to the bottom of this complex and complicated disease by bringing together a diverse group of experts made up of nearly 50 industry thought leaders, clinicians, and researchers from 12 societies and organizations.

Dr. Abraham, an expert in HCM diagnosis, said "While there have been many gatherings around this topic, this was a unique opportunity to pull together experts and create a sandbox where all societies come to play in an equal setting. The Forum creates an atmosphere that allows all participating societies the ability to offer their input and shape the discussion. I am thrilled at this opportunity and thankful to all the participants who gave their time and expertise to help drive advances together for the good of patient care."

Next on the agenda was a session titled *Transformative Approaches to Gene Therapy in HCM* delivered by special guest speaker **Jonathan Lindner, MD, FASE**. Dr. Lindner explained how cardiovascular imaging plays a major role in not just detecting and managing HCM, but also in the identification and testing of new therapies.

"The reason why an imaging Society is organizing this Forum is because non-invasive imaging has

played a huge role in understanding this disease—how different gene mutations lead to different manifestations and disease, and how or why patients respond to therapy," said Dr. Lindner.

He said imaging, particularly in conjunction with artificial intelligence application, could help "fine tune" clinical trials since not all HCM patients respond to treatments in the same way.

"Imaging offers a rich array of information, but there is possibly a larger role for ultrasound for new therapeutics in HCM," said Dr. Lindner.

He then led the audience through unpublished pioneering work suggesting that echocardiographic cavitation of microbubbles could play a transformative role in promoting gene therapy in HCM using the newest generation of viral vectors. He summed up the session by crediting the in-depth knowledge of the Forum attendees with their ability to "put the whole picture together."

"This room is filled with a diverse group of people who have unique skills, and this Forum creates the opportunity for innovation and future breakthroughs in management and treatment of HCM," Dr. Lindner concluded.

After a short break, attendees broke out into four Affinity Groups tasked with addressing specific questions related to each topic. Each group assembled in a separate room for 90 minutes of brainstorming and discussion on their respective topic. The small-group format of the Affinity Groups encouraged attendees to have robust, in-depth conversations about what works well for HCM patients and explored potential new ideas. They were asked to answer four questions during their discussions:

- What are the key knowledge and practice gaps in your topic?
- What are the emerging trends in your topic?

Affinity Groups

Attendees broke out into four Affinity Groups for 90 minutes of brainstorming and discussion on Diagnostic and Screening, Interventional Strategies, Medical and Gene Therapies, and Prognostic and Risk Stratification in HCM. The small-group format encouraged robust, in-depth conversations about what works well for HCM patients and explored potential new ideas.

- What is the best practice recommendation(s) for this topic?
- What are potential research topics that need to be addressed in this topic?

Each Affinity Group was also presented with questions and topics to better guide their conversations.

Diagnostic and Screening

- What is the burden of the disease?
- How do we screen and are there nuances to the current screening guidelines?
- What are standard diagnostic modalities?
- How are we establishing skills and competencies for key imaging modalities?
  - Are they adequate?
  - Do they need augmentation?
  - What is the best mechanism for consistency in measuring ejection fraction and gradients?
- When should we progress to multimodality imaging like magnetic resonance imaging, computed tomography, nuclear medicine/positron emission tomography?

Interventional Strategies

- What are the primary and emerging non-medical strategies for obstructive HCM?
  - Myectomy, ablation of various types—alcohol, radiofrequency, septal scoring along midline endocardium, PRISMA.
- What are the innovative surgical techniques beyond myectomy alone?
- Anesthesia and perioperative considerations for septal reduction therapy.
  - Same for non-cardiac surgery in HCM patients?
- Transvenous implantable cardioverter defibrillator (ICD) versus subcutaneous ICD—pros and cons—is one preferred?
- Non-medical therapies for non-obstructive HCM.

Affinity Group Presentations

Each of the four Affinity Groups presented the main points from their breakout sessions in 15-minute presentations. The outcomes from these breakout groups are being compiled into an HCM best practices document that will be submitted to various publications for widespread dissemination.

Medical and Gene Therapies

- Summary of emerging disease-specific medical therapies.
- Gene therapies and their implications.
- Role of imaging in identifying appropriate patients and monitoring of therapy.
- Potential challenges in imaging and monitoring?
- Any other emerging therapies that would be imaging focused?

Prognostic and Risk Stratification

- How effective is the current state to predict risk and disease course?
- What are the key imaging modalities and parameters that are important to prognostication?
- Is pediatric HCM the same disease or are there important differences between adults and children?
- How to treat reduced ejection fraction in HCM—do we follow guidelines or are there nuances?
- Role of transplant in HCM.

Attendees took a recess for lunch, and then once again convened for each group to present the main points from their breakout sessions in 15-minute presentations. The outcomes from these breakout groups are being compiled into an HCM best prac-

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–Dr. Lindner

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The day concluded with Dr. Abraham presenting a question to the attendees, "What resources are needed to act and continue to build educational and informational resources for HCM?" Each attendee offered a personal view of what they believed to be an important takeaway of the day. Here are a few examples of what was shared by participants:

- "The heart team model is the secret sauce of taking care of HCM patients and doing it in a form of excellence. This Forum is the heart care model right here and what we need to implement when we go back to our home [institutions and practices]."
- "One size does not fit all for patients suffering from HCM. We need to think about precision medicine and how to tailor our approach to all patients we see in our clinics."
- "It was good to hear different perspectives and challenges that we all deal with and consensus ideas on how we move forward."
- "Seeing you all in this room and all this brain power is heartwarming. Wall measurements are not equal in all people. [We need to] figure out what HCM is for the individual."
- "The best part of today was that we had the space and time to dialogue with each other without formal presentations and we actually had real discussions to come up with ideas."

Dr. Abraham concluded the day by thanking the attendees for their participation and reiterating the significance of the Forum for the field.

"The 2024 HCM Forum was intentionally multidisciplinary because improving HCM patients' care is a group effort,"

The ASE 2024 HCM Forum brought together a diverse group of experts to collaborate in one room to exchange ideas, discuss issues, share experiences, and determine the best ways to diagnose and manage patients with HCM.

said Dr. Abraham. "The ideas presented here will continue to build in significance as they radiate out to other organizations and scientists, enhancing the detection and treatment of HCM for years to come and helping our HCM patients."

The theme of the ASE 2024 HCM Forum was *Building Knowledge to Improve Patient Care*. The Forum made a *big splash* by bringing together a diverse group of experts to collaborate in one room to exchange ideas, discuss issues, share experiences, and determine the best ways to diagnose and manage patients with HCM. This is just the beginning. The clinical community and organizations will continue working to identify and discuss the opportunities and challenges in managing and treating HCM in hopes of creating a clear consensus in guideline-directed care for patients. Visit ASEcho.org/HCM to view all available resources ASE offers on HCM.

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FACULTY AND ATTENDEES

Dr. Theodore Abraham, *ASE 2024 HCM Forum Chair and 2023-2024 President-Elect*
University of California San Francisco

Alicia Armour
Duke Triangle Heart Associates

Dr. Mary Beth Brady
Johns Hopkins University School of Medicine

Dr. Matthew Czarny
Johns Hopkins Hospital

Dr. Joseph Dearani
Mayo Clinic

Dr. Jeanne DeCara
University of Chicago Medicine

Dr. Milind Desai
Cleveland Clinic

Dr. Andra Duncan
Cleveland Clinic

Dr. Benjamin Eidem
Mayo Clinic

Cody Frye
Atrium Health, Sanger Heart & Vascular Institute

Dr. Patrycja Galazka
Advocate Aurora Healthcare

Dr. Allison Hays
Johns Hopkins

Madeline Jankowski
Northwestern University

Dr. Jonathan N. Johnson
Mayo Clinic

Dr. Andrew Krahn
Heart Rhythm Society

Dr. Christopher M. Kramer
University of Virginia Health

Dr. Steven Lester
Mayo Clinic

Jane A. Linderbaum
Mayo Clinic

Dr. Jonathan Lindner
University of Virginia Medical Center

Dr. Leo Lopez
Stanford University School of Medicine

Dr. Thomas E. Macgillivray
MedStar Health Washington Hospital Center

Dr. G. Burkhard Mackensen
University of Washington Medicine

Dr. Yasdet Maldonado
Cleveland Clinic

Dr. Joseph E. Marine
Johns Hopkins University

Dr. Matthew Martinez
Atlantic Health System/Morristown Medical Center

Dr. Daniele Massera
NYU Langone Health

Dr. Carol Mitchell
University of Wisconsin-Madison

Dr. Sam Mohiddin
Barts Heart Centre

Dr. Noah Moss
Mount Sinai Hospital

Dr. Sherif Fathalla Nagueh
Methodist DeBakey Heart and Vascular Center

Dr. Srihari Naidu
Westchester Medical Center

Dr. Steve Ommen
Mayo Clinic

Dr. Anjali Owens
University of Pennsylvania

Dr. Dermot Phelan
Sanger Heart & Vascular Institute, Atrium Health

Lisa Salberg
Hypertrophic Cardiomyopathy Association

Dr. Nicholas Smedira
Cleveland Clinic

Dr. Jil C. Tardiff
University of Arizona

Dr. Andrew Wang
Duke University School of Medicine

Dr. Timothy C. Wong
University of Pittsburgh Heart and Vascular Institute

Dr. Anna Woo
Toronto General Hospital

Megan Yamat
University of Chicago Medical Center

PARTICIPATING ORGANIZATIONS AND SOCIETIES

American Academy of Pediatrics
American Association for Thoracic Surgery
Hypertrophic Cardiomyopathy Association
Hypertrophic Cardiomyopathy Medical Society
Heart Failure Society of America
Heart Rhythm Society
Intersocietal Accreditation Commission
Preventative Cardiovascular Nurses Association
Society of Cardiovascular Anesthesiologists
Society for Cardiovascular Angiography & Interventions
Society of Cardiovascular Magnetic Resonance
Society of Thoracic Surgeons

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Connecting, Collaborating, and Building Relationships at 2024 ASE INDUSTRY ROUNDTABLE THINK TANK

Contributed by **Natalie Costantino**,
ASE Communications Project Manager

Participation in the ASE Industry Roundtable (IRT) partnership creates successful alliances which foster the development of informed cardiovascular professionals, high-quality technology and products, standardized procedures, and more favorable legislative environments. On March 9 and 10, nearly 100 participants, including ASE volunteers and representatives from 16 companies, converged in New York City for connection, collaboration, and relationship building at the 2024 ASE IRT Think Tank.

In addition to offering industry partners with a scope of the field, this annual event enables participants and the Society to engage in meaningful conversations surrounding advancements and innovation. The Think Tank helps discover and develop ways for this diverse group to work together for the benefit of patients and offers insight into the growing and evolving healthcare environment.

Day one of the Think Tank began with a session from ASE President **Benjamin Eidem, MD, FASE**, and ASE Industry Relations Committee Chair **G. Burkhard Mackensen, MD, PhD, FASE**. Dr. Eidem presented industry attendees with an overview of the offerings and happenings at ASE, while Dr. Mackensen shared that the Think Tank agenda was thoughtfully crafted by the IRT Committee and IRT Partners for engagement.

"The field of cardiovascular ultrasound is growing, and the ASE IRT Think Tank brings together a diverse group of experts to help promote and guide that growth. This event creates a space for expertise, feedback, and clinical input, and brings industry partners, engineers, inventors, and clinicians to the same table," said Dr. Mackensen.

The second session on advocacy communicated the current legislative and regulatory issues affecting cardiovascular ultrasound and how they are applicable to Think Tank attendees. Advocacy Committee Chair **Dermot Phelan, MD, PhD, FASE**, and ASE's regulatory consultant and expert in health policy and reimbursement **Denise Garris**, Principal at the Korris Group, offered insight into the intricacies of advocating for the field and how the research ASE members do in collaboration with industry partners can guide advocacy efforts. They shared advocacy updates on the complexities of prior authorization, payment rates, site neutrality, and artificial intelligence. Throughout the hour session, there was an emphasis on the importance of working together and the significance of having a unified voice for echocardiography.

The next morning session was a panel discussion titled *Addressing Disparities in Cardiovascular Health*, which examined disparities in various disease states, highlighted challenges, and proposed solutions to ensure equitable patient access to cardiovascular care.

"The field of cardiovascular ultrasound is growing, and the ASE IRT Think Tank brings together a diverse group of experts to help promote and guide that growth. This event creates a space for expertise, feedback, and clinical input, and brings industry partners, engineers, inventors, and clinicians to the same table," said ASE Industry Relations Committee Chair G. Burkhard Mackensen, MD, PhD, FASE.

Moderator **Sujatha Buddhe, MD, FASE**, and panelists **Keith Collins, FASE, MS, RDCS**; **Pei-Ni Jone, MD, FASE**; **Lucy Safi, DO, FASE**; and **Ritu Thamman, MD, FASE**, relayed how disparities in race, gender, age, and region can occur in both cardiovascular diseases and interventions. Panelists discussed how inaccessibility can lead to significant cardiac issues, so there was an emphasis on how timely diagnosis in impoverished and underserved communities can create better patient outcomes. It was also determined that there is a need for more diversity in the echocardiography workforce, so that healthcare professionals more accurately reflect the patients being treated. The panel explained diversity adds a layer of sensitivity and could potentially address issues such as the current shortage of sonographers. Industry partners can assist in improving these disparities by creating opportunities, investing funds, and developing technical solutions.

After taking a recess for lunch, **Cynthia Taub, MD, MBA, FASE**, provided a brief update on an upcoming ASE guideline document titled *Standardization of Adult Echocardiographic Reporting*. As Chair of the diverse writing group, she is spearheading a document that will define universal content and stylistics in echocardiography reporting. She explained to industry partners that using consistent abbreviations, definitions, and terminology in reports reduces ambiguity for all who read it, especially patients. Industry partners can play an active role in advancing interconnectivity in the field by embracing echocardiography report standardization.

Next, ASE President-Elect and 2024 Hypertrophic Cardiomyopathy (HCM) Forum Chair **Theodore Abraham, MD, FASE**, delivered a summary of the ASE 2024 HCM Forum, which took place the day before the Think Tank. ASE's HCM Forum brought together nearly 50 industry thought leaders, clinicians, and researchers from 12 societies and organizations to discuss the issues, challenges, and clinical questions surrounding HCM. Participants in the Forum are currently working on creating a clinical document containing best practice guidelines for the disease. Industry partners were encouraged to consider other multidisciplinary conditions that could potentially follow the format of the HCM Forum. *Read more about the ASE 2024 HCM Forum in this issue of Echo magazine on pages 23-28.*

Dr. Abraham remained on stage to join fellow panelist **Jordan Strom, MD, MSc, FASE**, and moderators **Cody Frye, BA, RDCS, FASE**, and **Omar Khalique, MD, FASE**, for the final session of the day—*Navigating the Current State of Artificial Intelligence (AI) in Echocardiography: Overcoming Interpretability and*

RISE OF THE MACHINES | **Current and Future Uses of AI in Echo**

CURRENT USE	TESTING	FUTURE USE
View Classification	Diastolic Function	Prognostication
Automated Border Tracking (LVEF, GLS, LVMI)	Disease detection/classification (HCM, amyloid, AS, PAH, pericardial constriction)	Disease/symptom clustering
Automated measurements	Wall motion analysis	Scalability/POCUS
Acquisition guidance	CEUS algorithms	Tissue texture
NLP/Language Models		Cardiac monitoring/wearables
Prioritization Algorithms		Exercise response / dynamic information

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This slide, from the session titled *Navigating the Current State of Artificial Intelligence (AI) in Echocardiography: Overcoming Interpretability and Blackbox Challenges*, shares examples of the current and future uses of AI in echocardiography.

Blackbox Challenges. The panel presented an overview of the current landscape of AI in echocardiography and shared examples of the four different types of machine learning: (1) supervised learning (2) unsupervised learning (3) semi-supervised learning and (4) reinforcement learning. The session culminated with an in-depth, two-way discussion between the panel and Think Thank attendees about what each need from the other with regard to the future uses of AI in echocardiography. Comments were made both about the fears and limitations of AI, and its promise and opportunity. Discussions centered around the standardization of technologies, education on the processes of AI, and the need for large amounts of data.

Dr. Strom said, "AI algorithms are not yet working in practice because we need representative data—data that not only represents the kind of images that are seen in practice, but also the kinds of patients we encounter. Representative data will help reduce biases in care."

The second day of the Think Tank began with a *Meet the Experts* session. For more than an hour, participants engaged with ASE leaders in intimate, small-table discussions about some of the Society's top offerings for industry collaboration—education, guidelines and standards, advocacy, research and the ASE Foundation, and the ImageGuideEcho™ Registry.

Dr. Mackensen explained the value of these personal discussions by saying, "These face-to-face conversations between industry partners and ASE leaders present an opportunity for each side to share what is evolving and impacting the field of cardiovascular ultrasound and the role each can play in addressing gaps in technologies, procedures, or even the workforce."

The penultimate session of the Think Tank was a discussion titled *Mitigating Missed Opportunities: Optimizing Timing of Echocardiographic Imaging* featuring moderators **Megan Yamat, RDCS, RCS, FASE**, and ASE IRT Committee Co-Chair **Brian Davidson, MD, FASE**, and panelists **Samuel Bernard, MD, FASE**;

ASE Industry Relations Committee Co-Chair Brian Davidson, MD, FASE, (left) and ASE Industry Relations Committee Chair G. Burkhard Mackensen, MD, PhD, FASE (right).

(left to right) Panelists Keith Collins, FASE, MS, RDCS; Ritu Thamman, MD, FASE; Lucy Safi, DO, FASE; and Pei-Ni Jone, MD, FASE; join Moderator Sujatha Buddhe, MD, FASE, for a panel discussion that examined disparities in various disease states, highlighted challenges, and proposed solutions to ensure equitable patient access to cardiovascular care.

Margaret Park, BS, RDCS, RVT, FASE; and **Tam Doan, MD, FASE**. The session began with specific case examples demonstrating some of the pain points experienced in echocardiography laboratories and how those limitations can make it difficult to medically manage patients. Then, there was a group discussion on these limitations, which included workflow inefficiencies in echocardiography labs—the difficulty in abstracting clinically useful information from ordering providers and the time sonographers spend in determining the images and modalities that are needed—and the role industry partners and AI can play in integrating echocardiography reports and patient management.

The final session of the day highlighted the advancements and applications of point-of-care ultrasound (POCUS), 4D imaging, intracardiac echocardiography (ICE), and disease detection and miniaturized ultrasound devices and their impact on patient care. After introductory comments from moderators **Ashlee Davis, RDCS, ACS, FASE**, and **Renuka Jain, MD, FASE**, the panel—which also included **Craig Fleishman, MD, FASE**; **Dr. Mackensen; Karen Singh, MD, FASE**; and **Brandon Wiley, MD, FASE**—proposed

A highlight of this year's Think Tank was the *Meet the Experts* session, where attendees engaged with ASE leaders in intimate, small-table discussions about some of ASE's top offerings for industry collaboration.

nine polling questions to the audience. Industry attendees were asked for their opinions on the largest barriers in the dissemination of these session topics, as well as their input on training procedures and technological solutions. The interactive format of this session encouraged feedback from partners while also allowing the panel to share their perspectives, experiences, and observations.

Partners in Innovation is the tagline of the ASE IRT Program, and this phrase sums up exactly what makes the IRT Think Tank a special event. The Think Tank informs attendees on the current landscape of the field, while also considering possibilities for the future. As cardiovascular ultrasound continues to advance and diversify, there is strength in sharing ideas and collaborating. ASE thanks all who participated in this year's event and looks forward to continuing to thrive and innovate together.

GE Healthcare—ASE's longest IRT partnership—summed up the event by saying, "The 2024 ASE IRT Think Tank is instrumental for addressing collective challenges in echocardiography and advancing cardiovascular imaging. By uniting echocardiography leaders, this event fosters trust and enables impactful collaboration on key priorities, such as improving workflow, productivity, and supporting structural heart procedures. The robust ASE-vendor alignment further drives meaningful advancements through efficient goal setting and collaboration, showcasing the strong partnership between industry partners and ASE."

SAVE THE DATE:
ASE will host the 2025 ASE IRT Think Tank March 15-16 in New York City.

ASE'S 2024 INDUSTRY ROUNDTABLE PARTNERS

Abbott
Bracco
Bristol Myers Squibb
Cytokinetics
Edwards Lifesciences
Fujifilm Healthcare Americas Corp. (Cardiovascular Ultrasound)
Fujifilm Healthcare Americas Corp. (Medical Informatics)
GE HealthCare (Cardiovascular Ultrasound)
GE HealthCare (Pharmaceutical Diagnostics)
Intel
JenaValve
Lantheus
Pfizer
Philips Healthcare
Siemens Healthineers
Ultromics
Visura Technologies

(left to right) Panelists Brandon Wiley, MD, FASE; Craig Fleishman, MD, FASE; Karen Singh, MD, FASE; and G. Burkhard Mackensen, MD, PhD, FASE; join moderators Ashlee Davis, RDCS, ACS, FASE, and Renuka Jain, MD, FASE, on stage for a panel discussion titled *Beyond Traditional Ultrasound: POCUS, 4D, ICE, and Miniaturized Probes for When It Counts Most.*

RECOGNIZING ASE'S 2024 AWARD Winners

ASE is proud to support the cardiovascular ultrasound community through recognition of outstanding service, research, and training. We hope you enjoy reading about the impressive careers of the 2024 ASE Award Recipients, who will be recognized during the 35th Annual ASE Scientific Sessions in Portland, Oregon, June 14-16. These awards are peer-reviewed and were selected by the ASE Awards Committee, chaired by Sherif Nagueh, MD, FASE.

Physician Lifetime Achievement Award

Nancy Ayres, MD, FASE
Baylor College of Medicine
Houston, Texas

Dr. Nancy Ayres is the recipient of the **2024 Physician Lifetime Achievement Award**, acknowledging her expertise and innovative career in the field of fetal echocardiography and fetal heart disease.

After graduating from the University of Texas in Austin with a Bachelor of Arts in Biology, Dr. Ayres earned her medical degree from Texas Tech University School of Medicine in Lubbock. She completed a three-year residency in Pediatrics and the first year of her Fellowship in Pediatric Cardiology at the University of Virginia Hospital in Charlottesville, Virginia, before finishing her Fellowship at the University of Iowa Hospital and Clinics in Iowa City.

She then moved back to the Lone Star state and has held various academic and hospital appointments in the last 40 years. At Texas Children's Hospital (TCH) in Houston, she served as the Director of both the Non-Invasive Cardiac Imaging Laboratory and the Fetal Cardiac Imaging and Fetal Cardiology program for more than 30 years. Her Fetal Cardiac Intervention Program, which was started at TCH in 2012, remains active and has set the standard for advanced prenatal cardiac care and interventions in fetuses with all types of congenital disease. Currently, Dr. Ayres is an Associate Professor of Pediatrics at Baylor College of Medicine in Houston.

Dr. Ayres was the first TCH pediatric cardiologist to actively participate in fetal interventions, and along with her breadth of experience and passion for teaching and education, she has shared her knowledge with more than 200 fellows, and numerous residents and colleagues. In 1994, Dr. Ayres established a fourth-year advanced imaging fellowship training program to provide imaging expertise to categorical cardiology fellows. She's been recognized for her many contributions with multiple awards from her institution, professional societies, and Texas publications, and was the recipient of ASE's *Pediatric Excellence in Teaching Award* in 2010.

Since first joining ASE in 1992, Dr. Ayres has been an active member in the Society. She achieved Fellowship status, served on the Pediatric and Congenital Heart Disease Council and numerous committees and guideline writing groups, and is a longtime supporter of the ASE Foundation. She has also dedicated her time to monitoring and growing the next generation of ASE leaders by participating in mentorship efforts.

Dr. Ayres' immeasurable influence on the fetal echocardiography field and pediatric cardiology is on display in her many academic accomplishments. She has authored or co-authored more than 100 peer-reviewed publications, textbook chapters, and editorials, and has delivered numerous lectures nationally and internationally.

When not working, Dr. Ayres likes to travel with friends and visit with her son, who is a Navy Officer.

Sonographer Lifetime Achievement Award

Bonita Anderson, MApplSc(Med US), DMU(Cardiac), ACS, AMS, FASE
The Prince Charles Hospital
Brisbane, Queensland, Australia

Ms. Bonita Anderson is the recipient of the **2024 Sonographer Lifetime Achievement Award** recognizing her significant contributions as an echocardiography educator, her accomplishments and capabilities as an advanced cardiac sonographer, and her active involvement with ASE.

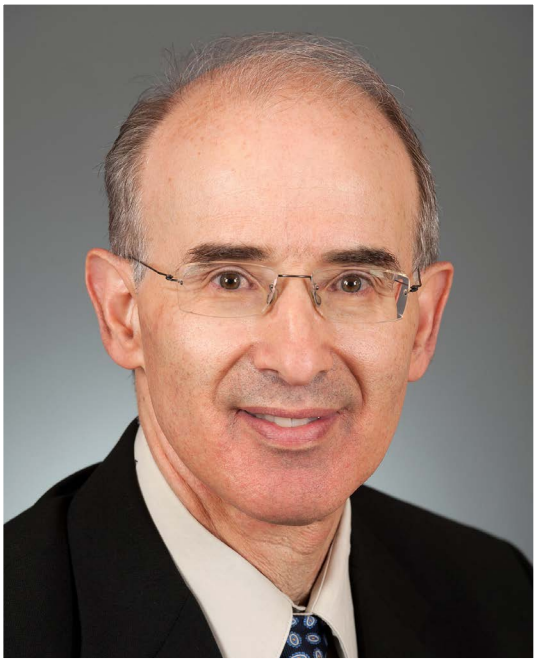
Ms. Anderson says she abides by the mantra, "If you're going to teach someone to fish, you need to go fishing yourself," and this belief has been continually present throughout her 40-year clinical and academic career. A prolific teacher and educator, Ms. Anderson co-founded the first university-based cardiac ultrasound qualification in Australia—the Graduate Diploma in Cardiac Ultrasound at Queensland University of Technology (QUT). She's also served on many local, national, and international advisory committees developing standards and establishing protocols to improve diagnostic accuracy in cardiac ultrasound.

Other notable professional achievements include authoring two textbooks, *Echocardiography: The Normal Examination and Echocardiographic Measurements* and *A Sonographer's Guide to the Assessment of Heart Disease*. Both publications are required reading by many echocardiography course providers in Australia, Europe, and the United States. In addition to sharing her knowledge and expertise through helpful educational resources, Ms. Anderson has taught hundreds of sonographers to scan, influenced thousands more, and guided many senior sonographers and medical staff in how to instruct others.

Since first joining ASE over 25 years ago, Ms. Anderson has served in positions on the Society's Board of Directors (2017-2019), *Cardiovascular Imaging Case Reports Editorial* Board, and various committees, task forces, and advisory groups. She achieved Fellowship status in 2009, received the ASE *Meritorious Service Award* in 2020, and is currently a member of the writing group for the upcoming diastolic function guidelines. She is also a member of the Australasian Sonographers Association and the Cardiac Society of Australia and New Zealand.

After earning her Associate Diploma in Clinical Measurement Techniques from the Queensland Institute of Technology, she earned a Diploma in Medical Ultrasonography (Cardiac) and a Master of Applied Science in Medical Ultrasound in the 1990s. In 2015, she was awarded an Advanced Cardiac Sonographer (ACS) credential. Ms. Anderson started her career as a cardiac technician and later advanced to a Senior Cardiac Scientist and Echocardiography Educator. At QUT, she enjoyed a 15-year academic tenure as lecturer/senior lecturer/course coordinator of the Graduate Diploma in Cardiac Ultrasound. Currently, she is a Clinical Fellow at the School of Clinical Sciences, Faculty of Health at QUT, and an Advanced Cardiac Scientist at the Prince Charles Hospital in Brisbane, Queensland, Australia.

In between work commitments, Ms. Anderson enjoys knitting and watching English murder mysteries.



Founders' Award For Lifetime Achievement In Echocardiography For PCHD

Tal Geva, MD, FASE
Boston Children's Hospital
Boston, Massachusetts

Dr. Tal Geva is being honored as the 18th recipient of the **2024 Founders' Award for Lifetime Achievement in Echocardiography for Pediatric and Congenital Heart Disease (PCHD)** for his advancements in the field of echocardiography in PCHD and his many research, clinical, leadership, teaching, and mentoring contributions.

Dr. Geva completed his medical education and residency in Pediatrics in Israel, before moving to the United States to complete a Cardiac Pathology Fellowship at Boston Children's Hospital (BCH) and Harvard Medical School and a Pediatric Cardiology Fellowship at Texas Children's Hospital (TCH) and Baylor College of Medicine. He then joined the pediatric cardiology faculty at TCH before returning to BCH and Harvard Medical School in 1994 as an Assistant Professor and attending physician in the echocardiography laboratory in the Department of Cardiology. Currently, he is the Cardiologist-in-Chief and Chairman of the Department of Cardiology at BCH, and the Alexander S. Nadas Professor of Pediatrics in the field of Cardiology at Harvard Medical School.

Throughout his more than 30-year career, Dr. Geva has focused on clinical expertise and innovation in PCHD while concentrating on cardiac imaging. Shortly after arriving at BCH in 1994, he established the first-of-its-kind cardiac magnetic resonance (CMR) program, which he also directed for nearly 10 years. It is the largest CMR program in the U.S., completing over 1,400 studies annually. Additionally, he has led a series of research initiatives on patients with repaired tetralogy of Fallot, while also supervising, performing, and interpreting more than 1,300 echocardiograms and 120 CMR annual examinations. Dr. Geva has also dedicated a large part of his professional career to the education and career development of trainees and junior faculty. Each week at BCH, he conducts an echocardiography teaching seminar for cardiology fellows, visiting physicians, and sonographers.

He has contributed to more than 100 book chapters, reviews, and editorials; published over 245 peer-reviewed original articles; is the co-editor of the textbook *Echocardiography in Pediatric and Congenital Heart Disease: From Fetus to Adult*, which is now in its third edition; and is a frequent speaker and faculty member at national and international conferences—including numerous visiting professorships.

Dr. Geva has been a member of ASE since 1994. During that time, he achieved Fellowship status in 2003; served two terms on the Board of Directors, chaired the PCHD Council, and received the 2014 *Excellence in Teaching in Pediatrics Award*.

Outside of work, Dr. Geva spends as much time as possible with his family. He enjoys cooking, classical music, and traveling.

Circulation & Vascular Ultrasound Council Luminary Award

Robert Eberhardt, MD, FASE
Boston Medical Center
Boston, Massachusetts

The Circulation & Vascular Ultrasound (CAVUS) Council is pleased to present **Dr. Robert Eberhardt** with the 2nd **CAVUS Luminary Award** for his exceptional contributions in vascular medicine and vascular imaging, and to recognize his research, clinical, and professional efforts to enhance training and quality in these areas.

After earning his Bachelor of Science in Biochemistry from State University of New York in Stony Brook, Dr. Eberhardt earned his medical degree from Albert Einstein College of Medicine in the Bronx. In the 1990s, he completed his internship and residency in Internal Medicine and Fellowship in Cardiovascular Medicine at institutions in Boston, Massachusetts. In the last 25 years, he's held various academic and hospital appointments, and is currently the Director of Medical Vascular Services and Co-Director of Noninvasive Vascular Laboratory at Boston Medical Center, and Clinical Professor of Medicine and Surgery in Cardiovascular Medicine and Vascular and Endovascular Surgery at Boston University Chobanian & Avedisian School of Medicine.

Dr. Eberhardt has served as a member and leader in various professional societies throughout his career. As an active ASE member for nearly 20 years, he chaired the CAVUS Council for two years, achieved Fellowship status in 2010, and has contributed to various ASE committees. Additionally, he served on the Board of Directors for the American Board of Vascular Medicine and Intersocietal Commission for the Accreditation of Vascular Laboratories. Other notable professional accomplishments include multiple recognitions as one of the best cardiovascular clinicians in *Boston Magazine's Best Doctors* and teaching distinctions including a *Boston Medical Center Cardiovascular Medicine Fellowship Teaching Award*.

Dr. Eberhardt's vast knowledge and experience have led to his invitation as a speaker or moderator on vascular related topics at numerous local, regional, national, and international meetings. He has also co-authored more than 70 peer-reviewed articles and book chapters. His research interests have focused on various vascular disorders, including understanding the mechanism and consequences of vascular dysfunction, as well as identifying clinical predictors of outcomes in various vascular disorders.

Additionally, his professional efforts have included a variety of mentoring activities and quality improvement projects. As an active clinician, he has dedicated time to consulting and teaching numerous fellows, residents, and medical students. He has also worked with key credentialing and accrediting organizations to enhance education and quality. Additionally, he has served on a variety of editorial boards as an official reviewer and editor.

In between work commitments, Dr. Eberhardt enjoys spending time with his family and engaging in outdoor activities including hiking and running.

2024 Outstanding Achievement In Perioperative Echocardiography Award

Feroze Mahmood, MD, FASE
Beth Israel Deaconess Medical Center
Boston, Massachusetts

The 11th recipient of the Outstanding Achievement in Perioperative Echocardiography Award is Dr. Feroze Mahmood acknowledging his impressive career as a pioneer in perioperative echocardiography and his innovative clinical, research, and educational contributions to the field.

Dr. Mahmood has played a major role in revolutionizing valve analysis and repair techniques. He established both the first transesophageal echocardiography (TEE) and transthoracic echocardiography (TTE) simulation centers in the country, which are used for training residents and fellows with probe manipulations and image acquisition techniques. Additionally, he innovated the technique of using three-dimensional (3D) echocardiographic data to print mitral, aortic, and tricuspid valves in the operating room, which has the potential to improve patient outcomes after surgery.

Dr. Mahmood completed a Fellowship in Science, earned his Bachelor in Medicine and Surgery, and began his medical training at institutions in his birthplace of Pakistan. In the late 1990s and early 2000s, he completed Clinical Fellowships in Surgery and Anesthesia from Harvard Medical School in Boston, Massachusetts, and a residency in anesthesia from Beth Israel Deaconess Medical Center. He continues to practice at both institutions today and is currently a Professor of Anesthesiology at Harvard Medical School and the Network Chief of Cardiac Anesthesia for Beth Israel Deaconess Medical Center.

Nationally and internationally recognized for his expertise on perioperative and 3D echocardiography, Dr. Mahmood is a frequent invited speaker and presenter at conferences and institutions worldwide. He is the co-author of two electronic books on echocardiography, as well as multiple original research and review articles, and book chapters. His research interests include cardiac angiogenesis, cardiac valve repair techniques, 3D imaging and printing, imaging for structural heart diseases, and the development of innovative pedagogy techniques. His dedication to education is also demonstrated in his various editorial activities, and teaching and training responsibilities of numerous residents, clinical fellows, and research fellows.

Dr. Mahmood first joined ASE in 2002 and achieved Fellowship status in 2015. He has served on both the ImageGuideEcho™ Registry Committee and Interventional Echocardiography Council Steering Committee, as well as the 2023 Scientific Sessions Program Committee. Additionally, he has been involved with various ASE Specialty Interest Groups, task forces, and workforces. He is also active in many other professional societies, and has served on the Society of Cardiovascular Anesthesiologists (SCA) Board of Directors and as a Director of SCA's Echo Week course.

In his free time, Dr. Mahmood is an avid squash player and operates a YouTube channel titled *Boston Cardiac*, where he shares educational videos on echocardiography.

2024 Meritorious Service Award

Cecilio "Leo" Lopez, MD, FASE
Stanford Children's Hospital
Palo Alto, California

Dr. Cecilio "Leo" Lopez is the recipient of the **2024 Meritorious Service Award** recognizing his extensive accomplishments in pediatric echocardiography and celebrating his long career as a clinician-researcher, mentor, and volunteer. Dr. Lopez has devoted an immeasurable amount of time advancing the Society and the field.

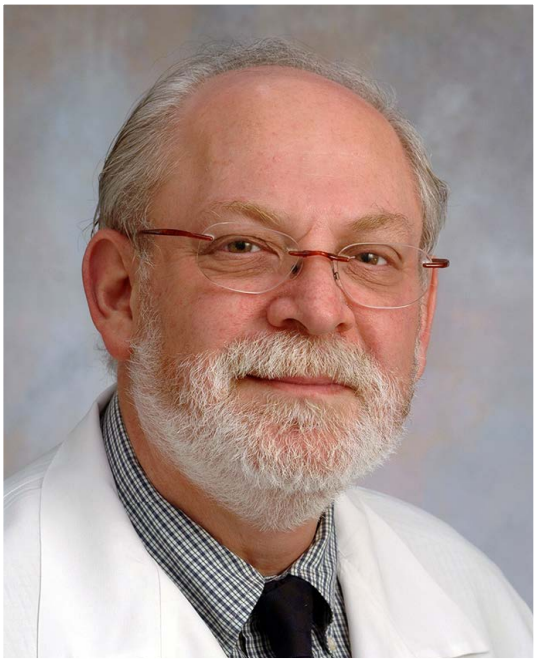
Since joining ASE in 1999, Dr. Lopez has held many leadership and membership roles, serving three terms on the ASE Board of Directors; chairing or co-chairing numerous councils, committees, sub-committees, writing groups, and task forces—including the Pediatric and Congenital Heart Disease Council; and, in recent years, engaging with the ASE Foundation, micro-volunteering projects, and numerous ASE guideline documents. He achieved Fellowship status in 2006 and is currently Co-Chair of the Education Committee, Abstract Co-Chair of the 2024 Scientific Sessions Program Committee, and a member of the ImageGuideEcho™ Pediatric Registry Sub-Committee.

Dr. Lopez is an active member and leader in other professional organizations. He served as President of the Society of Pediatric Echocardiography, is the current President of the Intersocietal Accreditation Commission Echocardiography, and has served on nearly 10 advisory boards for various organizations, including the *Journal of the American Society of Echocardiography* Editorial Board. He has participated in multiple medical missions to Guatemala, Russia, El Salvador, Peru, and Haiti.

He has published over 100 peer-reviewed and invited journal articles, review articles, and editorials; authored more than 20 book chapters; is the co-editor of two textbooks—including *Echocardiography in Pediatric and Adult Congenital Heart Disease*; and is a frequent speaker at regional, national, and international conferences. Additionally, Dr. Lopez has mentored numerous fellows and residents in the pediatric imaging community.

After earning his Bachelor of Arts in Biophysics from Johns Hopkins University, Dr. Lopez earned his medical degree from the University of Pennsylvania. He completed his internship and residency in Pediatrics, as well as his Fellowship in Pediatric Cardiology and Advanced Echocardiography, at Boston Children's Hospital and Harvard Medical School. Since that time, he has worked in New York City and Miami and is currently a Clinical Professor of Pediatrics at Stanford University School of Medicine, having recently stepped down as Medical Director of Echocardiography at Lucile Packard Children's Hospital Stanford.

In his free time, Dr. Lopez enjoys performing in musical productions at several local community theaters. He loves hip hop dancing and performs regularly with his dance crew NTL, which stands for Never Too Late. Lastly, he continues to sing with the doctor band Baby Blue Sound Collective, now in the process of completing its third album which will be available on iTunes.



Mentorship Award

Roberto Lang, MD, FASE
University of Chicago Medical Center
Chicago, Illinois

Dr. Roberto Lang is the recipient of the **2024 Mentorship Award** honoring his leadership and influence in cardiovascular ultrasound, decades-long involvement with ASE, and his exceptional commitment to mentorship.

Since joining ASE in 1991, Dr. Lang has held a number of noteworthy volunteer and leadership positions in almost every facet of the Society. He served as Board of Directors President from 2009-2010 and has Chaired or Co-Chaired a large number of ASE committees, task forces, writing groups, and editorial boards. He achieved Fellowship status in 2002, delivered the Edler Lecture at the 2012 ASE Scientific Sessions, and is a two-time past award winner receiving the 2015 *Meritorious Service* and 2008 *Richard Popp Excellence in Teaching* awards. He is also an active ASE Foundation volunteer and attended global health outreach events in Mexico, Cuba, and Argentina.

Throughout his career, he has published more than 700 manuscripts on cardiac imaging and physiology, written more than 100 book chapters, authored nearly 900 abstracts, and edited 12 books—including *ASE's Comprehensive Echocardiography* textbook, now in its third edition. He is a pioneer in the development of three-dimensional transthoracic and transesophageal echocardiography, a noninvasive technique that is used worldwide to diagnose heart disease.

Dr. Lang is a fellow in multiple professional societies and has served on the Editorial Boards of most cardiology peer-reviewed journals. He is currently the Board of Directors President of the National Board of Echocardiography, Inc.

The depth and breadth of Dr. Lang's career goes beyond his personal accomplishments. From physicians and sonographers seeking to sharpen their diagnostic skills to promising researchers embarking on a career of scholarship, Dr. Lang has influenced countless individuals from diverse backgrounds and regions across the globe. Throughout the years, he's graciously shared his knowledge and expertise with others—many of whom have exceled to leadership roles at their own institutions and many more who will become the next generation of leaders. Mentees frequently praise his contagious and joyous enthusiasm, his love for scientific discovery, and his enjoyment at seeing others succeed.

Dr. Lang earned his undergraduate and medical degree from Universidad Nacional de Buenos Aires in Argentina and completed his postdoctoral training at institutions in Israel, Wisconsin, and Illinois. Since 1985, he's held various academic appointments at the University of Chicago Medical Center in Illinois. Currently, he serves as the institution's Director of the Cardiac Noninvasive Imaging Laboratory and the A.J. Carlson Professor of Medicine.

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.